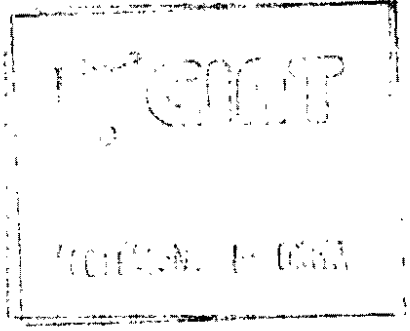
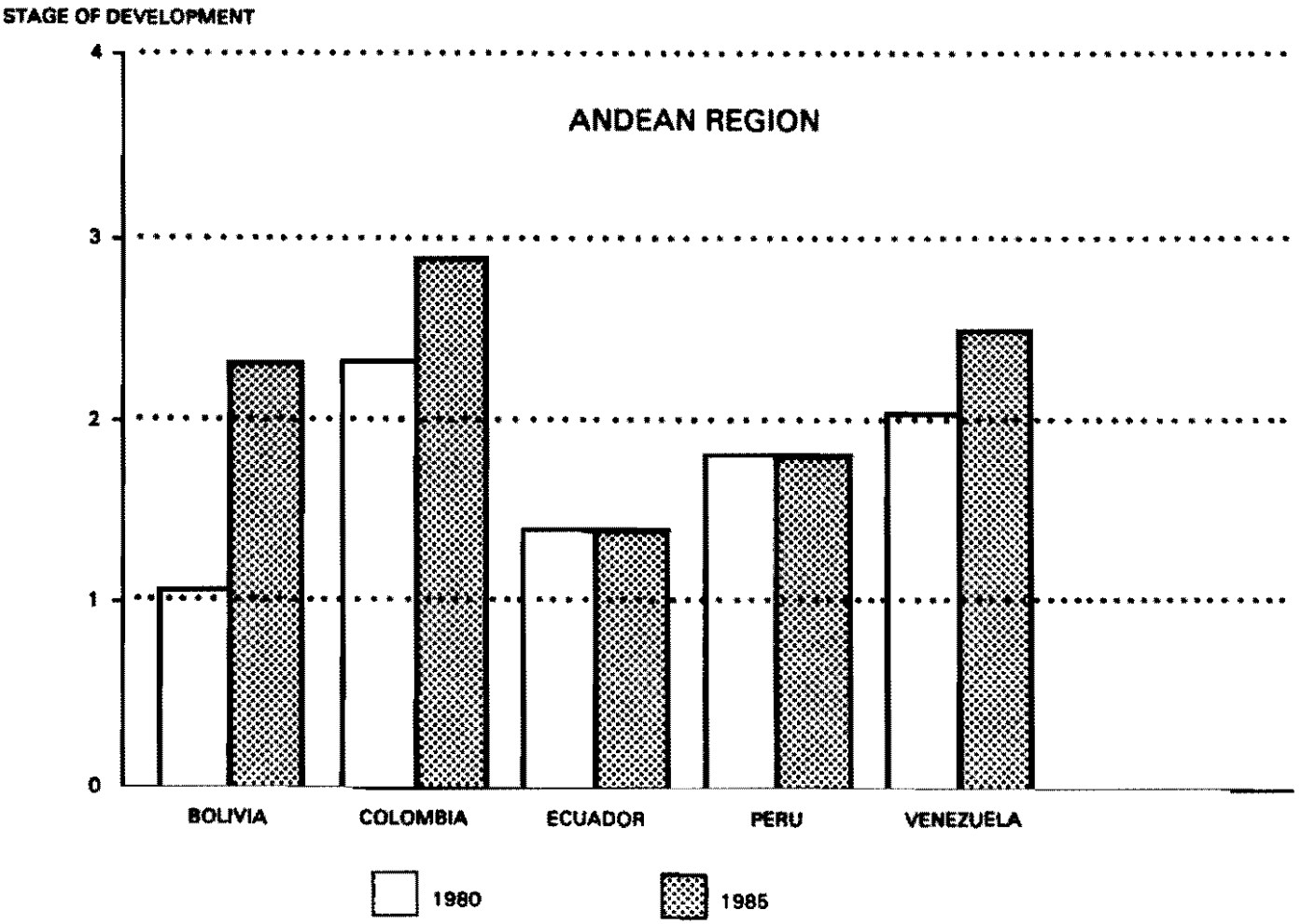


A PROFILE OF THE SEED INDUSTRY IN LATIN AMERICA

Document prepared by Johnson E. Douglas and Adriel E. Garay for the CIAT Internal Review in January, 1987. CIAT, Cali, Colombia.

Seed Sector Development



SUMMARY OF SEED STATUS

Subregion: ANDEAN REGION

Country	Goals and Plans			Research			Initial Seed Multiplic.			Seed Prod. Cond. and Storage			Quality Control			Extension and Marketing			Personnel Development			Leadership			Summa of Item
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
BOLIVIA	3	+	x	2	-	x	1.5	+	xx	3	+	x	2	+	x	1	+	x	3	+	xx	3	+	x	2.3
COLOMBIA	3	+	x	3	+	0	2	+	xx	3.5	+	0	3	+	0	3	-	x	3	+	x	3	+	x	2.9
ECUADOR	1	+	xx	2.5	+	x	2	+	xx	2	+	xx	1	-	xx	1	+	x	2	+	x	1	+	x	1.4
PERU	1	-	xx	3	+	x	2.5	+	xx	2	-	xx	1	-	xx	2	+	x	2	+	xx	2	+	x	1.8
VENEZUELA	2	-	xx	2.7	+	x	2.5	-	xx	2.8	-	xx	2.0	-	xx	2	x	xx	2.5	+	x	2.5	-	xx	2.5

Column 1 = Stage of Development

Column 2 = Advancing or not

Column 3 = Level of assistance needed

BOLIVIA

Goals and Plans

- Has clear objective of role of private and public sector.
- Leaders of associations have crop production plans and know seed needed.
- Goals are planned with cooperation of whole seed sector.
- More implementation of goals in lowlands compared to highlands.

Research

There are public institutions such as IBTA, semi-private such as CIAT and private foundations such as Pairumani, Universities such as San Simón in Cochabamba and René Moreno in Santa Cruz. Some good varieties in wheat, corn, soybeans, rice, beans have been identified. Tropical pasture is still weak as well as beans.

Initital Seed Multiplication

Only CIAT in Santa Cruz has a clear commitment for foundation seed production, but quality of work is still inadequate. Has modern processing plant and good farmers to cooperate with. Weak in wheat and corn foundation seeds. Outside assistance needed mainly on methodology of breeder foundation seeds as well as training in this area for whole country.

Seed Production, Conditioning and Storage

Mainly private sector in lowlands and public sector in highlands. There is enough installed conditioning capacity to carry out this activitiy for next 10 years. Small equipment and promotion of village level seed producers is non-existent. More than 20 new seed enterprises initiated in whole country and 14 new seed conditioning plants.

Quality Control

Very active and promoting certification service working in Santa Cruz. Smaller teams starting work in Yacuiba and Sucre. Other regions still to be initiated. Good to excellent laboratory equipment available in every region. Group will need training on a more permanent basis.

Extension and Marketing

Very weak throughout country. Inadequate to almost satisfactory for soybeans in Santa Cruz; but extremely weak for rice, corn, beans. None for pasture seeds. Extremely weak for wheat and potatoes in highlands.

Personnel Development

Very good with intense in-country and outside training. In addition to courses the seminars, round tables and frequent planning meetings of seed councils are carried onto Santa Cruz is extremely good site for in-country training center involving all aspects of seed programs as well as highland and lowland crops. CIAT trained 46.

Leadership

Still weak and on and off interest and leadership in official sector. Good leadership and interest in farmers organizations both in highland and lowland. Regional seed councils already leading sector very effectively in lowlands.

General Assessment

There is a good pasture seed production with assistance from COTESU, but still low volume of seed produce. There has been a vigorous push to seed development from 80-86 with USAID-MACA-CHEMONICS. Considerable interest. There is a need of another project to keep the momentum. CIAT could take very effective by specific areas in next stage, i.e. technical assistance on foundation seed production of beans, rice, corn, tropical pasture crops, soybeans and in-country training activities. There are good institutions for counterparts. Activity could be carried out by outreach person outposted in Santa Cruz. High chances of impact with low input in a short-term. Encourage small seed producer formation in highlands.

Extension and Marketing

Satisfactory. Marketing still passive in most cases and needs to be improved. Local seed companies strong enough to carry out more effective and innovative marketing programs.

Personnel Development

In-country training program limited. Good training being done in cooperation with CIAT. Needs more intensive, specific training activities for extension agents, foundation seed production, seed testing personnel etc. CIAT trained 97.

Leadership

Good leadership at ACOSEMILLAS, FEDEARROZ and ICA. Seed board where public and private participation is integrated. Good stable leadership in private companies, certification, research and farmers associations.

General Assessment

Colombia is most advanced in seed development in Andean Group. Some elements in program still weak, but could be accelerated with concentrated clear plans, i.e. foundation seed. CIAT could play a good support role on these objectives. Reinforce current efforts on small farmers seed production.

COLOMBIA

Goals and Plans

There seem good clear goals and plans in private sector. Goals of some elements i.e. foundation seeds still unclear within public sector. More clear goals needed in pasture crops, beans, cassava. Goals on hybrid corn, rice seem more clear.

Research

This element seems satisfactory, but cassava, tropical pastures research needs further improvement. Good materials available for seed multiplication on all crops. Cooperative attitude toward private sector research exists. Many new varieties release.

Initial Seed Multiplication

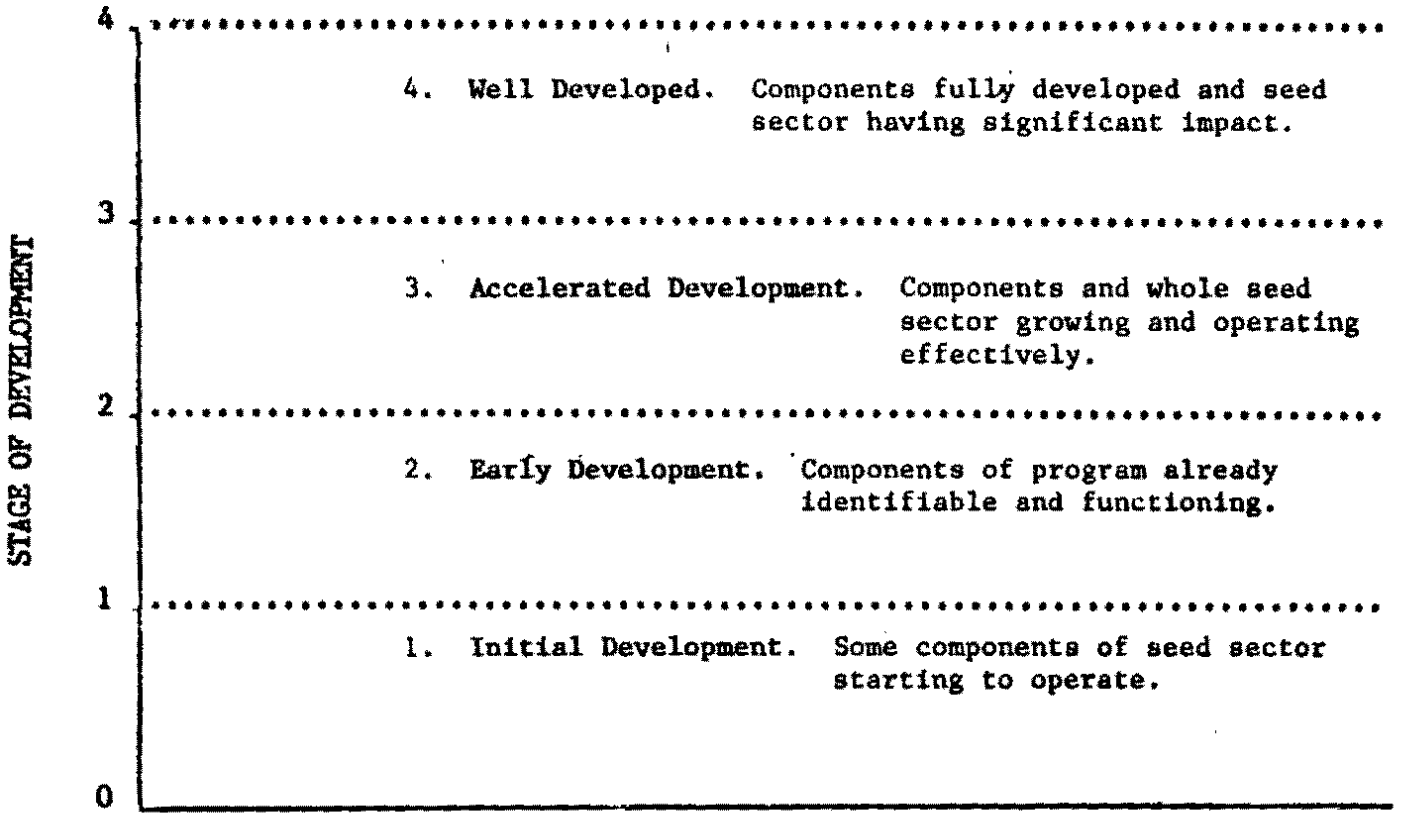
Production and supply of foundation seeds needs further development. Some infraestructure, more trained personnel and financial stability needed. Good area for CIAT assistance and impact in the short-term.

