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Folder ID: 1760186

Series: Central Files

Dates: 01/01/1973 - 12/31/1973

Fonds: Records of the Consultative Group on International Agricultural Research (CGIAR)

ISAD Reference Code: WB IBRD/IDA CGIAR-4177S

Digitized: 5/3/2021

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G - 2 - C . I . A . T .

1972/74
Vol. 11



1760186

Correspondence 72/74-02

A2003-012 Other #: 68 Box # 205558B

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December 31, 1973

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Volume II

RECORDS MANAGEMENT SECTION

A PROPOSAL FOR INCREASED RICE PRODUCTION IN THE HUMID

TROPICS OF THE AMERICAS

LOYD JOHNSON

PETER R. JENNINGS

The vast, fertile, naturally flooded, and poorly drained lowlands of tropical Asia are used largely for rice production. Techniques have been developed over centuries to render these soil and water resources into some of the world's most productive farm lands.

In contrast, similar lowlands in the alternative wet-dry climate of the American tropics remain unproductive. Historical restraints to exploitation of the ill-drained American lowlands included human diseases and the absence of animal power for land preparation. Malaria and yellow fever now are controlled and power equipment is widely available.

Major irrigation and drainage projects are underway in several Latin American countries to develop the humid lowlands for intensified agriculture. The projects are centered in huge areas still subject to periodic and uncontrolled flooding.

These projects were designed and developed for upland crops including maize, beans, sorghum, and cotton. Certain problems have reduced the utilization of these irrigation and drainage projects. These include strong wet and dry seasons, difficulties with internal and surface drainage, saline soil spots, and infestation with nut grass and other weeds resistant to herbicides. During the dry season fields are too dry to prepare and plant. Irrigation is difficult because of local high and low spots. During the wet season there are difficulties in dry land preparation due to local ponding of water and massive growth of weeds.

This proposal features a shift from upland crops to rice as the most feasible means of increasing food production in these areas. The rice technology required for widespread farming of the American tropics is available. This technology differs from the successful Asian rice culture only in two major respects. First, land is prepared in water with large power equipment by methods developed at CIAT and IRRI rather than with the water buffalo or hand tractor. Second, the crop would be established with hand-broadcast, pregerminated seed rather than transplanted. The proposed system would depend upon hand labor for planting, fertilizing, spraying for weed and pest control, harvesting, and threshing.

This modified technology, using modern varieties and methods developed in Colombia, has been successfully tested on commercial scale at CIAT. Two successive rice crops on CIAT fields, formerly unsuitable for any other crops, have leached out saline spots, controlled nut sedge, and resulted in precise land levelling. An average of 6 tons/ha/crop has paid for the development of land now suitable for a range of upland crops. A large scale application of this rice technology is underway at the ICA station "Turipana" located within INCORA Project No. 2. About 1,400 ha will be developed by continuous, year-around land preparation for water seeding of rice. The rice harvests will pay for land development and for future cultivation on portions of the station of upland crops. The remainder of the station will remain in commercial rice production. A cash flow estimate for the conversion of Turipana into a productive farm is attached as Appendix A.

The experience gained at CIAT and Turipana will be extended and further modified as required for the opening of the American tropics for rice production.

Initiation and Location of the Proposal

The conversion of the naturally flooded ill-drained lowlands to rice production should begin within one of the existing irrigation and drainage schemes. The developed water control facilities permit year-around cultivation and expansion of area. The work undertaken would not be research or experimentation in the conventional sense. Rather, it would put into practice proven technology. Ideally, small land holders would serve simultaneously as the paid labor force and as "trainees". As they absorbed the technology involved they would progressively convert their farms into rice culture.

Similar, agronomists from other irrigation and drainage projects would be brought in to participate in the work. Once trained they would return to practice the technology in their respective projects. The staff involved would be in contact with major existing and proposed irrigation and drainage projects to assist in planning and development of these projects for minimum capital investment and maximum and immediate production to pay for the projects costs.

The several irrigation and drainage projects begun in the American tropics encompass a large area but represent a small fraction of the potentially productive naturally flooded lowlands. This huge area has no water control at present but can produce rice during the wet season. The same technology, excepting the varieties, would be practiced for these areas lacking water control. The staff involved would introduce, evaluate, multiply, and distribute the better dwarf rices carrying floating genes which allow rapid stem elongation in moderately deep water. Capital generated by rice cultivation in areas lacking drainage would finance low-cost water control schemes around

the periphery of the large irrigation and drainage projects. Thus, conversion of land into production would progress from the most favored toward the most difficult areas, using rice harvests as the financing mechanism.

Staff Requirements for the Proposal

Three experienced rice scientists would comprise the rice production team. Although to some extent their areas of responsibility would overlap; one would handle land preparation, machinery, irrigation and drainage; the second would work with cultural practices; the third would be responsible for varietal evaluation and increase. An agricultural economist should be associated with the project to estimate social benefits and consequences of progress realized.

Proposal Expectations and Potential

The proposal has as its major objectives the massive increase of rice production on land that at present is now marginally productive and the development of this land for rice and other suitable crops as needed. Consequently, the staff involved would expect to be rated on the criterion of increased production of rice and other crops on the developed area. The potential of this activity would be the conversion of specific areas of the American tropics into a major world producer of rice and increase in other crops. The magnitude of the potential is estimated as 120 million hectares of recent tropical alluvial soils of which 10 to 60 million hectares may be developed for rice following the Asian pattern ^{1/}. This rice culture would provide direct employment of one person per every 2 to 4 hectares or direct employment of 2.5 to 30 million rural laborers. The developed rice area would

^{1/} Extensive supporting evidence for this estimate and related proposal potentials is detailed in Appendix B.

meet the requirements of rice in the Americas and leave a surplus for present and future world market requirements. This marketable surplus would be expected to replace the supplies previously provided from Thailand, Burma and Indochina from similar soils and climatic zones. Excess supplies could be used for industrial uses and animal feeds until needed for direct human consumption. A rapid substitution of rice for wheat, corn, cassava and plantains might be expected as the price of rice drops due to increased production. The additional consumption would then serve to stabilize the price.

APPENDIX A. - CASH FLOW (\$US) FOR THE DEVELOPMENT OF ICA-TURIPANA EXPERIMENT STATION INTO A PRODUCTIVE FARM

	UNITS	QUANTITY PER HECTARE	VALUE PER UNIT	DOLLARS PER HECTARE	JULY-1 DECEMBER-31 1973	JAN-1 JUNE-30 1974	JULY-1 DECEMBER-31 1974	JAN-1 JUNE-30 1975	JULY-1 DECEMBER-31 1975	JAN-1 JUNE-30 1976	JULY-1 DECEMBER-31 1976	JAN-1 JUNE-30 1977
Area first prepared and planted to rice	Ha	1.0	-	-	100	100	200	300	300	300	-	-
Area planted second time to rice	Ha	1.0	-	-	-	100	100	200	300	300	300	600
Developed area replanted to rice	Ha	1.0	-	-	-	-	100	200	400	700	700	700
Developed area in other crops	Ha	1.0	-	-	-	-	100	200	400	700	1000	1300
Total Area developed	Ha	1.0	-	-	24	140	233	367	533	600	600	600
Area harvested per period	Ha	1.0	-	-	24	140	233	367	533	600	600	600
Total Sales per period	Kg	5000	0.10	500	12000	70000	116500	183500	266500	300000	300000	300000
EXPENSES FOR PERIOD - TOTAL					(26600)	(8120)	(4360)	(10320)	32560	62040	62340	60840
BALANCE					6000	8500	14500	23000	25500	25500	15000	15000
1.0 RENTAL OF EQUIPMENT - SUBTOTAL	Ha	1.0	60	60	6000	6000	12000	18000	18000	18000	15000	15000
1.1 First land preparation	Ha	1.0	25	25	-	2500	2500	5000	7500	7500	15000	15000
1.2 Second land preparation						2500	2500	5000	7500	7500	22500	30000
2.0 RENTAL OF LAND - ICA - SUBTOTAL	Ha	1.0	0	-	-	-	-	-	-	-	-	-
2.1 First crop - rent	Ha	1.0	25	25	-	2500	2500	5000	7500	7500	7500	-
2.2 Second crop - rent	Ha	1.0	25	25	-	-	-	-	-	-	15000	30000
2.3 Third and later crops - rent	Ha	1.0	50	50	-	-	-	-	-	-	15000	15000
3.0 IRRIGATION WATER FEES INCORA	Ha	1.0	25	25	2500	5000	7500	12500	15000	15000	15000	15000
4.0 MATERIALS AND SUPPLIES - SUBTOTAL					110	11000	22000	33000	55000	66000	66000	66000
4.1 Seeds	Kg	100	0.25	25	2500	5000	7500	12500	15000	15000	15000	15000
4.2 Fertilizer - Urea	Kg	200	0.15	30	3000	6000	9000	15000	18000	18000	18000	18000
4.3 Insecticide - Furadan 3% granules	Kg	20	1.00	20	2000	4000	6000	10000	12000	12000	12000	12000
4.4 Herbicide	Lts	10	2.00	20	2000	4000	6000	10000	12000	12000	12000	12000
4.5 Small tools, threshers, etc.	Misc.			10	1000	2000	3000	5000	6000	6000	6000	6000
4.6 Miscellaneous and unforeseen				5	500	1000	1500	2500	3000	3000	3000	3000
5.0 CONTRACT LABORERS - SUBTOTAL					152	10640	25200	39980	64820	82380	86400	81600
5.1 Levee construction and repair	Man-days	8.0	2.00	16	1600	1600	3200	4800	4800	4800	-	-
5.2 Levee maintenance	Man-days	4.0	2.00	8	800	1600	2400	4000	4800	4800	4800	4800
5.3 Broadcasting seed	Man-days	1.0	2.00	2	200	400	600	1000	1200	1200	1200	1200
5.4 Broadcasting fertilizer	Man-days	2.0	2.00	4	400	800	1200	2000	2400	2400	2400	2400
5.5 Broadcasting or spraying insecticide	Man-days	1.0	2.00	2	200	400	600	1000	1200	1200	1200	1200
5.6 Weed control	Man-days	16.0	2.00	32	3200	6400	9600	16000	19200	19200	19200	19200
5.7 Irrigation water control	Man-days	10.0	2.00	20	2000	4000	6000	10000	12000	12000	12000	12000
5.8 Harvest (contract service)	Kg	5000	0.012	60	1440	8400	13980	22020	31980	36000	36000	36000
5.9 Miscellaneous and unforeseen	Man-days	4.0	2.00	8	800	1600	2400	4000	4800	4800	4800	4800
6.0 SALARIED PERSONNEL - SUBTOTAL					60.50	8460	14920	23380	33500	37560	37560	31560
6.1 Agricultural Engineer and Trainees	Man-month		400	24	2400	4800	7200	7200	7200	7200	7200	7200
6.2 Agronomist and trainees	Man-month		400	24	2400	4800	7200	7200	7200	7200	7200	7200
6.3 Secretary - clerk	Man-month		100	3.00	300	600	900	1500	1800	1800	1800	1800
6.4 Tractor driver	Man-month		100	10	1000	2000	3000	5000	6000	6000	6000	6000
6.5 Labor foreman	Man-month		60	3.60	360	720	1080	1800	2160	2160	2160	2160
6.6 Topography crew and trainees	Man-month		100	20	2000	2000	4000	6000	6000	6000	6000	-

APPENDIX A. TABLE
SCHEDULE OF PLANTING AND HARVESTING

	A R E A			
	PLANTED	HARVESTED	PERIOD	
	HA.	HA.	HARVEST	
July 73	4			
Aug. 73	20			
Sept. 73	-			
Oct. 73	25			
Nov. 73	25	4		
Dec. 73	26	20		24
Jan. 74	33			
Feb. 74	33	25		
March 74	33	25		
April 74	33	26		
May 74	33	33		
June 74	33	33		140
July 74	50	33		
Aug. 74	50	33		
Sept. 74	50	33		
Oct. 74	50	33		
Nov. 74	50	50		
Dec. 74	50	50		233
Jan. 75	83	50		
Feb. 75	83	50		
March 75	83	50		
April 75	83	50		
May 75	83	83		
June 75	83	83		367
July 75	100	83		
Aug. 75	100	83		
Sept. 75	100	83		
Oct. 75	100	83		
Nov. 75	100	100		
Dec. 75	100	100		533
Jan. 76	100	100		
Feb. 76	100	100		
March 76	100	100		
April 76	100	100		
May 76	100	100		
June 76	100	100		600
July 76	100	100		
Aug. 76	100	100		
Sept. 76	100	100		
Oct. 76	100	100		
Nov. 76	100	100		
Dec. 76	100	100		600

APPENDIX A

Table 3. - Equipment cost per hectare to repair and clean levees,
rototill and final level for second planting of rice
on ICA-Turipana Experiment Station

	<u>COST</u>
1. Repass to clean and repair levees with tractor, rototiller and levee shaper each \$ 5.00 per hour and 1.0 hour per hectare	\$ 5.00
2. Rototill land previously prepared and planted to rice with fair water coverage and medium vegetation each \$ 5.00 per hour and 3.0 hours per hectare	15.00
3. Final puddling and leveling prior to planting each \$ 3.33 per hour and 1.5 hours per hectare	<u>5.00</u>
	\$ 25.00

APPENDIX B. Supporting evidence on the potential of the proposal for increased rice production in the humid tropics of Latin America

- A. The World Food Problem, Volume II. A report of the president's science advisory committee. The White House, 1967.

p. 407. " The largest areas of potentially arable land lie in Africa and South America which, outside the relatively small continents of Europe and Australia, have the smallest cultivated areas".

" In Asia, if we substract the potentially arable land area in which water is so short that one 4-month growing season is impossible, there is essentially no excess of potentiãlly arable land over that actually cultivated ".

" In South America and Africa, we can be optimistic about the potential land and water resources. The limiting factors in agricultural development are not natural resources, but economic, institutions, and social problems ".

P. 408. " The need to develop the agricultural potential of the humid and subhumid tropics is a long-range need. ... we should concentrate on the development of research and teaching institutions. It will also be important to increase communication and coordination between different workers and to attempt to recapture what was learned from previous experiences ".

"Most major irrigation projects are concerned with only a small part of the total picture. Such projects normally are limited

(10)

to storage dams, diversion structures, canals and laterals, and in some cases to tubewells. All involved in project planning, project authorization, and project operation should recognize the vital necessity of providing adequately not only for water but for all the inputs and processes that are required if an irrigation scheme is to make a major contribution to the increased agricultural productivity of the nation. Only by providing in a timely manner all of the inputs required to make an irrigation project fully productive can the high cost of such projects be really justified. The information required for making intelligent decisions on location and magnitude of irrigation projects is generally inadequate in the developing nations. Training of personnel and providing of organizational capability for planning and implementation of projects within the concerned nations needs more attention. It is likely that these requirements may be more difficult to provide than the capital for construction".

P. 452-3. 7.4.5.6 "Integrated Planning and Management". Why is it that after an irrigation dam and main canal facilities have been constructed, measures to use this costly water with high efficiency are often overlooked or minimized? There are several reasons. One stems from the fact that large dams and canals are impressive and created visible monuments to the accomplishments of governments and assistance programs. On the other hand, the extensive network of small distributaries, head ditches, properly graded farm fields, simple water control devices, irrigations scheduled in accordance with the crop needs, and drainage systems are far less spectacular and may

not even be visible at all to the traveler or to the political leaders of a country. As a result, those measures necessary to achieve efficient utilization of developed water supplies seldom receive the financial support necessary to carry them out thoroughly enough to permit maximum crop production from the irrigation scheme. "

" In developing countries, the irrigation engineer is usually concerned with storage, diversion and conveyance of water. He is rarely involved even in the distribution of water to user associations, let alone to the farmer's fields. A fundamental part of engineering education for agriculture in these countries to be full recognition that an irrigation project is not complete until water has reached the last row of the last farm on a schedule in accordance with the needs of the crop, and any surplus has been taken care of by a suitable drainage system. Not only the project engineers but government officials, legislators, and other policy makers need to recognize that sound water management is as essential as water development if costly irrigation schemes are to contribute substantially to agricultural production ".

P. 434. Table 7-9. In Asia 83% of the arable land is cultivated. In Latin America 11% is cultivated.

P. 483. Table 8-5. Asia has 420 million acres of alluvial soils. Latin America has 295 million. Sixty eight percent of the alluvial soil in Asia is classified as potentially arable and 12 per as potential grazing land. In Latin America 13.5 percent is classified as arable under technology equivalent to that of the

United States and 64.4 percent is classified as potential grazing land. If Asian rice technology were adapted and used instead of the U.S. technology then some 140 million acres of alluvial potential grazing land could probably be reclassified as potentially arable. The dark colored soils and highly weathered and leached soils also should have large areas of potential rice soils using Asian technology.

Food, Population, and Employment. The impact of the Green Revolution.

Eds. T. T. Poleman and D. K. Freebairn. Praeger Publishers. New York. 1973

Table 9.5

Agricultural Mechanization in Asia. Vol. IV, No. 1. Farm Machinery

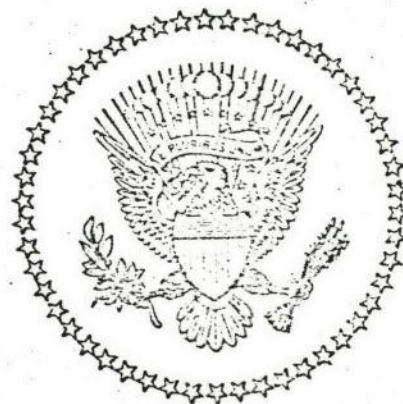
Industrial Research Corporation. 1973

Table 2

Table 4

Table 6

THE WORLD FOOD PROBLEM



*A Report of the
President's Science Advisory Committee*

VOLUME II

Report of the Panel on the
World Food Supply

THE WHITE HOUSE

MAY 1967

TABLE 7-9.—Present population and cultivated¹ land on each continent, compared with potentially arable land

See 474

Continent	Population in 1963 (millions of persons)	Area in billions of acres			Acres of cultivated ¹ land per person	Ratio of cultivated ¹ to potentially arable land (percent)
		Total	Potentially arable	Cultivated ¹		
(1)	(2)	(3)	(4)	(5)	(6)	
Africa.....	310	7.46	1.81	0.39	1.3	22
Asia.....	1,855	6.76	1.55	1.25	.7	83
Australia and New Zealand.....	14	2.03	.38	.04	2.9	2
Europe.....	445	1.18	.43	.33	.9	83
North America.....	255	5.21	1.15	.59	2.3	51
South America.....	197	4.33	1.68	.19	1.0	11
U.S.S.R.....	234	5.52	.88	.56	2.4	64
Total.....	3,310	32.49	7.88	3.43	1.0	44

¹ Our cultivated area is called by FAO "Arable land and land under permanent crops." It includes land under crops, temporary fallow, temporary meadows, for mowing or pasture, market and kitchen gardens, fruit trees, vines, shrubs, and rubber plantations. Within this definition there are said to be wide variations among reporting countries. The land actually harvested during any particular year is about one-half to two-thirds of the total cultivated land.

SOURCES

Column (1): Revelle, R., Population and food supplies: the edge of the knife. Nat. Acad. Sci. Proc. 56(2): 328-351. August 1966, and United Nations. Demographic Yearbook, 1964. New York, 1965.
 Column (2): U.S. Defense Intelligence Agency General Guide for estimating significant soil characteristics for predicting the gamma hazard from neutron-induced activity. U.S. Dep. Defense, 1953.
 Column (3): See Tables 7-6, 7-7, 7-8 of this chapter.
 Column (4): Table 1 in: Food and Agriculture Organization of the United Nations. Production Yearbook, 1964. Rome, 1965.

Of the total potentially arable land in the world, about 850 million acres or 11 percent of the total requires irrigation for even one crop. In the remaining nearly seven billion acres, at least one crop could be grown without irrigation, and over a considerable region, multiple-cropping is possible. Without irrigation, multiple-cropping could increase the gross cropped-area (the cultivated area times the number of crops) to 9.8 billion acres annually, about 2 billion acres more than the total arable land and about 3 times the presently "cultivated" land. The gross cropped-area could be increased an additional 6.5 billion acres if irrigation water could be made available for double- or triple-cropping. The maximum gross cropped-area on the earth is thus 16.3 billion acres.

All potentially arable land is also potential grazing land, and all that is not too dry can also be used for economically productive forestry. An additional 28 percent of the land area of the earth has some grazing potential, even though it is not potentially arable. Without high level technology, however, we estimate (See Table 7-5) that the total potential annual production of this grazing land is only about 24 million tons of live animal weight per year, a relatively small proportion of present livestock production.

The right amount of water applied for the proper length of time and at a frequency which conforms to crop needs requires the attention of an informed farmer and those who advise him. Governments should develop specific programs to improve the utilization of existing irrigation schemes and to train farmers in improved irrigation methods. There are many areas where water could be used much more efficiently. Where water is scarce, farmers should be encouraged to obtain the highest yields per unit of water applied rather than use excessive water in the hope of achieving somewhat greater yield. This will require in most cases some control of water use if the farmer is to forego possible yield gain to achieve maximum water-use economy.

Development is constrained at present by the problem of large numbers of people on the land. This cannot be changed rapidly, but the target should be intensification and advancement of technology as rapidly as is reasonable. A high density of rural population poses difficult problems in utilizing modern technology which is based, in part, on economies of scale in farming operations. Utilizing cooperatives and arranging farm units in such a way that modern implements can be operated should be considered; farm implement size can be scaled down also, as in Japan.

7.4.5.4 Irrigation Research. A great deal is known about irrigation and agriculture and some countries have spent too much of their limited manpower resources on "basic" research which is irrelevant or of remote long-range usefulness to the problems at hand. In developing countries, irrigation research programs should meet the practical needs of development. This does not exclude basic programs designed to solve future problems, but these should be consistent with long-term strategy.

7.4.5.5. Irrigation Is Capital-Intensive. Irrigation is very definitely a capital-intensive endeavor. It will not pay unless other inputs are also used intensively and the level of technology rises rapidly. This means that the economic success of irrigation development is tied in some measure to the development of other elements of the national or regional economy. Normally, projects will continue to require subsidy until some level of regional economic viability is reached. Therefore, the effort needs to be of critical size and scope. Under conditions in West Pakistan, project elements of about 1 million acres were considered to be the minimum critical size.

7.4.5.6 Integrated Planning and Management. Why is it that after an irrigation dam and main canal facilities have been constructed, measures to use this costly water with high efficiency are often overlooked or minimized? There are several reasons. One stems from the fact that large dams and canals are impressive and create visible monuments to the accomplishments of governments and assistance programs. On the other hand, the extensive network of small distribu-

ries, head ditches, properly graded farm fields, simple water control devices, irrigations scheduled in accordance with the crop needs, and drainage systems are far less spectacular and may not even be visible at all to the traveler or to the political leaders of a country. As a result, those measures necessary to achieve efficient utilization of developed water supplies seldom receive the financial support necessary to carry them out thoroughly enough to permit maximum crop production from the irrigation scheme.

A second reason is that in the basic plans for irrigation projects, consideration is seldom given to the problems in the catchment or watershed area above the storage or diversion point or to the problems of water utilization and drainage beyond the lateral canals. Management of forest and range lands in the upper catchments of river basins plays an important part in the success of water development schemes. Public agencies should therefore provide for appropriate coordination of watershed management and flood control measures with water development schemes downstream. While, fortunately, there is now a growing recognition of the need to look upstream and solve the watershed problems and to look beyond the canal laterals and deal with problems of drainage, most projects still fail to give enough attention to the other basic inputs required for a productive and permanently successful agriculture.

In developing countries, the irrigation engineer is usually concerned with storage, diversion and conveyance of water. He is rarely involved even in the distribution of water to user associations, let alone to the farmer's fields. A fundamental part of engineering education for agriculture in these countries needs to be full recognition that an irrigation project is not complete until water has reached the last row of the last farm on a schedule in accordance with the needs of the crop, and any surplus has been taken care of by a suitable drainage system. Not only the project engineers but government officials, legislators, and other policy makers need to recognize that sound water management is as essential as water development if costly irrigation schemes are to contribute substantially to agricultural production.

The sequence of processes required to achieve a productive and permanent irrigation agriculture is outlined in the chart on page 454.

7.4.5.7 Increased Knowledge of Weather and Climate. The practice of agriculture everywhere is highly dependent upon the weather. The farmer suffers extensive crop damage due to premature or late planting or harvesting because of drought or flooding, especially in regions of dramatic wet and dry seasonal changes common in many heavily populated areas. Weather and climate need to have increased study with the view to improving prediction in specific years and possibly some seasonal modification. Increased studies of the local weather

TABLE 8-5.—Total acreage by continents of different soil groups in the tropical zone and estimates of the areas potentially arable and potentially available for grazing

(Millions of acres)

Soil Groups	Africa			Asia			Latin America			Australia and New Zealand			Total	Total arable ¹	Total grazing
	Total	Arable ¹	Grazing	Total	Arable ¹	Grazing	Total	Arable ¹	Grazing	Total	Arable ¹	Grazing			
1. Light-colored soils; base rich.....	1,128	100	360	200	80	40	204	50	80	191	40	50	1,723	330	470
2. Dark-colored soils; base rich.....	267	140	30	134	60	10	260	125	40	61	20	10	722	345	90
3. Moderately weathered and leached soils.....	40	20	10	211	135	45	197	15	80	68	20	10	516	190	145
4. Highly weathered and leached soils.....	2,437	1,200	500	1,220	270	600	2,514	1,135	180	100	40	30	6,271	2,645	1,370
5. Shallow soils and sands.....	1,165	90	300	233	30	100	390	40	150	260	30	50	2,087	190	600
6. Alluvial soils.....	198	105	15	420	235	50	295	40	190	913	430	255
Total.....	5,235	1,715	1,155	2,408	860	905	3,850	1,405	720	679	150	150	12,232	4,130	2,930

¹ Under technology equivalent to that of the United States.

² Assumes application of irrigation water.

809.

789.

(16)

Food, Population, and Employment

The Impact of
the Green Revolution

edited by

Thomas T. Poleman

Donald K. Freebairn

Published for the
Cornell University Program on
Science, Technology, and Society

TABLE 9.5

Rural Land Use by Individual Countries

Country	Year	ARABLE LANDS		CULTIVATED LANDS		NATURAL PASTURES	
		In Thousands	Percent of	In Thousands	Percent of	In Thousands	Percent of
		of hectares	Latin America	of hectares	Arable Land	of hectares	Arable Land
		I	II	III	IV	V	VI
Argentina	1960	143,586.0	26.60	33,449.8	23.3	110,406.2	76.7
Bolivia	1950	14,318.6	2.65	3,091.0	21.6	11,227.6	78.4
Brazil	1950	160,544.0	29.84	67,976.0	42.3	92,568.0	57.7
Chile	1965	14,539.0	2.69	4,265.2	29.4	10,273.8	70.6
Colombia	1960	19,653.0	3.00	5,047.0	25.7	14,606.0	74.3
Costa Rica	1963	1,547.0	0.27	1,010.7	65.3	536.5	34.7
Cuba	1952	7,645.0	1.41	1,970.0	25.7	5,675.0	74.3
Dominican Rep.	1950	1,731.3	0.31	1,461.2	84.3	270.5	15.7
Ecuador	1954	3,335.5	0.61	2,081.0	62.4	1,254.5	37.6
El Salvador	1961	1,245.9	0.22	742.3	59.6	503.6	40.4
Guatemala	1962	2,108.9	0.39	1,566.7	74.3	542.8	25.7
Haiti	-	870.0	0.16	370.0	42.5	500.0	57.5
Honduras	1952	1,718.4	0.31	985.8	52.1	822.6	47.9
Mexico	1960	103,312.6	19.18	23,817.0	23.1	79,495.6	76.9
Nicaragua	1963	2,599.0	0.46	1,955.5	75.2	643.5	24.8
Panama	1961	1,371.7	0.24	1,237.0	90.2	134.7	9.8
Paraguay	-	10,759.0	1.98	859.0	8.0	9,900.0	92.0
Peru	1961	11,415.8	2.11	2,596.3	22.7	8,819.5	77.3
Uruguay	1961	16,099.0	2.90	2,251.7	14.0	13,847.3	86.0
Venezuela	1961	19,177.5	3.55	5,219.4	17.2	13,998.2	72.8
		537,847.7		162,862.6	30.0	375,985.9	70.0

Country	Year	Cultivated Land per Capita of Ru- ral Population in Hectares VII	Ranks of Urban Stability, 1970 VIII	Rural Population in Thou- sands, 1960 IX	Percent of Rural Popu- lation in Each Country, 1960 X	Percent of Rural Population in Latin America, 1960 XI
Argentina	1960	6.07	1	5.509	26.42	4.9
Bolivia	1950	1.19	4	2.592	70.03	2.3
Brazil	1950	1.81	3	37.555	53.86	34.0
Chile	1965	1.55	2	2.736	35.61	2.4
Colombia	1960	0.62	3	8.043	52.24	7.2
Costa Rica	1963	1.22	4	823	66.75	0.7
Cuba	1952	0.59	2	3.326	48.17	2.9
Dominican Rep.	1950	0.59	4	2.170	70.27	1.9
Ecuador	1954	0.71	4	2.909	66.84	2.6
El Salvador	1961	0.47	4	1.572	62.58	1.3
Guatemala	1962	0.53	4	2.765	72.38	2.4
Haiti	-	0.10	4	3.553	85.86	3.1
Honduras	1952	0.58	4	1.520	78.35	1.3
Mexico	1960	1.30	3	18.291	50.74	16.5
Nicaragua	1963	2.07	4	942	62.76	0.8
Panama	1961	1.98	4	624	58.76	0.6
Paraguay	-	0.76	4	1.119	64.64	1.0
Peru	1961	0.47	3	5.493	52.24	4.9
Uruguay	1961	3.10	1	713	28.07	0.6
Venezuela	1961	1.61	2	3.231	52.24	2.9
		1.47		110.131	51.60	

Source: Banco Interamericano de Desarrollo, "El desarrollo agrícola de América Latina en la próxima década," Cuadro I, Washington, D.C., Abril de 1967, p. 127.

APPENDIX A

Table 2. - Equipment cost per hectare to build levees, rototill, rough level, and final level for first planting of rice on ICA Turipana Experiment Station

	<u>COST</u>
1. Building of levees with a 75 RHp tractor with 200 cm wide rototiller and levee maker attachment to build 800 linear meters of levee at an average rate of 367 meters per hour. Tractor rate \$ 3.33/hour and rototiller \$ 1.67/hour total time 2.18 hours x \$ 5.00	\$ 10.90
2. Rototill new land in high weeds with poor water coverage with 75 RHp tractor and 200 cm rototiller at an average rate of 4.30 hours per hectare and \$ 5.00 rental rate	21.50
3. Rough leveling with 75 RHp tractor and point mounted blade each \$ 3.33 per hour and 5.90 hours per hectare to cut and move high spots to low areas	19.65
4. Final puddling and leveling prior to planting with 75 RHp tractor and 3 point mounted flexible spike tooth harrow each \$ 3.33 per hour and 2.28 hours per hectare	<u>7.59</u>
	\$ 59.64

AMA

AGRICULTURAL MECHANIZATION IN ASIA

VOL. IV, NO. 1, SPRING 1973

Multiple - Cropping and Mechanization

FARM MACHINERY INDUSTRIAL RESEARCH CORP

Table 1. Total Planted Area and Area Under High-Yielding Varieties of Wheat and Rice in APO Member Countries in 1969/70
(Unit: 1,000 hectares)

	Total planted area	Area under HY varieties	%
Wheat *			
India ¹⁾	16,000	6,111	38.2
Iran**	4,700 ²⁾	100 ²⁾	2.1
Nepal ¹⁾	388	75	19.3
Pakistan ¹⁾	6,219	2,833	45.6
Rice *			
Ceylon ¹⁾	671	26	3.9
India ¹⁾	38,000	4,371	11.5
Indonesia ¹⁾	7,972	749	9.4
Nepal ¹⁾	1,174	50	4.2
Pakistan ¹⁾	12,076	765	6.3
Philippines ¹⁾	3,100	1,354	43.7
Rep. of Vietnam ¹⁾	2,519	202	8.0

Source: 1) U.S. Department of Agriculture, "Imports and Plantings of high-yielding varieties of wheat and rice in the less developed nations", Washington, D.C., 1971, p. 101.

2) FAO, "The State of Food and Agriculture", Rome, 1971, p. 101.

* All the countries except Iran, varieties included are (a) dwarf and semi-dwarf varieties developed at the International Wheat and Maize Improvement Centre (CIMMYT) in Mexico and the International Rice Research Institute (IRRI) in the Philippines, and (b) direct descendants of these varieties developed in national breeding programmes. The definition thus excludes a number of local improved varieties not derived from the CIMMYT and IRRI varieties.

** Including Bostova No. 1 imported from U.S.S.R. and Mexican Inya 66 imported from Denmark etc. Expected to increase 350,000 hectares in 1971/72.

afraid of lowering in quality for export rice.

Facts indicated above will show that dissemination of the new high-yielding varieties has influenced the increase in food production. However, there are various problems to be overcome in disseminating new high-yielding varieties.

It is particularly observed in the dissemination of new high-yielding varieties of rice, showing lower percentage of area covered by new varieties than in the case of wheat with the exception of the Philippines. It is supposed that the dissemination of high-yielding varieties might be more difficult for rice than for wheat.

2. Increase in Production of Cereals and Importance of Diversification of Agriculture

As indicated in the foregoing sections, production of cereals has increased high during the period of these several years. This caused various problems

concerning supply and demand of food grains in this region. The problems will be discussed in the following paragraphs.

At first, it is easily found from the statistics that food importing countries have decreased their

Table 2. Some Indicators of Agricultural Input Materials

		"Yield mt/ha	"Increase in yield (Index)	"Ferti- lizer mt/ha	"Agri. Chemical kg/ha	"Machin- ery- HP/ha	"Labour Pers./ha	"Animal Head /ha
1967-68 Av. 1952-56 —1967-68								
Japan	I	5.14	146	371.3	11.60	2.664	2.16	0.30
Rep. of China	E	3.91	150	282.7	3.07	0.146	1.95	0.41
Rep. of Korea	I	2.84	124	210.5	2.17	0.003	1.96	0.30
Vietnam	I	2.05	159	43.6	0.02	0.023	2.10	0.61
Hong Kong	I	2.00	71	—	—	—	—	—
Nepal	E	1.87	104	0.6	0.02	0.004	2.49	1.20
Ceylon	I	2.05	143	43.1	1.42	0.110	1.20	0.37
Thailand	E	1.73	128	7.5	0.53	0.054	1.10	0.46
Indonesia	I	1.63	103	7.4	0.01	—	—	—
Pakistan	I	1.31	120	10.2	0.07	0.013	1.09	0.72
Philippines	I	1.09	110	16.4	0.27	0.023	0.71	0.26
India	I	1.00	123	11.0	0.27	0.008	0.90	0.51
Iran	I	1.00	57	5.7	0.15	0.154	0.37	0.12
Average		1.29	121	22.9	0.53	0.087	0.99	0.50

I: Importing countries of food grains

E: Exporting countries of food grains

Source of data: 1) Symposium on Fertilizer Economy, APO, 1971

2) Symposium on Agricultural Chemicals, APO, 1971

3) Expert Meeting on Agricultural Mechanization, 1968.

import, while in turn, the exporting countries have decreased their export much during the same period. For instance, Ceylon decreased her import of rice from 976,000 metric tons (in terms of paddy) in 1964-66 average to 514,000 metric tons in 1968. India decreased her wheat import from 6,679,000 metric tons in 1964-66 average to 3,090,000 metric tons in 1968/69.

This means that the self-sufficiency of food (cereals) has been attained or greatly improved in these several years particularly in the food importing countries. For instance, in Ceylon, the ratios of production to available supply of rice and all cereals were 46.5 per cent and 40.1 per cent respectively in 1964-66 average, while those in 1968 were 75.2 per cent and 58.1 per cent respectively. In India, in 1964-66 average the same ratios of wheat and all cereals were 61.1 per cent and 91.0 per cent respectively and those in 1968/69 were 86.4 per cent and 97.1 per cent respectively. In 1968/69 or 1969, Iran, India, Pakistan and the Philippines attained self-sufficiency of rice, though India is

Table 4. Percentage Distribution of Crops

	Rice	Wheat	Other cereals	Total cereals	Meat	Fruit	Veg.	Other Crops	Total	(1965) Percentage of agri. population	(ha) Average size of holding
Ceylon	20	—	—	20	3	6	4	67	100	54	1.59
Rep. of China	26	—	1	27	32	9	5	27	100	47	1.11
Hong Kong	—	—	—	—	—	—	—	—	—	6	—
India	26	9	10	45	3	4	5	43	100	70	2.62
Indonesia	36	—	7	43	12	4	3	48	100	66	1.06
Iran	6	30	4	40	12	3	5	40	100	54	8.29
Japan	26	2	2	30	13	8	11	38	100	24	0.90
Rep. of Korea	33	4	17	54	11	2	8	25	100	54	—
Nepal	44	6	17	67	7	1	2	23	100	92	1.22
Pakistan	27	10	2	39	6	4	1	50	100	74	2.37
Philippines	26	—	9	35	19	7	3	36	100	59	3.66
Thailand	52	—	6	58	10	5	3	24	100	78	3.64
Vietnam	62	—	—	62	19	5	1	13	100	85	1.57
Far East Ave.	31	5	7	43	8	5	5	39	100	48	6.17

Source: FAO Index Number of Gross Agricultural Production by Commodity Group, Monthly Bulletin of Agricultural Economics & Statistics, May 1971.

average to 1970. In India, Iran, Indonesia and the Philippines, all cereal production increased by 66, 48, 74 and 98 per cent respectively during the same period. As mentioned earlier, Pakistan and India have increased wheat production the most.

However, the Republic of China, Japan and the Republic of Korea have taken another direction. In these countries, the increase in meat or fruit production has been the highest among agricultural production during the same period. High increase in coarse grain production in the Republic of China is supposed to show the increased demand for feed grains. Extremely high rate of increase in coarse grains in Thailand has reflected increased export demand for feed grains resulting mainly from increased import demand of Japan, as stated before.

This shows that the change in cropping pattern has already been started in some extent.

Let us see the present situation of cropping pattern in the member countries. From Table 6 showing the percentage distribution of planted area by crop by country, it is found that the countries like Thailand, the Republic of Korea and Pakistan have more area under food crops such as cereals, starchy roots and pulses.

Particularly, Thailand and the Republic of Korea have high percentage of rice, and rice, wheat and barley altogether occupying more than 70 per cent of the total planted area.

Though the table does not indicate the percentage in detail, India and Pakistan have quite a large area of tea and jute (the latter figure might be included in others), so that the percentage of food crops is smaller than in the former two countries.

The countries such as Ceylon, Indonesia, and the Philippines show smaller percentage of planted area devoted to such food crops as mentioned earlier, particularly so in the case of Ceylon.

In turn, these countries have larger area of commercial crops such as coconut, sugar cane, tea, rubber, etc.

The Republic of China and Japan show lower percentages of planted area under cereals, though both had shown quite large percentage of the planted area in the past. Diversification of agriculture has taken place according to the change in demand for food, though they have yet various problems in this regard. Thailand also has made progress in diversification of agriculture, which will be discussed in detail later.

The situations mentioned above relate mainly to conditions of the

Table 5. Agricultural Production Index by Crop (1970) (1952-56=100)

	Total agri.	Cereals	Grains	Coarse Grains	Meat	Fruit	Veg.
Ceylon	154	245	123	123	104	162	143
Rep. of China	189	152	172	407	223	569	237
Hong Kong	—	—	—	—	—	—	—
India	148	166	178	138	118	142	134
Indonesia	133	148	125	125	148	136	132
Iran	169	174	164	118	156	93	144
Japan	185	99	31	30	463	364	214
Rep. of Korea	217	180	199	201	332	380	239
Nepal	108	109	130	118	116	198	198
Pakistan	165	182	209	120	156	232	143
Philippines	174	198	295	295	150	240	167
Singapore	—	—	—	—	—	—	—
Thailand	220	209	2,545	2,545	150	325	155
Vietnam	186	218	106	106	179	153	202

Source: The same with the previous table.

Table 6. Percentage Distribution of Planted Area in APO Member Countries

	"Ceylon 1966	"Rep. of China 1970	"India 1966/67	"Indo- nesia 1967	"Japan 1970	"Rep. of Korea 1970	"Paki- stan 1970	"Philip- pines 1970	"Thai- land 1950
Cereals	33.7	49.0	59.8	57.3	54.6	71.1	68.8	61.9	73.1
Rice	31.5	47.0	22.4	42.4	46.3	32.7	38.1	34.8	70.2
Wheat	—	0.1	8.3	—	3.6	32.7	22.8	—	—
Barley	—	0.0	1.8	—	3.6	—	0.7	—	—
Maize	0.7	1.4	3.3	14.9	1.1	5.7	7.2	27.1	2.9
Other coarse grains	1.6	0.5	24.0	—	—	—	—	—	—
Starchy roots	4.2	15.6	—	10.5	4.4	5.6	0.4	2.9	0.9
Pulses	—	9.2	13.7	5.7	5.3	10.8	5.4	0.9	2.2
Vegetables	—	8.2	2.1	—	10.8	5.4	0.8	0.7	1.1
Fruits	—	7.3	—	—	6.6	1.4	1.1	4.5	11.4
Sugar cane	0.5	5.6	1.5	0.8	—	—	2.7	4.1	1.6
Tobacco	0.4	—	—	1.3	—	1.1	—	—	—
Cocoa	—	—	—	—	—	—	—	0.1	—
Coffee	—	0.0	0.1	—	—	—	—	0.6	—
Tea	14.7	2.1	0.2	0.7	0.8	—	0.2	—	—
Oil palm	—	—	—	—	—	—	—	—	—
Coconut	26.9	—	0.6	11.1	—	—	—	21.1	1.6
Rubber	13.9	—	—	10.8	—	—	—	—	—
Mulberry	—	—	—	—	2.6	2.6	—	—	—
Other crops	5.7	3.3	22.0	1.8	14.9	2.0	20.6	3.3	8.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source of data: 1) Answer to the Questionnaire of APO

2) Economic Survey of Asia and the Far East, U. N., 1969

3) Pocketbook of Agriculture Forestry and Fisheries Statistics (in Japanese), 1972.

region at present. Let us see the changes in cropping pattern by country during the period from 1940 or 1950 to 1970 (Refer to Table 7 (a) — (i)).

In India, the planted area of cereals increased from around 81,000,000 hectares to 93,600,000 hectares or by 16 per cent during the period of 1950/51 to 1966/67, and in Pakistan, the corresponding area also increased around 21 per cent during the period of 1950 to 1970. In the Philippines, the planted area of cereals was around 3,000,000 hectares in 1940 which increased to 5,152,000 hectares in 1960 and a further increase was observed in 1970 to 5,533,000 hectares.

In the Republic of China, the increase in planted area of cereals had been very high during the period of 1940 to 1951. It increased from around 652,000 to 806,000 hectares or around 24 per cent during the period. However, during the period of 1951 to 1960

it increased by only 1 per cent, and during the period of 1960 to 1970, it decreased by 0.6 per cent. Among the planted area of cereals, that of rice increased by around 21 per cent during the period of 1940 to 1951, but since then become almost stagnant. Only the planted area of maize increased very high during the latter period. This increase in the planted area was supposed to reflect an increase in demand for feeds in the domestic market due mainly to the increased demand for animal foods, and the stagnation of rice area reflected a decrease in export demand and lowered increase rate of demand for rice in domestic market.

In Thailand, on the other hand, the planted area of both rice and maize has continuously increased high during the period of 1950 to 1970. The planted area of rice increased by 33 per cent, and that of maize in 1970 was as high as 19 times the area in 1950. The in-

crease in rice planted area was due partly to the larger foreign market and partly to the high increase rate of population, than in the case of the Republic of China. The increase in planted area of maize was due mainly to the increased external demand.

However, it should be noticed that in the case of cereals, the increase rate of production is becoming higher than that of area indicated above, so that even from the decreased land area of cereals the production would be increased.

As indicated in the foregoing sections, Japan is an exceptional case. During the period of 1950 to 1960, the planted area of rice was still growing, but particularly during the period from 1965 to 1970, it tended to decrease. Though the percentage of total planted area devoted to rice was still the highest, the actual area under rice decreased by around 10 per cent during the latter period. High rate of increase during the former period and high percentage of area under this crop even in the latter period were due mainly to high rice prices set under the Government price policy. The price was as high as around US\$385 per metric ton in terms of brown rice in 1970. However, the support price remained unchanged for some years, and the Government started the policy for cutting the acreage of planting rice. This caused a decrease in the planted area in this country.

With the exception of Japan both cultivated land area and planted area of all crops are still increasing. However, the expansion of cultivated land area is rather limited and the increase of total planted area was also so large relative to the cultivated area, with the exceptions of the Republics of China and Korea. Thus there has been some change in cropping pattern of all cultivated land, since in deficit countries the area under

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Alfonso Diaz

Superintendent Experiment
Station CIAT

The most productive lands in Tropical Asia are located in the naturally flooded, poorly drained lowlands used for rice production. These same areas are among the least productive areas of tropical America as they are in swamps and dry season pastures. CIAT is in a unique position to develop a production system suited to these tropical America lowlands by blending of the most adapted Asian wet land practices and Western industrial scheduling. As a first step continuous production has been implemented during 1972 on the CIAT fields and will be extended to other tropical lowland areas as results and interest are generated.

The original plan at CIAT was to use small 5 and 10 horsepower Japanese tillers to prepare about 1/2 hectare per work day. The areas used had not been develop-

ed for rice previously, thus a soil movement requirements, the uneven surface, and vegetation made the use of the small tillers impracticable. Finally larger 70 horsepower tractors with large rice and cane tires were used to level and prepare the fields. Some trials during 1973 will use the small tillers on the developed area since the soils have settled and formed a more stable surface and soil profile during 1972.

Land preparation has been the only operation where a power unit is used. Seeds and fertilizers are broadcast by hand. Insecticides and herbicides are applied by a knapsack sprayer, if liquid, and by hand broadcast, if in a granular form.

Intensive, continuous, and well paid use of labor has been set as a desirable goal. Time studies of labor required with scheduling

for continuous land preparation, planting, and harvesting and contract payments per unit of work have given data on labor requirements; these data will permit comparative costing and scheduling with other methods. Table 1 shows labor machine and material requirements and costs based on the CIAT 1972 data.

Table 2 shows dates of planting, harvesting, area, yields etc. The fields were harvested 120 to 140 days after sowing. These fields could have been immediately prepared and seeded, if adequate water and power were available. The requirements of other CIAT Programs with experimental plots had priority for water and power over the production systems field which explains the uneven scheduling.

Hand harvesting was expected to be the major problem. Since

combines are normally used in Colombia, most laborers had no experience with hand harvesting and no special threshers were available. Rice-plot harvests during 1971 had been successfully threshed on a 55 gallon drum. The CICA 4 rice variety was easily threshed on the drum with a high apparent output per man hour. A time and motion study Table 3 indicated that the output averaged 79 kg. per man hour which compares very favorably with 70 to 84 kilograms per manhour reported for a small engine powered thresher especially developed to replace hand threshing. The most important information of Table 3 is that the major effort is not in threshing but in cutting and carrying which require 62% of the effort. This led to the development of a CIAT man powered portable combine (see a photo) The contract laborers immediately expressed a preference for the portable unit. Since it required less effort, they harvested more per day and received more pay. Two laborers cut, threshed, cleaned bagged, and carried to the roadside 8 to 10 bags of 60 kilograms per day. The CIAT contract labor was paid was 21 pesos or about \$0.93 per bag which gave an earned income of \$3.72 to 4.65 per man day. Custom combine charges in Colombia are 15 pesos or \$0.67 per bag. The contract labor could earn \$2.68 to \$3.33 per day even if paid combine charges of \$0.67 per bag. Since normal wages are \$1.00 to \$1.50 per day, hand harvesting is an attractive job.

Unit data collected during 1972 in Table 1, 2 and 3 permit the development of various systems either labor intensive or machine intensive depending upon labor wages, labor availability and objectives. A production system to provide productive employment of laborers and land should be developed for areas that are near to major rivers, roads, ports, and cities such as Barranquilla, Cart-

Table 1. Average labor, equipment, and materials required for producing rice or CIAT production fields in 1972.

OPERATION	Man days/Ha.	Labor Cost-Dollars	Machine and Material Cost
1. Land preparation * with 70 rated horse-power tractor, rototiller and harrow	0.5-1.0	2.00	25.00 to 50.00
2. Construction ** or repair of 640 meters/Ha of levees with 50 cm. top, 75 cm. base and 25 cm high	8.0	16.0	—
3. Clean levees during crop season-640 meters	4.0	8.00	—
4. Broadcast pregerminated seed-100 Kg/Ha	1.0	2.00	15.00
5. Broadcast fertilizer-200 Kg/Ha. of Urea (2 applications of 100 Kg)	2.0	4.00	22.00
6. Application of insecticide Broadcast granules (20 Kg. of 3% active ingredient Furadan)	1.0	2.00	20.00
7. Weed Control.			
a) Handweed one time 30% of area	5.0	10.00	—
b) Knapack sprayer application of Propanil 3.6 Kg. in 100 lts. of water.	1.0	2.00	20.00
8. Irrigation-Maintenance of canals, dikes and keep flooded 100 days by pumping	10.0	20.00	25.00
9. A - Hand harvest 6000 Kg/Ha (cut, carry, stack, handthresh on a 55 gallon drum, clean, bag 100 bags and carry 100 mts. to road)	30.0	90.00	—
B - Hand harvest 6000 Kg/Ha (cut, thresh on portable thresher, clean, bag 100 bags and carry 100 mts. to road)	25.0	75.00	—
C - Combine with medium size, combine 100 sacks and carry 100 Mts. to road 3 man crew and combine for 1/3 day	1.0	6.00	60.00
Summary based on harvest method			
A	62.5	\$ 156.00	\$ 127.00 to \$152.00
B	57.7	\$ 141.00	\$ 127.00 to \$152.00
C	33.5	\$ 72.00	\$ 187.00 to \$212.00

Value of threshed rice at 25% Moisture content and 5% impurities was about \$85.00 per ton at the farm roadside where the buyer furnished bags and transportation during 1972. The 6000 Kg. /Ha average was sold for \$510.00 per hectare. Returns to land and management would be about \$200.00/Ha per crop of 135 days.

* Developmental land leveling and land preparation requires 1.0 manday and tractor day.
 ** Construction requires 16 mandays.

agena and Cali in Colombia and for other areas near major cities in other countries such as Guayaquil, Ecuador and Belem, Brazil. The system can be planned using the following data:

1. Land and water are available in blocks of to 10,000 hectares at rental rates less than \$50.00 per hectare per year and less than \$50.00 per hectare irrigation charges per year.

2. Laborers are available in excess of 10,000 in the area around the major city of 200,000 population with average wage rates of urban and rural laborer

less than \$2.00 per day and average work rates as given in Table 1.

3. Custom hire 70 horse-power tractors and equipment are available at \$50.00 per tractor day including operator fuel and all costs. Smaller tillers are not yet widely used but could be obtained.

4. Hand application or custom airplane and helicopters services are available at one manday or \$1.50 to \$4.00 per hectare per application of seed, fertilizer, and pesticides.

5. Hand harvest or custom

Table 2. Centro Internacional de Agricultura Tropical Station Operations
Production of Rice Cica 4 in 1972.

Lot No.	Date of		Days	Area Ha.	Production		
	Seeding	Harvest			Total Tons.	Tons/ Ha Kgs./ Ha.	Day
I ₂ S	6-XII-71	18-IV-72	134	3.75	19.4	5.17	39
H ₂ S	15-XII-71	26-IV-72	133	4.20	21.8	5.19	39
J ₂ S	12-I-72	24-V-72	133	1.80	9.2	5.11	38
K ₂ S	14-I-72	26-V-72	133	1.80	12.2	6.77	51
G ₂ S	11-II-72	12-VI-72	122	3.50	25.1	7.17	59
H ₂ N, I ₂ N	12-II-72	26-VI-72	135	7.45	50.0	6.71	50
	18-II-72	6-VII-72	139				48
G ₂ N	11-III-72	18-VII-72	139	4.00	19.5	4.88	35
H ₂ N	11-III-72	24-VII-72	135	4.00	17.7	4.42	33
I ₂ N	29-III-72	2-VIII-72	126	2.54	15.3	6.02	48
H ₂ S, I ₂ S	28-IV-72	31-VIII-72	125	3.00	20.3	6.77	54
H ₂ S, I ₂ S	12-V-72	22-IX-72	122	7.00	36.0	5.14	39
F ₂	23-V-72	28-IX-72	128	8.80	50.5	5.74	45
D ₂	26-V-72	4-X-72	131	8.80	66.8	7.59	58
Total				60.64	363.8		
Average			132			6.00	45

Table 3. Average values to hand harvest - cut, carry, stack, thresh on 55 gallon drum, clean, and sack a total of 48.4 tons paddy at 25% moisture content from a 9.6 hectare area.

Operation	Total Man Hours	Man Hours		Percent
		Per Ton.	Per Hectare	
Cut & Lay	1059	22	110	44
Carry and stack	430	9	45	18
Thresh	611	13	64	26
Clean and bag	296	6	31	12
Total	2396	50	250	100

combine services are available at \$0.67 to \$0.93 per bag of 62 kilograms.

6. Trucks for transportation are available at \$0.05 per ton-kilometer.

7. Productivity of paddy at harvest ranges from 30 to 60 Kg./Ha-day with an average of 45 Kg./Ha-day (Table 2).

8. Paddy sales price at farm with 25 percent moisture content and 5% impurities is \$85.00 per ton with sacks supplied by purchaser.

9. Temperatures, irrigation, rainfall, and other conditions permit continuous planting and harvesting during entire year.

10. Consumption of rice is expanding to replace cassava, plantain, corn, potatoes and wheat in local diet.

With the conditions as given then a mixture of labor, land, machinery and materials must be developed to farm a production

system. If one major condition is to provide productive employment and about 60 mandays are required per hectare distributed as in Table 1, then we can plan for continuous stable employment and production with 120 mandays of work during a 140 calendar day crop cycle.

One man can care for 2 hectares by planting and harvesting 0.2 hectares every 14 days. His labor input per 14 days period would be 12 days of which 5.6 days would be on levees, weed control and irrigation; 0.8 days on seeding, fertilizing and insect control and 5 days on hand harvesting.

The smallest complete operation system would be based upon a contract hire service for land preparation and marketing based upon a 5 horsepower tractive tiller and implements. The 5 horsepower tractive tiller should prepare 0.2 of land per day to ser-

vice 12 farmers during a 14 day period. The tiller could also transport the freshly harvested 1200 Kg. per day of paddy to a central pick-up point for sales transport to market by a truck. The next complete operation system would use a 10 horsepower unit which should prepare 0.4 hectare of land per day to service 24 farmers during a 14 day period and transport 2400 Kg. per day to a central pick-up point.

These two small systems would permit full utilization of labor and tractive tiller time under a very tight schedule. In case of delays due to sickness or tiller repairs then extra labor and equipment would need to be hired to maintain the schedule. The attractive feature is a continuous cash flow from the sale of 1200 Kg. of paddy 14 days for a gross farm sales value of about \$100.00. Expenses for 0.2 hectare should be approximately \$10.00 land preparation, \$3.00 for seed, \$5.00 for fertilizer, \$8.00 for pesticides, \$5.00 for irrigation and \$5.00 for rent. The extra \$64.00 would be returns to labor and management of approximately \$128.00 per month and \$1536.00 per year to the operator of a 2 hectare farm unit. The owner of the power tiller should have as attractive an income as the farm operators.

If his equipment expenses were \$25.00 per hectare and wages \$25.00 per hectare then the 5 horsepower tractive type tiller owner would make \$5.00 per day or \$120.00 per month and the 10 horsepower rotary tiller operators would make \$10.00 per day and \$240.00 per month. This potential income should attract capital and operators and be of interest to manufacturers of small power units and to government planning groups as a potentially desirable production system, however the small farm operator custom hire service is not now in existence and the initiative cooperation, and man-

agement skills to implement the system are not easy to obtain.

A more likely solution would be a 60 hectare commercial farm enterprise organized by an experienced rice farmer. This enterprise would be based upon a 70 horsepower tractors preparing 3.0 hectares of land per week, transporting the harvest to market, and returning with materials and supplies. The farmer could also be the tractor driver, supervisor and manager. He would employ about 30 laborers paid by contract to earn about \$25.00 per man week. His gross sales should be about 18,000 Kg. of paddy per week or \$1,430.00. His costs would be about \$750 labor, \$45.00 seed, \$65.00 fertilizers, \$120.00 pesticides, \$150.00 equipment, \$75.00 irrigation and \$75.00 land rental for total costs of \$1,280.00 per week. His potential returns for his labor and management would be \$250.00 per week or about \$13,000 per year. The yield of 6,000 Kg. of paddy at 25% moisture content is not difficult with reasonable water control and management and the farm price of \$85.00 per ton has been paid CIAT during 1972. The risk involved is that lower yields or prices would result in losses and any rice grower considering this system must be aware of that importance of production and price relationships. The costs of land, water and equipment, however leave considerable

leeway for production and price fluctuations before seriously endangering the cash flow to labor and management. It should be emphasized that the employment of 30 laborers at \$25.00 per week average contract wage would be economically and socially desirable in most tropical countries. The larger farm size would attract Professional management talent and the use of laborers would permit hand harvest during weather when combines would not work. When laborer wages exceeds about \$25.00 per week then combine harvest would likely be substituted and the labor crew reduced to 15 men and the equipment increased to add one combine at the cost of \$45.00 per day to harvest 0.5 hectare. The loss of employment opportunities and the foreign exchange cost for combines would be a serious consideration at the national level. However the farm size in many of tropical America areas can be increased to 120 hectares and maintain the same labor crew at higher wages. The combine would be attractive in reducing per hectare cost of labor housing, — transportation, and management. There is also the possibility that harvest losses could be minimized if the farm manager also operated the combine.

The commercial 120 hectare farm with a combine, a 70 horsepower tractor, implements, and

trailer could be operated on a continuous basis by the farm manager and 32 laborers to prepare plant and harvest 6.0 hectares per week. The tractor would be used 5 days or less per week and the combine 2 to 4 days per week. Laborers would be used largely for levee maintenance, irrigation, seeding, fertilizing and pest control. The Break down of costs would depend largely on wage rates. Suppose that wages are \$40.00 per manweek and \$1,280.00 per week for the 32 laborers, and other weekly costs are combine \$300.00, tractor and equipment \$300.00, irrigation charge \$150.00, land rental \$150.00, seed \$90.00, fertilizer \$130.00, pesticides \$240.00, for total costs of \$2,640.00 per week. If gross production is 36 tons at \$85.00 per ton then gross sales of \$3,060.00 per week leave an income to management of \$420.00 per week which is very attractive especially if rent is considered.

The production systems outlined are illustrations of the potential production and employment opportunities for management, machine operators, and laborers working together daily; each performing his part and participating in an income from continuous utilization of the available resources. No one method is universally good, however, the availability of land, water, favorable temperatures, and labor supply that are under utilized should lead to the organization of rice production systems in some of the tropical American areas which will set patterns for the future. The other implication is that there are obviously potential advantages in sizing units to reduce the equipment and managerial costs per hectare.



Soil preparation with 6 hp hand tractor used in intensive cropping systems.



CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

DIR-1462

December 29, 1973

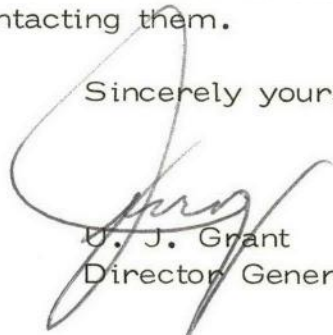
Dr. Harold Graves
World Bank 1818 H. Street
Washington, D. C.

Dear Harold:

According to a recent paper by Lowell Hardin the CGIAR has 28 members and 23 donors. Could you please supply us with the complete and correct address of all of these agencies along with the name of the person to whom we should write when contacting them.

29
20

Sincerely yours,



D. J. Grant
Director General

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CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

DIR-1462

December 29, 1973

Dr. Harold Graves
World Bank 1818 H. Street
Washington, D. C.

Dear Harold:

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supply us with the complete and correct address of all
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we should write when contacting them.

Sincerely yours,

J. Grant
Director General

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CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

DIR-1429

December 19, 1973

Mr. Harold Graves
Consultative Group on
International Agricultural Research
1818 H. Street, N. W.
Washington, D. C. 20433

Dear Harold:

We are having the review of CIAT programs from January 6 through 12. We have scheduled a CIAT staff seminar for a full review of our training program on January 15-16.

I have cabled you suggesting January 17-18 as possible dates for your visit. However, we could schedule it during the week of January 22 if this is more convenient for you.

I look forward to hearing from you as soon as you have your schedule firm.

Sincerely yours,



U. J. Grant
Director General

UJG.caa



CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

DIR-1428

December 19, 1978

Mr. Harold Graves
Consultative Group on
International Agricultural Research
1818 H. Street, N. W.
Washington, D. C. 20433

Dear Harold:

We are having the review of CIAT programs from January 6 through 12. We have scheduled a CIAT staff seminar for a full review of our training program on January 15-16.

I have called you suggesting January 17-18 as possible dates for your visit. However, we could schedule it during the week of January 22 if this is more convenient for you.

I look forward to hearing from you as soon as you have your schedule firm.

Sincerely yours,

U. D. Grant
Director General

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CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

DIR-1393

December 7, 1973

Mr. Harold Graves
Consultative Group on
International Agricultural Research
1818 H. Street, N. W.
Washington, D. C. 20433

Dear Harold:

This will acknowledge receipt of the transcrip of what members of the Consultative Group said during the meeting in Washington in early November. I appreciate the efforts of the Secretariat on our behalf.

We have received the 150,000 Dutch Marks from Germany and especially I wish to thank you for b ringing this money on straight for us.

Sincerely yours,

U. J. Grant
Director General

UJG.caa



~~File - Colombia~~
APARTADO AEREO 67-13
CABLES: CINATROP
CALI - COLOMBIA

CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

December 5, 1973

✓ G2a

Dr. DON SUTHERLAND
Chief, Livestock Division Latin America Region
Washington, D. C.

Greetings. As you have been recently informed by our invitation, CIAT is organizing a Seminar on Beef Cattle to take place in February of 1974. One of our Seminar preparations consists of an evaluation of the interaction between persons and institutions interested in the investigation of Beef Cattle. We hope to receive indications of this interaction by the following questions:

1. Who do you know on the enclosed list?
2. Who has cooperated with you?

We ask you to answer the first question in the boxes to the left of the names. Indicate not only the participants that you know personally, but also those you know through publications, correspondence, third person contacts or other media.

In the second question, please indicate in the boxes on the right the persons from whom you have received any form of cooperation, such as financial aid, technical assistance, leadership, supervision, materials, publications, data or any other information.

For example: /x/ Camilo Dominguez / /, means that you personally know or have heard of Mr. Domínguez, but you have not received any type of cooperation from him.

We hope you can give us the correct information to these two simple questions and send the list as soon as possible to the following address:

Jairo Cano Gallego
CIAT
Apartado Aéreo 6713
Cali, Colombia.

Until we have the pleasure to see you in Cali, please accept our sincere thanks for your collaboration.

Sincerely,

JAIRO CANO GALLEGO
Investigation and Training
in Communication.

JCG/git.

LISTA DE POSIBLES PARTICIPANTES EN EL SEMINARIO DE GANADO DE CARNE

CONOZCO A

HE RECIBIDO COOPERACION DE

AFRICA.

☐ B.D.H. Van Niekerk, P.T.V. ☐

☐ Bukar Shaib, Fed. Min. of Agricult. ☐

☐ Ishmaet Muruthe, Direct. of Vet. Ser. ☐

☐ Ruediger Sachs, Vet. Invest. Center ☐

ALEMANIA.

☐ Dieter Bommer, TAC ☐

☐ Joachin Hans Weniger, European Association for Animal Production ☐

ARGENTINA

☐ Filemón Torres, INTA ☐

☐ Blas Bravo, INTA ☐

☐ G. E. Joandet, An. Sci. Department. Texas A & M ☐

☐ Hernán Caballero, INTA ☐

☐ Lúcio Reza, Direct. Nal. Ec. Agr. ☐

☐ Luis Verde, INTA ☐

☐ Norberto Ras, IICA ☐

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☐ Colin Andrew, CSIRO ☐

☐ Dennis Minson, CSIRO ☐

☐ Dernick Tribe, Univ. of Melbourne ☐

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☐ Claude Smith, Direct of Agricult. ☐

☐ Neil Worker, USAID ☐

BOLIVIA.

☐ Bernardo Bauer, Estancias Elsner ☐

☐ Rayford Claxton, U. Autónoma ☐

☐ Simón Riera, Asoc. Boliviana de Producción Animal ☐

☐ Teddy Monasterios de la Torre, Departamento de Agricultura ☐

BRASIL.

☐ Alberto Alves Santiago, Inst. de Zoot. ☐

☐ Aristeu Mendez Peixoto, Escola Superior de Agricultura. ☐

☐ Donald Hargrove, University of Florida Mission. ☐

CONOZCO A

HE RECIBIDO COOPERACION DE

☐ Emanuel Adilson Serrao, IPEAN ☐

☐ Geraldo Carneiro ☐

☐ Geraldo de la Roche, Secr. de Agr. ☐

☐ Gregorio Blaszyk, Estação Experimental de Uberaba. ☐

☐ Helio Tollini, EAPA/SUPLAN ☐

☐ John Landers, IPI ☐

☐ José Barcellos, Min. de Agricult. ☐

☐ José Brandao Fonseca, Universidad Federal de Viçosa. ☐

☐ José de Aldemar C. Vigna, Universidad Federal Minas Gerais. ☐

☐ Luis M. M. de Freitas, CBA-ITAV ☐

☐ Mario Barbosa, U. Fed. Minas G. ☐

☐ Mario Fernández, Centro Panamericano de Fiebre Aftosa. ☐

☐ Mr. Roger, USAID ☐

☐ P.D.L. Guilbride, FAO/BRA ☐

☐ Roberto Meirelles de M., EMBRAPA ☐

COLOMBIA.

☐ Arturo Bonnet, Banco Ganadero ☐

☐ Bernardino Rodriguez, U. Tolima ☐

☐ Charles Mullenax, Caja Agraria ☐

☐ Demetrio Parra R., Asociación Panamericana de Med. Vet. y Zoo. ☐

☐ Diego Villegas, U. de Caldas ☐

☐ Ernesto Huertas, ICA ☐

☐ Foción González, Banco Cafetero ☐

☐ Germán Serrano, Asoc. Colombiana de Ganado Cebú. ☐

☐ Gonzalo Luque, U. Nal., Bogotá. ☐

☐ Guillermo Rufz, U. Córdoba ☐

☐ Hernán Chaverra, ICA ☐

☐ Horacio Ayala, ICA ☐

☐ Hugo Leyva, PROEXPO ☐

☐ Humberto Quintero ☐

☐ Jaime Estupiñán, ICA ☐

☐ Jorge Lopera, ICA ☐

☐ José Luis Torres, BID- B. Ganadero ☐

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☐ Juan Salazar, Caja Agraria ☐
☐ Luis Phanor Manrique, U.Nal., Palmira ☐
☐ Omar Patiño, U. Nacional, Bogotá. ☐
☐ Oscar Bonilla, U. de Antioquia ☐
☐ Rafael Castillo, Fondo Ganadero, Meta ☐
☐ Raúl Londoño, Fondo Gan. Antioquia ☐
☐ Ricardo Ochoa, ICA ☐
☐ Samuel Posada, U. Nacional, Medellín ☐
☐ Sigifredo Monsalve, ICA ☐

COSTA RICA.

☐ Gustavo Cubillos, IICA-CTEI ☐
☐ Héctor Muñoz, IICA ☐
☐ Hernán Fonseca, U. de Costa Rica ☐
☐ José L. Solano, Ministerio de Agricult. ☐
☐ Karel Vahnout, IICA ☐

CUBA.

☐ R. Ortíz, ICA ☐

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☐ Raúl Canas, Universidad California ☐

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☐ George Meal, World Bank ☐
☐ John Bishop, Florida-Pichilingue ☐
☐ Jorge Román, INIAP ☐
☐ Kamel Dow, Florida-Pichilingue ☐
☐ Luis Tergas, Florida-Pichilingue ☐
☐ Raúl Soikes, IICA ☐
☐ Tarciso Granizo, Banco Central ☐

EL SALVADOR.

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☐ Carlos F. Burgos, Min. Agr. y Gan. ☐

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☐ Jean Pagot, IEMVT ☐

GUATEMALA.

☐ Angel Iturbide, U. de San Carlos ☐

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☐ Oscar Cordon, Banco de Guatemala ☐
☐ Rafael Ibañez, DIGESA ☐
☐ Roberto Jarquin, INCAP ☐
☐ Roberto Waugh, ICTA ☐

HAWAII.

☐ Donald Pluncknett, U. of Hawaii ☐

HONDURAS.

☐ Candelario Ríos, Escuela Agrícola Panamericana. El Zamorano. ☐

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☐ Augusto Aguilera, Esc. Nal. de Agr. ☐
☐ Candelario Carrera, ITESM ☐
☐ Everardo González, Animal Science Department. ☐
☐ Francisco Bravo, INIP ☐
☐ Gustavo Reta, Ministerio Agricult. ☐
☐ Jorge de Alba, Centro Adiestramiento y Mejoramiento de la Produc. An. ☐
☐ Manuel Bernardo Aguirre, Secretaría de Agricultura. ☐
☐ Manuel Casas, Banco Agropecuario ☐
☐ Pedro Solana, INIP ☐
☐ Ramón Claveran, Fondo Banxico-Insurgentes. ☐
☐ Ricardo Garza Treviño, INIP ☐
☐ T. R. Preston, Min. de Hacienda ☐

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☐ Rodrigo González, Min. Agr. y Gan. ☐

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☐ Carlos Lam ☐
☐ Carlos Roux, Universidad de Panamá ☐

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☐ Eduardo Rufz, U. Nal. de Asunción ☐

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<input type="checkbox"/>	Arturo Flórez, Universidad Nacional	<input type="checkbox"/>
<input type="checkbox"/>	Cees Haan, COPERHOLTA	<input type="checkbox"/>
<input type="checkbox"/>	Eduardo Calleti, U. de San Marcos	<input type="checkbox"/>
<input type="checkbox"/>	Francisco Morillo, IICA	<input type="checkbox"/>
<input type="checkbox"/>	Guillermo Parodi, U. Nal. Agraria	<input type="checkbox"/>
<input type="checkbox"/>	K. Santhirasegaram, FAO-IVITA	<input type="checkbox"/>
<input type="checkbox"/>	Kirt Burri, Coord. de Proyectos Agro- pecuarios en América Latina	<input type="checkbox"/>
<input type="checkbox"/>	Manuel Moro, Centro Panamericano de Zoonosis.	<input type="checkbox"/>
<input type="checkbox"/>	Mariano Segura, U. Nal. Agraria	<input type="checkbox"/>
<input type="checkbox"/>	Rodolfo Vaccaro, U. de San Marcos	<input type="checkbox"/>
<input type="checkbox"/>	Saúl Fernández Baca, IVITA	<input type="checkbox"/>
<input type="checkbox"/>	Sergio Rojas, U. Nal. Agraria	<input type="checkbox"/>

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<input type="checkbox"/>	José Vicente Chandler, ARS-USDA	<input type="checkbox"/>
<input type="checkbox"/>	Paul F. Randel, Subestación Expe- rimental Agrícola Lajas.	<input type="checkbox"/>

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<input type="checkbox"/>	E. J. Campion, FAO	<input type="checkbox"/>
<input type="checkbox"/>	Héctor L. Rodriguez, UNPHU	<input type="checkbox"/>
<input type="checkbox"/>	Nicolás Casasnovas, División de Ga- nadería y Boyada.	<input type="checkbox"/>
<input type="checkbox"/>	Rafael Ledesma, Dirección General de Ganadería.	<input type="checkbox"/>

SURINAM.

<input type="checkbox"/>	H. Byron, Lands Boerdery.	<input type="checkbox"/>
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THAILAND.

<input type="checkbox"/>	James E. Johnston, Agricultural Project Leader.	<input type="checkbox"/>
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TRINIDAD.

<input type="checkbox"/>	Holman E. Williams, U. West Indies	<input type="checkbox"/>
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COOPERACION DE

UNITED KINGDOM.

<input type="checkbox"/>	Anthony Smith, U. of Edimburgh	<input type="checkbox"/>
<input type="checkbox"/>	Anthony Thorne, ODA	<input type="checkbox"/>
<input type="checkbox"/>	Will Mathieson, ODA	<input type="checkbox"/>
<input type="checkbox"/>	W. M. Hewderson, Agr. Research Council.	<input type="checkbox"/>

URUGUAY.

<input type="checkbox"/>	Roderick Von Oven, Plan Agropecuar.	<input type="checkbox"/>
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U. S. A.

<input type="checkbox"/>	Bobbie Van Haeften, USDA	<input type="checkbox"/>
<input type="checkbox"/>	Don Stoops, BIRF	<input type="checkbox"/>
<input type="checkbox"/>	Don Sutherland, BIRF	<input type="checkbox"/>
<input type="checkbox"/>	Frank Thomas, BIRF	<input type="checkbox"/>
<input type="checkbox"/>	Mike McGarry, BIRF	<input type="checkbox"/>
<input type="checkbox"/>	Ralph Hodgson, USDA	<input type="checkbox"/>
<input type="checkbox"/>	Sam R. Freiberg, IRI	<input type="checkbox"/>

U. S. & CANADA.

<input type="checkbox"/>	Al Kretsechmer, U. of Florida	<input type="checkbox"/>
<input type="checkbox"/>	August Schumacher, BIRF	<input type="checkbox"/>
<input type="checkbox"/>	B. R. Eddleman, U. of Florida	<input type="checkbox"/>
<input type="checkbox"/>	Barry Nestel, IDRC	<input type="checkbox"/>
<input type="checkbox"/>	Carl Sierk, USAID	<input type="checkbox"/>
<input type="checkbox"/>	Curry Brookshire, USAID	<input type="checkbox"/>
<input type="checkbox"/>	Curt Wolffelt, BIRF	<input type="checkbox"/>
<input type="checkbox"/>	Donald Farris, Texas A & M	<input type="checkbox"/>
<input type="checkbox"/>	F. Mauer, Texas A & M	<input type="checkbox"/>
<input type="checkbox"/>	G. Adams, Texas A & M	<input type="checkbox"/>
<input type="checkbox"/>	Gene Donefer, McGill University	<input type="checkbox"/>
<input type="checkbox"/>	Gerald Mott, U. of Florida	<input type="checkbox"/>
<input type="checkbox"/>	Glenn H. Beck, Kansas State Univ.	<input type="checkbox"/>
<input type="checkbox"/>	Howard Harvard Harper, USAID	<input type="checkbox"/>
<input type="checkbox"/>	Hugh Popenoe, Univ. of Florida	<input type="checkbox"/>
<input type="checkbox"/>	J. Conrad, University of Florida	<input type="checkbox"/>
<input type="checkbox"/>	Jack Halpin, USAID	<input type="checkbox"/>
<input type="checkbox"/>	James Fransen, BIRF	<input type="checkbox"/>
<input type="checkbox"/>	John A. Pino, Rockefeller Found.	<input type="checkbox"/>
<input type="checkbox"/>	José Soto Angli, IADS.	<input type="checkbox"/>
<input type="checkbox"/>	J. J. Callis, USDA	<input type="checkbox"/>

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U. S. & CANADA.

