



PROFXAG

NON-TRADITIONAL AGRICULTURAL EXPORT SUPPORT PROJECT

EL SALVADOR EXPORT CUCUMBER PRODUCTION

Assignment Number: ST/88-20

Contract Number: 596-0108-C-00-6060-00

SUBMITTED TO:

**Regional Office for Central America and Panama (ROCAP)
U.S. Agency for International Development
Guatemala City, Guatemala**

SUBMITTED BY:

Don Braden, PhD

through

**Chemonics International Consulting Division
2000 M Street, Northwest
Suite 200
Washington, D.C. 20036**

June 1988

A. Places and Dates-

Belize (Travel)	June 5, 1988
El Salvador	June 6-9, 1988
Guatemala	June 10-13, 1988
Belize (Travel)	June 14, 1988

B. Persons Contacted-

Ing. Mario Molina, Gerente de Proyectos, FUSADES
Mr. Carlos Escalon, Gerente, AGRIDSA
Mr. Pablo Alvarado, Director, Fundacion Chile
Mr. Ricardo Frohmader, Technical Advisor, PROEXAG Project

C. Purpose-

The purpose of this consultancy was to work with the DIVAGRO section of FUSADES and to make a preliminary assessment of the existing El Salvadorean export cucumber industry with emphasis on AGRIDSA, as follows:

1. Visit production areas to assess potential.
2. Visit packing facility.
3. Discuss production problems and constraints with producers.
4. Provide recommendations as needed.

D. Accomplishments-

As a result of this consultancy, FUSADES has proposed that this consultant be retained for a period of several months to direct the implementation of the preliminary recommendations. This consultant has agreed to return to El Salvador and work directly for FUSADES for a one-month period, beginning in June 1988, to direct the initiation of field trials. At the end of this one-month consultancy, it will be mutually decided whether the relationship will be extended.

E. Background-

As a result of cucumber producer interest, FUSADES' concern, and contacts with Mr. Ricardo Frohmader, PROEXAG Marketing Expert, the services of an export cucumber production person with Central American experience was provided for approximately a week by Chemonics International through the USAID/ROCAP financed PROEXAG Project. The services of this consultant were contracted to assess cucumber production potential and evaluate existant problems associated with export cucumber production in El Salvador.

F. Production History-

Apparently cucumbers are a common item in the diet in El Salvador and have been cultivated commercially for the local market for a long time. However, knowledge and experience in the area of export cucumber production in El Salvador is limited, maybe, non-existent. Small-scale efforts have been organized to attempt cucumber production during the past two export seasons, 1986-87 and 1987-88. The results of these two efforts would be considered to have been less than successful. It has been stated that production (export boxes per acre) was low and the principal factor limiting production was/is thought to have been due to viral infestation(s). More correctly, production was probably reduced due to the high level of infestation. Wherever cucurbits are planted in the Tropics, virus symptoms are usually evident and levels of infestations vary. Both in Central America and in the Caribbean, problems related to virus infestations in cucurbits, which were once thought to be serious problems, have been reduced and/or eliminated. Levels of infestation and frequency of infestation vary greatly.

G. Production Potential-

Cursory examination of weather data and soil analysis and fertilizer recommendations and field trips to two different production areas, Zapotitan and Santa Anna, would indicate that the agronomic potential for the production of cucumbers and other crops for export is excellent. On the surface, El Salvador seems to possess some agronomic advantages over some neighboring Central American countries that are presently and successfully engaged in the cucumber export business.

The future of the successful development of non-traditional exports in the Caribbean and Central America will ultimately depend upon the ability to produce the best quality at the lowest cost. Agronomic factors, such as edaphic and climatic conditions, have a great influence upon production levels and profitability and will determine where some of the successful production areas have developed and will be developed. Indications are that El Salvador has tremendous agronomic potential for the production of cucumber and other export crops.

H. Constraints to Development-

Possible constraints for export development lie in the area of irrigation water availability. In some cases, the infrastructure is missing or is in disrepair. Most likely, irrigation water will be found present; however, the cost of obtaining these resources might be prohibitive.

