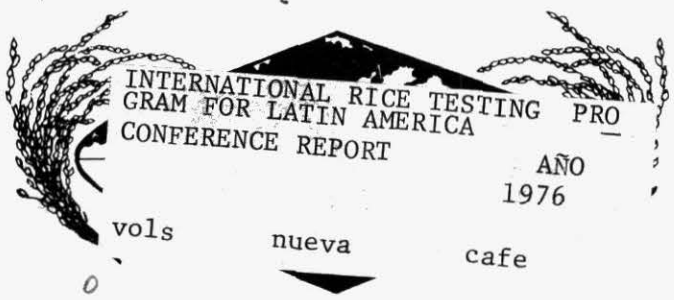
International Rice Testing Program for Latin America



First Conference Report

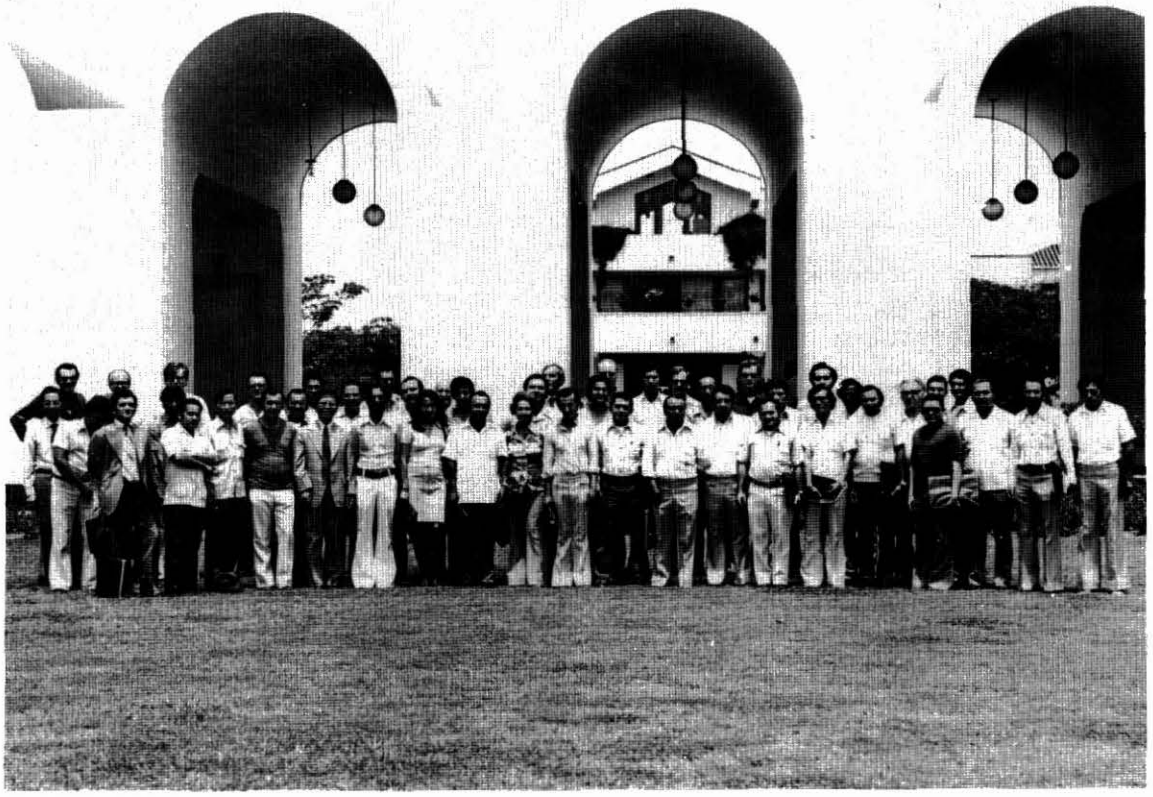
August 12 - 14, 1976

COOPERATION

CIAT
Centro Internacional de Agricultura Tropical

THE INTERNATIONAL RICE RESEARCH INSTITUTE
1960

First Conference on the International Rice Testing Program for Latin America



First row: José I. Murillo (Costa Rica), Francisco A. Andrade (Ecuador), Gilberto A. Abréu Vargas (Dominican Republic), Y.T. Hsieh (Dominican Republic), Armando Restrepo (Colombia), C.H. Wang (Brazil), Fernando Marmolejo (Colombia), Ana T. Montañez de Zamorano (Colombia), Ezequiel Espinosa (Panama), Alicia Pineda (CIAT), Levilier Castro (Colombia), Walter Ramiro Pazos (Guatemala), Manuel J. Rosero (CIAT), Hernando Suárez (Colombia), José A. Badia (Honduras), Fabio Montealegre (Colombia), Germán Rico (Venezuela), Elías García (Colombia), Leonardo Hernández Aragón (Mexico), Rafael Robayo (Colombia), Alvaro Celis (Colombia). Second row: S.H. Ou (IRRI), Jorge Vallejo R. (Colombia), Jairo González (Colombia), Ricardo J. Guazzelli (Brazil), J. Mauricio Rivera (Honduras), Dario Leal Monsalve (Colombia), Carlos E. Reyes (Panama), José I. Vidarte (Colombia), A.V.E. Chin (Guyana), José Hernández (Peru), M.J. Idoe (Surinam), Derly M. de Souza (Brazil), Paulo S. Carmona (Brazil), Ramón A. Alvarez (Colombia). Third row: Víctor C. Witte (Costa Rica), Loyd Johnson (CIAT), Peter R. Jennings (USA), Aníbal Rodríguez (Venezuela), César P. Martínez (USA), Evaldo P. Sant'Ana (Brazil), Hazim A. Al-Jibouri (Italy), G.W. Hofstede (Surinam), J. Ritchie Cowan (IRRI), William R. Coffman (IRRI), Harold Kauffman (IRRI), Luis A. Guerrero (El Salvador).

CONTENT

MEETING ON INTERNATIONAL RICE TESTING PROGRAM

FOR LATIN AMERICA

Final Program

Place: CIAT
Date: August 12-14, 1976

August 12, Thursday

08:00-09:00	Registration	
President:	Dr. John L. Nickel	
09:00-09:15	Welcome - Dr. John L. Nickel	
09:15-09:45	Review of International Rice Testing Program - H.E. Kauffman and J. Ritchie Cowan	
09:45-10:30	Variety testing for selection and multiplication of basic seed for locally adapted varieties - M.J. Rosero	
10:30-11:00	Coffee break	
President:	Loyd Johnson	
11:00-11:30	IRRI's GEU Program - W.R. Coffman	
	PRESENTATION OF REPORTS	
11:30-12:00	Brazil	
	Lowland Rice	- P.S. Carmona
	Upland Rice	- D.M. Souza
12:00-12:15	Colombia	- R. Robayo