<input type="checkbox"/>	J. G. Stone, U. of Guelph	<input type="checkbox"/>
<input type="checkbox"/>	Keith Gregory, ARS-USDA	<input type="checkbox"/>
<input type="checkbox"/>	Kenneth Turk, Cornell University	<input type="checkbox"/>
<input type="checkbox"/>	L. Wilson, Pennsylvania University	<input type="checkbox"/>
<input type="checkbox"/>	L. M. Roberts, Rockefeller Foundat.	<input type="checkbox"/>
<input type="checkbox"/>	Norman Collins, Ford Foundation	<input type="checkbox"/>
<input type="checkbox"/>	O. D. Butler, Texas A & M	<input type="checkbox"/>
<input type="checkbox"/>	R. Blaser, Agronomy Dept.	<input type="checkbox"/>
<input type="checkbox"/>	R. McDowell, Cornell University	<input type="checkbox"/>
<input type="checkbox"/>	R. L. Simmons	<input type="checkbox"/>
<input type="checkbox"/>	Reed Hertford, Ford Foundation	<input type="checkbox"/>
<input type="checkbox"/>	T. J. Cunha, University of Florida	<input type="checkbox"/>
<input type="checkbox"/>	W. Johnson, Carolina State Univ.	<input type="checkbox"/>
<input type="checkbox"/>	Wilfred Chandler, Purdue Univ.	<input type="checkbox"/>
<input type="checkbox"/>	William Pritchard, Univ. of Carolina	<input type="checkbox"/>

VENEZUELA.

<input type="checkbox"/>	Augusto Gallardo, Min. de Agricult.	<input type="checkbox"/>
<input type="checkbox"/>	Berndt Muller, U. Central	<input type="checkbox"/>
<input type="checkbox"/>	Carlos Palacios, CIV	<input type="checkbox"/>
<input type="checkbox"/>	Claudio Chicco, Centro Invest. Agr.	<input type="checkbox"/>
<input type="checkbox"/>	Dieter Plasse, U. Central	<input type="checkbox"/>
<input type="checkbox"/>	Edgardo Mendolfi	<input type="checkbox"/>
<input type="checkbox"/>	Eduardo González, U. Central	<input type="checkbox"/>
<input type="checkbox"/>	Foster B. Hamblin, MAC-FAO	<input type="checkbox"/>
<input type="checkbox"/>	Hugo Estrada, MAC-FAO	<input type="checkbox"/>
<input type="checkbox"/>	John Glenn, World Bank	<input type="checkbox"/>
<input type="checkbox"/>	Ronald Mackenzie, CIV	<input type="checkbox"/>

F A O

<input type="checkbox"/>	Peter Oram	<input type="checkbox"/>
<input type="checkbox"/>	Peter Brumby	<input type="checkbox"/>
<input type="checkbox"/>	Robert Temple	<input type="checkbox"/>

CIAT

<input type="checkbox"/>	Bela Grof	<input type="checkbox"/>
<input type="checkbox"/>	Carlos Lascano	<input type="checkbox"/>
<input type="checkbox"/>	Eric Wells	<input type="checkbox"/>
<input type="checkbox"/>	Guido Delgadillo	<input type="checkbox"/>

<input type="checkbox"/>	Howard H. Stonaker	<input type="checkbox"/>
<input type="checkbox"/>	Jerry Doll	<input type="checkbox"/>
<input type="checkbox"/>	Ned S. Raun	<input type="checkbox"/>
<input type="checkbox"/>	Osvaldo Paladines	<input type="checkbox"/>
<input type="checkbox"/>	Pat Moore	<input type="checkbox"/>

Este folleto contiene textos en Español y en Inglés.

Announcement of a Seminar

on

**Tropical America:
potential to
increase
Beef Production**

February 18 - 21, 1974

Centro Internacional de Agricultura Tropical

Anuncio de un Seminario

sobre

**AMERICA TROPICAL:
POTENCIAL PARA INCREMENTAR
LA PRODUCCION DE CARNE**

Febrero 18-21, 1974

**Centro Internacional de Agricultura Tropical (CIAT)
Cali, Colombia**

OBJETIVOS DEL SEMINARIO

1. Explorar el papel que desempeña la ganadería en el desarrollo agropecuario económico de las zonas tropicales.
2. Evaluar los factores que influyen en el desarrollo de la ganadería en esas áreas.
3. Identificar las maneras para aumentar la productividad de la ganadería.
4. Establecer las bases para el intercambio de tecnología e información entre las instituciones y las personas dedicadas a los programas de desarrollo agropecuario.
5. Ayudar al CIAT y a las entidades nacionales a establecer sus propias prioridades en cuanto a investigación ganadera y adiestramiento pecuario.

REUNION ESPECIAL A CELEBRARSE DESPUES DEL SEMINARIO

Viernes, 22 de Febrero

Después del Seminario habrá una reunión con algunos participantes específicos que tengan interés en discutir e identificar los medios de facilitar una mejor coordinación entre instituciones nacionales e internacionales, así como también entre los técnicos e investigadores que trabajan en esas instituciones en lo que respecta a programas de adiestramiento e investigación pecuaria.

Al celebrarse el Seminario se distribuirá información acerca de esta reunión y su respectivo programa de trabajo.

Si usted tiene interés de participar en esta reunión, favor informar sobre ello cuando haga su inscripción al Seminario.

GIRAS A DOS ESTACIONES EXPERIMENTALES PECUARIAS EN COLOMBIA ORGANIZADAS PARA DESPUES DEL SEMINARIO

Viábado, 23 de Febrero

Se harán los arreglos necesarios para visitar dos estaciones experimentales pecuarias del Instituto Colombiano Agropecuario (ICA): Carimagua, en los Llanos Orientales, y Turipaná, en el Departamento de Córdoba, en la Costa Norte. Se procurará formar dos grupos de 25 participantes, uno para cada estación.

En estas estaciones se podrán observar los siguientes trabajos:

Carimagua

- Proyecto de estudio sobre sistemas de producción de ganado de carne.
- Uso de alimentación suplementaria durante la época seca del año.
- Establecimiento de praderas con especies mejoradas de gramíneas/leguminosas.
- Investigaciones sobre suelos y sobre producción de cultivos.

Turipaná

- Programas de cruzamientos con las razas: Romo Sinuano, Charolais y Cebú.
- Una hacienda ganadera utilizada por el CIAT en el programa de Adiestramiento de Becarios en Producción Pecuaria.
- Praderas experimentales.

Por cada gira se cobrará una cuota de \$ 750.00 pesos (moneda colombiana), o sea, U.S. \$30.00, con la cual se cubrirán los gastos de transporte y de alimentación. Si además hubiera otros gastos, éstos serán cubiertos individualmente por los participantes.

PROGRAMA

1. Lunes, 18 de Febrero

0800 - 0830 Inscripción.

0830 - 0900 Bienvenida y apertura del seminario. U.J. Grant y Ned S. Raun

0900 - 1000 Discurso de apertura: La ganadería como instrumento de desarrollo en América Latina.

Roberto Meirelles de Miranda

1000 - 1030 Receso

Sección: Establecimiento y Manejo de Praderas
Moderador: Jaime Lotero

1030 - 1100 Requerimientos de nutrientes en el establecimiento de pastos mejorados.

Roger Jones

1100 - 1130 El manejo y utilización de praderas naturales.

Oswaldo Paladines

1130 - 1200 El establecimiento de praderas mejoradas a base de gramíneas y leguminosas tropicales.

K. Santhirasegaram

1200 - 1330 Almuerzo

1330 - 1430 Discusión general sobre establecimiento y manejo de praderas.

Sección: Manejo, Nutrición y Mejoramiento de Ganado

Moderador: Juan Salazar

1430 - 1500 Consideraciones sobre prácticas del manejo de ganado que influyen sobre la productividad.

Howard H. Stonaker

1500 - 1530 Receso

1530 - 1600 Suplementación de los animales en pastoreo.

B. D. H. Van Niekerk

1600 - 1630 Sistemas eficientes de mejoramiento usando razas adaptadas al medio trópico.

Dieter Plasse

1630 - 1730 Discusión general sobre el manejo, nutrición y mejoramiento del ganado.

1730 en adelante Formación de grupos de trabajo sobre selección y mejoramiento genético del ganado; sanidad animal; pastos y forrajes y problemas de nutrición; aspectos socioeconómicos de la producción de ganado de carne, y proyectos de desarrollo a base de producción pecuaria.

2. Martes, 19 de Febrero

Sección: Sanidad Animal

Moderador: Manuel Moro

0800 - 0830 Principales riesgos en sanidad animal al desarrollar nuevas áreas para producción de carne.

Eric A. Wells

0830 - 0900 Densidad de población y su relación con la sanidad animal.

Pedro Solana

0900 - 0930 Discusión general sobre sanidad animal.

0930 - 1000 Receso

Sección: Sistemas Intensivos de Engorde

Moderador: Claudio Chicco

1000 - 1030 Sistemas intensivos de engorde en pastoreo.

Gustavo Cubillos

1030 - 1100 Sistemas intensivos de engorde en confinamiento.

T. R. Preston

1100 - 1200 Discusión general sobre sistemas intensivos de engorde.

1200 - 1330 Almuerzo

1330 - 1500 Visita a los programas del CIAT.

1500 - 1700 Reunión de los grupos de trabajo.

1900 - 2100 Cóctel, parrillada y agasajo.

3. Miércoles, 20 de Febrero

Sección: Consideraciones Socioeconómicas

Moderador: Fabián Portilla

0800 - 0830 Aplicación de la tecnología al nivel del agricultor/ganadero.

Ramón Claverán

0830 - 0900 Administración de las empresas agropecuarias.

Sin nombrar aún

0900 - 0930 Visión sinóptica del "Workshop" realizado en el CIAT, sobre aspectos económicos de la ganadería.

Alberto Valdés

0930 - 1000 Análisis de sistema de la empresa ganadera.

Blas Bravo

1000 - 1030 Receso

1030 - 1130 Discusión general sobre consideraciones socioeconómicas.

1130 - 1300 Almuerzo

Sección: Proyectos de Desarrollo

Moderador: Lucio Reca

1300 - 1330 Diseño e implementación de un proyecto de desarrollo.

James Fransen

1330 - 1400 Política gubernamental en relación con los proyectos de desarrollo.

August Schumacher

1400 - 1430 Influencia del mercado externo sobre la producción nacional.

Curt Wolffelt

1430 - 1530 Discusión general sobre proyectos de desarrollo.

1530 - 1600 Receso

1600 - 1800 Reunión de los grupos de trabajo para preparar sus evaluaciones y redactar sus recomendaciones.

4. Jueves, 21 de Febrero

Moderador: Ned S. Raun

0800 - 0830 Informe del grupo de mejoramiento genético del ganado de carne.

0830 - 0900 Informe del grupo de sanidad animal.

0900 - 0930 Informe del grupo de pastos y forrajes y problemas de nutrición.

0930 - 1030 Informe del grupo socioeconómico.

1030 - 1100 Receso

1100 - 1200 Informe del grupo de proyectos de desarrollo.

1200 - 1330 Almuerzo

1330 - 1530 Discusión general

1530 - 1600 Receso

1600 1630 Resumen del seminario.

1630 - 1700 Evaluación del seminario

CONFERENCISTAS Y MODERADORES
(SPEAKERS AND MODERATORS)

1. Conferencistas (Speakers)

Blas Bravo
Economista
INTA
Casilla de Correos 276
Balcarce, Provincia de Buenos Aires
Argentina

Gustavo Cubillos
Agrostólogo
Departamento de Ganadería
IICA-CTEI
Turrialba, Costa Rica

Ramón Claverán
Zootecnista
Fondo Banxico
Insurgentes Nte. 423
Piso 12
México D.F., México

James Fransen
Agricultural Research Coordinator
Interamerican Bank for Reconstruction and
Development
1818 H. Street, N.W.
Washington, D.C. 20433
United States of America

Roger Jones
Soils Specialist
CSIRO
Pastoral Research Laboratory
Division of Tropical Agronomy
Private Mail Bag
Townsville, Queensland 4810
Australia

Roberto Meirelles de Miranda
Director Técnico EMBRAPA
Esplanada dos Ministerios
Caixa Postal 1316
Bloco 8 - 9 Andar 70000
Brasilia, D.F.
Brasil

Osvaldo Paladines
Zootecnista
CIAT

Conferencistas (continuación)

T.R. Preston

Zootecnista

Comisión Nacional de la Industria Azucarera

Humboldt No. 56

Piso 2

México 1, D.F., México

Pedro Solana

Director

Instituto Nacional de Investigaciones Pecuarias

Palo Alto

Km 15 1/2 Carretera México-Toluca

Apartado Postal 41652

México, D.F.

México

Dieter Plasse

Zootecnista

Universidad Central de Venezuela

Facultad de Ciencias Veterinarias

Apartado de Correo 4563

Maracay, Estado Aragua

Venezuela



K. Santhirasegaram
FAO Tropical Pasture Agronomist
IVITA, Apartado 4480, Pucallpa
Lima, Perú

August Schumacher
Inter-American Bank for Reconstruction and
Development
1818 H. Street, N.W.
Washington, D.C. 20433
United States of America

Howard H. Stonaker
Lfder de Producción de Ganado de Carne
CIAT

B.D.H. Van Niekerk
Deputy Manager-VIT-Dept.
Roche Products (EDMS) BPK
Brewrystraat 4 Posbus 129
Isando, Transvaal
South Africa

Alberto Valdés
Economista
CIAT



Eric A. Wells
Líder de Sanidad Animal
CIAT

Curt Wolffelt
Inter-American Bank for Reconstruction
and Development
1818 H. Street, N.W.
Washington, D.C. 20433
United States of America

2. Moderadores (Moderators)

Claudio Chicco
Zootecnista
Centro Nacional de Investigaciones Agropecuarias
Apartado 4653
Maracay, Estado Aragua
Venezuela

U.J. Grant
Director General
CIAT

Jaime Lotero
Agrostólogo
Instituto Colombiano Agropecuario
Apartado 51764
Medellín, Colombia

Manuel Moro
Jefe, Departamento de Laboratorios
Centro Panamericano de Zoonosis
Casilla 23
Ramos Mejía, Provincia de Buenos Aires
Argentina

Fabián Portilla
Director General, INIAP
San Javier No. 295
Apartado 2600
Quito, Ecuador

Ned S. Raun
Director, Ciencias Pecuarias
CIAT

Lucio Reca
Economista
Ministerio de Agricultura y Ganadería
Cuba 2560, 7o. (28)
Buenos Aires, Argentina

Juan José Salazar
Subdirector Técnico
Caja Agraria
Bogotá, D.E., Colombia

- 1030 - 1130 General discussion on socio/
economic aspects.
- 1130 - 1300 Lunch

Section: Development Projects
Moderator: Lucio Reca

- 1300 - 1330 Formulation and implementa-
tion of a development project.
James Fransen
- 1330 - 1400 Influence of government poli-
cy on development projects.
August Schumacher
- 1400 - 1430 Domestic response to inter-
national trade.
Curt Wolffelt
- 1430 - 1530 General discussion on de-
velopment projects.
- 1530 - 1600 Break
- 1600 - 1800 Work groups meet to pre-
pare their evaluation and
recommendations.

4. Thursday, 21 February

Moderator: Ned S. Raun

- 0800 - 0830 Report of the animal breeding
work group.
- 0830 - 0900 Report of the animal health
work group.
- 0900 - 0930 Report of the pastures/nu-
trition work group.
- 0930 - 1030 Report of the socio/economic
work group.
- 1030 - 1100 Break
- 1100 - 1200 Report of the development
project work group.
- 1200 - 1330 Lunch
- 1330 - 1530 General discussion.
- 1530 - 1600 Break
- 1600 - 1630 Synopsis of the seminar
- 1630 - 1700 Evaluation

- 0830 - 0900 The influence of population density on animal health.
Pedro Solana
- 0900 - 0930 General discussion on animal health.
- 0930 - 1000 Break

Section: Intensive Fattening Systems
Moderator: Claudio Chicco

- 1000 - 1030 Intensive systems of fattening cattle on pasture.
Gustavo Cubillos
- 1030 - 1100 Intensive systems of fattening cattle in confinement.
T. R. Preston
- 1100 - 1200 General discussion on intensive fattening systems.
- 1200 - 1330 Lunch
- 1330 - 1500 Visit CIAT programs
- 1500 - 1700 Work groups meet.
- 1900 - 2100 Cocktail, Barbecue and Entertainment.

3. Wednesday, 20 February

Section: Social/Economic Considerations
Moderator: Fabian Portilla

- 0800 - 0830 Application of technology at the farm/ranch level.
Ramón Claverán
- 0830 - 0900 Farm/ranch management.
To be named
- 0900 - 0930 Synopsis of a workshop held in CIAT on economic aspects of beef cattle production.
Alberto Valdés
- 0930 - 1000 Systems analysis of a beef cattle enterprise.
Blas Bravo
- 1000 - 1030 Break

1100 - 1130 Management and utilization of native pastures.

Osvaldo Paladines

1130 - 1200 The establishment of improved grass-tropical legume pastures.

K. Santhirasegaram

1200 - 1330 Lunch

1330 - 1430 General discussion on range management and establishment of improved pastures.

Section: Management, Nutrition and Animal Breeding.

Moderator: Juan Salazar

1430 - 1500 Influence of management practices on productivity.

Howard. H. Stonaker

1500 - 1530 Break

1530 - 1600 Supplementation of grazing cattle.

B. D. H. Van Niekerk

1600 - 1630 Efficient breeding systems using breeds adapted to the tropics.

Dieter Plasse

1630 - 1730 General discussion on management, nutrition, and animal breeding.

1730 - on Formation of animal breeding, animal health, pastures/nutrition, socioeconomics and development project work groups.

2. Tuesday, 19 February

Section: Animal Health

Moderator: Manuel Moro

0800 - 0830 Animal health hazards in developing new beef cattle production areas.

Eric A. Wells

To be seen at:

Carimagua

- Beef cattle production systems project
- Supplementation during dry season
- Establishment of improved grass/legume pastures
- Soils research and crop production investigations

Turipana

- Cross-breeding programs: Romo Sinuano, Charolais and Zebu
- Commercial ranch used for CIAT Production Specialists Training Program.
- Pasture trials.

PROGRAM

1. Monday, 18 February

0800 - 0830 Registration

0830 - 0900 Opening comments. U.J.Grant
and Ned S. Raun.

0900 - 1000 Keynote address: The role of
beef cattle in the development
of Latin America.
Roberto Meirelles de Miranda

1000 - 1030 Break

Section: Range Management and Establishment of
Improved Pastures

Moderator: Jaime Lotero

1030 - 1100 Nutrient requirements for the
establishment of improved
pastures.

Roger Jones

OBJECTIVES OF THE SEMINAR

1. To explore the roles of beef cattle enterprises in the agricultural and economic development of the lowland tropics.
2. To evaluate factors influencing the development of the beef cattle industry in these areas.
3. To identify techniques for increasing productivity of beef cattle enterprises.
4. To establish the bases for interchange of technology and information among institutions and individuals engaged in livestock and agricultural development programs.
5. To assist CIAT and national agencies in establishing their own priorities for beef cattle research and training.

POST SEMINAR MEETING

Friday, February 22

Following the seminar a meeting will be held, for interested participants, to discuss and identify means of improving coordination between beef research and training programs in national and international institutions.

Further details and program will be provided during the seminar.

If you are interested in participating, please advise us on registering.

POST SEMINAR FIELD TRIPS TO OTHER BEEF EXPERIMENTAL STATIONS IN COLOMBIA

Saturday, February 23

Arrangements will be made for interested persons to visit either the ICA station in Carimagua (Llanos Orientales) or Turipaná (Cordoba, North Coast).

There will be a charge of \$750.00 Colombian pesos (US\$30.00) to cover charter costs and meals. Any extra expenses, if any, should be covered by each individual.

Announcement of a Seminar

on

TROPICAL AMERICA:
POTENTIAL TO INCREASE
BEEF PRODUCTION

February 18-21, 1974

Centro Internacional de Agricultura Tropical (CIAT)
Cali, Colombia

Este folleto contiene textos en Español y en Inglés.

Announcement of a Seminar

on

**Tropical America:
potential to
increase
Beef Production**

February 18 - 21, 1974

Centro Internacional de Agricultura Tropical

Please turn over for English

Seminario

"América Tropical, Potencial para el Incremento de Producción
de Canado de Carne"

En el Centro Internacional de Agricultura Tropical (CIAT), Cali,
Colombia, Febrero 18 al 21, 1974

FORMULARIO DE ALOJAMIENTO Y LLEGADAS

En letra de imprenta, por favor

NOMBRE _____

INSTITUCION _____

DIRECCION _____

DIRECCION CABLEGRAFICA _____

ALOJAMIENTO DESEADO (Indicar uno) (Ver hoja adjunta para detalles)

En el CIAT: Sencilla ()

Doble ()

En el InterContinental Cali: Sencilla ()

Doble ()

Para compartirla, preferiblemente, con _____

Fecha de llegada	Vuelo	No.	Hora de llegada
------------------	-------	-----	-----------------

Fecha de salida	Vuelo	No.	Hora de salida
-----------------	-------	-----	----------------

Estoy interesado en la visita a: Carimagua ()

Turipaná ()

No podré asistir ()

Observaciones:

Seminar

"Tropical America; Potential to Increase Beef Production"

Held at the Centro Internacional de Agricultura Tropical (CIAT),
Cali, Colombia, February 18 thru 21, 1974

LODGING AND ARRIVAL SCHEDULE FORM

Please type or print

NAME _____

INSTITUTION _____

ADDRESS _____

CABLE ADDRESS _____

ACCOMMODATION DESIRED (Check one) (Please see attached sheet for details)

At CIAT; Single ()

Double ()

At InterContinental Cali; Single ()

Double ()

Roommate preference, if any _____

Date of arrival	Flight	No.	Arrival time
Date of departure	Flight	No.	Departure time

I am interested in the field trip to: Carimagua ()

Turipaná ()

I am not interested ()

Observations,

Versión en Español al reverso

For Your Information

Registration. There will be no registration fee. Arrangements for social evenings have been made for Monday and Tuesday. On registering, participants will receive tickets to these affairs. These will be CIAT hosted.

Participants will be able to purchase their lunch and dinner tickets at the registration desk. Meals will consist of a fixed menu, at \$40.= Colombian pesos (US\$1.60), for lunch, and \$45.= Colombian pesos (US\$1.80) for dinner. Breakfast can be signed to your room bill, which would be paid before departure.

Drinks can be served, at regular prices, at meals or in the lounge bar.

Lodgings. CIAT can house up to some 100 participants, two to a room, in large, comfortable rooms designed for privacy and work or study. Each has its own bathroom.

There are restaurant, cafeteria, snack bar and bar facilities, as well as a swimming pool and recreation room.

Rates are, \$225.= Colombian pesos (US\$9.=) for a single, and \$137.50 Colombian pesos (US\$5.50), for a double, per person, i.e. US\$11.= for two.

The InterContinental Cali Hotel is 40 minutes from CIAT and is a modern, first class hotel. Its rooms are air-conditioned and it has a swimming pool and dining and bar facilities. Rates are, \$260.= Colombian pesos for a single (US\$10.40), and \$330.= Colombian pesos (US\$13.20) for a double. Rate increases are expected in 1974.

Transportation. There will be transportation to and from the airport, which is only 5 minutes away from CIAT. Participants staying in Cali will be provided transportation to and from their hotel. Special visits into town or sightseeing tours can be arranged for all.

Money. Dollars and travelers' checks are accepted both at CIAT and at the InterContinental. These can be exchanged into Colombian pesos at both places.

Departing participants must pay an airport tax of \$200.= Colombian pesos.

Clothing. The temperature at CIAT is 24°C (75°F) all year round. The conference and dining facilities are air conditioned. Informal clothing is recommended for all meetings and, specially, on field trips. Ties and coats are suggested for the social events.

Ladies. A lunch has been arranged on Monday for all accompanying wives who wish to do some sightseeing or shopping.

PARA SU INFORMACION

Inscripción: No habrá tarifa de inscripción. Se han organizado reuniones sociales para las noches del lunes y el martes. Al inscribirse, los participantes recibirán invitaciones para estos actos, extendidas por el CIAT.

Los participantes podrán adquirir sus vales para las demás comidas, en el mostrador de inscripción. Las comidas constarán de un menú fijo, a \$40.00 Pesos Colombianos (US\$1.60), por almuerzo, y \$45.00 Pesos Colombianos (US\$1.80) por cena. El vale del desayuno puede ser firmado y será cargado a su cuenta, la que debe ser cancelada antes de partir.

Se servirán bebidas, a precios normales y según requeridas, en las comidas o en el bar del área de alojamiento.

Alojamiento: El CIAT puede alojar a unas 100 personas, a dos por apartamento, en cuartos amplios y confortables, aislados para tranquilidad y el estudio. Cada apartamento consta de su propio baño. Se ofrece servicio de restaurante, cafetería, bar, piscina y sala para recreación.

Las tarifas son de \$225.00 Pesos Colombianos (US\$9.00) para un apartamento sencillo, y \$137.50 Pesos Colombianos (US\$5.50), para uno doble, por persona, o sea, US\$11.00 para dos personas.

El Hotel InterContinental-Cali, dista a unos 40 minutos del CIAT y es un hotel moderno y de primera categoría. Goza de apartamentos con aire acondicionado y posee piscina y buen servicio de restaurante y cafetería. Las tarifas son: \$260.00 Pesos Colombianos (US\$10.40) para un cuarto sencillo, y \$330.00 Pesos Colombianos (US\$13.20) para uno doble. Pero se anticipan aumentos considerables en 1974.

Transporte: Habrá transporte desde y a el aeropuerto, el que está a solo 5 minutos del CIAT. A los participantes que se alojen en Cali se les proveerá transporte a y desde el hotel. Se pueden organizar visitas a la ciudad o excursiones para todos los participantes.

Moneda: Tanto en el CIAT como el InterContinental se aceptan dólares o cheques para viajeros. Estos pueden convertirse a pesos colombianos en ambos lugares.

Recordamos a los participantes que regresan a sus países que deberán pagar un impuesto de aeropuerto de \$200.00 Pesos Colombianos.

Ropa: En el CIAT la temperatura se mantiene en unos 24°C (75°F), todo el año. Los apartamentos y los comedores tienen aire acondicionado. Se recomienda usar ropa sport durante las reuniones, especialmente en las visitas al campo. Una chaqueta y corbata son aconsejables para las reuniones sociales.

Damas acompañantes: Se ha organizado un almuerzo el día lunes para aquellas damas que quisieran participar en excursiones o realizar compras.

Versión en Español al reverso

Seminar

"Tropical America, Potential to Increase Beef Production"

Held at the Centro Internacional de Agricultura Tropical (CIAT),
Cali, Colombia, February 18 thru 21, 1974

REGISTRATION FORM

(Please type or print)

Last name _____

First name _____

Institution _____

Address _____

Position _____

Degree (M.Sc., B.Sc., Ph.D., DVM, etc.) _____

Discipline (Veterinary medicine, breeder, educator, etc.) _____

Signature

Please turn over for English

Seminario

"América Tropical, Potencial para el Incremento de Producción
de Ganado de Carne"

En el Centro Internacional de Agricultura Tropical (CIAT), Cali,
Colombia, Febrero 18 al 21, 1974

FORMULARIO DE INSCRIPCION

(En letra de imprenta, por favor)

Apellido _____

Nombres _____

Institución _____

Dirección _____

Posición en ella _____

Grado (M.Sc., B. Sc., Ph.D., DVM, etc.) _____

Disciplina (Médico veterinario, mejorador, educador, etc.) _____

Firma



Foreign and Commonwealth Office

OVERSEAS DEVELOPMENT ADMINISTRATION

Eland House Stag Place London SW1E 5DH

Telephone 01-828 4366 ext

CIAT
G2

Dr U J Grant
Director General
Centro Internacional de Agricultura Tropical
Apartado Aereo 67-13
Cali
Colombia

Your reference

Our reference

NRR 236/222/08

Date

5 December 1973

UK GRANT-IN-AID TO CIAT

I am writing to confirm the pledge given at the 4th meeting of the Consultative Group that ODA will contribute £55,000 to CIAT in 1974. It is intended that the first call on these funds will be for Capital Funding for Beef and Cassava Programmes (£25,000), Animal Health Entomology project (£18,000), TPI/CIAT Cassava storage project (£12,000), any balance remaining thereafter being applied to your core budget generally.

2. I should explain that our pledges have to be made in sterling. Payments in respect of our grant can be made in dollars (or any other currency) but only to the maximum of the sterling sum pledged at the rate of exchange current at the time of payments.

3. Payments will be made 4 monthly in arrears in three instalments of £18,334, £18,333 and £18,333 in mid-April, mid-August and mid-December respectively. Would you please confirm that this arrangement is acceptable and provide details of the bank account to which you wish our funds to be credited.

4. As a discharge for our grant we will require three copies of the Centre's annual audited accounts in which our contribution is readily identifiable, and three copies of the auditor's report on these accounts, when these documents are available. I should be grateful for your early agreement to these arrangements.

5. I am copying this letter to Mr Graves in Washington and to Dr Spensley at Tropical Products Institute.

S A Bunce

Committed bank rate on
£ on December 12 was
£1 = \$2.31

OVERSEAS DEVELOPMENT ADMINISTRATION

6 and House 2nd Floor SW1E 5BH

Telephone 01-825 2555 ext



Mr H J Grant
Director General
Centro Internacional de Agricultura Tropical
Apartado Aéreo 54-15
Cali
Colombia

RE GRANT-19-110 TO CIAT

I am writing to confirm the grant given at the meeting of the Administrative Group that will contribute £15,000 to CIAT in 1984. It is intended that the first call on these funds will be for capital funding for seed and fertilizer programmes (£12,000), Animal Health, Entomology projects (£15,000), and CIAT's banana storage project (£15,000), and balance remaining thereafter being applied to your own budget generally.

I should explain that our grant has to be made in sterling. In respect of our grant we will be making a payment for any other currencies for only the balance of the sterling and at the rate of exchange existing at the time of payment.

Payment will be made 6 months after the grant is received. £15,000 and £15,000 in two instalments, and £15,000 in two instalments. You should please confirm that this is acceptable. We will be paying of the bank account for which you wish to have the grant.

As a discharge for our grant we will require three copies of the annual audited accounts in which the grant is used. These should be sent to three copies of the auditor's report on these accounts, and these accounts should be available. I should be grateful for your early agreement to these arrangements.

I am sending this letter to Mr Grant. I will keep the copy to the grant.

SECTION
COMMUNICATIONS

1973 DEC -7 PM 2:34

RECEIVED



CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

G 2a

DIR-1363

December 5, 1973

Mr. Robert S. McNamara
President
International Bank for Reconstruction
and Development
International Development Association
Washington, D. C. 20433


Dear Mr. McNamara:

Thank you for your letter of October 26 announcing the appointment of Mr. Warren C. Baum and Mr. Michael L. Hoffman, as Chairman and Vice Chairman of the Consultative Group, respectively. I look forward to the pleasure of collaborating with them.

Permit me to take this opportunity to thank you personally for the tremendous support which we have received in the development of the international centers. On behalf of the board, management and staff of CIAT we express our thanks.

With best regards.

Sincerely yours,



U. J. Grant
Director General

UJG.caa

Original to: *Mr. Mac Namara*
Date: *DEC 10 1973*
Communications Section

92a

December 4, 1973

Dear Jerry:

I was glad to talk with you by telephone yesterday concerning the possible IDB contribution and also center review procedures. I am sorry we were cut off, but it seemed to happen just as we had finalized our business.

I am expecting you here on Thursday, December 13. I have left time open until 10:30 when we shall have a meeting with IDB and USAID representatives. We shall also have a luncheon around 12:30.

If you do reach Washington on the Wednesday, Warren Baum, the Chairman of the Consultative Group, would very much like to see you. Unfortunately, he has to leave that night for Canada and so cannot join in anything on Thursday.

I also have your letter of November 24 regarding the use of any IDB contribution. As discussed on the 'phone, IDB's ideas now run to research program support, rather than the financing of training as highlighted in the memorandum you sent on the basis of your November 1-2 meeting with CIP and CIMMYT.

With best wishes,

Sincerely,



Bruce M. Cheek

Dr. U. J. Grant
c/o Dr. John A. Pino
Director for Agricultural Sciences
The Rockefeller Foundation
111 West 50th Street
New York
New York 10020

cc: Dr. John A. Pino
Mr. Baum
Mr. Yudelman
Mr. Ruddy/Mr. Lewis

BMC:mcj

92a

November 30, 1973

Mr. Andrew V. Urquhart
Controller
Centro Internacional de Agricultura
Tropical
Apartado Aereo 67-13
Apartado Nal. 737
Cali, Colombia

Dear Andrew:

This is to acknowledge and thank you for your letter of November 22 to Harold Graves concerning the center review procedures and the schedule for budget preparation for 1975. Harold is at present on mission in Africa concerning ILRAD, ILCA and IITA.

I refer to our telephone conversation of November 28 on the points raised in your letter. As I explained, we are beginning with a Phase I of discussions between the Secretariat and the Center Directors and their staff concerning the preparation of each Center's submission which, according to the Center Review Procedures paper of the Bell Subcommittee, is to be in the hands of the Secretariat in draft form by March 31 of each year. Last week we sent you the revised draft format of this paper for final comment by the end of December.

Harold Graves and Bill Lewis of P & B are in process of visiting the six centers in what we call the Phase I of the Center Review Procedures. I am joining them on the missions to CIP, which we had last week, to IITA, which is scheduled for next week, and to CIAT.

On the basis of the CIP discussions with Dick Sawyer, I am sending you in an informal way for your information and review with Jerry Grant two items. One is the two-page outline of points which we gave Dick Sawyer as being the points we thought his program and budget paper should cover. The second is a paper we modeled out on the basis of our discussions with Dick and of some notes which he gave us. We have sent it to him for comment. We have also sent both documents to Dr. Albrecht in IITA as a basis for our forthcoming discussions. As I said on the 'phone, these should be taken as informal documents and as rough guidelines for work in the center and for discussion with us. One of our principal objectives in the Phase I process is to help ensure that the program description does relate the narrative to the budget tables more effectively than in the past.

Mr. Andrew V. Urquhart

- 2 -

November 30, 1973

For the moment, at least, our plans include a visit to CIAT around February 18. This would be just before you have the Center Directors at CIAT for their March 4 meeting. It would also come about a month after your own internal review which begins, I understand, on January 12, and would fit within the January/March cycle of preparation of documents for the Secretariat. Then, to answer your last point, we would still expect a review team of two or three people to visit each center between April and May as a basis for preparing a Secretariat document consistent with the requirements of the Bell CRP paper.

When we get back from IITA, we shall be in touch with you again in the light of our further experience. Meanwhile, if you have any further questions or suggestions, I hope that you or Jerry Grant will be in touch again with Harold.

It was good to talk to you and I hope all is going well.

With best wishes,


Sincerely,



Bruce M. Cheek

Enclosures

cc: Mr. Ruddy/Mr. Lewis
BMC:mcj



42a

November 26, 1973

Dr. U.J. Grant
Director General
Centro Internacional De Agricultura Tropical
Apartado Aereo 67-13
Cali, Colombia.

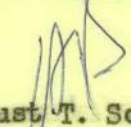
Dear Dr. Grant:

I am replying to your letter no. 334, dated September 18. I accept with pleasure your invitation to present a paper at the seminar on "Potentials for Increasing Beef Production in the American Tropics", to be held at CIAT on February 20, 1974, at 1330 hours.

I will be writing to you at a later date enclosing a copy of the required paper. I have noted that the deadline for papers is December 15. Jim Fransen told me he would be writing to you shortly regarding the specifics of Bank participation and papers to be provided.

Very much looking forward to meeting you and to participating in the seminar on February 20.

Yours sincerely,


August T. Schumacher

Cleared with and cc: L.E. Christoffersen
J. Fransen

cc: M. Yudelman

ATSchumacher/em



CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

M E M O R A N D U M

85-513

file TAC

TO: Dr. Alan Berg, IBRD

FROM: P. Pinstруп-Andersen, CIAT *(P.P.A.)*

SUBJECT: Some thoughts on the relationship between International Agricultural Center activities and human nutrition.

DATE: November 23, 1973

This memo refers to our conversation at the recent ADC meeting on nutrition programming and policy research held in Princeton. During that conversation you asked me to formulate in writing some of my thoughts on the need to consider the impact on human nutrition as an explicit goal of International Agricultural Center activities and possible action by TAC and the Centers to facilitate decision-making on research resource allocation for the purpose of improving human nutrition.

In my discussion I have emphasized why I believe it is important to consider improved nutrition as an objective of Center activities, the associated difficulties and some possible action aimed at facilitating the incorporation of the goal of improved human nutrition in decision-making on research priorities. The memo was written in haste and I apologize for its incompleteness. Please feel free to use parts or all of the content of this memo for presentation to the Technical Advisory Committee (TAC).

National vs. Center goals

Given the problem orientation of the Center activities I am sure that we can agree that the goals of the Centers must correspond with national development goals. Development goals of nations may be classified as efficiency, equity and security goals. Efficiency goals refer to such factors as increased gross national product, increased food production, etc. Equity goals include such goals as more equitable income distribution, improved human nutrition, etc. while security goals refer to factors contributing to internal and external security.

cc: Mr. Reulinger

RECEIVED



CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

MEMORANDUM

85-513

TO: Dr. Alan Berg, IBRD
FROM: P. Pinstrup-Andersen, CIAT (P.P.A.)
SUBJECT: Some thoughts on the relationship between International Agricultural Center activities and human nutrition.
DATE: November 23, 1973

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NOV 27 AM 8:50

RECEIVED

The development goals differ among countries. Furthermore, countries with similar development goals tend to differ with respect to relative importance placed on each of the development goals. Some countries may stress certain goals as for example increased foreign exchange earnings while maintaining other goals such as improved income distribution as being less important. Frequently, certain goals such as increased food production are stressed while other goals such as improved nutrition are implied. In this case it is assumed that increasing food production will result in improved nutrition. Few countries have made a major effort to quantify socially acceptable trade-offs among development goals. It is usually not clear from development plans, for example, how much foreign exchange a country is willing to give up to increase human nutrition by a certain amount.

Given this situation, how do the International Research Centers establish their research priorities in such a way as to maximize the contribution to development goals of the countries to be served? In other words, what should be the goals of the International Centers? Should the Centers - when deciding on research priorities - be concerned with the impact of their research on such social goals as increased employment and improved nutrition or should the sole objective be to expand food production and if the latter was decided, what criteria should be used to select the food commodities to be included in the Center activities?

One could argue that the sole purpose of the Centers is to facilitate an expansion of food production, leaving it to the individual countries to assure that the increased food supply is utilized in such a way as to satisfy the country's development goals. I would disagree with such an argument. While I agree that national policy measures should play a major role in assuring that improved agricultural technology developed by the international and national research institutes is utilized according to national goals, I strongly believe that the research institutes themselves have a major responsibility in assuring that research priorities are established on the basis of development goals and in such a way as to reduce the needs for corrective public policy measures.

The question then arises as to the relative importance to place on each development goal. Ideally, one would select a set of research priorities that would maximize the contribution to all the major development goals. However, some of the goals may conflict, e.g. labor-saving technology may reduce production costs, hence provide cheaper food for the consumer or increase net returns to the producer but at the same time it would conflict with the goal of increased employment.

The above may be summarized as follows:

1. The Centers must consider both efficiency and equity goals when establishing research priorities.

2. Establishing research priorities on the basis of equity goals is likely to be difficult because:

- a) National goals are frequently not well defined.
- b) There may be conflicts among the goals.
- c) Information on the impact of alternative research efforts on equity goals is scarce and frequently not fully understood.
- d) Development goals differ among countries to be served by the individual Center.

Improved human nutrition as a goal

Now let us focus on one of the development goals: improved human nutrition. The need to consider development goals - including improved human nutrition - in establishing research priorities was discussed above. Improving nutrition may be an extremely complicated task. In addition to the availability and price of foods with a large content of scarce nutrients, the nutritional level depends on a large number of factors such as purchasing power, family size and age distribution, health, education, etc. Although this discussion will focus on the contribution of the Centers to availability and price of the nutrients needed, it should be pointed out that new technology developed by the Centers may make a major contribution to human nutrition through increased purchasing power and improved health and education of the farmer and his family.

The nutritional impact of the Center research may be examined in two parts:

- 1. Nutritional content of the products for which production expanding technology is being developed by the Centers.
- 2. Distribution of the additional food supply resulting from the new technology on consumer groups, i.e. what proportion of the additional food supply will be consumed by nutrient deficit consumers?

Recent emphasis on legumes and beef as well as efforts to improve protein quantity and quality in staple foods indicate awareness among the staff and directors of the International Centers with respect to part 1.

Part 2, I believe, is much less recognized at the Centers, yet it is of great importance in establishing research priorities. Facilitating increases in the production of, say, high protein food can obviously only be

justified on nutrition grounds if the consumers of the additional protein supply were in fact short on protein.

✓ Obviously, the nutritional impact should not be the only relevant criteria for establishing research priorities at the Centers. I do believe, however, that the impact on human nutrition should be considered along with other development goals when choices are made among alternative research possibilities.

✓ How can this best be done? In cases where conflicts exist between the nutrition goal and other development goals, I see no possibility for establishing a universal rule for an acceptable trade-off, e.g. what amount of potential yield increase should we forego to obtain a certain increase in human nutrition? I would expect, however, that there would be a large number of cases where the nutrition consideration could be included without reducing the potential contribution to other goals such as increased yields and employment.

In order to make sound decisions as to the impact of alternative research efforts on human nutrition we need additional information on consumer behavior and the expected distribution of additional food supplies among consumer groups. Surprisingly little research has been done to estimate and predict the relationship between changes in food supply and resulting changes in human nutrition. As a case in point, I might mention that we know very little about who consumes additional food supplies and we know virtually nothing about the relationship between changes in food production and changes in nutrient intake by the producer and his family.

As part of a larger effort to provide information to improve the allocation of resources in applied agricultural research, the CIAT Agricultural Economics Program is presently carrying out a study to predict the impact of alternative agricultural research efforts on human nutrition. Without going into details of the study, it essentially attempts to predict the distribution of increasing supplies of each of a number of food commodities among consumer groups with emphasis on predicting the proportion of the additional nutrients being consumed by nutrient deficient consumer groups. It further predicts the impact of government price policies, income distribution and increased employment on the nutrient intake by nutrient deficient consumer groups. The present study is limited to non-farm consumers. Attempts will be made to expand the research to include farm families consuming home-grown foods. The primary purpose of the study is to develop and test methodology to be used in other similar research.

Recommendations

I believe that it would be useful to consider the following activities to facilitate appropriate consideration to nutrition objectives at the International Centers:

1. Arranging a 2-3 day workshop to discuss how a closer coordination between agricultural research and human nutrition can be established. Among other issues, the workshop might discuss: a) the relative importance of increasing human nutrition within the Centers' set of objectives, b) the needs for additional information on the impact of alternative research efforts on human nutrition, c) the research capabilities needed to provide the additional information and carry out the biological research suggested by this information, e.g. the need for an applied nutrition research component at one or more of the Centers, the need for economics research within the Centers to predict the nutritional impact of alternative research efforts and public policies (maybe similar to that presently carried out by CIAT), d) the need for new institutions and activities aimed at providing strong linkages among agricultural research, public policy and health and nutrition research and field programs both with respect to information flows and program execution, and e) the need to increase the understanding of the relationships between agricultural research activities and human nutrition among Center staff and trainees.

The participants for such a workshop might include: a) Center research directors, b) One economist from each Center, c) Three to four plant breeders working on protein improvement within or outside Centers, d) Two to three people working on applied nutrition programs, e) Three to four people working on research related to nutrition programming and economics, f) Interested members of TAC and CG.

2. Inviting an expert on applied human nutrition to become member of TAC.

3. Promote research aimed at providing information on the linkages between agricultural research, public policy and human nutrition. Such research may be carried out by the Center economists in collaboration with agriculturalists and nutritionists.

cc: Drs. N. Collins, F.F.
U.J. Grant, CIAT
E. Alvarez-Luna, CIAT
C. Francis, CIAT
A. Pradilla, CIAT



APARTADO AEREO 67-13

CABLES: CINATROP

CALI - COLOMBIA

CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

726 CIAT

CO-006-73

November 23, 1973

Mr. Harold Graves
Executive Secretary
C.G.I.A.R.
1818 H Street., N.W.
Washington, D.C. 20433
U.S.A.

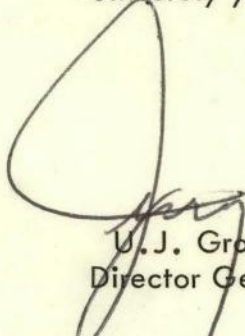
Dear Harold,

Attached to this letter is a copy of a letter I have written to Dr. G. Treitz of the German Ministry for Economic Cooperation, in which I accept their offer of 150,000 marks towards our 1973 budget.

Since this grant will reduce our needs for funds from other sources, this letter is to formally request that \$60,000 of the IDA grant to CIAT for 1973 be carried forward to be used for funding 1974 budgets. Since all of the IDA grant has already been received, we would show the \$60,000 in our year end accounts as grants received in advance. We understand this action will not lead to compensatory reductions in any grants towards our 1974 budgets.

With best regards.

Sincerely yours,


U.J. Grant
Director General

RECEIVED
NOV 30 1973
CIAT



CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

November 23, 1973

CO-006-73

Mr. Harold Graves
Executive Secretary
C.G.I.A.R.
1818 H Street, N.W.
Washington, D.C. 20433
U.S.A.

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\$60,000 in our year end accounts as grants received in advance. We
understand this action will not lead to compensatory reductions in any
grants towards our 1974 budgets.

With best regards,

Sincerely yours,

U.I. Grant
Director General

RECEIVED
1973 NOV 30 PM 2:19
COMMUNICATIONS
SECTION

CO-005-73

November 23, 1973

Dr. G. Treitz
Regierungsdirektor
Ministry for Economic Cooperation
Bundesministerium Fuer
Wirtschaftliche Zusammenarbeit
Kaiserstrasse 185
53 Bonn, Republica Federal Alemana

Dear Dr. Treitz,

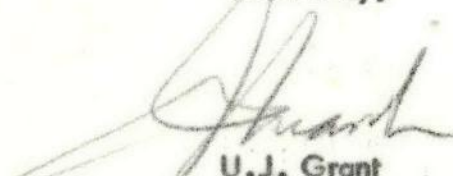
We have heard from Mr. Harold Graves, Executive Secretary of the Consultative Group on International Agricultural Research, that the German Ministry of Economic Cooperation has expressed a willingness to consider making 150,000 marks available to CIAT.

Mr. Graves indicated that if we were to accept it, this money could be used against our 1973 approved budget. On November 16 we cabled Mr. Graves advising him that we could definitely utilize the money which you have offered.

This letter is to thank you, on behalf of CIAT and its Board of Trustees, for the generous offer of support from the German Government and to make formal request for the payment of these funds. Should you be willing to do this immediately, payment can be made to our account # 6-31 29780, Bank of America, Broad Street, New York, N.Y. 10004.

We thank you for your interest in CIAT and your financial support of our operations.

Yours truly,



U.J. Grant
Director General

cc: Mr. Harold Graves



APARTADO AEREO 67-13

CABLES: CINATROP

CALI - COLOMBIA

CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

CO-002-73

November 22, 1973

Mr. Harold Graves
C.G.I.A.R.
1818H St., N.W.
Washington, D.C. 20433
U.S.A.

Dear Harold,

Jerry Grant passed on the welcome news on our funding - we look forward to getting the full details.

We are anxious to get a well thought out and workable calendar for all events in 1974 but in particular for the preparation of the budget and its review. We would therefore welcome any information you can give us on when you and others will require our budget, in what form (i.e. final or draft) and when and how you propose to carry out your reviews of programs and budget.

With best regards.

Yours sincerely,

Andrew Urquhart
Controller

REGION
COMUNICACIONES
1313 NOV 51 AM 1:22

RECEIVED



CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

November 22, 1973

CO-002-73

Mr. Harold Graves
C.G.I.A.R.
1818H St., N.W.
Washington, D.C. 20433
U.S.A.

Dear Harold,

Larry Grant passed on the welcome news on our funding - we look forward to getting the full details.

We are anxious to get a well thought out and workable calendar for all events in 1974 but in particular for the preparation of the budget and its review. We would therefore welcome any information you can give us on when you and others will require our budget, in what form (i.e. final or draft) and when and how you propose to carry out your reviews of programs and budget.

With best regards,

Yours sincerely,

Andrew Urquhart
Controller

RECEIVED
1973 NOV 27 AM 7:55
COMMUNICATIONS
SECTION

G2a

November 19, 1973

Dear Jerry:

With this letter, I am sending a transcript of what members of the Consultative Group said, during their meeting early this month in Washington, on the subject of the grants they intend to make to the international agricultural research centers for 1974. The statements show (if my arithmetic is correct) intentions to make the equivalent of about \$3,845,000 available to CIAT.

Some donors, including the International Development Association of the World Bank Group, have unallocated funds of which part could be made available to CIAT. As it happens, however, it is not possible to indicate what the allocation of these funds might be until about December 15. Until that time, it will not be known whether the Inter-American Development Bank (IDB) will be in a position to make grants to the international agricultural research institutes in the Western Hemisphere; and, until that is decided, it will not be known what needs of those centers, including CIAT, will remain to be covered by additional funding. In any case, needless to say, every effort will be made to meet the needs of CIAT -- although, if IDB is not able to provide financing, there may be a shortfall, despite our best efforts, in the funding of your capital budget for 1974. We will be in touch with you promptly when IDB has made its decision and it is possible to say what allocation IDA will be able to consider.

Sincerely yours,

Harold Graves

Enclosure - pp. 42-84

Dr. U. J. Grant
Director General
Centro Internacional de Agricultura Tropical
Apartado Aereo 67-13
Apartado Nal. 737
Cali
Colombia

HG
HGraves:apm

INCOMING CABLE

RECEIVED Log. 74

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CALICOL 52 16 1644

November 16, 1973

Distribution:

1973 NOV 17 PM 12:43

COMMUNICATIONS
SECTION

GRAVES

Agriculture & Rural
Development (for Mr. Graves)

INTBAFRAD

WASHINGTON DC

PLEASE CORRECT TEXT CABLE SENT YESTERDAY AS FOLLOWS QUOTE CIAT
COULD CERTAINLY UTILIZE SIXTY THOUSAND DOLLAR CONTRIBUT
-ION FROM GERMAN MINISTRY ECONOMIC COOPERATION TO BE APPLIED CIATS
1974 CORE ANE XX AND CAPITAL BUDGETS STOP WOULD WELCOME DETAILS OF
OTHER 1974 FUNDING STOP GRANT WILL CONTACT YOU NEXT WEEK
UNQUOTE

RAUN CINATROP

CFM CONTRIBUTION FROM GERMAN MINISTRY

1974 1974 RAUN CINATROP

INCOMING CABLE

RECEIVED

Log.251

Nov 16 3 42 PM 1973
COMMUNICATIONS
SECTION

NNNN

Distribution:

Agriculture & Rural Development
For Mr. H. Graves.

RCW12

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URWN CO COBX 041

CALICOL 41 15 1632

November 15, 1973

GRAVES

INTBAFRAC

WASHINGTON

CIAT COULD CERTANLY UTILIZE SIXTY THOUSAND DOLLAR
CONTRIBUTION FROM GERMAN MINISTRY ECONOMIC COOPERATION TO
BE APPLIED CIATS 1974 CORE AND CAPITAL BUDGETS STOP WOULD
DETAILS OF OTHER 1974 FUNDINK STOP GRANT WILL CONTACT
YOU NEXT WEEK

RAUN CINATROP

COLL 1974 1974

OFFICE MEMORANDUM

TO: Mr. Montague Yudelman

DATE: October 25, 1973

FROM: James M. Fransen

SUBJECT: COLOMBIA-Centro Internacional de Agricultura Tropical (CIAT)
A Continuous Rice Production System

1. The attached paper describes a continuous rice production system developed for the lowland tropics of the Americas (pages 24-27 provide best summary). The "system" would provide the basis for the conversion of land which today is marginally productive into highly productive land by focusing on land development through continuous rice production. The approach is attractive not only because it is oriented to smallholder producers, but because the only machinery required is a tractor for crucial land preparation and consequently makes maximum utilization of labor for other components of the rice production cycle.
2. The scientists responsible for development of the system (Johnson and Jennings) are extremely enthusiastic about its possibilities and believe the technology is ready for large scale application in development projects. A donor is considering the possibility of funding a "production team" of three or four people, who might be stationed say in Ecuador, to bring this technique to organizations concerned with agricultural development projects throughout the Latin American Lowlands. I share the belief that this production and development approach has merit and suggest that its value be further explored.
3. The first step might be for a small team from the LAC Region to visit CIAT (and Turipana) to see this operation first hand. Workload permitting, I would be willing to accompany them or to make the necessary arrangements. The team should confine its visit to an evaluation of the system and, if positive, the next step would be to talk with the donor agency. The donor hopes to take a decision soon on the funding and location of the "production team." The Bank's evaluation and reaction to the system would no doubt be of interest to the donor agency in arriving at a decision.
4. The system, to a large extent, involves the transfer and adaptation of Asian rice technology to the lowlands of the Americas. It would therefore be of most interest to the LAC Region. Consequently, I am copying this memorandum to Paul Goffin (and to others for information) and will arrange a meeting with him at his convenience.

Attachment.

cc: Messrs. Graves/Cheek, Darnell, Christoffersen, Goffin and Picciotto
ARA (with original)

G2a

Jim Hansen

A PROPOSAL FOR INCREASED RICE PRODUCTION IN THE HUMID

TROPICS OF THE AMERICAS

LOYD JOHNSON

PETER R. JENNINGS

The vast, fertile, naturally flooded, and poorly drained lowlands of tropical Asia are used largely for rice production. Techniques have been developed over centuries to render these soil and water resources into some of the world's most productive farm lands.

In contrast, similar lowlands in the alternative wet-dry climate of the American tropics remain unproductive. Historical restraints to exploitation of the ill-drained American lowlands included human diseases and the absence of animal power for land preparation. Malaria and yellow fever now are controlled and power equipment is widely available.

Major irrigation and drainage projects are underway in several Latin American countries to develop the humid lowlands for intensified agriculture. The projects are centered in huge areas still subject to periodic and uncontrolled flooding.

These projects were designed and developed for upland crops including maize, beans, sorghum, and cotton. Certain problems have reduced the utilization of these irrigation and drainage projects. These include strong wet and dry seasons, difficulties with internal and surface drainage, saline soil spots, and infestation with nut grass and other weeds resistant to herbicides. During the dry season fields are too dry to prepare and plant. Irrigation is difficult because of local high and low spots. During the wet season there are difficulties in dry land preparation due to local ponding of water and massive growth of weeds.

This proposal features a shift from upland crops to rice as the most feasible means of increasing food production in these areas. The rice technology required for widespread farming of the American tropics is available. This technology differs from the successful Asian rice culture only in two major respects. First, land is prepared in water with large power equipment by methods developed at CIAT and IRRI rather than with the water buffalo or hand tractor. Second, the crop would be established with hand-broadcast, pregerminated seed rather than transplanted. The proposed system would depend upon hand labor for planting, fertilizing, spraying for weed and pest control, harvesting, and threshing.

This modified technology, using modern varieties and methods developed in Colombia, has been successfully tested on commercial scale at CIAT. Two successive rice crops on CIAT fields, formerly unsuitable for any other crops, have leached out saline spots, controlled nut sedge, and resulted in precise land levelling. An average of 6 tons/ha/crop has paid for the development of land now suitable for a range of upland crops. A large scale application of this rice technology is underway at the ICA station "Turipana" located within INCORA Project No. 2. About 1,400 ha will be developed by continuous, year-around land preparation for water seeding of rice. The rice harvests will pay for land development and for future cultivation on portions of the station of upland crops. The remainder of the station will remain in commercial rice production. A cash flow estimate for the conversion of Turipana into a productive farm is attached as Appendix A.

The experience gained at CIAT and Turipana will be extended and further modified as required for the opening of the American tropics for rice production.

Initiation and Location of the Proposal

The conversion of the naturally flooded ill-drained lowlands to rice production should begin within one of the existing irrigation and drainage schemes. The developed water control facilities permit year-around cultivation and expansion of area. The work undertaken would not be research or experimentation in the conventional sense. Rather, it would put into practice proven technology. Ideally, small land holders would serve simultaneously as the paid labor force and as "trainees". As they absorbed the technology involved they would progressively convert their farms into rice culture.

Similar, agronomists from other irrigation and drainage projects would be brought in to participate in the work. Once trained they would return to practice the technology in their respective projects. The staff involved would be in contact with major existing and proposed irrigation and drainage projects to assist in planning and development of these projects for minimum capital investment and maximum and immediate production to pay for the projects costs.

The several irrigation and drainage projects begun in the American tropics encompass a large area but represent a small fraction of the potentially productive naturally flooded lowlands. This huge area has no water control at present but can produce rice during the wet season. The same technology, excepting the varieties, would be practiced for these areas lacking water control. The staff involved would introduce, evaluate, multiply, and distribute the better dwarf rices carrying floating genes which allow rapid stem elongation in moderately deep water. Capital generated by rice cultivation in areas lacking drainage would finance low-cost water control schemes around

the periphery of the large irrigation and drainage projects. Thus, conversion of land into production would progress from the most favored toward the most difficult areas, using rice harvests as the financing mechanism.

Staff Requirements for the Proposal

Three experienced rice scientists would comprise the rice production team. Although to some extent their areas of responsibility would overlap; one would handle land preparation, machinery, irrigation and drainage; the second would work with cultural practices; the third would be responsible for varietal evaluation and increase. An agricultural economist should be associated with the project to estimate social benefits and consequences of progress realized.

Proposal Expectations and Potential

The proposal has as its major objectives the massive increase of rice production on land that at present is now marginally productive and the development of this land for rice and other suitable crops as needed. Consequently, the staff involved would expect to be rated on the criterion of increased production of rice and other crops on the developed area. The potential of this activity would be the conversion of specific areas of the American tropics into a major world producer of rice and increase in other crops. The magnitude of the potential is estimated as 120 million hectares of recent tropical alluvial soils of which 10 to 60 million hectares may be developed for rice following the Asian pattern ^{1/}. This rice culture would provide direct employment of one person per every 2 to 4 hectares or direct employment of 2.5 to 30 million rural laborers. The developed rice area would

^{1/} Extensive supporting evidence for this estimate and related proposal potentials is detailed in Appendix B.

meet the requirements of rice in the Americas and leave a surplus for present and future world market requirements. This marketable surplus would be expected to replace the supplies previously provided from Thailand, Burma and Indochina from similar soils and climatic zones. Excess supplies could be used for industrial uses and animal feeds until needed for direct human consumption. A rapid substitution of rice for wheat, corn, cassava and plantains might be expected as the price of rice drops due to increased production. The additional consumption would then serve to stabilize the price.

APPENDIX A. - CASH FLOW (\$US) FOR THE DEVELOPMENT OF ICA-TURIPANA EXPERIMENT STATION INTO A PRODUCTIVE FARM

	UNITS	QUANTITY PER HECTARE	VALUE PER UNIT	DOLLARS PER HECTARE	JULY-1 DECEMBER-31 1973	JAN-1 JUNE-30 1974	JULY-1 DECEMBER-31 1974	JAN-1 JUNE-30 1975	JULY-1 DECEMBER-31 1975	JAN-1 JUNE-30 1976	JULY-1 DECEMBER-31 1976	JAN-1 JUNE-30 1977
Area first prepared and planted to rice	Ha	1.0	-	-	100	100	200	300	300	300	-	-
Area planted second time to rice	Ha	1.0	-	-	-	100	100	200	300	300	300	-
Developed area replanted to rice	Ha	1.0	-	-	-	-	-	200	400	700	700	600
Developed area in other crops	Ha	1.0	-	-	-	-	100	200	400	700	1000	1300
Total Area developed	Ha	1.0	-	-	-	-	100	200	400	700	1000	1300
Area harvested per period	Ha	1.0	-	-	24	140	233	367	533	600	600	600
Total Sales per period	Kg	5000	0.10	500	12000	70000	116500	183500	266500	300000	300000	300000
EXPENSES FOR PERIOD - TOTAL					38600	78120	120860	193820	233040	237960	237660	239160
BALANCE					(26600)	(8120)	(4360)	(10320)	32560	62040	62340	60840
RENTAL OF EQUIPMENT - SUBTOTAL					6000	8500	14500	23000	25500	25500	15000	15000
First land preparation	Ha	1.0	60	60	6000	6000	12000	18000	18000	18000	-	-
Second land preparation	Ha	1.0	25	25	-	2500	2500	5000	7500	7500	15000	15000
RENTAL OF LAND - ICA - SUBTOTAL					-	2500	2500	5000	7500	7500	25000	30000
First crop - rent	Ha	1.0	0	-	-	-	-	-	-	-	-	-
Second crop - rent	Ha	1.0	25	25	-	2500	2500	5000	7500	7500	7500	30000
Third and later crops - rent	Ha	1.0	50	50	-	-	-	-	-	-	15000	30000
IRRIGATION WATER FEES INCORP	Ha	1.0	25	25	2500	5000	7500	12500	15000	15000	15000	15000
MATERIALS AND SUPPLIES - SUBTOTAL					110	11000	22000	33000	66000	66000	66000	66000
Seeds	Kg	100	0.25	25	2500	5000	7500	12500	15000	15000	15000	15000
Fertilizer - Urea	Kg	200	0.15	30	3000	6000	9000	15000	18000	18000	18000	18000
Insecticide - Furadan 3% granules	Kg	20	1.00	20	2000	4000	6000	10000	12000	12000	12000	12000
Herbicide	Lts	10	2.00	20	2000	4000	6000	10000	12000	12000	12000	12000
Small tools, threshers, etc.	Misc.			10	1000	2000	3000	5000	6000	6000	6000	6000
Miscellaneous and unforeseen				5	500	1000	1500	2500	3000	3000	3000	3000
CONTRACT LABORERS - SUBTOTAL					152	10640	25200	39980	64820	82380	86400	81600
Levee construction and repair	Man-days	8.0	2.00	16	1600	1600	3200	4800	4800	4800	-	-
Levee maintenance	Man-days	4.0	2.00	8	800	1600	2400	4000	4800	4800	4800	4800
Broadcasting seed	Man-days	1.0	2.00	2	200	400	600	1000	1200	1200	1200	1200
Broadcasting fertilizer	Man-days	2.0	2.00	4	400	800	1200	2000	2400	2400	2400	2400
Broadcasting or spraying insecticide	Man-days	1.0	2.00	2	200	400	600	1000	1200	1200	1200	1200
Weed control	Man-days	16.0	2.00	32	3200	6400	9600	16000	19200	19200	19200	19200
Irrigation water control	Man-days	10.0	2.00	20	2000	4000	6000	10000	12000	12000	12000	12000
Harvest (contract service)	Kg	5000	0.012	60	1440	8400	13980	22020	31980	36000	36000	36000
Miscellaneous and unforeseen	Man-days	4.0	2.00	8	800	1600	2400	4000	4800	4800	4800	4800
SALARIED PERSONNEL - SUBTOTAL					60.60	8460	14920	23380	33500	37560	37560	31560
Agricultural Engineer and Trainees	Man-month		400	24	2400	4800	7200	7200	7200	7200	7200	7200
Agronomist and trainees	Man-month		400	24	2400	4800	7200	12000	14400	14400	14400	14400
Secretary - clerk	Man-month		100	3.00	300	600	900	1500	1800	1800	1800	1800
Tractor driver	Man-month		100	10	1000	2000	3000	5000	6000	6000	6000	6000
Labor foreman	Man-month		60	3.60	360	720	1080	1800	2160	2160	2160	2160
Topography crew and trainees	Man-month		100	20	2000	2000	4000	6000	6000	6000	-	-

APPENDIX A. TABLE 1A
SCHEDULE OF PLANTING AND HARVESTING

		A	R	E	A	
		PLANTED	HARVESTED	PERIOD		
		HA.	HA.	HARVEST		
July 73	73	4				
Aug. 73	73	20				
Sept. 73	73	-				
Oct. 73	73	25				
Nov. 73	73	25	4			
Dec. 73	73	26	20	24		
Jan. 74	74	33				
Feb. 74	74	33	25			
March 74	74	33	25			
April 74	74	33	26			
May 74	74	33	33			
June 74	74	33	33	140		
July 74	74	50	33			
Aug. 74	74	50	33			
Sept. 74	74	50	33			
Oct. 74	74	50	33			
Nov. 74	74	50	50			
Dec. 74	74	50	50	233		
Jan. 75	75	83	50			
Feb. 75	75	83	50			
March 75	75	83	50			
April 75	75	83	50			
May 75	75	83	83			
June 75	75	83	83	367		
July 75	75	100	83			
Aug. 75	75	100	83			
Sept. 75	75	100	83			
Oct. 75	75	100	83			
Nov. 75	75	100	100			
Dec. 75	75	100	100	5		
Jan. 76	76	100	100			
Feb. 76	76	100	100			
March 76	76	100	100			
April 76	76	100	100			
May 76	76	100	100			
June 76	76	100	100	600		
July 76	76	100	100			
Aug. 76	76	100	100			
Sept. 76	76	100	100			
Oct. 76	76	100	100			
Nov. 76	76	100	100			
Dec. 76	76	100	100	600		

APPENDIX A

Table 2. - Equipment cost per hectare to build levees, rototill, rough level, and final level for first planting of rice on ICA Turipana Experiment Station

	<u>COST</u>
1. Building of levees with a 75 RHp tractor with 200 cm wide rototiller and levee maker attachment to build 800 linear meters of levee at an average rate of 367 meters per hour. Tractor rate \$ 3.33/hour and rototiller \$ 1.67/hour total time 2.18 hours x \$ 5.00	\$ 10.90
2. Rototill new land in high weeds with poor water coverage with 75 RHp tractor and 200 cm rototiller at an average rate of 4.30 hours per hectare and \$ 5.00 rental rate	21.50
3. Rough leveling with 75 RHp tractor and point mounted blade each \$ 3.33 per hour and 5.90 hours per hectare to cut and move high spots to low areas	19.65
4. Final puddling and leveling prior to planting with 75 RHp tractor and 3 point mounted flexible spike tooth harrow each \$ 3.33 per hour and 2.28 hours per hectare	<u>7.59</u>
	\$ 59.64

APPENDIX A

Table 3. - Equipment cost per hectare to repair and clean levees, rototill and final level for second planting of rice on ICA-Turipana Experiment Station

	<u>COST</u>
1. Repass to clean and repair levees with tractor, rototiller and levee shaper each \$ 5.00 per hour and 1.0 hour per hectare	\$ 5.00
2. Rototill land previously prepared and planted to rice with fair water coverage and medium vegetation each \$ 5.00 per hour and 3.0 hours per hectare	15.00
3. Final puddling and leveling prior to planting each \$ 3.33 per hour and 1.5 hours per hectare	<u>5.00</u>
	\$ 25.00

APPENDIX B. Supporting evidence on the potential of the proposal for increased rice production in the humid tropics of Latin America

A. The World Food Problem, Volume II. A report of the president's science advisory committee. The White House, 1967.

p. 407. " The largest areas of potentially arable land lie in Africa and South America which, outside the relatively small continents of Europe and Australia, have the smallest cultivated areas".

" In Asia, if we subtract the potentially arable land area in which water is so short that one 4-month growing season is impossible, there is essentially no excess of potentially arable land over that actually cultivated ".

" In South America and Africa, we can be optimistic about the potential land and water resources. The limiting factors in agricultural development are not natural resources, but economic, institutions, and social problems ".

P. 408. " The need to develop the agricultural potential of the humid and subhumid tropics is a long-range need. ... we should concentrate on the development of research and teaching institutions. It will also be important to increase communication and coordination between different workers and to attempt to recapture what was learned from previous experiences ".

"Most major irrigation projects are concerned with only a small part of the total picture. Such projects normally are limited

(1)

to storage dams, diversion structures, canals and laterals, and in some cases to tubewells. All involved in project planning, project authorization, and project operation should recognize the vital necessity of providing adequately not only for water but for all the inputs and processes that are required if an irrigation scheme is to make a major contribution to the increased agricultural productivity of the nation. Only by providing in a timely manner all of the inputs required to make an irrigation project fully productive can the high cost of such projects be really justified. The information required for making intelligent decisions on location and magnitude of irrigation projects is generally inadequate in the developing nations. Training of personnel and providing of organizational capability for planning and implementation of projects within the concerned nations needs more attention. It is likely that these requirements may be more difficult to provide than the capital for construction ".

P. 452-3. 7.4.5.6 "Integrated Planning and Management". Why is it that after an irrigation dam and main canal facilities have been constructed, measures to use this costly water with high efficiency are often overlooked or minimized? There are several reasons. One stems from the fact that large dams and canals are impressive and created visible monuments to the accomplishments of governments and assistance programs. On the other hand, the extensive network of small distributaries, head ditches, properly graded farm fields, simple water control devices, irrigations scheduled in accordance with the crop needs, and drainage systems are far less spectacular and may

not even be visible at all to the traveler or to the political leaders of a country. As a result, those measures necessary to achieve efficient utilization of developed water supplies seldom receive the financial support necessary to carry them out thoroughly enough to permit maximum crop production from the irrigation scheme. "

" In developing countries, the irrigation engineer is usually concerned with storage, diversion and conveyance of water. He is rarely involved even in the distribution of water to user associations, let alone to the farmer's fields. A fundamental part of engineering education for agriculture in these countries to be full recognition that an irrigation project is not complete until water has reached the last row of the last farm on a schedule in accordance with the needs of the crop, and any surplus has been taken care of by a suitable drainage system. Not only the project engineers but government officials, legislators, and other policy makers need to recognize that sound water management is as essential as water development if costly irrigation schemes are to contribute substantially to agricultural production ".

P. 434. Table 7-9. In Asia 83% of the arable land is cultivated. In Latin America 11% is cultivated.

P. 483. Table 8-5. Asia has 420 million acres of alluvial soils. Latin America has 295 million. Sixty eight percent of the alluvial soil in Asia is classified as potentially arable and 12 per as potential grazing land. In Latin America 13.5 percent is classified as arable under technology equivalent to that of the

United States and 64.4 percent is classified as potential grazing land. If Asian rice technology were adapted and used instead of the U.S. technology then some 140 million acres of alluvial potential grazing land could probably be reclassified as potentially arable. The dark colored soils and highly weathered and leached soils also should have large areas of potential rice soils using Asian technology.

Food, Population, and Employment. The impact of the Green Revolution.

Eds. T. T. Poleman and D. K. Freebairn. Praeger Publishers. New York. 1973

Table 9.5

Agricultural Mechanization in Asia. Vol. IV, No. 1. Farm Machinery
Industrial Research Corporation. 1973

Table 2

Table 4

Table 6

THE WORLD FOOD PROBLEM



*A Report of the
President's Science Advisory Committee*

VOLUME II

Report of the Panel on the
World Food Supply

THE WHITE HOUSE
MAY 1967

TABLE 7-9.—Present population and cultivated¹ land on each continent, compared with potentially arable land

See 474

Continent	Population in 1965 (millions of persons)	Area in billions of acres			Acres of cultivated ¹ land per person	Ratio of cultivated ¹ to potentially arable land (percent)
		Total	Potentially arable	Cultivated ¹		
	(1)	(2)	(3)	(4)	(5)	(6)
Africa.....	310	7.46	1.81	0.39	1.3	22
Asia.....	1,855	6.76	1.55	1.25	.7	83
Australia and New Zealand.....	14	2.63	.38	.04	2.9	2
Europe.....	445	1.18	.43	.33	.9	88
North America.....	255	5.21	1.15	.59	2.3	51
South America.....	197	4.33	1.68	.19	1.0	11
U.S.S.R.....	234	5.52	.88	.56	2.4	64
Total.....	3,310	32.49	7.88	3.43	1.0	44

¹ Our cultivated area is called by FAO "Arable land and land under permanent crops." It includes land under crops, temporary fallow, temporary meadows, for mowing or pasture, market and kitchen gardens, fruit trees, vines, shrubs, and rubber plantations. Within this definition there are said to be wide variations among reporting countries. The land actually harvested during any particular year is about one-half to two-thirds of the total cultivated land.

SOURCES

Column (1): Peville, R., Population and food supplies: the edge of the knife. Nat. Acad. Sci. Proc. 56(2): 328-351. August 1966, and United Nations. Demographic Yearbook, 1964. New York, 1965.
 Column (2): U.S. Defense Intelligence Agency General Guide for estimating significant soil characteristics for predicting the gamma hazard from neutron-induced activity. U.S. Dep. Defense, 1953.
 Column (3): See Tables 7-6, 7-7, 7-8 of this chapter.
 Column (4): Table 1 in: Food and Agriculture Organization of the United Nations. Production Yearbook, 1964. Rome, 1965.

Of the total potentially arable land in the world, about 850 million acres or 11 percent of the total requires irrigation for even one crop. In the remaining nearly seven billion acres, at least one crop could be grown without irrigation, and over a considerable region, multiple-cropping is possible. Without irrigation, multiple-cropping could increase the gross cropped-area (the cultivated area times the number of crops) to 9.8 billion acres annually, about 2 billion acres more than the total arable land and about 3 times the presently "cultivated" land. The gross cropped-area could be increased an additional 6.5 billion acres if irrigation water could be made available for double- or triple-cropping. The maximum gross cropped-area on the earth is thus 16.3 billion acres.

All potentially arable land is also potential grazing land, and all that is not too dry can also be used for economically productive forestry. An additional 28 percent of the land area of the earth has some grazing potential, even though it is not potentially arable. Without high level technology, however, we estimate (See Table 7-5) that the total potential annual production of this grazing land is only about 24 million tons of live animal weight per year, a relatively small proportion of present livestock production.

The right amount of water applied for the proper length of time and at a frequency which conforms to crop needs requires the attention of an informed farmer and those who advise him. Governments should develop specific programs to improve the utilization of existing irrigation schemes and to train farmers in improved irrigation methods. There are many areas where water could be used much more efficiently. Where water is scarce, farmers should be encouraged to obtain the highest yields per unit of water applied rather than use excessive water in the hope of achieving somewhat greater yield. This will require in most cases some control of water use if the farmer is to forego possible yield gain to achieve maximum water-use economy.

Development is constrained at present by the problem of large numbers of people on the land. This cannot be changed rapidly, but the target should be intensification and advancement of technology as rapidly as is reasonable. A high density of rural population poses difficult problems in utilizing modern technology which is based, in part, on economies of scale in farming operations. Utilizing cooperatives and arranging farm units in such a way that modern implements can be operated should be considered; farm implement size can be scaled down also, as in Japan.

