Postharvest Institute for Perishables

VEGETABLE AND CITRUS PROJECT DEVELOPMENTS

WITH EMPHASIS ON EXPORT

A Report to the
U.S. Agency for International Development
Tegucigalpa, Honduras

by

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for the
Postharvest Institute for Perishables

GTS Report No.
PIP/Honduras/Nov. 83/No. 17

University of Idaho

in cooperation with
United States Agency for
International Development

Project Title: Storage and Processing of Fruits and Vegetables
Project No. AID/DSAN-CA-0265
Washington, D.C., U.S.A. 20523

Vegetable and Citrus Project Developments with Emphasis on Export

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December, 1983

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A. INTRODUCTION

Increasing agricultural production in Honduras has been a major outcry for sometime. More recently, however, this outcry has been "increase production with emphasis on export of agricultural product".

From recent visits to areas from Choluteca to Comayagua, El Progreso to La Ceiba and others, plus numerous conversations with producers, processors, shippers, brokers and entrepreneurs - both national and international - a series of observations, problem areas, suggestions and recommendations are submitted below. The comments are weighted somewhat by the author's experience of some 25+ years in Latin American private sector agribusiness.

A large number of agricultural projects have been undertaken over the past decade in Honduras; more failed than succeeded. Those that succeeded did so generally for the following reasons:

1. adequate capital,
2. positive results obtained from research/experiment trials,
3. commercial scale projects were based on these positive agronomic, postharvest handling and marketing results,
4. research investigations continued, and
5. strong management coupled with skilled staffs.

Per capita daily consumption of fruits and vegetables in Honduras, farm size, soil, climate and topography, level of mechanization plus irrigation as they pertain to fruits and vegetables have been adequately reported, including accounts of infrastructure. One of the more recent reports is "Vegetable Growing Guide". Bulletin No. 9, May 1982 by Le Da Ton for USAID.

This report, therefore, is divided as follows:

Vegetables
- observations, constraints and problem areas

Citrus
- (same)

Vegetable and Citrus - Ongoing Projects
- expansion, improvement, diversification
- conversion (food processing) brokerage, transport, storage and packaging

Vegetables and Citrus - New Projects
- joint ventures, small national projects, assistance required, research, marketing, transport, quality control, grades and standards, storage and packaging - for fresh processed produce.

B. VEGETABLE PRODUCTION

I. Introduction

Vegetables are grown mainly in three departments of Honduras: Comayagua, Francisco Morazán, and Intibucá. Although tomatoes, melons and cucumbers have been exported to the U.S. and Central America, production of vegetables in Honduras continues to lag behind increasing national demand. Imports of fresh vegetables from the U.S.A. and Guatemala have increased dramatically -- 110,000 kgs equal to L 40,000* in 1975 to 1.4 million kg and L 805,000 in 1980. A more recent imported figure is even more dramatic -- 1982 Honduras imports of onions from Guatemala above amounted to L 1.8 million.

II. Analysis of Production Constraints and Problems

Quality of Vegetable Seed

Good quality seed (viable, vigorous and free of disease) is an absolute prerequisite for any crop. Perhaps more than any other production input, poor quality seeds account for low yields of vegetables in Honduras. Imported seeds for one year are mixed with carry-over seeds from previous years, thus reducing the advantage of imported vegetables seed. A small percentage of seed requirements are met by locally produced, uncertified seed which is usually of low viability and vigor. Also, seed germination standards are not enforced.

Inferior Varieties

Honduras is blessed with a wide assortment of climates and soils. Most vegetable varieties are not suited for all markets, climates, and soils; thus there should be a wide choice of varieties for each crop to accomodate these different situations. (Example: table tomato versus industrial tomato - several varieties for each, plus cherry tomato). Unfortunately, this is not the case in Honduras; only a few and frequently only 1 or 2 varieties are available. This is in stark contrast with developed countries and many developing nations.

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*L = Lempira (Approximately 2L = $1

Most vegetable species are cross-pollinated in nature and deteriorate very rapidly if proper selection and isolation are not rigidly maintained during seed production. Since most growers either save their own seed or purchase uncertified, improperly grown/stored seed, most varieties, with time, lose their true identity and frequently result in inferior yields and inconsistent quality. There is also a great need for introducing early-, mid-, and late-season varieties of many species. This is particularly true for tomatoes. When a crop such as tomatoes has only one standard variety available, be it for table or processing, harvest is not spread out during the season and market gluts occur.

Finally, and of great potential importance, usually specific varieties are required for processing and/or export. A processing and/or export market cannot rely on excess fresh-market production to supply needed produce. On the contrary, often a separate set of varietal and cultural needs are required to satisfy these markets. Local consumers and importing countries demand a regular supply of high-quality produce if sales are to be maintained or increased. Multiple market outlets increase total demand and provide greater flexibility for the grower.