12:15-12:30	Costa Rica	- J. Murillo
12:30-13:30	Lunch	

13:30-13:45	Ecuador	-	F. Andrade
13:45-14:00	El Salvador	-	L. A. Guerrero
14:00-14:15	Guatemala	-	R. Pazos
14:15-14:30	Guyana	-	A. V. E. Chin
14:30-14:45	Honduras	-	M. Rivera
14:45-15:00	Dominican Republic	-	G. A. Abréu
15:00-15:30	Coffee break		
15:30-15:45	Mexico	-	L. H. Aragón
15:45-16:00	Panama	-	E. Espinosa
16:00-16:15	Peru	-	L. J. Hernández
16:15-16:30	Surinam	-	M. J. Idoe
16:30-16:45	Venezuela	-	G. Rico
16:45-17:00	Fedearroz	-	E. García
17:00-17:30	FAO	-	H. A. Al-Jibouri
17:30-18:00	Impact of High-Yielding Rice Varieties in Latin America with especial emphasis on Colombia - G. M. Scobie and R. Posada T.		

August 13, *Friday*

President:	W. R. Coffman
08:00-08:30	Rice breeding Objectives for Latin America - P. R. Jennings
08:30-08:45	Discussion of results of IRTP Nurseries Grown in 1975-76 in Latin America - H. E. Kauffman

08:45-09:30	Multilocational screening in breeding for blast resistance - S. H. Ou
09:30-10:00	Coffee break
10:00-12:30	Discussions on plans for Rice Testing Program in Latin America - Moderator: M. J. Rosero
	a) Mechanism for annual planning and review
	b) Management of nurseries
	c) Nurseries (International and Regional) Types Numbers Locations
	d) Seed supply and quarantine requirements
	e) Data handling and processing
12:30-13:30	Lunch
13:30-15:00	Field visit to CIAT rice experiments
15:00-15:30	Coffee break
15:30-17:00	Continue discussion on plans for rice testing program in Latin America

August 14, Saturday

08:00-09:45	Field visit to ICA-CIAT rice experiments
09:45-10:15	Coffee break

President:	J.R. Cowan
10:15-12:00	Summary and conclusions on plans for Rice Testing *Program* in Latin America in 1977 - M.J. Rosero and H. Kauffman

August 14-15

Visit to rice production areas in Tolima and Llanos

1. INTRODUCTION

1.1 IRTP - History

Farmers in developing countries have now adopted the new semidwarf rice varieties on from 20 to 25 percent of their rice land, mostly in irrigated and rainfed areas where water can be controlled. But the new rices will not grow or have not been adopted in other rice regions because of adverse conditions such as drought, deep water, cold temperatures, certain insects and diseases, adverse soils, or consumer preferences for special grain types. A wider range of rice varieties is needed to further spread the new rice technology, particularly to regions bypassed by the Green Revolution.