Seed Production, Conditioning and Storage

This activity is very strong and active. About 50 seed enterprises. Strong on sorghum and rice. Beans, cassava, pasture still weak. Satisfactory instalations for conditioning and storage of seeds. Special assistance on machinery and technical orientation needed for small farmers seed production. Internal quality control on existing seed enterprises would be valuable.

Quality Control

Good certification service available. Still weak on beans, pastures and other minor crops. Good mechanism to capture financial resources thru service charges. Need some laboratory equipment. Good promoting service. Could play leadership with small seed growers.


STAGE OF DEVELOPMENT
4
3
2
1
0
4. Well Developed. Components fully developed and seed sector having significant impact.
3. Accelerated Development. Components and whole seed sector growing and operating effectively.
2. Early Development. Components of program already identifiable and functioning.
1. Initial Development. Some components of seed sector starting to operate.

ECUADOR

Goals and Plans

Goals and plans at National level still unclear. There are no clear incentives to promote private sector yet. Guayaquil area clearing objective. New effort by EMSEMILLAS to carry out production and marketing more effectively especially in the coastal region.

Research

Declining. need innovative ideas to upgrade and maintain experienced personnel. No private breeding. Good varieties of rice, corn, soybean available. Little interest on beans. Hybrid corn H550 and new rice cv INIAP-10 being released in 1986.

Initial Seed Multiplication

Still insufficient. Enough drying, processing storage facilitites to carry out activity. With orientation on technology and strategies could promote private sector development. There is enough capacity to provide service. Price of basic seed still unrealistically low. Unnecessary for INIAP to produce certified class on coast.

Seed production, Conditioning and Storage

Overall still limited, but Guayaquil area starting to take off. EMSEMILLAS which is mainly government owned dominates activities. Available infraestructure defficient on reception-drying-holding bins for peak seasons. Production technology from field to storage need improvement. There are beginning attempts of about private seed growers in Guayaquil area, but clear incentives needed to further motivate their development. Need to identify good zones to produce unexpensively good quality seed.

Quality Control

Both internal and external control are still deficient. Internal control within EMSEMILLAS could improved in the short run but other seed enterprises will need assistance and certification service cannot deliver it due to limitations on personnel, resources in general.

Difficult to anticipate improvement in the near future; therefore industry should be heavily based on internal control.

Extension and Marketing

Weak extension. Extremely weak marketing on highlands. Aggressive and successful marketing starting in Guayaquil area with 100 distribution points for rice, corn and soybeans. Activity could be improved even further.

Personnel Development

No ongoing national seed courses. There is need especially on coast where seed will have to be produced based on best technology available. Has good number of personnel trained at CIAT and CETREISEM, but need more. CIAT could assist on this very effectively. CIAT trained 20.

Leadership

No representative leadership of sector yet. National seed commission represents mainly public sector. Private groups could very effectively assist. Regional seed commissions should be tried. High possibilities of success in some regions.

General Assesment

Overall Ecuador has stagnated, but within 85-86 Guayaquil is showing encouraging advances on production and marketing. Will need assistance on upgrading technology and to introduce needed strategies to stimulate the whole seed sector. Integral seed program not established yet; but a good model could be established in Guayaquil with adequate orientation. High impact possible in Guayaquil on technical assistance to whole seed sector.

PERU

Goals and Plans

There is good recognition of needs. There is excellent seed law. Plans seem isolated. Goals and plans are developed in response to crisis. There is no integral systematic plan to develop the national seed program yet. In general there is need for more participation of private sector on goal setting and planning.

Research

There is satisfactory research. Varieties released are good in rice, corn, wheat and potatoes. Good hybrid corn and sorghum available for coastal areas. Beans and pastures still initiating stage. In general, this element is advanced enough to assist effectively a more vigorous seed program

Initial-Seed Multiplication

With very few small programs this element has not been initiated yet. Already initiated good basic seed programs are: hybrid corn at La Molina University; rice in CIPA II , Chiclayo and lately on potatoes at Huaucuayo and other experimental stations. New Servicio Nacional de Semillas would carry out this activity, but will need outside assistance.

Seed Production, Conditioning and Storage

Good on hybrid corn for coast and hybrid sorghum for coast. Satisfactory on rice on Northern Coast. Still not adequate on rice for Huallaga area where there is great future for rice and corn. Non existent on wheat, beans and open-pollinated corn. There are only about 5 seed enterprises.

Quality Control

Certification has been created. Still very weak. Need training equipment and operating funds.

Extension and Marketing

Satisfactory extension service in some areas and inadequate in most areas. With exception of few cases, marketing is just initiating. Still passive. More agressive and innovative marketing strategies needed.

Personnel Development

Very little in country training. Some outside training. There are some trained personnel in all segments of seed programs, but perhaps not getting needed orientation and resources. Both in-country and outside training need assistance. CIAT trained 35.

Leadership

There is no organized seed sector. There are some excellent individuals that could lead sector at national and regional level. More leadership in private sector needed and could be developed based on farmers organizations.

General Assessment

Peru has had successful rice and corn seed programs, however, it is stagnating. There are some attempts in response to crisis situations. Needs a concentrated effort with on integral seed project to provide equipment, machinery and technical assistance to stimulate the whole seed program. CIAT could assist on putting together a seed project and could assist on selected phases of project during implementation phase. Good chances of impact in short term on selected foundation seed projects, but impact on comercial seeds would need longer term effort.

VENEZUELA

Plans and Goals

Not clearly developed on national basis. Some yearly plans for individual components. Major weakness in program. National seed committee on paper, but not functional. Private sector not adequately represented in decisions. Government paternalistic toward seed sector.

Research

Most research organized through FONAIAP on all major crops. Operation reasonably satisfactory—not achieving potential and not good cooperation with other agencies. Some private research and good potential exists for more effort. New hybrids of maize and sorghum, cereal varieties and grain legumes released recently. Programs operational on other crops but limited release of new varieties. Variety release system too demanding and not dynamic. No national system. Cooperation with CIMMYT, CIAT and CIP, but utilization of germplasm from the centers not too effective.

Initial Seed Multiplication

Seed section in FONAIAP responsible for basic seed production. Adequate facilities exist. Basic seed supplies adequate on maize, rice and sesame. Limited on sorghum, grain legumes and pasture seed. Policies on allocation of seed seem adequate.

Seed Production, Conditioning and Storage

Ten private organizations produce and condition most of maize, sorghum and grain legumes. About 40 are involved in other cereal varieties. Over 40 conditioning facilities exist. Enlarged commercial seed sector needed for future. Unclear government policies on role of private sector has been a limitation. Improving.

Quality Control

Five seed testing laboratories with FONAIAP testing 3,000 samples per year—70% maize seed. About 20 agronomists and 20 technicians working in seed quality section. Standards recently revised. Seed

certification, fiscalization and control of quality at marketing stage operational. Some private testing of samples, but internal quality control not adequate in organizations.

Extension and Marketing

Weakest aspect of program--extension inadequate. Marketing by private sector functioning, prices controlled by government. Limited dealers with organizations. Government involved in marketing seed with marketing corporation.

Personnel Development

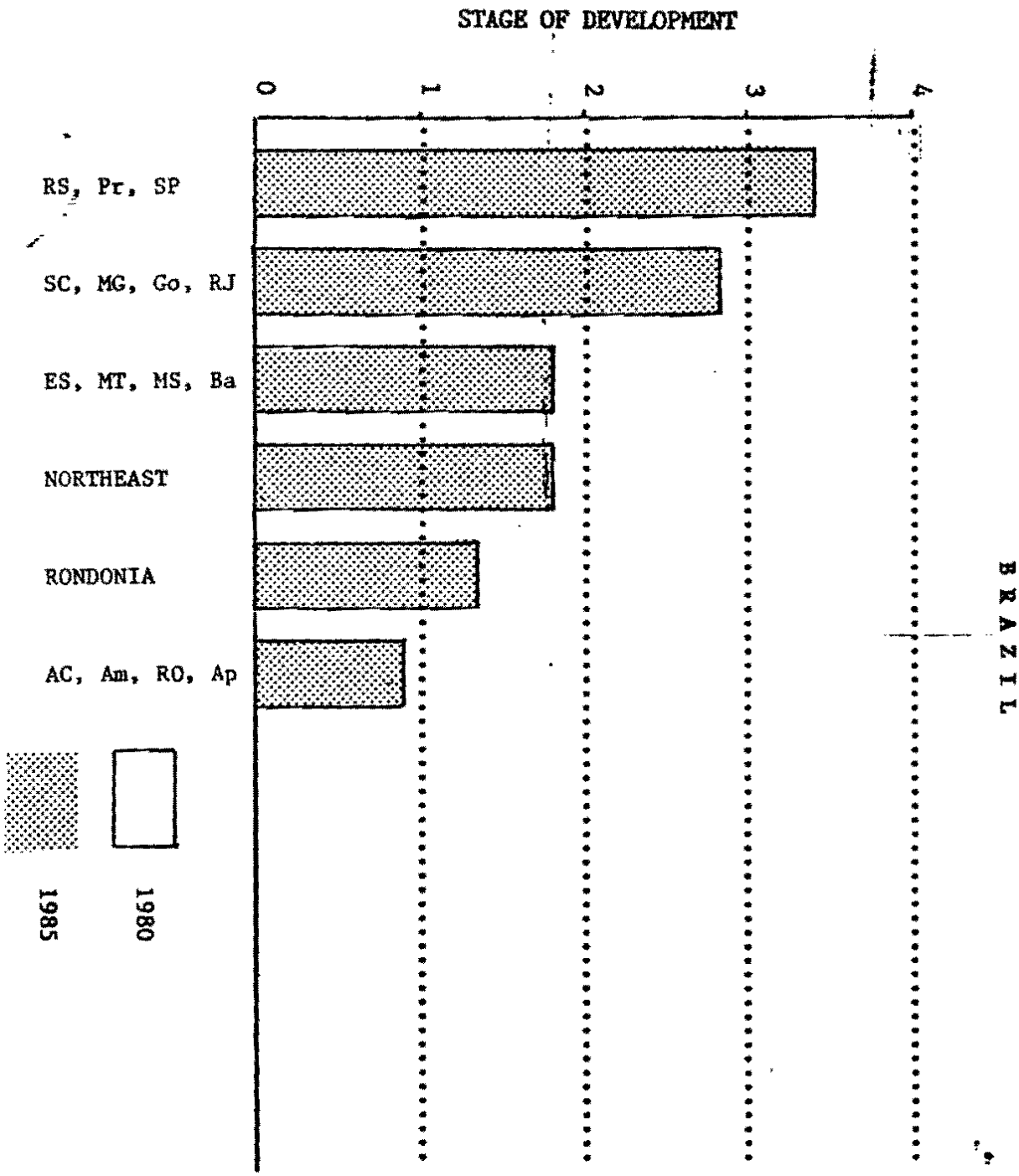
Clear training and personnel develpment plans do not exist. Several well-trained people in country, but not properly utilized. Universidad Central de Venezuela offers in seed production and technology at undergraduate level and four specialized courses at postgraduate level. Limited in- country training. Two Ph.D. in seed technology and some M.S. CIAT, 15 mostly from FONAIAP.