7.4.5.4 Irrigation Research. A great deal is known about irrigation and agriculture and some countries have spent too much of their limited manpower resources on "basic" research which is irrelevant or of remote long-range usefulness to the problems at hand. In developing countries, irrigation research programs should meet the practical needs of development. This does not exclude basic programs designed to solve future problems, but these should be consistent with long-term strategy.

7.4.5.5. Irrigation Is Capital-Intensive. Irrigation is very definitely a capital-intensive endeavor. It will not pay unless other inputs are also used intensively and the level of technology rises rapidly. This means that the economic success of irrigation development is tied in some measure to the development of other elements of the national or regional economy. Normally, projects will continue to require subsidy until some level of regional economic viability is reached. Therefore, the effort needs to be of critical size and scope. Under conditions in West Pakistan, project elements of about 1 million acres were considered to be the minimum critical size.

7.4.5.6. Integrated Planning and Management. Why is it that after an irrigation dam and main canal facilities have been constructed, measures to use this costly water with high efficiency are often overlooked or minimized? There are several reasons. One stems from the fact that large dams and canals are impressive and create visible monuments to the accomplishments of governments and assistance programs. On the other hand, the extensive network of small distribu-

tions, head ditches, properly graded farm fields, simple water control devices, irrigations scheduled in accordance with the crop needs, and drainage systems are far less spectacular and may not even be visible at all to the traveler or to the political leaders of a country. As a result, those measures necessary to achieve efficient utilization of developed water supplies seldom receive the financial support necessary to carry them out thoroughly enough to permit maximum crop production from the irrigation scheme.

A second reason is that in the basic plans for irrigation projects, consideration is seldom given to the problems in the catchment or watershed area above the storage or diversion point or to the problems of water utilization and drainage beyond the lateral canals. Management of forest and range lands in the upper catchments of river basins plays an important part in the success of water development schemes. Public agencies should therefore provide for appropriate coordination of watershed management and flood control measures with water development schemes downstream. While, fortunately, there is now a growing recognition of the need to look upstream and solve the watershed problems and to look beyond the canal laterals and deal with problems of drainage, most projects still fail to give enough attention to the other basic inputs required for a productive and permanently successful agriculture.

In developing countries, the irrigation engineer is usually concerned with storage, diversion and conveyance of water. He is rarely involved even in the distribution of water to user associations, let alone to the farmer's fields. A fundamental part of engineering education for agriculture in these countries needs to be full recognition that an irrigation project is not complete until water has reached the last row of the last farm on a schedule in accordance with the needs of the crop, and any surplus has been taken care of by a suitable drainage system. Not only the project engineers but government officials, legislators, and other policy makers need to recognize that sound water management is as essential as water development if costly irrigation schemes are to contribute substantially to agricultural production.

The sequence of processes required to achieve a productive and permanent irrigation agriculture is outlined in the chart on page 454.

7.4.5.7 Increased Knowledge of Weather and Climate. The practice of agriculture everywhere is highly dependent upon the weather. The farmer suffers extensive crop damage due to premature or late planting or harvesting because of drought or flooding, especially in regions of dramatic wet and dry seasonal changes common in many heavily populated areas. Weather and climate need to have increased study with the view to improving prediction in specific years and possibly some eventual modification. Increased studies of the monsoon weather

TABLE 8-5.—Total acreage by continents of different soil groups in the tropical zone and estimates of the areas potentially arable and potentially available for grazing

[Millions of acres]

Soil Groups	Africa			Asia			Latin America			Australia and New Zealand			Total	Total arable ¹	Total grazing
	Total	Arable ¹	Grazing	Total	Arable ¹	Grazing	Total	Arable ¹	Grazing	Total	Arable ¹	Grazing			
1. Light-colored soils; base rich.....	1,128	160	300	200	80	40	204	50	80	191	40	50	1,723	330	470
2. Dark-colored soils; base rich.....	267	140	30	134	60	10	290	125	40	61	20	10	722	345	90
3. Moderately weathered and leached soils.....	40	20	10	211	135	45	197	15	80	68	20	10	510	190	145
4. Highly weathered and leached soils.....	2,437	1,200	500	1,220	270	600	2,814	1,135	180	100	40	30	6,271	2,045	1,370
5. Shallow soils and sands.....	1,163	90	300	283	30	100	380	40	150	269	30	50	2,087	190	600
6. Alluvial soils.....	198	105	15	420	285	50	295	40	190	—	—	—	913	430	253
Total.....	5,235	1,715	1,155	2,408	860	905	3,850	1,405	720	679	150	150	12,232	4,130	2,930

¹ Under technology equivalent to that of the United States.² Assumes application of irrigation water.

80%

78%

Food, Population, and Employment

The Impact of
the Green Revolution

edited by

Thomas T. Poleman

Donald K. Freebairn

Publisher of the
Cambridge University Press
Series in Development and Society

TABLE 9.5

Rural Land Use by Individual Countries

Country	Year	ARABLE LANDS		CULTIVATED LANDS		NATURAL PASTURES	
		In Thousands	Percent of	In Thousands	Percent of	In Thousands	Percent of
		of hectares	Latin America	of hectares	Arable Land	of hectares	Arable Land
		I	II	III	IV	V	VI
Argentina	1960	143,586.0	26.60	33,449.8	23.3	110,406.2	76.7
Bolivia	1950	14,318.6	2.65	3,091.0	21.6	11,227.6	78.4
Brazil	1950	160,544.0	29.84	67,976.0	42.3	92,568.0	57.7
Chile	1965	14,539.0	2.69	4,265.2	29.4	10,273.8	70.6
Colombia	1960	19,653.0	3.00	5,047.0	25.7	14,606.0	74.3
Costa Rica	1963	1,547.0	0.27	1,010.7	65.3	536.5	34.7
Cuba	1952	7,645.0	1.41	1,970.0	25.7	5,675.0	74.3
Dominican Rep.	1950	1,731.3	0.31	1,461.2	84.3	270.5	15.7
Ecuador	1954	3,335.5	0.61	2,081.0	62.4	1,254.5	37.6
El Salvador	1961	1,245.9	0.22	742.3	59.6	503.6	40.4
Guatemala	1962	2,108.9	0.39	1,566.7	74.3	542.8	25.7
Haiti	-	870.0	0.16	370.0	42.5	500.0	57.5
Honduras	1952	1,718.4	0.31	985.8	52.1	822.6	47.9
Mexico	1960	103,312.6	19.18	23,817.0	23.1	79,495.6	76.9
Nicaragua	1963	2,599.0	0.46	1,955.5	75.2	643.5	24.8
Panama	1961	1,371.7	0.24	1,237.0	90.2	134.7	9.8
Paraguay	-	10,759.0	1.98	859.0	8.0	9,900.0	92.0
Peru	1961	11,415.8	2.11	2,596.3	22.7	8,819.5	77.3
Uruguay	1961	16,099.0	2.90	2,251.7	14.0	13,847.3	86.0
Venezuela	1961	19,177.5	3.55	5,219.4	17.2	13,998.2	72.8
		537,847.7		162,862.6	30.0	375,985.9	70.0

Country	Year	Cultivated Land per Capita of Ru- ral Population in Hectares VII	Ranks of Urban Stability, 1970 VIII	Rural Population in Thou- sands, 1960 IX	Percent of Rural Popu- lation in Each Country, 1960 X	Percent of Rural Population in Latin America, 1960 XI
Argentina	1960	6.07	1	5.509	26.42	4.9
Bolivia	1950	1.19	4	2.592	70.03	2.3
Brazil	1950	1.81	3	37.555	53.86	34.0
Chile	1965	1.55	2	2.736	35.61	2.4
Colombia	1960	0.62	3	8.043	52.24	7.2
Costa Rica	1963	1.22	4	823	66.75	0.7
Cuba	1952	0.59	2	3.326	48.17	2.9
Dominican Rep.	1950	0.59	4	2.170	70.27	1.9
Ecuador	1954	0.71	4	2.909	66.84	2.6
El Salvador	1961	0.47	4	1.572	62.58	1.3
Guatemala	1962	0.53	4	2.765	72.38	2.4
Haiti	-	0.10	4	3.553	85.86	3.1
Honduras	1952	0.58	4	1.520	78.35	1.3
Mexico	1960	1.30	3	18.291	50.74	16.5
Nicaragua	1963	2.07	4	942	62.76	0.8
Panama	1961	1.93	4	624	58.76	0.6
Paraguay	-	0.76	4	1.119	64.64	1.0
Peru	1961	0.47	3	5.493	52.24	4.9
Uruguay	1961	3.10	1	713	28.07	0.6
Venezuela	1961	1.61	2	3.231	52.24	2.9
		1.47		110.131	51.60	

Source: Banco Interamericano de Desarrollo, "El desarrollo agrícola de América Latina en la próxima década," Cuadro I, Washington, D.C., Abril de 1967, p. 127.

AMA

AGRICULTURAL MECHANIZATION IN ASIA

VOL. IV, NO. 1, SPRING 1973

Multiple-Cropping and Mechanization

Table 1. Total Planted Area and Area Under High-Yielding Varieties of Wheat and Rice in APO Member Countries in 1969/70
(Unit: 1,000 hectares)

	Total planted area	Area under HY varieties	%
Wheat *			
India ¹⁾	16,000	6,111	38.2
Iran **	4,700 ²⁾	100 ²⁾	2.1
Nepal ¹⁾	388	75	19.3
Pakistan ¹⁾	6,219	2,833	45.6
Rice *			
Ceylon ¹⁾	671	26	3.9
India ¹⁾	38,000	4,371	11.5
Indonesia ¹⁾	7,972	749	9.4
Nepal ¹⁾	1,174	50	4.2
Pakistan ¹⁾	12,076	765	6.3
Philippines ¹⁾	3,100	1,354	43.7
Rep. of Vietnam ¹⁾	2,519	202	8.0

Source: 1) U.S. Department of Agriculture, "Imports and Plantings of high-yielding varieties of wheat and rice in the less developed nations", Washington, D.C., 1971, p. 101.

2) FAO, "The State of Food and Agriculture", Rome, 1971, p. 101.

* All the countries except Iran, varieties included are (a) dwarf and semi-dwarf varieties developed at the International Wheat and Maize Improvement Centre (CIMMYT) in Mexico and the International Rice Research Institute (IRRI) in the Philippines, and (b) direct descendants of these varieties developed in national breeding programmes. The definition thus excludes a number of local improved varieties not derived from the CIMMYT and IRRI varieties.

** Including Bostova No. 1 imported from U.S.S.R. and Mexican Inya 66 imported from Denmark etc. Expected to increase 350,000 hectares in 1971/72.

afraid of lowering in quality for export rice.

Facts indicated above will show that dissemination of the new high-yielding varieties has influenced the increase in food production. However, there are various problems to be overcome in disseminating new high-yielding varieties.

It is particularly observed in the dissemination of new high-yielding varieties of rice, showing lower percentage of area covered by new varieties than in the case of wheat with the exception of the Philippines. It is supposed that the dissemination of high-yielding varieties might be more difficult for rice than for wheat.

2. Increase in Production of Cereals and Importance of Diversification of Agriculture

As indicated in the foregoing sections, production of cereals has increased high during the period of these several years. This caused various problems

concerning supply and demand of food grains in this region. The problems will be discussed in the following paragraphs.

At first, it is easily found from the statistics that food importing countries have decreased their

Table 2. Some Indicators of Agricultural Input Materials

		¹⁾ Yield mt/ha	²⁾ Increase in yield (Index)	¹⁾ Ferti- lizer mt/ha	²⁾ Agri. Chemical kg/ha	³⁾ Machin- ery- HP/ha	³⁾ Labour Pers./ha	³⁾ Animal Head /ha
		1967-68 Av. 1952-56 —1967-68						
Japan	I	5.14	146	371.3	11.60	2.664	2.16	0.30
Rep. of China	E	3.91	150	282.7	3.07	0.146	1.95	0.41
Rep. of Korea	I	2.84	124	210.5	2.17	0.003	1.96	0.30
Vietnam	I	2.05	159	43.6	0.02	0.023	2.10	0.61
Hong Kong	I	2.00	71	—	—	—	—	—
Nepal	E	1.87	104	0.6	0.02	0.004	2.49	1.20
Ceylon	I	2.05	143	43.1	1.42	0.110	1.20	0.37
Thailand	E	1.73	128	7.5	0.53	0.054	1.10	0.46
Indonesia	I	1.63	103	7.4	0.01	—	—	—
Pakistan	I	1.31	120	10.2	0.07	0.013	1.09	0.72
Philippines	I	1.09	110	16.4	0.27	0.023	0.71	0.26
India	I	1.00	123	11.0	0.27	0.008	0.90	0.51
Iran	I	1.00	97	5.7	0.15	0.154	0.37	0.12
Average		1.29	121	22.9	0.53	0.087	0.99	0.50

I: Importing countries of food grains

E: Exporting countries of food grains

Source of data: 1) Symposium on Fertilizer Economy, APO, 1971

2) Symposium on Agricultural Chemicals, APO, 1971

3) Expert Meeting on Agricultural Mechanization, 1968.

import, while in turn, the exporting countries have decreased their export much during the same period. For instance, Ceylon decreased her import of rice from 976,000 metric tons (in terms of paddy) in 1964-66 average to 514,000 metric tons in 1968. India decreased her wheat import from 6,679,000 metric tons in 1964-66 average to 3,090,000 metric tons in 1968/69.

This means that the self-sufficiency of food (cereals) has been attained or greatly improved in these several years particularly in the food importing countries. For instance, in Ceylon, the ratios of production to available supply of rice and all cereals were 46.5 per cent and 40.1 per cent respectively in 1964-66 average, while those in 1968 were 75.2 per cent and 58.1 per cent respectively. In India, in 1964-66 average the same ratios of wheat and all cereals were 61.1 per cent and 91.0 per cent respectively and those in 1968/69 were 86.4 per cent and 97.1 per cent respectively. In 1968/69 or 1969, Iran, India, Pakistan and the Philippines attained self-sufficiency of rice, though India is

Table 4. Percentage Distribution of Crops

	Rice	Wheat	Other cereals	Total cereals	Meat	Fruit	Veg.	Other Crops	Total	(1965) Percentage of agri. population	(ha) Average size of holding
Ceylon	20	—	—	20	3	6	4	67	100	54	1.59
Rep. of China	26	—	1	27	32	9	5	27	100	47	1.11
Hong Kong	—	—	—	—	—	—	—	—	—	6	—
India	26	9	10	45	3	4	5	43	100	70	2.62
Indonesia	36	—	7	43	12	4	3	48	100	66	1.06
Iran	6	30	4	40	12	3	5	40	100	51	8.29
Japan	26	2	2	30	13	8	11	38	100	24	0.90
Rep. of Korea	33	4	17	54	11	2	8	25	100	54	—
Nepal	44	6	17	67	7	1	2	23	100	92	1.22
Pakistan	27	10	2	39	6	4	1	50	100	74	2.37
Philippines	26	—	9	35	19	7	3	36	100	59	3.66
Thailand	52	—	6	58	10	5	3	24	100	78	3.64
Vietnam	62	—	—	62	19	5	1	13	100	85	1.57
Far East Ave.	31	5	7	43	8	5	5	39	100	48	6.17

Source: FAO Index Number of Gross Agricultural Production by Commodity Group, Monthly Bulletin of Agricultural Economics & Statistics, May 1971.

average to 1970. In India, Iran, Indonesia and the Philippines, all cereal production increased by 66, 48, 74 and 98 per cent respectively during the same period. As mentioned earlier, Pakistan and India have increased wheat production the most.

However, the Republic of China, Japan and the Republic of Korea have taken another direction. In these countries, the increase in meat or fruit production has been the highest among agricultural production during the same period. High increase in coarse grain production in the Republic of China is supposed to show the increased demand for feed grains. Extremely high rate of increase in coarse grains in Thailand has reflected increased export demand for feed grains resulting mainly from increased import demand of Japan, as stated before.

This shows that the change in cropping pattern has already been started in some extent.

Let us see the present situation of cropping pattern in the member countries. From Table 6 showing the percentage distribution of planted area by crop by country, it is found that the countries like Thailand, the Republic of Korea and Pakistan have more area under food crops such as cereals, starchy roots and pulses.

Particularly, Thailand and the Republic of Korea have high percentage of rice, and rice, wheat and barley altogether occupying more than 70 per cent of the total planted area.

Though the table does not indicate the percentage in detail, India and Pakistan have quite a large area of tea and jute (the latter figure might be included in others), so that the percentage of food crops is smaller than in the former two countries.

The countries such as Ceylon, Indonesia, and the Philippines show smaller percentage of planted area devoted to such food crops as mentioned earlier, particularly so in the case of Ceylon.

In turn, these countries have larger area of commercial crops such as coconut, sugar cane, tea, rubber, etc.

The Republic of China and Japan show lower percentages of planted area under cereals, though both had shown quite large percentage of the planted area in the past. Diversification of agriculture has taken place according to the change in demand for food, though they have yet various problems in this regard. Thailand also has made progress in diversification of agriculture, which will be discussed in detail later.

The situations mentioned above relate mainly to conditions of the

Table 5. Agricultural Production Index by Crop (1970) (1952-56=100)

	Total agri.	Cereals	Grains	Coarse Grains	Meat	Fruit	Veg.
Ceylon	154	245	123	123	104	162	143
Rep. of China	189	152	172	407	223	569	237
Hong Kong	—	—	—	—	—	—	—
India	148	166	178	138	118	142	134
Indonesia	133	148	125	125	148	136	132
Iran	169	174	164	118	156	93	144
Japan	185	99	31	30	463	364	214
Rep. of Korea	217	180	199	201	332	380	239
Nepal	108	109	130	118	116	198	198
Pakistan	165	182	209	120	156	232	143
Philippines	174	198	295	295	150	240	167
Singapore	—	—	—	—	—	—	—
Thailand	220	209	2,545	2,545	150	325	155
Vietnam	186	218	106	106	179	153	202

Source: The same with the previous table.

Table 6. Percentage Distribution of Planted Area in APO Member Countries

	¹⁾ Ceylon 1966	¹⁾ Rep. of China 1970	¹⁾ India 1966/67	²⁾ Indo- nesia 1967	³⁾ Japan 1970	¹⁾ Rep. of Korea 1970	¹⁾ Paki- stan 1970	¹⁾ Philip- pines 1970	¹⁾ Thai- land 1960
Cereals	33.7	49.0	59.8	57.3	54.6	71.1	68.8	61.9	73.1
Rice	31.5	47.0	22.4	42.4	46.3	32.7	38.1	34.8	70.2
Wheat	—	0.1	8.3	—	3.6	32.7	22.8	—	—
Barley	—	0.0	1.8	—	3.6	—	0.7	—	—
Maize	0.7	1.4	3.3	14.9	1.1	5.7	7.2	27.1	2.9
Other coarse grains	1.6	0.5	24.0	—	—	—	—	—	—
Starchy roots	4.2	15.6	—	10.5	4.4	5.6	0.4	2.9	0.9
Pulses	—	9.2	13.7	5.7	5.3	10.8	5.4	0.9	2.2
Vegetables	—	8.2	2.1	—	10.8	5.4	0.8	0.7	1.1
Fruits	—	7.3	—	—	6.6	1.4	1.1	4.5	11.4
Sugar cane	0.5	5.6	1.5	0.8	—	—	2.7	4.1	1.6
Tobacco	0.4	—	—	1.3	—	1.1	—	—	—
Cocoa	—	—	—	—	—	—	—	0.1	—
Coffee	—	0.0	0.1	—	—	—	—	0.6	—
Tea	14.7	2.1	0.2	0.7	0.8	—	0.2	—	—
Oil palm	—	—	—	—	—	—	—	—	—
Coconut	26.9	—	0.6	11.1	—	—	—	21.1	1.6
Rubber	13.9	—	—	10.8	—	—	—	—	—
Mulberry	—	—	—	—	2.6	2.6	—	—	—
Other crops	5.7	3.3	22.0	1.8	14.9	2.0	20.6	3.3	8.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source of data: 1) Answer to the Questionnaire of APO

2) Economic Survey of Asia and the Far East, U. N., 1969

3) Pocketbook of Agriculture, Forestry and Fisheries Statistics (in Japanese), 1972.

region at present. Let us see the changes in cropping pattern by country during the period from 1940 or 1950 to 1970 (Refer to Table 7 (a)–(i)).

In India, the planted area of cereals increased from around 81,000,000 hectares to 93,600,000 hectares or by 16 per cent during the period of 1950/51 to 1966/67, and in Pakistan, the corresponding area also increased around 21 per cent during the period of 1950 to 1970. In the Philippines, the planted area of cereals was around 3,000,000 hectares in 1940 which increased to 5,152,000 hectares in 1960 and a further increase was observed in 1970 to 5,533,000 hectares.

In the Republic of China, the increase in planted area of cereals had been very high during the period of 1940 to 1951. It increased from around 652,000 to 806,000 hectares or around 24 per cent during the period. However, during the period of 1951 to 1960

it increased by only 1 per cent, and during the period of 1960 to 1970, it decreased by 0.6 per cent. Among the planted area of cereals, that of rice increased by around 21 per cent during the period of 1940 to 1951, but since then become almost stagnant. Only the planted area of maize increased very high during the latter period. This increase in the planted area was supposed to reflect an increase in demand for feeds in the domestic market due mainly to the increased demand for animal foods, and the stagnation of rice area reflected a decrease in export demand and lowered increase rate of demand for rice in domestic market.

In Thailand, on the other hand, the planted area of both rice and maize has continuously increased high during the period of 1950 to 1970. The planted area of rice increased by 33 per cent, and that of maize in 1970 was as high as 19 times the area in 1950. The in-

crease in rice planted area was due partly to the larger foreign market and partly to the high increase rate of population, than in the case of the Republic of China. The increase in planted area of maize was due mainly to the increased external demand.

However, it should be noticed that in the case of cereals, the increase rate of production is becoming higher than that of area indicated above, so that even from the decreased land area of cereals the production would be increased.

As indicated in the foregoing sections, Japan is an exceptional case. During the period of 1950 to 1960, the planted area of rice was still growing, but particularly during the period from 1965 to 1970, it tended to decrease. Though the percentage of total planted area devoted to rice was still the highest, the actual area under rice decreased by around 10 per cent during the latter period. High rate of increase during the former period and high percentage of area under this crop even in the latter period were due mainly to high rice prices set under the Government price policy. The price was as high as around US\$385 per metric ton in terms of brown rice in 1970. However, the support price remained unchanged for some years, and the Government started the policy for cutting the acreage of planting rice. This caused a decrease in the planted area in this country.

With the exception of Japan both cultivated land area and planted area of all crops are still increasing. However, the expansion of cultivated land area was rather limited and the increase of total planted area was also not so large relative to the cultivated area, with the exceptions of the Republics of China and Korea. Thus there has been some change in cropping pattern of already cultivated land, since in food deficit countries the area un-



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The most productive lands in Tropical Asia are located in the naturally flooded, poorly drained lowlands used for rice production. These same areas are among the least productive areas of tropical America as they are in swamps and dry season pastures. CIAT is in a unique position to develop a production system suited to these tropical America lowlands by blending of the most adapted Asian wet land practices and Western industrial scheduling. As a first step continuous production has been implemented during 1972 on the CIAT fields and will be extended to other tropical lowland areas as results and interest are generated.

The original plan at CIAT was to use small 5 and 10 horsepower Japanese tillers to prepare about 1/2 hectare per work day. The areas used had not been develop-

ed for rice previously, thus a soil movement requirements, the uneven surface, and vegetation made the use of the small tillers impracticable. Finally larger 70 horsepower tractors with large rice and cane tires were used to level and prepare the fields. Some trials during 1973 will use the small tillers on the developed area since the soils have settled and formed a more stable surface and soil profile during 1972.

Land preparation has been the only operation where a power unit is used. Seeds and fertilizers are broadcast by hand. Insecticides and herbicides are applied by a knapsack sprayer, if liquid, and by hand broadcast, if in a granular form.

Intensive, continuous, and well paid use of labor has been set as a desirable goal. Time studies of labor required with scheduling

for continuous land preparation, planting, and harvesting and contract payments per unit of work have given data on labor requirements; these data will permit comparative costing and scheduling with other methods. Table 1 shows labor machine and material requirements and costs based on the CIAT 1972 data.

Table 2 shows dates of planting, harvesting, area, yields etc. The fields were harvested 120 to 140 days after sowing. These fields could have been immediately prepared and seeded, if adequate water and power were available. The requirements of other CIAT Programs with experimental plots had priority for water and power over the production systems field which explains the uneven scheduling.

Hand harvesting was expected to be the major problem. Since

combines are normally used in Colombia, most laborers had no experience with hand harvesting and no special threshers were available. Rice-plot harvests during 1971 had been successfully threshed on a 55 gallon drum. The CICA 4 rice variety was easily threshed on the drum with a high apparent output per man hour. A time and motion study Table 3 indicated that the output averaged 79 kg. per man hour which compares very favorably with 70 to 84 kilograms per manhour reported for a small engine powered thresher especially developed to replace hand threshing. The most important information of Table 3 is that the major effort is not in threshing but in cutting and carrying which require 62% of the effort. This led to the development of a CIAT man powered portable combine (see a photo) The contract laborers immediately expressed a preference for the portable unit. Since it required less effort, they harvested more per day and received more pay. Two laborers cut, threshed, cleaned bagged, and carried to the roadside 8 to 10 bags of 60 kilograms per day. The CIAT contract labor was paid was 21 pesos or about \$0.93 per bag which gave an earned income of \$3.72 to 4.65 per man day. Custom combine charges in Colombia are 15 pesos or \$0.67 per bag. The contract labor could earn \$2.68 to \$3.33 per day even if paid combine charges of \$0.67 per bag. Since normal wages are \$1.00 to \$1.50 per day, hand harvesting is an attractive job.

Unit data collected during 1972 in Table 1, 2 and 3 permit the development of various systems either labor intensive or machine intensive depending upon labor wages, labor availability and objectives. A production system to provide productive employment of laborers and land should be developed for areas that are near to major rivers, roads, ports, and cities such as Barranquilla, Cart-

Table 1. Average labor, equipment, and materials required for producing rice on CIAT production fields in 1972.

OPERATION	Man days/Ha.	Labor Cost-Dollars	Machine and Material Cost
1. Land preparation * with 70 rated horse-power tractor, rototiller and harrow	0.5-1.0	2.00	25.00 to 50.00
2. Construction ** or repair of 640 meters/Ha of levees with 50 cm. top, 75 cm. base and 25 cm high	8.0	16.0	--
3. Clean levees during crop season-640 meters	4.0	8.00	--
4. Broadcast pregerminated seed-100 Kg/Ha	1.0	2.00	15.00
5. Broadcast fertilizer-200 Kg/Ha. of Urea (2 applications of 100 Kg)	2.0	4.00	22.00
6. Application of insecticide Broadcast granules (20 Kg. of 3% active ingredient Furadan)	1.0	2.00	20.00
7. Weed Control.			
a) Handweed one time 30% of area	5.0	10.00	--
b) Knapack sprayer application of Propanil 3.6 Kg. in 100 lts. of water.	1.0	2.00	20.00
8. Irrigation-Maintenance of canals, dikes and keep flooded 100 days by pumping	10.0	20.00	25.00
9. A - Hand harvest 6000 Kg/Ha (cut, carry, stack, handthresh on a 55 gallon drum, clean, bag 100 bags and carry 100 mts. to road)	30.0	90.00	--
B - Hand harvest 6000 Kg/Ha (cut, thresh on portable thresher, clean, bag 100 bags and carry 100 mts. to road)	25.0	75.00	--
C - Combine with medium size, combine 100 sacks and carry 100 Mts. to road	1.0	6.00	60.00
3 man crew and combine for 1/3 day			
Summary based on harvest method			
A	62.5	\$ 156.00	\$ 127.00 to \$152.00
B	57.7	\$ 141.00	\$ 127.00 to \$152.00
C	33.5	\$ 72.00	\$ 187.00 to \$212.00

Value of threshed rice at 25% Moisture content and 5% impurities was about \$85.00 per ton at the farm roadside where the buyer furnished bags and transportation during 1972. The 6000 Kg. /Ha average was sold for \$519.00 per hectare. Returns to land and management would be about \$200.00/Ha per crop of 135 days.

* Developmental land leveling and land preparation requires 1.0 manday and tractor day.
 ** Construction requires 16 mandays.

agena and Cali in Colombia and for other areas near major cities in other countries such as Guayaquil, Ecuador and Belem, Brazil. The system can be planned using the following data:

1. Land and water are available in blocks of to 10,000 hectares at rental rates less than \$50.00 per hectare per year and less than \$50.00 per hectare irrigation charges per year.

2. Laborers are available in excess of 10,000 in the area around the major city of 200,000 population with average wage rates of urban and rural laborer

less than \$2.00 per day and average work rates as given in Table 1.

3. Custom hire 70 horse-power tractors and equipment are available at \$50.00 per tractor day including operator fuel and all costs. Smaller tillers are not yet widely used but could be obtained.

4. Hand application or custom airplane and helicopters services are available at one manday or \$1.50 to \$4.00 per hectare per application of seed, fertilizer, and pesticides.

5. Hand harvest or custom

Table 2. Centro Internacional de Agricultura Tropical Station Operations
Production of Rice Cica 4 in 1972.

Lot No.	Date of		Days	Area Ha.	Production		
	Seeding	Harvest			Total Tons.	Tons/ Ha Kgs./ Ha.	Day
I ₂ S	6-XII-71	18-IV-72	134	3.75	19.4	5.17	39
H ₂ S	15-XII-71	26-IV-72	133	4.20	21.8	5.19	39
J ₁ S	12-I-72	24-V-72	133	1.80	9.2	5.11	38
K ₁ S	14-I-72	26-V-72	133	1.80	12.2	6.77	51
G ₂ S	11-II-72	12-VI-72	122	3.50	25.1	7.17	59
H ₁ N, I ₁ N	12-II-72	26-VI-72	135	7.45	50.0	6.71	50
	18-II-72	6-VII-72	139				48
G ₁ N	11-III-72	18-VII-72	139	4.00	19.5	4.88	35
H ₂ N	11-III-72	24-VII-72	135	4.00	17.7	4.42	33
I ₁ N	29-III-72	2-VIII-72	126	2.54	15.3	6.02	48
H ₁ S, I ₁ S	28-IV-72	31-VIII-72	125	3.00	20.3	6.77	54
H ₂ S, J ₁ S	12-V-72	22-IX-72	122	7.00	36.0	5.14	39
F ₁	23-V-72	28-IX-72	126	8.80	50.5	5.74	45
D ₁	26-V-72	4-X-72	131	8.80	66.8	7.59	58
Total				60.64	363.8		
Average			132			6.00	45

Table 3. Average values to hand harvest - cut, carry, stack, thresh on 55 gallon drum, clean, and sack a total of 48.4 tons paddy at 25% moisture content from a 9.6 hectare area.

Operation	Total		Man Hours		Percent
	Man Hours	Per Ton.	Per Hectare		
Cut & Lay	1059	22	110		44
Carry and stack	430	9	45		18
Thresh	611	13	64		26
Clean and bag	296	6	31		12
Total	2396	50	250		100

combine services are available at \$0.67 to \$0.93 per bag of 62 kilograms.

6. Trucks for transportation are available at \$0.05 per ton-kilometer.

7. Productivity of paddy at harvest ranges from 30 to 60 Kg./Ha-day with an average of 45 Kg./Ha-day (Table 2).

8. Paddy sales price at farm with 25 percent moisture content and 5% impurities is \$85.00 per ton with sacks supplied by purchaser.

9. Temperatures, irrigation, rainfall, and other conditions permit continuous planting and harvesting during entire year.

10. Consumption of rice is expanding to replace cassava, plantain, corn, potatoes and wheat in local diet.

With the conditions as given then a mixture of labor, land, machinery and materials must be developed to farm a production

system. If one major condition is to provide productive employment and about 60 mandays are required per hectare distributed as in Table 1, then we can plan for continuous stable employment and production with 120 mandays of work during a 140 calendar day drop cycle.

One man can care for 2 hectares by planting and harvesting 0.2 hectares every 14 days. His labor input per 14 days period would be 12 days of which 5.6 days would be on levees, weed control and irrigation; 0.8 days on seeding, fertilizing and insect control and 5 days on hand harvesting.

The smallest complete operation system would be based upon a contract hire service for land preparation and marketing based upon a 5 horsepower tractive tiller and implements. The 5 horsepower tractive tiller should prepare 0.2 of land per day to ser-

vice 12 farmers during a 14 day period. The tiller could also transport the freshly harvested 1200 Kg. per day of paddy to a central pick-up point for sales transport to market by a truck. The next complete operation system would use a 10 horsepower unit which should prepare 0.4 hectare of land per day to service 24 farmers during a 14 day period and transport 2400 Kg. per day to a central pick-up point.

These two small systems would permit full utilization of labor and tractive tiller time under a very tight schedule. In case of delays due to sickness or tiller repairs then extra labor and equipment would need to be hired to maintain the schedule. The attractive feature is a continuous cash flow from the sale of 1200 Kg. of paddy 14 days for a gross farm sales value of about \$100.00. Expenses for 0.2 hectare should be approximately \$10.00 land preparation, \$3.00 for seed, \$5.00 for fertilizer, \$8.00 for pesticides, \$5.00 for irrigation and \$5.00 for rent. The extra \$64.00 would be returns to labor and management of approximately \$128.00 per month and \$1,536.00 per year to the operator of a 2 hectare farm unit. The owner of the power tiller should have as attractive an income as the farm operators.

If his equipment expenses were \$25.00 per hectare and wages \$25.00 per hectare then the 5 horsepower tractive type tiller owner would make \$5.00 per day or \$120.00 per month and the 10 horsepower rotary tiller operators would make \$10.00 per day and \$240.00 per month. This potential income should attract capital and operators and be of interest to manufacturers of small power units and to government planning groups as a potentially desirable production system, however the small farm operator custom hire service is not now in existence and the initiative cooperation, and man-

agement skills to implement the system are not easy to obtain.

A more likely solution would be a 60 hectare commercial farm enterprise organized by an experienced rice farmer. This enterprise would be based upon a 70 horsepower tractors preparing 3.0 hectares of land per week, transporting the harvest to market, and returning with materials and supplies. The farmer could also be the tractor driver, supervisor and manager. He would employ about 30 laborers paid by contract to earn about \$25.00 per man week. His gross sales should be about 18,000 Kg. of paddy per week or \$1,430.00. His costs would be about \$750 labor, \$45.00 seed, \$65.00 fertilizers, \$120.00 pesticides, \$150.00 equipment, \$75.00 irrigation and \$75.00 land rental for total costs of \$1,280.00 per week. His potential returns for his labor and management would be \$250.00 per week or about \$13,000 per year. The yield of 6,000 Kg. of paddy at 25% moisture content is not difficult with reasonable water control and management and the farm price of \$85.00 per ton has been paid CIAT during 1972. The risk involved is that lower yields or prices would result in losses and any rice grower considering this system must be aware of that importance of production and price relationships. The costs of land, water and equipment, however leave considerable

leeway for production and price fluctuations before seriously endangering the cash flow to labor and management. It should be emphasized that the employment of 30 laborers at \$25.00 per week average contract wage would be economically and socially desirable in most tropical countries. The larger farm size would attract Professional management talent and the use of laborers would permit hand harvest during weather when combines would not work. When laborer wages exceeds about \$25.00 per week then combine harvest would likely be substituted and the labor crew reduced to 15 men and the equipment increased to add one combine at the cost of \$45.00 per day to harvest 0.5 hectare. The loss of employment opportunities and the foreign exchange cost for combines would be a serious consideration at the national level. However the farm size in many of tropical America areas can be increased to 120 hectares and maintain the same labor crew at higher wages. The combine would be attractive in reducing per hectare cost of labor housing, — transportation, and management. There is also the possibility that harvest losses could be minimized if the farm manager also operated the combine.

The commercial 120 hectare farm with a combine, a 70 horsepower tractor, implements, and

trailer could be operated on a continuous basis by the farm manager and 32 laborers to prepare plant and harvest 6.0 hectares per week. The tractor would be used 5 days or less per week and the combine 2 to 4 days per week. Laborers would be used largely for levee maintenance, irrigation, seeding, fertilizing and pest control. The Break down of costs would depend largely on wage rates. Suppose that wages are \$40.00 per manweek and \$1,280.00 per week for the 32 laborers, and other weekly costs are combine \$300.00, tractor and equipment \$300.00, irrigation charge \$150.00, land rental \$150.00, seed \$90.00, fertilizer \$130.00, pesticides \$240.00, for total costs of \$2,640.00 per week. If gross production is 35 tons at \$85.00 per ton then gross sales of \$3,060.00 per week leave an income to management of \$420.00 per week which is very attractive especially if rent is considered.

The production systems outlined are illustrations of the potential production and employment opportunities for management, machine operators, and laborers working together daily; each performing his part and participating in an income from continuous utilization of the available resources. No one method is universally good, however, the availability of land, water, favorable temperatures, and labor supply that are under utilized should lead to the organization of rice production systems in some of the tropical American areas which will set patterns for the future. The other implication is that there are obviously potential advantages in sizing units to reduce the equipment and managerial costs per hectare. ■ ■



Soil preparation with 6 hp hand tractor used in intensive cropping systems.

G.2a

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CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH

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Telephone (Area Code 202) 477-3592
Cable Address - INTBAFRAD

DATE: October 18, 1973

TO: Members of the Consultative Group
FROM: Executive Secretary
SUBJECT: Changes in the 1974 Budget of CIAT

1. The Board of Trustees of the Centro Internacional de Agricultura Tropical (CIAT) has now approved changes in the 1974 budget of the Center. For the most part, these changes were foreshadowed in the report on the CIAT budget contained in a letter from Dr. Sterling Wortman of the Rockefeller Foundation and circulated by the Executive Secretary on September 25, 1973.

2. CIAT's capital budget request to the Consultative Group, as approved by the Board of Trustees, now stands at \$994,000, of which \$794,000 relates to the Center's headquarters and \$200,000 to field activities at Carimagua.

3. CIAT's core budget request is increased by two items: (a) a transfer of \$70,000 from the previous capital budget to the core budget, in line with the classification of expenditures agreed on by the Consultative Group Secretariat and the international agricultural research centers; and (b) an increase of \$30,000 in funds budgeted for a beef seminar to be held early in 1974, to permit an increase in the number of participants from Latin America. The core budget is thereby increased to \$4.5 million.

4. Copies of CIAT documents describing and justifying these changes are attached.

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September 17, 1973

REQUEST FOR CAPITAL FUNDS TO SUPPORT NEW AND EXPANDED ACTIVITIES

Centro Internacional de Agricultura Tropical

I. Purpose of This Request

This proposal represents a request to the Consultative Group for International Agricultural Research for \$794,000 to meet new and expanded program requirements of the Centro Internacional de Agricultura Tropical in the calendar year 1974. In summary, the requested funds will be used to finance the following:

1. Modification and conversion of existing facilities	\$ 50,000
2. Purchase of additional equipment commensurate with the growth in the size of the senior staff and the associated support services and activities	203,000
3. Purchase of equipment for new research and training programs, i.e., cassava, field beans and agricultural systems	198,000
4. Purchase of equipment for expansions in and the undertaking of new activities in original research and training programs, i.e., beef, swine, rice and maize	180,000
5. Purchase and modification of equipment for employee welfare services	13,000
6. Packing, shipping and handling charges on imported equipment	150,000
Total	<u>\$794,000</u>

This list of additional needed facilities and equipment is based on a thorough screening of the original and amended lists developed by the CIAT staff, taking into consideration purchases made through September, 1973. During the week of September 10, 1973, leaders of all programs at CIAT were interviewed and unfilled lists at that time classified into three categories: (a) Items to be charged against the original capital budget, (b) items to be purchased in 1974 with funds to be requested through the Consultative Group and (c) items to be included in capital requests for 1975 and later.

In addition, two categories of equipment were deleted from the list with the understanding that CIAT management would develop specific proposals for funding each of these through requests to the Consultative Group or directly to interested donors. These projects were for facilities and equipment to support expanded core beef program activities at Carimagua in the Colombian Llanos and the equipping of the Meat Laboratory (essentially now a slaughter house) so that research and training in meat technology may be undertaken.

II Development of CIAT Organization and Capital Support

The Centro Internacional de Agricultura Tropical (CIAT) was established in 1967 to help accelerate the agricultural and economic development of the lowland tropics. Through cooperative and collaborative programs with international, regional and national agencies, it seeks to increase agricultural productivity and production with the objective of improving the diets and welfare of people, both rural and urban.

The idea of CIAT was first proposed in a document prepared by Dr. Lewis M. Roberts, The Rockefeller Foundation, and Dr. Lowell S. Hardin, the Ford Foundation, in October 1966. They estimated that the costs of constructing and building such a center, with a proposed senior staff of 30 and a junior staff of 37, would be between \$4 and \$5 million dollars.

Subsequently, the W. K. Kellogg Foundation expressed an interest in participating in such a development, and the Rockefeller Foundation was authorized to initiate negotiations with the Government of Colombia. These led to the Act of Foundation, October 17, 1967, a formal agreement, November 7, 1967, recognition of the legal status of the center, December 4, 1967, and a presidential decree, March 7, 1968.

Allocations of enabling funds by The Rockefeller Foundation on May 16 and December 1, 1967, and February 8, 1968, facilitated early planning, as did an allocation of funds, November 29, 1967, by the Ford Foundation to cover expenses of review teams and feasibility studies.

The site for the center, near Palmira, Colombia, was selected in February, 1968, and the Government of Colombia initiated the process of acquiring the land. CIAT obtained access to a portion of the land in January, 1969, and received the final portion in October, 1969. The Government leases the land

to CIAT at a token fee, i.e., 10 Colombian pesos for 10 years.

A document, Proposed Program, Staff and Budget, was presented to the first meeting of the Board of Trustees, June, 1968. The Board approved the general program outlined, less work on dairy cattle, and authorized the director to plan and to seek support for a capital development program.

The director presented a master development plan to the Board of Trustees in May, 1969, along with preliminary architectural drawings and financial estimates. The cost of building and equipping the master plan dated June 3, 1969, was estimated at \$6,514,755, and the Board subsequently requested that a new plan, based on the amounts of money then known to be available (\$2,500,000 from the Rockefeller Foundation and \$1,157,715 from the W. K. Kellogg Foundation), be prepared and submitted to the Executive Committee for review and approval. A revised capital investment budget, April 13, 1970, as approved by the Executive Committee, was ratified by the Board of Trustees in July, 1970. This, plus the enabling grants already made, became the capital budget for CIAT.

Six contractors submitted bids in February, 1971, for the construction of the principal facilities, these ranging from a low of \$1,237,148 to a high of \$2,107,309. The low bid was in excess of the budget for these facilities by approximately \$350,000. When the matter was reviewed with the Rockefeller Foundation in March, 1971, CIAT was advised to proceed with the construction, on the basis that every effort would be made by the Foundation to find or allocate additional funds to complete the initial project.

The capital budget at that time was in accord with the decision of the CIAT Board of Trustees to design, build and equip a physical plant within the funds available in July, 1970, from the identified donors. The number and size of buildings had been scaled back and the basic equipment lists trimmed to the minimum. Even so, over the 5 years of planning, construction and equipping, inflation, change orders and unexpected expenses necessitated seeking additional funds.

Since March, 1971, the Rockefeller Foundation has made additional grants, bringing the total of its contributions for the Palmira facilities, through September, 1973, to \$3,976,543 not including payment of the packing, shipping

and insurance costs on the bulk of the equipment and furniture imported. In addition, the Kresge Foundation, in 1972, donated \$750,000 for the construction and equipping of the Communication Services Building portion of the basic plan.

In summary, the basic capital budget of CIAT was composed of the following contributions:

The Rockefeller Foundation	\$3,976,543*
The W. K. Kellogg Foundation	1,157,715
The Kresge Foundation	750,000
Miscellaneous sources, including earned interest	<u>360,128</u>
Total basic capital budget	\$6,244,386

The facilities built and equipped by October, 1973, consists of 24 laboratory modules (10 x 10 meters), one station operations building, field units for the animal science programs, one screenhouse, one greenhouse, communication services building, administration building, cafeteria and dining rooms, housing (four apartments, rooms for 64 conference guests, rooms for 80 trainees), and associated recreational facilities, a conference center with eight meeting rooms (some temporarily being used for offices), and an amphitheater. These facilities were intended to house and equip 36 scientists and their staffs, and with the operational programs consisting of a full thrust in beef, complementary programs in rice and corn in cooperation with IRRI and CIMMYT, and a limited program in swine.

CIAT has experienced a rapid acceleration in development, growth, initiation of programs, and increase in operating budget. At the outset, three donors were involved in core and restricted core support. Presently, there are ten donors, including those involved in special projects as well as core support. The original budget, intended to provide facilities and equipment for a senior staff of 36 scientists, must serve a minimum of 43 in 1974, plus 7 visiting scientists. While it will be necessary to squeeze most of these additional scientists and their staffs into the available office and laboratory space, they need equipment and other facilities unique to their research programs.

*In addition, The Rockefeller Foundation made available \$500,000 in 1968 for improvements and equipment at the ICA Research Center - Turipana to facilitate international research and training programs of CIAT.

CIAT is in a two-way pressure, to spread its limited funds to complete the basic plan to serve the initially established programs, while at the same time to provide minimum facilities for the growing programs approved by the CIAT Board in cassava and field beans, in August 1971, and agricultural systems in 1972.

This growth is evident in the increase in man-years of direct research staff time in these latter three programs:

In cassava from 1 in 1972, to 5.5 in 1973, to 5.9 in 1974

In field beans, from 1 visiting scientist in 1972, to 3.7 in 1973, to 4.9 in 1974, and

In agricultural systems, from none in 1972, to 1 in 1973, and 2.5 in 1974.

The total scientific staff budgeted for 1974 is 43. This does not include at least 7 other scientists assigned or posted to CIAT but not charged in the operational budget. But these scientists do need supporting staffs, working space, equipment and vehicles if they are to be productive.

III Details on Additional Financial Requirements

The following paragraphs outline briefly the basis for the amounts requested in the six categories indicated:

1. MODIFICATIONS TO AND CONVERSION OF EXISTING FACILITIES

\$50,000

To begin program operations in 1969, CIAT first converted the old farm buildings on the site into temporary offices, classrooms, laboratories, library, information center, dormitory and cafeteria. These facilities were vacated with the move into the new facilities in October, and CIAT now must modify and convert these old facilities so that they now can be used for such purposes as (a) warehouses, (b) feeding field and contract laborers, and (c) housing security personnel on a 24-hour basis.

In addition, upon completion of the Station Operations building in 1970, one-half of this structure was allocated temporarily to the commodity programs for offices and laboratories, as well as operational headquarters for the architects, contractors, and construction supervisory personnel. With the completion of the new buildings, it is important that as much as possible of this space be vacated and be converted for its original use, i.e., to provide

working areas for farm operations, machinery repair, general maintenance shops and crops processing.

2. PURCHASE OF ADDITIONAL EQUIPMENT COMMENSURATE WITH
GROWTH IN STAFF AND ACTIVITIES OVERALL \$205,000

a. Vehicles \$97,000

Appropriate work and transport vehicles are important not only to the efficiency of CIAT's operations but, in many cases, to make possible specific research and training activities. This is the case, for instance, in the need for 4-wheel drive "jeep" type vehicles required to transport research personnel involved in on-farm studies, i.e., beans (2), swine (1), cassava (2), and agricultural systems (3). Similarly, small rugged motorcycles have already demonstrated their value in getting personnel engaged in agricultural technology and social studies into remote areas, as well as facilitating on-base transportation to and from research plots distributed on the 500-hectare farm.

Four pickups are needed for the new programs in beans and cassava, while expanded research and training activities in existing programs need seven additional vehicles.

A delivery van is required to service the increased food and housing services; on-base housing of 80 trainees, plus a continuing series of conferences creates a demand for increased on-base bus services.

b. Office and Communication Services

Equipment \$69,000

Clerical staffs grow with increases in scientific staff and programs and with this the need for typewriters, furniture, files and related equipment. Similarly, as research programs produce data, demands rapidly increase for photographic and reproduction services. The volume of research reports coming out of the programs has already necessitated creating a position for an additional senior editor. With growth in staff and increased use of the housing facilities, it is necessary to expand the telephone and inter-communication system within CIAT.

c. Accounting Equipment \$28,000

The size and multiplicity of programs, as well as the growing number of

donors, special projects and on-base food, housing and conference activities have generated a demand for more adequate fiscal, accounting and inventory control equipment.

d. Data Processing Equipment \$14,000

Vital to the success of research and training functions is ready access to appropriate equipment for calculating and analyzing data. With an increase in senior staff members from 36 to 43 and attendant increases in numbers of research associates/assistants and trainees, CIAT needs additional calculators and plotting equipment to supplement the machines presently available. This need becomes particularly acute with the distribution of personnel throughout the laboratory and office complex covering several hectares.

3. NEW RESEARCH AND TRAINING PROGRAMS: CASSAVA,

FIELD BEANS AND AGRICULTURAL SYSTEMS \$198,000

CIAT's cassava and bean programs were started in 1972 and no funds were specifically appropriated in earlier grants to meet their capital needs. To date, they have operated basically with equipment diverted from other programs. The same is true of the Agricultural Systems program in its present form, although in this case capital requests are quite modest (less than \$2,000).

It is urgent that these programs be adequately equipped to do the job assigned to them. Funds are needed to purchase equipment for field, greenhouse and laboratory studies. Studies are conducted in farmers' fields as well as on the station and easily portable items of various types are needed to make them as effective as possible. Items for entomology, physiology, pathology, breeding, weed control, soils, agronomy and soil microbiology are included in these requests.

Major items of equipment needed in beans and in cassava are for studies of photosynthesis and plant type. Much of this equipment, totalling about \$60,000, is to be shared by the two groups. This includes gas analyzers, recorders, light measuring equipment and leaf area measuring units.

The pathologists in the two new programs need such items as microscopes, a centrifuge, a spectrophotometer and a microtome totalling in value about \$9,000 and a small screenhouse and related equipment costing approximately the same. These facilities will be used in studying the various bacterial, fungal and virus diseases which attack these two major commodities. Much of

this work is in support of the search for disease resistant varieties as well as in obtaining a better understanding of the nature of the diseases.

The entomologist working on these two commodities needs a small screen-house and related laboratory equipment for rearing insects, plus various items of sprayers, counters, etc. for field plot work and data collection. About \$5,000 is required for the laboratory items and about \$3,000 for the field and greenhouse items.

Soils and agronomy in these two programs require primarily land preparation equipment, planters, irrigation facilities, harvesters, balances, etc. for installing field plots and collecting data from them. The total needs are slightly in excess of \$30,000. Studies are related to fertilizer rates and their interaction with variety and soil conditions, planting density and methods and soil management practices.

Similar facilities for plot work are needed by the breeders, particularly for those working with beans. Incubators, balances, etc. also are required. In addition, the cassava program requests freeze-drying equipment to use in the experimental storage and shipment of pollen to be used in its crossing phases.

The weed control scientist working on cassava requests several relatively simple items of equipment for use in studying herbicide residues in field plots and totalling about \$3,000 in cost.

The soil microbiologist requests about \$8,000 items of equipment for use in studies on nitrogen fixation by beans.

In addition to the capital items requested specifically for beans and cassava, and amounting to \$72,906 and \$77,485, respectively, an additional greenhouse with associated equipment (\$42,000) is needed for plant growth and resistant studies with these two crops.

4. NEW AND EXPANDED ACTIVITIES IN EXISTING RESEARCH AND TRAINING PROGRAMS

\$180,000

Three factors contribute to the bulk of the equipment needs in this category: Acquisition of staff members over the past three years since original equipment lists were developed, developments in research programs leading to new studies and training opportunities, and further development of the experimental farm, thus making possible considerable expansion in replicated trials.

As a consequence, there are increased demands for farm machinery and tools (\$47,000) appropriate for plot work as well as production training. Growth in the commodity programs, particularly with increased interest in research leading to improvements in protein quality and content, create demands for additional nutrition-biochemistry laboratory equipment (\$50,000), including an amino acid analyzer and a gas chromatograph.

Additional equipment expenditures in animal health (\$26,000) will provide for laboratory courses not originally planned, expansion of the small animal colony, increased serum bank storage, equipment for the new position of entomologist, and more adequate large animal facilities for both hemoparasite studies and teaching.

General research support includes additional steam generation and sterilization equipment (\$15,000), and additional refrigerators, freezers, and cold rooms for storing and preserving research materials (\$12,000).

Finally, each of the established programs now have needs, not originally anticipated, for various items of equipment. While the amounts involved in individual items are relatively small, in total they represent a significant figure. Development of new varieties, for instance, creates new demands for facilities and equipment to support the international movement of seeds, particularly for the cleaning and processing of foundation stocks for distribution to other countries.

5. EMPLOYEE WELFARE AND BENEFITS

\$13,000

In addition to the services required by law, CIAT has expanded the range of services available to its total staff of 480. In space provided and equipped by CIAT, the government has taken special action in making available to employees medical examination and treatment services on the CIAT site. These services include a full-time nurse and a doctor on duty at CIAT 3 hours daily. When CIAT provides a dental chair, a dentist also will be assigned to increase the efficiency and effectiveness of these services. The government has agreed to fund the dental supplies. CIAT proposes to buy, adapt and equip a station wagon to serve as an ambulance for use in emergencies and to take possible accident victims and persons seriously ill to the hospital in Cali (30 kilometers distant) or Palmira (8 kilometers distant).

CIAT agreed to make space available and supply furniture and one of the local banks has established a branch at CIAT, thus further contributing to employee efficiency and satisfaction.

6. SHIPPING AND HANDLING CHARGES

\$150,000

Costs of packing, internal freight, international shipping, handling and insurance now average approximately 30 percent of the purchase price of items imported from the developed countries. Estimating that approximately \$500,000 of the expenditures outlined above will be made outside Colombia for vehicles and research equipment, this budget request includes \$150,000 for these purposes.

REQUEST FOR CAPITAL FUNDS TO SUPPORT CORE PROGRAM ACTIVITIES OF
THE CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL
IN THE COLOMBIAN LIANOS

1. Purpose of this Request

This proposal represents a request to the Consultative Group for International Agricultural Research for \$200,000 to provide equipment, not available through the Instituto Colombiano Agropecuario (ICA), so as to permit continuation and acceleration of the core program of the Centro Internacional de Agricultura Tropical (CIAT) in the low fertility, high acid soils of Latin America. In summary the requested funds will be used to finance equipment needed for and to support the following core program activities:

a) Food crop production, pastures establishment, family ranch	36,000
b) Pasture grass and legume seed production	25,300
c) Herd systems research	27,900
d) Station Operations	110,800
	<hr/>
TOTAL	200,000

2. Basis for this Request

The objective of CIAT is to contribute to the agricultural and economic development of the lowland tropics through increasing the productivity and production of selected key agricultural commodities. This effort concentrates on devising and testing production techniques and systems, and on training production specialists who will be influential in initiating and advancing agricultural development programs in

their countries. The CIAT programs are designed to complement and reinforce national programs and are developed and carried out, where possible, in collaboration with and/or in concert with national institutions.

Given the wide diversity in the principal soils and climatic types in Latin America, it is not possible for CIAT to study many of the production limiting problems at its headquarters site near Palmira, Colombia. Consequently the CIAT Board of Trustees has defined the entire country of Colombia as the initial base for CIAT core programs, and CIAT management has developed, in cooperation with the Instituto Colombiano Agropecuario and other institutions ways of carrying on research and training programs in other areas of Colombia typical of the vast areas in the Latin American tropics.

For instance, in 1968 the Rockefeller Foundation made a grant of \$500,000 to expand the research and training facilities at the Turipaná research center of ICA, near Monteria, in order that certain CIAT programs might be carried out in this coastal plains area (alluvial soils, alternate wet and dry seasons) typical of many such areas in Latin America.

With work well underway on the North Coast, increasing attention has been given to the problems posed by the vast areas of low fertility, high acid soils of the America tropics, such as those at the ICA Carimagua station in the eastern plains of Colombia.

The soils found in this location are typical of those which predominate in the American tropics. This includes the old sedimentary soils of Colombia and the Venezuelan llanos, and parts of Peru, Bolivia and Ecuador, as well as the old shield formations in central Brazil and southern Venezuela. It is estimated that there are approximately 300,000,000 hectares of such land and an even greater area of forested land in this region.

Soil scientists have coined a name to describe these soils. They call them "allic" soils and say they are unlike moderately acid soils with low fertility in that they are extremely acid (pH of 5 or below). In such a soil environment, the aluminum ion replaces calcium, magnesium and other nutrients which in turn are leached out. The exchangeable aluminum is toxic to most plant species. The term "allic" is used to indicate that aluminum is the predominant exchangeable cation, and to distinguish between these and moderately acid soils in which aluminum is not a problem.

Although only a fraction of the agricultural potential of these areas has yet been realized, these areas are now producing significant quantities of agricultural products. It is estimated that at least one half of the 150,000,000 head of cattle in the lowland tropics are found in allic soil areas. This is sharply accentuated in Brazil where 70-80% of the nation's cattle are found north of the Tropic of Capricorn where allic soils predominate. In addition upland rice produced in this same area in Brazil accounts for eighty per cent or so of the nation's total rice production.

Public and private sectors in Colombia, Venezuela, Peru, Bolivia and Brazil recognize the agricultural potential of these areas and their role in economic development. Increasing attention has been given to regional development, to commodity production programs, and to necessary infrastructure to support overall development of these regions.

The ICA Carimagua station has provided CIAT with an excellent base of operations for research and training programs in support of development of allic soil regions. This station of 20,000 hectares which is located in the heart of the Colombian Llanos on relatively level, and well-drained land on the south side of the Meta River, facilitates a broad range of research and training programs in developing systems and techniques of range and pasture based beef production, crop production and complete farm ranch systems for this and similar areas.

Both pastures and crops programs emphasize selection of species adapted to the low fertility soils environment. Plant tolerance of soil acidity is important to reduce the amount of lime required to neutralize the toxic aluminum which also interferes with uptake and metabolism of nutrients. Tolerant species also generally extract nutrients more efficiently, especially phosphorous. This is important for the settler or rancher interested in growing food crops in improved pastures with minimal initial fertilizer inputs.

The beef production program is directed towards developing life cycle production systems on pasture. The overriding consideration in this program is to feed and manage the cow so she can reproduce. Sustained increases in beef production depend directly on increasing calving percentage, to produce the heifers needed for herd expansion to stock extensive grassland areas now being utilized at only a fraction of their capacity, and to produce the feeders to be fattened and marketed.

3. Collaboration with ICA

ICA, a semi-autonomous agency of the Colombian Ministry of Agriculture is engaged in nationwide agricultural research, education and extension. This includes production programs in all principal commodities, extension, rural development projects, and direct participation with the Universidad Nacional de Colombia in under-graduate and graduate degree education. ICA currently employs 1200 professionals, with an annual operating budget of US \$18,000,000.

Other agencies in the Ministry of Agriculture that have mutually complementary programs with ICA are INCORA (land reform), Caja Agraria (agricultural credit), IDEMA (marketing) and INDERENA (natural resources).

A basic agreement was signed on April 15, 1969 between CIAT and ICA setting forth the objectives and norms for collaborative projects between the two institutions (Addendum A). This was followed by preparation of detailed commodity program agreements

in beef cattle (Addendum B), swine and opaque 2 corn specifying project areas of mutual interest, and prescribing basic procedures in the development and execution of collaborative experiments. All collaborative work programs between the two institutions are based on specific research agreements, developed and approved by appropriate persons in both institutions before being implemented. An example is the attached pastures and forages grazing trial collaborative experiment agreement (Addendum C).

Personnel, operational and capital requirement contributions of the two institutions vary depending upon the nature of the project, institutional interest and funding capability. ICA's contribution generally includes land, administrative and base facilities support, share of the technical planning and execution input, share of the labor force (all workers are employees of ICA, but CIAT provides funding for many of these) and a portion of the direct operational costs of collaborative experiments.

CIAT's contribution generally includes a major portion of direct operating costs of collaborative experiments; capital type expenditures for fences, corrals, waterers, pasture establishment, semi-permanent storage buildings and housing for professionals and workers which have been considered as legitimate operating expenses since ICA provides land and facilities; and providing certain equipment. These equipment items are considered as part of the equipment inventory of the CIAT center in Palmira, but which are provisionally assigned to Carimagua.

4. Collaborative ICA-CIAT Experiments: This includes research agreements on beef cattle production systems, food crop production, rice, corn, and cassava and grain legumes. The following is a listing of projects in which collaborative ICA -CIAT experiments are in progress or have been completed:

Commodity program

Project

a) Beef Production Systems

Pasture plant introduction

Soil microbiology

Forage plant improvement and breeding

Seed production of selected species

Pasture weed control

Pasture and forage utilization

Supplemental feeding

Devise specimen animal health programs
for beef cattle in the lowland tropics

Agricultural economics

Production systems (this includes food
crop production, farm structures, herd
production systems, family farm units
and farm surveys).

b) Rice

Nutrient requirements and sources under
upland and flooded mgt.

Screening for acid soil tolerance

Screening for blast resistance

Study of physiological disease "Anaran-
jamiento" on oxisols.

c) Corn

Screening for acid soil tolerance

Nutrient requirements

d) Cassava

Screening for acid soil tolerance

Nutrient requirements

Nitrogen sources and management.

e) Food Legumes

Screening for acid soil tolerance

Soil microbiology

The 1972 CIAT Annual Report provides detailed information on programs in Carimagua (Addendum D). A complete list of Beef Program projects, subprojects and experiments is provided in Addendum E.

5. Extent and Mechanisms of Transfer of Results

Results obtained from crops, beef cattle production systems and family ranch research in the Colombian Llanos will have high transferrability to the extensive alluvial soils areas of Latin America. The savannah grassland areas of the Llanos of Venezuela and Colombia, Campo Cerrado of Brazil and parts of Bolivia are similar in soil type and climate, as well as type of agriculture, and have similar problems and potentials. In addition, results obtained in Carimagua will have applicability to soils in lowland forested areas since they are very similar chemically and structurally to those in Colombian Llanos.

Mechanisms for extending and applying the results obtained in the Colombian Llanos include:

- 1) Training of agriculturists in techniques and systems of crops and livestock production who will be better qualified to plan, implement and supervise agricultural development programs in alluvial soil regions of their countries;
- 2) Provide technical counsel and assistance to national institutions in developing research, training and agricultural development programs in alluvial soil regions;
- 3) Direct participation in the development of research and training programs with national institutions outside of Colombia

6. Capital funding

- a) Capital expenditures to September, 1973.

- (1) ICA: ICA has had limited funding for station development. This has included 1) limited allocations from its annual operating budget for the

construction of semi-permanent facilities to be used on an interim basis until permanent facilities become available in late 1975; 2) operating funds for construction of fences, waterers, etc; 3) purchase of some equipment using Rockefeller Foundation 64035 grant funds (assist in development of all major ICA stations); 4) limited peso funds for the purchase of some equipment items.

- (2) CIAT: The CIAT capital development budget has not included any funds for construction of facilities or purchase of equipment for Carimagua. However, CIAT has provisionally located some equipment designated for the CIAT center in Carimagua. This includes two wheel tractors, three trailers, two disks, two pickups, two jeeps, two motorcycles, and assorted field and laboratory equipment. In addition a portion of pastures and forages, beef husbandry, animal health and soils/agronomy operating funds have been used for rental type expenditures for capital items, considering these as legitimate operating expenses where ICA provides land and support base. These have included expenditures for fences, waterers, salt feeders, corrals, storage buildings, provisional dormitories for workers (2) and professionals (1), provisional residences for married professionals (2).

a) Additional capital needs

Present facilities and equipment are not adequate to support the present program level on a continuing basis. However, most station personnel and non-resident visiting staff have been willing to tolerate these sub-marginal accommodations until more adequate facilities become available, and to make necessary adjustments in daily work routines for the successful execution of their respective programs. But these adjustments must be considered as strictly provisional, and would be absolutely unworkable on a continuing

basis. For instance only four rooms with two single baths are available for visiting professionals, with four to five beds in each room. Another example is the housing of one hundred farm laborers in two shed type, palm thatched buildings.

Similarly, combined ICA and CIAT equipment now located at Carimagua is inadequate to support the present program level, and improvisation is mandatory to provisionally cover these deficiencies. This has included temporary assignment to Carimagua of ICA and CIAT equipment normally located at other stations.

Additional facilities and equipment would increase our effectiveness in developing present programs, and are absolutely mandatory in developing additional work programs that are considered as necessary extensions of current programs.

(1) ICA : ICA has an Interamerican Development Bank (IADB) loan for the construction of permanent facilities in Carimagua. This includes construction of a shop, dormitory for 42 workers (84 with double bunks), dormitory for 36 professionals, a kitchen/dining unit to service both workers and professionals, three residences for married professionals, an office-laboratory building and a storage building. Bids are now being reviewed and a contractor will be selected in October, 1973. Construction will begin in January, 1974, with completion of all facilities in late 1975. This loan does not include any funds for equipment.

In addition ICA has agreed to construct for CIAT use four additional residences and a housing unit for unmarried personnel and visitors.

(2) CIAT : CIAT calculates that US\$200,000 of additional capital funding will be needed to provide adequate support for existing ICA-CIAT collaborative experiments, and to facilitate initiation of new collaborative experiments.

A summary of these needs is presented in Table I, specifying program area or support function, and amount for support of present projects and amount required for new projects.

Justification for these expenditures is as follows:

Item 1. \$36,000 for food crop production, pastures establishment, and family ranch programs. Food crop production includes studies in screening of food crops for acid soil tolerance, in determining fertility requirements of food crops, in summer production of vegetables and food legumes under irrigation. Pasture establishment includes studies on practical and economically feasible pasture establishment and range reseeding techniques in introduction of tropical forage legumes into native and improve grass pastures, nutrient and fertilizer requirements of key grasses and legumes, seeding techniques with and without cultivation, differential varietal tolerance to soil acidity. The family ranch program includes first setting up a prototype complete farm unit built around a subsistence and support base to provide food and shelter for the family with cash income from commercial beef cattle enterprise, minor species and perhaps some crops, and where emphasis is placed on conversion of family labor to capital. This prototype unit will be followed with a training unit to further test components in livestock and crop production. The third phase of the family ranch program will be to set up pilot units with ranchers off the Carimagua station.

Equipment required for this entire effort includes a wheel tractor,

farm machinery, four-wheel drive vehicle, equipment for the work-room and screenhouse, plus farm tools, simple sheds, corrals and fences.

Item 2, \$25,300 for development of a grass and legume seed production project emphasizing production of tropical grass and forage legume foundation seed; development of grass and legume seed production technology and techniques; establish seed production training programs for Latin Americans. Equipment needed for this project includes a seeder, small plot harvesting and threshing equipment, combine, seed processing equipment and four wheel drive vehicle.

Item, 3, \$27,900 for initiation of a second Herd Systems project to devise and test life cycle production systems using native and improved grass pastures with and without *Stylosanthes guyanensis*, a promising tropical forage legume. Interseeding of high protein tropical legumes with both native and improved grasses is often a practical method of correcting the protein deficiencies of these grasses, and in improving nitrogen status of the soil. Equipment required for the development of this project includes fences, corrals, simple sheds, watering facilities, and farm tools.

Item 4, \$110,800 for Station Operations Equipment: 1) \$10,300 for additional farm machinery to support overall development of new programs. This includes a wheel tractor and selected farm machinery: 2) \$ 27,000 for a road grader for construction and maintenance of 80 kilometers of station roads and maintenance of airstrip located on the station. This item is vitally needed for road construction and maintenance to efficiently service experiments at widely separated locations, and in making practical demonstrations of efficient methods of construction and maintenance of laterite rock surfaced roads; 3) \$1,500 for a dryer for drying pastures

and forages to be evaluated in feeding experiments; 4) \$10,000 for heavy duty farm truck; 5) \$20,000 for equipment for the kitchen/dining room unit; 6) \$20,000 for furniture for seven residences and a unit for unmarried staff and visitors; 7) \$22,000 for maintenance shop equipment.

Table I 1974 equipment requirements to support CIAT projects in Carimagua.

<u>Program area/support function</u>	<u>Current Experiments</u>	<u>New Experiments</u>	<u>TOTAL</u>
1. Food crop production, pasture establishment, family ranch		36,000	36,000
2. Seed production		25,300	25,300
3. Herd Systems II		27,900	27,900
4. Station Operations			
a) Additional farm machinery to support all programs	-	10,300	10,300
b) Road grader	27,000	-	27,000
c) Forage Dryer	1,500	-	1,500
d) Farm truck	10,000	-	10,000
e) Kitchen/dinning room equipment	-	20,000	20,000
f) Furniture for residences and unmarried and visitor housing	-	20,000	20,000
g) Maintenance shop equipment	22,000	-	22,000
	<hr/>	<hr/>	<hr/>
TOTAL	60,500	139,500	200,000
	=====	=====	=====

October 11, 1973

RESOLUTION No. 1

Revision of 1974 Core Budget.

Since the approval of the 1974 core budget of \$4,403,000 in May, 1973, two actions outside of CIAT indicate the desirability of revising the 1974 core budget to include the new requirements.

1. In accord with the document, Budgeting and Accounting Policies and Practices of International Agricultural Research Centers, prepared by Mr. Ruddy of the World Bank and reviewed by the center directors in February, 1973, and now adopted by the Consultative Group for International Agricultural Research, items such as replacement vehicles are to be included in annual operational budget requests rather than in capital. Consequently, the CIAT management recommends the Board of Trustees approve the transfer of the requested \$69,575 from the 1974 capital budget request to the operational budget request for the same year.

2. Subsequent to the planning and developing of the budget for the Seminar on the Increasing Beef Production in the Lowland Tropics, the Technical Advisory Committee to the CG met and requested that CIAT expand the objectives and participation of scientists in this seminar, scheduled for February 18, 1974. Consequently, the objectives have been broadened, the length of the seminar increased by one day, and the list of possible invitees increased by up to 40-50 additional persons. While CIAT had budgeted \$40,000 for this seminar, the actions undertaken are calculated to cost an additional \$30,000 to cover travel and per diem for the increased number of participants, as well as the additional per diem involved.

Therefore, it is hereby resolved that the CIAT management be authorized to increase the 1974 operational budget request to the Consultative Group by \$99,575 to cover the \$69,575 needed for replacement vehicles and \$30,000 for the beef seminar. The overall total, core and restricted core, would thus be \$4,502,575.



CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

DIR-1071

October 15, 1973

Mr. Harold Graves
Executive Secretary
Consultative Group on International
Agricultural Research
1818 H. Street N. W.
Washington, D. C.

Dear Harold:

As you requested and with the kind cooperation of Mr. Jim Fransen, I am sending herewith the following documents:

- a) A letter I wrote to the members of our Board of Trustees (together with 2 enclosures) which gives details of our capital requirements for 1974.
- b) A paper which describes our request for capital funds to support core operations in the Colombian Llanos (at Carimagua)
- c) Resolutions numbers 1, 2, 3, and 4 which were approved by our Board on October 11 and 12.
- d) The report I made to the Board on the Capital plan.

As you will gather from the resolutions, the Board approved adjustments to our 1974 core budget, which bring it to a new total of \$4,502,575 and capital expenditures in 1974 of \$1,353,530 and authorized me to seek funds for these amounts.

The listing of equipment for Carimagua has now been approved by Dr. Armando Samper, our new Chairman of the Board, so the requirement in Resolution 4 has been satisfied.

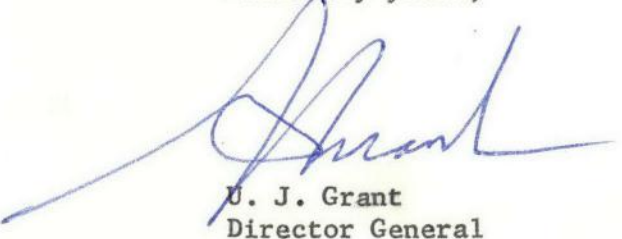
The Board had certain reservations regarding projections of capital requirements for 1975 to 1977. A sub-committee of the Board has been established which will, amongst other things, review with management and staff precisely what capital will be required for the years 1975 - 1977. We hope to be able to report to you with figures early in 1974.

We have just completed our Inauguration, which went off very well, and we look forward to a visit from the Consultative Group Secretariat in the not too distant future.

We are getting together some photographs and other material on the Inauguration which we will be sending to each donor.

With best regards.

Sincerely yours,

A handwritten signature in blue ink, appearing to read "U. J. Grant", with a long horizontal flourish extending to the left.

U. J. Grant
Director General

UJG/h

Encl.

cc: Mr. A. Urquhart - Comptroller

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SIMPOSIO

EL POTENCIAL DEL TROPICO BAJO
THE POTENTIAL OF THE LOWLAND TROPICS

Octubre 13, 1973

Centro Internacional de Agricultura Tropical, Cali, Colombia.

Como parte de los actos de inauguración de sus nuevas facilidades físicas, ubicadas entre las ciudades de Cali y Palmira, en el Valle del Cauca, Colombia, el Centro Internacional de Agricultura Tropical (CIAT) patrocinará un simposio sobre el tema: "El Potencial del Trópico Bajo".

Los objetivos de este simposio son:

- 1) Ofrecer oportunidades a los participantes para que obtengan e intercambien experiencias y conocimientos sobre las maneras por las cuales los potenciales de los trópicos bajos pueden ser y son realizados; así como sobre la importancia de una acción continua y cooperativa.
- 2) Estimular apreciaciones realistas de estos potenciales y fomentar interacción efectiva entre los científicos agrícolas que exploran las soluciones a los problemas críticos de producción, y aquellos que planifican, asignan recursos y dirigen los esfuerzos nacionales de desarrollo.
- 3) Presentar al CIAT como una nueva y activa agencia en el desarrollo de los trópicos bajos, brindando la oportunidad a los participantes para que conozcan cómo sus propias actividades pueden relacionarse con el personal científico, programas, recursos y facilidades del CIAT.

VIERNES, OCTUBRE

20:00

SABADO, OCTUBRE

07:30

09:00

PROGRAMA

VIERNES, OCTUBRE 12 — FRIDAY, OCTOBER 12

20:00 Recepción informal - Informal reception

SABADO, OCTUBRE 13 — SATURDAY, OCTOBER 13

07:30 Desayuno en el CIAT - Breakfast at CIAT

Moderador - **Lewis M. Roberts**

Moderator

09:00 Acelerando el desarrollo por medio de mayor producción agrícola.

Accelerating development through increased agricultural productivity.

Galo Plaza, Secretario General de la Organización de Estados Americanos (Secretary General, Organization of American States).

10:00	<p>Los Trópicos Bajos de América Latina: Los recursos y el ambiente para la acción de desarrollo.</p> <p>The Lowland Tropics of Latin America: The resources and environment for development action.</p> <p>Paulo de T. Alvim, Director Centro de Pesquisas do Cacau, Brasil (Director, Cacao Research Center, Brazil).</p>	14:00
11:00	<p>Desarrollo Económico e Infraestructura: Los medios y fines del desarrollo.</p> <p>Economic Development and Infrastructure: The means and ends of development.</p> <p>Raul Prebisch, Asesor del Secretario General de la O. N. U. (Adviser to U. N. Secretary General).</p>	15:00
11:45	Discusión General - General Discussion	
12:30	Almuerzo - Lunch	

14:00

Población y calidad de vida: La dimensión humana.