At present, the most serious constraint for the development of export cucumber operations is the lack of a proven or successful production technology. This area of interest can not be expected to develop if the already identified constraints, i.e. virus infestation, can not be overcome or reduced.

Also, there exists a scarcity of experienced personnel and this problem does not only exist in the area of production. Once the production gets rolling we must have personnel prepared for the management of an export

H. Constraints to Development (Continued)-

operation. It would be a sad day if we are able to produce the perfect cucumber but we do not have the ability to successfully manage operations and market the product.

At present, there is an absence of farm equipment which will be necessary to be able to obtain high levels of production. Specialized spray and land preparation equipment will be required and are indispensable to be able to obtain a high level of production. It is possible that the present lack of appropriate equipment will seriously limit the results of that can be with field trials. One can not duplicate or develop a 'proven' program if you do not have the equipment.

I. Present Posture-

The different organizations involved with the development of export cucumber operations have all agreed that the problem is production related and that virus infestation is a serious limitation. Nevertheless, at present not one cucumber trial/planting is in existence. A lot can be learned and people can be trained if crops are planted 'off season'. In the export cucumber business we have a market limited from January to April. You can wait for the season or you can try to learn more about the crop prior to the 'big push'. One can learn a great deal by establishing a program of repetitive planting.

J. Recommendations-

It is not clear about the divisions of responsibility and who, producer, FUSADES, or technical advisor or advisors, should do what, but the following areas of interest should be investigated:

1. Duplicate a proven cucumber production technology.

Evaluate and test export cucumber production technology developed in the region and which is being presently utilized with apparent success. Duplication will be difficult due to the absence of specialized farm equipment and the absence of specific materials but this endeavor will prove a valuable exercise and will highlight problem areas. Plot size can small, as small as, 0.05 acre.

2. Develop production technology in more than one geographic area with a repetitive planting program.

A 'better' plant is better able to resist disease, etc. High yields and low costs per production unit can be only obtained with time and with trial and error. Different potential areas of production should be identified to allow for comparison and eventual identification of inherent advantages. Also, one does not want to put all of one's cucumbers in one basket. A bi-weekly planting program will help train field technicians through repetition. Plot size can be 0.05 acre and technicians must have enough time available to

J. Recommendations (Continued)-

participate fully. Supervision will be required and technician performance and interest should be evaluated. A similar program can be developed to train farmers once technicians know more than the farmers.

3. Develop expertise in the use of STYLET OIL.

The use of this material has been reported to work in a number of cucurbit production areas in the Tropics for the control of viral problems. Evidently the application methods, etc. are specific and exacting. This tool needs to be evaluated.

4. Identify geographical areas where there is a lower incidence of virus.

Attempt to determine geographic areas where the incidence of virus is less. At present, tomato plants located at in Zapotitan show greater viral infestation than tomato plants near Santa Anna. Tomato virus are not necessary cucumber virus but the vectors might be the same.

5. Establish program for eliminating surrounding vegetation.

This agricultural practice was a standard and important aspect of the Honduras Cucumber production technology to avoid problems from virus infestation. Where the recommended practices were not followed there were incidences where losses due to viral infestation were significant.

6. Start 'caged plant' trials.

Construct simple frames with mosquito screen to inclose cucumber plants next to un-screened cucumber plants. If justified, different screen mesh could be used and different insect trapping procedures could be implemented. This program would be initiated to determine possible virus vectors. Three possible vectors are:

- a. Diabrotica.
- b. Aphids.
- c. White fly.

7. Start planning sterile barrier trials.

This technique was used commercially in Honduras and was initiated using alternating bands of sorghum, mungbean, and fallow strips surrounding cucumber plantings to lower pest control costs. Also, considerable success has been obtained when cucumber plantings were surrounded with Eucalyptus plantings and/or by maintained bands around plantings free of all vegetation.

d'

8. Start planning reflective mulch trials.

This technique was developed commercially for summer squash production in New Jersey in the late 1960's. Squash was planted using reflective mulches and virus infestation problems were eliminated.

9. Ecological studies and aspects.

A literature review on the following subjects should be conducted:

- a. Virus vectors.
- b. Cucumber virus pathogens.
- c. Virus/host plant relations.