Leadership

Potential exists, but major weaknesses in program appear to center around weak leadership and a lack of cooperation among institutions. New seed technology association may help provide focal point for some activities and new direction.

General Assessment

Coordination of effort at governmental level weak. National Seed Committee needs to be activated with strong private participation. Basic seed program needs strengthening especially on sorghum, pastures and beans. Good potential for private sector develop. Cassava good potential. In-country training development needed. Seed Unit can provide guidance in developing national goals, basic seed production improvement and in-country training development.


STAGE OF DEVELOPMENT
0
1
2
3
4
RS, Pr, SP
SC, MG, Go, RJ
ES, MT, MS, Ba
NORTHEAST
RONDONIA
AC, Am, RO, Ap
1985
1980
BRAZIL

SUMMARY OF SEED STATUS

Subregion: BRAZIL

Country	Goals and Plans			Research			Initial Seed Multiplic.			Seed Prod. Cond. and Storage			Quality Control			Extension and Marketing			Personnel Development			Leadership			Summa of Item
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
,Pr, SP	3.5	+	0	3.5	+	x	3.5	+	0	3.5	+	0	3.0	+	x	3.0	+	x	3.5	+	0	3.5	+	0	3.4
,MG,Go, RJ	2.5	+	x	3.0	+	x	3.0	+	0	2.0	+	x	2.0	+	x	2.5	+	x	2.0	+	x	2.0	+	x	2.8
,MT,MS, Ba	2.0	+	x	2.0	+	x	2.0	+	x	1.5	+	x	1.5	+	xx	2.0	+	x	1.5	+	xx	1.5	+	xx	1.8
rdeste	2.0	+	xx	2.0	+	x	2.0	-	xx	1.5	-	x	1.5	+	x	2.0	+	xx	1.5	+	xx	2.0	+	x	1.8
ndonia	1.5	+	xx	1.0	+	xx	0.0	+	x	2.0	+	xx	1.0	+	xx	1.5	+	xx	1.5	+	xx	1.5	+	xx	1.3
,Am,RO, Ap	1.5	-	xx	1.0	+	xx	0.0	+	xx	1.0	+	xx	0.5	+	xx	1.0	+	xx	1.0	+	xx	1.0	+	xx	0.9

Column 1 = Stage of Development

Column 2 = Advancing or not

Column 3 = Level of assistance needed

BRAZIL

Rio Grande do Sul (RS), Paraná (Pr), Sao Paulo (SP).

Goals and Plans:

Well defined.

Research:

FECOTRIGO (Cooperatives), IRGA (Irrigated Rice), IPAGRO (Agric. Sec.) some agronomy schools, EMBRAPA through research centers at RS, IAPAR (Agric. Sec.), OCEPAR (Coop.), Francisco Terrazava (Private) and CNP Soja (EMBRAPA) at Pr and IAC (Agric. Sec.), ESALQ and other agronomy schools are consistently developing improved varieties of rice, soybean, wheat, corn, cotton and coffee. However, with some particular crops, some states are doing better than others. Pr well with beans, for example.

Initial Seed Multiplication:

Through SPSB, cooperatives, seed growers associations and CATI (SP) and other state research institutions basic seed produced. Supplies can be considered dependable. Good exchange of basic seed among agencies.

Seed Production, Conditioning and Storage:

Very well supplied. Many seed enterprises functional.

Quality Control:

Internal quality control is being implemented in seed enterprises and seed certification is underway, replacing fiscalized seed.

Extension and Marketing:

The extension needs to put more effort on the benefits of using high quality seeds from better cultivars. These 3 states are seeds exporters having a fair marketing system developed. RS produces 305.000 tons of soybean of which around 40% is for export. Pr produces 211.000 tons of wheat with some exported and SP produces corn, cotton and peanuts also with some export objectives.

Personnel Development:

Training began more than 20 years ago at "Universidade Federal de Pelotas" (RS) followed by ESALQ (SP) where undergraduate and graduate level seed courses are offered. Specialized in-country courses offered. Now these 3 States have many personnel trained and being well utilized.

Leadership:

In most cases, personnel with seed background are in decision making positions, such as the President of CESM (State Seed Commission) RS.

General Assessment

These regions are the most developed in the country. Pr and Rs have more balanced public-private activities, SP more public sector oriented and not evolving as fast. With many seed producers, equipment manufacturers, on-going seed program, many crops and well-known universities. CIAT's primary effort should be to help one university strengthen training of students in the environment comparable to their own. These students could be from the Southern Cone for informal courses and from throughout Latin America for M.S. and Ph.D. degree. At the moment, CIAT has an agreement with CETREISEM (Universidad Federal de Pelotas), however, this Center is going slowly and needs further assistance from outside, so it could strengthen its training program. Experience of this region needs to be utilized more fully to help seed sector of less developed areas. Ready to develop stronger seed certification program and integrate with fiscalization program. Quality standards can be improved especially for rice.

BRAZIL

Santa Catarina (SC), Minas Gerais (MG), Goias (GO) and Rio de Janeiro (RJ).

Goals and Plans:

Somewhat defined. Many of the components in place. Need further clarification.

Research:

EMPASC in SC, EPAMIG, some agronomy schools (Vicosa and Lavras) and CNP Milho e Sorgo (EMBRAPA) in MG, EMGOPA and EMBRAPA through research centers in GO and PESAGRO and agronomy school (Km 47) in RJ are conducting effective work on main crops. Many improved varieties released.

Initial Seed Multiplication:

Some through the SPSB (EMBRAPA). EMPASC, EPAMIG and EMGOPA are beginning also to produce basic seed. Some policy problems on responsibility between State and nation responsibilities. EMGOPA making progress on Basic Seed production of beans.

Seed Production, Conditioning and Storage:

There is not sufficient seed processing plants, specially in SC. In SC the main seed production is with potato (51.500 ton), soybean (50.000 ton) in MG; soybean (87.000 ton), corn (33.600 ton) and in GO soybean (64.000 ton) and upland rice (20.000 ton). Additional seed enterprises needed.

Quality Control:

Not much internal quality control and seed certification. Primarily just fiscalized seed (with $\pm$ 10% of the seed checked).

Extension and Marketing:

In SC and MG the extension network is good, but needs greater seed emphasis. Marketing programs weak, even though GO exports soybean seeds to Mato Grosso.

Personnel Development:

Minas Gerais has several well-trained agronomists. On the other hand, the other States need to train several more of their professionals to have strong programs.

Leadership:

Not very active. Needs strengthening.

General Assessment

CIAT can assist directly with the State seed program through strategies, assistance and training acting as a catalyzer (The resource may be found inside the country). Basic seed production programs such as one at EMGOPA could be assisted more in cooperation with Bean Program representative. Some assistance currently being provided to seed sector in SA in cooperation with Rice Program. Seed certification can be initiated more effectively. Quality standards can be improved.

BRAZIL

Espirito Santo (ES), Mato Grosso (MT) Mato Grosso do Sul (MS) and Bahia (Ba)

Goals and Plans:

Not clearly defined.

Research:

EMPABA and EMBRAPA Research Center in BA, EMCAPA (?) in ES, EMBRAPA Research Center and agronomy school in MS and EMBRAPA Research Center (?) in MT are doing some work. Area considered an agriculture frontier. Many species need testing to identify adapted varieties.

Initial Seed Multiplication:

The SPSB has a unit in MS and MT mainly working with soybean. All these States import some basic seeds from other regions (PR, MG, GO, SP, RS). System within State needs strengthening.

Seed Production, Conditioning and Storage:

Bahia is a good area for seed production, especially near the Sao Francisco River. In MS, MT and Ba condition and storage are a problem due to mechanical damage and high temperatures.

In MT the main seed production is soybean (29.000 ton) and rice (most upland 2.200 ton) in MS soybean (65.000 ton), wheat (30.000 ton) and pasture (highest in the country, 5.000 ton) and in Ba soybeans (15.000 ton) and cotton (6.000 ton). There is no seed growers association in ES, so no data was found. Limited seed production capacity currently.

Quality Control:

Not much internal quality control and very limited external (fiscalized seed) control.

Extension and Marketing:

Weak, extension. Market only starting to develop.

Personnel Development:

There are a few professionals with M.S. in Ba and ES. These States need considerable training effort. Seed technology should be incorporated into agronomy courses in universities.

Leadership:

Ba appears to be the only State with reasonable leadership.

General Assessment

CIAT help directly with the State Secretary of Agriculture through a commodity or group of commodities. Region should take advantage of experiences in more developed areas of Brazil, perhaps through a special project operated within the country.

BRAZIL

Northeast including Pará (Pa).

Goals and Plans:

Not clearly defined. The government has a large project (BID) for irrigation in this region. Seed production could be integrated into these plans.

Research:

IPA and EMBRAPA Research Center at Petrolina in Pernambuco are the best known research institutions in the region. Limited improved varieties available. More testing needed.

Initial Seed Multiplication:

Almost non-existent. The SPSB has a unit in Pernambuco and another in Maranhao for the whole region. Needs strenghtening.

Seed Production, Conditioning and Storage:

Most farmers keep their own seeds. Seed production is very low. New seed enterprises needed.

Quality Control:

Very weak. Federal fiscalized seed quality standards used. System needs development.

Extension and Marketing:

Extension is doing something, however, well-trained people lacking. Politics has a very high role in agriculture development in this region. Marketing does not exist.

Personnel Development:

A few agronomists with post-graduate courses in seed technology. The agronomy school at Fortaleza CE offers courses in seed technology. Much effort needed.

Leadership:

Very weak.

General Assessment

CIAT help directly with the State agricultural programs. Need a technological package (seeds, better varieties and adequate agricultural practices) for diffusion. Region should take advantage of experiences in more developed areas of Brazil, perhaps through a special project operated within the country.

BRAZIL

Rondonia.

Goals and Plans:

Just opened agriculture frontier.

Research:

EMBRAPA Research Center at Porto Velho. It has 3 branches throughout the State. Improved varieties just starting to be identified.

Initial Seed Multiplication:

Does not have.

Seed Production, Conditioning and Storage:

Does not have an organized seed production program. Only a few seed producers. The State has 3 seed processing plants, however, just one in good condition to work. Rice, corn and soybeans are the main crops.

Quality Control:

One seed laboratory at Porto Velho. Limited seed testing.

Extension and Marketing:

Weak extension and non existing marketing.

Personnel Development:

One with M.Sc. in charge of the seed laboratory and varietal trials. Extremely limited otherwise.

Leadership:

Weak.