Inadequate Cultural Methods and Inputs

It should be emphasized that in this section the term "inadequate" does not necessarily imply converting to large-scale commercial production systems used in developed countries. Rather it refers to the need to improve yield and quality of vegetables, utilizing inputs and methods readily adaptable by the growers. An effective system for technology transfer is not well established in Honduras and adaptive research is needed to identify more appropriate technologies for vegetable production and conversion. Planting dates, spacing, and plant arrangements may vary with each variety and intended market. Since water is readily available in most vegetable areas in Honduras, it appears that some growers over-irrigate or use improper practices. Example observed: onion beds were flooded in Comayagua area resulting in excessive losses from crown rot. Research and technology transfer are urgently needed to maximize efficient water use and reduce losses as mentioned above.

Relatively low amounts of inorganic fertilizer are used in Honduras. Although no specific data are available for vegetable growers, it is felt that inadequate amounts for high vegetable yields are used. Cost of inorganic

fertilizer is high and credit is not readily available. In addition, at times certain fertilizers are not available in sufficient quantities and when needed. These and other associated problems have tended to discourage the use of fertilizers particularly at higher levels required for better vegetable yields.

Inadequate plant protection is a serious problem with vegetable production in Honduras. Many growers do not have spraying equipment and/or have not been trained in the technology of chemical pest control. Fruit fly (med. and others), aphids, cutworms, white fly and borers (stem and fruit) are only some of the major insect pests in cucurbits and solanaceous fruits. Powdery mildew is reported as the most serious (and costly) fungal problem for the cucurbit family. There is a real need to introduce varieties resistant to specific diseases and insects.

Improved certified seeds are expensive for small farmers. Thus, inexpensive hand or power-drawn vegetable seeders would reduce seed costs by reducing seeding rates per ha. Currently, many Honduran growers broadcast and thin following germination. Precision seeding would encourage purchasing improved seeds since the rates required would be less.

Credit

Vegetables are highly intensive crops and initial investment is very high compared to most agronomic crops. In many cases cold storage and delayed marketing are very beneficial in improving net economic return. Thus, credit is needed, but unfortunately few growers are able to utilize low-interest, institutional credit. To varying degrees middlemen provide credit services for growers; however, in so doing, the growers are obliged to sell to the middlemen and often at a very low price.

Marketing Fresh and Processed Vegetables

Although the major treatise of this topic will follow, brief comments are submitted herein as they relate to production and handling of vegetable crops. First and foremost, a "marketing system" has developed in Honduras that tends to reduce profits by the growers. Because credit is not easily available, the average grower has traditionally relied on middlemen to supply partial credit and a market for his produce. Apparently, these middlemen are "somewhat" organized, while the growers are not. The end results are large profits for the "coyotes" middlemen and very modest profits for the grower.

Some form of facilitating organization is needed to provide credit, help purchase and monitor production inputs (fertilizers, pesticides, etc.) and establish a more efficient and direct marketing system. Those few projects that presently export vegetables and citrus have similar outstanding problems -- ineffective marketing (brokerage) in a limited number of international markets.

Second, although fresh vegetables for local markets will and should be a major focus in Honduras, processed vegetable products and fresh produce grown specifically for export should be expanded.

Major Problems of Specific Projects

In the cantaloupe, honeydew and watermelon export project of PATSA (UBCo. subsidiary) located at Choluteca, major problems are seen to be as follows:

- excessive overland freight costs (Choluteca to Puerto Cortés),
- excessive ocean freight-containers from Puerto Cortés to Gulfport,
- 35-45% culls with little value on local market, disease control -- powdery mildew,
- sailings of container ships - schedules are too infrequent,
- and last, but by no means least, brokerage, sales in U.S. market and, because of sailings, inability to exploit European markets.

For the cucumber project of "Fruta del Sol Cooperative", located at Comayagua, major problems seen to be:

- excessive ocean freight and other export costs,
- some producers do not carry cost controls,
- logistical problems, some caused by delays in executing/signing contracts,
- small area (38 ha.) after more than 6 years of project life,
- nematode infestations and wind damages, windbreaks needed,
- centralized management
- and again, as above, better and more brokerage is needed.

C. CITRUS PRODUCTION

I. Introduction

Oranges, including tangerines and mandarin-type fruit, are by far the most important citrus fruit, accounting for over 80% of the world commercial production. Table 1 below reflects orange production by major producers. Note forecast for Brazil of nearly 16 million tons by 1992, a 50% increase over current levels.

TABLE 1.

Orange and Tangerine Production by Major Producers
Million Metric Tons

	Actual		Estimate	Forecast			% Annual Growth Rate		
	1980	1981	1982	1983	1987	1992	1981-87*	1987-92	1981-82*
United States	11.5	10.1	7.5	9.2	10.8	10.9	1.9	0.1	1.1
Brazil	9.8	10.4	11.4	11.3	13.9	15.8	4.7	2.5	3.7
Japan	3.9	3.2	3.1	3.5	3.8	4.1	1.7	1.6	1.6
Spain	2.6	2.6	2.5	2.6	2.7	3.0	1.0	2.3	1.6
Italy	2.1	2.1	2.1	2.1	2.3	2.5	1.4	2.2	1.8
Mexico	1.8	1.7	1.8	1.8	2.0	2.2	1.5	2.0	1.7
Other Major Exporters	7.3	7.2	7.5	7.5	8.6	9.8	2.7	2.8	2.8
Total Selected Countries	39.0	37.3	35.9	38.0	44.0	48.3	2.7	1.9	2.4

*Growth between 1981 and later period measured from the three-year centered average of production around 1981.