To meet this need, cooperative rice research and testing programs must be expanded among the world's rice scientists. The germ plasm base of the new rices can be expanded by crossing more diverse traditional varieties with improved, semidwarf and intermediate-height varieties and by testing them under a wider range of environmental conditions.

The International Rice Testing Program (IRTP) was initiated in early 1975 to formalize and develop a network of scientists working with diverse germ plasm under a wide range of agroclimatic and cultural conditions. The United Nations Development Programme (UNDP) made funds available to help IRRI initiate and coordinate the program with national programs and other international centers.

By participating in the network-type program, scientists can cooperatively develop a "critical mass" of genetic technology that will feed improved genetic materials and breeding information to scientists across the rice-growing world.

Through the program, scientists in each cooperating nation can share and evaluate each country's best rices under their own environmental conditions. The critical mass effect can speed the development, evaluation and dissemination to farmers of a continuous flow of improved rice varieties genetically tailored to grow well under a range of conditions.

1.2 The CIAT Rice Program - History

The Interamerican Rice Program started in 1967 following the transfer of its leader Dr. Peter R. Jennings from the International Rice Research Institute to CIAT. CIAT research facilities were not available then so work commenced in close cooperation with the rice program of the Colombian Institute of Agriculture (ICA). The cooperative CIAT-ICA program featured an informal pooling of personnel, facilities and budgetary resources of both organizations for purposes of research and training. A major factor in the progress realized has been ample cooperation of ICA and CIAT, both at Palmira, at the other ICA research centers and also with the Colombian Federation of Rice Growers (FEDEARROZ) to carry out regional tests on farmers fields.

Since 1967, the main objective of the CIAT Rice Program has been to increase the average national yield per unit area throughout Latin America. The strategy used to increase rice production per unit area was based on the following:

a. Development of superior varieties for irrigated direct seed areas. Initially the relatively small transplanted crops and the vast upland areas have not been emphasized.

b. Training of research and extension personnel.

c. Study of possible solutions to overcome limiting agronomic factors to ensure maximum yielding ability of new varieties.

Extensive travel has been made to Mexico, Central America, Panama and all major rice producing countries in South America and the Caribbean to identify yield limiting factors and identification of personnel and stations for international testing of improved lines and varieties. The closest cooperation has been developed between the Central American countries, Panama, Colombia, and Ecuador. Valuable contacts were also established with Brazil, Venezuela, Peru, Paraguay and other countries.

A major part of CIAT's cooperative programs has been in the training of personnel for national programs. From 1967-74, 76 rice technicians from all major rice Latin American countries were trained in varietal improvement, agronomy, plant pathology, and seed production.

This does not include those trained as crop production specialists in a one-year course of which ri :e is one of the major crops covered in the course.

The major achievement of the CIAT-ICA rice program was the development and release of the varieties CICA 4 and CICA 6 in 1970 and 1974. Two additional varieties, CICA 7 and CICA 9 were released in May 1976.

Other research achievements at CIAT have been: a) the multiplication and forwarding of basic seed of CIAT-ICA varieties as well as IRRI varieties (IR8 and IR22) to several Latin American countries, and, b) the development of methods and equipment for a Modified Asian System of land leveling and land preparation in water that permits the conversion of seasonally flooded alluvial soils to irrigated rice land.

So far Colombia has received the major benefits of the new technology. In 1975 Colombia's production rose to 1, 600, 000 tons of paddy rice; a surplus production of about 300, 000 tons was available for exports. Colombia is estimated to have produced 68 percent more rice in 1974 than it would have in the absence of new varieties. The corresponding preliminary figure for Latin America, excluding Brazil was 40 percent. This is strongly indicative of the potential for extending the Colombian experience to other countries of Latin America.

2. RICE IN LATIN AMERICA

In Latin America, rice is an important crop and it represents a staple food in most, if not in all, Latin American countries, especially for the people of the lowland tropics. Rice is becoming an increasingly important part of the diet in Latin America with the rapid population increase and the limited potential of expanded production of highland crops, such as wheat, potatoes and maize, which are staple foods for these regions. These facts are expected to contribute to increased consumption of rice on a per capita basis as rice is substituted for traditional staple foods. This substitution, plus the population growth, will result in an expanding local market for rice. The same expansion in world population should also result in a potential export market for Latin America as populations in Thailand and Burma increase and local consumption reduces their exports.

The actual area, production and yield of rice in Latin America is given in Table 1. These data were provided by each country's delegates present at this first conference of the Internacional Rice Testing Program for Latin America. Map 1 shows the distribution of the rice areas.