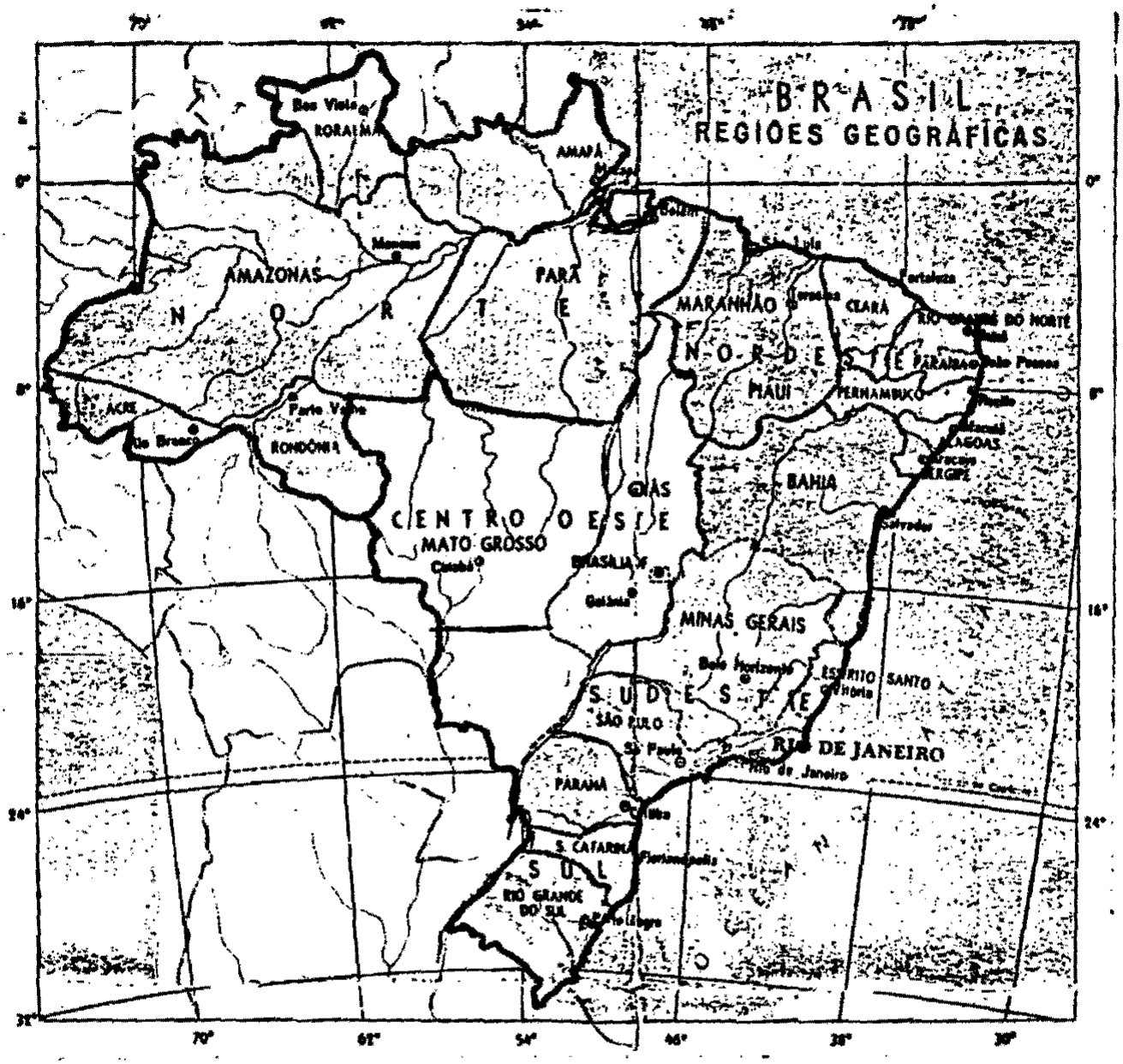
General Assessment

CIAT help directly with the State Secretary of Agriculture. Concepts in Successful Seed Programs: A Planning and Management Guide need to be applied. Area should receive priority for training opportunities. Assistance from more developed areas of Brazil possible.

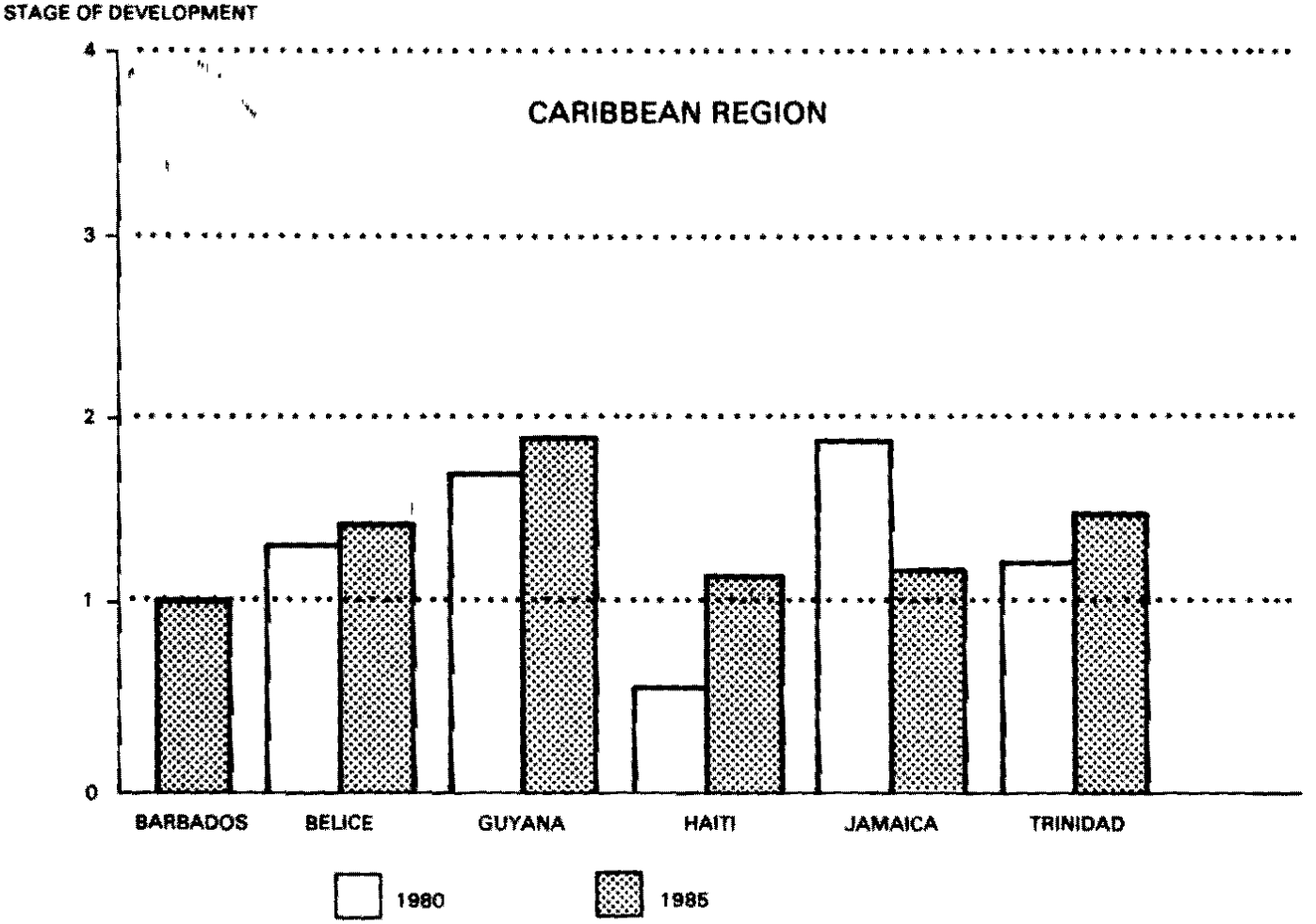
BRAZIL

Acre, Amazonas, Roraima and AMAPA.

These States are just being developed where Acre seems to be a little more advanced. It will take a while before they will have some infrastructure.


BRASIL
REGIÕES GEOGRÁFICAS
NORTE
AMAZONAS
PARÁ
RORAIMA
AMAPÁ
ACRE
RONDÔNIA
NORDESTE
MARANHÃO
PIAUÍ
CEARÁ
RIO GRANDE DO NORTE
PARAÍBA
PERNAMBUCO
ALAGOAS
SERGIPE
BAHIA
CENTRO OESTE
MATO GROSSO
GOIÁS
BRASÍLIA
SUDESTE
MINAS GERAIS
ESPÍRITO SANTO
SÃO PAULO
RIO DE JANEIRO
PARANÁ
SUL
SANTA CATARINA
RIO GRANDE DO SUL

Seed Sector Development



SUMMARY OF SEED STATUS

Subregion: CARIBBEAN (Eng.)

Country	Goals and Plans			Research			Initial Seed Multiplic.			Seed Prod. Cond. and Storage			Quality Control			Extension and Marketing			Personnel Development			Leadership			Summar of Item
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
BARBADOS	1	-	XX	1	-	XX	1	-	XX	1	-	XX	1	-	XX	1	-	XX	1	+	XX	1	-	XX	1
BELICE	1.5	-	XX	2	-	XX	1.7	-	XX	1.5	-	XX	1	-	XX	1.5	-	XX	1	-	XX	1	-	XX	1.4
GUYANA	2	+	XX	2	+	X	2	+	X	1.5	-	XX	2	-	XX	1.5	-	XX	2	+	X	2	+	X	1.9
HAITI	1	-	XX	1.5	-	XX	1.2	-	XX	1.3	-	XX	.5	-	XX	1.2	-	XX	1	-	XX	1	-	XX	1.1
JAMAICA	1	-	XX	2	-	XX	1	-	XX	1	-	XX	1	-	XX	1.5	-	XX	1	-	XX	1	-	XX	1.2
TRINIDAD	1.5	-	XX	2.5	+	X	1.5	+	XX	1	-	XX	1	-	XX	1	-	XX	1.5	+	XX	1	-	X	1.5

Column 1 = Stage of Development

Column 2 = Advancing or not

Column 3 = Level of assistance needed

BARBADOS

Goals and Plans

Not developed

Research

Relies on CARDI

Initial Seed Multiplication

CARDI - limited

Seed Production, Conditioning and Storage

Farmer to farmer spread and vegetable seed merchants

Quality Control

Non existent

Extension and Marketing

Limited

Personnel Development

Limited, CIAT

Leadership

Primarily from CARDI

General Assessment

Development of seed testing laboratory, key seed producer/sellers and seed quality declared system needed. Seed Unit can provide guidance, training and assist CARDI to play a more dynamic role in seed development.

BELICE

Goals and Plans

Ministry of Agriculture interested in seed sector, limited goals and plans.

Research

Concentrated on Belmopan Central Farm and some outlying stations. Close links with CARDI especially on peanuts, maize and forage crops. Breeding material from CIMMYT, CIAT and Southern U.S. Experiment Stations.

Initial Seed Multiplication

Some multiplication at Central Farm, Big Falls Ranch and Mennonite settlement. No clear allocation policy for seed.

Seed production, Conditioning and Storage

Contracting by MOA with Big Falls Ranch, Mennonites and Continuous Crop Improvement Company. Mennonites produce open-pollinated maize varieties and also purchase hybrid seed from Pioneer.

Facilities as Belmopan limited. Mennonites have seed drying, sizing and storage facilites.

Quality Control

Seed testing laboratory available at Belmopan. No other quality control.

Extension and Marketing

Some extension, but inadequate. Credit available, prices set by government. Seed sold through six agricultural extension centers of MOA and extension system. Mennonites sell to members and neighbors.

Personnel Development

Limited. CIAT, 1 MOA and 1 CARDI

Leadership

Limited, but good interest.

General Assessment

Improve basic seed program, increase seed production capacity and link seed laboratory with a seed quality declared program. Seed Unit can provide guidance, training and assist CARDI to play a more dynamic role in seed development.

GUYANA

Goals and Plans

Not clearly developed, changing

Research

National Agricultural Research Institute (NARI) newly formed and operating at Burma. Cooperation --CARDI, CIAT, and CIMMYT. Strongest effort in rice.

Initial Seed Multiplication

NARI responsibility. Fair facilities. Improperly utilized. Lacking flexibility and clear direction.

Seed Production, Conditioning and Storage

Using government seed farms. Problems of spare parts and normal governmental problems. Potential for progressive farmer produced seed, but policies unclear. Imported vegetable seed.

Quality Control

Satisfactory laboratory, but limited field inspection. No seed legislation or quality control on imported seed.

Extension and Marketing

Weak. Government setting seed prices of basic grains.

Personnel Development

Two M.S. trained in MSU. CIAT 2, generally weak.

Leadership

M.S. trained in administrative positions -- above average.

General Assessment

Need clarified goals, strengthened basic seed program, special effort to develop farmer seed producers, strengthened field inspection and quality control system and less government involvement in seed prices. Seed Unit can provide guidance, training and assist CARDI to play a more dynamic role in seed development.

JAMAICA

Goals and Plans

Not developed - major problem.

Research

New facilities at Bodles Research Station provide excellent location for research. Interest and some work with sorghum, cassava, pasture species, beans, cowpeas, pigeon peas and corn. Cooperation with CARDI and some links to CIAT and CIMMYT.