Citrus is grown in the Department of Cortés, Atlántida, Colón, Yoro, Comayagua, El Paraíso and Santa Bárbara. For oranges, the four principal varieties found in these areas are Piña, Valencia, Victoria and Navel. Orange growers and area planted are as follows:

Department	No. of Growers	Ha.
Atlántida	67	409 (250 ha. SFCo. included)
Colón	80	200
Cortés	50	1250
Yoro	60	554
Comayagua	13	70
El Paraíso	40	80
Sta. Bárbara	10	35
		2600

Other sources indicate as much as 2900 ha. planted to oranges.

Grapefruit growers and area planted:

Department	No. of Growers	Ha.
Atlántida	20	745 (330 ha. SFCo. included)
Colón	90	700
Yoro	6	75

(Note: Data from SFCo. and 2 independent producers indicate a total of 2650 ha. of grapefruit, the diffence being in Bajo Aguán (INA) plantings that were lost and/or abandoned.) An additional 150 ha. recently planted and not producing are not included.

Persian lime growers and area planted:

Department	No. of Growers	Ha.
Cortés an Yoro	14	65
Comayagua	1	35

Almost 35% of grapefruit area is planted to Ruby Red Variety, 60% plus to White Marsh Seedless and 2% to pink varieties. Although White Marsh Seedless normally yields 20-30% more than Ruby Red, it does not draw the prices that Ruby Reds are famous for. Ruby Reds "set" or establish grapefruit prices and other varieties such as White Marsh Seedless generally follow with prices some 25-30% lower. Price differences of 50%, to the favor of Ruby Reds, are not uncommon.

TABLE 2. Orange Area and Production

	Hectares Planted			Hectares Planted Per Variety				Short Tons Produced per Variety (2000)				
	Young Planting	Production	Total	Valencia	Victoria	Piña	Other	Valencia	Victoria	Piña	Other	Total
Sonaguera - Colón	131	130	260	2	12	247	-	50	250	5000	-	5300
Olanchito - Colón	0	98	98	20	10	0	8	425	215	1250	-	6000
El Progreso - Yoro	8	513	521	187.5	52.5	222	49	2400	475	3575	575	7025
Tela - Atlántida	-	35	35	24	4	7	-	480	80	140	-	700
Choloma - Cortés	-	542	542	162	101	279	-	4502	2628	7420	-	14,550
TOTAL	139	1318	1457	395.5	179.5	625	57	7857	3648	17385	575	29,465

TABLE 3. Honduras Grapefruit Producers - Area and Production

ACREAGE	S.F. Co.	LAFFITE	INA	LEAN	OTHER	TOTAL
Actual	820	220	4410	300	150	5900
Planted	-	80	640	200	-	920
TOTAL	820	300	5050	500	150	6820
VARIETY						
White Marsh Seedless	560	-	3560	200	100	4420
Ruby Red	250	300	1422	300	-	2272
Pink	10	-	68	-	50	128
TOTAL	820	300	5050	500	150	6820

PRODUCTION (000 BOXES)
(1 box = 40 lbs.)

YEAR	S.F. Co.	LAFFITE	INA	LEAN	OTHER	TOTAL
79-80 actual	364.7	98.0	6.0	20.0	20.0	508.7
80-81 "	477.2	60.7	10.7	50.9	18.5	618.0
81-82 estimated	668.2	90.0	50.0	125.0	25.0	958.2
82-83 "	710.0	120.0	100.0	150.0	25.0	1115.0
83-84 "	730.0	150.0	200.0	175.0	35.0	1290.0
84-85 "	775.0	175.0	300.0	200.0	30.0	1480.0
85-86 "	790.0	200.0	500.0	200.0	50.0	1740.0

II. Analysis of Production Constraints and Problems

Quality of Citrus

With the exceptions of root stock selection, grafting (material and art) and pruning, most of the comments under the vegetable section will apply here as well. Orchard maintenance, suffice to say, generally leaves a lot to be desired. Some grapefruit orchards, those of SFCo., René Laffite and a few others were fair to good. Proper pruning was noticed, trees have good vigor, populations vary but weed control and drainage were very good. However, although Aguán Valley was not visted, all reports and conversations with citrus specialists, both national and international, indicate that grapefruit and oranges there are pathetically behind the worst citrus areas elsewhere in Honduras. Orchards are reported to look "totally abandoned" with weeds as high or higher than grapefruit and orange trees.

Inferior Varieties

This is a misnomer for citrus as it is more correctly defined as "inferior locations". The north coast areas of Honduras are excellent for grapefruit. However, for export quality oranges and lime, hot nights and low elevations reduce acid and color so necessary for top grades. Under such conditions, acids convert in part to sugar and colors are dulled causing an inferior grade and subsequently reduced prices in export market. Sweet oranges are in demand at national and other Central American markets. Export quality grapefruit should and is being produced in north coast areas. New plantings of orange and Persian lime for export to Europe or U.S. at sea level and high temperatures in areas such as the north coast of Honduras could be very costly to all involved.