Population and quality of life: The human dimension.

Benjamin Viel, Director Ejecutivo Región Hemisferio Occidental, Federación Internacional de Planificación Familiar. (Executive Director, Western Hemisphere Region, International Planned Parenthood Federation).

15:00

Innovación y Cooperación Institucional: Internacional, regional y nacional.

Institutional Innovation and Cooperation: International, regional and national.

Armando Samper, Sub-Director General, Representante Regional Para América Latina de la F. A. O. (Sub-director General, Regional Representative for Latin America, F. A. O.)

16:00 Discusion General - General Discussion

17:00 Cierre - Adjourn

Traducción simultánea : Español-Inglés

Simultaneous Interpretation : English-Spanish

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Coincident with dedication of its new physical facilities located between the cities of Cali and Palmira, in the Cauca Valley of Colombia, the Centro Internacional de Agricultura Tropical will sponsor a symposium on the theme: "The Potential of the Lowland Tropics."

The objectives of this symposium are:

- 1) To provide opportunities for participants to gain and exchange knowledge and insight about the ways by which the potentials of the lowland tropics can be and are being realized, as well as the importance of continued, concerted action.
- 2) To stimulate realistic appraisals of the potentials and to encourage effective interaction between agricultural scientists who are seeking solutions to critical production problems and those who are preparing plans, allocating resources, and providing continuity of direction in national development efforts.
- 3) To introduce CIAT as a new working partner in the development of the lowland tropics and afford opportunities for participants to learn how its programs, staff, resources and facilities may relate to their own activities.

15 OCT. 1973

CT-file

To: Members of the Consultative Group for International Agricultural Research
and the Technical Advisory Committee

Gentlemen,

Last week, we dedicated the new physical facilities of CIAT in a series of three events. The first, Founders' and Collaborators' Day, provided opportunity to recognize those persons whose vision and dedication helped develop the overall concept and assured initial financial support, plus those whose cooperation and active participation accelerated the development of CIAT's programs and physical plant.

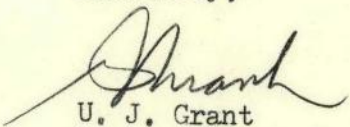
Second, with the active participation of the president of Colombia, Dr. Misael Pastrana Borrero, the new facilities were formally dedicated with some 800 persons participating.

Finally, nearly 200 persons attended the inaugural symposium on the topic, "The Potential of the Lowland Tropics."

We regret that your busy schedules prevented your being with us for these events, but we are looking forward to the opportunity to welcome you to CIAT soon.

Enclosed are copies of the Dedication Program and Brochure, as well as the Program for Founders' and Collaborators' Day. We plan to publish, as soon as possible, the symposium papers plus other major addresses associated with the three-day event. In addition, we are summarizing the newspaper coverage of these events. We shall forward a copy when available.

Sincerely,


U. J. Grant
Director General

UJG:sbr

HOTEL
INTER-CONTINENTAL
CALI

AVENIDA COLOMBIA 2-72 - APARTADO AEREO 7457, - CALI - COLOMBIA - TELEFONO: 893041 - CABLES: INHOTELCOR



14th October.

Dear Harold,

Sorry I didn't get round to saying
good-bye before I left but time ran out on me.

We duly got CIAT inaugurated -
not without difficulty.

So far we haven't had our \$60,000
(I think that is the amount) from the bank.

After drinking so much at inauguration, we
need it so perhaps you could chase it up.

Please give my regards to Bruce,
Carol and Audrey.

Yours,

Andrew V.



PROGRAMA

CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

PROGRAMA DE INAUGURACION DEL CIAT

Octubre 12 de 1973

Llegada del señor Presidente
Dr. Misael Pastrana Borrero

Bendición.

Excelentísimo señor Jesús
Antonio Castro Becerra, Obispo
de Palmira.

Presentación de los huéspedes
especiales y breves palabras
sobre el CIAT.

Doctor U. J. Grant,
Director General del CIAT.

Palabras del Presidente de
la Junta Directiva del CIAT.

Señor Francisco de Sola.

Palabras en nombre de las
Instituciones patrocinadoras
del CIAT.

Doctor John H. Knowles,
Presidente de la Fundación
Rockefeller.

Visita a las instalaciones
y lotes experimentales del
CIAT.

Almuerzo.

Continuación visitas a las
instalaciones y lotes.

Las visitas a las instalaciones de los lotes experimentales
se continuarán por la tarde. En cada lugar por visitar habrá
una persona que ofrece explicaciones y queda a iniciativa
personal los lugares que se deseen visitar.

CIAT DEDICATION DAY PROGRAM
October 12, 1973

Arrival of H. E. the President
of Colombia, Doctor Misael
Pastrana Borrero.

Blessing.

H. E. Jesús Castro Becerra,
Bishop of Palmira.

Introduction of special
guests and words on CIAT.

Doctor U. J. Grant, Director
General of CIAT.

The President of CIAT's
Board of Trustees.

Mr. Francisco de Sola.

Words from the Donors.

Doctor John H. Knowles,
President of the Rockefeller
Foundation.

Tour of facilities and
experimental plots.

Lunch.

Tour continued.

Tour of installations and experimental plots are continued
in the afternoon. There will be people assigned for
explanations and the tour can be made freely and at will.

PROGRAMA

DIA DE LOS FUNDADORES
Y DE LOS COLABORADORES

Founders' and Collaborators' Day

11 de Octubre, 1973



CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

Hace siete años, en este mes de Octubre —después de un largo período de discusiones; de estudio de varias colaboraciones que se solicitaron y se recibieron; de síntesis de ideas, y de revisiones al texto original— los Doctores Lewis M. Roberts, de la Fundación Rockefeller, y Lowell S. Hardin, de la Fundación Ford, redactaron un informe en el cual se proponía el establecimiento de un centro internacional en América Latina el cual describieron, en parte, en la forma siguiente:

“El instituto latinoamericano no se ocupará de un solo cultivo ni de una sola actividad específica. Se concentrará en la identificación y solución de problemas de la agricultura y de la ganadería del trópico, así como en el adiestramiento de especialistas dentro de un ambiente académico y de una disciplina de investigación orientada hacia la resolución práctica de problemas agropecuarios. Se reconoce que el instituto deberá orientar sus mejores esfuerzos hacia el mejoramiento de unos pocos cultivos que sean fundamentalmente importantes para las poblaciones de las zonas tropicales desde el punto de vista de la nutrición, en vez de diluir los esfuerzos en un gran número de cultivos... el trabajo con ganado se concentrará en las especies rumiantes dando énfasis al estudio y prevención de las principales enfermedades que atacan esas especies, así como a los problemas relacionados con la nutrición, producción y utilización de forrajes y manejo de praderas; mejoramiento genético y fisiología de la reproducción de tales especies de ganado, y al enfoque económico de los varios sistemas de crianza de ganado bajo condiciones tropicales”.

En este informe se incluyeron observaciones y experiencias obtenidas desde 1950 por el personal de la Fundación Rockefeller en diferentes programas agropecuarios desarrollados en Colombia. Este documento desencadenó una serie de eventos que culminó con el establecimiento, en el año 1967, del Centro Internacional de Agricultura Tropical como entidad con personería jurídica.

Como consecuencia de lo anterior, la institución inició sus actividades en 1968 y ahora, en la presente semana, está inaugurando sus nuevas instalaciones en la que será su sede permanente.

En el evento que hoy se celebra deseamos hacer un cálido reconocimiento a dos grupos de personas que han tenido activa participación en el desarrollo y organización del CIAT: a) aquellas personas cuya clara visión y abnegada consagración fueron factores que contribuyeron a plasmar el concepto filosófico global sobre el cual se fundamenta la institución, y b) aquellas personas cuya cooperación, colaboración o participación activa ayudó a acelerar el desarrollo del CIAT, tanto en la estructura de sus programas de acción como en la construcción de su sede. Al primer grupo se le ha designado como Fundadores y al segundo, como Colaboradores.

Aunque ninguna persona contabilizó las innumerables horas de ardua labor que varias docenas de personas dedicaron a la cristalización del CIAT, ofrecemos en la página siguiente una nómina de los hechos fundamentales que ocurrieron a lo largo del proceso de cristalización, y sus correspondientes fechas, así como algunos nombres de personas que están asociadas con tales hechos.

Seven years ago this October, after months of deliberation, collaboration and discussion with representatives of many institutions, Dr. Lewis M. Roberts, The Rockefeller Foundation, and Dr. Lowell S. Hardin, The Ford Foundation, prepared a report in which they proposed an international center be established in Latin America, and described it, in part, as follows:

"The Latin American institute would not be concerned with a single crop or enterprise. It would concentrate on the identification and solution of tropical crop and livestock problems and on the training of people in a problem-solving research and educational environment. It is recognized that the institute should focus its major efforts in crop improvement on only a few crops that are vitally important from the standpoint of nutrition rather than dilute its forces on a large number of crops... Livestock work would concentrate on ruminant animals, with emphasis on the study and prevention of diseases, nutrition, forage production, utilization and range management, genetics and reproduction, and the economics of various systems of husbandry under tropical conditions."

This report took into account The Rockefeller Foundation experience since 1950 with agricultural programs in Colombia. Moreover, the document triggered a chain of events which culminated in the Centro Internacional de Agricultura Tropical as a legal entity in 1967, as an operating institution in 1968, and the new physical facilities being dedicated this week.

Being recognized today are two extremely important groups of individuals: a) those whose vision and dedication helped develop the overall concept and assured initial financial support, and b) those whose cooperation, collaboration and active participation accelerated the development of CIAT's programs and physical plant. The first group is identified as the Founders and the second as the Collaborators.

While no one kept records of the countless hours dozens of persons have spent bringing CIAT into being, the following paragraphs list some of the important milestones on the way.

Fechas fundamentales en la creación del CIAT

Milestones

Octubre, 1966

Se redactó una propuesta para crear un instituto internacional dedicado a la investigación y al adiestramiento para servir a las zonas bajas tropicales de las Américas. El documento fue elaborado por los Doctores Lewis M. Roberts y Lowell S. Hardin.

A proposal for creating an international institute for agricultural research and training to serve the lowland tropical regions of the Americas, Dr. Lewis M. Roberts and Dr. Lowell S. Hardin.

12 de Mayo, 1967

Se firmó un documento de entendimiento entre el Gobierno de Colombia y la Fundación Rockefeller (la cual, para facilitar los trámites, firmó también a nombre de la Fundación Ford). En este documento se acordó crear un centro internacional para realizar investigación y adiestramiento en agricultura tropical.

Memorandum of Understanding signed between the Government of Colombia and the Rockefeller Foundation (acting also on behalf of the Ford Foundation to minimize legal issues) for the formation of an international center for research and training in tropical agriculture.

16 de Mayo, 1967

Se recibió el primer donativo para crear un fondo de capital, el cual fue otorgado por la Fundación Rockefeller; posteriormente se recibieron otros donativos.

First grant of capital funds by the Rockefeller Foundation, with several subsequent grants to follow.

17 de Octubre, 1967

Se redactó el Acto de Fundación según la ley de Colombia; Jorge Ortiz Méndez fue autorizado para iniciar las gestiones pertinentes para obtener la personería jurídica del CIAT.

Act of Foundation of CIAT under Colombian law, with Jorge Ortiz Mendez authorized to initiate appropriate procedures to obtain legal status.

18 de Octubre, 1967

Acto de fundación oficial del Centro Internacional de Agricultura Tropical y emisión del estatuto legal que lo acredita como institución reconocida por el Gobierno de Colombia.

Act of Foundation of the Centro Internacional de Agricultura Tropical and statutes of the center registered with Government of Colombia.

- 7 de Noviembre, 1967 Se firmó un memorando de entendimiento entre el Gobierno de Colombia y la Fundación Rockefeller.
- Memorandum of Understanding implemented by signing of an agreement between the Government of Colombia and the Rockefeller Foundation.
- 29 de Noviembre, 1967 Asignación de fondos por parte de la Fundación Ford con los cuales fue posible hacer estudios de factibilidad e integrar equipos de especialistas para el diseño de programas de trabajo.
- Allocation of enabling funds by the Ford Foundation for feasibility studies and review teams.
- 4 de Diciembre, 1967 El CIAT se estableció como una corporación de acuerdo a las leyes de la República de Colombia (Resolución No. 4939 la cual fue publicada en el Diario Oficial No. 32.417, el día 30 de Enero, 1968).
- CIAT established as a corporation under the laws of the Republic of Colombia (Resolution No. 4939, published in Diario Oficial No. 32,417 on Jan. 30, 1968).
- Febrero, 1968 Se escogió el terreno para establecer la sede del CIAT.
- Site selected.
- 7 de Marzo, 1968 La República de Colombia otorgó franquicia aduanera al CIAT para hacer importaciones.
- Decree by Republic of Colombia granting CIAT import privileges.
- 28-30 de Junio, 1968 Se celebró la primera reunión de la Junta Directiva del CIAT.
- First meeting of Board of Trustees.
- 15 de Abril, 1969 Se firmó un acuerdo de colaboración entre el Instituto Colombiano Agropecuario y el CIAT para la realización de proyectos cooperativos relacionados con la investigación y el adiestramiento en el campo agropecuario.
- Agreement signed between Instituto Colombiano Agropecuario and CIAT for the conduct of cooperative projects in agricultural research and training.
- 30 de Junio, 1969 La Fundación W. K. Kellogg otorgó un donativo para el fondo de capital del CIAT.
- The W. K. Kellogg Foundation makes capital grant.

12 de Junio, 1970

Se firmó un acuerdo entre la Universidad Nacional y el CIAT en el cual se establecen esquemas cooperativos para el programa de estudios posgraduados relacionados con las ciencias agrícolas.

Agreement signed between National University and CIAT with respect to cooperative arrangements for post-graduate programs in agricultural sciences.

15 de Septiembre, 1972

La Fundación Kresge otorga un donativo para el fondo de capital del CIAT.

The Kresge Foundation makes capital grant.

Enero, 1973

El CIAT asigna a dos miembros de su personal técnico para que colaboren con el Instituto de Ciencia y Tecnología Agrícola, en Guatemala.

CIAT assigns two staff members to work in Guatemala with the Instituto de Ciencia y Tecnología Agrícola.

PROGRAMA

DÍA DE LOS FUNDADORES Y DE LOS COLABORADORES

Salón de Conferencias A

11 de Octubre, 1973

10:30 a. m.

Maestro de Ceremonias

Francisco de Sola

- | | | |
|-------|------------------------------------------------------------------------------------|--------------------|
| 10:30 | Bienvenida y presentación de invitados y personal del CIAT | U. J. Grant |
| | Relato del desarrollo del CIAT | U. J. Grant |
| | La participación de Colombia en el desarrollo del CIAT | Jorge Ortiz Méndez |
| | Presentación de placas de reconocimiento a los fundadores y colaboradores del CIAT | Francisco de Sola |
| | Palabras en nombre de los fundadores y de los colaboradores. | |
| 12:00 | Cocteles | (Salón) |
| 12:30 | Almuerzo | (Salón comedor A) |
| 14:00 | Visita a las instalaciones del CIAT y a los lotes experimentales y demostraciones. | |

Nota: Habrá servicio de comedor para los huéspedes residentes de 19:00 a 20:30.

PROGRAM

FOUNDERS' AND COLLABORATORS' DAY

Conference Room A

October 11, 1973

10:30 a. m.

Master of Ceremonies

Francisco de Sola

- | | | |
|-------|----------------------------------------------------------------------------------|--------------------|
| 10:30 | Welcome and presentation of guests and personnel of CIAT | U. J. Grant |
| | History of the development of CIAT | U. J. Grant |
| | The participation of Colombia in the development of CIAT | Jorge Ortiz Mendez |
| | Presentation of recognition plaques to the founders and collaborators of CIAT | Francisco de Sola |
| | Responses by representatives of the founders and collaborators. | |
| 12:00 | Cocktails | (Lounge) |
| 12:30 | Lunch | (Dining room A) |
| 14:00 | Conducted tour of new buildings of CIAT and experimental and demonstration plots | |

Note : Dinner service will be available for resident guests from 19:00 to 20:30

FUNDADORES — FOUNDERS

Las personas mencionadas en esta lista se identifican con las posiciones que ocuparon o con las actividades que ejercieron cuando participaron en la fundación del CIAT.

(Persons are identified with respect to the positions or activity in which they initially participated in the founding of CIAT).

Virgilio Barco

Miembro, Comité Organizador del CIAT (Member, Organizing Committee), 1967, Colombia.

Enrique Blair Fabris

Ministro de Agricultura (Minister of Agriculture), Colombia.

Alvaro Barcellos Fagundes

Miembro, Primera Junta Directiva del CIAT (Member, First Board of Trustees), Brasil.

Abdón Espinosa Valderrama

Ministro de Hacienda (Minister of Finance), Colombia.

Ulysses J. Grant

Director del Programa de Agricultura de la Fundación Rockefeller para Colombia (Director, The Rockefeller Foundation Agricultural Program in Colombia).

Lowell S. Hardin

Ejecutivo de Programas, Fundación Ford (Program Officer, The Ford Foundation).

J. George Harrar

Presidente, Fundación Rockefeller (President, The Rockefeller Foundation).

Felipe Herrera

Miembro, Primera Junta Directiva del CIAT (Member, First Board of Trustees), Chile.

Forrest F. Hill

Asesor de Programas, Fundación Ford (Program Advisor, The Ford Foundation).

Alberto Lleras Camargo

Miembro, Junta Directiva de la Fundación Rockefeller (Member, Board of Trustees, The Rockefeller Foundation), Colombia.

Carlos Lleras Restrepo

Presidente de Colombia (President of Colombia).

Russell G. Mawby

Vicepresidente, Fundación W. K. Kellogg (Vice-President, The W. K. Kellogg Foundation).

Jorge Méndez Munevar

Miembro, Comité Organizador del CIAT (Member, Organizing Committee), 1967, Colombia.

Emory Morris

Presidente, Fundación W. K. Kellogg (President, The W. K. Kellogg Foundation).

Pedro Navas Pardo

Miembro, Comité Organizador del CIAT (Member, Organizing Committee), 1967, Colombia.

Jorge Ortiz Méndez

Gerente General, Instituto Colombiano Agropecuario (General Manager).

Enrique Peñalosa Camargo

Ministro de Agricultura (Minister of Agriculture), Colombia.

Fernando Peñaranda Canal

Gerente General, Instituto Colombiano Agropecuario (General Manager).

Lewis M. Roberts

Director Asociado de Ciencias Agropecuarias de la Fundación Rockefeller (Associate Director, Agricultural Science, The Rockefeller Foundation).

Julián Rodríguez Adame

Miembro, Primera Junta Directiva del CIAT (Member, First Board of Trustees), México.

Armando Samper Gnecco

Ministro de Agricultura (Minister of Agriculture), Colombia.

Rafael Samper

Miembro, Comité Organizador del CIAT (Member, Organizing Committee), 1967, Colombia.

Edgardo Seoane

Miembro, Primera Junta Directiva del CIAT (Member, First Board of Trustees), Perú.

Philip Sherlock

Miembro, Primera Junta Directiva del CIAT (Member, First Board of Trustees), Jamaica.

Francisco de Sola

Miembro, Primera Junta Directiva del CIAT (Member, First Board of Trustees), El Salvador.

Rodrigo Uribe Echavarría

Miembro, Primera Junta Directiva del CIAT (Member, First Board of Trustees), Colombia.

R. K. Waugh

Director Asociado del Programa de Agricultura de la Fundación Rockefeller para Colombia (Associate Director, The Rockefeller Foundation Agricultural Program in Colombia).

Sterling Wortman

Director de Ciencias Agropecuarias de la Fundación Rockefeller (Director, Agricultural Science, The Rockefeller Foundation).

Germán Zea Hernández

Ministro de Relaciones Exteriores (Minister of Foreign Affairs), Colombia.

COLABORADORES — COLLABORATORS

Las personas mencionadas en esta lista se identifican con las posiciones que ocuparon o con las actividades que ejercieron cuando colaboraron en el desarrollo del CIAT.

(Persons are identified with respect to the position or activity in which they initially collaborated in the development of CIAT).

Fabio Arango

Gerente Regional, Instituto Colombiano Agropecuario (Regional Manager), Cali.

Enrique Arbeláez

Comandante, Batallón Codazzi (Commander, Codazzi Battalion), Palmira.

José Vicente Ayerbe Cháux

Asesor legal (Consulting Attorney), Cali.

William Baldwin

Presidente, Fundación Kresge (President, The Kresge Foundation).

Alfonso Bonilla Aragón

Presidente, Unidad de Acción Vallecaucana (President, Unidad de Acción Vallecaucana), Cali.

Miguel Bueno Madrid

Gerente, Bueno Madrid & Cía. (Manager, Bueno Madrid & Co.), Cali.

Alejandro Camargo

Comandante, Distrito de Policía No. 2 (Chief of Police), Palmira.

Henry Eder

Presidente, Corporación Valle del Cauca (President, Corporación Valle del Cauca), Cali.

Carlos Franco

Alcalde de Palmira (Mayor of Palmira).

Bernardo Garcés Córdoba

Ministro de Obras Públicas (Minister of Public Works), Colombia.

Pedro Luis Giraldo

Alcalde de Palmira (Mayor of Palmira).

Adel González Montenegro

Decano, Facultad de Agronomía, Universidad Nacional de Colombia.
(Dean, Faculty of Agronomy, National University, Colombia), Palmira.

Humberto González Narváez

Ministro de Comunicaciones (Minister of Communications), Colombia.

Mario Latorre Rueda

Rector, Universidad Nacional (Rector, National University), Colombia.

Alberto López

Jefe de Aduanas (Head of Customs), Cali.

Rodrigo Lloreda

Gobernador, Valle del Cauca (Governor, Valle del Cauca).

Jorge Mejía Salazar

Presidente, Banco de Bogotá (President, Banco de Bogota).

José Mejía Salazar

Presidente, Banco Ganadero (President, Banco Ganadero).

Alfredo Morris

Gerente, Hacienda Tumaco (Manager, Hacienda Tumaco), Palmira.

Alfonso Ocampo Londoño

Rector, Universidad del Valle (Rector, Universidad del Valle), Cali.

Patrick Owens

Representante, Fundación Rockefeller (Representative, The Rockefeller Foundation), Cali.

José F. Patiño Restrepo

Director Ejecutivo, Asociación Panamericana de Facultades de Medicina (Executive Director, Pan American Association of Medical Schools), Bogotá.

Luis E. Patiño

Director, Centro Nacional Investigaciones Agropecuarias, ICA (Director, ICA Research Center), Palmira.

Marino Renjifo Salcedo

Alcalde de Cali (Mayor of Cali).

Santiago Salcedo

Gerente, Ingenio Tumaco (Manager, Ingenio Tumaco), Palmira.

Jesús Sánchez Barona

Secretario de Fomento y Desarrollo (Secretary for Promotion and Development), Valle, Colombia.

Henrique Tono

Vicerrector, Universidad del Valle (Vice-Rector, Universidad del Valle), Cali.

Jorge Valencia

Secretario, Cámara de Comercio de Palmira (Secretary, Chamber of Commerce), Palmira.

Gabriel Velásquez

Decano, Facultad de Medicina, Universidad del Valle (Dean, Medical Faculty, Universidad del Valle), Cali.

INTERNATIONAL DEVELOPMENT
ASSOCIATION

INTERNATIONAL BANK FOR
RECONSTRUCTION AND DEVELOPMENT

INTERNATIONAL FINANCE
CORPORATION

OUTGOING WIRE

396-5765

TO: BYRNES
CINATROP
CALI

DATE: OCTOBER 10, 1973

CLASS OF
SERVICE: ~~TELEX~~

TELEX
FULL RATE
IN

COUNTRY: COLOMBIA

TEXT:
Cable No.:

RE CIAT DEDICATION CEREMONIES. THIS IS TO CONFIRM THAT BANK WILL
BE REPRESENTED BY CARLOS QUIJANO, BANK'S RESIDENT REPRESENTATIVE IN
COLOMBIA. QUIJANO ARRIVING CALI FROM BOGOTA ON THURSDAY MORNING
AVIANCA FLIGHT ARRIVING CALI ~~7:55~~ 7:55. PLEASE ARRANGE HOTEL FOR HIM
THURSDAY AND FRIDAY NIGHTS. QUIJANO NOT PLANNING ANY SPEECH ON BANK'S
BEHALF. *FRANSEN ALSO ATTENDING* REGARDS

GRAVES

NOT TO BE TRANSMITTED

AUTHORIZED BY:

NAME Harold N. Graves, Jr.

DEPT. International Relations

SIGNATURE *Harold N. Graves, Jr.*
(SIGNATURE OF INDIVIDUAL AUTHORIZED TO APPROVE)

REFERENCE:

CLEARANCES AND COPY DISTRIBUTION:

BMC/HG:mcj

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INTERNATIONAL DEVELOPMENT
ASSOCIATIONINTERNATIONAL BANK FOR
RECONSTRUCTION AND DEVELOPMENTINTERNATIONAL FINANCE
CORPORATION

OUTGOING WIRE

396-2762

DATE: OCTOBER 10, 1973

TO: EYRENS
CINATOP
CALICLASS OF
SERVICE

COUNTRY: COLOMBIA

TEXT:
Cable No.:

RE CIAT DEDICATION CEREMONIES. THIS IS TO CONFIRM THAT BANK WILL
BE REPRESENTED BY CARLOS GUILANO, BANK'S RESIDENT REPRESENTATIVE IN
COLOMBIA. GUILANO ARRIVING CALI FROM BOGOTA ON THURSDAY MORNING
AVANCEA FLIGHT ARRIVING CALI 7:55. PLEASE ARRANGE HOTEL FOR HIM
THURSDAY AND FRIDAY NIGHTS. GUILANO NOT PLANNING ANY SPEECH ON BANK'S
BEHALF. FRANKLIN ALSO ATTENDING. REGARDS

GRAVES

NOT TO BE TRANSMITTED

AUTHORIZED BY:

SECTION
COMMUNICATIONS

NAME

Harold N. Graves, Jr.

DEPT.

International Relations

SIGNATURE

SIGNATURE OF INDIVIDUAL AUTHORIZED TO APPROVE

DISPATCHED

REFERENCE

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OCT 10 1 42 PM 1973

SNC/HG:mcj

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42a

OUTGOING WIRE

396-5769

TO: GRANT
CINATROP
CALI

DATE: OCTOBER 10, 1973

CLASS OF
SERVICE: ~~FULL RATE~~

COUNTRY: COLOMBIA

TEXT:
Cable No.:

HOPE TO BE ABLE TO DISTRIBUTE TO CONSULTATIVE GROUP MEMBERS RELEVANT DOCUMENTS CONCERNING CIAT BUDGET PROPOSALS FOR 1974 AND TO DO SO FROM WASHINGTON OCTOBER SIXTEEN. WOULD GREATLY APPRECIATE YOUR GIVING TO GUY BAIRD ANY DOCUMENTS WHICH CAN BE DISTRIBUTED SO THAT I CAN GET THEM FROM HIM WHEN HE RETURNS TO WASHINGTON OCTOBER FIFTEEN. BEST WISHES AND CONGRATULATIONS ON INAUGURATION.

GRAVES

NOT TO BE TRANSMITTED

AUTHORIZED BY:

NAME Harold N. Graves, Jr.

DEPT. International Relations

SIGNATURE *Harold N. Graves, Jr.*
(SIGNATURE OF INDIVIDUAL AUTHORIZED TO APPROVE)

REFERENCE:

HGraves:apm
ORIGINAL (File Copy)

(IMPORTANT: See Secretaries Guide for preparing form)

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INTERNATIONAL DEVELOPMENT
ASSOCIATIONINTERNATIONAL BANK FOR
RECONSTRUCTION AND DEVELOPMENTINTERNATIONAL FINANCE
CORPORATION

OUTGOING WIRE

396-2727

DATE: OCTOBER 10, 1973

TO: GRANT
CINATROP
CALLCLASS OF
SERVICE

FULL RATE

COUNTRY: COLOMBIA

TEXT:
Cable No.:

HOPE TO BE ABLE TO DISTRIBUTE TO CONSULTATIVE GROUP MEMBERS RELEVANT
DOCUMENTS CONCERNING CIA BUDGET PROPOSALS FOR 1974 AND TO DO SO FROM
WASHINGTON OCTOBER SIXTEEN. WOULD GREATLY APPRECIATE YOUR GIVING TO
GUY BAIRD ANY DOCUMENTS WHICH CAN BE DISTRIBUTED SO THAT I CAN GET THEM
FROM HIM WHEN HE RETURNS TO WASHINGTON OCTOBER FIFTEEN. BEST WISHES AND
CONGRATULATIONS ON INAUGURATION.

GRAVES

NOT TO BE TRANSMITTED

SECTION
COMMUNICATIONS

AUTHORIZED BY:

NAME: Harold N. Graves, Oct 10 1 42 PM 1973

DEPT: International Relations

DISPATCHED

SIGNATURE OF INDIVIDUAL AUTHORIZED TO APPROVE

SIGNATURE

REFERENCE

Graves: sgm
ORIGINAL (File Copy)

(IMPORTANT: See Secretaries Guide for preparing form)

Checked for Dispatch

for use by Communication Section

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INTERNATIONAL DEVELOPMENT
ASSOCIATION

INTERNATIONAL BANK FOR
RECONSTRUCTION AND DEVELOPMENT

INTERNATIONAL FINANCE
CORPORATION

52a

OUTGOING WIRE

TO: GRANT
CINATROP
CALI

DATE: OCTOBER 9, 1973

CLASS OF
SERVICE:

LT TELETYPE
ITT

COUNTRY: COLOMBIA

TEXT:
Cable No.:

COMBINATION OF FLU BUG AND PRESSING COMMITMENTS HERE NECESSITATE
CANCELLATION MY PARTICIPATION CIAT INAUGURATION. VERY DISAPPOINTED.
BANK ARRANGING TO BE REPRESENTED BY CARLOS QUIJANO, RESIDENT REPRESENTATIVE
IN COLOMBIA. BEST WISHES TO YOU AND YOUR COLLEAGUES FOR WHAT WILL SURELY
BE OUTSTANDING OCCASION. REGARDS.

RICHARD DEMUTH

NOT TO BE TRANSMITTED

AUTHORIZED BY:

NAME Harold N. Graves, Jr.

DEPT. International Relations

SIGNATURE *Harold N. Graves, Jr.*
(SIGNATURE OF INDIVIDUAL AUTHORIZED TO APPROVE)

REFERENCE:

RHD/ HGraves: apm

ORIGINAL (File Copy)

(IMPORTANT: See Secretaries Guide for preparing form)

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Checked for Dispatch:

INTERNATIONAL DEVELOPMENT
ASSOCIATIONINTERNATIONAL BANK FOR
RECONSTRUCTION AND DEVELOPMENTINTERNATIONAL FINANCE
CORPORATION

OUTGOING WIRE

TO:

GRANT
CINATROP
CALI

COUNTRY:

COLOMBIA

TEXT:

Cable No.:

DATE: OCTOBER 9, 1973

CLASS OF
SERVICE

COMBINATION OF FLU BUG AND PRESSING COMMENTS HERE NECESSITATE
CANCELLATION MY PARTICIPATION CIAT INAUGURATION. VERY DISAPPOINTED.
BANK ARRANGING TO BE REPRESENTED BY CARLOS GUILANO, RESIDENT REPRESENTATIVE
IN COLOMBIA. BEST WISHES TO YOU AND YOUR COLLEAGUES FOR WHAT WILL SURELY
BE OUTSTANDING OCCASION. REGARDS.

RICHARD DEMUTH

NOT TO BE TRANSMITTED

AUTHORIZED BY:

NAME

Harold N. Graves, Jr.

DEPT

International Relations

SIGNATURE

DISPATCHED

END/ Graves: apm

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COMMUNICATIONS
SECTION

Oct 9 8 40 PM 1973

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For Use By Communications Section

Checked for Dispatch

OUTGOING WIRE

396-5769 CIA7 C

TO: GRANT
CINATROP
CALI

DATE: OCTOBER 1, 1973

CLASS OF
SERVICE: *LT* *RCA*

COUNTRY: COLOMBIA

TEXT:
Cable No.:

REFERENCE YOUR LETTER SEPTEMBER TWENTY ON BEEF SEMINAR BELIEVE YOU SHOULD ASK YOUR BOARD INCREASE YOUR BUDGET AS PER YOUR PAGE FOUR. IF BOARD APPROVES WE WOULD PROMPTLY INFORM CONSULTATIVE GROUP OF THIS NEW FIGURE AS WELL AS ANY NEW FIGURES RESULTING FROM BOARD ACTION ON YOUR CAPITAL BUDGET FOR 1974 INCLUDING CARIMAGUA EQUIPMENT MENTIONED IN WORTMAN LETTER TO ME SEPTEMBER SEVENTEEN. SALUDOS.

GRAVES

NOT TO BE TRANSMITTED

AUTHORIZED BY:

NAME Harold N. Graves, Jr.

DEPT. International Relations

SIGNATURE *Harold N. Graves, Jr.*
(SIGNATURE OF INDIVIDUAL AUTHORIZED TO APPROVE)

REFERENCE:

HGraves :apm

ORIGINAL (File Copy)

(IMPORTANT: See Secretaries Guide for preparing form)

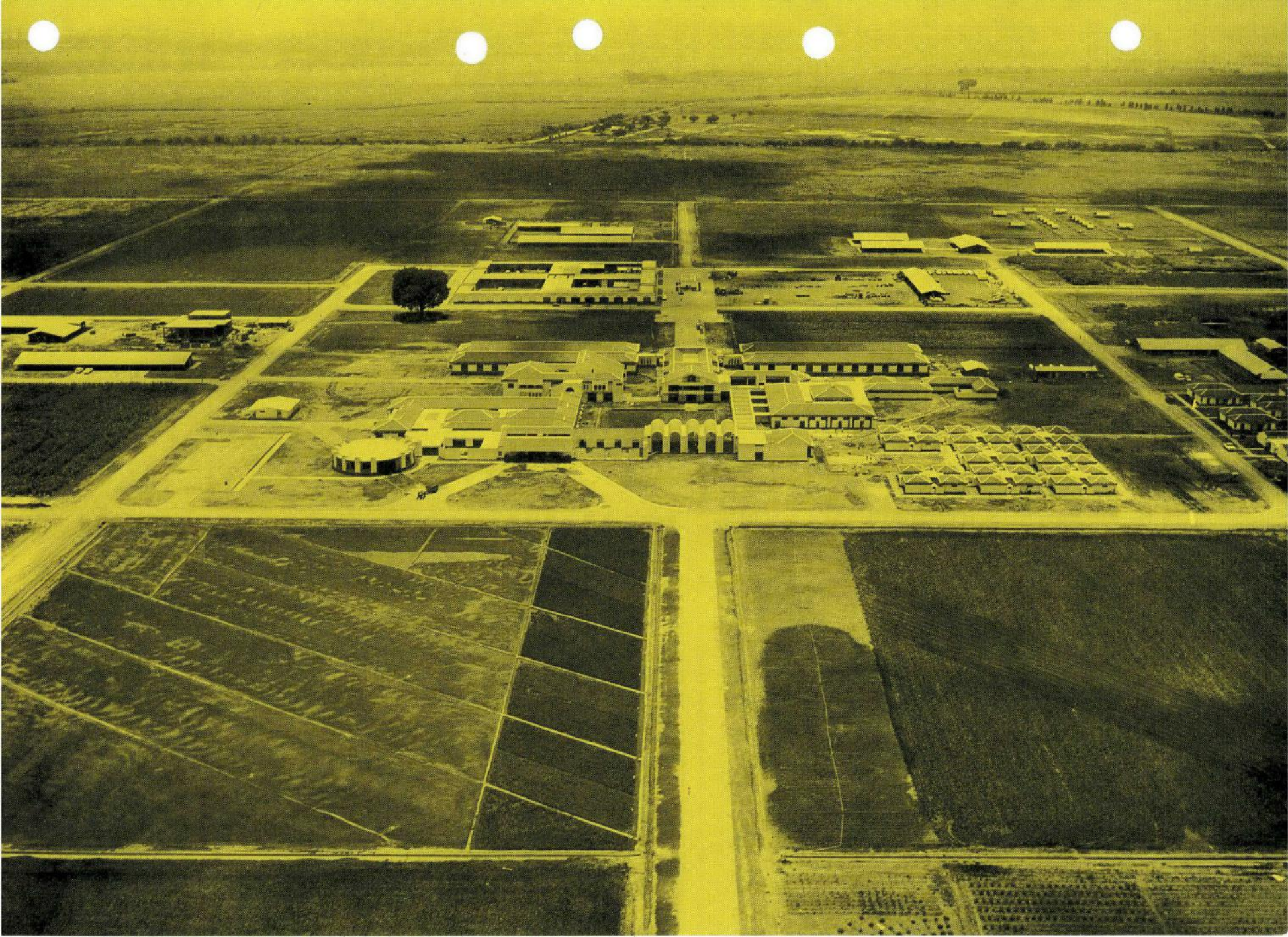
CLEARANCES AND COPY DISTRIBUTION:

cc: Dr. Fransen

For Use By Communications Section

Checked for Dispatch: *[Signature]*





CIAT (Centro Internacional de Agricultura Tropical) es una institución autónoma, sin fines de lucro, dedicada a la investigación y educación internacional. Se incorporó en 1967 para ayudar a incrementar el desarrollo agrícola y económico del trópico bajo. A través de su trabajo con los gobiernos y empresas privadas en el incremento de la producción y la productividad de las cosechas alimenticias básicas, el CIAT ha fijado, como su objetivo final, mejorar la nutrición y el bienestar de las poblaciones rurales y urbanas.

Aunque el CIAT opera en escala mundial, especialmente en ciertos productos, inicialmente concentra sus actividades en las áreas de los trópicos bajos de América Latina y el Caribe.

Programas. En este momento, el CIAT trabaja en seis productos agrícolas: ganado de carne, yuca, porcinos, leguminosas de grano, arroz y maíz. El objetivo en cada uno de estos es el desarrollo, ensayo y demostración de sistemas eficientes para producir cada producto bajo determinadas condiciones. La investigación y el adiestramiento son llevadas a cabo, para cada producto agrícola, por un equipo multidisciplinario de científicos y especialistas. Se dedica cada equipo a procurar e identificar las soluciones a los problemas que limitan la producción. Además, otro equipo de investigadores estudia la unidad física dentro de los sistemas agrícolas.

En cada equipo están incluidas todas las disciplinas pertinentes, tales como economistas, ingenieros, sociólogos, antropólogos y especialistas en comunicaciones, junto con los científicos agrícolas y biólogos.

Política.

A fines de septiembre de 1973, la Junta estaba integrada por eminentes personalidades cuyos nombres aparecen más adelante.

***CIAT** (International Center for Tropical Agriculture) is an autonomous, non-profit, international research and educational organization. It was incorporated in 1967 to help accelerate the agricultural and economic development of the lowland tropics. By working with national governments and private enterprise to increase the production and productivity of basic food crops, the ultimate goal is to improve the diets and welfare of people, rural and urban.

While CIAT operates world-wide, particularly with certain commodities, initially it concentrates on selected areas of the lowland tropics of Latin America and the Caribbean.

*** Programs.** Presently, CIAT works with six major commodities: Beef, cassava, swine, beans, rice, and maize, the goal for each being the development, test, and demonstration of efficient systems for producing the commodity under particular situations. Research and training in each commodity is carried out by a multi-disciplinary team of scientists and specialists. Each team concentrates on identifying and seeking solutions for the problems most limiting production. In addition, another research team studies farm units as agricultural systems.

All relevant disciplines are included on each commodity team, including economists, engineers, sociologists, anthropologists, and communication specialists, as well as the agricultural and biological scientists.

Policy.

At the end of September 1973, the Board of Trustees was made up of distinguished scientists, educators and administrators of various countries whose names appear on the opposite page.

Francisco de Sola - Presidente
Socio Colectivo, Administrador, H. de Sola e Hijos, Sucesores, El Salvador.

Armando Samper Gnecco - Vicepresidente
Representante Regional para América Latina, F.A.O.

Moisés Behar Alcahe
Director, Instituto de Nutrición de Centro América y Panamá (INCAP), Guatemala.

Norman Collins
Asesor de Programas Agrícolas, Fundación Ford.

Luis B. Crouch
Presidente, Industrias Asociadas, República Dominicana.

Luis Duque Gómez
Rector, Universidad Nacional de Colombia.

Ulysses J. Grant
Director General, C.I.A.T.

Luis Marcano
Presidente, Fundación Shell, Venezuela.

Rafael Mariño Navas
Gerente General, Instituto Colombiano Agropecuario (ICA).

Roberto Meirelles de Miranda
Director, Empresa Brasileira de Pesquisa Agropecuaria (EMBRAPA), Brasil.

Fabián Portilla
Director, Instituto Nacional de Investigaciones Agropecuarias, (INIAP), Ecuador.

Lewis M. Roberts
Director Asociado Ciencias Agrícolas, Fundación Rockefeller

Julián Rodríguez Adame
Consultor Agrícola, México.

Edgardo Seoane
Presidente, Banco de Fomento Agropecuario del Perú.

Philip Sherlock
Secretario General, Asociación de Universidades del Caribe, Jamaica.

Howard A. Steppler
Profesor de Agronomía, McGill University, Canadá.

Hernán Vallejo Mejía
Ministro de Agricultura de Colombia.

Fondos. Más de 6 millones de dólares fueron donados por tres instituciones filantrópicas de los Estados Unidos para financiar la construcción y el equipamiento de la nueva sede. Las contribuciones fueron asignadas por facilidades, así: Fundación Rockefeller, investigación, administración y operaciones; Fundación W. K. Kellogg, adiestramiento, conferencias, alojamiento, alimentación y recreación; y Fundación Kresge, servicios de comunicación y biblioteca.

La mayor parte de los fondos donados para la operación del CIAT (cerca de US\$ 4.000.000 para 1973) provienen de entidades representadas en el Grupo Consultivo para la Investigación Agrícola Internacional. En 1973 provinieron fondos de los gobiernos de los Estados Unidos, Canadá, Países Bajos y Suiza, de las Fundaciones Ford, Rockefeller y W.K. Kellogg, y de la Agencia Internacional de Desarrollo del Banco Internacional para la Reconstrucción y el Desarrollo (Banco Mundial). Se obtuvieron fondos para proyectos especiales del Centro de Investigación para el Desarrollo Internacional, de Canadá, del Banco de Desarrollo Interamericano, de la Fundación Rockefeller y de la Fundación W. K. Kellogg.

El gobierno de Colombia ha contribuido sustancialmente, con el arriendo de las 520 hectáreas que ocupa el CIAT, a un costo nominal, y facilitando los proyectos cooperativos del CIAT en sus estaciones experimentales en Palmira, Turipaná y Carimagua. Además, el gobierno otorga privilegios especiales para la importación y facilita la obtención de las visas para becarios y visitantes.

Funds. More than \$ 6.000.000 U. S. were donated by three United States philanthropic organizations to finance the building and equipping the new physical plant. Contributions of the donors were generally allocated for the facilities indicated: Rockefeller Foundation, research, administration, station operations; W.K. Kellogg Foundation, training, conference, housing, food, recreation; and Kresge Foundation, communication services and library.

Most of the funds for the annual operation of CIAT (this year amounting to nearly \$ 4.000.000 U. S.) are provided by donors represented in the Consultative Group for International Agricultural Research. In 1973, operations are funded by the governments of the United States, Canada, the Netherlands and Switzerland, the Ford, Rockefeller and W. K. Kellogg Foundations and the International Development Agency of the International Bank for Reconstruction and Development (World Bank). Funds for special projects were provided by the International Development Research Center of Canada, the Interamerican Development Bank, the Rockefeller Foundation and the W. K. Kellogg Foundation.

The Government of Colombia assists substantially by leasing the 520-hectares headquarters site to CIAT at a token rental in addition to facilitating CIAT's cooperative projects on its research stations at Palmira, Turipaná, and Carimagua. It also provides import privileges and expedites visas for trainees and visitors.

Personal. El CIAT emplea a más de 600 personas, la mayoría de ellas Colombianas. El personal científico y administrativo actual asciende a 45, representando a unas 20 disciplinas y provenientes de 13 países: Australia, Colombia, Costa Rica, Chile, Dinamarca, Ecuador, Estados Unidos, Japón, México, Nueva Zelandia, Perú, Los Países Bajos y el Reino Unido.

Idiomas. El CIAT es una institución bilingüe, la mayoría de sus publicaciones son editadas en español e inglés; traducciones simultáneas son ofrecidas en todas las conferencias y el uso de ambas lenguas es fomentado entre su personal. Mientras que los cursos son dictados en español, se aceptan becarios de otros idiomas para adiestrarlos como investigadores agrícolas.

Staff. CIAT employs more than 600 people, most of them from Colombia. The current senior scientific and administrative staff of 45 represent some 20 disciplines and come from 13 countries: Australia, Chile, Colombia, Costa Rica, Denmark, Ecuador, Japan, Mexico, New Zealand, the Netherlands, Peru, the United Kingdom and the United States.

Language. CIAT is a bilingual institution. It publishes most of its materials in Spanish and English, provides for simultaneous interpretation at its conferences and symposia, and encourages bilinguality in its staff, particularly at the higher levels. While production courses are taught in Spanish, non-Spanish speaking persons are accepted for training as research interns.

Canjes Internacionales. El CIAT colabora con personas e instituciones de diversos países, a través de proyectos especiales, adiestramiento, distribución de semillas y otros materiales, e investigaciones cooperativas. Algunas de las actividades que se vienen realizando son:

- * Con fondos otorgados por la Agencia para el Desarrollo Internacional, la Universidad A&M de Texas mantiene en el CIAT un grupo de investigadores que estudia las enfermedades hemoparásitas en el ganado. Este grupo y el personal científico del CIAT colabora con el Instituto Veterinario de Investigación del Trópico y la Altura del Perú, y con la Organización Veterinaria de Africa Oriental, en Kenia.

- * En Guatemala, el CIAT colabora con el recién establecido Instituto de Ciencia y Tecnología Agrícolas en el desarrollo de programas de investigación y adiestramiento. Dos científicos del CIAT trabajan en Guatemala en este programa.

- * Se realizan evaluaciones de pastos y forrajes en Bolivia, Brasil, Colombia, Ecuador, Perú y Venezuela.

- * La biblioteca del CIAT opera como el centro mundial de información sobre yuca.

- * Se trabaja en programas de producción porcina en Ecuador, en colaboración con el INIAP. Técnicos de Bolivia y Costa Rica que fueron adiestrados en el CIAT, ahora dictan cursos sobre producción porcina en sus respectivas universidades y desarrollan proyectos porcinos en sus países.

- * Han sido distribuidas semillas de la variedad de arroz CICA-4 y están ahora siendo comercializadas en Argentina, Brasil, Costa Rica, Ecuador, Guatemala, Honduras, Perú y Venezuela.

- * CIAT colabora en los experimentos de maíz que se realizan en los países del Grupo Andino.

- * En el resto del mundo, el CIAT mantiene estrechas relaciones con los demás centros internacionales y regionales, tales como el Instituto Internacional de Investigación de Arroz (IRRI), en las Filipinas; el Centro Internacional para el Mejoramiento de Maíz y Trigo (CIMMYT), en México; el Instituto Internacional de Investigación de Cultivos en los Trópicos Semi-áridos (ICRISAT), en la India; el Instituto Internacional de Agricultura Tropical (IITA), en Nigeria; el Centro Asiático de Investigación y Desarrollo de Horticultura (AVRDC), de Taiwan; el Centro Internacional de la Papa (CIP), de Perú; y el Instituto Interamericano de Ciencias Agrícolas (IICA), de Costa Rica.

International Outreach. Through special projects, training, distribution of seeds and other materials, and cooperative research, CIAT assists institutions and individuals in many countries. Some of the on-going activities include the following:

- * The Texas A&M University, with funds supplied by the U. S. Agency for International Development, maintains a research team at CIAT to study hemoparasitic diseases of cattle. This group and the CIAT staff cooperate with the Veterinary Institute of Tropical and Highland Research, Perú, and the East African Veterinary Organization, Kenya.

- * In Guatemala, CIAT is assisting the newly established ICTA (Instituto de Ciencia y Tecnología Agrícolas) to develop research and training programs. Two of CIAT staff members are working in Guatemala on this program.

- * Pasture and forages evaluations are underway in Bolivia, Ecuador, Colombia, Peru, Venezuela and Brazil.

- * The CIAT Library operates a world information center on cassava.

- * Cooperative work has been established between CIAT and the INIAP swine programs in Ecuador. Technicians from Bolivia and Costa Rica trained at CIAT, now teach courses on swine production at their respective universities and are developing swine projects in their countries.

- * Seeds of the CICA-4 rice variety have been distributed widely and are now being grown commercially in Guatemala, Honduras, Costa Rica, Venezuela, Ecuador, Peru, Argentina and Brazil.

- * CIAT coordinates maize experiments within the Andean Group countries: Venezuela, Colombia, Ecuador, Peru and Bolivia.

- * Worldwide, CIAT works closely with other international and regional centers, including the International Rice Research Institute (IRRI) in the Philippines, Centro Internacional para el Mejoramiento de Maíz y Trigo (CIMMYT) in Mexico, International Crop Research Institute for the Semi-Arid Tropics (ICRISAT) in India, International Institute of Tropical Agriculture (IITA) in Nigeria, Asian Vegetable Research and Development Center (AVRDC) in Taiwan, Centro Internacional de la Papa (CIP) in Peru and the Instituto Interamericano de Ciencias Agrícolas (IICA) in Costa Rica.

PROGRAMAS Y ACTIVIDADES

Sistemas de Producción de Ganado de Carne

Este programa desarrolla una base tecnológica adecuada y adiestra personal orientada hacia producción, para apoyar a una eficiente industria ganadera, bajo las variables condiciones del trópico. Representa un esfuerzo de largo alcance cuyo objetivo final es el de hacer uso más efectivo de vastas áreas de tierra, en el momento relativamente subdesarrolladas e inexploradas, ya sean para la producción de ganado de carne o para empresas agrícolas, en general.

Se llevan a cabo programas de investigación y adiestramiento en el CIAT y, en colaboración con el Instituto Colombiano Agropecuario, en la estación de Carimagua, en los Llanos, y en Turipaná, en la Costa Norte de Colombia.

Los objetivos del programa son suministrar una provisión adecuada de forraje por medio de pastos y leguminosas; controlar enfermedades y parásitos y desarrollar sistemas económicos de producción. Se brinda especial atención a la reproducción, reconociendo que para mantener alzas en la producción de ganado de carne se deberá incrementar el porcentaje de nacimientos.



PROGRAMS AND ACTIVITIES

Beef Production Systems

The beef cattle program is developing an adequate technological base and training production-oriented personnel to support an efficient beef cattle industry under the varying conditions of the tropics. It represents a long-range effort with the ultimate objective of making more effective use of vast areas of relatively undeveloped, unexploited land, either for beef production or more general agricultural enterprises.

Research and training programs are in progress at the CIAT Center and, in collaboration with ICA, the Colombian Agricultural Institute at the Carimagua station in the Colombian Llanos and the Turipaná station near Montería, on the north coast.

Research objectives are to provide adequate feed supply through improved grasses and legumes, to control diseases and parasites, and to develop economical systems of production. Particular attention is given to reproduction, recognizing that sustained increases in beef production directly depend on increasing calving percentage.

Sistemas de Producción de Yuca

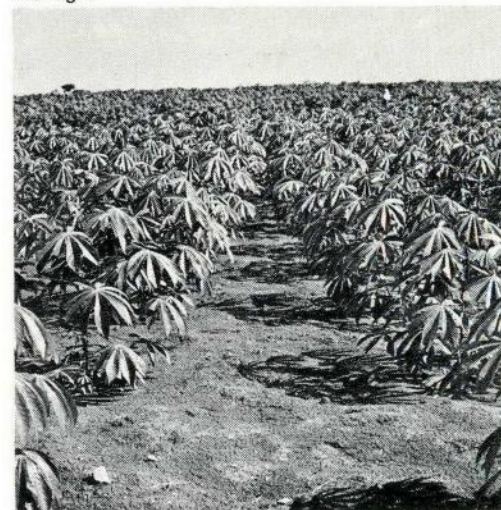
Son varios los factores que contribuyen al creciente interés en yuca, un cultivo de raíz que produce almidón. Es cultivado y aceptado extensamente, tiene un amplio campo de adaptabilidad y parece poseer un gran potencial en términos de incremento de productividad y calidad. Se espera un aumento en la función de la yuca en cuanto a su función como alimento humano. Se está empleando cada vez más y con mayor diversificación a la yuca seca como alimento animal.

El esfuerzo principal del CIAT está en producir paquetes de producción de yuca que sean tolerantes a amplias variaciones climáticas y edáficas, que son directamente aplicables a unidades pequeñas pero que puedan ser fácilmente adaptadas para producción a gran escala. El desarrollo de nuevas variedades es esencial para lograr estos objetivos así como son mejorar las prácticas de producción, el control de las plagas, enfermedades y malezas, que limitan la producción. Todos influyen en el rendimiento. La calidad del producto es también importante como son su preservación y almacenamiento apropiado.

Cassava Production Systems

Several factors contribute to the increasing interest in cassava, a starch-producing root crop. It is widely grown and accepted, has a wide range of adaptability and appears to have a great potential in terms of improvement in yield and quality. The role of cassava as food for humans is expected to increase in importance. To an increasing extent, dried cassava is being used widely as a livestock feed.

CIAT's main effort is to provide cassava production packages, tolerant to a wide climatic and edaphic variation, that are directly applicable to small scale units, but that can readily be adapted for large scale production. Essential to these goals are the development of new varieties, the improvement of production practices, and the control of pests, diseases, and weeds that limit production. All of these influence yield. Quality of the product also is important, as is its preservation by appropriate storage.

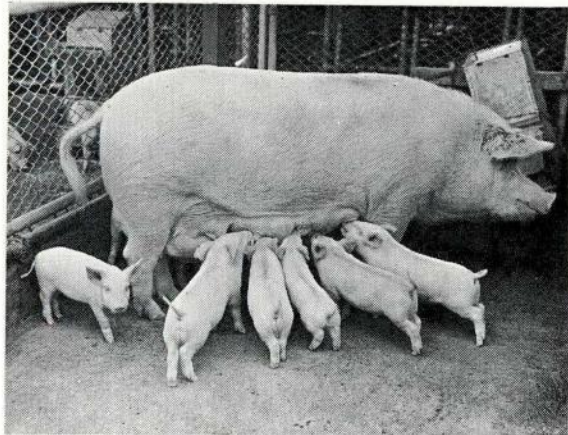


Sistemas de Producción Porcina

El programa de porcinos desarrolla sistemas eficientes de producción capaces de suministrar al consumidor carne de cerdo de alta calidad, a precios convenientes, a la vez reduciendo el riesgo para el productor, asegurándole ingresos uniformes. El programa adiestra a profesionales a que empleen estos sistemas eficazmente y los adapten a las condiciones locales.

Los problemas de los pequeños productores, de donde proviene aproximadamente el 80% de la producción porcina anual en los trópicos bajos de América Latina de unos cien millones de cabezas, son los que reciben primera prioridad. Los factores manejo, sanidad y socio-económico que limitan la productividad eficiente y económica, son estudiados por un equipo interdisciplinario que enfoca sus esfuerzos en las condiciones de la producción en las fincas pequeñas y comerciales.

Además los especialistas en producción porcina evalúan los alimentos, especialmente las fuentes de proteína, que pueden originarse y emplearse en las fincas del trópico, y colaborar en el desarrollo de los programas nacionales de producción porcina.



Swine Production Systems

The swine program is developing efficient swine production systems capable of providing increased supplies of high quality pork to consumers, at reasonable prices, at the same time, reducing the risks to the producer and assuring him a regular income. The program trains professionals to use the systems effectively and to adapt and extend them to meet local conditions.

Problems of small farms from which come approximately 80 percent of the some 100 million swine produced annually in the lowland tropics of Latin America, receive first priority. Husbandry, health and socio-economic factors that limit efficient, economic production are studied by an inter-disciplinary team which focuses on production conditions on both small and commercial swine farms.

In addition, the swine production specialists evaluate feeds, particularly protein sources, that can be grown and used on tropical farms, and assist in the development of national swine production programs.

Sistemas de Producción de Leguminosas de Grano

Las leguminosas de grano son la fuente proteínica para la mayoría de los pueblos de América Latina. Los precios al consumidor han llegado a un nivel que impiden la competencia con los cereales, de costo menor y alto rendimiento. Una de las causas de esto es el bajo rendimiento obtenido con las actuales variedades mejoradas. Los promedios nacionales de producción en América Latina oscilan alrededor de 500 kgs. por hectárea en contraste con rendimientos de 1.400 kgs. por hectárea en los Estados Unidos.

Todo esfuerzo dedicado a incrementar los rendimientos de leguminosas de grano es importante pero no son claros los factores que limitan estos rendimientos. El CIAT, a través de investigaciones interdisciplinarias y en colaboración con los programas nacionales, está descubriendo maneras de aumentarlos.

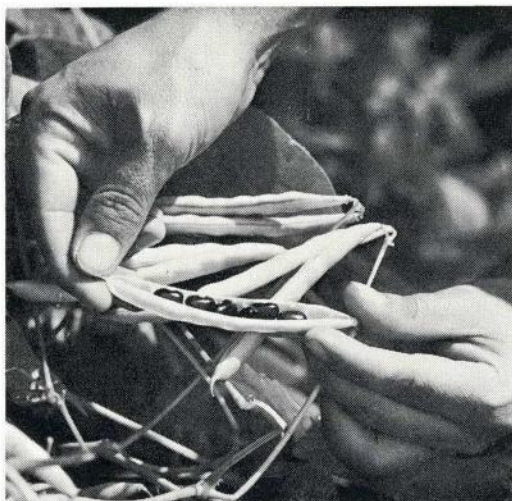
Su trabajo incluye la evaluación de unas 3.000 variedades para determinar el potencial de rendimiento, la resistencia a enfermedades e insectos y la adaptabilidad a altas temperaturas. La principal atención se concentra, en colaboración con otras instituciones, en la definición de una planta tipo para el trópico.

Bean Production Systems

Beans are the main source of protein for many people in Latin America. Consumer prices have reached levels which cannot compete with the lower priced, high-yielding cereals. One of the main reasons for this are the low yields obtained even with present improved varieties of beans. The national averages of production in Latin America are around 500 kg/ha as compared with 1,400 kg/ha in the United States.

Efforts to increase bean yields are essential, but the factors limiting yields are not clear. Through concentrated, multi-disciplinary research, in cooperation with national programs, CIAT is determining ways to increase them.

Work underway includes evaluation of some 3,000 varieties for yield potential, resistance to diseases and insects, and to determine adaptation to high temperatures. In cooperation with other institutions, major attention is directed toward defining an improved plant type for the tropics.



Planes de Producción de Arroz

El programa de arroz del CIAT se concentra en mejoramiento, agronomía y adiestramiento. El programa es coordinado con el Instituto Internacional para la Investigación del Arroz (IRRI). Nuevas variedades mejoradas están siendo ensayadas o cultivadas comercialmente en por lo menos 14 países, en unas 358.000 hectáreas. Algunas selecciones, en los últimos pasos de evaluación, podrán ser lanzadas como nuevas variedades antes de finalizar 1973.

El programa de mejoramiento continúa enfocándose hacia el desarrollo de nuevas variedades capaces de aumentar el rendimiento en las fincas de tierras bajas. Se está dando mayor énfasis al desarrollo de variedades de secano y a variedades con tolerancia a suelos ácidos. Uno de los problemas mayores, aún sin resolver, es el de hallar una variedad resistente al añublo, con características de planta y grano aceptables. La solución contribuiría mucho a aumentar el rendimiento del arroz, irrigado y de secano.

En el momento, el CIAT explora algunos de los problemas del cultivo del arroz secano, especialmente bajo condiciones de suelo ácido, y también, la posibilidad de usar arroz de agua profunda en tierras de América Latina que son periódicamente o permanentemente inundadas.



Rice Production Systems

CIAT's rice program concentrates on breeding, agronomy and training. The program is coordinated with the International Rice Research Institute. New, improved plant type varieties are now either being tried or grown commercially in at least 14 countries in Latin America on an estimated 358,000 hectares. Some selections, now in the final stages of evaluation, may be released as new varieties before the end of 1973.

The breeding program continues to direct efforts toward developing varieties capable of increasing lowland farm yields.

Development of upland varieties and varieties with acid soil tolerance receive added emphasis. A major unresolved problem is a variety resistant to the blast disease and with acceptable plant and grain characteristics. This would contribute greatly to both lowland and upland rice production.

Currently, CIAT is exploring some of the problems of growing upland rice, particularly under acid soil conditions, and also the possibility of using deep water rice on lands of Latin America periodically or permanently flooded.

Sistemas de Producción de Maíz

Los estudios sobre el maíz se concentran en los problemas más críticos que afectan el rendimiento en la zona andina.

El mejoramiento de la calidad proteínica se ha dedicado al maíz opaco-2 con endosperma modificada, incluyendo la introducción de nuevo germoplasma del Centro Internacional de Mejoramiento de Maíz y Trigo y del Perú, selecciones de opacos colombianos y recombinaciones de estas fuentes.

La excesiva altura del maíz cultivado en el litoral de la zona andina limita el rendimiento al reducir la eficiencia de la producción del grano y al dificultar la cosecha debido al volcamiento. Selecciones braquíticas y de porte bajo, ambas con endosperma amarillo o blanco, escogidas por su rendimiento a diversas variaciones climáticas, son incrementadas para proveer semilla suficiente de cada familia, para amplia distribución en 1974.

Hacia fines de año, estarán listos para distribución materiales enanos convertidos, con la propiedad modificada de opaco-2 (con endosperma duro). Estos materiales suministrarán a los mejoradores, a los proyectos de desarrollo y a los agricultores, con un maíz de alta calidad que posee un tipo de grano más aceptable.

Maize Production Systems

Maize research concentrates on the most critical problems currently limiting yields in the Andean zone.

Protein quality improvement has concentrated on opaque-2 maize with a modified endosperm, including introduction of new germ plasm from Centro Internacional para el Mejoramiento de Maíz y Trigo and from Peru, selections from Colombian opaques, and recombinations of these sources.

Excessive plant height of maize grown in coastal regions of the Andean zone limits yields by reducing efficiency of grain production and complicating the harvest operation by lodging. Brachytic and short plant selections, both with yellow and white endosperm, selected for their yield over a range of climatic (temperature) zones, are being increased to provide sufficient seed of each family for wide distribution in 1974.

By year end, converted dwarf materials with the modified opaque-2 (hard endosperm) property will be ready for distribution. This material will provide breeders, development projects, and farmers with a high quality maize which has a more acceptable grain type.

Programas de Sistemas Agrícolas

El objetivo a largo plazo del Programa de Sistemas Agrícolas es el de desarrollar un proceso por el cual puedan analizarse los sistemas existentes en la finca. Esto ayudará a los técnicos a entender el proceso de decisión que adopta el agricultor. Tal información y comprensión facilitará la selección, el desarrollo y la utilización de la tecnología agrícola que irá a mejorar las áreas rurales.

El CIAT está reuniendo un grupo integrado de especialistas para atacar el problema de llegar a la apreciación de la finca, sobre todo de la pequeña unidad. Este equipo estudiará ciertos sistemas agrícolas típicos al trópico americano, para identificar los componentes pertinentes y el por qué y cómo han subsistido dichos sistemas.

Posteriormente, el equipo investigará formas de mejorar a algunos de estos sistemas en cuanto a la calidad y cantidad del rendimiento, el nivel de vida que sustentan y la realización de las ambiciones de los que los operan.



Agricultural Systems Program

The objective of the Agricultural Systems Program is to develop a process by which existing farm systems can be identified and analyzed. This activity will help scientists develop an understanding of the decision-making process of farmers. Such information and insight will facilitate the selection, development and utilization of agricultural technology for improving rural areas.

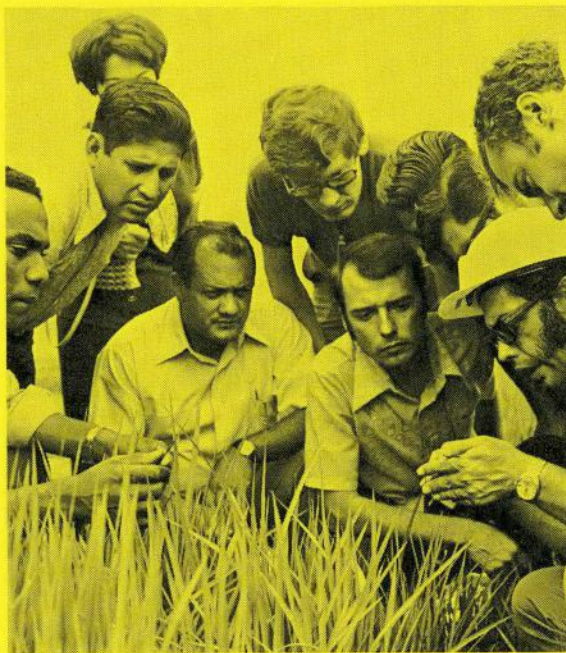
CIAT is assembling a closely integrated team of specialists to attack the complex problem of seeking understanding of farms, particularly the smaller units. The team will study certain typical farming systems in tropical America to identify the relevant components and why and how such systems have persisted. Then it will seek ways to improve some of these systems in terms of quality and quantity of output, the standard of living which they support, and the realization of other goals of the operators.



ADiestRAMIENTO

Las actividades de adiestramiento ofrecen experiencias de aprendizaje a los profesionales para que algunos, puedan conducir investigaciones, enfocadas a productividad, en sus propias organizaciones y, la mayoría, puedan trabajar como especialistas en producción, ya sea de cultivos o pecuaria, colaborando en la transmisión y comunicación de la nueva tecnología agrícola.

El objetivo inicial es el de preparar personas para acelerar la investigación de la aplicación de la nueva tecnología en sus países. Los estudiantes ayudan a formar vínculos para el intercambio de conocimientos sobre los problemas agrícolas y sus soluciones y, finalmente, levantar y reforzar redes para la investigación y comunicación entre técnicos.



TRAINING

Training activities provide learning experiences for professionals, some to conduct production-oriented research in their own organizations, while larger numbers become crop or animal production specialists, helping, to translate and communicate new agricultural technology.

Of immediate concern is the preparation of individuals to accelerate research on the application of new technology in their own countries. These trainees help to develop effective links for the exchange of knowledge about agricultural problems and their solution, and eventually, to build and strengthen effective networks for research and communication among scientists.

In 1972, 118 persons participated in training activities, 56 as research interns, 31 as production specialists, 8 as master's degree candidates, 7 as research fellows working on doctoral theses, and 16 as special students. Twenty countries were represented.

CONFERENCIAS Y SIMPOSIA

Para ser efectivos los programas de desarrollo agrícola deben tener una dirección dinámica, bien formada, por encima del nivel técnico. Aquellos que determinan e influyen sobre las políticas nacionales, controlan los créditos y los recursos, dirigen sistemas de fabricación y distribución, y suministran transporte, mercadeo, procesamiento y almacenamiento, requieren fuentes fidedignas de datos y estimados de potenciales y requerimientos de producción.

Sobre todo, los técnicos agrícolas tienen la responsabilidad de comunicarse eficazmente con estos directivos, para hacer conocer cuales desarrollos agrícolas son factibles y cuales políticas y facilidades se requieren para aumentar la productividad.

El programa de conferencias y simposia del CIAT incluye seminarios sobre políticas para dirigentes nacionales; simposia y reuniones para investigadores; cursos cortos para especialistas en producción; y otros eventos apropiados para los representantes de distintas entidades en el sistema global de desarrollo agrícola.

CONFERENCES AND SYMPOSIA

Effective agricultural development programs depend upon dynamic, well-informed leadership above the technical level. Those who make and influence national policies, control credit and resources, manage manufacturing and distribution systems, and provide transportation, marketing, processing and storage need unbiased sources of reliable data and estimates of production potentials and requirements.

Moreover, agricultural scientists have a responsibility to communicate effectively with this leadership - to make known what agricultural developments are feasible and what policies and facilities are required to increase productivity.

CIAT's around-the-year conference and symposia program will include policy seminars for national leaders, scientific symposia and technical workshops for research workers, short courses for production specialists, and such other events as may be appropriate for representatives of various entities in the total agricultural development system.



LA SEDE

El CIAT comenzó a emplear personal y desarrollar programas en el año 1968. Luego de ocupar oficinas en Cali, por espacio de algunos meses, la institución fué trasladada a la granja de Palmira en 1969. Las construcciones de la antigua granja fueron convertidas en oficinas, laboratorios, aulas, biblioteca, dormitorio y casino.

Como resultado, la mayoría de los programas están provistos de personal y en plena operación, aquí y en otras partes. Se han adiestrado a más de 200 jóvenes y unas 1.000 personas han participado en las conferencias internacionales.

El total del área cubierta de las nuevas construcciones es de 30.000 metros cuadrados y ofrece, además de oficinas y laboratorios, las siguientes facilidades:

Alojamiento para 176 personas, casino y comedor para 600 a la vez; 6 salas para conferencias y un anfiteatro; una biblioteca de 50.000 volúmenes; centro de recreación, con piscina y campo de fútbol.

Se han provisto facilidades especiales para la colonia de animales pequeños, laboratorio para necroscopia, laboratorio para carne y unidades de metabolismo para el estudio de ganado y porcinos.

En el desarrollo de la estación experimental fueron nivelados 230 hectáreas, construídos 45 kilómetros de caminos, 36 kilómetros de canales para drenaje, 21 kilómetros de canales para irrigación y 54 kilómetros de cercas.

Se emplearon a más de 700 técnicos y obreros en la construcción del proyecto.



THE PHYSICAL PLANT

CIAT began employing staff and developing programs in 1968. After a few months in rented office space in Cali, operations were transferred to the farm in early 1969. The old farm buildings were converted into offices, laboratories classrooms, library, dormitory and cafeteria.

As a result, most of the commodity programs are staffed and have extensive research underway here and elsewhere. More than 200 young men and women have been trained, and some 1,000 persons have participated in international conferences and symposia.

The total new construction area of 30,000 square meters provides, in addition to the offices and laboratories for the staff, the following:

Housing for up to 176 persons; cafeteria and dining facilities for 600 at one time; six conference rooms plus an amphitheater; a 50,000 volume library; recreational facilities, including a swimming pool and a soccer field.

Special facilities have been provided for a small animal colony, necropsy laboratory, meat sciences laboratory, and metabolic units for research with cattle and swine.

Development of the experimental farm has included levelling 230 hectares, building 45 kilometers of roads, 36 kilometers of drainage canals, 21 kilometers of irrigation canals and 54 kilometers of fencing.

More than 700 technicians and laborers have been employed on the construction project.

PRINCIPALES DISEÑADORES, CONTRATISTAS Y PROVEEDORES PRINCIPAL DESIGNERS, CONTRACTORS, SUPPLIERS

Arquitectos:

Architects:

Jaime Ponce de León,
de Llorente, Ponce de León
Bogotá.

Contratistas generales:

General Contractors:

Bonilla y Jordán, Cali

Interventoría:

Robert W. Etheredge
Pablo Páez de F.

Decoración interiores y muebles:

Interior Design and Furniture:

E. Carl Litton, Maple Hall,
Inc., Chicago
Carvajal & Cía, Cali
Muebles Palmira Ltda.,
Palmira

Diseño y equipos de cocina:

Kitchen Design and Equipment:

Calmaquip Engineering
Corporation, Miami

Diseño y equipos de laboratorio:

Laboratory Design and Fixtures:

Fisher Scientific, New Jersey
Lab. Line, Cali

Equipos de sonido:

Sound Systems:

Philips de Colombia S. A.,
Bogotá.

Contratistas instalación eléctrica

Electrical Contractors:

Ingeniería y Montajes
Finnin, Cali

Sistemas de Teléfonos:

Telephone Systems:

Siemens S. A, Bogotá
Ericsson de Colombia S. A.
Bogotá

Pisos:

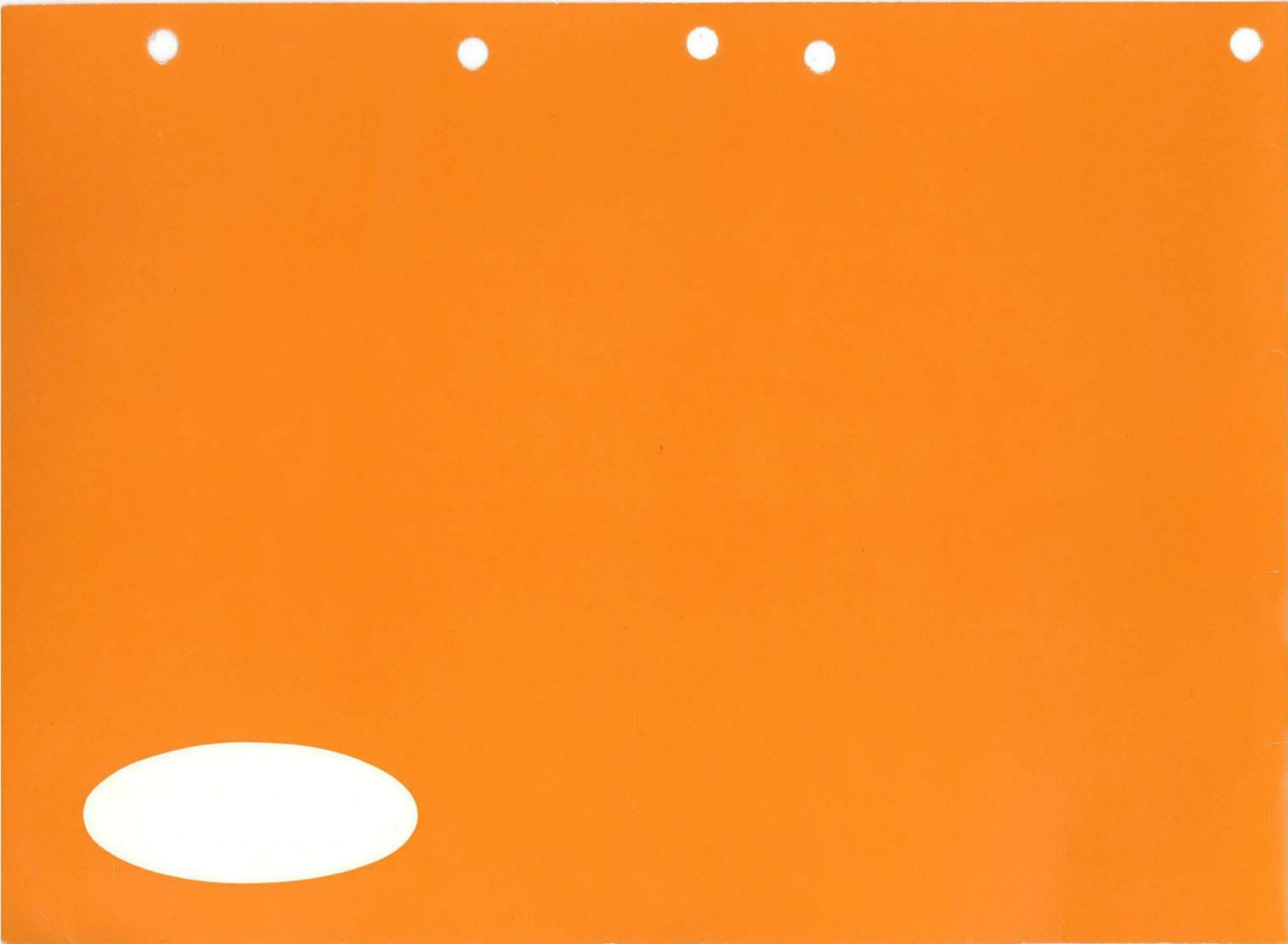
Floorings:

Armstrong Cork Co., New
Jersey
Fábrica de Baldosas de
Palmira, Palmira
Tubos Moore, Bogotá

Otras instalaciones y servicios:

Installations and Other Services:

Nesbitt & Company
(puertas corredizas), Miami
Roy Alpha Ltda. (instalaciones eléctricas), Cali
Aerocosta Airlines
(transporte) Barranquilla.
De Lima y Cía. (seguros)
Cali.