Initial Seed Multiplication

Quite limited. Thetford Farm first developed with FAO assistance as basic seed farm. Unit sold to private group with change in government-seed production not major objective of the present farm. Bodles Research Station needs basic seed production unit.

Seed Production, Conditioning and Storage

Thetford Farm was only government effort. No private enterprises or producers. Pioneer Hybrids have a testing location, but no local production for country. Farmer to farmer sales only.

Quality Control

Seed testing laboratory only -- tests about 200 samples a year. No other quality control activities except plant quarantine.

Extension and Marketing

Limited extension system--rated poor in effectiveness. Seed prices government controlled and subsidized. Marketing by importers including Pioneer with maize and sorghum.

Personnel Development

Extremely weak -- personnel available three years ago not on jobs today. Two seed pathologists with University of West Indies trained in Denmark. CIAT, 3 trained but only one partially on seed.

Leadership

Lacking in seed program, but government interest.

General Assessment

Need clarified goals, initiate a proper basic seed production program, steps to involve private sector in seed program with emphasis on farmer seed producers, quality declared program linked to laboratory and high level governmental support to seed development. Seed Unit can provide guidance, training and special help to basic seed production program.

TRINIDAD & TOBAGO

Goals and Plans

Exist for cereals, legume grains and vegetables only. Weak in ability to achieve. CARDI and University of West Indies (UWI) potential help, but also unclear on role to play.

Research

Reasonably satisfactory work on all crops except hybrid maize and sorghum. Combined effort of Ministry, CARDI and UWI. Some assistance from CIAT and CIMMYT. Emphasis on testing of introduced germplasm. New varieties being released but inadequately used. Private research encouraged but none done.

Initial Seed Multiplication

Chaguaramas Agricultural Development Project (CADP), a seed farm, was set up in 1971 with German assistance. Initially, good progress made; but when German assistance stopped, activities have deteriorated. Some basic seed produced, but inadequate and of questionable quality. New and good storage facility added during last two years. UWI has potential for complementary basic seed production.

Seed Production, Conditioning and Storage

Total effort with CADP and quite inadequate. Import Pioneer hybrids, sell seed and multiply F2 on farm for sale next year. Vegetable seed imported, but UWI report shows much poor quality at farmer level.

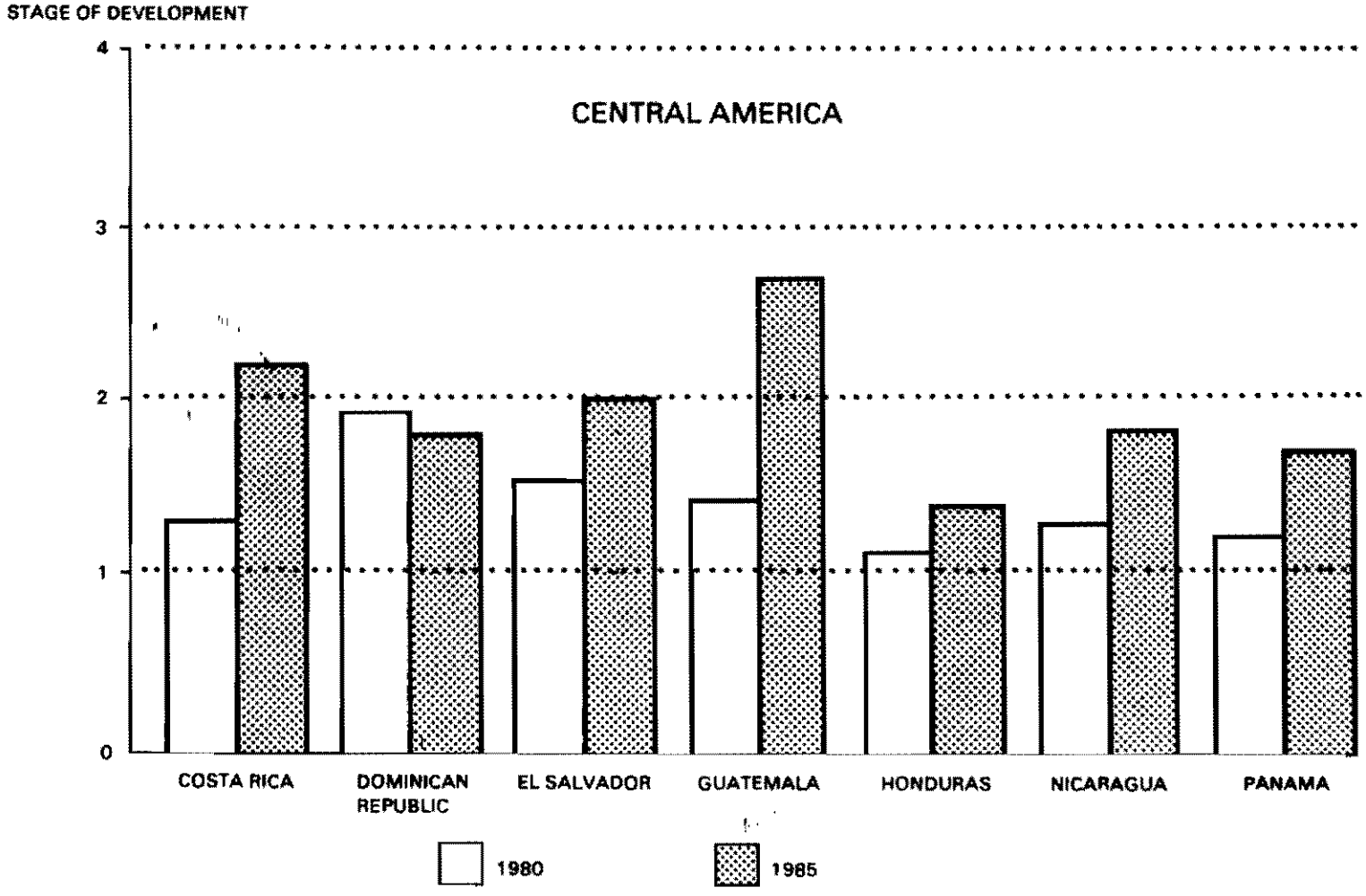
Quality Control

Poorly operated seed laboratory at CADP—testing about 200 samples per year. No other quality control activities except for plant quarantine.

Extension and Marketing

Inadequate promotion of new varieties -- people not properly prepared for job. Credit available to farmers -- seed prices controlled

Seed Sector Development



SUMMARY OF SEED STATUS

Subregion: CENTRAL AMERICA

Country	Goals and Plans			Research			Initial Seed Multiplic.			Seed Prod. Cond. and Storage			Quality Control			Extension and Marketing			Personnel Development			Leadership			Summary of Item
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
OSTA RICA	3	+	XX	2	+	XX	2	+	XX	2	+	XX	3	+	X	1	-	XX	2.5	+	X	3	+	X	2.2
OMINICAN CPUBLIC	2	+	XX	2	+	XX	2	+	XX	2	+	XX	1.5	-	XX	2	-	XX	2	-	XX	1	-	XX	1.8
. SALVADOR	2	+	XX	2	+	XX	3	+	X	2.5	+	XX	2.5	-	XX	1	-	XX	1	-	XX	2	+	XX	2.0
UATEMALA	3	+	XX	3	+	XX	3	+	X	3	+	X	2	-	X	2.5	+	X	2	+	X	3	+		2.7
ONDURAS	1	+	XX	2	+	XX	2	+	XX	1.5	+	XX	1	+	XX	1	+	XX	2	-	XX	1	-	XX	1.4
ICARAGUA	2.5	+	X	2	+	XX	2	+	XX	2	+	XX	1	+	XX	2	+	X	1	+	XX	2	+	XX	1.8
ANAMA	1.5	+	XX	2	+	XX	1	+	XX	2	-	XX	3	+	X	1	-	XX	2	+	XX	2	-	XX	1.75

Column 1 = Stage of Development

Column 2 = Advancing or not

Column 3 = Level of assistance needed

COSTA RICA

Goals and Plans

Adequate legislation and implementation for seed promotion, protection improvement control and use of high quality seed through National Seed Office. Private sector is growing mainly on rice. National Production Council about 15% on rice and supply basic seed as well as seed for other crops not produced by private sector. Plans are to strengthen the private sector.

Research

Done by University (maize and beans). Minister of Agriculture (coffee, cacao, rice, maize, beans) and CATIE (coffee and cacao). Work also is done in vegetables and cotton, however, mostly imported.

Initial Seed Multiplication

Procedures followed to release and registration of new cultivars are well organized and defined by the seed Law. Specific committees on cultivars for each crop representing different institutions working under National Seed Office coordination. National Seed Office is responsible for basic seed production and supply both private and official sector. Multiplication is done under contract with private farmers.

Seed Production, Conditioning and Storage

The main crop is rice. Maize is starting by private sector. Other crops are beans, forage crops, coffee and ornamentals. Most of the commercial seed multiplication is done by contract with farmers having the approval of the National Seed Office. Storage facilities are adequate for rice, however, as other crops progress, more storage facilities will be necessary. Incentives are needed for other crops different than rice and corn. CNP imports other seeds not produced in the country.

Quality Control

Certification service is well organized by National Seed Office. Official laboratory is in CIGRAS (Centro de Investigación de Granos y Semillas) tied up to the University. Internal quality control is acceptable.

Extension and Marketing

Emphasis mainly in rice. Other crops extension service is defficient. CNP distributes seed through delegates throughout the country. Private sector distributes seed through agroservices under commission fees.

Personnel Development

It is adequate to present needs. As seed sector grows, more training will be necessary. 18 professionals have been trained at Seed Unit activities. ARTES courses also have been contributed.

Leadership

Looks adequate. There is awareness with regard to seed importance.

General Assessment

Good potential for other crops different than rice. Needs to reinforce marketing actions and seed extension programs. Personnel development different than quality control have to be promoted. Development of new seed enterprises with other crops specialization.

DOMINICAN REPUBLIC

Goals and Plans

Seed Department of SEA (Secretaria de Estado de Agricultura) has the responsibility to coordinate seed activities. Other Departments and organizations related to seed plans are the Seed Division of Research Department, Extension and Training Department, centers of agroservices sales and Agricultural Bank. Interest to develop private sector exists. Most of the seed production is done by contract with the advanced producers. Seed certification exists by Law, but it is not functioning strongly. Sometimes, seeds are used as a political input and distributed at a subsidized price. Private sector is affected by this issue. National Seed Committee is a consultant entity with private sector participation - not very active.

Research

Main research centers are: CESDA (South); CENDA - Santiago (North) for crops like beans, maize, sorghum, pigeon pea and roots and tuber crops, CENIP for pastures; CEDIA for rice. New materials and systems for seed production for corn with CIMMYT cooperation. Sorghum, rice, beans, soybeans and cassava cultivars are also in progress. National variety release system not functional, therefore, research program decides about cultivars.

Initial Seed Multiplication

Basic seed production unit produces material for red beans. CEDIA with China government assistance produce basic rice seed. Responsibilities are distributed through the SEA research system and actions are not clear except for rice.

Seed Production, Conditioning and Storage

Most of seed is produced by the Seed Department through contract to farmers. Three private companies produce about 50% of rice seed; some corn and sorghum. Beans are produced primarily by Seed Department. Seed storage is about 128.000 m/ton with controlled conditions distributed throughout the country. Most seed is sold as "Semilla Mejorada".

Seed Quality

Weak certification program is operating. Internal quality control for private sector is better. A lot of help needed.

Extension and Marketing

Most of seed from the official sector is distributed through Extension Service and center of agroservices sales with at least 40 stores distributed in the country.

Personnel Development

Poor for seed professionals. Looking for local training. 29 professionals have participated on Seed Unit training courses and conferences.

Leadership

Very poor. Bureaucracy is too large and dedicated to political problem. It is difficult to define who and where leadership is developed. Private sector is so small that leadership is not significant.

General Assessment

Good potential for many crops. Needs to define clear goals and actions in short and long-run. Actions to reinforce private seed production and marketing is needed. Therefore, seeds have to be treated as an important input. Need ways to reinforce credit to develop private sector and to improve seed certification system. Improve the utilization of professionals trained in specific disciplines on the seed sector.