No citrus germ banks of commercial importance exist in Honduras.

Inadequate Cultural Methods and Inputs

Most of the comments under this section for vegetables are also applicable to citrus. In general, orchard maintenance is not impressive. Pruning cycles are delayed, overlooked (not done) or improperly executed. Example: "machetes" used to "hack" off limbs instead of a pruning saw or shears. Use of fertilizers varies from inadequate to excessive, generally most inadequate. Poor harvesting methods and in-field preselection were other problem areas most often mentioned.

Many private growers, members and non-members of a Citrus Producers Association, have one common problem - high unitary cost due to low production. Orange orchards with average yields of 1100 to less than 1400 boxes per ha (40 lbs. = 1 box) of exportable oranges are not encouraging. Total production reported is some 2400 boxes per ha, yet 60% generally is not exportable.

The lack of multiple market outlets is again a problem common to most citrus growers. A regular supply of quality produce is the demand of all markets, fresh and industrial (for processing).

D. CONSTRAINTS COMMON TO VEGETABLE AND CITRUS PRODUCTION FOR EXPORT

A concise listing of major constraints as they relate to vegetable and citrus production for both national and export markets is as follows:

1. High level production costs because of very low productivity at the farm level. This is due to:
   - inferior varieties, generally low-quality
   - limited number of varieties
   - low amounts of fertilizer, both organic and inorganic
   - availability, cost and regulation of inputs
   - improper cultural practices and water management
   - excessive portion of total production is cull or not exportable
2. An inefficient marketing system due to:
   - excessive number of middlemen
   - inconsistent and questionable practices in marketplace
   - little price/market information, especially for the small/average grower
   - limited access to export markets
   - lack of grade/quality, sanitation standards and enforcement
3. Inadequate storage and transportation due to:
   - limited refrigerated transport
   - limited sailings/availability of Ro-Ro and container ships
   - lack of adequate cold storage for perishable fruits and vegetables
4. The absence of market research and market development

5. Inappropriate government regulations which have resulted in:
   - higher cost of already costly inputs (import tax on dolomite limestone, other inputs not available in Honduras)
   - policies that directly discourage national or foreign investment capital. Land tenure/ownership and other portions of Agrarian Reform should be seriously studied and revised
   - taxes on exported agriculture produce, fresh and processed
6. The lack of credit for the average grower and the cost of that available.

E. VEGETABLE AND CITRUS - ONGOING PROEJCTS
(Requiring Capital Infusions)

I. Cucumber Product of "Fruta del Sol Cooperative" - Comayagua

Presently this project has included only export shipments of fresh cucumber plus local sales of culls and limited trial plots of a few other vegetables. Although still relatively small (80-90 ha projected for 83/84 season), this project could/should be expanded and diversified.

It is suggested that cucumber plantings be increased to a minimum of 150 ha over the next 2 years. This would increase exportable fruit from 35100 boxes (55 lbs per box), export yield from 38 ha during 5 months (December through April) of 82/83 season, to some 125,000 boxes. There is interest in the Comayagua area from cooperative, agrarian reform groups and individual farmers to participate and join "Fruta del Sol". This group "Fruta del Sol Cooperative" does not exclude anyone or any type of organization. Another of their strong points which should be exploited by any expansion and diversification effort, is their ability to transmit technical assistance to participating growers. In the administrative area (presently a bit weak), ACDI assistance will strengthen this most energetic management group.

It is also suggested that agronomic trials and marketing studies be undertaken as soon as possible so as to determine the feasibility of "Fruta del Sol" becoming a diversified vegetable cooperative, producing primarily for the export market. Cherry tomatoes, onion, okra, cowpeas, stringbean, sweet corn and others should be included in investigations.

"Fruta del Sol" should be able to undertake the cucumber expansion portion if:

- adequate production financing is available to present and additional new growers
- financing for land leveling and irrigation as required is available
- financing is available for packing plant improvement and possible substations located closer to producing areas and other increases in capital investments due to expansion of cucumber portion of the project
- feasiblity study of markets, cost, alternative packaging materials, transport (inland and marine), refrigerated storage needs and agronomic trials (for crops mentioned above and others) are conducted/funded by USAID.

Note: For current data as to unitary cost, detailed production, packing, transport and brokerage cost, see "Final Report 1982-1983 Agroindustrial Project" submitted to USAID by SFCo.

Agronomic investigations should include:

- variety trials, at least 4 varieties of each vegetable,
- date of planting, depth of planting and population trials,
- herbicide trials, overlaid,
- disease and insect control trials,
- trials with and without irrigation, and
- fertilizer trials, also could be overlay.

All trials should be replicated (no less than 4). Second phase of investigations should include large scale experimental trials (from .5 to 2 acres), also replicated from which cost and yields can be obtained.