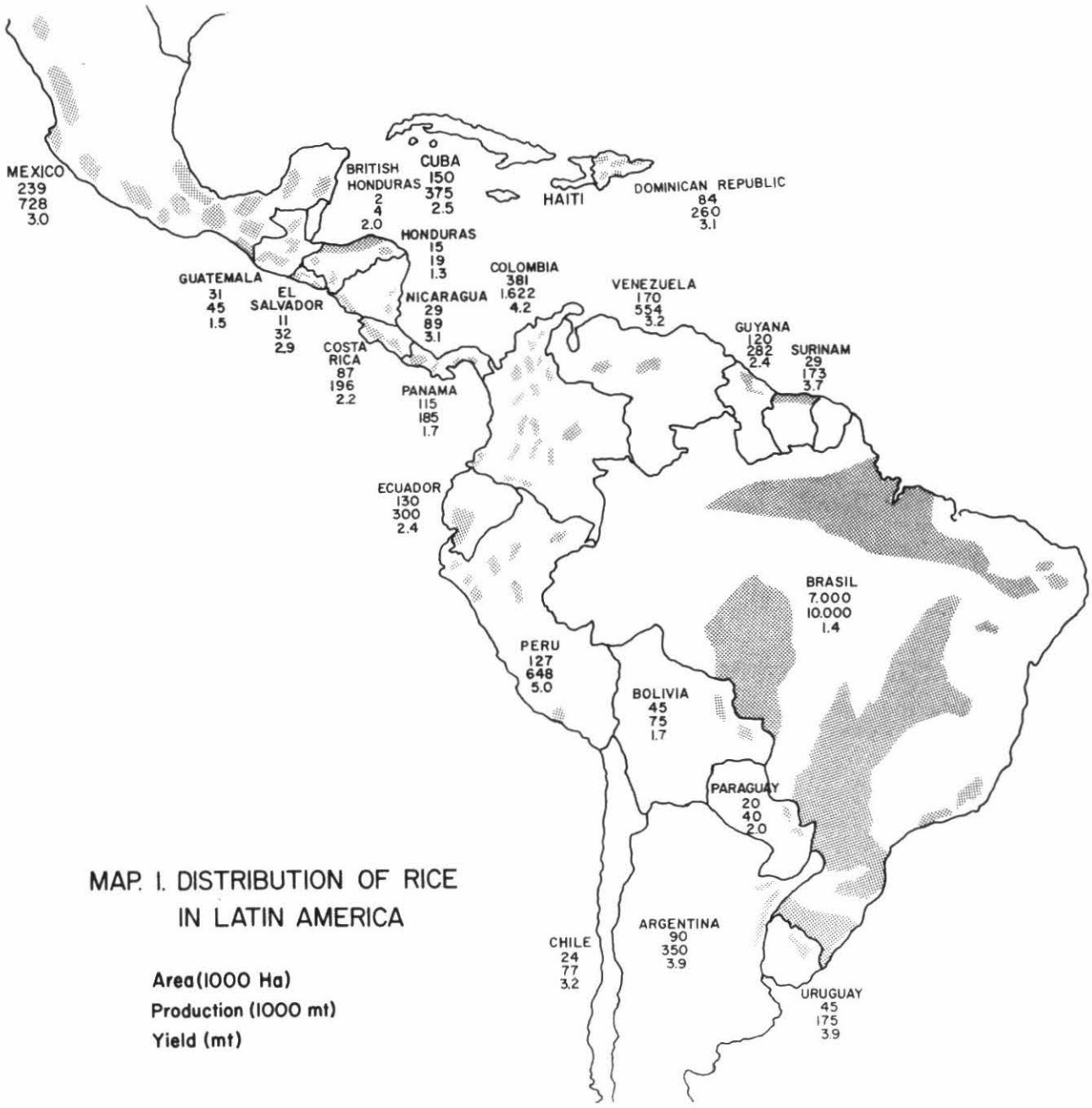
In certain regions of Latin America, rice area and production are very important. The yields are generally low, especially for the upland area. In some countries, like Peru and Colombia, where rice crops are

Table 1. Area, production and yields of rice crop in Latin America, 1975 1/

Country	Area (1,000 ha)		Production (1,000 ton)		Yield (ton/ha)	
	Lowland	Upland	Lowland	Upland	Lowland	Upland
Brazil	1050,0	5950,0	2860,0	7140,0	2.7	1.2
Colombia	285,9	95,5	1471,1	151,1	5.1	1.6
Costa Rica	-	87,1	-	195,6	-	2.2
Dom. Republic	84,0	-	260,0	-	3.1	-
Ecuador	45,5	84,5	300,0	-	-	2.4
El Salvador	-	11,1	-	32,1	-	2.9
Guatemala	-	31,0	-	45,5	-	1.5
Guyana	120,0	-	282,0	-	2.35	-
Honduras	-	15,0	-	19,2	-	1.3
Mexico	119,5	119,5	501,9	216,1	4.2	1.8
Panama	-	115,0	-	185,0	-	1.7
Peru	107,1	25,0	610,5	37,5	5.7	1.5
Surinam	29,0	-	173,0	-	3.7	-
Venezuela	65,0	105,0	292,0	262,5	4.5	2.5
Subtotal	1906,0	6638,7	6750,5	8284,6	3.5	1.3
Total	8544,7		15035,1			

1/ Figures given by the delegates attending the first conference of the International Rice Testing Program for Latin America at CIAT, 12-14 August, 1976.