EL SALVADOR

Goals and Plans

The Ministry of Agriculture and Livestock through CENTA is responsible for seed production certification, commercialization, importation and exportation. Individual private initiative as well as cooperative system is continuing to develop. National Seed Committee and seed trade association are now working together.

Research

CENTA is responsible. New varieties and hybrids for maize, and sorghum as well as rice varieties are in the line. Clean seed production for 4 bean cultivars is in process with small farmers seed production programs.

Initial Seed Multiplication

Basic seed production program is organized as a separate entity under CENTA. CIMMYT financed new equipment and technical assistance for this purpose on maize. Basic seed for corn, rice, sorghum, beans (clean seed), sesame, peanuts and soybean is produced. Plans are to organize CENTA only for basic seed production.

Seed Production, Conditioning and Storage

Four processing plants are actively working. Two official and two private. Official seed production is done by contract with private enterprises and cooperatives. CENTA storage facilities are excellent. Official: 48.000 q.; private: 3.000 q.

National Seed Production Association is actively working to define seed price, look for seed production areas and develop new seed plans. Good relation between both sectors.

Quality Control

CENTA is responsible. Good facilities and well organized. More training and professional development needed.

Extension and Marketing

Maize continues to be very active. The private sector uses agroservices to distribute seeds. The official sector sells directly to cooperative system of land reform. Poor distribution channels and storage facilities at consumer place.

Personnel Development

Six professionals have been trained at CIAT. Four in ARTES courses. Seminars at national level are starting and giving good results.

Leadership

Improving. New leaders are coming into private seed production. It needs to strengthen.

General Assessment

Emphasis is needed to train in-country and outside people in different seed disciplines and crops. Concentrate efforts to help CENTA to specialize in basic seed production. Strengthen the marketing process and dealer system. Reinforce the new seed production association in all aspects.

PRODUCCION Y COMERCIALIZACION DE SEMILLAS EN EL SALVADOR

PERIODO 1985-1986

CULTIVOS	PRODUCCION EN QQ		DISPONIBILIDAD TOTAL	COMERCIALIZADA HASTA FEBRERO 1986	PRECIOS PROMEDIOS DE VENTA EN ¢
	ESTATAL	PRIVADA			
MAIZ:					
Semilla básica	750	-	-	487	400.oo
Comercial certificada	1520	51471	52991	62616	95.oo
ARROZ:					
Semilla Básica	650	-	650	279	200.oo
Comercial certificada	2100	7050	9150	3135	80.oo
SORGO:					
Semilla básica	44	-	44	22	200.oo
Comercial certificada	2500	3700	6200	1356	70.oo
FRIJOL:					
Semilla mejorada	1483	-	1433	750	100.oo
AJONJOLI:	60	-	60	72	150

GUATEMALA

Goals and Plans

The administrative procedures have been managed to encourage the development of a private controlled seed industry since 1977. Even though, seed national Law is not promulgated. Agreements and regulations are well accepted by the seed sector. Positive actions can be summarized as follows: Full disposition of genetic and basic seed materials coming from official research sector, price incentive to promote seed production and commercialization, official service to private seed producers, official participation on seed production and marketing as buffer; promotion of a seed producer association.

Research

Through application of an agriculture technology system, ICTA has achieved adequate production technology for main crops. Basic seed production unit is considered as a support discipline for production programs. ICTA works with International Research Centers to develop and test improved germplasm. Well adapted materials, tolerant to diseases problem, materials have been released for corn, beans, rice and wheat. Advances have also been achieved on sorghum, sesame, soybean and melon. Some impact in potatoes and horticultural crops also is reported. Cassava is almost unknown in Guatemala. Private research for adaptation of new materials mainly for corn and sorghum is also present.

Initial Seed Multiplication

Seed programs of ICTA have the responsibility to produce, processing, maintain and supply basic seed. ICTA processing and storage facilities at Barcenas are used by private growers for a fee. System is working adequately for main crops. Closed pedigree materials for maize and sorghum are directly multiplied and maintained by private industry.

Seed Production, Conditioning and Storage

98% of seed production is private initiative and 70% is processed by private sector in three main plants. 30% is processed in 3 official (ICTA) plants. Storage facilities are adequate in both sectors.

Conditions are adequate since climatic conditions in some areas of the country allow a storage period of two years without high investments. Main production maize, sorghum and wheat.

Quality Control

DIGESA (Dirección Nacional de Servicios Agrícolas) is the quality control and certification entity. They are also responsible for importation and exportation. System not strong.

Extension and Marketing

Seed marketing is a private activity throughout the agroservice and dealer system for agricultural inputs. Official participation is directed to quality control through DIGESA.

Personnel Development

In general, private and official sector have a well trained seed personnel. Seed program at ICTA has a M.Sc. level coordinator, 6 B.S. level assigned to 3 regions. 22 professionals have been trained at CIAT in different courses and seminars. Commodity programs also are well equipped with good professionals for seed improvement. Limited national courses conducted.

Leadership

Private and official seed sector have a strong leadership. Excellent relationship among them is also a characteristic. The formation of ANTES in 1986 (Asociación Nacional de Tecnólogos de Semillas), APSG (Asociación de Productores de Semillas de Guatemala) in 1981 and the high contribution to promote ARTES in the region demonstrate the leadership of Guatemalan seed sector.

General Assessment

This is the strongest program in the subregion. Quality control program needs to improve. Define clear goals for small farmer seed production and highland crops will help to continue progress in the program. In-country training needs to reinforce in a more permanent basis. Other crops different than beans need to be included.

DISPONIBILIDAD Y ORIGEN DE SEMILLA DE GRANOS BASICOS
1974 - 1985

AÑO	DISPONIBILIDAD T.M.	IMPORTACIONES* %	PRODUCCION NACIONAL % ICTA	% PRIVADOS
1974	497	65	28	7
1975	2,060	66	16	18
1976	1,873	84	14	2
1977	1,954	64	30	16
1978	2,100	53	29	18
1979	2,452	45	10	45
1980	2,679	42	9	49
1981	3,042	38	8	54
1982	3,297	29	3	68
1983	2,955	27	3	70
1984	3,499	22	1	77
1985	2,400	14	1	85

HONDURAS

Goals and Plans

The development of private seed industry and the role of official sector is clarifying. Private sector is working basically with hybrid corn and sorghum, official sector works on basic seed production, along with EAP, basic grain seed such as rice and beans and seed quality control. Definitions need to be clear in price policies, determining amount of seeds to be produced, imported and commercialized, type and costs of service to be offered by the Ministry to the private industry (e.g. processing, storage, etc.). Development of regulation to implement the Seed Law is necessary.

Research Programs

Rice, corn and sorghum are more organized and advanced than beans and cassava. The National Program for Agriculture Research (PNIA) maintains a system to evaluate new genetic material. The EAP also maintains a research program on beans. New varieties were released during 1985 for maize, sorghum, beans and soybeans.

Initial Seed Multiplication

EAP has been the main basic seed producer for maize, sorghum, rice and beans. They have good technical and physical structure. PNIA produces basic seed for maize, beans, sesame, rice, sorghum and soybeans. CIMMYT is supporting an official basic seed program for maize. Apparently, basic seed production is starting, however, responsibility is not well defined and so continuity is hazardous.

Seed Production Conditioning and Storage

38% of total area for corn, rice and sorghum utilize certified seed. Most of this seed is purchased by the Ministry of Natural Resources under contract with producer farmers. However, intensive plans have been oriented toward private sector where 3 plants are reported in 1985. FACACH (National Cooperative Federation) is establishing a complete seed program. Up to now, private sector is not

significant. Official sector offers service of drying, processing, treatment, packaging and storage at a moderate price for private sector. A private national association of seed producers is being organized this year.

Quality Control

Seed Law gives the responsibility for quality control to National Resources Seed Program (official sector). Seed analysis are offered to private sector and are working according to ISTA Rules. Minimum quality requirements are already established for maize, rice and sorghum. Official laboratories are in Tegucigalpa and San Pedro Sula. EAP also operates a well equipped laboratory.

Extension and Marketing

Official seed production is distributed through Extension Service; poor dealer system is developed. Private dealers are interested in seed distribution and importation. They are part of private seed association.

Personnel Development

The Seed Unit has trained 13 professionals in different seed technology activities and participated in workshops and seminars. Three Master professionals have reinforced the seed program during 1985. ARTES courses also have contributed during last 2 years. This is still a high priority activity in Honduras. Limited in country training.

Leadership

The lack of strong leadership is the weak area in Honduras.

General Assessment

Major weakness is in leadership. Needs to define clear goals and objectives. Needs assistance in upgrading technology and to define strategies to stimulate the whole seed sector. Private sector needs financial and technical assistance. In-country training needed to complement subregional and regional effort.

NICARAGUA

Goals and Plans

Lot of changes during the last years, information is not clear. MIDA through INTA (Instituto Nacional de Tecnología Agropecuaria) is responsible for seed supply. Government and private sector apparently have well defined functions. Seed sector growth is programmed according to quinquennial plans. It looks to be well planned.

Research

Carried out mostly by INTA, under crop sections. Rice research is in collaboration to Empresa Nacional de Arroceros (ENARROZ) and Asociación Nicaraguense de Arroceros (ANAR). The latter one is responsible for rice seed production. A well defined program for material evaluation and seed production is under national beans program. Cassava and pastures are incipient. Maize, sorghum, sesame, soybean look well organized. Cotton is an important crop. No information available.

Initial Seed Multiplication

Big effort is going in this regard for crops like corn, sorghum, beans and rice. Cassava and pastures are starting.

Seed Production, Conditioning and Storage

Two government plants (EMPROSEM) and one private (ANASEMILLA) are working at present. ANASEMILLAS is only working on rice. EMPROSEM produces most. Almost 50% of hybrid maize, total hybrid sorghum and 40% of beans were imported in 1985. Storage capacity under controlled conditions is 2,500 m.t. for a total disponibility of 8,500 m.t.

Quality Control

Certification is under MIDA. Oficina Nacional de Certificación in 1984 was only with one professional. They need a lot of help. Internal quality control of EMPROSEM and ANASEMILLAS is improving.

Extension and Marketing

Seed distribution for rice is going through ANAR system. In other crops, INRA (Instituto Nacional de Reforma Agraria) participates through State farm system.

Personnel Development

Even though a big effort is underway by the Government as well as for professionals, needs a lot of help in this regard. 10 professionals have been trained at CIAT Seed Unit. ARTES courses also have been used.

Leaderhsip

It is fair. Needs strength to go ahead with the program.

General Assessment

Needs to emphasize outside training. Actions to increase seed production could be through cooperative system to spread risk and responsibilities. Certification program needs more assistance.

VOLUMENES DE SEMILLA 1985 NICARAGUA

XXXII REUNION PCCMCA

ARZO 1986

DISPONIBILIDAD	COMERCIALIZACION ORIGEN		TOTAL	PRECIOS		
	NACIONAL	IMPORTADO		GRANO	SEMILLA	RELACION
1,019.0	0.0	533.0	533.0	1,660.0	3,588.	2.16
1,827.0	562.0	0.0	562.0	1,660.0	2,776	1.67
2,836.0	562.0	533.0	1095.0			
1,016.0	0.0	1,016.0	1016.0	890.0	1,900	2.16
195.0	195.0	0.0	195.0	880.0	1,900	2.16
1,211.0	195.0	1,016.0	1211.0			
1,228.0	?	?	?	1,900.0 3/	2,150	1.13
572.0	320.0	176.0	496.0	3,250.0	4,600	1.42

iembre 1984.

34 y Enero 85

idor de arroz oro.

PANAMA

Goals and Plans

National Seed Committee (under MIDA Budget) is responsible for planning and execute national policies, and coordinate public and private activities. A new IDB contract is oriented to enhance basic seed program, ENASEM (Government seed enterprise) and NSC. Private seed sector is incipient, however, plans are to reinforce it. Decisions are not sufficiently strong to see some progress.

Research

MIDA is in charge through IDIAP. Good results in rice and corn. Poor in beans, cassava and pastures. Private research for corn and sorghum is coming.