For this and other projects to be suggested, there is no shortage of qualified graduate agronomists and other technical specialists. Too many Zamorano graduates with ample experience (some recently released from the Division of Tropical Research - SIATSA) are known to be presently looking for work. "Fruta del Sol" should be a solid base for expansion and diversification because they have reduced the percentage of rejected (non-exportable) fruit to 28% and are doing an efficient job of selling rejected fruit to local markets. They also have probably the best vegetable produce brokerage arrangement in Honduras with Six L's Packing Company in

Immokalee, Florida. Prices obtained during 82/83 averaged almost $14.00 per 55 lb box. Although Six L's seems to be doing a good job of brokering "Fruta del Sol's" cucumbers, it is felt that such an exclusive arrangement does have obvious drawbacks. Non-exclusive arrangements with several brokerage houses should be more to the interest of "Fruta del Sol".

All of the above suggestions pertain to cucumber and other vegetables for the fresh market with emphasis on export. Such a set of suggestions, if incorporated, would become a reality over a short term - from 3 to 5 years. A longer range suggestion, using this same group as a base, would be to initiate required investigations for a food conversion processing plant. A food technologist could begin once positive results were obtained from first phase investigations and commercial scale vegetable production was underway.

"Fruta del Sol" must diversify for several obvious reasons. First, the required overhead for a one-product project is too costly when only 6-7 months of management is needed. A larger and more diversified organization could justify the necessary administrative cost. Another reason is their present excessive risk exposure to volatile price fluctuations for only one commodity. Yet another reason is that with expansion and diversification, new capital investments in integrated undertakings could be justified. Example: investment in a box factory, transport company, cold storage facilities and other. There is an intermediate need of a classing/sorting machine at cucumber packing plant. A request to USAID has already been executed.

II. Melon Project of PATSA in Choluteca

This project now exports (to U.S. markets) cantaloupe, honeydew and watermelon - 1982/83 exportable canteloupe amounted to some 95,000 boxes (slatted wood, 55 lbs per box), honeydew melons 58,000 crates (cardboard box - 30 lbs per box) plus over 4,000 boxes of watermelon. The "melon group", consisting of BANADESA, INA, MNR, PATSA and grower cooperative started their first commercial scale operations during 1976/77 season when some 350 mzs were planted to cantaloupe. This year (83/84 season) some 1500 mzs are now being planted to cantaloupe, 300 mzs plus to honeydew and no more than 150 mzs to watermelon. Average farm size is 10-12 mz and average profit to growers last year was L 1100 per mz. Although this project has grown to its present size of some 2000 mzs overall and has diversified to a degree, more diversification is direly needed. The melon portion should also be expanded somewhat (a short-range projection indicates a maximum of 2500 mzs by 1986/87).

This PATSA project has some of the same glaring weaknesses noted for "Fruta del Sol". Administration/overhead for a 5-7 month season is difficult to justify. Brokerage was attempted by the banana sales group at UBCo. for the first few years and results were not satisfactory. Sun World, also associated with UBCo. until only recently, did a better job of selling in U.S. markets but a more efficient group of brokers is an obvious need.

Here again, there is a strong base for expansion and diversification. Agronomic and market investigations as outlined above for the cucumber project could/should be undertaken at the earliest possible date. The PATSA group like "Fruta del Sol" is impressive. They have an outstanding technical assistance group called "Unidad de Asistancia Técnica de Melón" (UATM) that functions. This group along with other operational/management portions of this project should be expanded as agronomic trials, transport, storage, packaging and marketing studies are determined to be feasible. Several varieties of squash and ginger should also be included. Onion tests should include trials for harvesting onions during dry months of March/April as well as for other seasons. Onions harvested in dry season can be field cured and stored. Local market prices are most attractive for onions during September through December and from March to July.

This melon project, besides financial assistance for investigations and studies described above, also needs new capital for investments in expensive machinery such as hydrocoolers (for the quick reduction of field heat from melons and other produce for prolonging shelf life. UBCo. is not going to put any more capital into this project.

Note: Conference rate for 40 foot container ships (not Ro-Ro) was $2800 per container for melons until March 1983 when reduced to $1800, ocean freight from Puerto Cortés, Honduras to Gulfport, Mississippi, U.S.A.

Presently, the weak points of this project are:

high percentage of non-exportable;
brokerage, better and for more markets;
overland and marine transport (excessive cost); and
lack of a more diversified program.

Sales of non-exportable melons should be investigated. Can a slightly lower grade of fruit be sold by a more efficient set of brokers than ones presently being used? Can more local sales be encouraged? Can in-field cultural practices be improved even more than they have? The answer to all three questions is believed to be "yes" to varying degrees. Melon research and investigations (like that for cucumber project) must continue along with diversification recommended. Disease free varieties, more hardy varieties and unique traits required in produce because of market demand are always improvements that result in lower unitary production cost and benefit all concerned, consumers included. Improved marketing, postharvest handling and distribution must be improved for this project.