Delegates from Argentina, Bolivia, Cuba, Nicaragua, Paraguay and Uruguay did not attend. These countries have about 250,000 ha of rice.



MAP. I. DISTRIBUTION OF RICE IN LATIN AMERICA

Area(1000 Ha)
Production (1000 mt)
Yield (mt)

irrigated, the yields are very high. High yields in Peru are due to both favorable climatic conditions and improved varieties; in Colombia they mainly result from the adoption by farmers of the high yielding varieties CICA 4, IR8, IR22 and CICA 6.

In all Latin American countries, blast disease was reported to be the most serious problem limiting rice production. However, other diseases (sheath blight, brown leaf spot, leaf scald and hoja blanca) were reported to be common problems in the rice fields of the region, and some of them are serious or potentially serious diseases. Among the insects, leaf hoppers (Sogatodes), stem borers, water weevil, and stink bugs are common problems. Weed control is also an important problem, especially red rice in countries where rice is direct-seeded.

Rapid seed multiplication and distribution to farmers and the lack of adequate facilities for storage, processing and marketing are other common problems.

Since the Latin American rice crop is largely grown under upland conditions, a lack of adequate drought-tolerant is also an important constraint to increased production.

Other problems that were identified as needing additional attention in Latin America are related to grain quality, soil problems, cold tolerance and deep water varieties. Long and vitreous grain types with good milling and cooking qualities (soft and dry after cooking) were

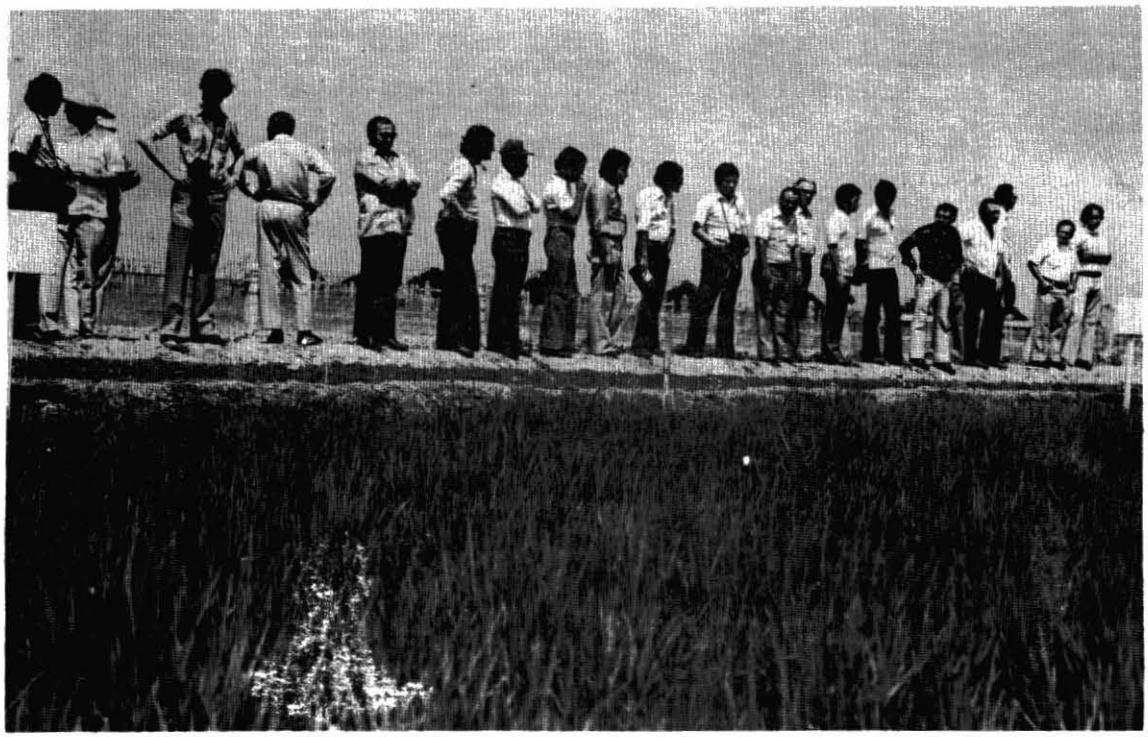
requested; rice varieties tolerant to acid and saline soils and low temperatures were requested by some countries. Also, the need to deep water rice varieties was emphasized for lowland areas which are flooded during the rainy season in several countries of Northern South America.