Initial Seed Multiplication

Now IDIAP is in charge. Good facilities are in progress under IDB contract. Basic seed plants will be in Rio Hato where initial multiplication for rice, corn, cassava and pastures is held. Lack of trained personnel for this purpose in IDIAP.

Seed Production, Conditioning and Storage

90% of seed production is rice. 35% of total requirement is produced by ENASEM. 15% by private sector; other 50% do not use certified seed. Other crops are almost insignificant, although, highly necessary. Development of private sector is incipient and uncertain while ENASEM is growing more. No credit to develop private sector.

Quality Control

Under CNS, well organized and equipped. Well and abundant trained personnel. Seed categories are basic, registered, certified and selected seed.

Extension and Marketing

ENASEM seed is sold through National Bank of Development and the private sector sells the seed through agroservice system. Apparently,

there is not problem for rice. Other crops are almost insignificant. No marketing companies. It is necessary to reinforce. Good in-country training from Oficina Nacional de Semillas to extension people.

Personnel Development

CIAT has been trained 20 professionals. Two from private sector; through IDB postgraduate training is in process. Private sector is weak. National training program coordinate by NSC is also working.

Leadership

NSC contributing but limited impact. It is necessary to reinforce especially in private sector.

General Assessment

It is important to define the role of ENASEM in the seed sector. Other crops different than rice might have good potential (pastures, hybrid corn). Reinforce with training other portions of the seed sector different than quality control, i.e. basic seed production and marketing. It is important to assist the formation of new seed enterprises.

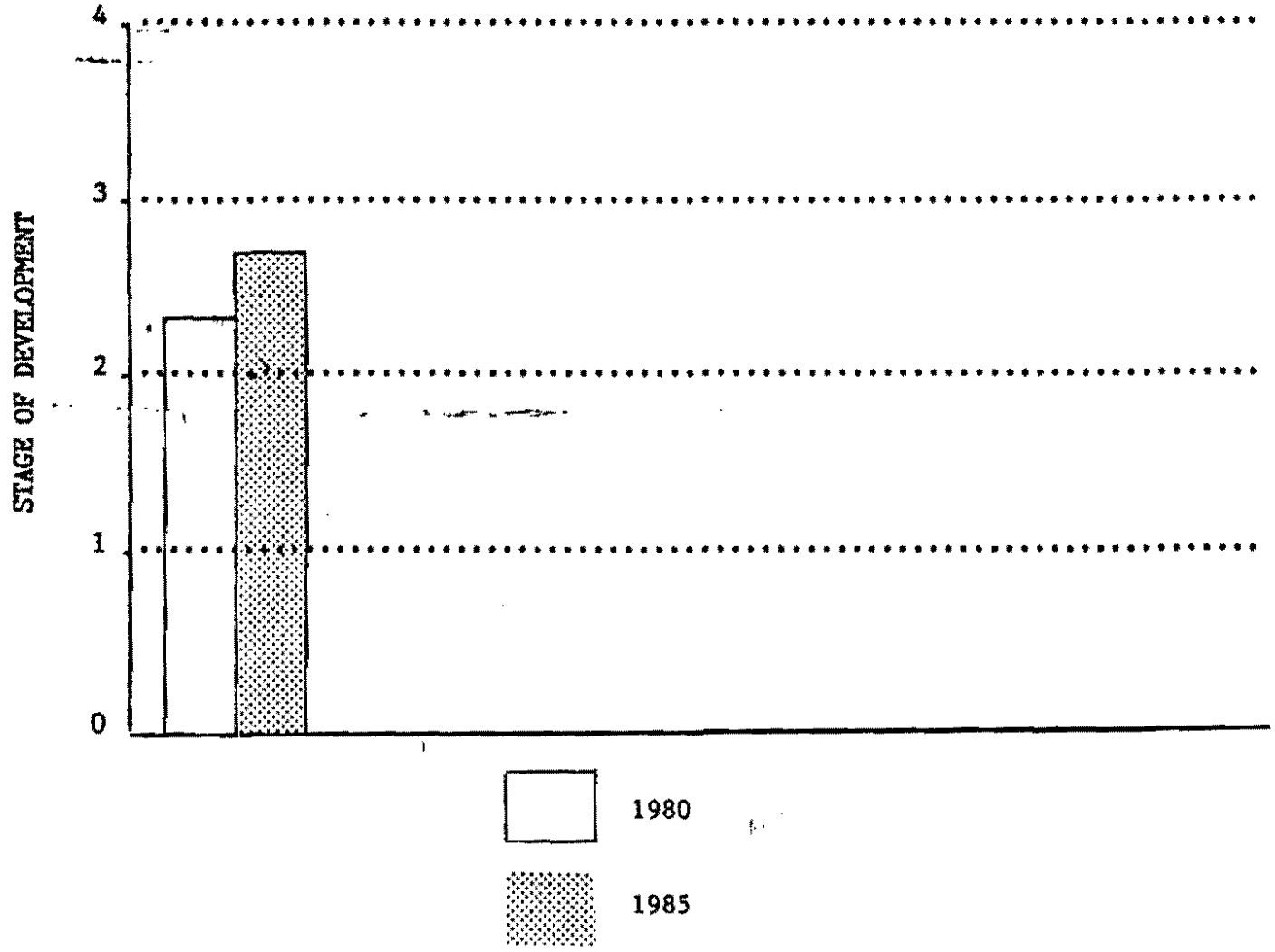
MINISTERIO DE DESARROLLO AGROPECUARIO

COMITE NACIONAL DE SEMILLAS
SECRETARIA TECNICA

PLAN DE MULTIPLICACION DE SEMILLAS DE ARROZ, MAIZ, FRIJOL, POROTO Y SOYA - PERIODO 1985

CULTIVOS	CATEGORIA DE SEMILLA EN HECTAREAS				
	TOTAL HAS.	BASICA	REGISTRADA	CERTIFICADA	SELECCIONAD
ARROZ	953	1	9	284	658
MAIZ	115	2	-	113	-
FRIJOL	25	1	0,5	0,5	23
POROTO	19	-	-	-	19
SOYA	3,25	0,25	-	3	-
TOTALES	1,116,25	4,25	9,5	400,5	701

M E X I C O



SUMMARY OF SEED STATUS

Subregion: MEXICO

Country	Goals and Plans			Research			Initial Seed Multiplic.			Seed Prod. Cond. and Storage			Quality Control			Extension and Marketing			Personnel Development			Leadership			Summar of Item
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
MEXICO	2.5	+	x	3.3	+	x	2.0	-	xx	2.8	+	x	2.5	+	x	3	+	x	2.5	-	xx	2.7	+	x	2.6

Column 1 = Stage of Development

Column 2 = Advancing or not

Column 3 = Level of assistance needed

MEXICO

Goals and Plans

Focused primarily on role of PRONASE, the public sector seed enterprise. World Bank study during last two years has caused some broader consideration of goals and plans. Past emphasis on development of PRONASE; local private sector development neglected. Major exception is the development of "patronato" system where research effort is closely linked and supported by farmers. Seed multiplication system development planned with this system.

Research

National research network extensive. Wheat and maize research assisted substantially by Rockefeller Foundation and close links remain with CIMMYT program. Wheat effort most successful. Significant research on other major crops. Links with CIAT, CIP and ICRISAT. Numerous varieties developed. Major limitation in moving varieties to farmers.

Initial Seed Multiplication

Responsibility for breeder seed maintenance and multiplication with research programs. Basic seed multiplication responsibility of PRONASE except in case of wheat with the patronatos. Primary weakness in program because new breeder seed not normally supplied to PRONASE after initial release and PRONASE has been unable to maintain quality of original seed supplied. Currently research programs are initating effort to produce more basic seed. Effectiveness of this program will depend on their ability to organize system and staff to do better than PRONASE -- should not assume this will happen automatically. New allocation system on basic seed needed to open opportunities for more seed enterprises to obtain basic seed and compete equally with PRONASE.

Seed Production, Conditioning and Storage

Major responsibility of this aspect of program with PRONASE. State controlled monopoly on many crops limited development of local

seed enterprises. Large quantities seed supplied through the system, but quality of seed questionable. Major problem a lack of effective internal quality control program and sales of seed stored too long. Patronato system effective in meeting wheat seed needs in Northern Mexico. Transnational companies able to enter the market with sorghum hybrids since research program not strong and USA developed hybrids well adapted. Seed stock for multiplication imported, but currently debate on whether to continue importation. More pressure to produce seed stock in country. Similar situation with vegetable seed production. Limited pasture seed production, but interest growing.

Quality Control

Seed Certification and Inspection Service operating many years, but reputation and integrity in question. Many reports of seeds approved without actually moving through a generation system or proper retesting after storage. System centrally controlled from Mexico City with improperly trained staff. Leadership at state level appointed on non-technical basis. Currently, attempts to "reform" system by using state committees, strengthen seed testing laboratories and train staff. Consideration needed of basic structure and developing mechanisms to remove system from political influence with increased involvement of users of system in decisions on policies related to operation. Seed standards need revision to assure they are achievable. Improved system needed to check quality of non-certified seed. Surveys of quality of seed used and post-control checks of material produced needed. Improved links with seed quality programs in USA and Canada would help program and improve ease of seed movement.

Extension and Marketing

Promotion of new varieties most effective in patronato areas. System working in other parts of country -- improvements needed. Marketing system with PRONASE appears awkward and bureaucratic. Closely linked to banking system. Use of independent dealers limited except in case private enterprises. Seed pricing tends to be controlled by PRONASE price. System not able to adjust quickly

to changing conditions. Subsidized system used in past and seed sales stimulated temporarily, but government not able to maintain system. Credit available through banking system. PRONASE system fould be improved by major decentralization of control or actually selling the 30 plus seed conditioning units through the country to local seed growers and other interested in the respective areas.

Personnel Development

Greatest weakness in program. Inadequate in-country training in past and failure to provide adequate training of key people abroad has caused program to become "self- satisfied" and limited in ability to change with needs. University at Saltillo, UAAAN, best opportunity in country to assist. Potential exists at Chapingo but staff limited today. PRONASE now undertaking staff development effort. Quality control program starting similar effort. Most CIAT trained people not in positions to influence program in short-run except Juan Carlos Garcia. University people will influence program in long- run. CIAT trained 29 including 12 from universities.