For the Choluteca vegetable diversification research trials, it is felt that irrigation will be required (small, PBC 1" to 1 1/4" main line). A joint venture with a U.S. produce brokerage company seems to be most indicated for this project. Griffin & Brand Inc. of McAllen, Texas is one such highly qualified group that can be recommended - their reputation speaks for itself. Some of their people have recently been to Choluteca and are presently conducting studies.

III. Naturas, S.A. - Processing Plant at Comayagua

Time did not permit an inspection of this plant or talks with their principals. However, this installation should be considered and evaluated as a possible portion of any project contemplating food conversion. Although Naturas presently is processing tomatoes for paste, catsup and juice, they are using only a small percentage (less than 25%) of their processing capability. Their other products are principally juices and the concentrate is imported from the United States, Guatemala, Israel and others. Naturas only blends the concentrate with water and cans the project juices: pear, apple, pineapple, grape, orange, mango, and others. Reportedly, all packaging material, tinplate for juices and paste and glass for catsup, is imported. This plant was constructed almost 10 years ago and was given a series of tax incentives, also reported for 10 years. Consequently, present owners may soon be desirous of selling again if word spreads of studies for another processing plant in the Choluteca area. Tomato growers in this area along with specialists

qualified to know agree that Naturas, S.A. has not been the positive catalyst to tomato production in the Comayagua area that they were promoted to be. Suggestion for study: a possible purchase of this plant by joint venture organization. Linkage could then possibly result between "Fruta del Sol" and a newly organized Naturas.

IV. National Association of Citrus Producers - San Pedro Sula

This growers' association was organized in 1977 and today consists of some 400 members although less than 100 (80-90) are considered active. Grapefruit, orange and lime growers from Atlántida, Comayagua, Colón, Yoro, Sta. Bárbara and Cortés participate in this association now headquarterd in San Pedro Sula. The grapefruit area (see Table No. 3) is concentrated in the Departments of Atlántida and Colón, SFCo. being by far the largest in Colón (or in the entire country). Grapefruit producers - small, medium or large, independent producers, cooperatives or multinationals have generally not joined this association. Consequently, the association dedicates its efforts for the most part toward orange and lime sales.

The president and moving force of this citrus association, Doña Ilsa Díaz Zelaya, who from a rather small, humble office in her home, runs the affairs of this potentially very productive and active growers' association. Although she has experienced numerous problems and delays (from government) in obtaining a telephone line and a telex (presently has telephone, but no telex), she is in daily contact with European and North American markets as well as others in Central America. She actually transacts the business of this growers' association and seems to be very capable (uses runners back and forth between telex office and her home).

Doña Ilsa and the association have fought for and obtained a few concessions from the government. Active members now have no export tax deductions, import taxes on those inputs used only by them are reduced as have been a few port charges. The Díaz Zelaya family is one of, if not the largest, orange growers in the country. However, all of her orchards visited along with others inspected in the San Pedro Sula/El Progreso area were not producing or being maintained as they should (see improper agronomic/cultural practices). Drainage was horrible, pruning and fertilization were poor also.

The association has recently (July 1983) submitted a feasibility study for a juice extraction plant to the "Banco Central de Honduras" requesting L 679,250 of FONDEI financing. An additional L 104,500 would come from another bank and L 261,250 from association funds. FONDEI terms would be 5 years with 17% interest. The private bank portion would be for 3 years and 19% interest. Plant capacity is indicated to be 3,000,000 liters per year of "straight line" natural orange juice. First-year production is projected to be 2,000,000 liters.

Griffin & Brand (mentioned above) from McAllen, Texas have spent 3-4 days in San Pedro Sula with Doña Ilsa and others of this association. Today, November 1, 1983, Doña Ilsa and other representatives of the citrus and vegetable industry of Honduras are visiting the Offices of Griffin & Brand in Texas, having been personally invited by Mr. Othal Brand, Chairman of the Board of Directors. What may result is:

- participation of Griffin & Brand in juice plant, financing, design, verification, etc.,
- participation or financing of cold storage facilities,
- technical assistance, (so direly needed) in field, at packing plants and with other postharvest handlings, and/or
- sales in international market, a strong part of Griffin & Brand's operations.

Export of fresh oranges during 1980 was some 35,000, 1981 40,000 boxes, 1982 almost 100,000 boxes and for 1983, contracts have been signed for the export of over 150,000 boxes. It is estimated that over 200 million oranges (most estimates indicate 250 million) are produced in Honduras. Of this amount, 50 million are estimated as exportable. Using 80 count as average for a 40 lb box, that would mean over 600,000 boxes of fresh oranges could be exported. Of the remaining 150 million units, how much goes for domestic consumption, how much is waste or how much exactly is available for conversion to juice, concentrate or other forms is not known. Yet only from the difference between a conservative 600,000 boxes potential and maybe 150,000 boxes exported this year, you have 36,000,000 export quality oranges before worrying about what portion of 150 million units is available. The plant projected for the association requires only 26 million units the first year.

How can USAID help this association and other citrus growers of the north coast? First and most important is to assist growers to increase production (yields need to double, treble in some cases) and improve quality. A concerted effort is urgently needed to:

- improve orchard practices, particular emphases on pruning practices (open window and other methods) and fertilization,
- improve tree population,
- improve disease and insect control, and
  improve drainage.