Table 2 shows the potential for expansion of rice production in Latin America as indicated by the delegates of the various countries. It

Table 2. Potential rice areas and scientists in Latin America 1/

Country	Potential new area (1, 000 ha)	Number of scientists
Brazil	20, 000	44
Colombia	3, 000	17
Costa Rica	30	4
Dominican Republic	-	19
Ecuador	200	8
El Salvador	5	12
Guatemala	50	11
Guyana	-	7
Honduras	100	6
Mexico	100	12
Panama	20	8
Peru	200	29
Surinam	-	3
Venezuela	360	6
Total	24, 065	164

1/ Data given by delegates attending the first conference of the International Rice Testing Program for Latin America, at CIAT, 12-14 August, 1976.



Participants observe the demonstration plots of outstanding rice varieties.

Elías García (Colombia), Derly de Souza (Brasil) and Ramiro Pazos (Guatemala) listen to M. Rosero (CIAT) the explanations on rice research.

:ELD TOUR

OTS

General view of rice experimental plots planted with two international yield nurseries.

Participants observe how laborers cut and thresh rice using a portable thresher developed at CIAT.

also shows the small number of scientists presently working in the national rice programs. As we look to the future world food needs, Latin America represents a major resource in its potential to produce rice. Expanded research programs and technological transfer and technical assistant are needed.

3. NURSERIES

The nurseries available for distribution by the IRTP at IRRI are mentioned in Table 3 of this report. Each of these was discussed by the participants and those not relevant to Latin American conditions were eliminated from consideration. Ten nurseries (Table 3) were of interest to the participants who requested immediate dispatch of 121 nursery sets as indicated. A few additional countries not represented at the conference are also expected to participate. These nurseries may be sent directly from IRRI or channeled through CIAT, whichever seems more practical and economical.

Although the nurseries listed in Table 3 were considered useful and relevant to Latin America it was recognized that each of them would contain large amounts of inappropriate material due to grain type and other factors. It was, therefore, decided that nurseries should be developed specifically for Latin America (Table 4) beginning with a yield nursery (VIRAL) to be distributed by October 1976 and blast (VIPAL) and observational

Table 3. IRRI nurseries of the International Rice Testing Program of importance for Latin America

IRTP Nurseries		Brasil	Colombia	Costa Rica	Rep. Dominicana	Ecuador	El Salvador	Guatemala	Guyana	Honduras	México	Panamá	Perú	Surinam	Venezuela	Total
Yield Rendimiento	IRYN-E Precoz	4		1			1	1		2	4			1	2	16
	IRYN-M Temprano	3	2	1			1	1		2	4		1		2	17
	IURYN Secano	4		1			1	2		2	4	2			1	17
Observational Observación	IRON Riego	4	2	1						3	4		1		2	17
	IURON Secano	3	1	1			1	1		2	4	2	1		1	17
Diseases Enfermedades	IRBN Piricularia	5	2	1			1	1		2	5	2	1		2	22
	IRSHBN Pudrición vaina		1	1								2			1	5
Environmental & Soils Problemas de clima y suelo	IRSATON Salinidad		1		1						2					4
	IRCTN Bajas temp.				1											3
	IRDWON Flotantes		1			1				1						3
TOTAL		25	10	7	2	1	5	6		14	27	8	4	1	11	121

Table 4. Rice nurseries for Latin America

Country	VIRAL 1/	VIPAL 2/	VIOAL 3/	Total
Argentina 4/	1	1	1	3
Brazil	4	5	5	14
Colombia	2	2	2	6
Costa Rica	1	1	1	3
Dominican Republic	1	1	1	3
Ecuador	1	1	1	3
El Salvador	1	1	1	3
Guatemala	2	1	2	5
Guyana	1	1	1	3
Honduras	2	2	2	6
Mexico	3	5	3	11
Nicaragua 4/	1	1	1	3
Panama	2	2	2	6
Paraguay 4/	1	1	1	3
Peru	1	1	1	3
Surinam	1	1	1	3
Uruguay 4/	1	1	1	3
Venezuela	2	2	2	6
Total	28	30	29	87

1/ VIRAL = International Yield Nursery for Latin America

2/ VIPAL = International Blast Nursery for Latin America

3/ VIOAL = International Observational Nursery for Latin America

4/ These countries were not represented by a delegate, at the conference of the International Rice Testing Program for Latin America (CIAT, 12-14 August, 1976) but they would enter this international cooperation.