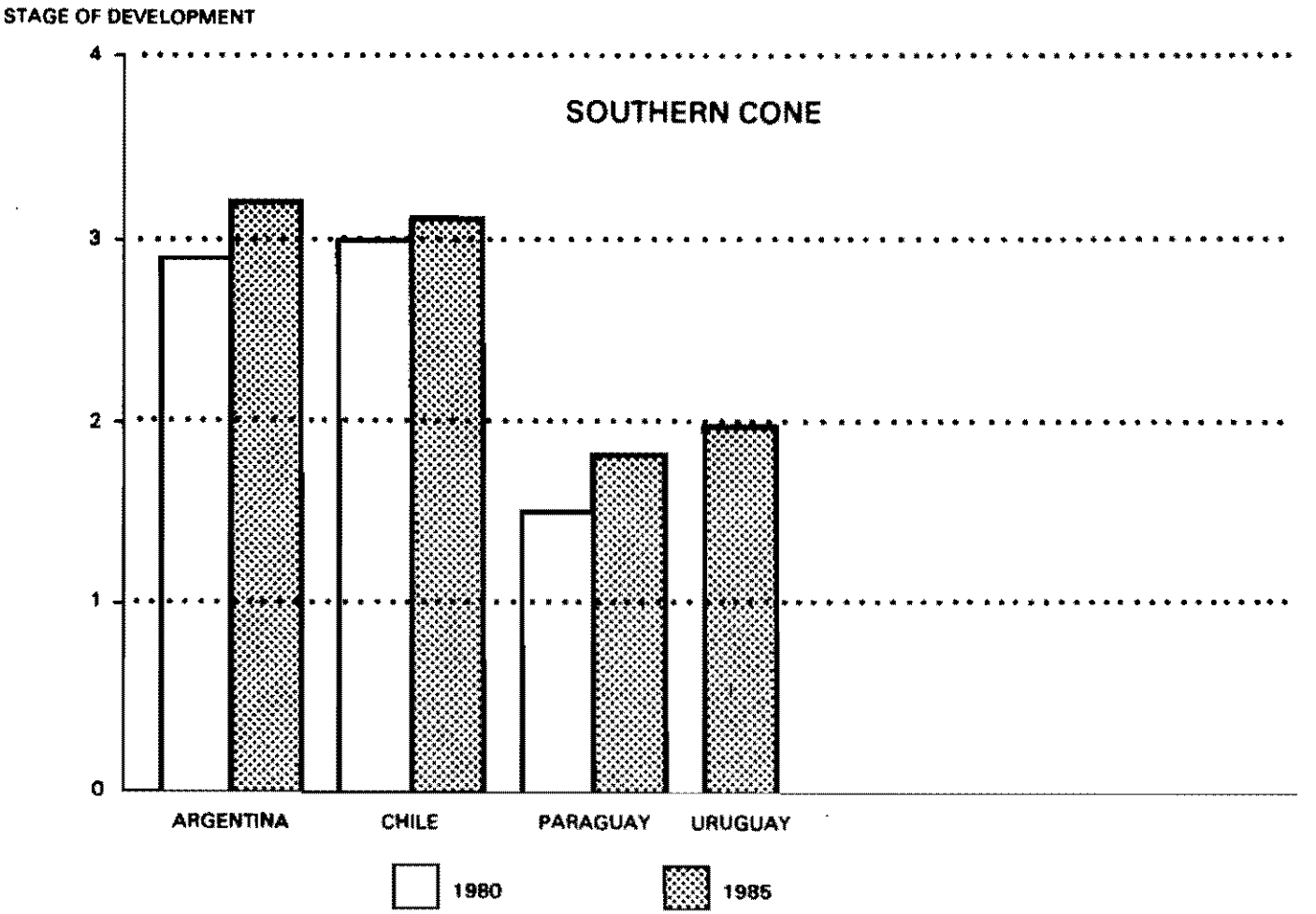
Leadership

Capable people available, but system of appointment makes it difficult to maintain them in positions long enough to have desired impact.

General Assessment

Properly organized and functioning basic seed production program highest priority after clarified goals by government. Decentralization or privatization of PRONASE needed. Continued improvement of internal and external quality control. Some decentralization of quality control service in implementation. Increased development of seed technology in university system to strengthen in-country training. Increased training of seed program leaders outside the country. Seed Unit can assist in clarifying goals, basic seed production, training, strategies and organization and university training effort.

Seed Sector Development



SUMMARY OF SEED STATUS

Subregion: SOUTHERN CONE

Country	Goals and Plans			Research			Initial Seed Multiplic.			Seed Prod. Cond. and Storage			Quality Control			Extension and Marketing			Personnel Development			Leadership			Summary of Item
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
ARGENTINA	3.3	+	X	3.5	+	X	3	+	0	3.5	+	0	3.3	+	X	3.0	+	X	3.0	+	X	3.0	+	X	3.2
CHILE	3	+	X	3.5	+	X	3	+	X	3.1	+	0	3.0	+	X	2.7	+	X	3.0	+	X	3.5	+	X	3.1
PARAGUAY	2	+	X	1.6	+	X	1.2	+	X	2.0	+	X	2.0	+	X	1.5	+	X	1.5	+	XX	2.3	+	X	1.8
URUGUAY		+	XX	2	+	XX	2	+	XX	2	+	XX	2	+	XX	2	+	XX	1.5	+	XX	2	+	XX	2

Column 1 = Stage of Development

Column 2 = Advancing or not

Column 3 = Level of assistance needed

ARGENTINA

Goals and Plans

One of oldest seed programs in the region and has developed an effective operational system. Goals and plans most clear with hybrids of maize and sorghum and cereals. Not so well developed for pasture seed and vegetables. National Seed Commission functional and contributing to seed sector development.

Research

Public sector research functioning effectively through INTA especially with hybrids of maize and sorghum, cereals and industrial crops. Programs satisfactory with other crops. Links with CIMMYT especially on wheat and CIAT primarily with beans. Facilities adequate. Private sector research strong with hybrids and two organizations involved in research on varieties, especially wheat. INTA has policy to supply lines and breeding material to private sector -- the most advanced system in region. Private sector research encouraged. Large numbers of materials being released from public and private programs for maize, sorghum, cereals and oilseed crops.

Initial Seed Multiplication

INTA responsible for breeder and basic seed multiplications -- individual breeding programs manage own breeder seed. Working through selected cooperatives basic seed is multiplied. System effective but consideration given to develop stronger "basic seed unit". Basic seed production adequate for maize, sorghum, cereals and oil seed. Limited on grain legumes, pasture seed and vegetables. Facilities adequate. Clear allocation policies for basic seed. Adequate staff. Private sector manages own production well.

Seed Production, Conditioning and Storage

One of the strongest and dynamic commericial seed sectors in region with 40 enterprises in hybrid business and over 400 involved in production of other seed. Adequate seed conditioning facilities. Some equipment made in Argentina. Potential for training from other parts of the region in seed enterprises in the country.

Quality Control

Legislation exists and effective quality control activities in seed certification, fiscalization and marketing control. Ten public sector seed testing laboratories and 27 private laboratories. Large number of samples tested. Adequate facilities. Staff competent -- some training and contacts outside country needed.

Extension and Marketing

Extension effort on maize, sorghum, cereals, oilseeds, and vegetables quite good. Grain legumes and pastures weak. On-farm testing of maize, sorghum, cereals and oilseeds. Promotion by private sector comparable to extension effort. No special policies to stimulate seed marketing except economic incentive. Credit available. Percentage of area seeded with improved varieties as follows: Maize and sorghum, 100%; wheat, 30% ; barley, 2.5% ; beans, 2.9% ; soybeans, 61% ; peanut, 9.1% and potato, 14%. Concentrated effort needed on crops with low percentages.

Personnel Development

Plan exists for personnel development and general level of people in program is high. Limited in potential for obtaining advanced training in seed. Plan for University of Cordaba to develop M.S. level program needs acceleration to provide opportunity for increased advanced training in country. Increased short course training in-country needed. CIAT trained 15.

Leadership

Competent leadership in both public and private sector, especially in private sector.

General Assessment

Further improvement in organization and operation of basic seed program needed. Quality control system needs to become less paternalistic with improved effectiveness through services offered. Greater in-country training effort especially through lead universities. Seed Unit can provide guidance on basic seed effort and seed quality control system. Help in-country training development effort.

CHILE

Goals and Plans

Well developed for hybrids of maize, varieties of cereals and grain legumes. Less well developed for pasture seed, oil seed and vegetable seed. Program well established many years and one of the most advanced in the region. Political problems have hampered development during the last few years. Currently increased emphasis on private sector development.

Research

Functional programs on all crops except vegetables. Pasture and oilseed weakest programs. INIA responsible for public effort. Increasing private effort with hybrids and cereals. Plant variety protection program operational. Substantial number of hybrids and varieties being released of maize, wheat, barley and beans.

Initial Seed Multiplication

INIA responsible for breeder and basic and has special units to handle production. Conditioning facilities exist and functional -- program better than average.

Commercial Seed Production, Conditioning and Storage

The major effort is through private organizations. Initially a public sector company was started, but now that effort has been converted into a private company, ANASAC, with substantial local production, imported seed and export business. This company deals with all major crops. Additionally, six companies are in the hybrid maize and sorghum business and over 20 others deal in other crops. A seed association with 45 members is operational. Successful in exporting seed to Europe and USA. Adequate seed conditioning facilities and storage.

Quality Control

One of first operational seed certification programs in region. Also have marketing control program and plant quarantine. Five

public sector seed testing laboratories and several private laboratories. Both private and public laboratories testing over 5,000 samples per year. Standards well developed and applied. Experienced people managing operations. Effective program.

Extension and Marketing

Extension system not working well. Private sector promoting hybrids and varieties of cereals well. Improvement needed with other crops. ANASAC has about 30 staff members involved with sales. Areas planted have continued to drop since 1973 as has the percent of certified seed used. These problems are political and economic and not related to the potential strength of the seed sector.

Personnel Development

Clear policy for personnel development does not exist. Private sector relatively stronger than public sector, but compared to many other countries in region the seed sector has done well in developing an adequate staff. CIAT trained people with public sector and ANASAC.

Leadership

Continuity of leadership good in quality control program. Program has benefitted from continuity of experienced people. Leadership not a constraint unless present political problems affect it.

General Assessment

Strengthened basic seed program needed. Increased in-country training development useful. Seed Unit could assist both of the above.

PARAGUAY

Goals and Plans

More developed for cereal grains and soybeans and lacking for beans and pasture crops. Plans mainly responds to market situation in Brazil. Attempt has been made to clarify goals.

Research Programs

There is organized research on most crops except beans. New varieties available on small cereals and soybeans very limited on corn, beans and pastures.

Initial Seed Multiplication

No organized effort on foundation seed production. Almost satisfactory only on wheat. Installations to carry out this activity need improvement.

Seed Production, Conditioning and Storage

There are two public units working on all crops and 12 private seed enterprises operating. 10 seed conditioning plants. Seed available mainly on small grains and soybeans. Processing infrastructure seems adequate for short-term objectives, but storage needs improvement. 10-15,000 mt. seed produced/year where wheat and soybean dominate.

Quality Control

There is legislation to control quality on corn, sorghum, small cereals and soybeans. Certification service being adequately executed on these crops. There are 3 laboratories in public sector and four in private. Average of 6,000 samples being tested yearly.

Extension and Marketing

Weak extension and marketing, limited on-farm testing, availability of credit to acquire certified seed satisfactory on small cereals, soybeans and pasture crops.

Personnel Development

Very few trained personnel on both private and public sector. No in-country training activity. Few well-trained personnel trained in USA and Brazil.

Leadership

Seed sector leadership could be improved. Leadership exists on isolated elements.

General Assessment

Compared to other Southern Cone countries, Paraguay seems to be lagging behind in overall seed industry development. Greater effort needed on training which could be carried out regionally in Pelotas as well as CIAT. With some outside assistance resources could be oriented to upgrade whole seed sector. Follow-up activities needed to the seed development strategies identified in 1983.

URUGUAY

Goals and Plans

New Seed Law is in force since 1983. Executive Unit in DIGRA (Dirección General de Granos) under MAP (Ministry of Agriculture and Fisheries). Objectives are to guarantee seed quality, to promote research and seed industry for internal supply and export purposes. Seed Law establishes norms for cultivar evaluation, registration of species and cultivars, seed certification, seed commercialization, registration seed producers and dealers, marketing fiscalization and quality control, importation, exportation and protection of new cultivars. Advisory Committee is formed by official and private sector.

Research

Agricultural Research Center Alberto Boerger (CIAAB) is responsible for cultivar evaluation and recommendations. Work done in 5 experimental stations. Also Agricultural Faculty of Montevideo and other private organizations are working in small grains, maize, rice, sunflower, soybean and forage crops. Variety protection law exists.

Initial Seed Multiplication

Initial seed multiplication is carried out by official and private sector. Release is after 3 years of evaluation by official sector. However, initial multiplication under provisional registration is accepted to increase volume, not for sale.

Seed Production, Conditioning and Storage

13 producing companies in 1980 throughout the country. No recent imformation about seed production. Seed association exists.

Seed Quality

Standards for small grain, rice, corn, sorghum, sunflower, soybean, alfalfa, white and red clover, birdsfoot trefoil, forage grasses (Ryegrass, Festuca, Falaris) were established in 1984. Certification Division is under DIGRA. Field regulations are AOSCA and laboratory analysis use ISTA rules. Seed categories are foundation, registered, certified, emergency and commercial seed.

Extension and Marketing

Registration is required for marketing companies. 12 firms are engaged in marketing along with the producing companies.

Personnel Development

FAO is helping in this regard with national and international training courses. 3 professionals have participated in Seed Unit training activities.

Leadership

Needs reinforcement.

General Assessment

Program needs increased training outside and broader in-country training program. Increased contact needed with other Southern Cone countries and program at CETREISEM.-

Categories of Development