It is suggested that a citrus specialist (U.S.) spend at least one year visiting and teaching citrus growers proper orchard maintenance. This specialist should have one, preferably two nationals for training whereby the citrus association can eventually take over this program.

Another suggestion is to place a qualified quality control person in this same area to assist and educate growers to grades and qualities required in export markets. Both of these suggestions are made irrespective of Griffin & Brand participation. However, if this association does not obtain the financing needed for their juice plant or cold storage facilities, USAID assistance is strongly recommended and most urgent.

V. Grapefruit Growers (Others than SFCo.) in La Ceiba Area

The growers in this area account for the largest percentage of quality grapefruit produced in the country. They ship principally Ruby Red and White Marsh Seedless to U.S. markets as fresh. Refrigerated containers are loaded at packing sheds and trucked to port (Port of Tela - 1 1/2 hours). Practices at packing shed were observed to be far better than those for oranges. Quality control, washing and fumigation plus classing, sizing and packing were all impressive. Qualified supervision was quickly noticed in packing shed. These independent producers sold their grapefruit to SFCo. until last year when they all became disenchanted over prices offered. These producers, 10-12 in number, account for 550 ha+, and their yields are 1200 to 1400 boxes of exportable fruit per ha.

SFCo. has just finished a juice factory which is presently being tested. Limited operations are scheduled to begin by mid-November. Four FMC extractors give this plant the capacity to process 1200 oranges per minute equal to 145 short tons in 8 hours. It can also process grapefruit. When SFCo. management was asked if they would process grapefruit for independent growers on a contract price basis (whereby independents could broker their own juice), their answer was "we probably will not have time". SFCo. could, of course, have invited equity participation by the independent growers, but they did not choose to do so. This factory is certainly better than none as it will assist orange and grapefruit growers to increase profits through sales of their non-exportable produce to this SFCo. plant.

SFCo. is having a number of problems with their large 6000 acre pineapple project and their citrus operations, reportedly due to serious labor problems (unions demanding 80% across-the-board increases), huge price increases and losses, so they may decide to reduce very soon. SFCo. has an enormous investment just in their pineapple project. - over $2100 per acre in land preparation cost, drainage included. Standard Fruit Company was reluctant to disclose their investment in the new citrus plant mentioned above.

Consequently, the independent citrus growers of that area are seeking financing to build another plant, joint venture or on their own or financing for possibly purchasing all or part of SFCo. new citrus plant. Other groups (related to some of the grapefruit producers) may also seek financing for purchase of equity in the pineapple business of SFCo.

Although the grapefruit producers in this area are not organized, they do have a very dynamic, capable young man who they look to as their representative. His name is René Lafitte. One cannot help but be impressed with this man's track record, his energy and overall knowledge of the citrus industry in Honduras.

A request to USAID is presently being put together for financial assistance for another straight line, single strength juice plant. An ideal location for such a plant is the Sonaguera (Dept. of Colón) area. Reasons: closer to Port of Trujillo, reduced transport cost, closer to grapefruit producing cooperative and other small growers around Sonaguera plus the Bajo Aguán area. Technical assistance for this group would be required only for

their conversion (juice and/or sections) plant. Again, investigations and assistance are required for alternative packing materials and methodology - tinplate is far too expensive. Such an undertaking (USAID-sponsored, hopefully) should be linked to all suggested projects involving packaging as well as be made available to any agroindustrial group that could benefit from such a needed development.

For the entire national fruit and vegetable industry, a USDA fumigation specialist is needed in Honduras. Med fruit fly is known to exist in several rather large pockets. Proper fumigation tunnels are needed urgently. The EPA has ordered that EDB (Ethyl Dibromide) fumigations be discontinued by the end of 1983. Proper fumigation of fresh fruits and vegetables from Honduras destined to U.S. and other markets with material approved by EPA is essential. Numbers of fumigation tunnels and specialists required should be determined by the suggested USDA person from an evaluation survey of Honduras' requirements.

F. NEW PROJECTS

I. Foundation Seed Production

Although distantly related to the tnesis of this report, it is felt too important to exclude. There is no foundation seed program in Honduras for rice, corn or other basic grains or for any seeds. A program was started by SIATSA, Julio Romero was the most qualified director at the helm until said program was cancelled and Romero was released. The importance of such a program cannot be overemphasized. A foundation seed project should grow to include a certified seed branch. It should also expand so as to include vegetable seeds. The seed plant (small, but new) is located at Guaruma Experimental Farm, close to SIATSA laboratory. It is strongly suggested that USAID contact this man and do the necessary financing to revitalize this very important now missing segment of agriculture in Honduras.

The writer's opinion: There is no other person as qualified or as experienced in seeds or in grain seeds, in particular, and so dedicated to his work as Julio Romero. If given the chance, Romero's results will be a positive success.

Note: Julio Romero is now working with MNR on a contract basis. He lives in Pedro Sula, telephone number 54-0603.