(VIOAL) nurseries to be distributed in 1977. A total of 87 sets of these nurseries were requested. Nominations for the VIRAL were taken (Table 5 and the respective cooperator agreed to provide 1.5-2.0 kg of seed to the coordinator at CIAT by 15 September, 1976. For the VIPAL and VIOAL,

Table 5. Rice varieties nominated for the first International Rice Yield Nursery in Latin America (VIRAL), 1976

Line or variety name	Nominating Country
CICA 4	ICA-CIAT, Colombia
CICA 6	ICA-CIAT, Colombia
CICA 7	ICA-CIAT, Colombia
CICA 9	ICA-CIAT, Colombia
4440	ICA-CIAT, Colombia
4444	ICA-CIAT, Colombia
CR1113	Costa Rica
Juma 57	Dominican Republic
Juma 58	Dominican Republic
118	INIAP, Ecuador
Tikal 2	ICTA, Guatemala
N	Guyana
77916	Guyana
Macuspana 75	INIA, Mexico
Bamoa A75	INIA, Mexico
Inti	PNA, Peru
IR2058-78-1-3-2-3	IRRI, Philippines
IR2823-399	IRRI, Philippines
IR2863-38	IRRI, Philippines
IR1529-680-3	IRRI, Philippines
Bg 90-2	Sri-Lanka
Apani	Surinam
Camponi	Surinam
Cesvoni	Surinam

it was agreed to send small quantities of seed to the coordinator before October 1976 for multiplication. The coordinator will use these and selected entries from the IRRI/IRTP nurseries to formulate the VIPAL and VIOAL for distribution in March 1977.

Participants felt that, in the future, it would probably be appropriate to formulate other nurseries specifically for Latin America. Meanwhile, it was suggested that the appropriate IRRI/IRTP nurseries be used directly, discarding obviously unsatisfactory entries (short grains, etc.) before planting.

4. OPERATIONAL PROCEDURES

There are several steps necessary to make the testing program successful. Each must be carried out in a timely and appropriate manner. The coordinating center needs the cooperation of the national scientist of the cooperating countries and vice versa. It is truly a team effort. If it is successfully and enthusiastically carried out, much valuable information can be obtained in the minimum amount of time. The following steps reflect the sequence of key events and the associated discussion of the general nature of each step.

4.1 Cooperating Country Entry Nominations

The strength of the international testing program is the cooperating country's participation. IRTP provides individual countries an invaluable opportunity to evaluate their superior material under diverse conditions

to thus determine its potential or lack of potential for use in other countries and/or regions and as donor parents. Therefore, nominations from cooperating countries are very essential.

4.2 Role of CIAT and IRRI

For countries which are small and have limited financial and physical resources for conducting extensive testing, CIAT will screen entries where numbers are large and provide nurseries which are reasonable in size. When preparing nurseries for dispatch it is important to have adequate seed stocks on hand. Thus, it will be advisable for CIAT to eventually multiply the seed stocks for all entries. Initially, these hopefully can be supplied in adequate amounts by the nominating scientists and, in some cases, IRRI could supply seed.

Cooperating rice breeders in national programs will provide their best varieties and advanced lines; CIAT will provide "germ plasm" from its breeding program as would be appropriate and timely. IRRI will supply "germ plasm" from its GEU program and from its germ plasm bank. During the screening process national programs may name and release varieties from the tested material or they may find it appropriate to generate crosses from superior performing materials identified from IRTP.

4.3 Nursery Requests

Cooperating scientists will need to request reasonably well in

advance the nursery(ies) desired and the number of sets. Large countries should have a single coordinator through whom the country's requests might be channeled to the IRTP coordinator. If countries have specific quarantine requirements, the IRTP coordinator should be advised. Specific shipping instructions would be most helpful. A return post card will be provided by which the cooperating scientist might advise the IRTP coordinator of receipt of seed and its general condition upon arrival.

4.4 Seed and Field Book Dispatch

The seed will be packaged in such a way as to minimize the work necessary for the cooperator to get the trials established promptly and efficiently. The seed will be treated ad deemed advisable by knowledgable pathologists and entomologists.

In IRTP it is important to take data uniformly. Field books will be sent to each cooperator. Note taking should follow the format outlined in the booklet "Standard Evaluation for Rice Testing" that will be adapted for Latin America.

4.5 Conduct of Trials

The trials should be conducted within the framework of the established and accepted practices of the country and/or region in which they are being grown. Appropriate guidelines will be listed in the preface of each field book. It will not be necessary to record data which would seem inappropriate for a given location or peculiar set of conditions.