✓ 92a
cc: DI

September 26, 1973

Dear Jerry:

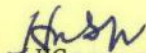
I have today asked the Controller's Department of the International Development Association (an affiliate of the World Bank) to transfer \$97,500 to the account of CIAT in The Bank of America, New York.

Of this amount, \$37,500 is the final quarterly installment of IDA's original grant of \$150,000 for CIAT's core and capital budget for 1973. The remaining \$60,000 is a supplemental grant; it is a restricted core grant, intended for application against the costs of conferences, symposia, workshops, training courses and similar activities, as listed in your letter of April 2, 1973, to me on the subject of these activities.

Sincerely,

Harold Graves
Associate Director
International Relations Department

Dr. U. J. Grant
Director General
Centro Internacional de
Agricultura Tropical
Apartado Aereo 67-13
Apartado Nal. 737
Cali, Colombia


HGraves/pnn



Record Removal Notice

File Title CGIAR - G-2 - Centro Internacional de Agricultura Tropical (CIAT) - Correspondence 72/74-02		Barcode No. 1760186		
Document Date September 26, 1973	Document Type Memorandum			
Correspondents / Participants To: Robert Jones From: Harold Graves				
Subject / Title Disbursement of IDA grant funds to Centro Internacional de Agricultura Tropical (CIAT)				
Exception(s) Financial Information iv				
Additional Comments		<p>The item(s) identified above has/have been removed in accordance with The World Bank Policy on Access to Information or other disclosure policies of the World Bank Group.</p> <table border="1"><tr><td>Withdrawn by Sherrine M. Thompson</td><td>Date April 12, 2021</td></tr></table>	Withdrawn by Sherrine M. Thompson	Date April 12, 2021
Withdrawn by Sherrine M. Thompson	Date April 12, 2021			

Mr. Robert Jones

September 25, 1973

Harold Graves *HG*

Supplemental Agricultural Research Grants for 1973: to
CIMMYT, to CIAT, to the International Laboratory for
Research on Animal Diseases (ILRAD) and to the Inter-
national Livestock Center for Africa (ILCA)

The Board of Executive Directors has now approved the President's recommendations concerning additional IDA grants to various international agricultural research centers in 1973. These recommendations were contained in a President's Memorandum of September 12, 1973 (IDA/R73-99). The grants are to be made by IDA from funds transferred to the Association out of the Bank's FY 1972 net income.

The grants are as follows:

To Centro Internacional de Agricultura Tropical (CIAT), \$60,000. This sum is in addition to the \$120,000 already granted to CIAT for 1973.

To Centro Internacional de Mejoramiento de Maiz y Trigo (CIMMYT), \$500,000. This sum is in addition to the \$1,000,000 already granted to CIMMYT for 1973.

To International Laboratory for Research on Animal Diseases (ILRAD), \$100,000. This grant will be paid into an initial fund (on the ICRISAT model) which probably will be established around October 15, 1973.

To International Livestock Center for Africa (ILCA), \$100,000. This grant will be paid into an initial fund (also on the ICRISAT model) which probably will be established sometime before the end of the calendar year 1973.

I am sending you a separate memo specifically requesting the disbursement of the CIAT grant, and am sending another memo specifically requesting the disbursement of part of the CIMMYT supplemental grant. When the time comes, I will also provide requests for disbursements to ILRAD and ILCA.

HGraves:apm



CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

G2a

DIR-972

September 20, 1973

Mr.
HAROLD GRAVES
Consultative Group on International
Agricultural Research
1818 H. Street, N.W.
Washington, D.C.
U.S.A.

Dear Harold :

This letter constitutes a report on action taken by CIAT in accord with the recommendations of Paras. 203 through 208, TAC, Report of the TAC Sub-Committee Mission to Review the Research Needs for Protein Production in Tropical America, Agenda Item 4, Sixth Meeting, Washington, D.C., 26 July - 3 August 1973, and a request for clarification on procedures for requesting the additional financial support the proposed seminar entails.

At the time of the TAC recommendation, CIAT had already made plans for a seminar on The Potential of Tropical America to Increase Beef Production, February 18-21, 1974. The steering committee for this seminar had met at CIAT on April 10, 1973, establishing at that time certain objectives, outlining a tentative program, and suggesting a preliminary list of speakers and participants. Members of this steering committee were as follows: James Fransen, World Bank; Hector Munoz, IICA; Juan Salazar, ICA, Colombia; Jose Soto Angli, Interamerican Development Bank, and a number of the CIAT professional staff directly concerned with the program issues.

As the result of informal conversations with various members of the TAC and CG during International Centers' Week and further correspondence with Dr. Fransen, CIAT has taken the following actions to bring the proposed seminar into accord with the proposals of TAC :

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CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

65a

DIR-972

September 20, 1973

Mr.
HAROLD GRAVES
Consultative Group on International
Agricultural Research
1818 H. Street, N.W.
Washington, D.C.
U.S.A.

Dear Harold :

This letter constitutes a report on action taken by CIAT in accord with the recommendations of Para. 203 through 208, TAC Report of the TAC Sub-Committee Mission to Review the Research Needs for Protein Production in Tropical America, Agenda Item 4, Sixth Meeting, Washington, D.C., 26 July - 3 August 1973, and a request for clarification on procedures for requesting the additional financial support the proposed seminar entails.

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As the result of informal conversations with various members of the TAC and CG during International Centers' Week and further correspondence with Dr. Fransen, CIAT has taken the following actions to bring the proposed seminar into accord with the proposals of TAC :

1973 SEP 26 10:10:09

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a) Extended the program an additional day to provide opportunity to discuss and identify means for improving coordination among national and international institutions in their beef research and training programs. To assist in planning the program for this session, it is suggested that two additional members be added, one designated by TAC and the other by FAO. We have already indicated to Dr. Peter Oram that an FAO representative would be welcome. It is anticipated that this enlarged steering committee could define the program for this session by correspondence.

b) Expanded the invitational list both within Latin America and internationally to insure participation of key persons instrumental to the establishing of a cooperative network as well as those whose knowledge and experience in other areas would be important inputs.

c) Revised the budget to reflect the additional costs such a seminar would entail.

A tentative program is attached. Titles of papers may be modified somewhat according to suggestions made by speakers. Invited moderators of sections and persons to present papers are indicated in parenthesis (). Since we have not yet received confirmation from many of the invited moderators and speakers, this list is only for your information and not for circulation.

To give you a more definite idea of the general goals of this seminar, we expect that this event will provide opportunity for participants :

1. To explore the roles of beef cattle enterprises in the agricultural and economic development of the lowland tropics.

2. To evaluate factors influencing the development of the beef cattle industry in these areas.

3. To identify techniques for increasing productivity of beef cattle enterprises.

4. To establish the bases for interchange of technology and information among institutions and individuals engaged in livestock and agricultural development, with

particular attention to establishing and facilitating a regional program, or programs, on various aspects of beef cattle research and training in tropical America and

5. To assist CIAT and national agencies in establishing their own priorities for beef research and training.

Also enclosed is the proposed invitational list. This also is subject to additions and revisions, particularly for those countries where, as yet, no name is listed. Although the principal focus of this seminar is the Latin American lowland tropics, we feel that many countries in other parts of the world have similar problems and could benefit from participation. Similarly, we recognize that scientists and production specialists in some of these areas have much to contribute to Latin America. You will note that many scientists from outside of the Americas have been invited to present papers.

As our 1974 Proposed Program and Budget document states, we budgeted \$40,000 for this seminar, this to be distributed as follows :

Basic Arrangements (Translation, simultaneous interpretation, advance printing, clerical, postage, local transportation, and miscellaneous local expenses).	\$ 3,000
Program Planning and Development, including meetings of the Steering Committee.	5,000
Program Speakers, Moderators, Panelists, travel and per diem (20 persons).	14,000
Editing, Publication, Distribution of the Proceedings in two languages.	10,000
Participant Travel and Per Diem (20 persons from Latin America).	8,000
	40,000
	=====

If additional funds could be made available, these could be used to provide travel and per diem, as follows :

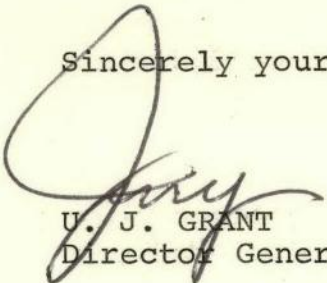
50 Additional Participants from Latin America. \$ 20,000

10-15 Additional Participants from Other Areas. 10,000
\$ 30,000

Given this amount of support, we could expect that the seminar attendance would be at least 100, not including the numbers of persons likely to come at the expense of their organizations, plus the CIAT staff and those from interested Colombian organizations. The total number thus participating would range from about 140 to 170.

Although our informal discussions during International Centers' Week led to the implication that funds to supplement CIAT's budget for this seminar might likely be provided, it is not clear to us how these funds are either requested or would become available. We would appreciate being advised on this point as soon as possible so that we may put the matter before our Board of Trustees at its meeting October 11, if such action is required.

Sincerely yours,


U. J. GRANT
Director General

Copy: Dr. Fransen
Dr. W. Mathieson
Dr. P. Oram



CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

DIR-960

September 19, 1973

Mr. Harold Graves
Associate Director
International Relations Department
1818 H. Street, N. W. Washington D. C.

Dear Harold:

I received your letter indicating that the bank will designate its representatives to attend our Dedication ceremonies within a few days. We would be most pleased to have you attend and hope you will make a special effort to be present.

We spent most of last week with Sterling Wortman and he indicated that he will report to the Consultative Group relatively soon.

Looking forward to seeing you at the Dedication.

Sincerely yours,



U. J. Grant
Director General

UJG.caa



CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

DIR-980

September 19, 1978

Mr. Harold Graves
Associate Director
International Relations Department
1818 H. Street, N.W., Washington, D.C.

Dear Harold:

I received your letter indicating that the bank will designate its representatives to attend our Dedication ceremonies within a few days. We would be most pleased to have you attend and hope you will make a special effort to be present.

We spent most of last week with Sterling Workman and he indicated that he will report to the Consultative Group relatively soon.

Looking forward to seeing you at the Dedication.

Sincerely yours,

M. J. Grant
Director General

UJG:cas

RECEIVED
SEP 27 1978
CIAT

INTERNATIONAL DEVELOPMENT
ASSOCIATION

INTERNATIONAL BANK FOR
RECONSTRUCTION AND DEVELOPMENT

INTERNATIONAL FINANCE
CORPORATION

92a

OUTGOING WIRE

396-5769

TO: GRANT
CINATROP
CALI

DATE: SEPTEMBER 18, 1973

CLASS OF
SERVICE: FULL RATE

Relx
Re

COUNTRY: COLOMBIA

TEXT:
Cable No.:

DEMUTH WOULD PROBABLY REPRESENT CG AT CIAT DEDICATION CEREMONIES
BUT YOUR ORAL INVITATION NOT APPARENTLY FOLLOWED BY WRITTEN ONE. WOULD
ALSO APPRECIATE ANY MATERIALS ON LOWLAND TROPICS SEMINAR SCHEDULED
FOLLOWING DAY. REGARDS.

CHEEK
CGIAR

NOT TO BE TRANSMITTED

AUTHORIZED BY:

NAME **Bruce M. Cheek**

DEPT. **International Relations**

SIGNATURE *B. M. Cheek*
(SIGNATURE OF INDIVIDUAL AUTHORIZED TO APPROVE)

REFERENCE: **BCheek:apm**

ORIGINAL (File Copy)

(IMPORTANT: See Secretaries Guide for preparing form)

CLEARANCES AND COPY DISTRIBUTION:

cc: **Mr. Demuth**

For Use By Communications Section

Checked for Dispatch: *✓*

INTERNATIONAL DEVELOPMENT
ASSOCIATION

INTERNATIONAL BANK FOR
RECONSTRUCTION AND DEVELOPMENT

INTERNATIONAL FINANCE
CORPORATION

OUTGOING WIRE

396-2769

TO:

GRANT
CINATOP
CALL

COUNTRY:

COLOMBIA

TEXT:

Cable No.:

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CHEEK
CGIAR

NOT TO BE TRANSMITTED
SECTION
COMMUNICATIONS
OFFICES AND COPY DISTRIBUTION

AUTHORIZED BY:

Bruce M. Cheek

NAME

Mr. Demuth

SEP 18 1 45 PM 1973

International Relations

DEPT

DISPATCHED

SIGNATURE

(SIGNATURE OF INDIVIDUAL AUTHORIZED TO APPROVE)

REFERENCE

Bcheek:sgm

ORIGINAL (File Copy)

(IMPORTANT: See Secretary's Guide for preparing form)

Checked for Dispatch

For Use by Communications Section

92a

September 11, 1973


Dr. U.J. Grant
Director
Centro Internacional de
Agricultura Tropical
Apartado Aereo 67-13
Cali, Colombia

Dear Dr. Grant,

Thank you for your letter of August 27 and your invitation to present my views to the Center Directors, and a seminar to your staff. I am pleased to accept your invitation. The tentative dates of March 4th and 5th sound reasonable, the morning of the 5th for the Directors and perhaps the afternoon of the 4th for your staff. I presume the staff date is more flexible if anything should happen so that I have to move my schedule.

I would like also to thank you for the invitation to the inauguration and dedication of CIAT. As things now stand I am afraid that pressure of other business prevents me from joining you. Would you please advise the appropriate authorities. I expect the Bank to be adequately represented, and no doubt you will be informed fairly soon as to who will be there from this organization. In the remote likelihood that I can get down there for the inauguration I would like to leave my option open, but unless you hear from me to the contrary I have to wish you good luck by mail rather than in person.

Yours sincerely,


M. Yudelman
Director
Agriculture and Rural
Development Department

cc: Messrs. Darnell/Fransen

MYudelman:lkt

92a

September 6, 1973

Dear Jerry:

I refer to your letter of August 23 to Harold, who is presently on leave. We have just submitted the request to the Executive Directors for our supplemental contribution to the centers for calendar 1973, including the \$60,000 proposed for CIAT. About two weeks from now, I hope that we can take action on your request and I will be in touch with you again at that time.

Sincerely yours,



Bruce M. Cheek

Dr. U. J. Grant
Director General
Centro Internacional de Agricultura
Tropical
Apartado Aereo 67-13
Apartado Nal. 737
Cali
Colombia



BMC:mcj

42a

September 5, 1973

Dear Jerry:

Let me thank you for the invitation which Mr. McNamara and others here have received to be present for the dedication of CIAT on October 12. Mr. McNamara, as you know, regrets that he cannot attend. The World Bank, however, does certainly intend to be represented, and I expect to be able to let you know by October 1 who our representative will be.

Sincerely yours,

Harold Graves
Associate Director
International Relations Department

Dr. U. J. Grant
Director General
Centro Internacional de Agricultura
Tropical
Apartado Aereo 67-13
Apartado Nal. 737
Cali
Colombia

Handwritten initials
cc: Mr. Ljungh
Mr. Demuth
Mr. Baum
Mr. Yudelman
HG:mcj



CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

DIR-838

August 24, 1973

Mr. Harold Graves
Consultative Group on International
Agricultural Research
1818 H. Street, N. W.
Washington, D. C.

Dear Harold:

Please find enclosed a copy of Mr. Francisco de Sola's remarks made at the CIAT session during the Consultative Group week. I believe that Mr. De Sola's remarks are quite significant and would be of interest to the Board members of the various centers.

I am sure that Mr. de Sola would be pleased to have you reproduce them and send them to the appropriate persons among the CG.

Sincerely yours,

U. J. Grant
Director General

UJG.caa
encl.



CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

STATEMENT OF FRANCISCO DE SOLA, CHAIRMAN CIAT, AT INTERNATIONAL
CENTERS WEEK, WASHINGTON, D.C. TUESDAY JULY 31st., 1973

Mr. Chairman

I welcome the opportunity to address this distinguished gathering, as retiring Chairman of the Board of CIAT; this for two different reasons;

First because it affords me the pleasure of thanking all of the donor and funding agencies represented here today, on behalf of the Board of Trustees, for their generous and continued support, manifested not only in material ways but also with very substantial moral support and recognition.

In the second place I wish to take the opportunity to speak briefly as a trustee of one of the younger Centers believing that you might like to hear some of the thoughts that run through one's mind, in retrospect, after five years of service. I speak for myself alone, as an independent member of the Board, in the sense that I have no affiliation or connection with any governmental or international funding agency. I am simply a man of business, interested in the work of the Centers and grateful for having had the opportunity of serving.

I shall touch on three subjects very briefly: The posture and effectiveness of Trustees; some bureaucratic aspects of Administration, and finally I will make some observations on the role of the Centers and their relationship to national and international agencies.



CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

- 2 -

As regards the Trustee; two years ago I asserted that if we are to attract serious, responsible, concerned men to the Board of the Centers these must have reasonable assurance of adequate funding over a long period of time. It is not possible to shape policy or strategy responsibly without having this assurance. It is true that Centers should not go in for long term pure research as such - their role being to do production - oriented research, so as to satisfy quickly the rising needs of the population for food and their general welfare. Funding for operational budgets should be planned at least five years in advance in order to assure a continuity of results and so as to give confidence and assurance to all members of the Board. In this respect, when considering financial matters at the Board table, there is quite a difference in the position of the trustee designated by a donor agency, and the independent one. The role of the former is a delicate one by virtue of his affiliation; it requires restraint and sophistication not to become overly dominant in discussions of a financial nature, be it for operational or capital funding. It is easy for him to fall into the habit of acting as a delegate or representative instead of as a Trustee on an equal basis with all of the others. Unless it is carefully handled - and I must say that this has not been cause for serious concern at CIAT - some of the less experienced members of the Board may feel that they have little voice or participation - or they may tend to leave the decisions on important issues to the trustees named by the funding institutions. We are really speaking now more of a question of style rather than of form. It is important therefore to select trustees who will not be overly impressed or misled by implications of formal affiliations in their colleagues.

I believe that we have not taken advantage of the full potential of our Trustees. We have not used their capabilities as influential members of their communities - which they are - They could do much to bring about closer, harmonious relationships with



CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

- 3 -

national and international bodies with whom the Centers are working. As for the composition of the Boards, they seem clumsy as they are at present, on account of their size and heterogeneous quality. For good reasons it has been considered necessary to invite men from many different geographical areas. However this makes it difficult and expensive to bring them together for more than once or twice a year. In order to derive greater benefit from the groups discharging the trusteeship I believe that the size and geographical composition of the Boards should be reconsidered. Meetings should be held more frequently and questions of policy making and public relationships should be held more frequently and entrusted to the trustees with greater frequency, either individually or collectively.

Turning to the day-to-day business of the Center, it seems to me that too much paper work is asked of the Administration. Too many reports, too many reviews; too many review teams, detract from important work in the field. One yearly review should be sufficient to satisfy all funding agencies. Independent visits and reviews for individual funding agencies should be discouraged. As in the case of a corporation, all stockholders should be able to satisfy their legitimate inquiries once a year at one collective exercise, such as the one we are engaged in now.

Finally - and now referring to some of the thoughts expressed during the Seminar last week - I would like to endorse strongly the need for the Centers to be very sensitive to national policies, or, as I expressed on one occasion, to their lack of policies. The Centers should offer help in forming national policy and not be too reticent in coming forward. They should cultivate strong friendly working relations with national agencies - such as CIAT has been able to do in Colombia, Ecuador, Guatemala and Bolivia, due to



CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

- 4 -

the creditable work of management and staff. It is in this field where the Trustee can be of great usefulness, acting as liaison with the scientific or political community. Centers should not shy away from the limelight. The work they are doing is important, but it is equally as important that the general public be made aware of it. The Centers must have a very clear identity for what they are as well as for what they are doing. In this day of institutional proliferation, pro bono publico, the image of the legitimate institutions must be very sharp, their work understood and their objectives so well defined and expressed that there can be not the slightest doubt about their intentions.

Nationalism has increased throughout the world; it seems to ride on a wave of disillusionment and a desire for new forms of sovereign expression. The Centers must work - willy nilly - within national boundaries and they will have to keep up a mutuality of interest with those communities in which they live in order to assure their autonomy and effectiveness.

These are some of the thoughts, Mr. Chairman, that have run through my mind during the last five years. I hope that they may contribute in some form to better, stronger and more intimate working relationships between Trustees, the funding agencies, and the national and international communities.

FdeS/elm



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Archives
& Records Management

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Withdrawn by Sherrine M. Thompson	Date April 12, 2021			

92a

FRANCISCO DE SOLA, SAN SALVADOR, C. A.

August 16th, 1973.

Mr. Robert McNamara
Chairman
International Bank for
Reconstruction and Development
1818 H. Street
Washington D.C. 20433
U.S.A.

Dear Mr. McNamara:

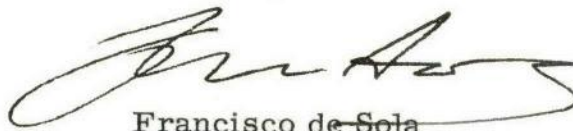
I wish to thank you and Mrs. McNamara for your kind hospitality to me during International Centers Week. One of the nicest things that can happen, when travelling away from home, is to be asked to share the warmth of another; a distinct courtesy which I deeply appreciate.

I am sorry that you are not able to entertain an invitation to speak at the 1974 Graduation exercises of our Graduate School of Business Administration (INCAE) at Managua, but quite understand the circumstances. Feeling that you may be interested in knowing something about the institution, I have asked Dr. Ernesto Cruz, our Rector, to send you some of the pertinent literature.

I am enclosing a copy of the statement I made prior to the CIAT presentation, at International Centers Week, since this document was not registered with the Secretariat.

If ever you, or any member of your family, were to come to Central America, I would hope to reciprocate your kind hospitality. Do please advise me of any impending trip.

Sincerely,



Francisco de Sola

FdeS/rcb
Encl.

President has seen

August 1967

Mr. Robert Thompson
Chairman
International Bank for
Reconstruction and Development
1818 H Street
Washington D.C. 20433
U.S.A.

Dear Mr. Thompson:

I wish to thank you and Mrs. Thompson for your letter
regarding the new building International Center West. One of the
most things that can happen, when things are going from bad to
is to be asked to share the burden. I am sure a building company
which I deeply appreciate.

I am sorry that you are not able to contribute to the
to speak at the 1967 International Conference of the Americas
of American Administration (IAA) at a time, but please write me
about the circumstances. I will let you know as I hear of
something something new and better. I am sure that the
Chair, Mr. Rector, to send you some of the pertinent literature.

I am enclosing a copy of the state of the world and the policy
of the International Center West, which is a
document was not related with the Secretary.

I trust you, for my neighbor at your time, with respect
to Central America, I would hope to participate your first trip.
active. Do please advise me of any impending trip.

Sincerely,

1973 AUG 21 10:10:23
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CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

STATEMENT OF FRANCISCO DE SOLA, CHAIRMAN CIAT, AT INTERNATIONAL
CENTERS WEEK, WASHINGTON, D.C. TUESDAY JULY 31st., 1973

W
Mr. Chairman

I welcome the opportunity to address this distinguished gathering, as retiring Chairman of the Board of CIAT; this for two different reasons;

First because it affords me the pleasure of thanking all of the donor and funding agencies represented here today, on behalf of the Board of Trustees, for their generous and continued support, manifested not only in material ways but also with very substantial moral support and recognition.

In the second place I wish to take the opportunity to speak briefly as a trustee of one of the younger Centers believing that you might like to hear some of the thoughts that run through one's mind, in retrospect, after five years of service. I speak for myself alone, as an independent member of the Board, in the sense that I have no affiliation or connection with any governmental or international funding agency. I am simply a man of business, interested in the work of the Centers and grateful for having had the opportunity of serving.

I shall touch on three subjects very briefly: The posture and effectiveness of Trustees; some bureaucratic aspects of Administration, and finally I will make some observations on the role of the Centers and their relationship to national and international agencies.

CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

- 2 -

As regards the Trustee; two years ago I asserted that if we are to attract serious, responsible, concerned men to the Board of the Centers these must have reasonable assurance of adequate funding over a long period of time. It is not possible to shape policy or strategy responsibly without having this assurance. It is true that Centers should not go in for long terms pure research as such - their role being to do production - oriented research, so as to satisfy quickly the rising needs of the population for food and their general welfare. Funding for operational budgets should be planned at least five years in advance in order to assure a continuity of results and so as to give confidence and assurance to all members of the Board. In this respect, when considering financial matters at the Board table, there is quite a difference in the position of the trustee designated by a donor agency, and the independent one. The role of the former is a delicate one by virtue of his affiliation; it requires restraint and sophistication not to become overly dominant in discussions of a financial nature, be it for operational or capital funding. It is easy for him to fall into the habit of acting as a delegate or representative instead of as a Trustee on an equal basis with all of the others. Unless it is carefully handled - and I must say that this has not been cause for serious concern at CIAT - some of the less experienced members of the Board may feel that they have little voice or participation - or they may tend to leave the decisions on important issues to the trustees named by the funding institutions. We are really speaking now more of a question of style rather than of form. It is important therefore to select trustees who will not be overly impressed or misled by implications of formal affiliations in their colleagues.

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CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

- 3 -

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CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

- 4 -

the creditable work of management and staff. It is in this field where the Trustee can be of great usefulness, acting as liaison with the scientific or political community. Centers should not shy away from the limelight. The work they are doing is important, but it is equally as important that the general public be made aware of it. The Centers must have a very clear identity for what they are as well as for what they are doing. In this day of institutional proliferation, pro bono publico, the image of the legitimate institutions must be very sharp, their work understood and their objectives so well defined and expressed that there can be not the slightest doubt about their intentions.

Nationalism has increased throughout the world; it seems to ride on a wave of disillusionment and a desire for new forms of sovereign expression. The Centers must work - willy nilly - within national boundaries and they will have to keep up a mutuality of interest with those communities in which they live in order to assure their autonomy and effectiveness.

These are some of the thoughts, Mr. Chairman, that have run through my mind during the last five years. I hope that they may contribute in some form to better, stronger and more intimate working relationships between Trustees, the funding agencies, and the national and international communities.

FdeS/elm



CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

167

DIR-787

August 9, 1973

Mr. Robert McNamara
President
International Bank for Reconstruction
and Development
1818 H. Street, N. W.
Washington, D. C. 20433

Dear Mr. McNamara:

Just a note to say that I am much encouraged by the efforts of the Consultative Group on behalf of the International Centers. I know that these efforts are successful to a great extent because of the personal interest that you have taken in them. On behalf of the Board and Staff of CIAT, I wish to thank you.

I am truly sorry that it will not be possible for you to participate in the inauguration of the CIAT facilities this fall, but I do hope that you will visit us at your earliest opportunity.

Thank you for the very nice dinner at your home and for the opportunity to participate in the discussions.

Sincerely yours,

U. J. Grant
Director General

UJG.caa

RECEIVED
COMMUNICATIONS
JUL 11 1973
BUREAU OF AGRICULTURE
WASHINGTON, D.C.

Rec'd in IRD

8/20/73



CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

DIR-787

August 9, 1973

Mr. Robert McNamara
President
International Bank for Reconstruction
and Development
1818 H. Street, N. W.
Washington, D. C. 20433

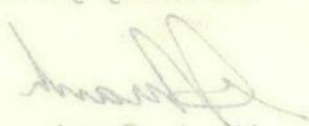
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Thank you for the very nice dinner at your home and for the opportunity to participate in the discussions.

Sincerely yours,


U. J. Grant
Director General

UJG:cas

Rec'd in IRD
8/20/73

RECEIVED
1973 AUG 17 PM 2:48
COMMUNICATIONS
SECTION

Please turn over for English

Por favor complete este formulario y envíelo al CIAT lo más pronto que le sea conveniente. Nos ayudará a preparar y organizar su visita.

Fecha: _____

NOMBRE: _____

(LE ROGAMOS MARQUE CON X LAS CASILLAS CORRESPONDIENTES)

() Si, acepto su invitación y espero llegar a Cali:

El día _____ a la hora _____ Vuelo _____

() Estaré acompañado por _____

() Vendré solo

() Deseo/deseamos partir de Cali: el día _____ a las _____
vuelo _____

() No podré asistir.

* * * * *

Hasta donde nos sea posible, dispondremos de alojamiento en el CIAT, ubicado a 40 minutos de Cali y a 5 minutos del Aeropuerto Internacional. Cada apartamento dispone de baño y dos camas. Por favor indique su preferencia para que podamos hacer los arreglos necesarios.

() Alojamiento en el CIAT

() Alojamiento en un hotel de Cali. Transporte por cuenta del CIAT

() No tengo preferencia

() Haré mis propios arreglos para alojamiento y transporte.

Otros: _____

* * * * *

LE ROGAMOS DEVOLVER ESTE FORMULARIO A:

Dr. Francis C. Byrnes, Coordinador
General de las Ceremonias de Inauguración del CIAT,
Apartado Aéreo 67-13
Cali, Colombia CABLES:CINATROP

Please complete and return this form to CIAT at your earliest convenience. It will help us plan and prepare for your visit.

Date: _____

NAME: _____

(CHECK APPROPRIATE BOXES BELOW)

() Yes, I am accepting your invitation and expect to arrive Cali:

Day _____ Date _____ Flight _____

() I will be accompanied by _____

() I will be alone

() I/we plan to depart Cali: Day _____ Date _____ Flight _____

() I regret it will not be possible for me to attend.

To the extent facilities permit, we hope to have lodging available at CIAT, 40 minutes from Cali, 5 minutes from the International Airport. Each room has a private bath and twin beds. Please check your preference on housing so that we may make appropriate local arrangements.

() Housing at CIAT

() Housing at hotel in Cali, with CIAT providing transportation

() No preference; handle as most convenient

() I will make my own arrangements for housing and local transportation.

Others: _____

RETURN THIS FORM TO: Dr. Francis C. Byrnes, General Chairman
CIAT Dedication Events
Apartado Aéreo 67-13
Cali, Colombia

CABLES: CINATROP

La Junta Directiva y el Director General

*Tienen el honor de invitar a
Mr. Robert McNamara
a la inauguración de la sede del*

Centro Internacional de Agricultura Tropical

*con la asistencia del Excelentísimo Señor Presidente de la República de Colombia,
Doctor Misael Pastrana Borrero, en el Municipio de Palmira, Valle,
Colombia, el Viernes 12 de Octubre de 1973 a partir de las 9:00 a. m.*

*R. S. V. P.
Bogotá: 41 88 48 - 43 12 59*

*Cali : 67 17 37 - 67 14 11
Apartado Aéreo: 6713
Cali - Colombia*

G2a

AIR MAIL
REGISTERED

August 8, 1973

Dear Jerry:

With this letter, I am sending you the verbatim transcript of that part of the Consultative Group meeting in which donors stated their intentions with regard to grants to the various international agricultural research centers for the financial requirements of the centers in 1974. This will enable you to make your own calculations of the grants intended for CIAT by governmental donors and by the Kellogg Foundation. In addition, no doubt, you will want to make allowance for contributions to CIAT by the Ford and Rockefeller Foundations, although the Foundations, as you know, will be reserving their specific decisions on these contributions until later in 1973.

The World Bank's affiliate, the International Development Association (IDA), also will be willing to consider a contribution to CIAT for 1974, within the limits of IDA's available resources and taking account of the needs of other Centers whose needs may not be fully met by other donors.

We would hope that donors to CIAT would have made up their minds sufficiently for you to have by next November 1 a good idea of what funds to expect for 1974.

Sincerely yours,

Harold Graves

Enclosure - pp. 38-94

Dr. U. J. Grant
Director General
Centro Internacional de
Agricultura Tropical
Apartado Aereo 67-13
Apartado Nal. 737
Cali
Colombia

cc: Dr. Wortman and Dr. Hardin

HGraves:apm

John

92a

Mr. Urquhart

August 7, 1973

Harold Graves

CIAT 1974 Budget

In your CIAT review, you pointed out that some items included in CIAT proposed capital budget for 1974 (for instance, replacement of vehicles) actually should have been put in the core budget.

I would appreciate it if you would adjust CIAT's 1974 core and capital budgets accordingly and let me know what the figures are.

HGraves:apm

John

OUTGOING WIRE

TO: ROBERT MORRIS
CINATROP
CALI

DATE: JULY 31, 1973

CLASS OF
SERVICE: Telex 05769

COUNTRY: COLOMBIA

TEXT:
Cable No.:

CAN RECEIVE MANUSCRIPT CALMAQUIP MIAMI ATTENTION PENA MONDAY MORNING

WVI
BYRNES

NOT TO BE TRANSMITTED

AUTHORIZED BY:

NAME Harold N. Graves, Jr.

DEPT. International Relations

SIGNATURE *Harold N. Graves, Jr.*
(SIGNATURE OF INDIVIDUAL AUTHORIZED TO APPROVE)

REFERENCE:

CLEARANCES AND COPY DISTRIBUTION:

For Use By Communications Section

ORIGINAL (File Copy)

(IMPORTANT: See Secretaries Guide for preparing form)

Checked for Dispatch: *WVI*

INTERNATIONAL DEVELOPMENT
ASSOCIATION

INTERNATIONAL BANK FOR
RECONSTRUCTION AND DEVELOPMENT

INTERNATIONAL FINANCE
CORPORATION

OUTGOING WIRE

DATE: JULY 31, 1973

TO: ROBERT MORRIS
CINATROP
CALI

CLASS OF
SERVICE: Telex 05769

COUNTRY: COLOMBIA

TEXT:
Cable No.

CAN RECEIVE MANUSCRIPT CALMAQUIP MIAMI ATTENTION PENNA MONDAY MORNING

BYRNES

NOT TO BE TRANSMITTED

COMMUNICATIONS
SECTION

FOR USE BY COMMUNICATIONS SECTION
FOR DISPATCH AND COPY DISTRIBUTION

JUL 31 5 20 PM 1973

NAME: Harold N. Graves, Jr.

DEPT: International Relations

DISPATCHED

SIGNATURE OF INDIVIDUAL AUTHORIZED TO APPROVE:

For Use by Communications Section

ORIGINAL (File Copy)

(IMPORTANT: See Secretariat Guide for preparing form)

Checked for Dispatch

C 2
✓ cc: 62a

Mr. McNamara

July 30, 1973

Harold Graves

Your Dinner This Evening

You have met on previous occasions all but two of your guests this evening, I believe. The two exceptions may be Dr. Nyle Brady, formerly of Cornell University, who has just taken over the post of Director of the International Rice Research Institute, and Dr. Francisco de Sola, the Chairman of the Board of Trustees of the International Center for Tropical Agriculture (CIAT) near Cali, Colombia.

We are temporarily at an impasse with Dr. de Sola and the Director of CIAT, Jerry Grant, on an issue concerning CIAT's budget request for 1974. While it is certain to be resolved, you should know about it now.

The CIAT Board of Trustees has approved the Center's budget for running costs of \$4.4 million in 1974, but has not approved the Director's proposed capital budget (\$1.5 million). The Director and his Chairman take the position that the capital budget was approved in principle at various times in the past (most recently in the spring of 1972). This position is not accepted by some of the other Trustees, including those who represent Rockefeller, Ford and the Canadian International Development Agency (the U. S. has no representative). It is clear, actually, that the Board has never been given a detailed justification for this expenditure of capital, and that, in fact, this Center has no multi-year capital plan, although its management is proposing to ask the Consultative Group to finance \$4.5 million of capital expenditures in the period 1974-76.

Under the procedures followed in the Consultative Group, neither TAC nor the donors in the Group can consider CIAT's capital budget for 1974 until it represents a properly considered proposal from the Center's Board of Trustees. At our current meeting, Dr. de Sola and Dr. Grant are pressing TAC, various donors, and the Secretariat to change position on this question of procedure; but we are all, so far as I know, standing fast. (For that matter, CIAT's Charter from the Colombian Government and the Center's own bylaws require that its expenditures be approved annually by its Board of Trustees.)

As a result, the CIAT Board will have to consider this matter at a special meeting to be convened not later than October 12, when CIAT Trustees gather for the dedication of the Center's newly completed

92a

OUTGOING WIRE

TO: DR. U. J. GRANT
CHAMPAIGN HILTON HOTEL
CHAMPAIGN
ILLINOIS

DATE: JULY 9, 1973

CLASS OF
SERVICE: FULL RATE

Wn machine

COUNTRY: USA

TEXT:
Cable No.:

IF IMPOSSIBLE YOUR BOARD OR EXECUTIVE COMMITTEE CONSIDER CAPITAL
BUDGET THIS WEEK WILL DISTRIBUTE CIAT CAPITAL BUDGET PAPER TO TAC AND
CONSULTATIVE GROUP WITH SOME SUCH LANGUAGE AS FOLLOWS: QUOTE THE
ATTACHED CAPITAL BUDGET OF CIAT FOR 1974 HAS BEEN PREPARED BY THE
DIRECTOR GENERAL AND STAFF OF CIAT IN THE CONTEXT OF BUDGET DISCUSSIONS
BY THE BOARD OF TRUSTEES, AND WILL BE SPECIFICALLY CONSIDERED BY THE
BOARD BEFORE THE AUTUMN MEETING OF THE CONSULTATIVE GROUP UNQUOTE REGARDS

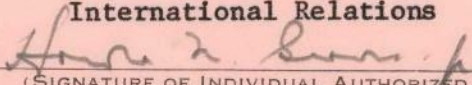
HAROLD GRAVES

NOT TO BE TRANSMITTED

AUTHORIZED BY:

NAME Harold N. Graves, Jr.

DEPT. International Relations

SIGNATURE 
(SIGNATURE OF INDIVIDUAL AUTHORIZED TO APPROVE)

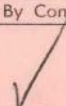
REFERENCE: HGraves:apm

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(IMPORTANT: See Secretaries Guide for preparing form)

Checked for Dispatch: 

INTERNATIONAL DEVELOPMENT
ASSOCIATION

INTERNATIONAL BANK FOR
RECONSTRUCTION AND DEVELOPMENT

INTERNATIONAL FINANCE
CORPORATION

OUTGOING WIRE

TO:

DR. W. J. GRANT
CHAMPAIGN HILTON HOTEL
CHAMPAIGN
ILLINOIS

DATE: JULY 9, 1973

CLASS OF
SERVICE FULL RATE

COUNTRY: USA

TEXT:
Cable No.:

IF IMPOSSIBLE YOUR BOARD OR EXECUTIVE COMMITTEE CONSIDER CAPITAL
BUDGET THIS WEEK WILL DISTRIBUTE CIAT CAPITAL BUDGET PAPER TO TAG AND
CONSULTATIVE GROUP WITH SOME SUCH LANGUAGE AS FOLLOWS: QUOTE THE
ATTACHED CAPITAL BUDGET OF CIAT FOR 1974 HAS BEEN PREPARED BY THE
DIRECTOR GENERAL AND STAFF OF CIAT IN THE CONTEXT OF BUDGET DISCUSSIONS
BY THE BOARD OF TRUSTEES, AND WILL BE SPECIFICALLY CONSIDERED BY THE
BOARD BEFORE THE AUTUMN MEETING OF THE CONSULTATIVE GROUP UNQUOTE REGARDS

HAROLD GRAVES

NOT TO BE TRANSMITTED

AUTHORIZED BY:

NAME

Harold N. Graves, Jr.

DEPT.

International Relations

SIGNATURE

[Signature]

REFERENCE

HGraves:apw

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(IMPORTANT: See instructions for preparing form)

COMMUNICATIONS
JUL 9 1 23 PM 1973

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[illegible]

ITT-17 AWA478 VIA ITT

SANSALVADORELSALVADORCA 219 4 1528 PAGE 1/51

July 4, 1973

LT

Distribution: Mr. Graves

DR HAROLD GRAVES INTBAFRAD

WASHINGTONDC

RECEIVED

JUL 5 11 05 AM 1973
COMMUNICATIONS
SECTION

I WISH TO MAKE REFERENCE TO YOUR TELEPHONE CONVERSATIONS WITH NORMAN COLLINS MEMBER OUR BOARD AS WELL AS DOCTOR GERALD GRANT DIRECTOR GENERAL CIAT AND SUGGESTION THAT CAPITAL FUNDS REQUESTED BY CIAT REQUIRE BOARD APPROVAL STOP FOR YOUR INFORMATION CIAT BOARD AT ITS ANNUAL MEETING MAY

1969 APPROVED MASTER DEVELOPMENT PLAN FOR CIAT AND AUTHORIZED BOARD CHAIRMAN AND DIRECTOR GENERAL TO SEEK ADDITIONAL CAPITAL FUNDING BEYOND THAT AVAILABLE FROM ROCKEFELLER AND KELLOGG FOUNDATIONS STOP PRESENT NEEDS WERE REVIEWED WITH CIAT BOARD AT MAY 1973 MEETING AND CURRENT REQUEST FOR ADDITIONAL FUNDING IN 1974 IS CONSISTENT WITH AUTHORIZATION

CITED ABOVE STOP FOLLOWING MAY BOARD MEETING MANAGEMENT AND STAFF HAVE GIVEN CONSIDERABLE ATTENTION TO IDENTIFY OUR MOST URGENT NEEDS ALL OF WHICH ARE OUTLINED IN ENCLOSURES TO JUNE 20TH LETTER ADDRESSED TO YOU BY OUR DIRECTOR GENERAL ALL OF WHICH I FULLY ENDORSE STOP THESE FIGURES WITH SUPPORTING DETAILS ARE INCLUDED IN DOCUMENTATION

BEING MAILED CONSULTATIVE GROUP MEMBERS THIS WEEK STOP IF YOU FEEL THAT ANY DETAILS ARE LACKING OR REQUIRE FURTHER CLARIFICATION PLEASE DO NOT HESITATE TO CALL ME OR DOCTOR GRANT STOP I AM MOST ANXIOUS THAT OUR PRESENTATION RECEIVE THE FULL COMPLETE AND EQUITABLE SUPPORT THAT THE EFFORTS OF CIAT MANAGEMENT AND STAFF DESERVE REGARDS

FRANCISCO DE SOLA CHAIRMAN BOARD OF TRUSTEES

92a

OUTGOING WIRE

TO: GRANT
CINATROP
CALI

DATE: JULY 2, 1973

CLASS OF
SERVICE: FULL RATE

ITT
by machine

COUNTRY: COLOMBIA

TEXT:
Cable No.:

MANY THANKS YOUR LETTER JUNE 20 CONCERNING CAPITAL BUDGET. TRUST YOU UNDERSTAND TAC AND CONSULTATIVE GROUP PREPARED TO CONSIDER ONLY BUDGET REQUIREMENTS STUDIED AND APPROVED BY BOARD OF TRUSTEES. I INFER FROM YOUR LETTER THAT CIAT BOARD HAS NOT YET APPROVED YOUR CAPITAL BUDGET OF ONE AND ONE-HALF MILLION DOLLARS FOR 1974.

REGARDS

GRAVES

NOT TO BE TRANSMITTED

AUTHORIZED BY:

NAME Harold N. Graves, Jr.

DEPT. International Relations

SIGNATURE *Harold N. Graves, Jr.*
(SIGNATURE OF INDIVIDUAL AUTHORIZED TO APPROVE)

REFERENCE: HGraves:apm

CLEARANCES AND COPY DISTRIBUTION:

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ORIGINAL (File Copy)

(IMPORTANT: See Secretaries Guide for preparing form)

Checked for Dispatch:

[Signature]

INTERNATIONAL DEVELOPMENT
ASSOCIATION

INTERNATIONAL BANK FOR
RECONSTRUCTION AND DEVELOPMENT

INTERNATIONAL FINANCE
CORPORATION

OUTGOING WIRE

TO: GRANT
CINATROP
CALL
COUNTRY: COLOMBIA

DATE: JULY 2, 1973
CLASS OF
SERVICE: FULL RATE

TEXT
Cable No:

MANY THANKS YOUR LETTER JUNE 20 CONCERNING CAPITAL BUDGET. TRUST YOU
UNDERSTAND TAG AND CONSULTATIVE GROUP PREPARED TO CONSIDER ONLY BUDGET
REQUIREMENTS STUDIED AND APPROVED BY BOARD OF TRUSTEES. I INFER FROM YOUR
LETTER THAT CIBT BOARD HAS NOT YET APPROVED YOUR CAPITAL BUDGET OF ONE AND
ONE-HALF MILLION DOLLARS FOR 1974.

REGARDS

GRAVES

NOT TO BE TRANSMITTED

COMMUNICATIONS
SECTION

JUL 2 11 24 AM '73

DISPATCHED

NAME: Harold N. Graves, Jr.
DEPT: International Relations

For Use by Communications Section

REFERENCE: HGRAVES:aqm

ORIGINAL (File Copy)

(IMPORTANT: See Secretary's Guide for preparing form)

Checked for Dispatch

111
of no value

92a

June 29, 1973

Dear Dr. Grant:

Thank you for your letter of June 20 to Harold Graves regarding your 1974 budget and your estimates for 1975 and 1976. It is very helpful for us to have this information.

Harold's letter to you, incidentally, went out at a time when we thought the centers generally would be projecting their requirements only to 1976. We understand now that the directors agreed at Bellagio to project their requirements to 1977, and we trust that your completed program and budget presentation will contain this projection.

Harold asks me to give you his greetings, and I myself am looking forward to meeting you in the course of the July-August meetings.

Sincerely yours,



Bruce M. Cheek
Deputy Executive Secretary

Dr. U. J. Grant
Director General
Centro Internacional de Agricultura
Tropical
Apartado Aereo 67-13
Apartado Nal. 737
Cali, Colombia

cc: Sir John Crawford/Mr. Neylan

Mr. Fransen

Mr. Ruddy/Mr. Urquhart

BMC:mcj



CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

DIR-710

June 28, 1973

Dr. Harold Graves
Consultative Group on International
Agricultural Research
1818 H. Street, N.W.
Washington, D. C.

Dear Harold:

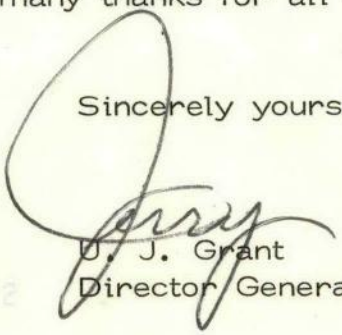
You must have received by now our financial statement on our capital program. I regret the typographical error made on it, but I sent you a cable correcting the amount for Out of Colombia Participation from \$500,000 to \$300,000 in each of the years 1975 and 1976. I presume that this is now clarified.

I also had a cable from Mr. Urquhart requesting this information at the earliest possible time. We mailed it on Wednesday June 20. You should have received it by now. If not, I will send you a copy immediately.

As you realize CIAT began its capital program with a too small budget. We are having difficulty in getting our capital in tune with our operating development. We started with two donors on the operating side and we are now up to ten. We have not picked up the extra capital we need to move ahead as rapidly as we are capable of doing. I hope that this situation will be realized by the Consultative Group and can be corrected over the next two years period.

With best wishes, and with many thanks for all of your help.

Sincerely yours,



D. J. Grant
Director General

UJG.caa

SECTION
COMMUNICATIONS

1973 JUN -2 PM 10:21

RECEIVED



CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

DIR-710

June 28, 1973

Dr. Harold Graves
Consultative Group on International
Agricultural Research
1818 H. Street, N.W.
Washington, D. C.

Dear Harold:

You must have received by now our financial statement on our capital program. I regret the typographical error made on it, but I sent you a cable correcting the amount for Out of Colombia Participation from \$200,000 to \$300,000 in each of the years 1975 and 1976. I presume that this is now clarified.

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With best wishes, and with many thanks for all of your help.

Sincerely yours,


D. J. Grant
Director General

COMMUNICATIONS
SECTION

1973 JUL -9 PM 10:54

UJG:cas

RECEIVED

INTERNATIONAL DEVELOPMENT
ASSOCIATION

INTERNATIONAL BANK FOR
RECONSTRUCTION AND DEVELOPMENT

INTERNATIONAL FINANCE
CORPORATION

92a

OUTGOING WIRE

TO: RAUN

DATE: JUNE 28, 1973

CINATROP

CLASS OF

CALI

SERVICE: LT OR ~~TELEX~~

COUNTRY: COLOMBIA

111

TEXT:
Cable No.:

THE
IF/REPORT IS NOT CONFIDENTIAL COMMA MOST GRATEFUL RECEIVE AIRMAIL COPY CIAT
BEEF PROGRAM EXTERNAL REVIEW PANEL REPORT STOP ESPECIALLY INTERESTED
COMMENTS BRAZIL AND WOULD WELCOME SUGGESTED CONTACTS THERE IN VIEW MY
PROPOSED TRIP BRAZIL EARLY AUGUST ASSIST EMBRAPA IDENTIFY AND PREPARE
RESEARCH PROPOSAL

REGARDS
FRANSEN
INTBAFRAD

NOT TO BE TRANSMITTED

AUTHORIZED BY:

CLEARANCES AND COPY DISTRIBUTION:

NAME Mr. James M. Fransen
DEPT. Agricultural Research Coordinator
Agriculture Department

SIGNATURE *James M. Fransen*
(SIGNATURE OF INDIVIDUAL AUTHORIZED TO APPROVE)

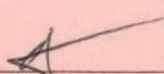
REFERENCE: Brazil Research Project

JMFransen:go

ORIGINAL (File Copy)

(IMPORTANT: See Secretaries Guide for preparing form)

For Use By Communications Section

Checked for Dispatch: 

2014-10-10
 10:10 AM
 10:10 AM

92a.

INCOMING TELETYPE

Log. 215

FROM BOGOTA

JUN 25 3 25 PM '73
COMMUNICATIONS SECTION

Distribution:
Mr. Urquhart

1400 ESTO

440098 IBRD UI

5769 CIAT CO TELEX NO. 297 JUNE 25/73

ATT.: URQUHART

CAPITAL BUDGET DATA SENT TO GRAVES JUNE 20 MAILING COPY TO YOU

GRANT

CIAT

440098 IBRD UI

5769 CIAT CO

.....=

INCOMING TELETYPE

Log 239

52a

JUN 22 4 34 PM 1973

COMMUNICATIONS
SECTION

1531 ESTO

440098 IBRD UI

5769 CIAT CO TELEX NO. 293 JUNE 22/73 DK

FROM: CALI

Distribution:

Mr. Graves

ATT.: HAROLD GRAVES

REGRET TYPOGRAPHICAL ERROR PAGE TWO PHYSICAL FACILITIES EQUIPMENT

FOR CORE OPERATIONS OUTSIDE COLOMBIA SHOULD READ 300,000 FOR

1975 AND 300,000 FOR 1976

GRANT CIAT

440098 IBRD UI

5769 CIAT CO

--- TELETYPE NUMBER.

INTERNATIONAL DEVELOPMENT
ASSOCIATION

INTERNATIONAL BANK FOR
RECONSTRUCTION AND DEVELOPMENT

INTERNATIONAL FINANCE
CORPORATION

G2a

OUTGOING WIRE

TO: GRANT
CINATROP
CALI

DATE: June 22, 1973

CLASS OF
SERVICE: LT

COUNTRY: COLOMBIA

TEXT:
Cable No.:

[Handwritten signature]

CIAT BUDGET DOCUMENTS WHICH WE HAVE SEEN MAKE NO MENTION OF ANY
CAPITAL FUNDING REQUIREMENTS FOR 1974 STOP ARE THERE ANY STOP WOULD ALSO
APPRECIATE RECEIVING AS SOON AS POSSIBLE THE FULL FY74 BUDGET AND TABLES
REGARDS

URQUHART

NOT TO BE TRANSMITTED

AUTHORIZED BY:

NAME Michael E. Ruddy

DEPT. Programming and Budgeting

SIGNATURE *[Handwritten signature: M. E. Ruddy]*
(SIGNATURE OF INDIVIDUAL AUTHORIZED TO APPROVE)

REFERENCE:

[Handwritten initials]

ORIGINAL (File Copy)

(IMPORTANT: See Secretaries Guide for preparing form)

CLEARANCES AND COPY DISTRIBUTION:

For Use By Communications Section

Checked for Dispatch: *[Handwritten checkmark]*

INTERNATIONAL DEVELOPMENT
ASSOCIATION

INTERNATIONAL BANK FOR
RECONSTRUCTION AND DEVELOPMENT

INTERNATIONAL FINANCE
CORPORATION

OUTGOING WIRE

DATE June 22, 1973

TO: GRANT
CINATROP
CALL

CLASS OF
SERVICE LT

COUNTRY: COLOMBIA

TEXT
Cable No.

REMARKS
CAPITAL FUNDING REQUIREMENTS FOR 1974 STOP ARE THERE ANY STOP WOULD ALSO
APPRECIATE RECEIVING AS SOON AS POSSIBLE THE FULL FY74 BUDGET AND TABLES
THAT BUDGET DOCUMENTS WHICH WE HAVE SEEN MAKE NO MENTION OF ANY

URGENT

NOT TO BE TRANSMITTED

CLEARANCE AND COPY DISTRIBUTION

COMMUNICATIONS

Program and Budget
JUN 22 3 31 PM 1973

Michael E. Rudy

AUTHORIZED BY

NAME

DEPT

SIGNATURE

SIGNATURE OF INDIVIDUAL AUTHORIZED TO APPROVE

REFERENCE

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JUN 22 4 34 PM 1973

COMMUNICATIONS
SECTION

1531 EST

440098 IBRD UI

5769 CIAT CO TELEX NO. 293 JUNE 22/73

FROM: CALI

Distribution:

Mr. Graves ✓

Seen
by HG

cc: Mr. Urguhart ✓

ATT.: HAROLD GRAVES

of letter 6/20

REGRET TYPOGRAPHICAL ERROR PAGE TWO PHYSICAL FACILITIES EQUIPMENT

FOR CORE OPERATIONS OUTSIDE COLOMBIA SHOULD READ 300,000 FOR1975 AND 300,000 FOR 1976instead of 500,000 ✓

GRANT CIAT

440098 IBRD UI

5769 CIAT COV --- TELEX NUMBER.



CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

DIR-661

T.BG
2. HG

June 20, 1973

Mr. Harold Graves
Executive Secretary
Consultative Group on International
Agricultural Research
1818 H. Street, N. W.
Washington, D. C.

Dear Harold:

Your cable requesting information on our projected operational and capital financial needs for 1974, 1975, and 1976 came while I was away, but the staff already was engaged in a comprehensive review of the capital budget situation for this year and 1974. Our 1974 operational fund requirements are as outlined in the 1974 Proposed Program and Budget document sent you in early May. This was approved by the Board of Trustees.

We have reviewed and revised our projections of program, staffing and financial needs, we are able at this time to present the following:

PROJECTIONS ON OPERATIONAL NEEDS

	<u>1974</u>	<u>1975</u>	<u>1976</u>
Per budget document for 1974, on basis of 43 senior staff	4,403,253		
Taking into account inflation, plus new senior positions, as indicated		(46)* 4,970,000	(53)* 6,250,000

*Senior staff numbers

Mr. Harold Graves

2.
DIR-661

CAPITAL FUND NEEDS

	<u>1974</u>	<u>1975</u>	<u>1976</u>
Per attached outline, 1974	\$ 1,500,000		
Additional laboratories, auditorium, housing and equipment	-	\$ 750,000	\$ 750,000
Additional equipment and replacement vehicles	-	100,000	100,000
Facilities, equipment for other work sites in Colombia	-	200,000	200,000
Physical facilities, equipment for core operations outside Colombia	-	3 500,000	3 500,000
Capital Sub-total	1,500,000	1,350,000	1,350,000
Total, Capital&Operations	5,903,253	6,320,000	7,600,000

We are developing explanatory narratives which will be part of the overall CIAT program and budget presentation to the Consultative Group. In accord with your request, we expect to mail this in early July. This will include an elaboration of the capital equipment needs as indicated above. If, in the meantime, you need additional information, please let us know.

The Board of Trustees has requested that at the earliest date possible we meet with representatives of IRRI and CIMMYT to review how jointly we can best carry out the world-wide responsibilities with respect to rice and wheat. Results of this discussion may influence our long-term budget projections, and our Board has asked us to take this into account in making the 5-year projection. In the meantime, we will have to proceed on the basis of the estimates presented here.

With respect to the report of the External Review Team on the Beef Program, we expect that the final document will be ready in early July. We received a preliminary draft this past week, and this is being reviewed

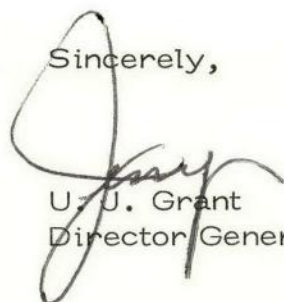
Mr. Harold Graves

3.
DIR-661

by our staff members as well by the review team. In some cases, the team has asked us to supply additional information, or to clarify a particular aspect.

Your cooperation and interest in our financial and program affairs are most welcome and appreciated.

Sincerely,

A handwritten signature in dark ink, appearing to be 'U. J. Grant', written over the typed name.

U. J. Grant
Director General

UJG.caa

encl.

cc. Mr. F. de Sola

Dr. R. G. Mawby

Dr. L. M. Roberts

Outline of 1974 Capital Budget Needs of CIAT

1. To reimburse Phase I capital grants for non-budgeted expenditures made to permit interim operations of CIAT, 1969-1973, plus purchase of high priority equipment necessary to support program activities in Phase II and Phase III operations, 1971-73:

* Modification of old farm buildings to serve as temporary offices, classroom, library, dining facilities, information center and dormitory	\$ 25,000	
* Modification of Station Operations building to provide temporary laboratories and offices	35,000	
* Temporary electrical, water, and sewage	25,000	
* Purchase initial equipment for cassava and bean programs	<u>35,000</u>	\$140,000

Note: These funds will be used to complete the Phase I physical construction program, as follows:

* Completion of Meat Laboratory	\$105,000
* Additional roads, landscaping	35,000

2. To purchase additional scientific equipment and instruments to support increased activities and expansion in original commodity programs as well as equipment required for new programs and expanded services, as follows:

* Beef, Swine, Rice, Corn Programs	\$145,000	
* Cassava	60,000	
* Field Beans	80,000	
* Biometric Services	10,000	
* Central Laboratory Services	86,000	
* Information Services	55,000	
* Library, including book purchases	70,000	
* Administrative services	10,000	
* Food, Housing and Conference Services	<u>65,000</u>	\$581,000

3. To purchase vehicles to support senior professional staff of 43, plus additional farm and maintenance equipment and tools, as follows:

* Replacement and Additional Vehicles	\$170,000	
* Farm Machinery for Training Programs	25,000	
* Maintenance equipment and tools	<u>36,000</u>	\$ 231,000

4. To finance miscellaneous construction and modifications of physical facilities, as follows:

* Modifications to new buildings	\$ 25,000	
* Information Booth and Guard Station	5,000	
* Sports and recreational areas	<u>18,000</u>	\$ 48,000

Sub-Total, CIAT Headquarters	\$1,000,000
------------------------------	-------------

- | | |
|-------------------------------------------------------------------------------------|---------|
| 5. To purchase an aircraft adequate to meet CIAT's transportation needs in Colombia | 500,000 |
|-------------------------------------------------------------------------------------|---------|

Grand Total	<u>\$1,500,000</u>
-------------	--------------------

G2a

SPECIAL DELIVERY

May 23, 1973

Dr. H. G. Dion
Technical Adviser
Canadian International
Development Agency
Jackson Building, 122 Bank Street
Ottawa 4
Ontario
Canada

Dear George:

By separate mail, I have sent back to you two copies of your preliminary draft report, one marked up by Dick Demuth and the other marked up by me. I have read it, as the book reviewers say, with profit and pleasure.

Talking on the telephone, Dick seems to have three major comments. One, he would like to see more indication in the report of how the activities you describe correspond with, or deviate from, the 1973 program approved by the Board of Trustees and endorsed by the Consultative Group. Perhaps this could be covered in a general statement applicable to the whole report, rather than to bits and pieces of it. Two, Dick would like to see a summary of some kind at the beginning of the report. For me, the most interesting part of the preliminary draft report was the material at the end, on issues; and perhaps this could go up front as a kind of summary-cum-introduction. Three, Dick thinks there is too much technical detail in the report.

Let me repeat the comments I made to you on the telephone last week and add one or two others. The repeated comments are two: One, I think there needs to be some discussion under the heading of "outreach" -- probably bringing in the training programs -- since one of the concerns about CIAT is that up to now, it has seemed to be too much a Colombian center and too little a Latin American one. Two, I think your idea about giving some prominence to CIAT's economic work is a good one; but I do think that means that you have to bring the subject up much earlier in your text.

Both Dick and I have the feeling that the preliminary draft does not point up the information that both TAC and the Consultative Group

Dr. Dion

- 2 -

May 23, 1973

will be looking for: namely, the new program developments that will take place in 1974 as against 1973 -- including both additions to the 1973 program and subtractions from it. I appreciate that this was difficult to do at the time of drafting, since some of the most important decisions of this kind had not yet been taken by the Board.

Since the time of your draft, also, we have had the benefit of receiving CIAT's own document presenting its 1974 program to the Board. A document very much like this, presumably, will be circulated to the members of the Consultative Group and of TAC for their consideration at Centers Week. That suggests that -- particularly now that you have gone through the excruciating exercise of getting all the basic facts off your chest in the preliminary draft report -- your report could essentially be a commentary on the CIAT budget document itself (without necessarily identifying or describing itself as such).

In any case, the report needs to bring out more emphatically that in 1974, both the cassava and the systems programs will be much strengthened; and perhaps -- depending on what the CIAT Board decided last week -- the field bean program will have to be added to these two.

I'll get at the CIP preliminary draft report right away and let you have my comments as quickly as possible. And I'll look forward to getting the CIMMYT preliminary draft.

Sincerely,

Harold Graves

HGraves:apm

INTERNATIONAL DEVELOPMENT
ASSOCIATION

INTERNATIONAL BANK FOR
RECONSTRUCTION AND DEVELOPMENT

INTERNATIONAL FINANCE
CORPORATION

OUTGOING WIRE

TO: GRANT
CINATROP
CALI

DATE: MAY 23, 1973

CLASS OF
SERVICE: LT

COUNTRY: COLOMBIA

TEXT:
Cable No.:

THANKS FOR TEXT OF PROPOSED PROGRAM AND BUDGET FOR 1974 AS
PARPARED FOR YOUR BOARD. TRUST YOU WILL SEND ME WELL AHEAD OF CENTERS
WEEK A STATEMENT CONCERNING CAPITAL EXPENDITURES IN 1974 AND ALSO
TABULATIONS SHOWING ESTIMATED CORE EXPENDITURES 1975 AND 1976 AND
ESTIMATED CAPITAL EXPENDITURES FOR SAME YEARS, TOGETHER WITH LANGUAGE
EXPLAINING ANY MAJOR OUTLAYS SUCH AS ORIGINALLY PROJECTED FOR 1975.
WOULD ALSO APPRECIATE RECEIVING COPY OF LIVESTOCK REVIEW IF POSSIBLE.

REGARDS

HAROLD GRAVES

NOT TO BE TRANSMITTED

AUTHORIZED BY:

NAME

~~XXXXX~~ Harold N. Graves, Jr.

DEPT.

International Relations

SIGNATURE

(SIGNATURE OF INDIVIDUAL AUTHORIZED TO APPROVE)

REFERENCE:

ORIGINAL (File Copy)

(IMPORTANT: See Secretaries Guide for preparing form)

CLEARANCES AND COPY DISTRIBUTION:

HG:mcj

For Use By Communications Section

Checked for Dispatch:

INTERNATIONAL DEVELOPMENT
ASSOCIATIONINTERNATIONAL BANK FOR
RECONSTRUCTION AND DEVELOPMENTINTERNATIONAL FINANCE
CORPORATION

OUTGOING WIRE

TO: GRANT
CINATROP
CALI

COUNTRY: COLOMBIA

TEXT:
Cable No.:

DATE: MAY 23, 1973

CLASS OF
SERVICE: IT

THANKS FOR TEXT OF PROPOSED PROGRAM AND BUDGET FOR 1974 AS
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EXPLAINING ANY MAJOR OUTLAYS SUCH AS ORIGINALLY PROPOSED FOR 1975.
WOULD ALSO APPRECIATE RECEIVING COPY OF LIVERSTOCK REVIEW IF POSSIBLE.

REGARDS

HAROLD GRAVES

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COMMUNICATIONS

MAY 23 7 21 PM 1973

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AUTHORIZED BY:

NAME

HAROLD N. Graves, Jr.

DEPT.

International Relations

SIGNATURE

(SIGNATURE OF INDIVIDUAL AUTHORIZED TO APPROVE)

REFERENCE

ORIGINAL (File Copy)

(IMPORTANT: See Secretariat Guide for preparing form)



G 2 a

May 9, 1973

Mr. Harold Graves
Executive Secretary
Consultative Group on International
Agricultural Research
1818 H St. N.W.
Washington, D.C. 20433, U.S.A.

Your file Votre référence

Our file Notre référence

Dear Harold:

Enclosed is a first preliminary draft of the report on CIAT. I have not myself proof-read or edited it in any way as yet. I am sending it to you for your general comments, and any helpful suggestions you or others may want to make regarding presentation, length, details, undesirable inclusions, etc.

Can I suggest that you feel perfectly free to mark up the draft copy in any way, make marginal notes or comments on the back of the previous page, etc. and return it to me so that I may have the benefit of the editorial advice, and can incorporate the desirable additions into my own editing and revision job. The quote from the Hardin-Roberts report should obviously be an appendix, incidentally.

I have sent a second copy to Gerry Grant at CIAT, so that he and his staff can correct factual errors, and modify words so as to avoid wrong inferences.

I will assume that two weeks is time enough for feedback, and whether or not I receive the draft back from you (or Grant) I will do my own editing and revisions about the end of May, and have it in your hands by perhaps June 11.

Yours sincerely,

H.G. Dion
Agricultural Adviser

Encl.

CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

CIAT was organized late in 1967, and its effective organizational life began in 1968. It is a direct descendent of the Rockefeller Foundation agricultural program which had operated in Colombia for many years. The original proposal ^{for CIAT} was made in a report in 1966 by Roberts and Hardin, on behalf of the Rockefeller and Ford Foundations leading to an agreement between the Government of Colombia and the Rockefeller Foundation (which assumed the organizational function) for the establishment of the Centre on land at Palmira near Cali provided by the Government of Colombia, and to an agreement between the Ford and Rockefeller Foundations that they would jointly be responsible for initial funding, with the expectation that they would be joined by other donors, as has, in fact, happened.

The physical facilities of the Institute have naturally required a great deal of planning and calculation to match requirements and resources, ^{and} in spite of delays occasioned by the necessary and inevitable revisions, the new buildings will be essentially completed on schedule during 1973, and the staff will leave the temporary offices and laboratories they have been occupying. The new building and field facilities are being completed within the limits of the funds available (including contingency funds), and are efficiently designed and laid out for minimum maintenance, for an Institute which is expected to have an indefinite but extended existence. The capital cost of the buildings and field facilities (exclusive of land costs, contributed by Colombia) is \$6.4 million contributed by the Rockefeller, Kellogg and Kresge Foundations, and includes extensive accommodation suitable for both trainees and students in residence and for senior scientists and administrators attending symposia and conferences.

How much of this report reflects the 1972 CIAT report?

Summary

Break up conference

Relation of what is being done to approval program, Budgetary factors?

The objectives of the Institute have been very well described in the original proposal by Roberts and Hardin:

"Lands presently contributing little to food production exist in the hot tropics of Latin America, Africa, and Asia. While modern scientific crop and livestock production knowledge of these tropical regions is scant, these areas are believed to have a substantial agricultural potential. In relatively close juxtaposition to the largely untapped lowland areas between the Tropics and Cancer and Capricorn live an estimated more than half of the world's people whose diets are usually deficient in both quantity and quality.

"The hot tropics have been slow to develop because of many interrelated political, economic, social, climatic, and biological factors. Much of the knowledge which might permit rational utilization of the lowland tropics for food production remains to be developed. The hot tropical regions, except for export crop technology developed by colonial powers, have been largely bypassed by modern agricultural science. Under increasing population pressure people are now moving into lowland tropical areas that until now have been sparsely populated. The question is therefore this. Given the world's present and prospective food needs, can man through modern science develop the production, marketing, distribution knowledge, institutions and techniques whereby more intensive agricultural use of lowland tropical areas becomes economically feasible?

"To help answer the above question in Latin America, the creation of an International Institute for Research and Training in Tropical Agriculture is proposed. A number of indigenous experiment stations have already been established in the tropical lowlands of Latin America. Thus a potential network of stations with which a strong, autonomous international institute could productively cooperate now exists.

"To allocate funds for research and training in the hot tropics is to invest in an area of undefined potential. The objective here is to make a strong start toward solving the problems peculiar to the tropics. If rising expectations of people in these areas are to be realized, productivity of the agricultural sector must rise.

"The Latin American tropics comprise a variety of ecological zones, each of which will require specific adaptive research to capitalize upon its inherent productive capacity. The areas concerned may be roughly divided, based upon present knowledge, into land areas which are favorable, unfavorable, and unclassified as to potential.

"The first are known to have unexploited potential for greatly increased returns from relatively small inputs. These include the northern coastal plains of Colombia, the Caribbean and Pacific littorals of Mexico and Central America, the Pacific coast of Ecuador, and the eastern Andean slopes between 500 and 1,000 meters elevation extending from Venezuela through Colombia, Ecuador, Peru, and Bolivia.

"The second category includes much of the hot humid jungles of the Amazon and Orinoco basins and the Colombian Pacific coast, where greater efforts and investment will be necessary to pave the way for agricultural advance.

"Little is known about the third category of lands. Their potential for both crop and animal production may be good. Included are the central plateau of Brazil and the flat plains or llanos of Venezuela and Colombia.

"The areas described vary with respect to rainfall patterns, soils, topography, ease of access, communications, and stage of social and economic development. They have, however, two factors in common which are important for crop adaptation: temperature and photoperiod. Experience with rice, corn, and other crops has shown that these two conditions make it relatively easy to move plant materials throughout the tropical zone and have them adapt reasonably well. The low latitude regions throughout the world possess one important attribute economically important when combined with other production factors. This is the amount of solar energy at earth's surface which in the low latitudes is at its maximum for the photosynthetic process.

"The proposed institute would emphasize an interdisciplinary approach by highly qualified career scientists employing advanced research facilities. It would help develop trained people at locations within the region in which the scientists expect to work. The institute would have as a major goal the training of scientists and the development of technology to serve in building strong national programs and institutions. Cooperative arrangements with other centers for research, training, and extension would be developed throughout a large region. International exchanges and communications among scientists from the several related fields and nations would be encouraged. Were such a center located in Colombia, it would add an important link to the chain of international institutes concentrating on tropical and semitropical agriculture. An international institute of this type in Latin America is greatly needed to train Latin American scientists and to provide the mechanism to promote cooperative work in the Latin American area on common problems.

"The Latin American Institute would not be concerned with a single crop or enterprise. It would concentrate on the identification and solution of tropical crop and livestock production and distribution problems and on the training of people in a problem-solving research and educational environment.

"It is recognized that the institute should focus its major efforts in crop improvement on only a few crops that are vitally important from the standpoint of nutrition rather than dilute its forces on a large number of crops. It is proposed that top priority be given to one or more of the most potentially important grain legume crops for direct human consumption such as soybeans, beans, cowpeas, and pigeon peas. These are rich sources of protein, the nutritive element that is so important for normal growth and health and the one that is the most deficient on a world-wide scale, especially in the tropical regions. A portion of the present protein deficit and greatly increased future needs for this vital component in man's diet must be supplied from animal sources. It is therefore proposed that forage legumes and grasses for livestock be given a high priority rating along with the grain legumes for direct human use.

"Corn and rice are of primary importance in the tropical regions of Latin America. Fortunately the proposed institute will not need to make a primary thrust in its research and training programs to improve these two crops, since the basic work being done by the International Maize and Wheat Improvement Center in Mexico and the IRRI in the Philippines makes this unnecessary. In order to fully capitalize regionally on the valuable results emanating from the IMWIC and the IRRI, it would, however, be highly desirable for the institute in Latin America to serve as the headquarters for a small group of corn and rice specialists, probably only one or two for each crop, who would work in close connection with IMWIC and the IRRI in extending these results, and doing the necessary adaptive research to do so, throughout Latin America.

"The crop improvement program activities previously mentioned are those recommended for the institute to concentrate on at the beginning. The development of proper cropping patterns or systems of rotation to overcome problems of soil management and fertility, diseases, insects, and weeds might make it highly desirable for the institute to give attention to a few other crops important to the tropics in the future. Needs, opportunities, and results should dictate the decisions in this connection. Crops, or categories of crops that are important, or potentially so, for the tropics are root crops such as cassava, yams, and sweet potatoes; vegetables; and tropical fruits as plantains and citrus fruits.

"The crop program would be conducted by an interdisciplinary team including geneticists - plant breeders, soil scientists, plant physiologists, plant protection and weed control specialists, agricultural economists, and engineers.

"Livestock work would concentrate on ruminant animals, with emphasis on the study and prevention of diseases; nutrition; forage production, utilization, and range management; genetics and reproduction; and the economics of various systems of husbandry under tropical conditions. This, too, would be an interdisciplinary effort.

.

"Much of the institute's work, particularly in adaptive research for the various ecological zones, would be carried on at cooperating indigenous institutions located throughout the Latin American tropics.

"In addition to its own research program, the institute would cooperate with national institutions in the region on problems of mutual interest; it would conduct part of its experimental work in collaboration with these; and it would maintain a bank of genetic materials for the major crops and perhaps breeding stock in animals which would be available to the cooperating stations. Ties with the other two major international institutes mentioned above, in the Philippines and Mexico, would assure the program an international scope, permit exchange of information and of scientists, and avoid duplication of work.

"The training program would be an essential component of the work of the institute. In collaboration with other North American and Latin centers and through direct cooperation with the National University and the University of Valle both formal academic and intern type training would be provided. In-service training as well as opportunities for study at the predoctoral and postdoctoral levels are proposed. The institute itself, however, would not become a degree-granting institution. It is expected, however, that the institute would become the locus for in-service, dissertation and postdoctoral research experience for young scientists and technicians."