II. Agricultural Supply and Technical Assistance Projects

Numerous fertilizer blends, trace elements such as zinc, boron, magnesium and others are not readily available in Honduras. Other agricultural materials and supplies required by vegetable and citrus growers are also not available. Some of the faulty cultural/agronomic practices mentioned have, in part, been caused by the non-availability of certain items.

Agricultural supply and technical centers are suggested for at least 3 areas - north coast; the Citrus Association, Comayagua, as part of "Fruita del Sol Cooperative"; and in Choluteca as part of the Melon Program, preferably with the melon producers cooperative. These would be small undertakings but are so vitally needed. Supplies should include:

- orchard oil (only in areas indicated),
- fertilizers not available - trace elements (magnesium, boron, zinc, others),
- pruning saws (only for 2 areas needed),
- pruning shears " " " "
- wax, for packing stations,
- detergents, for packing stations,
- plus a list of items growers claim are not available.

No more than two technicians/specialists (preferably one) would be required for each center. These men, if properly selected, would do more toward increasing agricultural production in Honduras than any other single or group of undertakings. After about the second year, growers/grower association should assume the cost of these centers.

III. "Agricola Industrial El Zamorano" (AGRIZA)

This is a group only recently put together by Jaime Letelier, a most successful agrobusiness entrepreneur with a social consciousness. AGRIZA consists of eleven very qualified professionals all with diverse expertise and experience. Some were unemployed, most were underemployed in government jobs. Letelier has been the catalyst for this organization from the first idea. It was he who saw the need to give such qualified people an opportunity to participate in the private sector. An in-depth study and request for financing are to be presented to USAID/Honduras - Felipe Manteiga by November 8, 1983.

This undertaking is most unique in several ways. It is really five projects in one. Lands have already been purchased and construction of buildings required for portions of a swine project is well underway. Each of the professionals mortgaged his home to acquire initial funds. All 12 will participate with an equal share of AGRIZA. Letelier will have one share and will be the 12th participant as well as assist in management.

One of the five projects or divisions is a citrus germ bank principally for oranges. No germ bank (of commerical importance) exists in Honduras. This division will have some initial "built-in" sales as another division, the citrus and fruit group will buy original stock required from germ bank group. Milk cattle is another division, onion production yet another and the swine division. Gross sales for ten years and financing required for this project are detailed in the table that follows.

Lands are located some five minutes past "Escuela Agrícola Panamericana - El Zamorano". Inspection trips were made over most of their fields under cultivation. Sorghum and bean fields were well above average.

This project is strongly recommended as it looks to be sound not only from a technical/financial standpoint but, and more import, it could be considered a pilot project for assisting in correcting some of the social problems and dangers that can result from same.

Footnotes - for All Projects

It is suggested that all efforts possible be made to channel credits straight to approved project, i.e., without the intervention of "Ministerio de Hacienda" or "Banco Central". Costly delays and losses would be avoided.

Most of the projects herein recommended are highly labor intensive. Citrus year round, multi-cropping of vegetables as well as the foundation/certified seed program plus dairy and swine projects all are labor intensive.

TABLE 4. Producción por Proyecto Bruto
(L 1,000)

PROYECTO	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Vivero genético	0	585.0	585.0	585.0						
Frutales	0	0	0	0	194.2	491.8	1165.6	1002.4	1416.0	1800.6
Cebollas	600.0	600.0	600.0	600.0	600.0	600.0	600.0	600.0	600.0	600.0
Cerdos	0	178.2	356.4	1113.8	1113.8	1113.8	1113.8	1113.8	1113.8	1113.8
Ganadero	44.1	143.1	198.0	198.0	198.0	198.0	198.0	198.0	198.0	198.0
TOTALES	644.1	1506.3	1739.4	2496.8	2106.0	2403.6	3077.4	2913.2	3327.8	3712.4

Financiamiento por Proyecto
(L 1,000)

PROYECTO	1984	1985	1986	1987	1988
Vivero genético	409.0	383.1			
Frutales	279.0	110.8	137.5	447.9	273.3
Cebollas	431.7	166.8			
Cerdos	88.3	108.8			
Ganadero	96.7	119.9			
Estructura	379.8				
TOTALES	1684.5	889.4	137.5	447.9	273.3

G. CITRUS - BITS AND PIECES

Processed citrus products, primarily frozen concentrated and single strength juices, have increased in importance over the past two decades and now utilize about 45% of production in the major producing countries. The United States typically processes about half of the world's citrus, nearly all of which is consumed domestically. Brazil processes about one-third of the world total and supplies about three-fourths of world trade in frozen concentrated orange juice (FCo.s).

Imports of citrus fruit, except for grapefruit, to the European Community (EC) are subject to common external tariffs of up to 20%. Citrus juices are also subject to EC tariffs of 15 to 19% ad valorem.

Cuba will show the largest growth rate of orange exports, quadrupling over the next ten years as a result of a concerted government effort to expand citrus export earnings.

The United States is most likely to be the largest single citrus importer, but most of its imports will be in the form of orange juice.