4.6 Reporting Data and Analysis

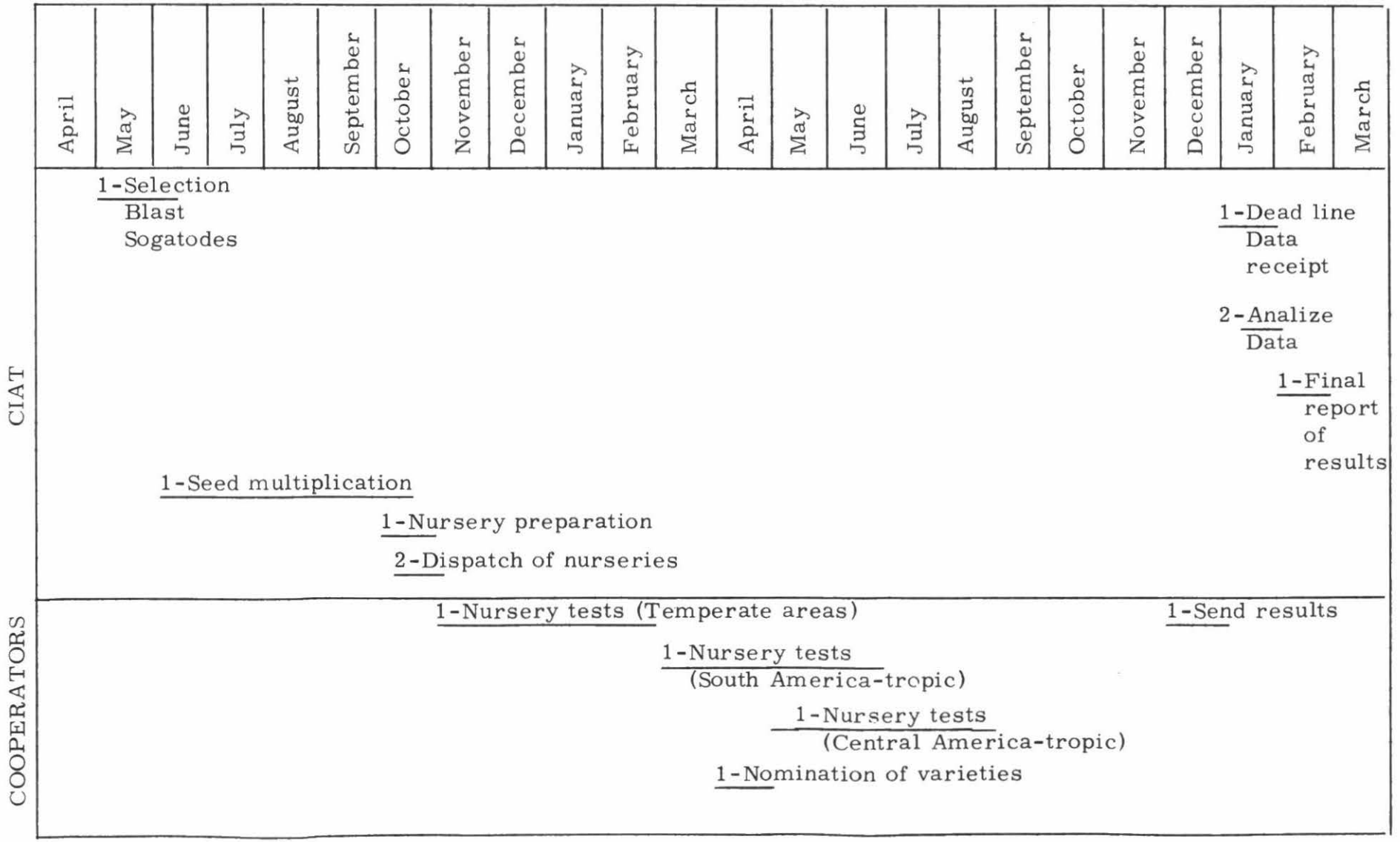
Once the data has all been collected it is most important that it be sent promptly to the IRTP coordinator. Sufficient copies of data recording sheets are provided in the Field Books so that there will be a copy for the cooperator and one for the country coordinator (in countries which have one) in addition to the original which will be sent "air mail" to the IRTP coordinator. All data will be analyzed promptly upon receipt by the IRTP coordinator.

4.7 Reports to Cooperators

The value of the IRTP to the cooperators will be measured largely in how promptly reports can be made on any given season's data. The data will be interpreted on the basis of the analysis, correlated between countries and/or regions. Graphs will be prepared plus any other appropriate means which would be most meaningful and valuable to the cooperating scientist. This will entered in an attractive report form and returned to the cooperator, hopefully in short enough time to permit its use in the planning of the next season's research. It may be as a preliminary or final report.

Within reason a fairly strict schedule must be followed so that IRTP serves the scientist to the maximum. To this end please note the schedule displayed in Table 6. This calendar of events will give all participants an idea of their relative roles of responsibility.

Table 6. Calendar of activities for the International Rice Testing Program for Latin America



Lista de Participantes en la Reunión IRRI-CIAT sobre
Programa de Pruebas Internacionales de Arroz en América Latina
CIAT. Agosto 12-14, 1976

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