CIAT has interpreted its mandate in the form of its bylaws as follows:

The Center will have the rights and obligations to carry out the following activities:

1. To develop and demonstrate production systems for specific crops and animals in specific environments.

2. To develop information and practices for use in bringing into economical production specific lowland areas not presently developed or fully utilized.
3. To develop and demonstrate effective techniques and strategies for the rapid spread and adoption of improved varieties and agricultural practices.
4. To help national institutions to develop staffs, programs, and facilities so that these may handle more effectively present and future research and educational tasks.
5. To provide an information center to process and exchange data and references relevant to the agricultural and economic development of the lowland tropics.
6. To provide a facility to collect, preserve, supply, and exchange plant and animal germ plasm.
7. To provide opportunities for the further training and development of professionals and non-professionals in agriculture at CIAT and elsewhere.
8. To participate in such other related activities as directed by the Board of Trustees.

In its studies, CIAT's ~~present~~ operational activities are directed away from examining CIAT's operational philosophy in the activities it carries out to achieve its objectives, four different areas of major emphasis can be discerned, as follows.

A. Commodity-oriented programs

These include the food crops for consumption and sale of major importance to concern for the Latin American lowland tropics. Two different levels of activity exist -

- (1) a relatively low level of manpower input for corn and rice, where CIAT assumes the responsibility on behalf of CIMMYT and IRRI and with their cooperation, of acting as a regional relay station for the local adaptation and dissemination of CIMMYT and IRRI based genetic materials, and

(2) a major attack on crop improvement in cassava and field beans (*Phaseolus vulgaris*), where CIAT has assumed primary responsibility for an in-depth program of genetic improvement and agronomic development of these crops, limited in general to the Andean region in the case of beans with obvious spillover for other countries of the world where beans are grown.

B. Development Program for the Lowland Tropics

In this area CIAT is concentrating a major effort in finding efficient ways of utilizing the vast land resources of the llanos of Colombia and the Campo Cerrado of Brazil, which represent a badly under-utilized land resource and which could on a global scale, with appropriate management, add very significantly (i.e. more than 100 million hectares) to the world's productive capacity. These lands are grazing lands, and the main thrust of CIAT's program is the development of beef production first through rangeland improvement by legumes and grasses, and by improvement in health and the control of diseases.

C. Rural Development and the Small Farmer

Agricultural development and the improvement of rural life in the lowland tropics largely depends on improving the productive capacity and the way of life of the small farmer, who may not be far from the subsistence level. These are the producers engaged in multi-cropping for instance -- the system by which 75% of the beans in Central America, and 90% in Colombia are produced.

Similarly 80-90% of the hogs produced are owned by small farmers, who have perhaps two sows. ^{It is essential to} ~~An understanding of~~ not only the production problems these farmers have, but what controls their acceptance, rejection, or rate of adoption of new technology. ^{Thus,} ~~is essential. It is from this point of~~ ^{not only} ~~view that~~ the swine program is used, to highlight solutions to nutritional, management and health problems of swine, but also to gather information on the socio-economic aspects of swine production. Similarly, the attention paid to the development of farming systems, and the proposals for the agricultural systems program are aimed largely at the small farmer close to the subsistence level.

D. Training

CIAT's training program is a major activity, on which very significant amounts of staff time, and both core and special project financing are involved. CIAT's philosophy for this work includes the training of people to transfer the new "package" of technology where this exists, as it does for rice and corn, for instance, and will almost certainly for beans and cassava, but in addition it has two other major components,

- (1) training the future trainers in the fundamentals and practices of either crop production or livestock production, to assist in increasing the effectiveness of national extension and development programs; and
- (2) assisting with the training of the future scientific and research leaders of the region to strengthen "institution building", and to help meet the enormous shortage of practically-trained research workers, the need for which was highlighted by Roberts and Hardin,

All of these programs include concentrated attention on the human and economic problems involved, as well as the scientific, technical and practical solutions.

The Research Program

CASSAVA

The cassava program, initiated in 1971, was given a strong base by the extensive germ plasm collection available at CIAT, of the Western hemisphere cassava material. Apparently only a few importations were made at the time cassava was introduced into Africa and Asia from South America, and consequently it would appear there is a narrow-genetic base for cassava everywhere except in its region of origin.

The cassava team, coordinated by Dr. James Cock, physiologist, is operating at a level of 18½ professional man-years, with 5½ of these being senior scientific staff. Exploratory work is proceeding rapidly, with forward programs depending on assessment of areas of promising pay-off. An important input into this assessment was provided by a cassava meeting in Cali in January 1972, which helped to set both general and specific objectives for the program. The specific technical objectives are -

- (1) to improve the present low yields - average world yields now are about 9 T/ha/yr (fresh) while it appears that on experimental trials 50 T/ha/yr could be achieved (with simple yield improvement by selection) using good agronomic practices.
- (2) to improve storage technology
- (3) to search for cassavas with zero HCN
- (4) to improve the nutritional value of cassava.

The 1971 field program was badly disrupted by an attack of cassava bacterial blight which destroyed the experimental material. By vigorous efforts, the disease has been wiped out at CIAT, and the germ plasm collection made blight-free by "indexing" -- i.e. getting disease free cuttings from the plant tips and rooting these under mist. The development of methods of rapid multiplication of planting material has greatly assisted recovery from the effects of the blight disaster. Methods have been worked out which can prevent similar attacks based on clean planting material, sanitation and rotation.

The germ plasm collection contains 2,000 accessions, and represents only part of the material undoubtedly available.

With respect to yielding ability, attention is being focussed on aspects including plant type ("plant architecture"), leaf retention (the avoidance of leaf drop), planting, spacing and density (3-10,000 plants/ha is a preliminary optimum), weed control (hand weeding at 30 and 60 days after planting is apparently sufficient, herbicides are useful) and fertilizer response.

In attacking the disease problem, it appears that a high level of resistance to bacterial blight exists in some varieties, for African mosaic, some resistant varieties are known; and to "super-elongation", a potentially very serious fungal (*Taphrina*?) disease identified for the first time by the team, striking varietal differences in resistance exist. For *Cercospora* leaf-spot inoculation methods are being designed to permit development of a screening technique.

Large varietal differences in resistance to thrips exist, these are positive indications of the possibility of resistance to shoot-fly and with respect to spider-mites, the preliminary observations encourage the team to consider possibilities for development of resistant varieties. There are no indications of varietal differences in resistance to the horn worm Errinnys ello but fortunately it can be easily controlled with insecticides, and biological control by predators is generally efficient.

The storage problem is being attacked in two ways. A method has been devised (or re-discovered) of storing fresh roots for several weeks by surrounding the pile with straw in earth covered "clamps" -- this has very important economic implications for the small producer in giving him more flexibility in dealing with buyers. A study of the factors of importance in drying cassava has demonstrated that long sticks with square cross section permit better air circulation than the traditional flat chips, and drying has been found to be correlated with wind speed rather than temperature.

Screening of the germ plasm collection will be completed by July 1973 for a zero HCN strain of cassava. However testing can only be completed by the survey of inbred lines. One such variety has been reported from Indonesia but has been lost. It is recognized that there is a possible hazard in selecting for low HCN or sweet strains, in that less care in worrying about cyanide may make cassava-eating populations ~~an~~ more susceptible to accidental or low level toxicity. A study by the animal science group on rats (and now in progress with swine) has indicated no evidence of goitre or ataxic neuropathy even with high levels of HCN in the cassava diets,

providing the diet is sufficiently high in the sulfur-containing amino acids.

While the variety Llavera had received a lot of attention because of its high nitrogen content, and had stimulated some interest because it was thought that this reflected a higher protein content, and could therefore be used as the basis for improving the nutritive value of cassava.

NT a
Sulphur

CIAT's Advisory Committee on Cassava has recommended that work be concentrated on raising the yields of carbohydrate, but that if in the ~~course~~ ^{course} of the work on yield improvement, lines appear which do in fact have significantly superior protein contents, these ~~will~~ ^{should} be exploited at that time.

In recognition of the low level of protein CIAT is cooperating with a Canadian university with the object of adding microbial protein to cassava through fermentation with suitable sources of inorganic nitrogen.

Tests in the Llanos demonstrated that some varieties had tolerance to low pH and high soluble aluminum, and did not apparently require large lime amendments. This adaptation and the demonstrated ability of the crop to grow on soils marginal for other crops re-inforces the appreciation of its role and possibilities for the less favourable parts of the low tropics.

Field Beans (Phaseolus vulgaris)

~~While~~ CIAT's field bean program began in 1970, ^{and} it became a major activity when CIAT undertook in 1972 primary responsibility for a bean improvement program for the Andean region. While the work on developing improved varieties will be aimed at this particular region, there will undoubtedly

be a spin-off for other areas where the ecological conditions and the limits of adaptation of the varieties permit.

Field beans are primarily a small farmers crop in Latin America -- in Central America approximately 75% of bean production is in multi-cropping systems with corn, while in Colombia this is estimated to be 90%. While there has been much varietal and quality improvement work done, it appears there has been no major improvement of the potential yielding ability of field beans in modern times, and while the problems are imposing, the odds are highly in favour of achieving significant success.

CIAT began this program with considerable experience in field beans and other grain legumes. About 2,000 varieties with a range of resistance to a number of pests and diseases was present at ICA in Colombia. Introductions from the USDA made 3700 accessions available to the program. The germ-plasm bank has about 7000 accessions at present, with perhaps another 3000 cultivars to be added, and perhaps a further 2000 that could be collected from farmers' fields in different parts of the region. Arrangements are being explored to maintain a duplicate of the CIAT germ-plasm bank of beans in the USDA facilities at Fort Collins, Colorado.

Work has already begun on the testing and observation of the germ-plasm collection for 23 different characters. This checking is being carried out at 4 locations representing 4 different ecological conditions, 3 in Colombia and one in Ecuador. ~~It is proposed that~~ The lines having desirable characteristics will be involved in a program of hybridization and multiplication, and after mass selection, ^{it is expected that} three or four populations with adaptations for different elevations will ultimately be available for distribution to national bean breeding programs, which will be part of the

regional cooperative bean breeding network.

The program already has three trainees in residence, and has cooperative programs underway with Cambridge, Cornell and Michigan State Universities.

Beans, being legumes, have their nitrogen metabolism controlled by the effectiveness of the nodule bacteria, controlled in turn by the effectiveness of the inoculant used. CIAT is the only research institute involved in Rhizobium work between Mexico and Chile, and must concentrate on this aspect of the bean work. At present 400 different strains of Rhizobium are in the CIAT collection, and they are being screened against each bean variety of interest. There are enormous differences in the effectiveness of the different Rhizobium strains, and by the end of 1974, it is anticipated that strain recommendations can be made for each variety. Major differences have also been found in the persistence of the cultures in different peats tested, for purposes of shipping and transportation. Rhizobium has a great sensitivity to acid soils, and it has been demonstrated that various seed coatings such as limestone or rock phosphate are effective in promoting inoculation in strongly acid soils.

At present the microbiology team is considering how CIAT might best either stimulate or participate in the production for commercial distribution of Rhizobium strains in the region.

With regard to insect pests, there are marked varietal differences in resistance (tolerance?) to leaf hoppers, and the germ plasm is being screened to identify the resistant types. There is apparently some correlation between apparent resistance to leaf hoppers and the pubescence (hairiness) of the leaves. There is biological resistance to spider mites, and the

resistant materials are being identified by screening to provide suitable sources for the future breeding programs.

In the tropics beans suffer from more than 250 diseases, in contrast to about 50 in temperate regions. The most important diseases in the tropics are the rusts, bacterial blight, the virus diseases and mosaics, and root rots. A new disease, web blight, has recently been identified as a potentially serious menace at lower altitudes -- fortunately resistant varieties exist. Screening is proceeding for all major diseases, in a search for sources of horizontal resistance (as contrasted with vertical or single gene resistance, which may not be effective against new races of the pathogen). Of 1300 varieties screened for resistance to the local rusts, 400 proved to have either major or significant degrees of resistance, while of 200 screened for bacterial blight, 58 were more or less resistant. The screening for resistance is being carried on at a number of locations, in a number of different countries, to identify material resistant to the widest possible range of the various pathogens.

Initial screening of varieties for tolerance to the high soil acidity (and low calcium levels) of the soils of the llanos has established that there are major varietal differences, and that types tolerant of low soil ph, not requiring large amendments of lime, do exist, and presumably this kind of adaptation could be bred into new bean populations.

The bean team is pursuing its objectives vigorously, and in spite of the short period in which they have been active, and the fact that the team is still (March '73) being assembled, their achievements are impressive and promising.

Maize

While CIMMYT has the world-wide responsibility within the Institute system for maize, CIAT acts as CIMMYT's regional relay station for the Andean region, and at CIAT, both selection within CIMMYT populations and crossing with types having characteristics desirable for the region are carried on to produce materials even more useful to the breeding programs of the Andean countries. Only one scientist is assigned solely to maize, with the remainder of the inter-disciplinary staff, totalling an additional 8 man-years for 1973, being involved only for part of their time with maize.

Boval up

In the past three seasons, approximately 200 different lines have been introduced for evaluation, of which 50 have been good enough to go into yield trials, of which in turn 5 have gone forward for increase to permit distribution to the various national maize improvement organizations to provide them with material either for multiplication for release as a new locally named variety, or to be incorporated into their national breeding programs. All of this material is screened for desirable physiological characters and disease resistance at locations in four different countries to maintain wide adaptation from the point of view of photoperiod and temperature effects, but also to confirm its satisfactory performance with the challenge of different races of pathogens.

The most exciting recent developments have involved the production of adapted high yielding disease resistant short plants, resistant to lodging (falling over) with high applications of nitrogen and consequent high yields. The incorporation of a gene from brachytic (branching) types of maize, which acts as a dwarfing gene, has effectively reduced plant height (and ear height) by a meter, making a plant which is physiologically and anatomically superior. Lines incorporating this characteristic will shortly be available to the national programs. Work is going forward on the incorporation of the hard-

endosperm-high-lysine material received from CIMMYT into these short lines, and this material looks very promising for the future.

A technique has been devised which is simple and rapid for preliminary screening of kernels which have the high lysine characteristic. It involves shaving off a piece of the endosperm, staining it, and examining it with a microscope to check the pattern of dye distribution to check the differential absorption of the dye.

Serious consideration is being given in the program to the agronomic characteristics of the maize plant which fits the standard small farmer cultivation practices in the Andean region, where beans and maize grow together in a multi-cropping system, with the maize supporting the beans -- tall plants with weak stalk strength are poorly adapted to such a system.

A newsletter on maize which appears periodically throughout the year has been an effective tool in encouraging communication and exchanging information in the region. It is part of a program which culminates in the report of an annual conference of maize scientists organized by CIAT.

The staffing of the maize unit is minimal, but it is regarded as satisfactory providing no major problem appears -- for example, the appearance of a new major insect pest would require the services of an entomologist, not now available to the program. Such an eventuality would require some new staff inputs, but whether from CIMMYT, reassignment of CIAT staff, or new staff would be a matter for discussion and agreement with CIMMYT.

The present high quality protein opaque-2 materials with soft endosperm have had limited acceptance by growers in the Andean region thus far, and wider acceptance awaits the distribution of the hard endosperm materials already in the breeding pipeline. Research on the value of this high quality protein maize for human diets has been centered in Colombia, and the CIAT staff is presently cooperating in a village demonstration which is aimed at measuring

the effect on public health of substituting high quality maize for normal maize in the diet. This involves an imaginative approach to involve the local maize merchants, who are an essential part of getting the maize into the consumers' homes.

Rice

This program is carried on in CIAT on IRRI's behalf, with the understanding that for Latin America IRRI works through CIAT, but will when necessary provide short-term back-stopping for its regional relay. In 1973 5½ man years are *being* devoted to rice, with the basic disciplines contributing on a part-time basis. This is considered to be adequate but minimal for the present program, but, if, as seems desirable, additional emphasis is to be given to upland rice, some difficult decisions will have to be made with respect to adding staff, or reducing the work on irrigated rice. The present program is well integrated into the Colombian ICA program, which assists in the rapid internationalization of CIAT's output of rice lines and breeding materials. The current season has many thousands of lines under test at CIAT and ICA facilities, which after preliminary evaluation *with the (?)* are reduced to relatively small numbers for testing and evaluation in regional international field trials. While CICA 4 (in Colombia) and other similar varieties, which have been selected to suit local conditions from IRRI's IR 22, have had very wide adoption by rice growers, in many Central and South American countries, they are seriously attacked by blast (*Pericularia oryzae*) and major emphasis has been given to a crossing program which is aimed at incorporating the generalized blast resistance carried by the varieties Colombia 1 and Tetep.

A method has been developed which will produce, under artificially induced high humidity, high infections of blast in areas where it doesn't occur, which enables the screening for blast to be conducted in separate nurseries, with a high level of control. As a result of the blast resistance work,

fifteen lines with good blast resistance are in the last stages of purification, and the first stages of increase, and have been distributed to 6 countries for testing and evaluation -- two of these fifteen show real promise, with wide adaptation, good agronomic characters, good cooking and milling quality and of course, blast resistance.

As a second part of the breeding program, crosses were made with ICA 10, resistant to hoja blanca disease, apparently through resistance to mechanical damage by the insect vector *Sogatodes orizicolus* to incorporate resistance to this disease into the new lines being developed. Work is continuing on lines in which improved cooking and milling quality has been incorporated. In the nurseries more than 22000 pedigree rows were evaluated in the past year for resistance to blast, hoja blanca and for cooking and milling quality as well as other factors. A new variety superior to CICA 4, which is less subject to loss by seed shattering, has a better grain type and is earlier, is about to be released in Colombia.

In agronomy trials, preliminary studies have demonstrated the superiority of the application of nitrogen sometime after planting rather than before. Another set of tests has been aimed at evaluating varieties for their ability to produce stubble or ratoon crops (i.e. by regrowth after the first harvest). The IRRI based varieties had this capacity but others of the varieties tested did not. A study has been made of the factors controlling the appearance of "aranjamiento" or orange-leaf disease caused by excessive availability and uptake of reduced ironⁱⁿ the soils, and water management and other practices are being worked out for its control. On highly acid soils of the llanos varieties have been identified which are adapted to these soils, and do not require large additions of lime in order to produce. Such material has obvious value as a source of genetic variation to build in adaptation to these conditions.

Stem borers have arisen as a problem, particular where rice is grown near sugarcane which acts

as an alternate host - fortunately, in most cases, biological control from natural predators is quite efficient, but in addition it appears that the borer (*Rupela* spp) shows definite preferences (or aversions) for particular varieties of rice, and some resistance can be conferred through the appropriate breeding materials.

Sheath blight is serious with some rice varieties in Colombia -- in a screening for resistance to the organism (*Corticium sasakii*) 63% of the 148 varieties planted were resistant.

Upland rice has become a matter of concern in the program -- 70% of the rice produced in Central and South America is upland rice, and in Brazil, it represents 90% of the almost 4 million hectares in rice. The main problems are associated with drought, and acid soils low in bases. Screening has begun of the IRRI-based varieties and local materials to detect varietal differences which could be used for incorporation into an upland rice improvement program. Obviously, with the staff available, increased emphasis on upland rice will have some effects on the program on irrigated rice, and some questions face the Board of Trustees on the relative emphasis to be given to the two versions of this crop.

Some work has been carried on with floating rice, aimed at the river estuaries of Brazil, Ecuador and Colombia, using crosses of the improved dwarf rices and traditional floating varieties. The best variety of this improved material will probably be released for distribution in 1973.

The rice program has had real success in the area, with varieties based on locally adapted selections of IR 22 (CICA4 Etc.) proving very successful under good management and yielding up to 5T/ha under farm conditions. Jamaica has increased its rice production from about 100 acres in ¹⁹⁷² to an anticipated 3-5000 acres in 1974, and the Dominican Republic has recently obtained 100 T of Avance 72 (IR22 selection) to replace the traditional varieties -- indications are that yields will be increased by 50-60%. In the countries with a longer

history of involvement, much of the rice area has been converted to the improved dwarfs, and real success has been obtained in gaining adoption of the new production technology to which these varieties respond so well.

Beef

While the tropical regions below 1000 m elevation in Latin America have half of the area's cattle, the industry is essentially stagnant, producing offtake at only 20-25% of the rate per animal unit (e.g. 7 years to market) ^{of production} ~~at what is produced~~ in more temperate regions. The program aims at (1) forage improvement for better nutrition and (2) improved animal health and disease control, these factors being assessed as of paramount importance in improving calving percentage and growth rate.

The beef program is responsible for about 34% of CIAT's budget, illustrating the high cost of work with grazing animals. The costs would be much higher were it not for the extensive assistance provided by ICA at its stations where cooperative programs operate. About 40% of the beef program is carried on in the Llanos, about 20% on the North Coast lowlands, about 20-30% at CIAT itself, and only about 5-10% in programs outside of Colombia primarily because of the high costs involved, and the problems associated with finding adequate out-station facilities and cooperative arrangements similar to those provided by Colombia. The location specific nature of the work makes the problems of arranging such out-stations ^{are} a troublesome matter for the program.

In the forage improvement program which began in 1967 the attack is based on improving the native savannah pasture, which is exceedingly low in protein (2-5%) and in Phosphorus (less than 0.10% in contrast to an acceptable 0.20%). The average gains are only 12 kg/ha/yr, since there is a loss in the dry season equivalent to 7 kg/ha/yr. Rotational grazing has not proven

profitable, but rotational burning (to produce 1 field of new growth per month) has promise, and gives weight gains rather than losses in the dry season. With better grasses (molasses grass - *melinis minutiflora*) 80-100 kg/ha/yr in liveweight gains have been achieved, and while the establishment costs are equivalent to \$23 U.S./ha for establishment ~~primarily~~ primarily to correct soil acidity and phosphorus deficiency, the increased offtake is worth \$25/yr, and the pasture will last for perhaps 15 years with adequate nitrogen fertilization. ~~at~~ However, the persistence of such a pasture under a regime involving periodic burning, which is a standard management tool, is suspect.

Since growth rates in cattle are dependent on protein intake, the legumes are very important keys to improving the protein level of the grazing lands. In CIAT's search for legumes adapted to the different situations, Stylo (*Stylosanthes guyanensis*) has been identified as one of the better adapted species -- 120 accessions of Stylo are being screened, and some strains have shown resistance to anthracnose, a serious and limiting disease. Grazing trials with mixtures of Stylo with both sown grasses and native pasture are underway to determine productivity and response to management in an attempt to lengthen the season of productive growth. Stylo has been easily established by direct seeding into the native pasture with phosphorus fertilization.

In the Animal Health Program, a staff of five are involved, supplemented by two (plus two due to arrive shortly) financed by Texas A & M University. Most of the program is devoted to beef, with about 10% of the effort on swine. In monitoring the incidence of breeding problems, and the unexplained abortion storms which occur, it has been established that there is a very low incidence of Brucellosis, and no indications of any effect from the three other usual breeding diseases. Granular vaginitis was identified in a very high proportion of the cattle, but is considered not likely to be

of importance. The Texas A & M team are concentrating on the tick-borne diseases babesiosis and paraplasmiasis, and in addition to the development of immunizing antigens from bovine blood, are searching for other sources. Epidemiological field trials are beginning to find out how best to use the protective antigens -- a problem complicated by the fact that there is no constant re-injection to bolster resistance, and that the antigen immunity is lost after a year, making it possible for catastrophic losses to occur when susceptible cattle are moved into infective areas. A beginning has been made on screening wildlife for diseases transmissible to cattle, but without definite results thus far. The Animal Health program covers all of these major diseases which are likely to be important, with the exception of foot and mouth disease (which is vigorously pursued in coordinated national programs.) The program is hampered somewhat by a shortage of entomologists to assist with work on the tick-vector particularly on the effect of improved pastures on the incidence of tick-borne diseases.

Swine

It is estimated that there are more than 100 million swine in Latin America, with 60 million of these in Brazil alone. 80-90% of these animals are on small subsistence farms, with the rest being produced commercially. CIAT's philosophy in its swine program is to apply technology to assist in solving the ~~social~~ problems of the small farmer, since the larger farmers are in general in a position to use the answers which are at hand, but the small farmer needs help. The problems are primarily associated with effective extension techniques, and with the socio-economic aspects, since the small farmer uses swine as a form of saving, for later sale, but not usually for his own consumption. Present production problems are primarily associated with deficiencies of plant protein, and the solutions all hinge on identifying good sources of plant protein in the tropics.

The typical small farmer with swine has one or two sows foraging ⁶ large, producing a litter of about 7, half of which survive to weaning, and due to poor nutrition, they will weigh about 50 kg after 15-18 months. The extraction rate (harvesting) on the small farm is only about 30-40%, while in normal commercial operations 160-170% is considered normal. It is obvious that these native swine have responded to selection pressure under poor nutrition. Improvement in swine productivity can have a tremendous impact on the lives of small farmers, but can only be achieved after mastering the feeding problems. In a village project, CIAT has demonstrated that with traditional feeding practices, the local pigs gained only 4 kg each in 56 days, with feeding costs for corn coming to Col \$18.80 per kg of gain, worth about Col \$9.00, while with an improved "package" of disease prevention and feeding practices gains averaged 26 kg for the same period, with feed costs at Col \$7.50 per pound of gain. The practicability of such systems depends on the availability of a reasonably cheap locally available protein source, and an adequate access to a market with adequate prices for the animals. Such situations are very local today, and depend on the chance availability of particular feeding stuffs, such as brewers' grains which is the basis for a project in Bolivia, and cottonseed meal, soybean meal, etc. in other particular locations. Work on cowpeas as a protein source suitable for local culture has been promising from the point of view of field production. The unprocessed cowpeas contain a factor inhibiting protein utilization, and studies on methods of overcoming this through cooking or other processing are continuing.

Feeding regimes have been worked out by CIAT for systems based on waste bananas, cassava, rice bran and polishings, sugar or molasses, and of course, the high-lysine high-protein opaque 2 maize, which has been demonstrated to be an adequate sole source of both energy and protein for most of the life-cycle. The likely release of opaque 2 lines with vitreous kernels

makes this avenue of swine development very promising indeed, and has
a
a real possibility for a breakthrough in swine production for the small
producer.

Agricultural Systems

The Agricultural Systems program being developed at CIAT has for its primary objective the study and improvement of the family farm, which too often is a subsistence farm. Some of these farms are single commodity farms as is the case with rice or beef, while some are multiple commodity farms, e.g. those for instance which may involve maize, beans and perhaps cassava, interplanted, with a swine production project as part of the farm unit. The rice group and the beef production team have for some years been involved in analyzing existing farm systems, and developing models and budgets for viable family operations. This work will continue, and will continue to be the responsibility of the individual commodity groups. What is being added in the Agricultural Systems program is the provision of an interdisciplinary team of not only the biological scientists but input from the social sciences, systems engineering, etc., to serve as a broader based consulting group for the commodity teams. In addition the systems group will carry primary responsibility for the multi-commodity farming systems. The general approach will be to analyze existing farms, to identify groups of "base line" farms for which data have been collected and analyzed, and after the identification of possible courses of action to increase productivity, the program would shift into an operational research stage, during which new technology would be introduced, monitored, and the reasons for adoption, rejection, success or failure identified.

The Agricultural Systems team proposed will be ^{drawn} composed almost entirely by ^{from} staff already available or positions previously approved, with the exception

of additional help in sociology and systems engineering.

Soils

Because of the importance of finding solutions to the problems of utilizing the soils of the Llanos, by both the identification of plant materials adapted to the acid base depleted soils, and by correcting nutrient deficiencies, the basic work on tropical soils has been separated into a specific program item.

In identifying acid-tolerant plant types which could be used as a source of germ plasm for crop improvement programs, a systematic screening program has been undertaken, and already acid-tolerant types of cassava, cowpeas, corn, rice and beans have been identified, which produce reasonably well with lime additions as low as 0.5T/ha as opposed to the 6T/ha required for less tolerant types.

In addition to these crops, screening has begun with peanuts, sorghum and plantain, because of their importance as food crops or livestock supplements and their place in the small farm enterprise, even with beef, for the production of the family's food supplies.

In addition to calcium, deficiencies of zinc and boron deficiencies have been demonstrated, and corrected with appropriate soil amendments.

A program of tillage studies has been undertaken which indicates that minimum or zero tillage has potentially great advantages for reducing labour inputs, time required for replanting, evaporation losses, and soil erosion, providing adequate weed control can be achieved by herbicides or other methods at a reasonable cost. For the small farmer, this has major implications since even herbicides may be more easily obtainable than time and adequate power for traditional "good" cultivation.

Economics

The agricultural economics program aims at

- (1) helping to identify factors limiting the production of commodities in CIAT's program, and
- (2) assessing the economic and social implications of various ways of eliminating or reducing these inhibiting factors in order to
 - (a) assist in guiding the allocation of research and training efforts, and
 - (b) assess the probable consequences of alternative private investment and public policies with respect to food, agriculture and human welfare.

During the past year, a survey of 487 North Coast beef cattle producers was made -- the data indicate that 58% of the farms have less than 200 ha, while only 14% are larger than 500 ha; the smaller farms have an unexpectedly high (1/3) proportion of their total revenue from milk; cow-calf operations are the norm, with fattening as the main operation on a relatively small number; net returns/ha of pasture are inversely related to farm size; calving rate decreases as farm size increases.

An in-depth study of a small number of ranches is continuing, with daily information collection -- the program is expected to supply valuable and very reliable information.

With Ford Foundation assistance, a regional study on beef production is being undertaken to consolidate basic information on the status of the industry and on public policies such as taxation, credit, land tenure, etc. directly relating to development. The study is expected to provide guidelines on the nature of necessary future studies on beef.

On swine, work continues on the economic valuation of different feedstuffs, initially on rice, opaque 2 and common maize, with the development of a model

which permits economic analysis of the feasibility of substitutions.

Information is being compiled on the economics of existing and recommended production and marketing systems, to identify bottlenecks, and to assess feasibility under specific conditions. A study in Peru has been undertaken with respect to the feasibility of swine production in the rain forest region, and has identified transportation costs and risks involved in storage and transport as major problems.

With Cassava, 330 cassava producers have been surveyed in Colombia to describe production practices, and to estimate costs of production and labour use, as a preliminary to extending the study to other countries. A study of potential demand for cassava for human, livestock and industrial uses is being carried on cooperatively with the University of Guelph in Canada.

A study of the possible substitution of cassava flour for part of the wheat flour in bread has indicated that while it is technically feasible, it is economically unsound. A survey of world production and yield trends forecasts an increase in area cropped of about 200,000 ha/yr, yielding an additional 2 million tons annually.

With beans and the grain legumes, studies are beginning on the present and future demand and the possibilities for export outside of the Latin America region. Socio-economic factors that may contribute to the current low yields are also being studied.

With maize studies have been made on economic factors limiting maize production, price and consumption elasticity as compared to other food crops as production or income increases, and on the feasibility of partial substitution of opaque 2 maize flour in bread. Collaborative studies with programs in the various countries of the region are planned to stimulate both local involvement and international cooperation.

The effective participation of the economics staff in the biological and technical research programs in CIAT is having a beneficial effect on the efficiency of the program, and on its orientation to the solution of human as well as technical problems, to make sure that research results can be and are utilized for the benefit of both the small farmers and the consumers.

Training

CIAT has been concerned from its beginning with the shortage in the region of good agricultural scientists with good practical training. Training has been a major program segment, and the production of training personnel has been as important a part of CIAT's output as have new varieties or improved production practices. The function of the training program is primarily to "train the trainers" -- to staff national programs which will produce the trainees for development programs in their own countries. Progress in this direction is slow, but encouraging, and it is obviously necessary to continue to demonstrate the virtues of such training programs as ~~an~~ objectives for national programs.

The case of CIAT's training operations are the courses for production specialists - livestock production specialists and crop production specialists, attending for periods of 12 months, with at least half of their work in the field, either on ranches, or the research plots, and with a thorough grounding in both the theoretical and practical aspects of the various disciplines of their specialties. In 1972, 17 livestock production specialists from 6 different countries were in training, while the crop production course had 14 trainees also from 6 different countries, both courses being funded in part by the Inter-American Development Bank.

In addition to these specialist training courses, CIAT had 58 ~~as~~ post-graduate in-service trainees in 14 different aspects of research (including 12 on rice), 15 ~~as~~ research scholars or fellows working for advanced

degrees on problems of vital interest to CIAT in 12 different fields, and 16 special trainees (students pursuing courses of less than 3 months) in 13 different fields, for a total of 118 trainees from 20 different countries. Not included in these figures are a number of training courses lasting less than three months, such as the 30 day course in rice production at Cali for 22 research and extension agronomists from Brazil -- such courses are vital in outreach development.

In encouraging national institutions to establish field oriented training programs as part of their educational system, a major breakthrough is in sight with three Colombian universities ~~are~~ considering such programs as part of their final (fifth) year undergraduate curricula. In Ecuador and the Dominican Republic, conditions are encouraging for a concentrated effort in the development of national production specialist programs and 15 of the 25 trainees selected for the next crop production training course will be from these two countries.

Seminars

During the past year several major seminars were organized, with the object of using international expertise and cooperation to help explore and define CIAT's research objectives. The seminar on Cassava was held in January, and involved those specialists from all over the world who could contribute. The present direction of the Cassava program is the direct result of that seminar.

A similar seminar on beans and other grain legumes was held in February '73, and included 150 scientists from 20 countries including representation from Africa, who examined the present situation concerning production utilization and research gaps. The seminar examined the ways in which CIAT as an international institute could bolster national programs, and established machinery by which an advisory committee would be formed to assess progress periodically on both national and international levels. One important

result of the meeting was the proposal for more emphasis on physiology (to attempt to explain and improve the relatively poor productive capacity of the grain legumes) and in consequence such a post is being considered in CIAT for 1974.

Two swine seminars were held during the year, one in May in San Jose, Costa Rica, attended by 135 teaching, research and extension personnel concerned with problems of swine production. The second, on swine production systems, held in Cali in September 1972 attracted 85 leading swine scientists to discuss the economics and nutritional aspects of swine production in the lowlands. Both seminars were very effective in forming continuing relationships for CIAT's swine outreach program.

With the completion of CIAT's physical facilities, an ambitious program of conferences and symposia is being planned for the coming year, to facilitate the exchange of information on new production possibilities on which the countries of the region can base development plans. Including in the staffing for these meetings are two simultaneous interpreters who will also serve as translators, to assist CIAT in the problems of disseminating material in both Spanish and English.

CIAT, for purposes of clarity, is presenting its program (and budget) in terms of crops and commodities (e.g. rice, beef, etc.) rather than in terms of disciplines (e.g. animal science, plant pathology, etc.) to make the presentation fit in fact what has been traditional practices, but with provisos that sharing of a professional's effort will not be done among too many projects. This is causing some problems (i.e. can the maize program operate satisfactorily without the input of a specialist/ⁱⁿ either plant pathology or entomology?) -- these problems are being faced realistically, with the assurance that continuing changes will be made

as necessary. What is obvious is that^{as}/CIAT's relatively young programs develop, and as production answers and new plant materials appear, and as these are translated into outreach programs (as has already been done successfully with rice) additions will have to be made to the staffing of programs where reinforcement will have a high payoff.

Several problems stimulate vigorous discussion at CIAT, including the following: With CIAT's limited budget should the concentration of the beef research be on the Colombian North Coast lowlands where it is more convenient and cheaper to operate, or at Carimagua in the llanos of the ~~Amaz~~ Amazon valley, where there are more likely direct applications to the vast Campo Coorado of Brazil? At present, there is about twice the expenditure at Carimagua in comparison to that at the North Coast.

In view of the importance of milk as a source of revenue in the smaller North Coast beef herds, should CIAT be involved with milk as part of its cattle program? In view of the need for adequate and early knowledge of the development of new races of plant diseases so that plant breeders can meet the new threats in time, what role should CIAT play in Latin America to develop a network of plant protection reporting stations, and a plant disease reporting bulletin? Beans are not likely to be nearly as successful at low tropical altitudes as at intermediate levels -- should CIAT involve itself in a grain legume program for the low altitude tropics? And if so, what legumes? Such questions present problems at CIAT's present stage of scientific (and budget) development but the fact that they are asked indicates the continuous need to re-examine priorities, and to match ambitions and resources, both human and financial, without diluting the effort on the basic programs and objectives for which CIAT was established.

CIAT is a young insitute, with a complex and difficult program which is still developing. Staff are being added carefully and only when needed,

92a.

OUTGOING WIRE

TO: BYRNES

DATE: MAY 8, 1973

CINATROP

CLASS OF
SERVICE: LT

CALI

111

COUNTRY: COLOMBIA

TEXT:
Cable No.:

WORLD BANK GROUP DOES NOT INTEND OBSERVE YOUR BOARD MEETING
BUT THANKS YOUR SEVERAL INVITATIONS TO STAFF

REGARDS

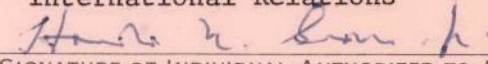
HAROLD GRAVES

NOT TO BE TRANSMITTED

AUTHORIZED BY:

NAME Harold N. Graves, Jr.

DEPT. International Relations

SIGNATURE 
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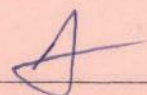
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APARTADO AEREO 67-13
CABLES: CINATROP
CALI - COLOMBIA

CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

May 2nd., 1973

MAY 9 REC'D

92a.

Mr. Robert S. McNamara
President
International Bank for Reconstruction
and Development
International Development Association
Washington, D.C. 20433
U.S.A.

Dear Mr. McNamara:

All of us regret very much that we shall not have the pleasure of your presence at the inauguration of CIAT's facilities next October. I quite understand your difficulty with conflict of dates.

I trust I may have the pleasure of seeing you at the July meeting of the Consultative Group in Washington.

Sincerely,

Francisco de Sola

FdeS/elm

1973 MAY 15 11:15 AM



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Fdes/elm

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92a

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

INTERNATIONAL DEVELOPMENT ASSOCIATION

OFFICE MEMORANDUM

TO: Mr. Montague Yudelman

DATE: April 25, 1973

FROM: James M. Fransen

SUBJECT: COLOMBIA-Centro Internacional de Agricultura Tropical (CIAT)
Steering Committee for Seminar on Beef Production in Lowland
Tropics of Latin America
Back-to-Office and Full Report

1. Under terms of reference dated April 5, 1973, I visited Colombia from April 9 through 16 and participated on the above Steering Committee.

Beef Production Seminar

2. The theme of the Seminar, now scheduled for February 18-21, 1974, is "Tropical America's Potential for Increasing Beef Production." The keynote address is to highlight the beef cattle industry as an instrument of development in Latin America and the Seminar would focus on biological and non-biological considerations as well as the role of development projects in increasing beef production.

3. CIAT invited the Bank to present a case study on a livestock development project from a country in the lowland tropics of Latin America which would illustrate the role of development projects in applying technology and show how appropriate sector policy enhances development. They also would like the presentation to bring in the role of international beef trade and its effect on domestic slaughtering, processing and marketing. This is a worthwhile undertaking and I recommend that we accept the invitation. Following further consultations with CPS and Regional Office staff, I suggest that we promptly confirm to Ned Raun of CIAT our intent to participate in the Seminar.

Dedication of CIAT

4. The dedication of CIAT headquarters is scheduled for October 12-13, 1973. CIAT management would like a World Bank official, widely recognized in international development, to present the principal address and were disappointed when Mr. McNamara was unable to accept their invitation. They are considering alternative speakers and will keep us informed.

CIAT and Brazil

5. Colin McClung, Deputy Director General, and Ned Raun, Director Animal Science Programs, reviewed with me their interest in more direct research activities in Brazil. Both believe that CIAT must eventually conduct part of its core research activities in Brazil if it is to fully cover the more important regions in the lowland tropics of Latin America. Although they believe that CIAT's overall interest in more direct research involvement in Brazil should include beef, beans, upland rice and possibly cassava, both emphasized beef cattle research in the discussion.

April 25, 1973

6. CIAT currently has authorization from its Board to spend up to US\$50,000 on outreach activities in Brazil. They plan to initiate beef cattle work with the funding available but consider that a more intensive and long-term arrangement is necessary. This would require long-term funding and a more formal arrangement with EMBRAPA, the new corporation responsible for Brazilian agricultural research activities. They have had discussions with the Director of EMBRAPA and other Brazilian authorities and are hopeful that they will soon initiate beef outreach activities in Brazil in association with EMBRAPA.

7. In Bank agricultural research activities we encourage links between country research programs and international center activities. The linkage suggested for CIAT and EMBRAPA is ideal and should be supported as appropriate.

JMFransen:go

cc: Messrs. Baum, Lee, Burney, Raizen, Engelmann, van der Tak, Graves, McIvor, Stoops, Darnell, Knox, Calika, Wiese, Zinman, Goffin, Sutherland and Bowron.

✓ Official Files.

April 23, 1973
For discussion

Caryl -

CIAT -

Our files

lower

PROCEDURES FOR CIAT OUTREACH PROGRAMS

The CIAT policy in establishing cooperative programs in other countries (outreach) should be as simple as possible but with enough in writing so that misunderstanding will be avoided. Particular attention should be given to features which might appear to favor one country or one organization over another. Hence, general guide lines are desirable.

Documentation should be informative of the nature of the work, avoiding the legalistic as much as possible. In fact, it is recognized that goodwill and clear understanding are essential to the success of a project, but a legally binding agreement may in itself be of little value.

Governments may, of course, wish to follow a more legalistic route and, if so, CIAT would not object. In fact, in more complex agreements, particularly where CIAT personnel are stationed in the country, or where CIAT may wish to retain ownership of equipment or other property, a firm legal document is indicated. Even if the Congress must ratify an agreement as appears to be the case in Guatemala, the time necessary to finalize an agreement may be well worthwhile.

The range of activities that CIAT is or may be involved in is so great that no one format would serve as a basis for understanding. Local requirements are so different and the work itself so variable that a "standard" agreement would not appear feasible. However, all agreements should have certain features in common. Some points to be standardized are as follows:

- (1) When CIAT personnel are in residence in a country to work on project matters, they should be accorded whatever privileges are granted to UN, FAO or other technical missions. These provide for exemption from income tax, duty free importations of personal effects and similar advantages. Details have usually been worked out with such agencies and the terms can be examined ahead of time. If a particular country wishes to up-grade terms to approximate those of diplomatic missions, this would normally be quite acceptable, but CIAT's stance would be to presume recognition as an international technical assistance agency.
- (2) Procedures should be described wherein CIAT would nominate staff to be posted in the host country and official approval would be given. The nature of the duties of each post should be described in writing at this point.
- (3) CIAT would usually be a managing agency for a grant from a donor agency or country and funds would be directed towards specific ends in the host country. CIAT would expect that the host country would either exempt imported supplies and equipment from payment of duties or the host country would pay the duties. That is, project funds would not be used for payment of taxes and duties. This would include non-payment of transportation taxes for official travel, including travel of CIAT staff and dependents when going to and from post or on officially sanctioned trips in the host country.

- (4) Basic agreements would specify the length of time the agreement would be in force and would provide means for renewal if mutually agreeable. Provision for early termination should be made in the agreement, but notification should be given in writing well ahead of actual termination.
- (5) CIAT should specify in each agreement that its participation was dependent upon availability of funds. Lack of funding should be recognized as one possible reason why CIAT might have to terminate an agreement ahead of time.
- (6) The host country would normally be expected to provide office space, locally employed personnel and, in some instances, vehicles for official use. CIAT would not expect the local government to provide salaries, housing, transportation, or other perquisites and facilities for CIAT staff. Things which the host country would be expected to provide would be described in the basic agreement in the same degree of detail used in describing what CIAT would provide.

The above features are principally ones which should be given in an "umbrella" agreement signed by the Director General of CIAT and an appropriate official of the host country, usually the Minister of Agriculture of his designate. Frequently, this general agreement would have to be supplemented by letters of understanding on specific assignments or specific research or training projects. These could include many other details such as specific budgets, work on project outlines, statements on how publications would be handled etc.

It frequently will be desirable to undertake small, limited-scope projects which involve contributions both technical and physical from CIAT and a cooperating agency such as a university or local experiment station. In fact, such cooperation may precede the more comprehensive type of collaboration. These arrangements should be specific as to who does what and when, but they should not be blown up in importance. The local Director, Rector, or other head of agency and the Director General of CIAT would normally be the parties to such an agreement. Depending upon circumstance, the Minister of Agriculture or Education would be given a copy for information but usually would not need to sign it. In most cases the CIAT "Director of Outreach" or the Director General would discuss the general procedures with the Minister and would make sure that he was aware of CIAT's general objectives and of the fact that cooperative projects of limited scope were under discussion. His guidance would be sought on protocol.

CIAT staff should be encouraged to develop ideas for outreach or cooperative work, but they should not make firm commitments, expressed or implied. Proposals should be discussed with CIAT's Director of Outreach and with the cooperative agency as they are being developed. In this regard the Director of Outreach should be relieved of most routine duties at CIAT and be free to travel to cooperating countries on a regular basis. He should establish and maintain contact with governments and should have major responsibility for explaining CIAT's program to them.

April 23, 1973
For discussion

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AN ECONOMIC ANALYSIS OF ALTERNATIVE MEANS TO MEET
AIR TRANSPORTATION NEEDS OF CIAT PERSONNEL WITHIN COLOMBIA

Prepared by Per Pinstруп-Andersen for the Meeting of the Executive
Committee of the Board of Trustess of CIAT. April 24-26, 1973

Program of Agricultural Economics
Centro Internacional de Agricultura Tropical
Cali, Colombia
April, 1973

This analysis was made in accordance with the request of the Executive Committee of the CIAT Board of Trustees at its meeting on March 2-3, 1973.

The analysis focuses on estimating the costs associated with alternative ways to meet internal air transportation needs. Other factors such as safety and flexibility are considered but no attempts are made to quantify the impact of these factors on relative costs and benefits.

The report includes an analysis of the travel pattern and costs during 1972, followed by a description of various alternatives to present arrangements. Then, the costs of alternative means are estimated and compared to present costs and the report terminates with a short discussion of the impact of alternative means on other factors such as safety and flexibility.

Travel patterns and costs 1972

Present internal travel needs are met through regular service of commercial airlines primarily Avianca wherever available and an aircraft chartered by CIAT between Bogotá and Carimagua.

Total cost of travel between Cali and Bogotá, Medellín and Montería during 1972 was estimated at approximately U.S.\$21,000 (Table 1). The cost of the charter plane Bogotá-Carimagua was approximately U.S.\$40,000 of which ICA was charged U.S.\$15,000. Hence total travel cost to CIAT between Cali and Bogotá, Medellín, Montería and Carimagua was approximately U.S.\$60,000 of which ICA pays U.S.\$15,000.

The CIAT personnel made approximately 450 round trips Cali-Bogotá, 91 Cali-Montería and 24 Cali-Medellín during 1972 (Table 1). The charter plane to Carimagua which normally flies twice a week (Tuesday and Thursday) carried 450 passengers (round trip).

There is no apparent trend in the travel over months except for low travel activities during December and January (Figures 1, 2, 3, 4). While considerable fluctuation among months was found in the travel to Medellín and Montería, the Bogotá travel showed no large monthly fluctuations. A very strong weekly fluctuation was found in the Bogotá, Medellín and Montería travel (Figures 5, 6, 7, 8). As might be expected, departure from Cali takes place primarily in the beginning of the week. The return from Montería takes place primarily towards the end of the week while Thursday shows the largest number of returns from Bogotá (primarily originating in Carimagua). Figures 9 and 10 show the monthly travel to and from Carimagua by ICA and CIAT personnel. Most of this travel took place on the charter plane scheduled for Tuesday and Thursday.

The duration of trips to Bogotá and Montería is shown in Figures 11 and 12. Three days, including travel time, is the most frequent duration of trips both to Montería and Bogotá. One and two-day trips to Bogotá were found to be very frequent as were four-day trips to Montería.

Various staff members have expressed the need for an air transportation service that would allow for a one-day visit to Montería and Carimagua. Since such service was not available during 1972, the data obtained do not provide information on this issue.

On the basis of the information obtained, we may conclude that the demand for air transportation to Montería is largest on Tuesdays and from Montería on Fridays and Saturdays. The demand for air transportation to Bogotá is largest on Mondays and Thursdays while no strong preference was found among week days with respect to return trips from Bogotá. It is not possible to predict the preferred week days for travel to Carimagua on the basis of the data available since transportation was available only Tuesdays and Thursdays. It is expected, however, that these days were selected on the basis of the preferences of the personnel that uses the services most frequently.

The average weekly demand for air transportation during 1972 was approximately 9 seats round trip between Cali and Bogotá, 2 between Cali and Montería and 9 between Bogotá and Carimagua, the latter including ICA personnel. Considering recent staff expansions and recent and expected increases in research and training activities in Montería and Carimagua we may expect a considerable increase in the demand for air transportation within Colombia.

Based on the above findings it appears that most of the needs for air transportation within Colombia could be met through the use of a 7-9 passenger aircraft carrying out two weekly flights between Cali and Montería with stop in Medellín if needed and two weekly flights Cali-Bogotá-Carimagua. Most needs for special flights, e.g. transportation of special groups, could probably be met with the same aircraft.

A suggested flight schedule is shown below:

<u>Day</u>	<u>Dept.</u>	<u>Arrival</u>	
Monday/Thursday	7:00 a.m.	8:00 a.m.	Cali-Bogotá
" "	8:15 a.m.	9:15 a.m.	Bogotá-Carimagua
" "	4:00 p.m.	5:00 p.m.	Carimagua-Bogotá
" "	5:15 p.m.	6:15 p.m.	Bogotá-Cali
Tuesday/Friday	7:00 a.m.	9:30 a.m.	Cali-Montería ^{1/}
" "	4:00 p.m.	6:30 p.m.	Montería-Cali ^{1/}
Wednesday	7:00 a.m.	8:00 a.m.	Cali-Bogotá ^{2/}
"	5:15 p.m.	6:15 p.m.	Bogotá-Cali ^{2/}
Saturday	Special trips as needed		

^{1/} Stop at Medellín, if needed.

^{2/} This flight may be used to obtain maintenance in Bogotá or it may be replaced by occasional needs (special flights).

Total flying time associated with this schedule would depend on the type of aircraft but would be approximately 20 hours/week or 87 hours/month for a small twin-engine aircraft not including special trips.

The above schedule allows for two one-day trips and one four-day trip weekly to Montería, Carimagua and Medellín and a variety of combinations for trips to Bogotá.

Alternative means of air transportation: availability and costs

Basically two alternatives to present arrangements are open to CIAT:
(1) Leasing or chartering and (2) Purchase.

The costs associated with each of these alternatives depend on the type of plane needed. Recommendations concerning the brand of airplane best suited for CIAT are beyond the scope of this analysis. It is necessary, however, to establish certain characteristics of the planes to be analyzed in order to carry out cost estimates. The four characteristics to be dealt with in this analysis are: (1) Passenger and freight capacity of plane; (2) Service ceiling; (3) Type of engine, and (4) Pressurized or non-pressurized cabin. Only twin engine aircrafts will be considered.

(1) Passenger and freight capacity: Based on the above mentioned demand for air transportation during 1972 and given the recent staff expansions and recent and expected increases in research and training activities in Montería and Carimagua it appears that the most convenient capacity would be 7-9 passengers where part of the passenger space could be used for freight if needed. This is assuming two weekly services to Montería, Bogotá and Carimagua as specified above.

(2) Service Ceiling: Given the topography and climatical conditions, the service ceiling may greatly influence the safety of the transportation. A large number of small twin engine commercial airplanes in Colombia have a single-engine service ceiling of about 11,000 feet. Although the experts interviewed do not agree entirely on this issue, it appears that safety is considerably improved under Colombian conditions if the single-engine service ceiling is lifted to at least 14,000 feet.

(3) Type of engine: Experts agree that turboprop engines are safer than piston engines. However, it is beyond the scope and capacity of this analysis to evaluate the difference in safety due to type of engine. According to available information, no small turboprop plane is presently available in Colombia for leasing or charter arrangement.

(4) Pressurization: The comfort of the passengers is greatly enhanced if the cabin is pressurized under high altitude flying. However, according to available information, there are no small airplane with pressurized cabin available in Colombia for leasing or charter arrangements.

Leasing and charter arrangements

Two companies have offered to place small aircrafts at the disposition of CIAT on a full time basis. TANA (Taxi Aéreo Nacional Ltda.) offers a Beech Super 18 (8 passengers, single engine service ceiling: 10-11,000 feet,

piston engine, non-pressurized) including complete maintenance and service for Col.\$200.000/month assuming 80 hrs./month (U.S.\$8.510.64).

Another company, Aerovías is offering a Queen Air (9 passengers, single engine service ceiling: 11,000 feet, piston engine, non-pressurized) including complete maintenance and service for U.S.\$8,500/month plus U.S.\$50/hour of flying time or a total of U.S.\$12,500/month assuming 80 hours/month.

Aerovías also offers a King Air (7-9 passengers, single engine service ceiling: 14,000 feet, turboprop engine, pressurized cabin) for U.S.\$13,000 per month plus U.S.\$80.00 per hour of flying time or a total of U.S.\$19,400 per month assuming 80 hrs./month. The aircraft will be purchased by Aerovías exclusively for the use by CIAT and the minimum duration of the contract is seven years.

Purchase

The cost associated with the purchase and maintenance of an aircraft obviously depends on the type of aircraft. The cost estimates reported in Tables 2 and 3 refer to a used Beechcraft King Air (7-9 passengers, single engine service ceiling: 14,000 feet, turboprop engine, pressurized cabin) and a new Cessna 421 (6-8 passengers, single engine service ceiling: 13,000 feet, piston engine, pressurized cabin), respectively. These aircrafts were chosen as representing two classes of aircrafts that to varying degree appear to meet the requirements expressed by CIAT management with respect to safety and the capacity requirements estimated in this study.

It is assumed that the used King Air can be obtained at a price of U.S.\$300,000. As shown in Table 2, total annual costs for the King Air are estimated to be U.S.\$143,358 if the aircraft is used 80 hours/month and U.S.\$150,506 if used 90 hours/month. The hourly costs are estimated at U.S.\$149.33 and U.S.\$139.36 for 80 and 90 hours/month, respectively. In estimating the costs it is assumed that the aircraft is used six years, after which it carries a re-sale value of U.S.\$60,000. Furthermore, it is assumed that the capital invested in the aircraft carries an annual interest rate of 7.5 percent.

An amount equal to 15 percent of the direct operating costs is charged to administration of the maintenance and service of the aircraft including hangar space. It may be possible to reduce this cost slightly. However, there is presently little expertise in Colombia with respect to the maintenance of small turboprop aircrafts. Therefore, some training may be necessary in order to obtain a well qualified mechanic.

The total costs associated with the purchase and maintenance of a Cessna 421 or similar aircraft were estimated to be U.S.\$109,023 per year if used 80 hours/month and U.S.\$113,082 if used 90 hours/month (Table 3). The costs per flight hour were estimated at U.S.\$113.57 and U.S.\$104.71, respectively.

In addition to costs, the flow of cash expenses over time may be important for budget planning within CIAT. Tables 4 and 5 show the flow of cash expenses associated with the purchase and maintenance of the two aircrafts analyzed above. Two cash flows are estimated for each aircraft. One flow is estimated under the assumption that the aircrafts are purchased under the financing plan developed by Calmaquip (see Appendix) and another refers to a situation where the aircraft is paid by special funds at the time of delivery. If interest free special funds are available and no reserves are needed for future replacement of the aircraft, a new Cessna 421 can be maintained for approximately the sum presently spent on travel to Montería, Medellín, Bogotá and Carimagua. Maintaining a King Air under these conditions would cost approximately U.S.\$30,000 more per year.

Cost comparisons

Table 6 shows the estimated costs of alternatives as compared to costs incurred during 1972. It is assumed that ICA will continue to pay an annual sum equal to that paid during 1972 (U.S.\$15,000) for air services to Carimagua, adjusted for inflation (5% annually). It is further assumed that all present air transportation on commercial airlines between Cali and Bogotá, Medellín and Montería except when connected with foreign travel, will be taken over by the alternative means. Increasing future needs for air transportation is not considered in the estimates.

Under these assumptions, the purchase of a used King Air aircraft would add U.S.\$82,906 to the present annual travel cost of CIAT while the purchase of a Cessna 421 would add U.S.\$48,571. The cost of leasing a Queen Air would be approximately the same as purchasing a used King Air, while leasing a new King Air would be considerably more costly. The cheapest alternative considered is the lease of a Super 18 from TANA.

It should be noted that the leasing proposal from Aerovías refers to a new King Air aircraft (value approximately U.S.\$520,000) while the cost estimates for CIAT purchase refers to a used aircraft (assumed value U.S.\$300,000). Hence, while expected total costs to Aerovías will be higher, maintenance costs and the risk of major outlays for spare parts is expected to be higher for the used aircraft purchase by CIAT. Also, the risk that the aircraft may be grounded for longer periods of time while waiting for imported spare parts is larger for a used aircraft.

In general, it may be expected that the cost of leasing arrangements will be higher than the cost associated with purchasing any given aircraft primarily because CIAT is exempt from import duties ^{1/} and the need for a certain profit margin for the company leasing the plane.

^{1/} Present import duty is 30 percent of purchasing price if the aircraft is brought in assembled and 15 percent if assembled in Colombia.

Up to this point we have compared only direct costs (ticket costs vs. costs of alternatives). The loss of staff time is another important cost factor to consider. This is particularly important between Cali and Montería where the commercial service is somewhat deficient. The flight from Medellín to Montería is frequently delayed or cancelled, leaving staff members in Medellín for extended time periods. It is not certain that the Avianca service to Montería will be improved greatly in the near future. In addition to Avianca, a small airline, ACES, flies between Medellín and Montería.

It is not possible to estimate the loss of staff time due to the cancelling of schedule flights with a great deal of certainty. It is possible, however, to estimate the difference in staff time needed, assuming that the commercial flights perform according to schedule. This estimate will then form a lower limit for the amount of staff time lost.

According to the current Avianca schedule, the travel from Cali to Montería takes 5 hours and 10 minutes and from Montería to Cali 3 hours and 40 minutes, or in total approximately 4 hours more than the time needed by the alternative means being considered. A total of 91 persons made a round trip Cali-Montería during 1972. The hourly cost of a senior staff member is approximately U.S.\$14. Hence the cost due to lost staff time is estimated to be U.S.\$5.096 assuming that commercial flights are always on time. Considering delays in departures, the commercial flights between Cali and Bogotá normally take about one hour in each direction, hence we expect little difference in needed staff time in this case.

Other factors

In addition to relative costs, it is important to consider other factors such as flexibility and safety. For the scientist who need to spend 4-6 hours at Carimagua or Montería, the alternatives considered in this study provide more flexibility and require considerably less total staff time than present arrangements. Furthermore, the easy access to Montería and Carimagua may improve the research and training activities carried out on these stations through more frequent supervision.

An analysis of relative safety among alternatives is considered beyond the scope of this analysis. However, as mentioned above, most small commercial airplanes available for service in Colombia, including the aircraft presently used by CIAT between Bogotá and Carimagua, have a single-engine service ceiling of about 11,000 feet or less and do not have pressurized cabin.

Concluding remarks

The purpose of this analysis was to provide additional information for decision-making with respect to meeting the needs for air transportation within Colombia. Recommendations as to the most feasible means to meet the needs are beyond the scope of the report.

It may be concluded that none of the alternative means considered in this analysis can be obtained at the cost of domestic air transportation during 1972. However, all the alternatives are expected to provide considerably more and better service than that obtained during 1972. The alternatives will provide more flexibility, and reduce the loss of staff time during travel by means of which staff efficiency may be increased and research and training activities at Monteria and Carimagua improved. Furthermore, the alternatives considered, except for one - Super 18 - are likely to improve passenger safety.

It is not possible on the basis of available data, to determine the economic benefits from improved safety, increased staff efficiency and improved research and training activities. Furthermore, the value of non-economic benefits associated with safety are essentially subjective and the price CIAT is willing to pay to obtain additional safety depends on the philosophy of the CIAT management. Hence, while this analysis presents alternative costs, it cannot quantify alternative benefits.

Table 1. Estimated cost of official travel between
Cali and Bogotá, Medellín, Carimagua and Montería 1972

	No. of seats	Estimated costs ^{1/}	
		(Col.\$)	U.S.\$ ^{2/}
Cali-Bogotá; Bogotá-Cali	456	339.264.00	15.421.09
Cali-Medellín; Medellín-Cali	24	16.176.00	735.27
Cali-Montería; Montería-Cali	91	101.010.00	4.591.36
Bogotá-Carim.; Carim.-Bogotá	449	873.500.00	39.704.55
Charged to ICA	-	321.561.00	14.616.41
Charged to CIAT	-	551.939.00	25.088.14
Total CIAT	-	1.008.389.00	45.835.86
Total ICA	-	<u>321.561.00</u>	<u>14.616.41</u>
Grand Total	1.020	1.329.950.00	60.452.27

1/ Estimated on the basis of present ticket prices as follows:

Cali - Bogotá (round trip)	Col.\$ 744.00
Cali - Medellín (round trip)	674.00
Cali - Montería (round trip)	1.110.00
Bogotá - Carimagua: charter	

2/ Exchange rate used: U.S.\$ 1.00 = Col.\$ 22.00

Table 2. Estimated total cost of purchasing and maintaining a used King Air 90 or similar aircraft ^{1/}

	Fixed per month (Col.\$)	Per flight hour (Col.\$)	Annual costs (U.S.\$) ^{2/}	
			80 hrs. month	90 hrs. month
<u>Operating costs ^{3/}</u>				
Flight crew	32.000	-	16.340	16.340
Fuel	-	384	15.687	17.648
Oil	-	6	245	276
Maintenance	7.000	500	24.000	26.553
Engine Overhaul (U.S.\$40.000 per 3.000 hrs.)	-	313	12.786	14.385
Landing fees, etc.	-	60	2.451	2.757
Total operating costs	39.000	1.203	71.509	77.959
<u>Additional costs</u>				
Insurance (2.8%/yr., value U.S.\$300.000)			8.400	
Interest (7.5%/yr. of balance)			15.000	
Depreciation (6 yrs., 20% replacement value)			40.000	
Management costs (15% of direct oper. costs)			8.449	9.147
Grand total			143.358	150.506
Total cost per hour			149.33	139.36

^{1/} Cost estimates beyond 1974 should consider cost increases due to inflation (see Table 4).

^{2/} Exchange rate: U.S.\$1 = Col.\$ 23.50.

^{3/} Based on information from TANA.

Table 3. Estimated total cost of purchasing and maintaining a new Cessna 421 or similar aircraft ^{1/}

	Fixed per month (Col.\$)	Per flight hour (Col.\$)	Annual costs (U.S.\$)	
			80 hrs. month	90 hrs. month
<u>Operating costs</u>				
Flight crew	32.000	-	16.340	16.340
Fuel	-	200	8.170	9.191
Oil	-	40	1.634	1.838
Maintenance	7.000	200	11.745	12.766
Engine Overhaul (U.S.\$15.000 per 1.600 hours)		220	8.987	10.111
Landing fees, etc.		60	2.451	2.757
Total operating costs	39.000	720	49.327	53.003
<u>Additional costs</u>				
Insurance (2.8%/yr. value U.S.\$280.000)			7.840	
Interest (7.5% of balance)			13.905	
Depreciation (7 yrs., 20% replacement value)			32.000	
Management costs (15% of direct oper. costs)			6.051	6.434
Grand total			109.023	113.082
Total cost per hour			113.57	104.71

^{1/} Cost estimates beyond 1974 should consider cost increases due to inflation (see Table 5).

Table 4. Cash-flow associated with the purchase and
maintenance of a used King Air or similar aircraft

Year	Principal and interest payments on loan <u>1/</u>	Insurance, operating and management costs excluding engine overhaul <u>2/</u>		Engine overhaul	Assumed ICA payment	Total, with Calmaquip financing plan <u>3/</u>		Total without financing <u>4/</u>	
		80 hrs.	90 hrs.			80 hrs.	90 hrs.	80 hrs.	90 hrs.
1973 <u>5/</u>	71.304	-	-	-	-	71.304	71.304	-	-
1974	72.731	75.572	81.121	-	15.000	133.303	138.852	60.572	66.121
1975	68.681	79.351	85.177	-	15.750	132.282	138.108	63.601	69.427
1976	64.631	83.318	89.436	40.000	16.538	171.411	177.529	106.780	112.898
1977	60.581	87.484	93.908	-	17.364	130.701	137.125	70.120	76.544
1978	29.531	91.858	98.603	-	18.233	103.156	109.901	73.625	80.370
1979	-	96.451	103.533	-	19.144	77.307	84.389	77.307	84.389

- 1/ Assuming a purchasing price of U.S.\$300,000 and using the "Model Sample" made by Calmaquip as basis for estimating financing costs (see Appendix).
- 2/ An annual cost increase of 5 percent on the dollar due to inflation is assumed.
- 3/ Total expenses less U.S.\$15,000 expected to be paid by ICA for air service to Carimagua assuming that the aircraft is paid over five years at an interest rate of 7.5 percent.
- 4/ Assuming that the aircraft is paid in total by special funds upon delivery.
- 5/ Assuming that purchase takes place towards the end of 1973.

Table 5. Cash-flow associated with the purchase and
maintenance of a new Cessna 421 or similar aircraft

Year	Principal and interest payments on loan <u>1/</u>	Insurance, operating and management costs excluding engine overhaul <u>2/</u>		Engine overhaul		Assumed ICA payment	Total, with Calmaquip financing plan <u>3/</u>		Total without financing <u>4/</u>	
		80 hrs.	90 hrs.	80 hrs.	90 hrs.		80 hrs.	90 hrs.	80 hrs.	90 hrs.
1973 <u>5/</u>	66.548	-	-	-	-	-	66.548	66.548	-	-
1974	67.880	54.231	57.166	-	-	15.000	107.111	110.046	39.231	42.166
1975	64.100	56.943	60.024	15.000	15.000	15.750	120.293	123.374	56.193	59.274
1976	60.320	59.790	63.026	-	15.000	16.538	103.572	121.808	43.252	61.488
1977	56.540	62.779	66.176	15.000	-	17.364	116.955	105.352	60.415	48.812
1978	27.561	65.918	69.486	-	15.000	18.233	75.246	93.814	47.685	66.253
1979	-	69.214	72.960	15.000	15.000	19.144	65.070	68.816	65.070	68.816

- 1/ Assuming a purchasing price of U.S.\$280.000 and using the "Model Sample" made by Calmaquip as basis for estimating financing costs (see Appendix).
- 2/ An annual cost increase of 5 percent on the dollar due to inflation is assumed.
- 3/ Total expenses less U.S.\$15.000 expected to be paid by ICA for air service to Carimagua assuming that the aircraft is paid over five years at an interest rate of 7.5 percent.
- 4/ Assuming that the aircraft is paid in total by special funds upon delivery.
- 5/ Assuming that purchase takes place towards the end of 1973.

Table 6. Estimated annual cost of five alternatives
as compared to costs of air transportation during 1972 ^{1/}

	<u>U.S.\$/yr.</u>	<u>Difference from 1972 ^{3/}</u>
Actual cost 1972 ^{2/}	45.452	-
Estimated cost to CIAT ^{1/} of:		
Super 18 (TANA)	87.128	+ 41.676
Cessna 421 (CIAT)	94.023	+ 48.571
Queen Air (Aerovías)	135.000	+ 89.548
King Air (CIAT)	128.358	+ 82.906
King Air (Aerovías)	217.800	+ 172.348

^{1/} Assuming 80 hrs./month.

^{2/} Total cost less U.S.\$15.000 paid by ICA.

^{3/} Assuming that all present CIAT air travel to Medellín, Montería, Bogotá and Carimagua will be replaced by the alternatives. There is likely to be some need for travel on commercial airlines to Bogotá and Medellín under the alternative arrangements.

Figure 1. Official travel Cali-Bogotá by
CIAT personnel, by month 1972.

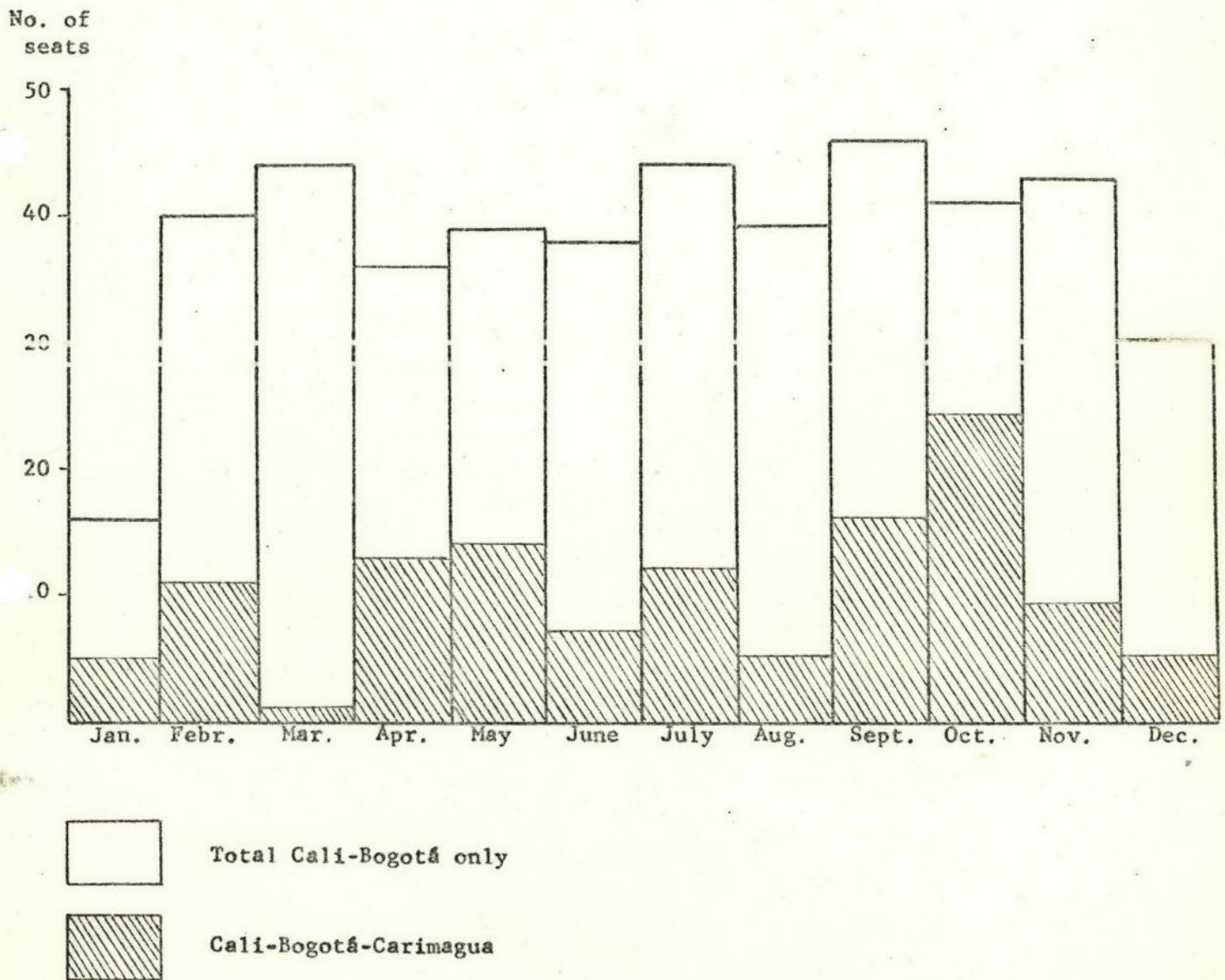


Figure 2. Official travel Bogotá-Cali by CIAT
personnel, by month 1972.

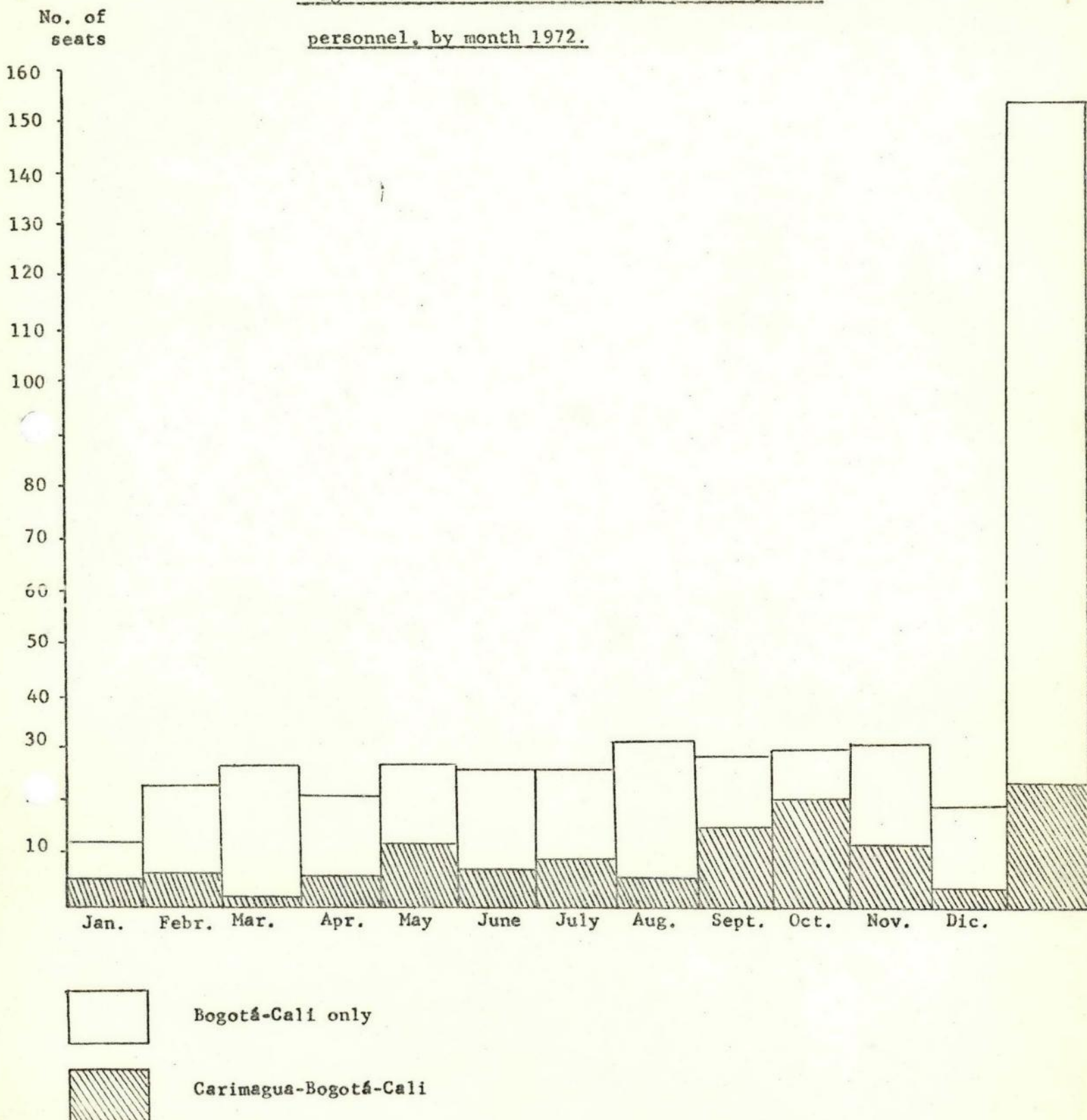


Figure 3. Official travel Cali-Medellín and Medellín-Montería by CIAT personnel, by month 1972



Figure 4. Official travel Medellín-Cali and Montería-
Medellín bt CIAT personnel, by month 1972.

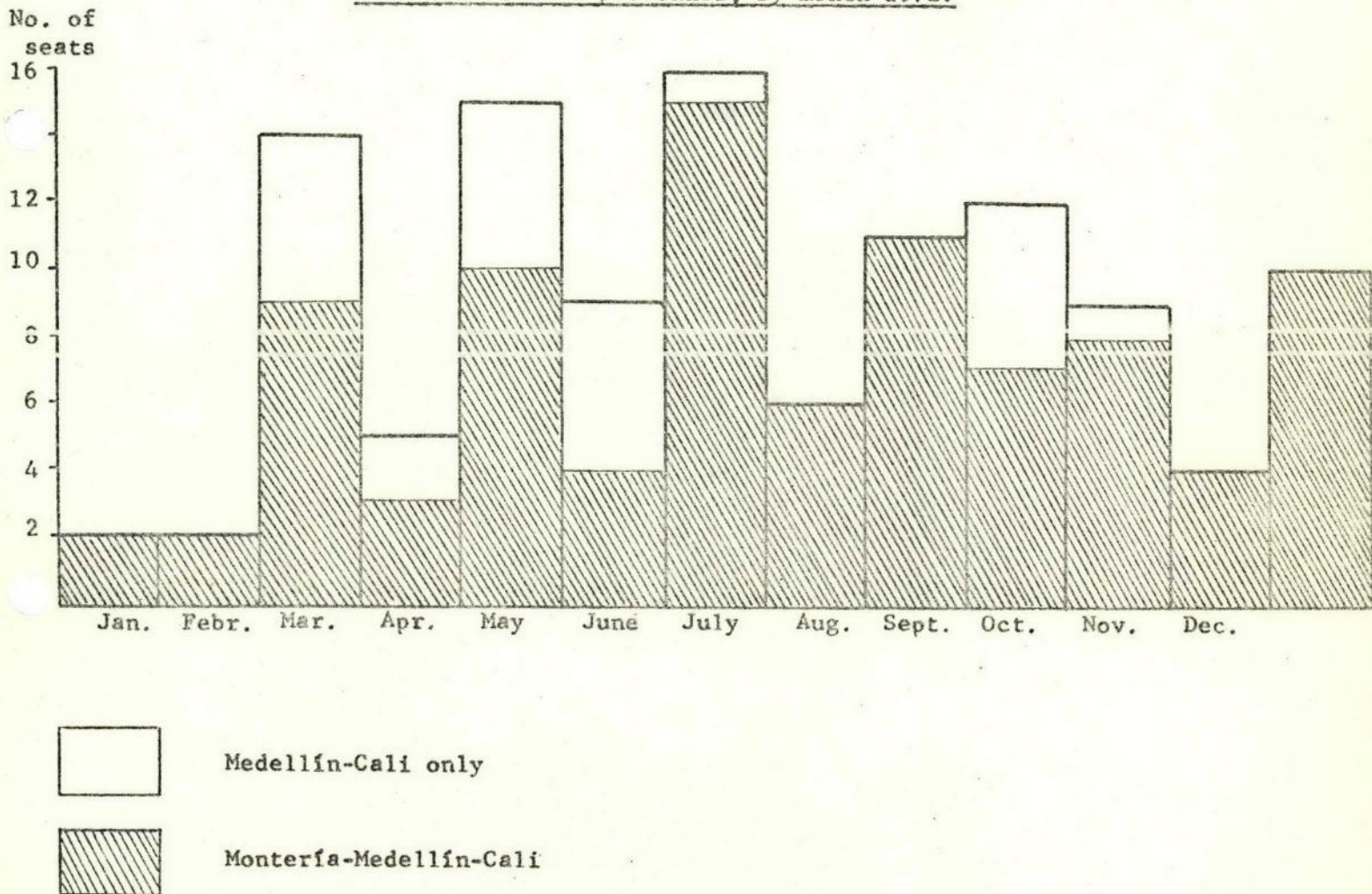
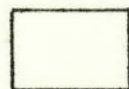
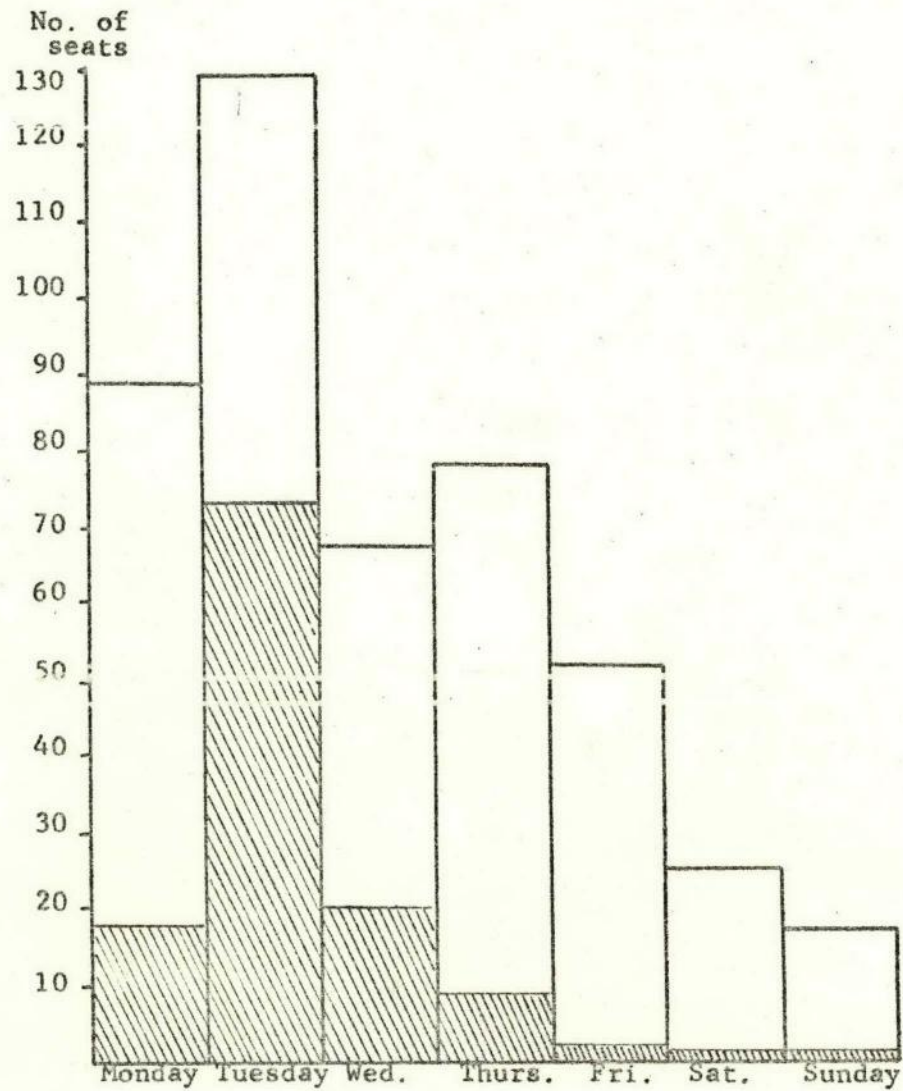


Figure 5. Official travel Cali-Bogotá by CIAT
personnel, by week day 1972.



Cali-Bogotá only



Cali-Bogotá-Carimagua

Figure 6. Official travel Bogotá-Cali by CIAT
personnel, by weekday 1972.

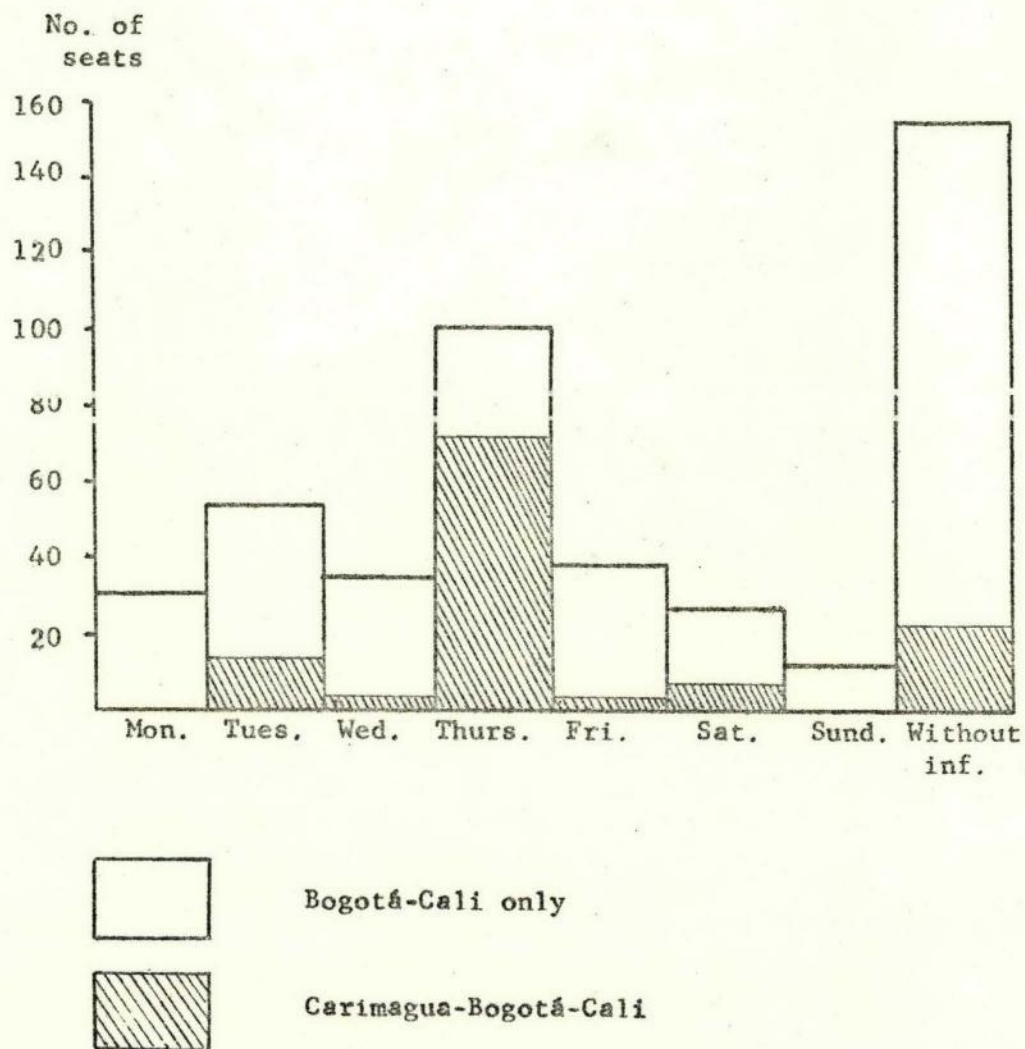


Figure 7. Official travel Cali-Medellin and Medellin-Monterfa by CIAT personnel, by weekday 1972.

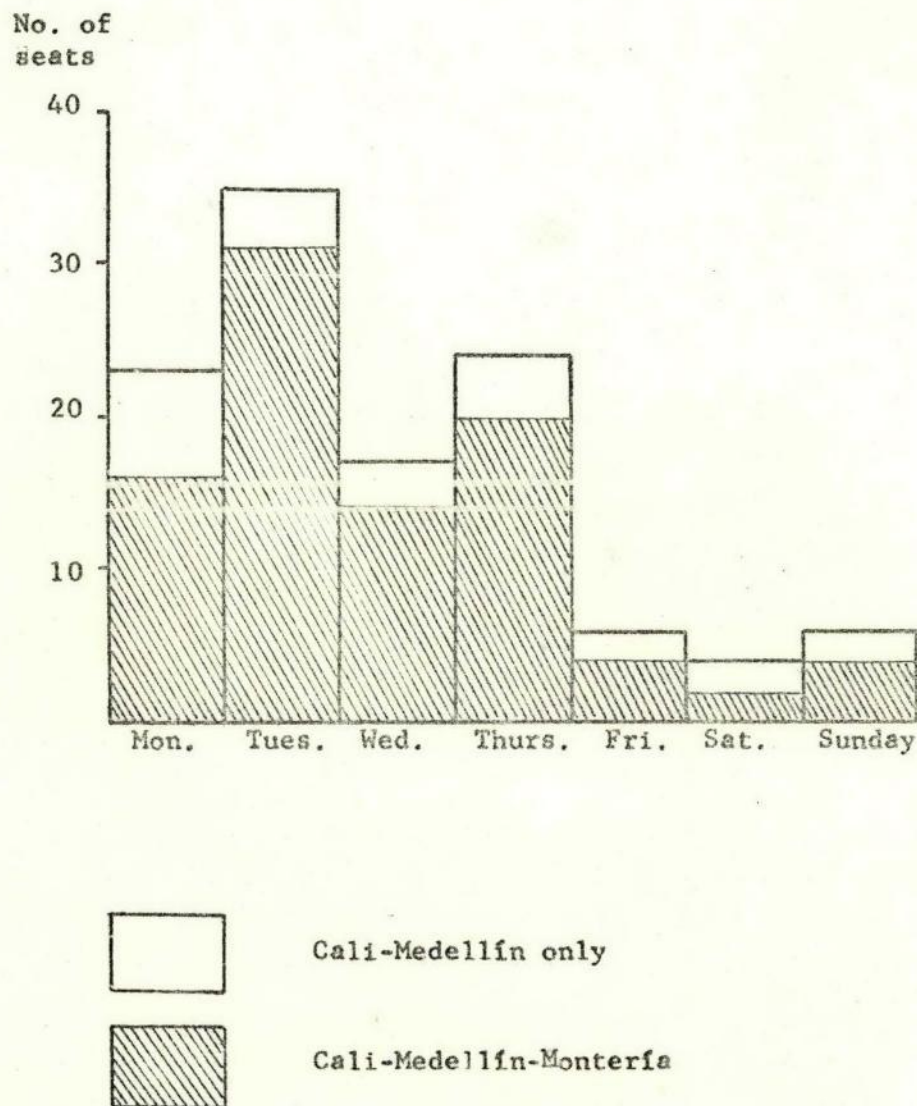


Figure 8. Official travel Medellín-Cali and Montería-Medellín by CIAT personnel, by weekday 1972.

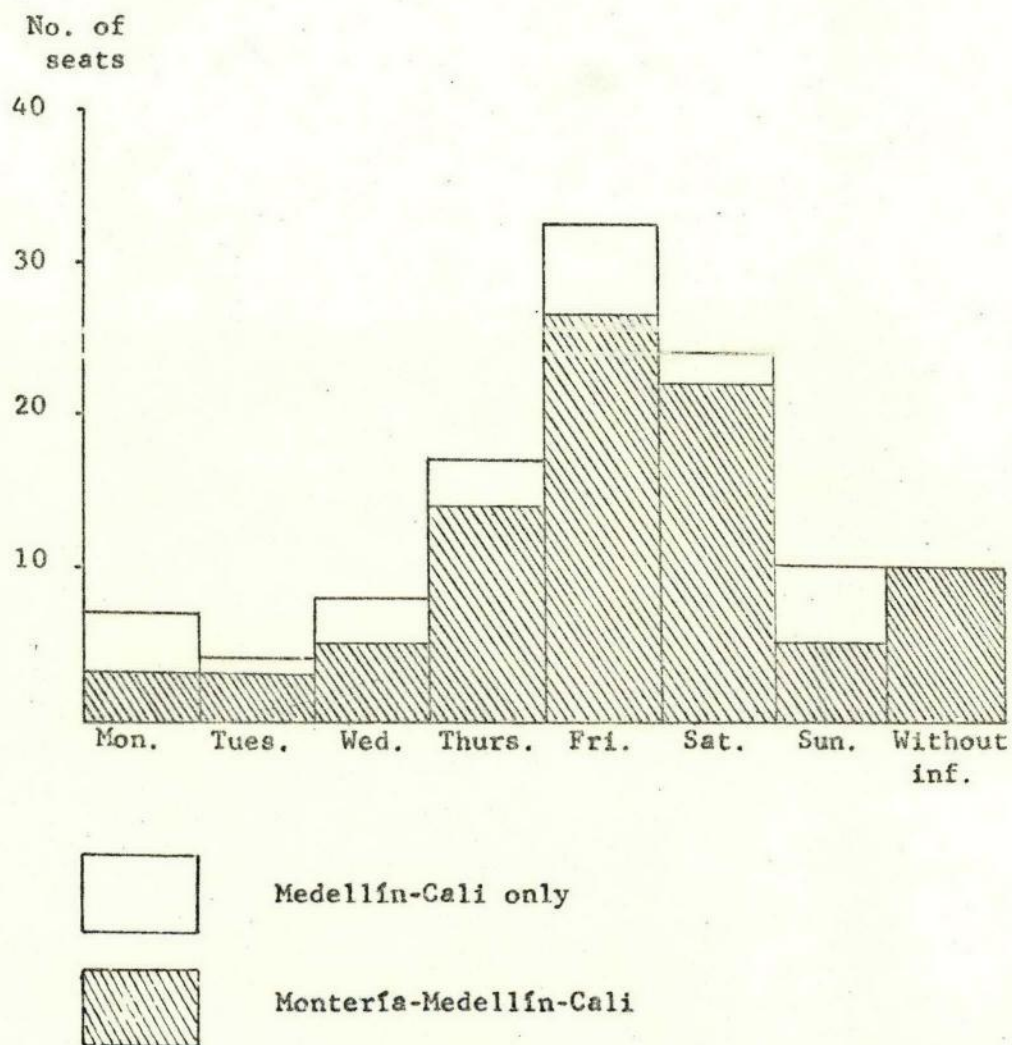


Figure 9. Official travel Bogotá-Carimagua by
CIAT and ICA personnel, by month 1972.

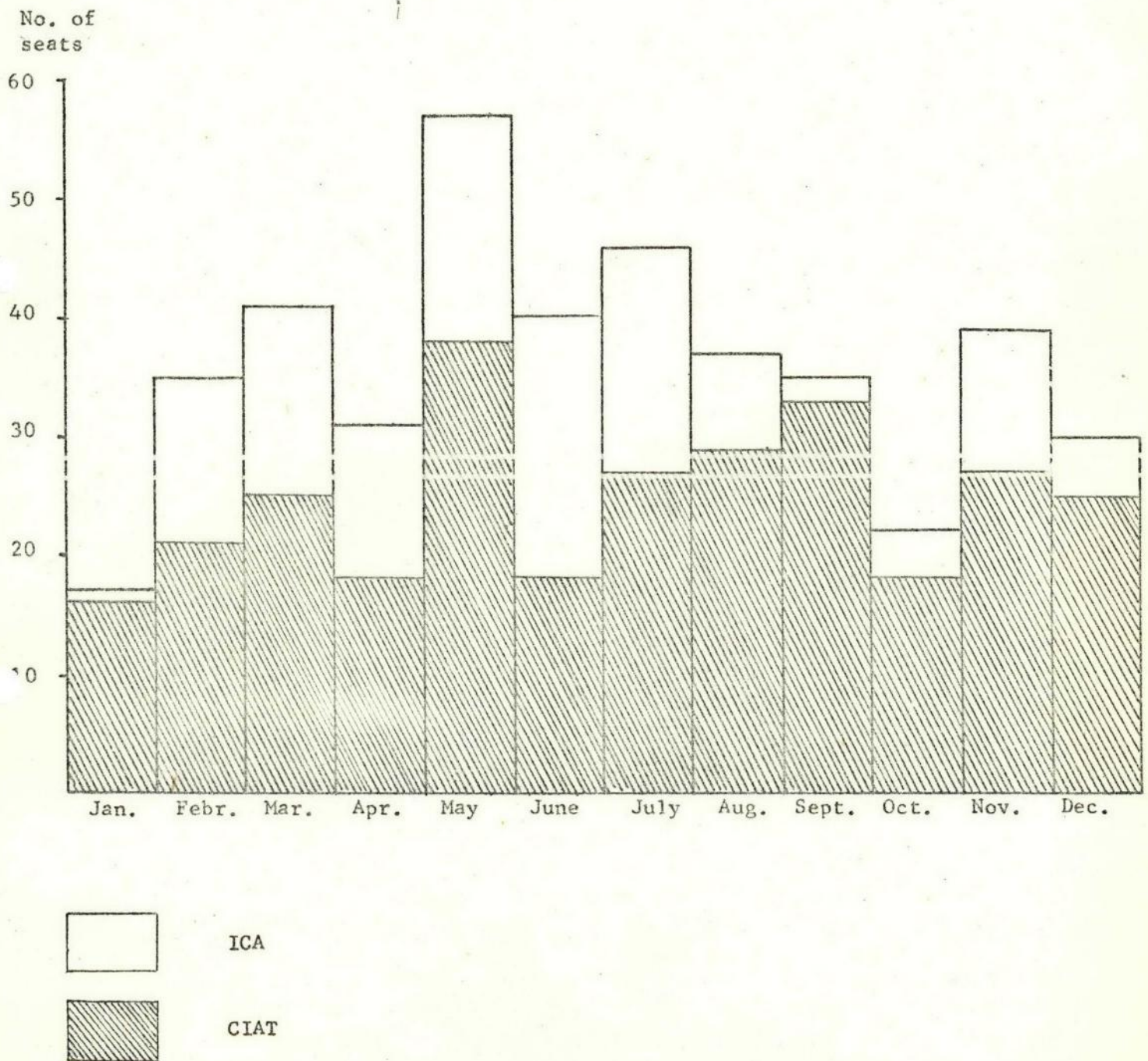


Figure 10. Official travel Carimagua-Bogotá by
CIAT and ICA personnel, by month 1972.

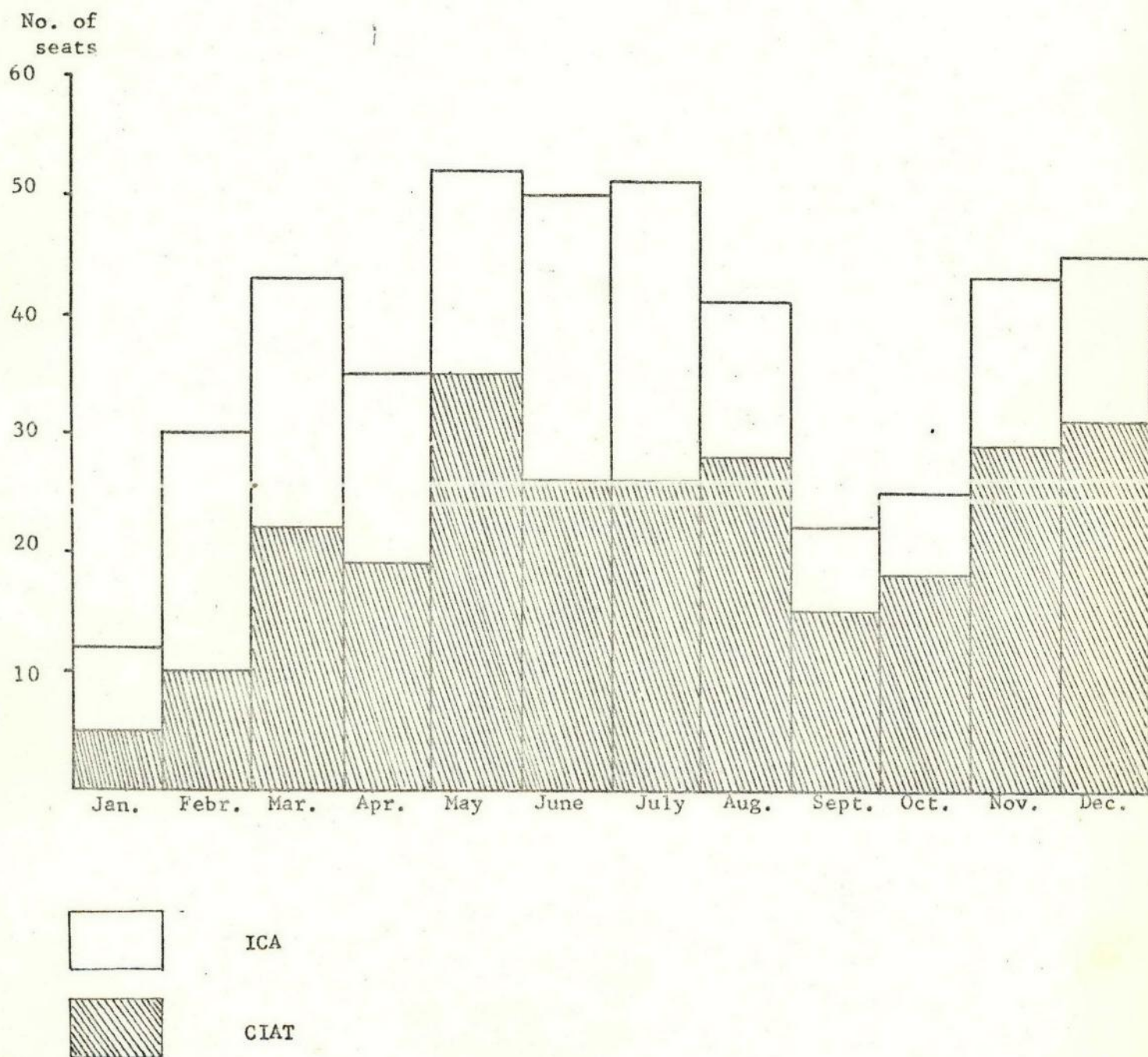


Figure 11. Duration of trips Cali-Monterfa-Cali

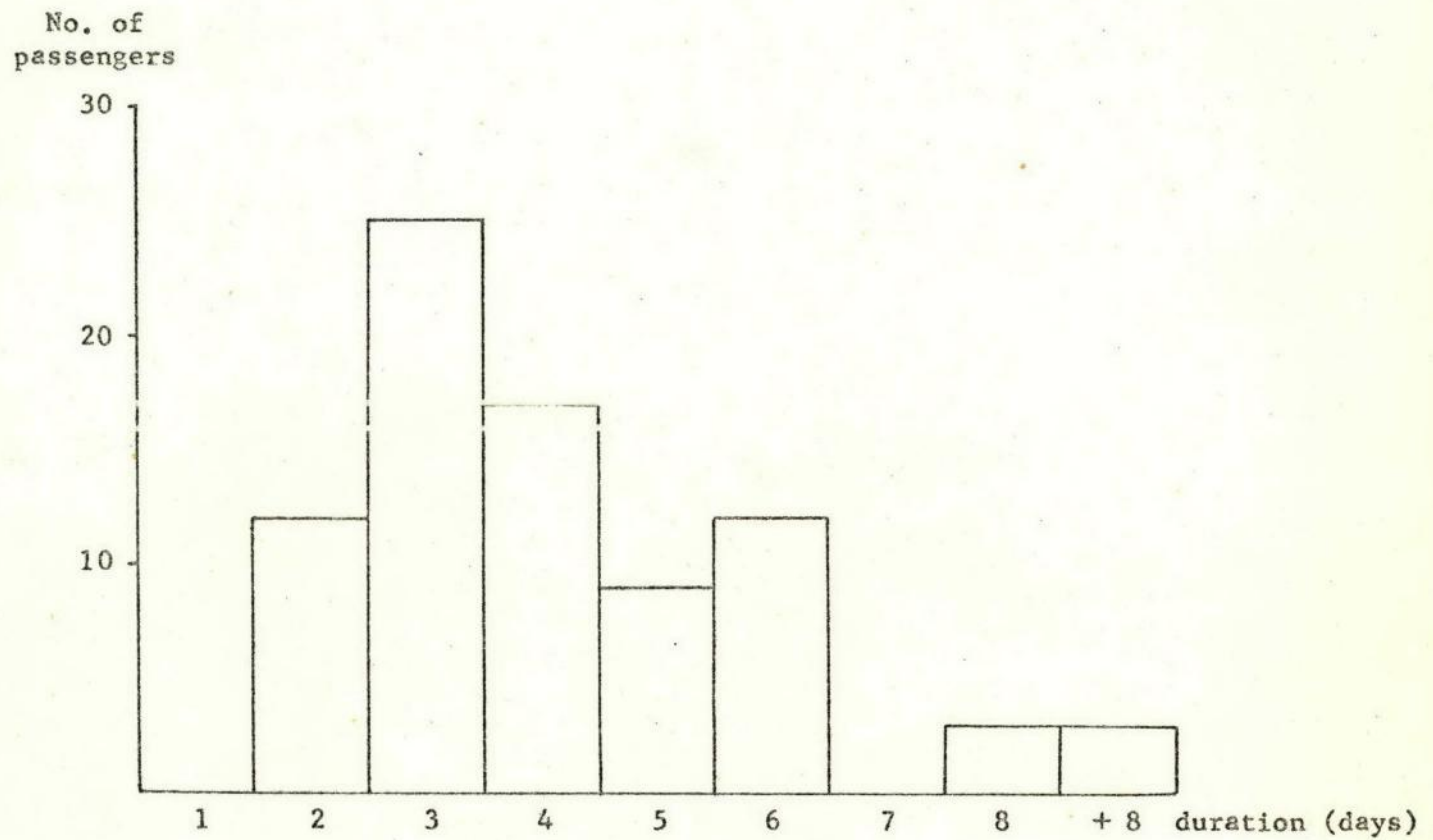
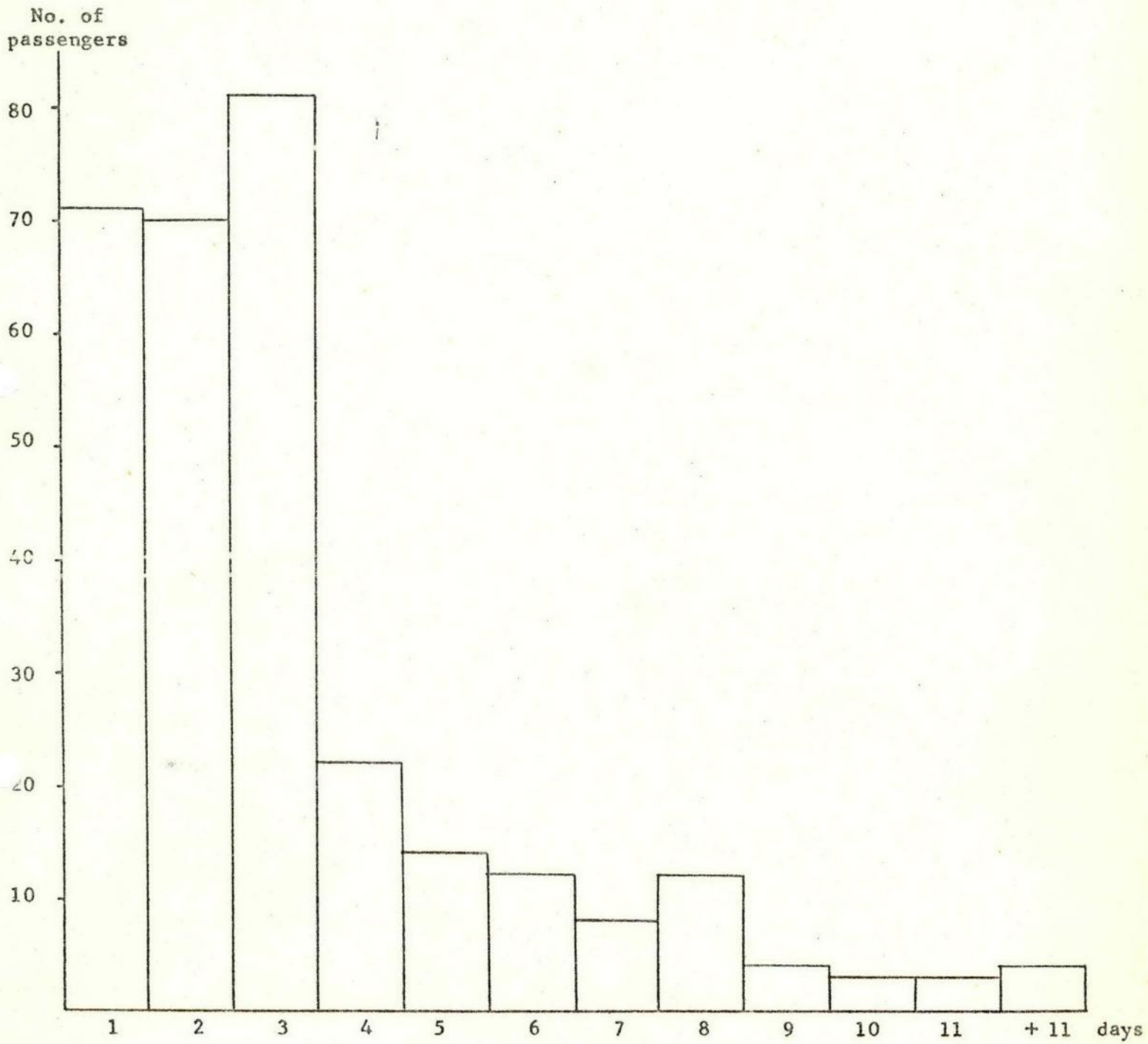


Figure 12. Duration of trips Cali-Bogotá-Cali



Calmaquip

APPENDIX

Engineering Western Hemisphere Corporation

1424 N. W. LE JEUNE RD.

MIAMI, FLORIDA 33126

CABLE: CALMAQUIP

PHONE (305) 871-4260

MAILING ADDRESS: P. O. BOX 555 RIVERSIDE STATION, MIAMI, FLORIDA 33135 U.S.A.

TELEX NO. 051-751

February 19, 1973

MODEL SAMPLE OF A TRANSACTION USING AS AN
ESTIMATED PURCHASE PRICE THE AMOUNT OF \$300,000.00
FOR REFERENCE PURPOSES ONLY

Estimated Purchase Price: \$300,000.00

Down Payment	\$30,000.00
FCIA Insurance Policy 2.52% of \$270,000.00	6,804.00
Security Deposit 10% of Financed Portion	27,000.00
Calmaquip's Fees -2½% of \$300,000.00	7,500.00

20 QUARTERLY PAYMENTS

Amount Financed: \$270,000.00

Quarter	<u>Total Payment</u>		<u>Interest Pmt.</u>	<u>Principal</u>	<u>Balance</u>
	<u>Principal &</u>	<u>Interest</u>			
		<u>6% + 1½% =</u>		<u>Payment</u>	<u>Principal</u>
		<u>7½%</u>			
1 Quarter	\$18,562.50	\$5,062.50	\$13,500.00	\$256,500.00	
2 "	18,309.38	4,809.38	13,500.00	243,000.00	
3 "	18,056.25	4,556.25	13,500.00	229,500.00	
4 "	17,803.13	4,303.13	13,500.00	216,000.00	
5 "	17,550.00	4,050.00	13,500.00	202,500.00	
6 "	17,296.88	3,796.88	13,500.00	189,000.00	
7 "	17,043.75	3,543.75	13,500.00	175,500.00	
8 "	16,790.63	3,290.63	13,500.00	162,000.00	
9 "	16,537.50	3,037.50	13,500.00	148,500.00	
10 "	16,284.38	2,784.38	13,500.00	135,000.00	
11 "	16,031.25	2,531.25	13,500.00	121,500.00	
12 "	15,778.13	2,278.13	13,500.00	108,000.00	
13 "	15,525.00	2,025.00	13,500.00	94,500.00	
14 "	15,271.88	1,771.88	13,500.00	81,000.00	
15 "	15,018.75	1,518.75	13,500.00	67,500.00	
16 "	14,765.63	1,265.63	13,500.00	54,000.00	
17 "	14,512.50	1,012.50	13,500.00	40,500.00	
18 "	14,259.38	759.38	13,500.00	27,000.00	
19 "	14,006.26	506.25	13,500.00	13,500.00	
20 "	13,753.13	253.13	13,500.00	----0----	
	<u>\$323,156.30</u>	<u>\$53,156.30</u>	<u>\$270,000.00</u>		

NOTE: A) The interest rate has been based on today U.S. Bank Prime rate for budget purpose only, as the actual interest will float and adjusted every quarterly.

B) The security deposit will be used by Calmaquip Eng. W. H. Corp. to cover the principal of installments No. 19 & 20.

62a

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

INTERNATIONAL DEVELOPMENT ASSOCIATION

OFFICE MEMORANDUM

TO: Mr. James M. Fransen

DATE: April 5, 1973

FROM: Montague Yudelman

SUBJECT: COLOMBIA - Centro Internacional de Agricultura Tropical (CIAT)
Steering Committee for International Seminar on Tropical
Beef Cattle Production
Terms of Reference

1. On or about April 9 you will travel to Colombia to participate on the above Steering Committee. The Committee is to plan an International Seminar on the Development of the Beef Cattle Industry in Tropical Regions, with particular reference to Latin America, tentatively scheduled to be held at CIAT on November 19-22, 1973.
2. Upon your return to the Bank on April 16 you will report as appropriate.

JMFransen:go.

cc: Messrs. Baum, Lee, Burney, Raizen, Engelmann, van der Tak, McIvor, Darnell, Stoops, Knox, Calika, Wiese, Zinman, Goffin, Sutherland and Bowron.

Official Files.



CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

TC-193-73
April 2, 1973

Mr. Harold Graves
Executive Secretary
Consultative Group on International
Agricultural Research
1818 H Street, N. W.
Washington, D. C. 20433

Dear Harold:

Thank you for the opportunity to review the problem of the \$60,000 shortfall in our operational budget for 1973. If we assume this relates primarily to conferences and symposia plus production training courses, two activities defined as special projects in earlier years, our financial needs for 1973 are as follows:

Seminar on Potentials for Field Beans and Other Food Legumes in Latin America, February 28-March 1, including publications, costs of followup meetings of Steering Committee and Special Task Force, less the \$23,000 contribution from BID to cover travel and per diem of 50 participants.	\$ 35,000
Workshop on Plant Protection in Maize, February	4,000
Andean Corn Workshop, Cochabamba, Bolivia, March	7,000
Dedication of CIAT, and Inaugural Symposium	60,000
Seminar on Beef Production in Latin America	40,000
Miscellaneous small conferences and workshops being planned by commodity groups	8,000
Anticipated shortfalls in production training programs because of "no shows" in enrollment	<u>6,000</u>
	\$164,000

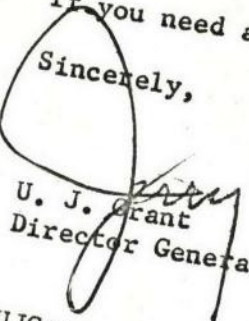
Our budget request for 1973 anticipated \$60,000 from the W. K. Kellogg Foundation to apply against conference and symposia needs, leaving the projected shortfall of \$104,000, which was incorporated in and funded in the 1973 core budget. At the same time, the projected \$60,000 from Kellogg was also counted toward core support. The net result was a \$60,000 item to be identified. Consequently, we request the Consultative Group consider funding this shortfall.

Original to: *GRAVES*
Date: *APR 12 1973*
Communications
Section

Mr. H. Graves
Page 2

If you need additional information or explanation, please let us know.

Sincerely,


U. J. Grant
Director General

UJG:cee

cc Dr. R. Mawby, W. K. Kellogg Foundation
Dr. F. C. Byrnes, CIAT
Mr. L. M. González, CIAT

92a

April 2, 1973

Dear Jerry:

I've now had a very rough, preliminary report from Andrew Urquhart on CIAT's budget for 1974. This confirms that your figures will not begin to be final until the next meeting of your Executive Committee. As I understand it, the Committee is to meet on April 24 and 25 in Miami.

Would you be willing to have a representative of the Consultative Group attend whatever part of that meeting is going to be devoted to the budget? I'd be grateful if you'd let me know, one way or another, by telegram.

Sincerely,

Harold Graves

Dr. U. J. Grant
Director General
Centro Internacional de
Agricultura Tropical
Apartado Aereo 67-13
Apartado Nal. 737
Cali
Colombia

cc: Dr. Lewis Roberts, Rockefeller Foundation
Dr. Norman Collins, Ford Foundation

HGraves:apm

John



CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

TC-193-73

April 2, 1973

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Executive Secretary
Consultative Group on International
Agricultural Research
1818 H Street, N. W.
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Workshop on Plant Protection in Maize, February	4,000
Andean Corn Workshop, Cochabamba, Bolivia, March	7,000
Dedication of CIAT, and Inaugural Symposium	60,000
Seminar on Beef Production in Latin America	40,000
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CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

TC-193-73
April 2, 1973

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Executive Secretary
Consultative Group on International
Agricultural Research
1818 H Street, N.W.
Washington, D.C. 20432

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Workshop on Plant Protection in Mexico, February	4,000
Andean Corn Workshop, Cochabamba, Bolivia, March	7,000
Dedication of CIAT, and Inaugural Symposium	60,000
Seminar on Beef Production in Latin America	40,000
Miscellaneous small conferences and workshops being planned by commodity groups	8,000
Anticipated shortfalls in production training programs because of "no shows" in enrollment	6,000
	<u>\$164,000</u>

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1973 APR 12 PM 6:54

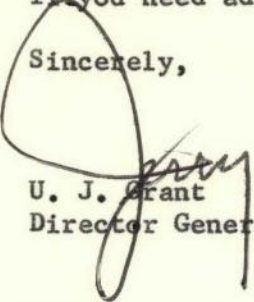
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RECEIVED
APRIL 12 1973
CIAT

Mr. H. Graves
Page 2

If you need additional information or explanation, please let us know.

Sincerely,



U. J. Grant
Director General

UJG:cee

cc Dr. R. Mawby, W. K. Kellogg Foundation
Dr. F. C. Byrnes, CIAT
Mr. L. M. González, CIAT

AN ECONOMIC ANALYSIS OF ALTERNATIVE MEANS TO MEET
AIR TRANSPORTATION NEEDS OF CIAT PERSONNEL WITHIN COLOMBIA

Prepared by Per Pinstруп-Andersen for the Meeting of the Executive
Committee of the Board of Trustess of CIAT. April 24-26, 1973

Program of Agricultural Economics
Centro Internacional de Agricultura Tropical
Cali, Colombia
April, 1973

This analysis was made in accordance with the request of the Executive Committee of the CIAT Board of Trustees at its meeting on March 2-3, 1973.

The analysis focuses on estimating the costs associated with alternative ways to meet internal air transportation needs. Other factors such as safety and flexibility are considered but no attempts are made to quantify the impact of these factors on relative costs and benefits.

The report includes an analysis of the travel pattern and costs during 1972, followed by a description of various alternatives to present arrangements. Then, the costs of alternative means are estimated and compared to present costs and the report terminates with a short discussion of the impact of alternative means on other factors such as safety and flexibility.

Travel patterns and costs 1972

Present internal travel needs are met through regular service of commercial airlines primarily Avianca wherever available and an aircraft chartered by CIAT between Bogotá and Carimagua.

Total cost of travel between Cali and Bogotá, Medellín and Montería during 1972 was estimated at approximately U.S.\$21,000 (Table 1). The cost of the charter plane Bogotá-Carimagua was approximately U.S.\$40,000 of which ICA was charged U.S.\$15,000. Hence total travel cost to CIAT between Cali and Bogotá, Medellín, Montería and Carimagua was approximately U.S.\$60,000 of which ICA pays U.S.\$15,000.

The CIAT personnel made approximately 450 round trips Cali-Bogotá, 91 Cali-Montería and 24 Cali-Medellín during 1972 (Table 1). The charter plane to Carimagua which normally flies twice a week (Tuesday and Thursday) carried 450 passengers (round trip).

There is no apparent trend in the travel over months except for low travel activities during December and January (Figures 1, 2, 3, 4). While considerable fluctuation among months was found in the travel to Medellín and Montería, the Bogotá travel showed no large monthly fluctuations. A very strong weekly fluctuation was found in the Bogotá, Medellín and Montería travel (Figures 5, 6, 7, 8). As might be expected, departure from Cali takes place primarily in the beginning of the week. The return from Montería takes place primarily towards the end of the week while Thursday shows the largest number of returns from Bogotá (primarily originating in Carimagua). Figures 9 and 10 show the monthly travel to and from Carimagua by ICA and CIAT personnel. Most of this travel took place on the charter plane scheduled for Tuesday and Thursday.

The duration of trips to Bogotá and Montería is shown in Figures 11 and 12. Three days, including travel time, is the most frequent duration of trips both to Montería and Bogotá. One and two-day trips to Bogotá were found to be very frequent as were four-day trips to Montería.

Various staff members have expressed the need for an air transportation service that would allow for a one-day visit to Montería and Carimagua. Since such service was not available during 1972, the data obtained do not provide information on this issue.

On the basis of the information obtained, we may conclude that the demand for air transportation to Montería is largest on Tuesdays and from Montería on Fridays and Saturdays. The demand for air transportation to Bogotá is largest on Mondays and Thursdays while no strong preference was found among week days with respect to return trips from Bogotá. It is not possible to predict the preferred week days for travel to Carimagua on the basis of the data available since transportation was available only Tuesdays and Thursdays. It is expected, however, that these days were selected on the basis of the preferences of the personnel that uses the services most frequently.

The average weekly demand for air transportation during 1972 was approximately 9 seats round trip between Cali and Bogotá, 2 between Cali and Montería and 9 between Bogotá and Carimagua, the latter including ICA personnel. Considering recent staff expansions and recent and expected increases in research and training activities in Montería and Carimagua we may expect a considerable increase in the demand for air transportation within Colombia.

Based on the above findings it appears that most of the needs for air transportation within Colombia could be met through the use of a 7-9 passenger aircraft carrying out two weekly flights between Cali and Montería with stop in Medellín if needed and two weekly flights Cali-Bogotá-Carimagua. Most needs for special flights, e.g. transportation of special groups, could probably be met with the same aircraft.

A suggested flight schedule is shown below:

<u>Day</u>	<u>Dept.</u>	<u>Arrival</u>	
Monday/Thursday	7:00 a.m.	8:00 a.m.	Cali-Bogotá
" "	8:15 a.m.	9:15 a.m.	Bogotá-Carimagua
" "	4:00 p.m.	5:00 p.m.	Carimagua-Bogotá
" "	5:15 p.m.	6:15 p.m.	Bogotá-Cali
Tuesday/Friday	7:00 a.m.	9:30 a.m.	Cali-Montería ^{1/}
" "	4:00 p.m.	6:30 p.m.	Montería-Cali ^{1/}
Wednesday	7:00 a.m.	8:00 a.m.	Cali-Bogotá ^{2/}
"	5:15 p.m.	6:15 p.m.	Bogotá-Cali ^{2/}
Saturday	Special trips as needed		

^{1/} Stop at Medellín, if needed.

^{2/} This flight may be used to obtain maintenance in Bogotá or it may be replaced by occasional needs (special flights).

Total flying time associated with this schedule would depend on the type of aircraft but would be approximately 20 hours/week or 87 hours/month for a small twin-engine aircraft not including special trips.

The above schedule allows for two one-day trips and one four-day trip weekly to Montería, Carimagua and Medellín and a variety of combinations for trips to Bogotá.

Alternative means of air transportation: availability and costs

Basically two alternatives to present arrangements are open to CIAT:
(1) Leasing or chartering and (2) Purchase.

The costs associated with each of these alternatives depend on the type of plane needed. Recommendations concerning the brand of airplane best suited for CIAT are beyond the scope of this analysis. It is necessary, however, to establish certain characteristics of the planes to be analyzed in order to carry out cost estimates. The four characteristics to be dealt with in this analysis are: (1) Passenger and freight capacity of plane; (2) Service ceiling; (3) Type of engine, and (4) Pressurized or non-pressurized cabin. Only twin engine aircrafts will be considered.

(1) Passenger and freight capacity: Based on the above mentioned demand for air transportation during 1972 and given the recent staff expansions and recent and expected increases in research and training activities in Montería and Carimagua it appears that the most convenient capacity would be 7-9 passengers where part of the passenger space could be used for freight if needed. This is assuming two weekly services to Montería, Bogotá and Carimagua as specified above.

(2) Service Ceiling: Given the topography and climatical conditions, the service ceiling may greatly influence the safety of the transportation. A large number of small twin engine commercial airplanes in Colombia have a single-engine service ceiling of about 11,000 feet. Although the experts interviewed do not agree entirely on this issue, it appears that safety is considerably improved under Colombian conditions if the single-engine service ceiling is lifted to at least 14,000 feet.

(3) Type of engine: Experts agree that turboprop engines are safer than piston engines. However, it is beyond the scope and capacity of this analysis to evaluate the difference in safety due to type of engine. According to available information, no small turboprop plane is presently available in Colombia for leasing or charter arrangement.

(4) Pressurization: The comfort of the passengers is greatly enhanced if the cabin is pressurized under high altitude flying. However, according to available information, there are no small airplane with pressurized cabin available in Colombia for leasing or charter arrangements.

Leasing and charter arrangements

Two companies have offered to place small aircrafts at the disposition of CIAT on a full time basis. TANA (Taxi Aéreo Nacional Ltda.) offers a Beech Super 18 (8 passengers, single engine service ceiling: 10-11,000 feet,

piston engine, non-pressurized) including complete maintenance and service for Col.\$200.000/month assuming 80 hrs./month (U.S.\$8.510.64).

Another company, Aerovías is offering a Queen Air (9 passengers, single engine service ceiling: 11.000 feet, piston engine, non-pressurized) including complete maintenance and service for U.S.\$8.500/month plus U.S.\$50/hour of flying time or a total of U.S.\$12.500/month assuming 80 hours/month.

Aerovías also offers a King Air (7-9 passengers, single engine service ceiling: 14.000 feet, turboprop engine, pressurized cabin) for U.S.\$13.000 per month plus U.S.\$80.00 per hour of flying time or a total of U.S.\$19.400 per month assuming 80 hrs./month. The aircraft will be purchased by Aerovías exclusively for the use by CIAT and the minimum duration of the contract is seven years.

Purchase

The cost associated with the purchase and maintenance of an aircraft obviously depends on the type of aircraft. The cost estimates reported in Tables 2 and 3 refer to a used Beechcraft King Air (7-9 passengers, single engine service ceiling: 14.000 feet, turboprop engine, pressurized cabin) and a new Cessna 421 (6-8 passengers, single engine service ceiling: 13.000 feet, piston engine, pressurized cabin), respectively. These aircrafts were chosen as representing two classes of aircrafts that to varying degree appear to meet the requirements expressed by CIAT management with respect to safety and the capacity requirements estimated in this study.

It is assumed that the used King Air can be obtained at a price of U.S.\$300.000. As shown in Table 2, total annual costs for the King Air are estimated to be U.S.\$143.358 if the aircraft is used 80 hours/month and U.S.\$150.506 if used 90 hours/month. The hourly costs are estimated at U.S.\$149.33 and U.S.\$139.36 for 80 and 90 hours/month, respectively. In estimating the costs it is assumed that the aircraft is used six years, after which it carries a re-sale value of U.S.\$60.000. Furthermore, it is assumed that the capital invested in the aircraft carries an annual interest rate of 7.5 percent.

An amount equal to 15 percent of the direct operating costs is charged to administration of the maintenance and service of the aircraft including hangar space. It may be possible to reduce this cost slightly. However, there is presently little expertise in Colombia with respect to the maintenance of small turboprop aircrafts. Therefore, some training may be necessary in order to obtain a well qualified mechanic.

The total costs associated with the purchase and maintenance of a Cessna 421 or similar aircraft were estimated to be U.S.\$109.023 per year if used 80 hours/month and U.S.\$113.082 if used 90 hours/month (Table 3). The costs per flight hour were estimated at U.S.\$113.57 and U.S.\$104.71, respectively.

In addition to costs, the flow of cash expenses over time may be important for budget planning within CIAT. Tables 4 and 5 show the flow of cash expenses associated with the purchase and maintenance of the two aircrafts analyzed above. Two cash flows are estimated for each aircraft. One flow is estimated under the assumption that the aircrafts are purchased under the financing plan developed by Calmaquip (see Appendix) and another refers to a situation where the aircraft is paid by special funds at the time of delivery. If interest free special funds are available and no reserves are needed for future replacement of the aircraft, a new Cessna 421 can be maintained for approximately the sum presently spent on travel to Montería, Medellín, Bogotá and Carimagua. Maintaining a King Air under these conditions would cost approximately U.S.\$30,000 more per year.

Cost comparisons

Table 6 shows the estimated costs of alternatives as compared to costs incurred during 1972. It is assumed that ICA will continue to pay an annual sum equal to that paid during 1972 (U.S.\$15,000) for air services to Carimagua, adjusted for inflation (5% annually). It is further assumed that all present air transportation on commercial airlines between Cali and Bogotá, Medellín and Montería except when connected with foreign travel, will be taken over by the alternative means. Increasing future needs for air transportation is not considered in the estimates.

Under these assumptions, the purchase of a used King Air aircraft would add U.S.\$82,906 to the present annual travel cost of CIAT while the purchase of a Cessna 421 would add U.S.\$48,571. The cost of leasing a Queen Air would be approximately the same as purchasing a used King Air, while leasing a new King Air would be considerably more costly. The cheapest alternative considered is the lease of a Super 18 from TANA.

It should be noted that the leasing proposal from Aerovías refers to a new King Air aircraft (value approximately U.S.\$520,000) while the cost estimates for CIAT purchase refers to a used aircraft (assumed value U.S.\$300,000). Hence, while expected total costs to Aerovías will be higher, maintenance costs and the risk of major outlays for spare parts is expected to be higher for the used aircraft purchase by CIAT. Also, the risk that the aircraft may be grounded for longer periods of time while waiting for imported spare parts is larger for a used aircraft.

In general, it may be expected that the cost of leasing arrangements will be higher than the cost associated with purchasing any given aircraft primarily because CIAT is exempt from import duties ^{1/} and the need for a certain profit margin for the company leasing the plane.

^{1/} Present import duty is 30 percent of purchasing price if the aircraft is brought in assembled and 15 percent if assembled in Colombia.

Up to this point we have compared only direct costs (ticket costs vs. costs of alternatives). The loss of staff time is another important cost factor to consider. This is particularly important between Cali and Montería where the commercial service is somewhat deficient. The flight from Medellín to Montería is frequently delayed or cancelled, leaving staff members in Medellín for extended time periods. It is not certain that the Avianca service to Montería will be improved greatly in the near future. In addition to Avianca, a small airline, ACES, flies between Medellín and Montería.

It is not possible to estimate the loss of staff time due to the cancelling of schedule flights with a great deal of certainty. It is possible, however, to estimate the difference in staff time needed, assuming that the commercial flights perform according to schedule. This estimate will then form a lower limit for the amount of staff time lost.

According to the current Avianca schedule, the travel from Cali to Montería takes 5 hours and 10 minutes and from Montería to Cali 3 hours and 40 minutes, or in total approximately 4 hours more than the time needed by the alternative means being considered. A total of 91 persons made a round trip Cali-Montería during 1972. The hourly cost of a senior staff member is approximately U.S.\$14. Hence the cost due to lost staff time is estimated to be U.S.\$5.096 assuming that commercial flights are always on time. Considering delays in departures, the commercial flights between Cali and Bogotá normally take about one hour in each direction, hence we expect little difference in needed staff time in this case.

Other factors

In addition to relative costs, it is important to consider other factors such as flexibility and safety. For the scientist who need to spend 4-6 hours at Carimagua or Montería, the alternatives considered in this study provide more flexibility and require considerably less total staff time than present arrangements. Furthermore, the easy access to Montería and Carimagua may improve the research and training activities carried out on these stations through more frequent supervision.

An analysis of relative safety among alternatives is considered beyond the scope of this analysis. However, as mentioned above, most small commercial airplanes available for service in Colombia, including the aircraft presently used by CIAT between Bogotá and Carimagua, have a single-engine service ceiling of about 11,000 feet or less and do not have pressurized cabin.

Concluding remarks

The purpose of this analysis was to provide additional information for decision-making with respect to meeting the needs for air transportation within Colombia. Recommendations as to the most feasible means to meet the needs are beyond the scope of the report.

It may be concluded that none of the alternative means considered in this analysis can be obtained at the cost of domestic air transportation during 1972. However, all the alternatives are expected to provide considerably more and better service than that obtained during 1972. The alternatives will provide more flexibility, and reduce the loss of staff time during travel by means of which staff efficiency may be increased and research and training activities at Montería and Carimagua improved. Furthermore, the alternatives considered, except for one - Super 18 - are likely to improve passenger safety.

It is not possible on the basis of available data, to determine the economic benefits from improved safety, increased staff efficiency and improved research and training activities. Furthermore, the value of non-economic benefits associated with safety are essentially subjective and the price CIAT is willing to pay to obtain additional safety depends on the philosophy of the CIAT management. Hence, while this analysis presents alternative costs, it cannot quantify alternative benefits.

Table 1. Estimated cost of official travel between
Cali and Bogotá, Medellín, Carimagua and Montería 1972

	<u>No. of seats</u>	<u>Estimated costs ^{1/}</u>	
		<u>(Col.\$)</u>	<u>U.S.\$ ^{2/}</u>
Cali-Bogotá; Bogotá-Cali	456	339.264.00	15.421.09
Cali-Medellín; Medellín-Cali	24	16.176.00	735.27
Cali-Montería; Montería-Cali	91	101.010.00	4.591.36
Bogotá-Carim.; Carim.-Bogotá	449	873.500.00	39.704.55
Charged to ICA	-	321.561.00	14.616.41
Charged to CIAT	-	551.939.00	25.088.14
Total CIAT	-	1.008.389.00	45.835.86
Total ICA	-	<u>321.561.00</u>	<u>14.616.41</u>
Grand Total	1.020	1.329.950.00	60.452.27

1/ Estimated on the basis of present ticket prices as follows:

Cali - Bogotá (round trip)	Col.\$ 744.00
Cali - Medellín (round trip)	674.00
Cali - Montería (round trip)	1.110.00
Bogotá - Carimagua: charter	

2/ Exchange rate used: U.S.\$ 1.00 = Col.\$ 22.00

Table 2. Estimated total cost of purchasing and maintaining a used King Air 90 or similar aircraft ^{1/}

<u>Operating costs ^{3/}</u>	<u>Fixed per month (Col.\$)</u>	<u>Per flight hour (Col.\$)</u>	<u>Annual costs (U.S.\$) ^{2/}</u>	
			<u>80 hrs. month</u>	<u>90 hrs. month</u>
Flight crew	32.000	-	16.340	16.340
Fuel	-	384	15.687	17.648
Oil	-	6	245	276
Maintenance	7.000	500	24.000	26.553
Engine Overhaul (U.S.\$40.000 per 3.000 hrs.)	-	313	12.786	14.385
Landing fees, etc.	-	60	2.451	2.757
Total operating costs	39.000	1.203	71.509	77.959
<u>Additional costs</u>				
Insurance (2.8%/yr., value U.S.\$300.000)			8.400	
Interest (7.5%/yr. of balance)			15.000	
Depreciation (6 yrs., 20% replacement value)			40.000	
Management costs (15% of direct oper. costs)			8.449	9.147
Grand total			143.358	150.506
Total cost per hour			149.33	139.36

^{1/} Cost estimates beyond 1974 should consider cost increases due to inflation (see Table 4).

^{2/} Exchange rate: U.S.\$1 = Col.\$ 23.50.

^{3/} Based on information from TANA.

Table 3. Estimated total cost of purchasing and maintaining a new Cessna 421 or similar aircraft ^{1/}

	Fixed per month (Col.\$)	Per flight hour (Col.\$)	Annual costs (U.S.\$)	
			80 hrs. month	90 hrs. month
<u>Operating costs</u>				
Flight crew	32.000	-	16.340	16.340
Fuel	-	200	8.170	9.191
Oil	-	40	1.634	1.838
Maintenance	7.000	200	11.745	12.766
Engine Overhaul (U.S.\$15.000 per 1.600 hours)		220	8.987	10.111
Landing fees, etc.		60	<u>2.451</u>	<u>2.757</u>
Total operating costs	39.000	720	49.327	53.003
<u>Additional costs</u>				
Insurance (2.8%/yr. value U.S.\$280.000)			7.840	
Interest (7.5% of balance)			13.805	
Depreciation (7 yrs., 20% replacement value)			32.000	
Management costs (15% of direct oper. costs)			<u>6.051</u>	<u>6.434</u>
Grand total			<u>109.023</u>	<u>113.082</u>
Total cost per hour			<u>113.57</u>	<u>104.71</u>

^{1/} Cost estimates beyond 1974 should consider cost increases due to inflation (see Table 5).

Table 4. Cash-flow associated with the purchase and
maintenance of a used King Air or similar aircraft

<u>Year</u>	<u>Principal and interest payments on loan 1/</u>	<u>Insurance, operating and management costs excluding engine overhaul 2/</u>		<u>Engine overhaul</u>	<u>Assumed ICA payment</u>	<u>Total, with Calmaquip financing plan 3/</u>		<u>Total without financing 4/</u>	
		<u>80 hrs.</u>	<u>90 hrs.</u>			<u>80 hrs.</u>	<u>90 hrs.</u>	<u>80 hrs.</u>	<u>90 hrs.</u>
1973 5/	71.304	-	-	-	-	71.304	71.304	-	-
1974	72.731	75.572	81.121	-	15.000	133.303	138.852	60.572	66.121
1975	68.681	79.351	85.177	-	15.750	132.282	138.108	63.601	69.427
1976	64.631	83.318	89.436	40.000	16.538	171.411	177.529	106.780	112.898
1977	60.581	87.484	93.908	-	17.364	130.701	137.125	70.120	76.544
1978	29.531	91.858	98.603	-	18.233	103.156	109.901	73.625	80.370
1979	-	96.451	103.533	-	19.144	77.307	84.389	77.307	84.389

- 1/ Assuming a purchasing price of U.S.\$300.000 and using the "Model Sample" made by Calmaquip as basis for estimating financing costs (see Appendix).
- 2/ An annual cost increase of 5 percent on the dollar due to inflation is assumed.
- 3/ Total expenses less U.S.\$15.000 expected to be paid by ICA for air service to Carimagua assuming that the aircraft is paid over five years at an interest rate of 7.5 percent.
- 4/ Assuming that the aircraft is paid in total by special funds upon delivery.
- 5/ Assuming that purchase takes place towards the end of 1973.

Table 5. Cash-flow associated with the purchase and
maintenance of a new Cessna 421 or similar aircraft

<u>Year</u>	<u>Principal and interest payments on loan <u>1/</u></u>	<u>Insurance, operating and management costs excluding engine overhaul <u>2/</u></u>		<u>Engine overhaul</u>		<u>Assumed ICA payment</u>	<u>Total, with Calmaquip financing plan <u>3/</u></u>		<u>Total without financing <u>4/</u></u>	
		<u>80 hrs.</u>	<u>90 hrs.</u>	<u>80 hrs.</u>	<u>90 hrs.</u>		<u>80 hrs.</u>	<u>90 hrs.</u>	<u>80 hrs.</u>	<u>90 hrs.</u>
1973 <u>5/</u>	66.548	-	-	-	-	-	66.548	66.548	-	-
1974	67.880	54.231	57.166	-	-	15.000	107.111	110.046	39.231	42.166
1975	64.100	56.943	60.024	15.000	15.000	15.750	120.293	123.374	56.193	59.274
1976	60.320	59.790	63.026	-	15.000	16.538	103.572	121.808	43.252	61.488
1977	56.540	62.779	66.176	15.000	-	17.364	116.955	105.352	60.415	48.812
1978	27.561	65.918	69.486	-	15.000	18.233	75.246	93.814	47.685	66.253
1979	-	69.214	72.960	15.000	15.000	19.144	65.070	68.816	65.070	68.816

- 1/ Assuming a purchasing price of U.S.\$280.000 and using the "Model Sample" made by Calmaquip as basis for estimating financing costs (see Appendix).
- 2/ An annual cost increase of 5 percent on the dollar due to inflation is assumed.
- 3/ Total expenses less U.S.\$15.000 expected to be paid by ICA for air service to Carimagua assuming that the aircraft is paid over five years at an interest rate of 7.5 percent.
- 4/ Assuming that the aircraft is paid in total by special funds upon delivery.
- 5/ Assuming that purchase takes place towards the end of 1973.

Table 6. Estimated annual cost of five alternatives
as compared to costs of air transportation during 1972 ^{1/}

	<u>U.S.\$/yr.</u>	<u>Difference from</u> <u>1972 ^{3/}</u>
Actual cost 1972 ^{2/}	45.452	-
Estimated cost to CIAT ^{1/} of:		
Super 18 (TANA)	87.128	+ 41.676
Cessna 421 (CIAT)	94.023	+ 48.571
Queen Air (Aerovías)	135.000	+ 89.548
King Air (CIAT)	128.358	+ 82.906
King Air (Aerovías)	217.800	+ 172.348

^{1/} Assuming 80 hrs./month.

^{2/} Total cost less U.S.\$15.000 paid by ICA.

^{3/} Assuming that all present CIAT air travel to Medellín, Montería, Bogotá and Carimagua will be replaced by the alternatives. There is likely to be some need for travel on commercial airlines to Bogotá and Medellín under the alternative arrangements.

Figure 1. Official travel Cali-Bogotá by
CIAT personnel, by month 1972.



Figure 2. Official travel Bogotá-Cali by CIAT
personnel, by month 1972.

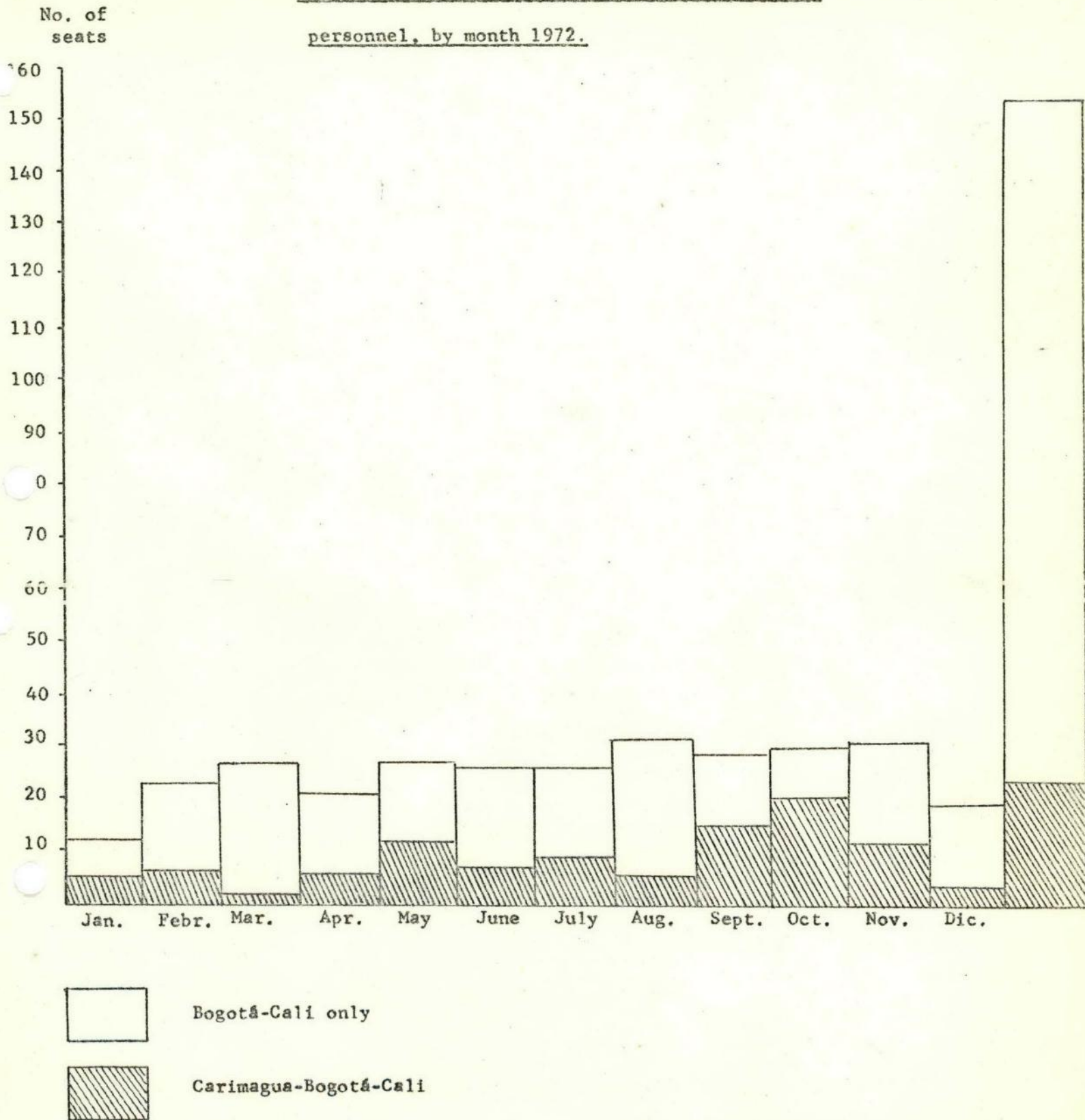


Figure 3. Official travel Cali-Medellín and Medellín-Montería by CIAT personnel, by month 1972

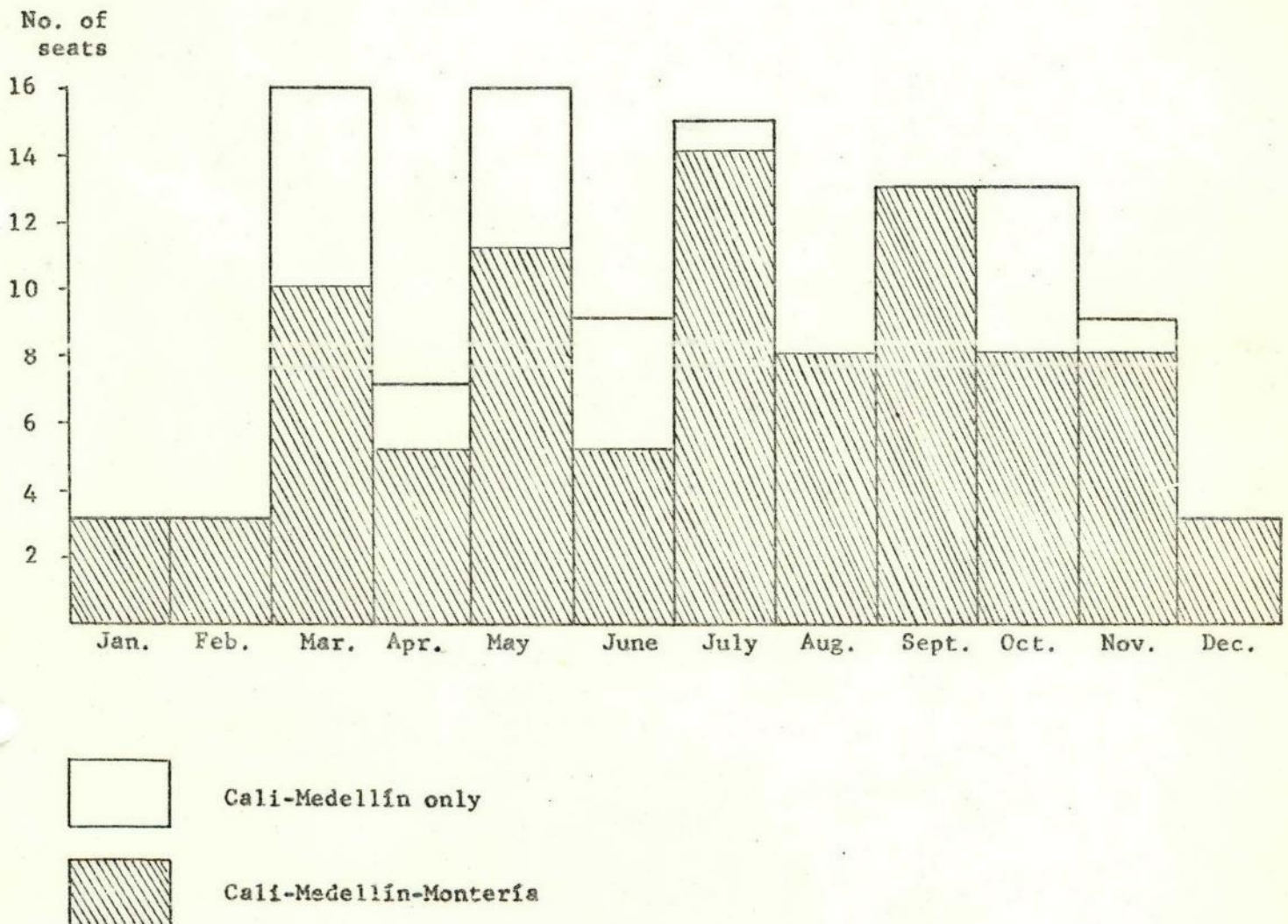


Figure 4. Official travel Medellín-Cali and Montería-Medellín-Cali
Medellín by CIAT personnel, by month 1972.

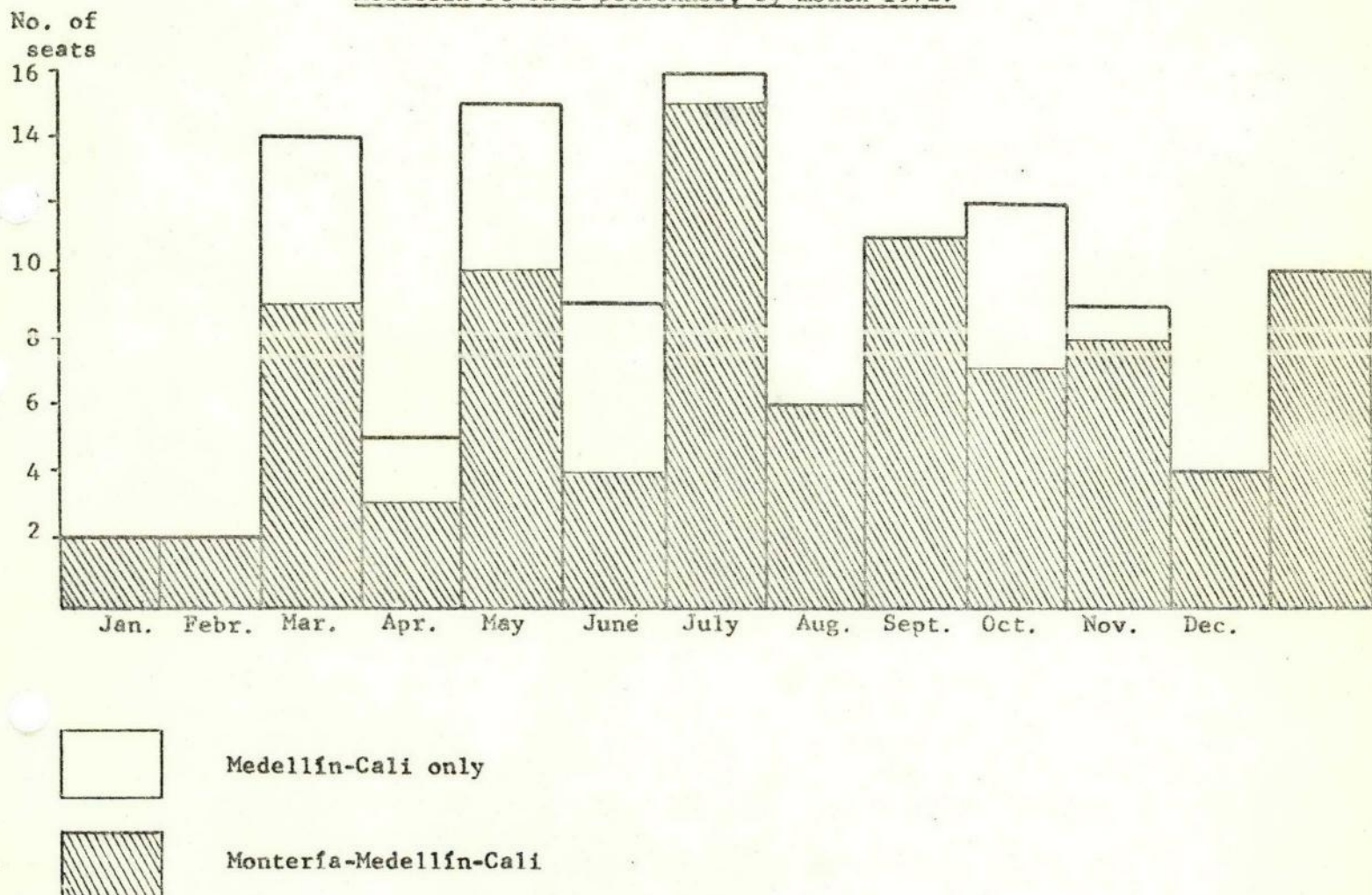


Figure 5. Official travel Cali-Bogotá by CIAT
personnel, by week day 1972.

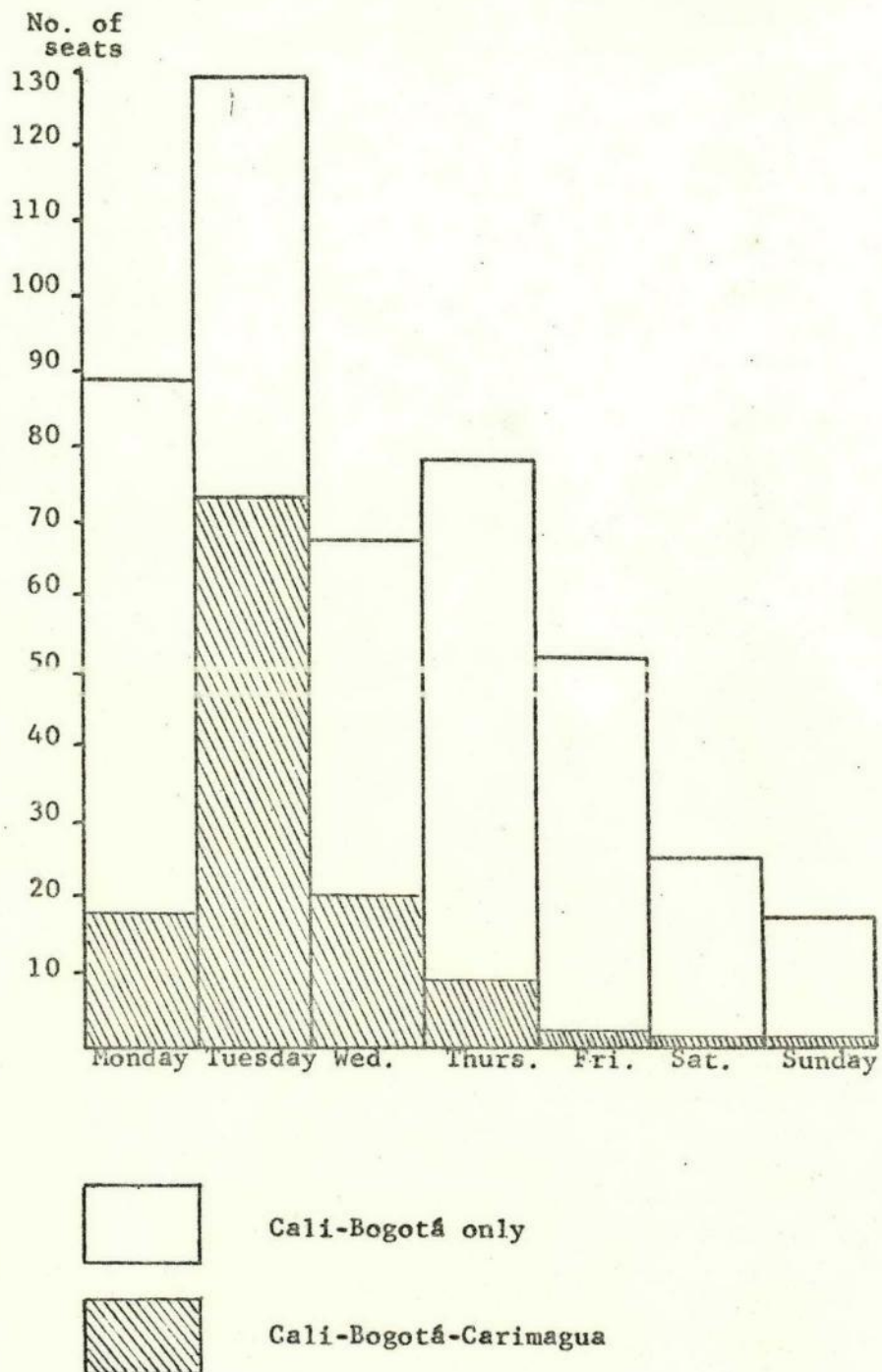
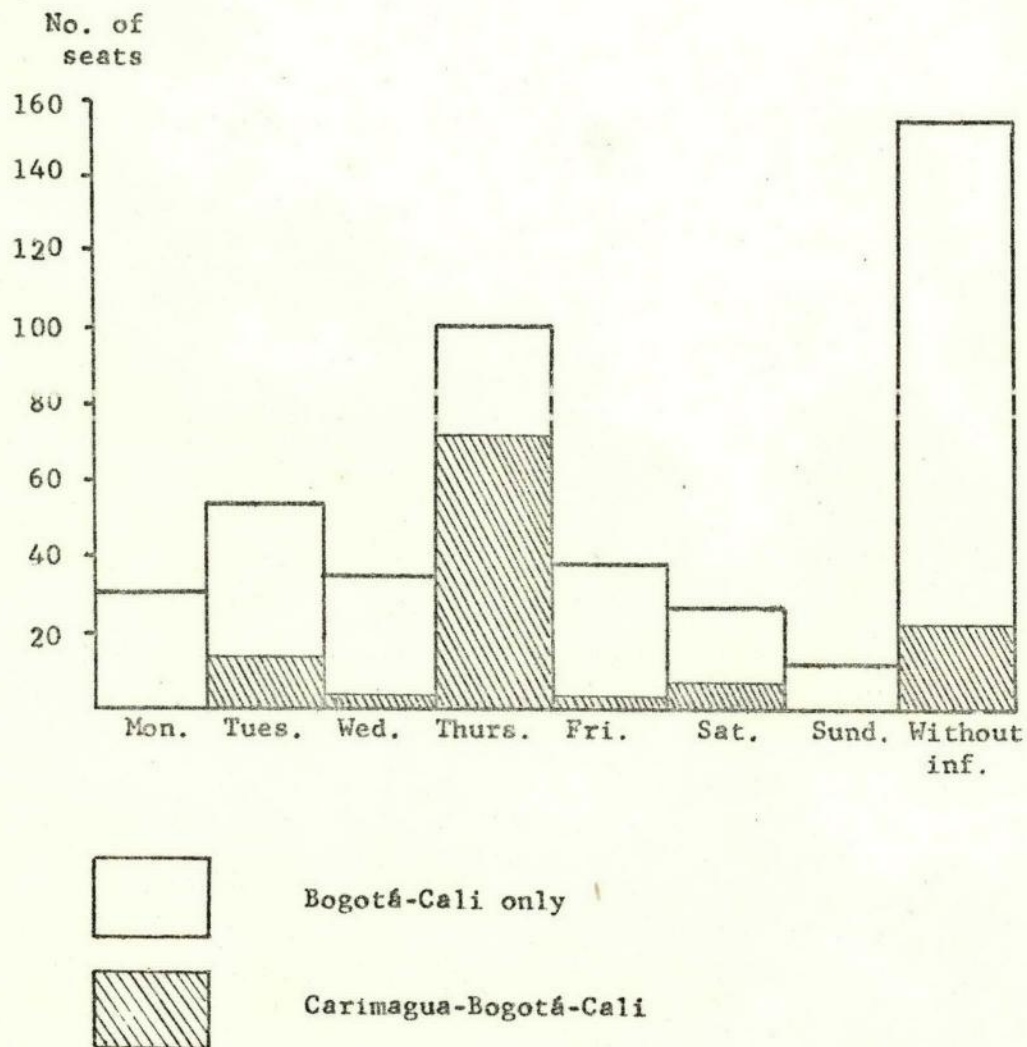


Figure 6. Official travel Bogotá-Cali by CIAT
personnel, by weekday 1972.



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Figure 7. Official travel Cali-Medellin and Medellin-Monterfa by CIAT personnel, by weekday 1972.

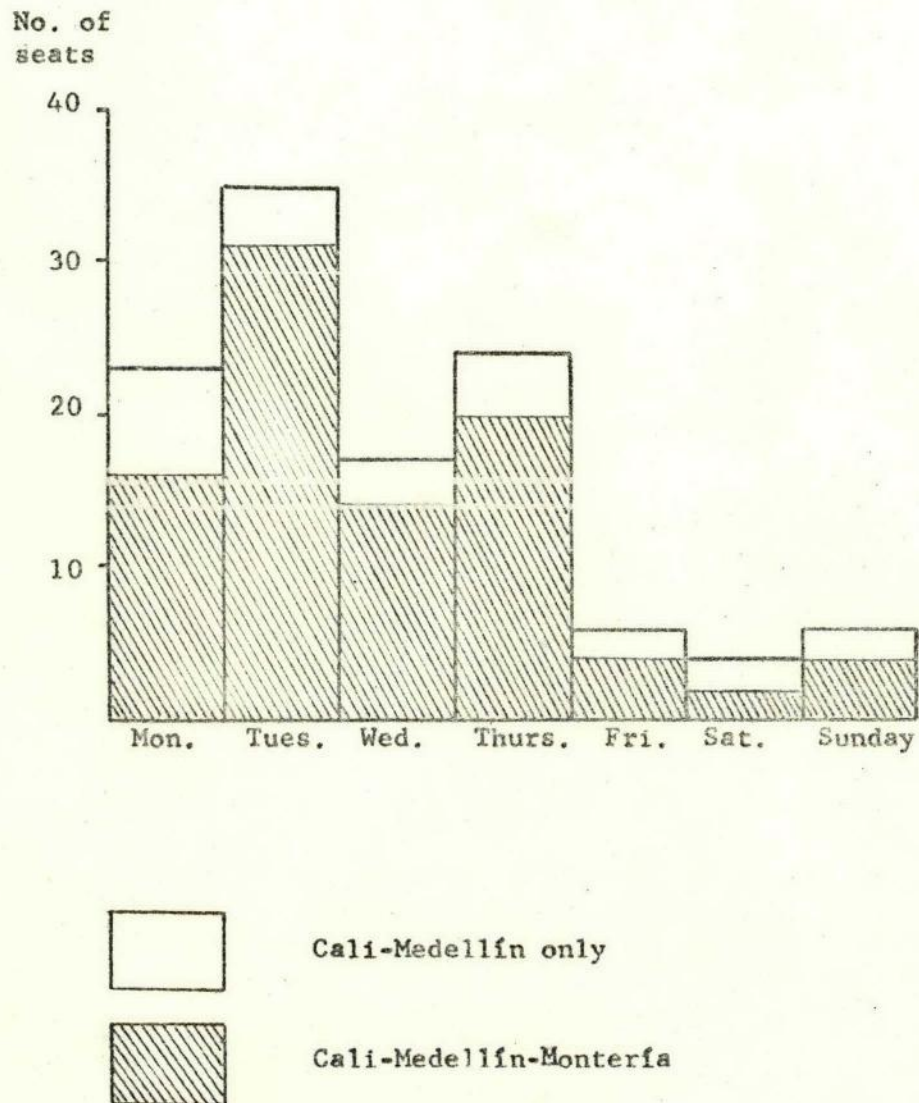


Figure 8. Official travel Medellín-Cali and Montería-Medellín by CIAT personnel, by weekday 1972.

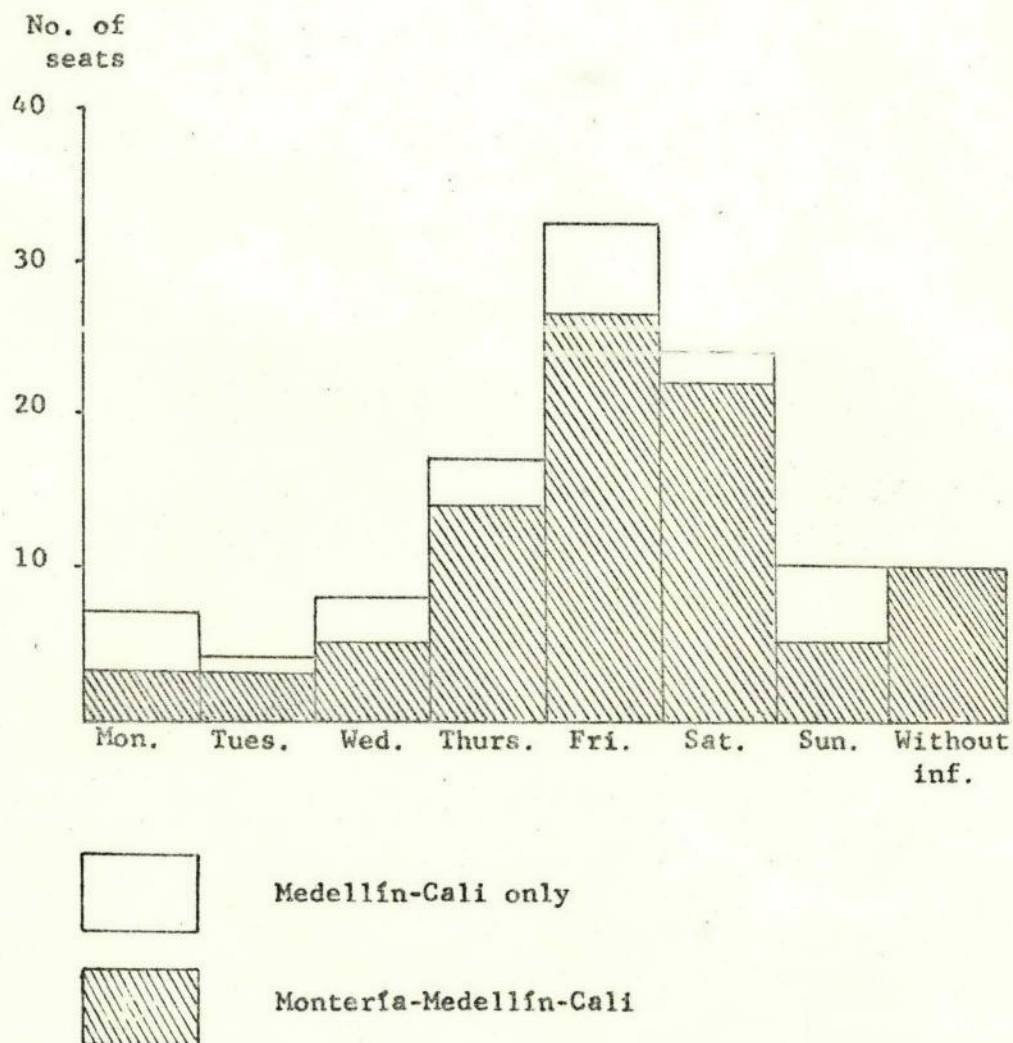


Figure 9. Official travel Bogotá-Carimagua by
CIAT and ICA personnel, by month 1972.

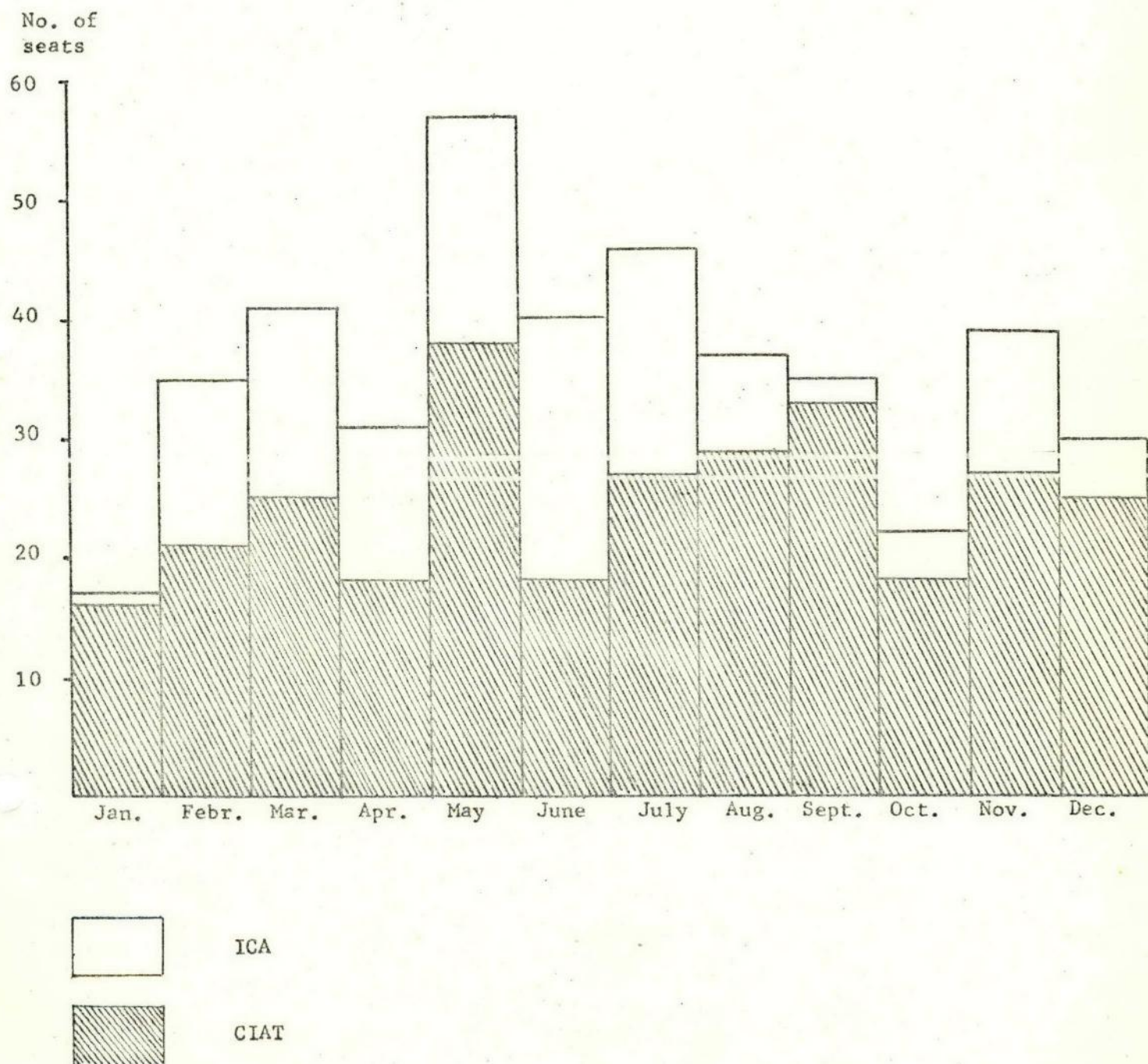


Figure 10. Official travel Carimagua-Bogotá by
CIAT and ICA personnel, by month 1972.

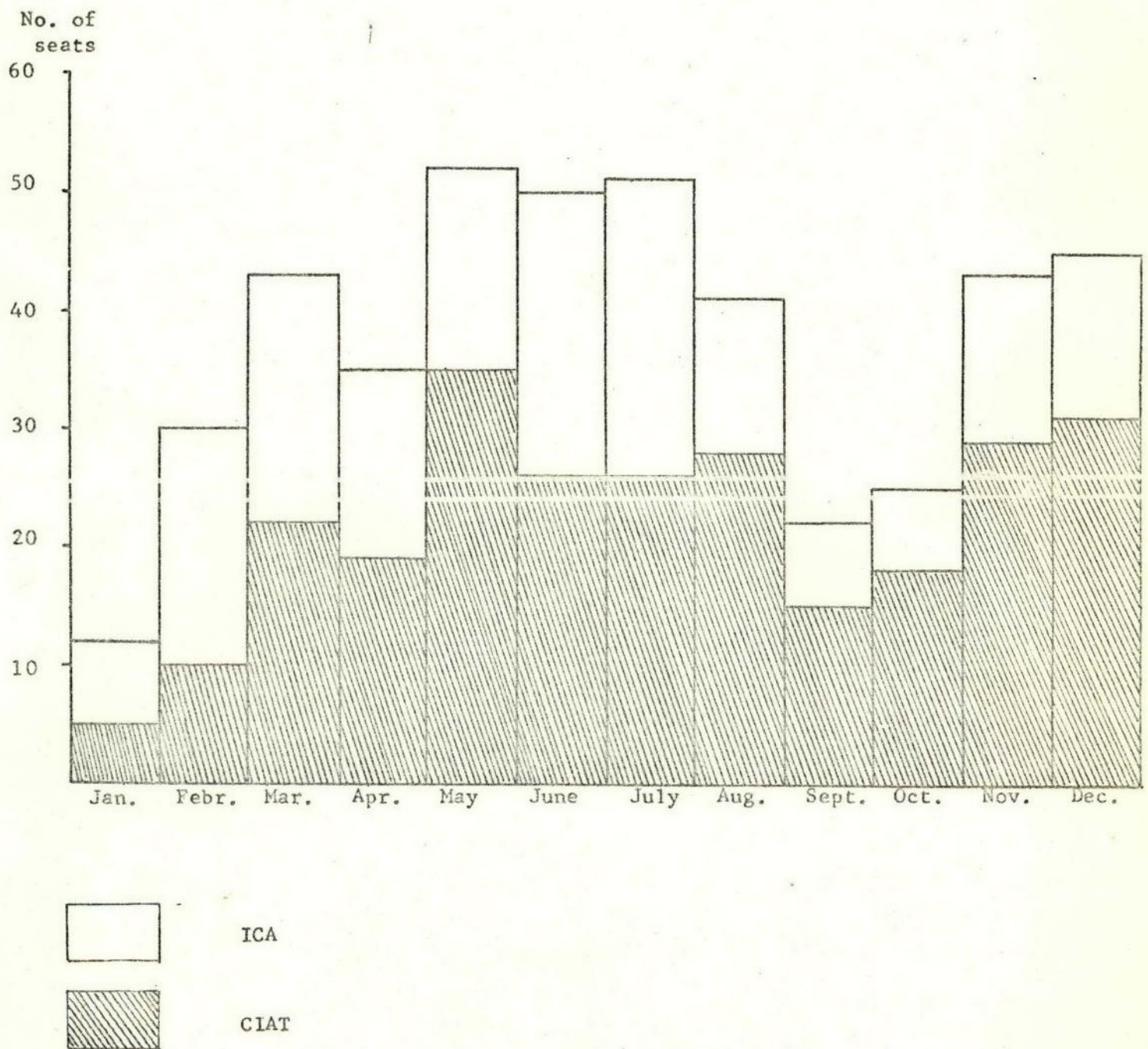


Figure 11. Duration of trips Cali-Monterfa-Cali

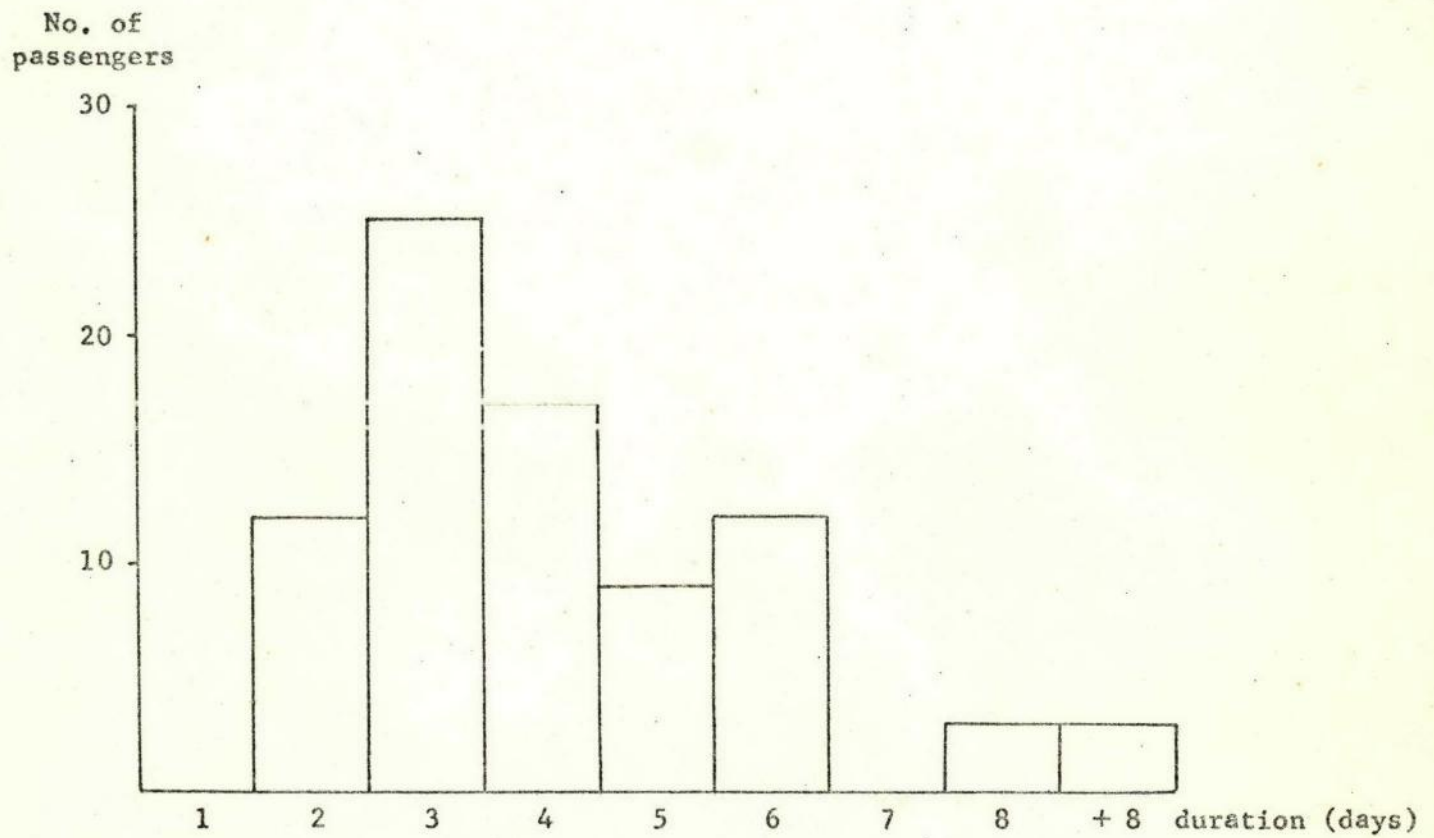
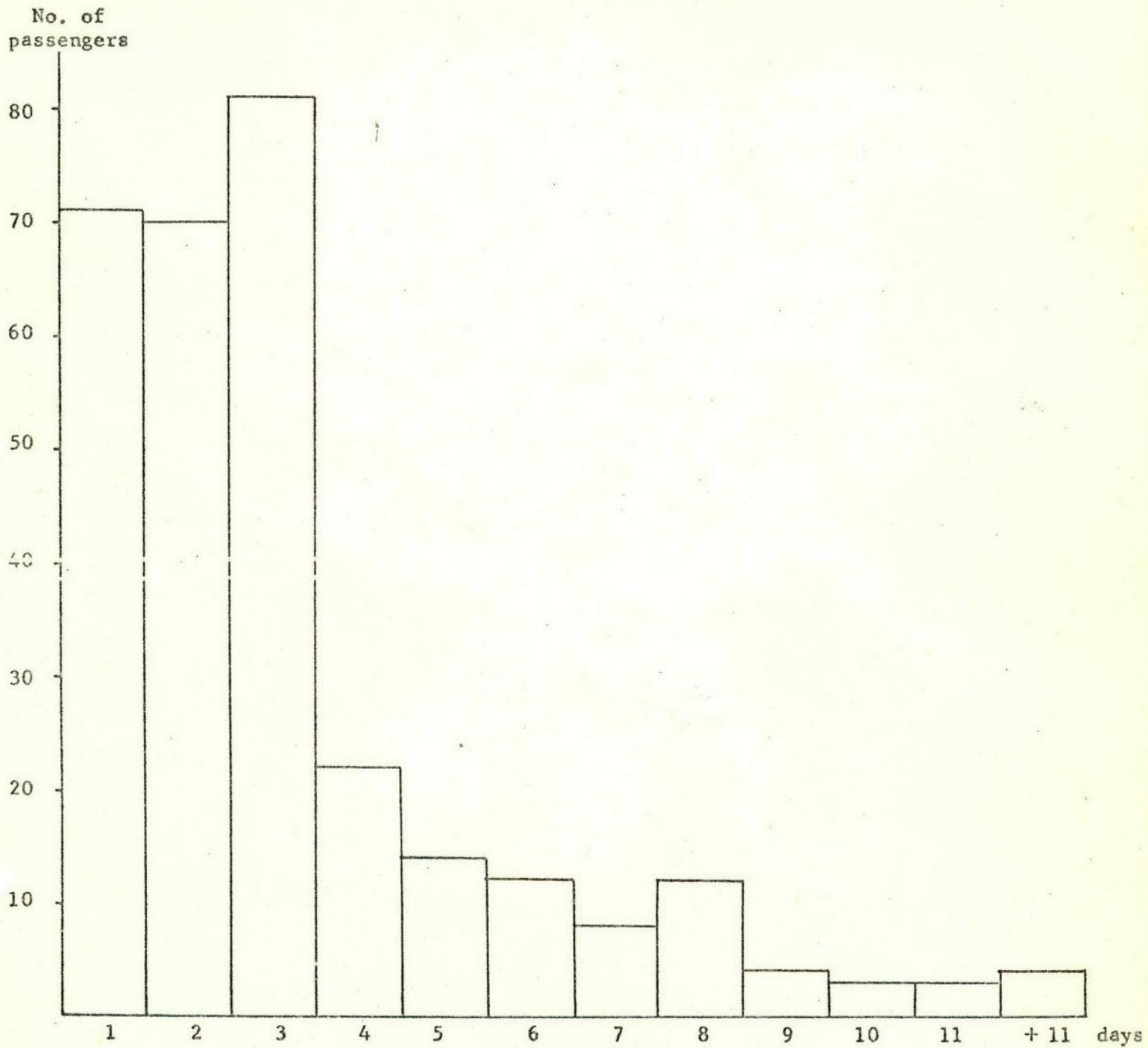


Figure 12. Duration of trips Cali-Bogotá-Cali



Calmaquip

Engineering Western Hemisphere Corporation

1424 N. W. LE JEUNE RD.

MIAMI, FLORIDA 33126

CABLE: CALMAQUIP

PHONE (305) 671-4260

MAILING ADDRESS: P. O. BOX 653 RIVERSIDE STATION, MIAMI, FLORIDA 33135 U.S.A.

TELEX NO. 051-751

February 19, 1973

MODEL SAMPLE OF A TRANSACTION USING AS AN
ESTIMATED PURCHASE PRICE THE AMOUNT OF \$300,000.00
FOR REFERENCE PURPOSES ONLY

Estimated Purchase Price: \$300,000.00

Down Payment	\$30,000.00
FCIA Insurance Policy 2.52% of \$270,000.00	6,804.00
Security Deposit 10% of Financed Portion	27,000.00
Calmaquip's Fees -2½% of \$300,000.00	7,500.00

20 QUARTERLY PAYMENTS

Amount Financed: \$270,000.00

Quarter	Total Payment	Interest Pmt.	Principal Payment	Balance Principal
	Principal & Interest	6% + 1½% = 7½%		
1 Quarter	\$18,562.50	\$5,062.50	\$13,500.00	\$256,500.00
2 "	18,309.38	4,809.38	13,500.00	243,000.00
3 "	18,056.25	4,556.25	13,500.00	229,500.00
4 "	17,803.13	4,303.13	13,500.00	216,000.00
5 "	17,550.00	4,050.00	13,500.00	202,500.00
6 "	17,296.88	3,796.88	13,500.00	189,000.00
7 "	17,043.75	3,543.75	13,500.00	175,500.00
8 "	16,790.63	3,290.63	13,500.00	162,000.00
9 "	16,537.50	3,037.50	13,500.00	148,500.00
10 "	16,284.38	2,784.38	13,500.00	135,000.00
11 "	16,031.25	2,531.25	13,500.00	121,500.00
12 "	15,778.13	2,278.13	13,500.00	108,000.00
13 "	15,525.00	2,025.00	13,500.00	94,500.00
14 "	15,271.88	1,771.88	13,500.00	81,000.00
15 "	15,018.75	1,518.75	13,500.00	67,500.00
16 "	14,765.63	1,265.63	13,500.00	54,000.00
17 "	14,512.50	1,012.50	13,500.00	40,500.00
18 "	14,259.38	759.38	13,500.00	27,000.00
19 "	14,006.26	506.25	13,500.00	13,500.00
20 "	13,753.13	253.13	13,500.00	----0----
	<u>\$323,156.30</u>	<u>\$53,156.30</u>	<u>\$270,000.00</u>	

NOTE: A) The interest rate has been based on today U.S. Bank Prime rate for budget purpose only, as the actual interest will float and adjusted every quarterly.

B) The security deposit will be used by Calmaquip Eng. W. H. Corp. to cover the principal of installments No. 19 & 20.



CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

March 27th., 1973

Mr. Robert McNamara
President
International Bank for Reconstruction
and Development
1818 H Street, N.W.
Washington, D.C. 10433
U.S.A.

Dear Mr. McNamara:

I am sorry that I was unable to attend last year's International Center's Week but am planning to be on hand for the meeting next July.

I now wish to refer to the invitation issued by our Director General, Dr. U.J. Grant, inviting you to deliver the keynote address for us at the Symposium that we are holding at the time of the inauguration of CIAT's new facilities, October 12th and 13th of this year.

We wish to make this a significant occasion, given the importance that we feel should be attributed to the work of CIAT as an International Center, as well as to all of its sister International Centers throughout the world.

Certainly your presence and your remarks on the topic suggested, - "The Cost to Society of Unrealized Potentials" - will add much to the interest and success of our gathering. At the same time we would like to show you what has been done, and continues to be done, with the generous contributions of so many donors on an international scale. We believe we are building for the future, both in scientific research and in human resource development.

We now request your personal participation - which we would greatly appreciate - and which will give added recognition to the need for continued and sustained support to scientific research in world food production and to the development of the human resources necessary to manage such programs and reach their imperative goals.

Sincerely,

Francisco de Sola
Chairman Board of Trustees

FdeS/elm



cc office Pres

42a

March 19, 1973

Dear Jerry:

Thank you for your letter of March 7. I believe that the \$60,000 shortfall you point out in your budget for 1973 can be met through the Consultative Group, and that you should plan on the basis that the funds will be available. We can definitely dispose of this matter by about June 1, when all the first round of CG allocations should be complete and we can see exactly how the funds can be made available.

In the meantime, it would help me to have more detail than your 1973 budget showed on special projects. Specifically, I'd like to know what activities are to be covered by the \$104,000 which was shifted out of your special projects budget into your core budget, after Colin McClung's letter on this subject last August 22; and I'd like to know the estimated cost of each of these activities. This might make it easier to present the matter of the \$60,000 to some donors who might be asked to provide the funds needed.

Sincerely yours,

Harold Graves

Dr. U. J. Grant
Director General
Centro Internacional de Agricultura
Tropical
Apartado Aereo 67-13
Cali
Colombia

Handwritten initials
HG:mcj

G2a

March 16, 1973

Dear Frank:

Many thanks for sending me copies of the Selected Notes from the Directors' meeting at Bellagio. They are so interesting that it seems to Mr. Demuth and me that the members of the Consultative Group would appreciate having them, and that it would help the Centers for the Group to be aware of what the Centers are doing cooperatively to move forward on both the research and administrative fronts.

Since you have given me the option of doing so, I will distribute copies of the Notes to the Consultative Group. I'll also send copies to the Group's Technical Advisory Committee, to which some observations in the Notes seem to be particularly pertinent.

Sincerely yours,

Harold Graves
Executive Secretary

Mr. Francis C. Byrnes
Secretary-Treasurer
Centro Internacional de Agricultura
Tropical
Apartado Aereo 67-13
Cali
Colombia

cc: Dr. H. R. Albrecht (Ibadan and Washington)
Dr. D. S. Athwal
Dr. R. W. Cummings
Dr. U. J. Grant
Mr. Haldore Hanson
Dr. R. L. Sawyer

HG:mcj

Handwritten signature



CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

DIR-263

March 7, 1973

Mr. Harold Graves
Consultative Group on
International Agricultural Research
1818 H. Street, N. W.
Washington, D. C. 20433

Dear Harold:

The presence this week of Dr. George Dion and Mr. Andrew Urquhart has provided us with opportunity to review and discuss a number of interesting issues. One of the questions which I brought to your attention earlier when the pledges from the various donor organizations were announced has been raised again with them. They suggested that I should bring this to your attention in writing.

Our budget request for 1973 involved receiving \$290,000 from the W. K. Kellogg Foundation for restricted core support of the training and communication program, and another \$60,000 for support of conferences and symposia participation, this latter being shown under "Special Projects" in our budget document.

In recording the \$350,000 contribution of the W. K. Kellogg Foundation, it appears that the CG credited the entire amount to the restricted core and/or core, and hence reduced by this amount the shortfall between the total of the donor pledges and the core funds needed. In making up the deficit, therefore, the additional funds provided through the World Bank were reduced by \$60,000. The net result to CIAT, as we interpret it, is either ^{or} \$60,000 deficit in core or a similar deficit in support for conferences and symposia.

We are bringing this matter to your attention so that if the situation permits the Consultative Group could have the opportunity to make up this deficit in our conference and symposia budget.

Your comments will be most appreciated since we must begin

81417 12 11:30



CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

DIR-263

March 7, 1973

Mr. Harold Graves
Consultative Group on
International Agricultural Research
1818 H. Street, N. W.
Washington, D. C. 20433

Dear Harold:

The presence this week of Dr. George Dion and Mr. Andrew Uppshart has provided us with opportunity to review and discuss a number of interesting issues. One of the questions which I brought to your attention earlier when the pledges from the various donor organizations were announced has been raised again with them. They suggested that I should bring this to your attention in writing.

Our budget request for 1973 involved receiving \$290,000 from the W. K. Kellogg Foundation for restricted core support of the training and communication program, and another \$60,000 for support of conferences and symposia participation, this latter being shown under "Special Projects" in our budget document.

In recording the \$250,000 contribution of the W. K. Kellogg Foundation, it appears that the CG credited the entire amount to the restricted core and/or core, and hence reduced by this amount the shortfall between the total of the donor pledges and the core funds needed. In making up the deficit, therefore, the additional funds provided through the World Bank were reduced by \$80,000. The net result to CIAT, as we interpret it, is either \$80,000 deficit in core or a similar deficit in support for conferences and symposia.

We are bringing this matter to your attention so that if the situation permits the Consultative Group could have the opportunity to make up this deficit in our conference and symposia budget.

Your comments will be most appreciated since we must begin

SECTION
COMMUNICATIONS
1973 MAR 15 PM 11:20

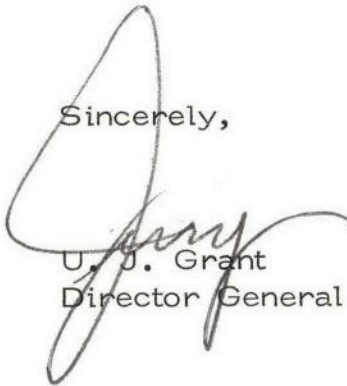
RECEIVED

a search for special funds if there should be no chance of receiving such from the CG.

Best regards.

Saludos!

Sincerely,

A large, stylized handwritten signature in dark ink, appearing to be 'U. S. Grant', written over the typed name.

U. S. Grant
Director General

UJG.caa

cc. Dr. R. G. Mawby

D. and
R.

TENTATIVE AGENDA

BUSINESS MEETING, EXECUTIVE COMMITTEE, BOARD OF TRUSTEES

Hotel InterContinental Cali

SATURDAY, March 3

- 14:00 Call to Order
- Minutes of Previous Meeting
- Review of Agenda
- 14:30 Report by Director General and Discussion of Issues
 Arising Out of Report
- (a) Internal Program Reviews
- (b) Directors' Conference - Bellagio
- (c) Conversations with Donors and Consultative Group
- 15:30 Review of Financial Status of CIAT
- (a) Status of Capital Budget
- (b) Auditor's Report on 1972 Operations
- (c) Revised Budget for 1973
- 16:00 Review of Proposed Program and Budget for 1974
- 17:30 Reorganization of Finance Committee
- Review by Finance Committee of Recommendations on Staff
 Salaries

SUNDAY, March 4

- 08:00 Action by Executive Committee on Report of Finance Com-
 mittee on Salaries and Related Matters
- 08:15 Discussion of Proposed Agricultural Systems Research
 Program
- 09:00 Review of Plans for Dedication and Inaugural Seminar
- 10:00 Discussion of Future Program Reviews

- 10:30 Reports on and Discussions of Present and Projected Outreach Programs
- 11:30 Report on and Discussion of Seminar on Field Beans
- 12:00 Lunch
- 13:00 Review of Situation with Respect to Present and Future Board Members and Board Officers
- (a) Terms of Chairman and Vice-Chairman
 - (b) Possible Need to Recommend Revision in By-Laws to Permit Greater Flexibility in Membership Terms and to Provide for Continuity in Leadership.
 - (c) Nominating Committee and Consideration of Possible New Board Members
- 14:00 Report by Ford Foundation on Potential New Programs
- (a) Agricultural Economics Research Network
 - (b) Agricultural Economics Information, Collection and Distribution Activity
- 14:45 Other Business



CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

G2

PRELIMINARY PROSPECTUS

July 28, 1972

TITLE - SEMINAR ON IMPROVEMENT OF FIELD BEANS AND OTHER
FOOD LEGUMES IN LATIN AMERICA

DATE - February 26 - 28, March 1 - 1973

LOCATION - Cali, Colombia

PLACE - Hotel Intercontinental - Gran Salon, Cali

PARTICIPANTS - Sixty representatives of disciplines, countries, areas and governmental and private institutions interested in improvement of production, marketing, and acceptance of food legumes with particular emphasis on Phaseolus vulgaris. Plus such others who are able to participate on bases of own financing.
Total attendance expected: 150

PURPOSE:

1. TO CONSIDER

- a) The state of food legume production and research in Latin America.
- b) The roles and research coordination of the various agencies, in improving the production, marketing and acceptance of food legumes in Latin America.

2. TO IDENTIFY

- a) Priorities in research, training, production and distribution activities.
- b) Specific responsibilities of the international agencies related to the efforts and needs of national and regional programs.
- c) Means of financing and supporting specific projects.

3. TO MOBILIZE AND STIMULATE - A network of institutions and individuals in Latin America for cooperative efforts and exchange of materials.

PROGRAM:

- A. PRODUCTION
 1. Genetic identification
 2. Seed production
 3. Agronomic practices and plant protection
 4. Production systems
- B. PHYSICAL ASPECTS OF MARKETING
 1. Transport
 2. Storage
- C. CONSUMPTION AND DEMAND
 1. Food value
 2. Preferences and availability
 3. Demand and prices
- D. INSTITUTIONAL POLICIES AND ACTIVITIES
 1. Financing and support
 2. Rural associations
 3. Research and training
 4. Coordination
- E. ACTION STRATEGY

DEVELOPMENT PROCEDURES:

- I. Meeting of Steering Committee, June 16-17, 1972

Participants:

Dr. Silvio Hugo Orozco	Coordinator, Food and Oil Crops - ICA - Colombia
Ing. Agr. Heliodoro Miranda	Assoc. Geneticist - IICA - Guatemala
Dr. S. Litzenberger	Agronomy Research Specialist - AID - U.S.A.
Dr. Antonio Pinchinat	Geneticist - IICA - Costa Rica
Dr. Clibas Vieira	Breeder and Pathologist, UREMG - Brazil

Dr. Eduardo Casas	Computing Center, Colegio de Postgraduados, Chapingo, Mexico
Dr. D. Green	Iowa State University - U.S.A.
Dr. E. Alvarez-Luna	Director, Plant Sciences - CIAT
Dr. F. C. Byrnes	Leader, Training and Communication-CIAT
Mr. K. Buhr	Visiting Scientist, Food Legumes-CIAT
Dr. J. Doll	Weed Control Specialist-CIAT
Dr. G. Galvez	Leader, Plant Protection-CIAT
Dr. G. Hernandez-Bravo	Coordinator, Bean Improvement-CIAT
Dr. A. Villacorta	Entomologist-CIAT
Dr. P. Graham	Soil Microbiologist-CIAT
Dr. F. Fernandez	Coordinator, Plant Sciences Training-CIAT
Dr. P. Pinstруп-Andersen	Leader, Agricultural Economics-CIAT
Dr. F. Monge	Librarian-CIAT
Mr. D. Evans	Assoc. Administrator, Conferences and Symposia-CIAT

- II. Questionnaire to select scientists to establish extent of cultivation, consumption, problems, interests, support, etc., being prepared by Dr. P. Pinstруп-Andersen, with the cooperation of Dr. A. Pinchinat of IICA.

- III. About 30 specialists will be requested to deliver presentations summing up knowledge accumulated in their respective disciplines.

Various techniques such as speaker-discussants-open forum, speakers-panel-open forum, speakers-small group discussions, etc., will be used in accordance with subjects to be covered.

TENTATIVE BUDGET

Travel - 60 persons x \$300.00	\$ 18,000.00
Per Diem - 60 persons x 5 x \$25.00	7,500.00
Expenses of steering committee meetings	2,000.00
Contingencies to cover partial funding of Latin American participants	6,500.00
Reception and Dinner	3,300.00

Extra Local Expenses

Transportation	300.00
Communication	300.00
Clerical	700.00
Printing/Reproduction/Photography	5,000.00
Translation of manuscript	500.00
Simultaneous interpretation	<u>900.00</u>
	\$ 45,000.00

February 15, 1973

Dear Jerry:

Since there is no one on the staff here who could make a contribution to CIAT's forthcoming Seminar on Field Beans and Other Legumes in Latin America, we will not take advantage of your kind invitation to attend. We know the meeting is an important one, and hope that it will be as productive as you expect. If a publication is issued on the basis of the Seminar, I would very much appreciate receiving a copy.

Per will have told you about the TAC meeting. I would like to mention that he himself made an excellent impression there.

Sincerely yours,

Harold Graves

Dr. U. J. Grant
Director General
Centro Internacional de
Agricultura Tropical
Apartado Aereo 67-13
Apartado Nal. 737
Cali
Colombia

HGraves:apm

HG



APARTADO AEREO 67-13

APARTADO NAL. 737

CALI - COLOMBIA

CABLES: CINATROP

CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

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DIR-155

February 5, 1973

Mr. Harold Graves
Associate Director
Development Services Department
International Bank for
Reconstruction and Development
International Development Association
1818 H. Street, N. W.
Washington, D. C. 20433

Dear Harold:

I saw your cable and letter indicating that the bank was making available a grant of \$150,000 to CIAT to be paid in four equal payments.

We much appreciate this action on the part of the bank.

Sincerely yours,

Muchas Gracias!

[Signature]
U. J. Grant
Director General

UJG.caa

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CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

DIR-155

February 5, 1973

Mr. Harold Graves
Associate Director
Development Services Department
International Bank for
Reconstruction and Development
International Development Association
1818 H. Street, N. W.
Washington, D. C. 20433

Dear Harold:

I saw your cable and letter indicating that the bank
was making available a grant of \$150,000 to CIAT to be paid
in four equal payments.
We much appreciate this action on the part of the bank.

Sincerely yours,

U. J. Grant
Director General

UJG:cas

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APARTADO AEREO 67-13

APARTADO NAL. 737

CALI - COLOMBIA

CABLES: CINATROP

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CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

016-ACM

Cali, January 31, 1973

Mr. Harold Graves
Consultative Group on International
Agricultural Research
1818 H. Street, N. W.
Washington, D. C. 20433

Dear Harold:

In Dr. Grant's absence I am writing to acknowledge your cable informing him that the World Bank is making a grant \$150,000 towards the CIAT core budget. We understand that this will be in four equal increments to be paid out at the start of each quarter.

We sincerely appreciate this favorable action and all the other efforts which have been made on behalf of our Center.

With best regards.

Sincerely yours,

A. Colin McClung
Deputy Director General

ACM/hhv

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CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

016-ACM

Call, January 31, 1973

Mr. Harold Graves
Consultative Group on International
Agricultural Research
1818 H. Street, N.W.
Washington, D.C. 20433

Dear Harold:

In Dr. Grant's absence I am writing to acknowledge your
cable informing him that the World Bank is making a grant
of \$120,000 towards the CIAT core budget. We understand that
this will be in four equal increments to be paid out at the
start of each quarter.

We sincerely appreciate this favorable action and all the
other efforts which have been made on behalf of our Center.

With best regards,

Sincerely yours,

Colin McElman

A. Colin McElman
Deputy Director General

ACM/hvy

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PRESENT AND FUTURE ROLES OF INTERNATIONAL CENTERS IN RICE IMPROVEMENT IN LATIN AMERICA AND THE CARIBBEAN /1

Introduction

The question often arises as to how rice can best be improved in Latin America and the Caribbean. Who should do it and where? To what extent, if any, do IRRI varieties need modification or improvement for use in Latin America and the Caribbean? How can the outstanding breeding materials be used most effectively? Who will promote the effective use of these materials and who will train the people necessary to adapt them and get them into production on farms?

Is a Latin America rice program actually needed? How important is it in comparison with certain other programs? If important, what should be its primary objectives? Who should be responsible for program planning, development, execution? How should the funds be obtained and managed?

These and similar questions frequently arise within and outside the CIAT management and staff. The issues are important; they need prompt resolution. It is the purpose of this paper to provide facts and perspective relevant to the situation. Through discussion, we hope the issues can be clarified, decisions reached, and recommendations drafted.

1 Discussion Paper prepared by the CIAT staff

January, 1973

Rice in Latin America in Relation to World Situation

Latin America produces rice on approximately 6.5 million hectares annually. This amounts to about 5 percent of the total world rice area. During the last 10 years the total rice area and the proportion of the total world rice area found in Latin America have tended to increase slightly. Latin America annually produces 10 million tons of rice, or about 3.5 percent of the world total.

Approximately 62 percent of the total production of rice in Latin America is grown under upland conditions, the balance being irrigated. About 82 percent of the total rice area in this part of the world is classified as upland, with only 18 percent in irrigation. Upland yields are estimated at 1.3 tons per hectare, while irrigated rice yields approximate 3.6 tons. The overall yield average in Latin America is 1.8 tons, and statistics for the past 10 years indicate no significant change. 62.6?

Rice is an important constituent of the human diet in Latin America even though the amount the people eat averages only 50 percent as much per capita as Asians. The varied diet in Latin America includes corn, wheat, potatoes, beans and cassava whereas many Asians eat rice at every meal if it is available. In some areas, however, rice is the principal food, and per capita consumption in Brazil is about 75 percent that of Asia. Exports and imports of rice in Latin America are about equal.

The rice produced in Latin America may seem rather insignificant in comparison to the production and consumption of rice in Asia, but rice is an important ingredient in the diets of Latin Americans. Rice consumption in Latin America could increase significantly if prices were reduced relative to other foodstuffs. In some Asian countries, production increases have brought about lower prices. Even if per capita consumption of rice does not increase, population growth alone will probably create a 30 percent increase in demand for rice over the next decade.

Much of Asia is now deficient in rice, and some countries have as much as 80 percent of the total arable land in rice. In contrast, Latin America has vast areas suitable for rice production, although not yet in rice. These areas would include marginal lowland pastures subject to poor drainage and periodic flooding, alluvial soils of river basins, coastal plains under plantation crops now abandoned or operating at low levels of productivity because of diseases or market declines,

and latosols of lowland inland plains and forests.

Even though average yields increase, it would seem difficult for Asia to increase rice production sufficiently to meet the demands of an increasing population in the future. Unfavorable weather conditions for even one season could seriously deplete world rice reserves. On the other hand, Latin America, given sufficient trained technical personnel and certain economic conditions, could produce enough rice to meet much of the increased world demand.

The IR8, CICA-4 and IR22 varieties, grown under irrigation and good cultural practices, produce excellent yields in Latin America, comparable to those grown under similar favorable conditions in Asia.

It is estimated that 35 to 45 percent of the flooded or irrigated rice in the Western Hemisphere outside of the United States, is already planted to IRRI varieties, including IR8. Cuba has approximately 200,000 hectares of flooded rice and 98 percent of it is IR8. The newer varieties are replacing IR8 as seed becomes available. IR22 does as well as or maybe even somewhat better than CICA-4 under flooded conditions in certain areas of Colombia.

The soils in much of the area where upland rice is a potentially important crop in Latin America are latosols or oxisols, highly acid and often having high iron and aluminum content. Unfortunately, most of the rice varieties adapted to flooded soils are almost non-productive under these conditions. One variety, Monolaya, for example yields 2 to 3 tons per hectare when CICA-4 and IR22 yield zero under some upland conditions on latosols.

The CIAT Rice Program to Date

The cooperative rice program between the Instituto Colombiano Agropecuario and CIAT had its origin in 1967 when the head of the varietal improvement program at IRRI returned to Colombia to work in the agricultural program of the Rockefeller Foundation. He subsequently was transferred to CIAT and the ongoing cooperative activities continued. An agronomist was added in 1970 to exploit the progress realized in varietal development and adaptation.

Building upon an established decade of progress in rice research at IRRI, CIAT developed a breeding program designed to permit Latin

America to participate in the new rice technology. The specific objectives of the work at CIAT were to incorporate into selected dwarf types developed at IRRI characteristics required for successful production and marketing of rice in Latin America, eg., grain shape and size, cooking quality, leaf hopper (*Sogatodes*) resistance, temperature tolerance, and adaptability to direct seeding.

Agronomic work emphasized definition of cultural practices to obtain optimum farm yields as well as the testing and seed multiplication of the new varieties. A network of CIAT-trained people facilitates international testing and introduction of new varieties throughout much of Latin America.

To date, neither stable resistance to the blast disease nor resistance to sheath blight has been transferred to acceptable agronomic varieties. Blast is the primary concern of the program at present, and considerable work has been and is being done in crossing and in evaluating genetic materials for resistance to this disease.

Some progress has been made in the search for varieties with a broad spectrum of resistance to the many races of blast. This material will benefit greatly both lowland and upland rice improvement programs. Increases in yields and grain quality and the reduction in losses because of shattering are being studied. Deep water varieties will be tested on lowland overflow areas in 1973.

CIAT and ICA have begun to evaluate material for adaptability to upland conditions and for acid soil tolerance. It is possible that some of the newer crosses may be of value.

The rice area of Latin America can be divided into four distinct classes; but CIAT's program has concentrated on the second.

- 1) Temperate. The CIAT program has placed low priority on this area and no research has been undertaken. It may be possible to provide some assistance to farmers in the areas through breeding lines arising from cooperative work of IRRI in Korea, the United Arab Republic and elsewhere.
- 2) Favored areas where soil fertility rainfall or water availability, and drainage are satisfactory, to permit upland and lowland culture. The technology package is essentially complete (excepting blast resistance) and adoption of the new varieties has reached

35 to 45 percent of this area in the past three years.

- 3) Ill-drained, fertile lowlands. This area, heavily exploited in Asia has been ignored in Latin America. The present technology is almost adequate to exploit this vast area. Modifications in farm machinery use, seeding methods, weed control, and harvesting practices would be necessary.
- 4) Upland, moderately fertile soils receiving a minimum of 200 mm. rainfall/month. Little is known about this huge area which represents 82 percent of the rice land of Latin America, and present technology will have marginal applicability. Results occasionally obtained with some of the vigorous new varieties of improved plant type suggest, however, that considerable increase in production on upland sites is possible. A large program, exclusively focused on this area, would be necessary to cause any significant impact.

CIAT has been working in lowland rice with all of the rice-growing countries in Latin America and the Caribbean for the past four years. It has furnished genetic materials from IRRI and its cooperative breeding programs with ICA to most of the rice growing countries and institutions within the area. CIAT has multiplied and distributed seed of CICA-4 and IR22 throughout Latin America. At this time these two varieties are being grown commercially, or are being tested on a commercial scale, in at least 12 countries. Several countries have released these or similar varieties under different names.

CICA-4 was developed and released by ICA and CIAT. It was obtained through three cycles of selection of segregating materials introduced from IRRI in 1968. The original cross was made by IRRI. When released in 1971, it was recommended for irrigated and upland areas up to 1,000 meters above sea level, while IR22 was recommended for irrigated areas up to 700 meters. CICA-4 is resistant to hoja blanca and highly resistant to leaf hopper, Sogatodes. It has moderate resistance to sheath blight and is susceptible to blast. IR22 is resistant to Sogatodes, moderately resistant to hoja blanca and susceptible to blast.

Some 200 representatives of 23 Latin American countries participated in a CIAT-sponsored seminar in October 1971 to consider the opportunities and implications associated with the introduction of new, high-yielding rice varieties in Latin America. The basic objectives were to provide opportunities for agricultural policy decision makers to learn about the new rices, the conditions necessary for their successful production, and the possible economic implications of increased rice supplies. Both a summary and a comprehensive report on this seminar have been published.

CIAT has trained 28 rice specialists for 11 Latin America countries. These men have received practical experience in how to conduct research on plant improvement, pathology, agronomy, entomology and weed control. Some received special training in seed production and certification, and the entire group of 21 extension specialists from one state in Brazil received an intensive one-month course in rice production. Principles and skills of rice production have been a major input in the training of 24 crop production specialists from several countries for work in diversified crop situations.

Most of the rice specialists in Latin America are general agronomists and are not sufficiently trained to carry out major plant improvement work without some supervision. It has been possible to improve somewhat the capabilities and efficiencies of these men, but they lack experience and CIAT has provided leadership and helped them with their rice improvement problems. CIAT maintains close contact with these men through visits and correspondence. Nearly 50 of these men and their colleagues came to CIAT for a refresher workshop of one-week in 1972. Certain breeding materials and information are supplied to them regularly.

Currently, a rice specialist from the Dominican Republic, trained at CIAT two years ago, is on loan to the Ministry of Agriculture in Jamaica where the practice of planting rice in water is being introduced.

In summary, CIAT has made considerable progress toward improving lowland rice-production in Latin America through collaboration with the national programs in the area. These close working relationships are reinforced through the 28 young men trained at CIAT in rice improvement and seed production during

the past four years. In essence, the CIAT program has functioned as an outreach program of IRRI in testing and distributing IRRI material and in collaborating in international trials. The CIAT program has not been an independent, uncoordinated effort. It has built on the progress made by the IRRI scientists and where necessary, has modified available materials to adapt them to Latin American conditions, and has trained personnel to test and introduce these materials in the various rice producing countries of the region.

Adoption and Impact of the New Rice Varieties in Latin America.

The best available data, supplemented by firsthand observations, indicate that in late 1972 nearly 550,000 hectares, or about 8 percent of the total present rice land in Latin America was planted to one of the new high-yielding varieties. Most of this was in lowland rice except in a few countries, such as Costa Rica and Nicaragua, where many farmers grow these varieties under rainfed conditions.

Estimated 1972 production of the new varieties is 1,979,000 tons, or 15.3 percent of the estimated production of 12,938,000 tons.

Generally, the limited data available suggest that the adoption pattern has been an initial growing of IR8 to replace a traditional variety, with IR8 being replaced in one or two seasons, given availability of seed, by CICA-4, IR22 or a locally named close relative of these. Data available from a few areas, however, indicate some seasonal fluctuations resulting from unique production and marketing circumstances.

If we assume a present lowland, irrigated rice area of about 1,140,000 hectares, then between 35 and 45 percent of the lowland area is in the new varieties. This represents a rapid adoption rate considering the limited promotional efforts by either CIAT or IRRI.

If this is the general adoption pattern throughout Latin America, then we need to know why the some 45 to 65 percent of the lowland rice producers continue to grow the old varieties. Given this information, then we might be in a better position to plan what approaches, if any, might be warranted or necessary to gain greater acceptance of the new rices.

When overall rice production (or national self sufficiency) is the goal, factors other than new varieties must be taken into account. Cuba is a good example of the fact that availability of seed and widespread acceptance of a new variety does not necessarily increase national

production significantly. Although nearly 100 percent of the rice area of Cuba is irrigated and 98 percent of the rice is IR8 or other improved types, the yields of irrigated rice are the lowest in the hemisphere. Attention to improved cultural practices is needed concurrent with the introduction of new varieties. This requires local adaptive research on cultural practices and intensive training of rice extension specialists and agricultural teachers.

Public policy can interfere with as well as facilitate national efforts to increase rice production. Over the past three years, with CIAT providing technical assistance and training, the Dominican Republic has been moving rapidly into the new varieties with attendant increases in total production, the national average yield in 1971 being nearly 2.5 tons per hectare, with 85,600 hectares in lowland rice and only 2,000 in upland. But, with a change in the land reform policies in late 1972, thousands of hectares have gone out of rice production. The country faces a huge import problem in 1973, and already is seeking additional technical assistance and training from CIAT in an effort to bring other lands into rice production.

As part of its regular evaluation of international symposia and seminars, CIAT has underway a longitudinal study of the Seminar on Rice Policies in Latin America, held in October 1971. The immediate post-seminar evaluation had indicated that the seminar had been useful to participants in clarifying ideas about new high-yielding rice varieties, their adoption and diffusion, and "second generation" problems. In addition, participants had discussed the appropriate policies to take full advantage of the production potential of these varieties and to avoid, if possible, any negative effects.

An inquiry in December, 1972, conducted by interviewing seminar participants in six countries suggests that the visible effects of this seminar have been limited to the participants' observations as described above. None of these countries have developed policies, as yet, with respect to the new rices. Opinions expressed by seminar participants in these recent interviews were consistent with the view that adoption of the new dwarf varieties has not had a significant impact on rice production in Latin America as a whole. A major negative factor for these new varieties is that the millers tend to pay lower prices for these than for traditional varieties.

Another factor identified by the participants is that for the new rice varieties to attain their production potential, well-leveled soils, good water supplies and high amounts of nitrogen fertilizer are required. These conditions are met only in relatively limited areas of lowland rice production and by producers who encounter little or no budget restrictions.

Many of the areas in which the conditions can be met are in more temperate areas for which the new rice varieties available are not adapted. Overall, the overwhelming amount of the rice area in upland rice cannot be ignored as a basic issue.

Despite these negative aspects, it is estimated that the use of the new varieties, including IR8, in Latin America has added at least \$50,000,000 a year to the economies of the various countries during the past three years. The situation now appears to have reached a plateau, with some 40 percent of the lowland rice producers continuing with one or more of the new varieties, but alert to the possibility that something better may soon be available.

The evidence and experience to date indicates that, as far as lowland rice production is concerned, the rice varieties developed by IRRI are being used to good advantage in Latin America and the Caribbean with a minimum amount of adaptive work. As a consequence, it seems difficult to justify, except on a low priority or specific problem basis, continuation of a separate lowland rice program at CIAT or elsewhere in the Western Hemisphere.

The Major Rice Problem in Latin America.

Discussion of the activities and accomplishments with the new, high yielding rice varieties in Latin America tends to obscure the fact that the major problems, both in kind and magnitude, are associated with upland rice production.

At least 80 percent of the present rice area in Latin America is upland. The yields are woefully low, probably averaging 1.3 tons or less per hectare. Upland rice operations tend to be small in scale, hence hundreds of thousands of farm families are involved. In some areas, however, upland rice is produced on large farms. Experience to date with lowland varieties from IRRI or developed out of IRRI lines indicates that some of these can not even survive when grown under upland conditions on acid soils.

Latin America's largest country, Brazil, an area larger than the continental United States, perhaps offers the world's greatest potential for upland rice production. In early January, a team of rice specialists organized by CIAT appraised first-hand the rice situation in Brazil. The group reports the country offers excellent opportunities for mounting a large scale program for upland rice improvement. The results of such a program would be of interest throughout Latin America and possibly in other parts of the world where upland rice is important.

The question thus arises as to how and where such an intensified upland rice program should be based, and how such an activity, if not a direct IRRI operation, could be coordinated with IRRI. There has been no clear-cut expression by the Technical Advisory Committee, the Consultative Group for International Agricultural Research or individual donors with respect to possible financial support of an upland rice program of any significant magnitude.

Perhaps the management of the international centers need to recommend procedures how the question of upland rice research and development might best be resolved.

The Issues for Decision .

The Present CIAT Program. CIAT is working at varying levels of staff and resources on six commodities, but with major emphasis on beef and cassava. It is now increasing work on field beans (*Phaseolus vulgaris*) as a regional program. The programs in swine, rice, and corn are slowly decreasing in percentage of the total budget and staff. In addition, CIAT is developing a program in Agricultural Systems Research.

Some observers comment on the breadth of the CIAT program with the implied criticism that the breadth denies the possibility of reaching adequate depth. The question also is raised as to how many commodities a multi-commodity center can adequately manage.

The CIAT staff and management are coming to the conclusion that a reasonable number of commodity programs can be managed, provided financing assures adequate staffing and resources. Each commodity requires a certain minimum of staff and support, but there are considerable savings in overhead.

As our programs are staffed and begin to function, demands increase, and it becomes clear that additional funds will be needed if CIAT is to continue its present number of commodity programs.

Given present budget and staffing, it is likely that within two years, CIAT will have to recommend which of the commodities are to be continued and which are to be eliminated, or to be funded on some other basis. If special funded projects can be established,

then CIAT could retain such of its relay and adaptive programs as necessary. Otherwise, it will likely recommend the dropping of these in order to develop more fully the commodity programs for which it has major responsibility.

Continuation of Work on Lowland Rice. Despite the relatively small area on lowland rice in comparison to the rest of the world, lowland rice will continue to be an important crop in Latin America, particularly until radical improvements in upland production are achieved. Consumer demands for rice will increase as a result of population growth, increases in income, and the higher status which rice has as food in relation to other energy sources.

Some problems of grain quality still exist; insect and disease resistance could be improved; the blast problem has not been resolved, and efficient cultural practices are needed for specific applications. Large areas of Latin America, probably more naturally suitable for lowland rice culture than the production of any other crop, are available for development, subject to the decision of national governments.

If IRRI were to assume responsibility for lowland rice in Latin America and the Caribbean, it would need one or more mechanisms to facilitate its work. Perhaps these might be possible through special projects with national agencies, CIAT or other regional institutions.

How shall all of this work related to lowland rice in Latin America be carried on, by whom, and under what financial support? To the extent that the problems are of an economic, social, or public policy nature, how shall these be engaged? By whom?

Specific Program on Upland Rice. Some work is now underway on upland rice in various countries. Scientists at IRRI have been interested in some aspects of the problem, including the testing of the new varieties for their adaptation to upland conditions. Over the past 2-3 years, IRRI, aided by a special grant from the Rockefeller Foundation, has been cooperating with the Government of the Philippines in an effort to improve upland rice production in an area of Central Luzon.

Because of its interest in identifying and seeking understanding of the problems of agricultural development in the latosols of Latin America, CIAT has demonstrated the unsuitability of presently available

dwarf rice types in such areas. The combination of rice blast disease and lack of adaptation to high acid soils is fatal.

Given the importance of upland rice as a crop, not only in Latin America, but in other parts of the world as well, what procedures do we as directors of the international centers wish to suggest? Does the problem warrant a specific program, or an expansion in or adaptation of present work with lowland rice?

Escalation in Roles of International Centers. Finally, it appears that expectations of donors, governing boards, and center personnel change over time with respect to the end product of a given center's efforts. This escalation proceeds from an initial concern about improving the yield potential of a specific commodity, to the development of cultural practices and production systems through which the potential can be realized, to the training of both research and production specialists to staff national programs, to various efforts to develop new and strengthen existing national institutions to consideration of the social, economic and political issues associated with the adoption of new technology and the determination of who shall share in the benefits of increased production and productivity and how this will be accomplished, and, up to now, to direct and indirect involvement in community of regional integrated programs in which the agricultural technology is only a part of the overall effort.

Broadening of the scope of the centers' responsibilities generates new issues relating to nature and size of staff, size of budget, and ways of working with national programs. Although the international centers are known or classified as primarily research organizations, achievement of their objectives (and expectations of donors) necessitates a wide range of diverse activities. The yardsticks by which others measure us encompass the effect of the technology produced on increased production and productivity in farmer's fields to the attendant impact this has on the agricultural and economic development of the developing world.

Criteria for a Basic Strategy. Discussion of the role and relationships of the various centers with respect to lowland rice, and possible actions on the upland problem, illustrate a more general issue. With the multiplication of centers and the possible relay and adaptive functions one center may undertake for another, the question arises as to where the responsibility for the world strategy for improvement of a specific commodity should rest.

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It seems logical at this stage to suggest that the world strategy for a specific commodity should be assumed and developed by the international center charged with the improvement of that commodity. This strategy would be developed in consultation with TAC and the Consultative Group, taking into account the capabilities of other interested international centers and certain national programs of particular excellence or specialization.

Acceptance of this responsibility by an international center would carry with it the assurance of financial support necessary to mobilize and operate an effective worldwide network of cooperating stations. Some of the funds might be included in the core budget, while other funds would be available on an outreach or special project basis. Such an approach would minimize duplication, maximize the attention the commodity receives in all parts of the world, and increase the efficiency of management and communication.

If this strategy is not appropriate, it still seems logical that we, as directors of the centers, take the initiative in formulating policies and strategies within which we can supplement each others work effectively and efficiently.



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Document Date January 23, 1973	Document Type Memorandum			
Correspondents / Participants To: Robert Jones From: Harold Graves				
Subject / Title Transfer of Funds to Centro Internacional de Agricultura Tropical (CIAT)				
Exception(s) Financial Information iv				
Additional Comments		<p>The item(s) identified above has/have been removed in accordance with The World Bank Policy on Access to Information or other disclosure policies of the World Bank Group.</p> <table border="1"><tr><td>Withdrawn by Sherrine M. Thompson</td><td>Date April 12, 2021</td></tr></table>	Withdrawn by Sherrine M. Thompson	Date April 12, 2021
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REVIEW PANEL

ORAM

INTERNATIONAL DEVELOPMENT
ASSOCIATIONINTERNATIONAL BANK FOR
RECONSTRUCTION AND DEVELOPMENTINTERNATIONAL FINANCE
CORPORATION

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TO: ORAM
FOODAGRI
ROME

DATE: JANUARY 15, 1973

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STRONG NEGATIVE REACTION TO ANY PLEASE TELEX NOT LATER THAN NINETEEN
JANUARY. WILL INFORM SIR JOHN HERE TWENTY-TWO JANUARY.

SOILS -- MARCELO NUNEZ CAMARGO, MINISTRY OF AGRICULTURE, RIO DE
JANEIRO.

PASTURE AND FORAGE -- MEMBER MARK HUTTON CSIRO AUSTRALIA ALTERNATE
E. F. HENZELL, CSIRO AUSTRALIA. MEMBER LOY CROWDER IITA NIGERIA ALTERNATE
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CLAY CENTER NEBRASKA ALTERNATE ROBERT TEMPLE FAO.

ANIMAL HEALTH -- MEMBER W. M. HENDERSON ARC INSTITUTE FOR RESEARCH AND
ANIMAL DISEASES, COMPTON BERKS ALTERNATE H. L. STODDARD UNIVERSITY OF MINNESOTA.

AGRICULTURAL ECONOMIST -- MEMBER JAMES PLAXICO OKLAHOMA STATE UNIVERSITY
ALTERNATE JOHN L. DILLON UNIVERSITY OF NEW ENGLAND ARMIDALE AUSTRALIA.

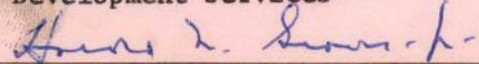
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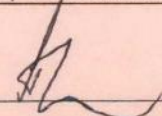
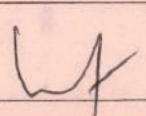
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 GEORGE MOLL UNIVERSITY OF FLORIDA
 E. E. HENSELT, CSIRO VICTORIA. MEMBER FOR SCOTLAND ILLA MICHIA UTTERVILLE
 BUREAU AND HOUSE -- MEMBER MARK HUTTON CSIRO VICTORIA UTTERVILLE
 JAMES
 SOILS -- MARCELO MONTEZ CAMACHO, MINISTRIA DE AGRICULTURA, RIO DE
 JANEIRO. MITT INFORM SIX JOHN BEKE TWENTY-TWO JANEIRA.
 SIBONG MEGALIAE REACTION TO VIA PLEASE TELEPH NOT FIVE JANU NINETEEN
 FOR KEITHA OF CIVIL BEKE CALLE PROGRAN FIRST NAME OF MAY. IF YOU HAVE
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CINATROP
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DATE: JANUARY 9, 1973

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COUNTRY: COLOMBIA

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SUGGESTION WE COULD POSTPONE CIAT VISIT ONE WEEK. CHEEK AND
SELF WILL ARRIVE TUESDAY EVENING JANUARY 22 AND WILLIAM LEWIS
ON WEDNESDAY. WOULD PLAN TO LEAVE SATURDAY MORNING. TRUST
THIS WILL STILL BE CONVENIENT AND WOULD APPRECIATE HOTEL
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NAME Bruce M. Cheek

DEPT. Agriculture & Rural Development

SIGNATURE B. M. Cheek
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SEIT WILL ARRIVE TUESDAY EVENING JANUARY 22 AND WILLIAM LEWIS
ON WEDNESDAY. WOULD PLAN TO LEAVE SATURDAY MORNING. TRUST
THIS WILL STILL BE CONVENIENT AND WOULD APPRECIATE HOTEL
RESERVATIONS CALL INTERCONTINENTAL BEING CHANGED ACCORDINGLY.

SALUDOS

GRAVES

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AUTHORIZED BY:

NAME:

Bruce M. Cheek

DEPT:

Agriculture & Rural Development

SIGNATURE:

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DIR-027

January 9, 1973

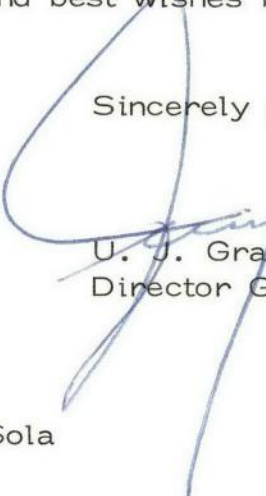
Mr. Harold Graves
Consultative Group on International
Agricultural Research
1818 H. St. N. W.
Washington, D. C. 20433

Dear Harold:

Thank you for your letter of December 28 concerning the support to CIAT from the Swiss Government. We would first like to thank you and all of your staff for the support which you have given us in getting this new donor for CIAT's core program. It would appear that their contribution is given in such a way that we can make maximum use of it. I much appreciate the help you are giving us in getting the budget covered.

With best regards and best wishes for a Happy New Year.

Sincerely yours,



U. J. Grant
Director General

UJG.caa

cc. Mr. Francisco de Sola



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CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

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