Weed species and vegetation in and around production areas should be identified. Different virus pathogens should be identified and symptoms described. Presence, prevailing direction, amount, and effect of wind should be considered. Virus infestation should be identified in relation to geographical location and date of appearance (season or time (month) of the year).

K. AGRIDSA Packinghouse-

The AGRIDSA packinghouse, located in the Zapotitan area is an impressive and well-done endeavor. The equipment appears brand new and, if anything, more than one needs. It is possible that one would consider the following:

1. Eliminate water dump system and go to a bin-dump system which would have to be combined with harvesting bucket/field bin system. This change should be considered to eliminate the use of sacks during harvest, simplify harvesting and packinghouse operations, contract farmer accounting, and, most important, reduce the risk of post-harvest pathogen dispersion.
2. The existence of a shaded receiving area was not evident.
3. There seems to be limited storage area for boxes (cardboard cartons) and other materials.
4. The packinghouse is so compact and well organized that pallet-jacks could be used on the floor and in the cold rooms and thus reducing or eliminating the need for a forklift.
5. It is likely that the truck loading area needs to be modified, expanded, enlarged, or extended to be able to position a number of containers at one time.
6. The purchase of box stichers needs to be considered as the machines provided are complicated and a break-down of the existing equipment might stop operations unless qualified mechanics and spare parts are readily available.
7. The maintenance of a large inventory of spare parts is recommended.

K. AGRIDSA Packinghouse (Continued)-

8. The reject line could be modified so that reject fruit could be returned to contract farmers in a manner ready for domestic marketing.

9. At the packinghouse, aspects related to water and power supplies were not examined investigated but should be evaluated in depth. The presence of variable speed motors on the packing line was not noted. In whole, the packinghouse has been well designed and the packing equipment of high quality. With ease this facility could handle 100-plus boxes per hour. With slight modification and increased numbers of packing personnel, production of 200 boxes per hour could be obtained.

10. The absence of farming equipment was conspicuous and this problem has to be addressed as quickly as possible if a reasonable level of production is to be expected. One can not expect contract farmers to purchase specialized farm equipment such as bedders, seeders, and/or sprayers.

L. FUSADES' Research Effort-

FUSADES must be congratulated for their efforts in this area. In the long-run, success in the area of non-traditional exports will depend greatly upon production levels, related to unit cost of production, and diversity of product line. Efforts made in this area will prove beneficial. Examination of this area was not included in the present scope of work and time limitations did not allow for anything but a brief glimpse of this activity. It would seem that FUSADES should look into the following aspects of this important function:

1. Acquisition of equipment and the number of crops being investigated.
2. Determine what level of effort is warranted for this activity.
3. Examine organization and personnel qualifications.
4. Relate activities and level of activity with economic justification.

L. Miscellaneous-

Attached one will find a number of items, some of which were requested and while others were unsolicited, as follows:

1. Sample for Project Outline Form.
 2. List of materials needed for cucumber production trials.
 3. List of suggested farm equipment.
 4. Cucumber Trial Schedule and suggested organization.
 5. Schedule of consultant's activities.
- 6

1. Project Proposal (PPForm.FRM)

- a. Date:
- b. File Number:
- c. Location:
- d. Objective:
- e. Dates:
 - i. Initiation:
 - ii. Termination:
- f. Project Manager(s):
- g. Data to be taken:
- h. Experimental design and/or plot layout:
- i. Special instructions:
- j. Project Preparer:
- k. Project Approval: Date:

2. Export Cucumber Trial Material List-

	Unit		Unit
	----		----
a. Fertilizers-			
1. Urea (46-00-00)	lb		
2. Triple-Super Phosphate (00-46-00)	lb		
3. KCl (00-00-60)	lb		
4. Fe Source	lb		
5. Cu Source	lb	6. Mn Source	lb
7. B Source	lb	8. Zn Source	lb
9. Magnesium Sulphate	lb		
b. Pesticides-			
1. Benlate	lg	2. Bravo 500	lt
3. Kocide 101	lb	4. Vydate	lt
5. Dithane M45	lb	6. Furadan 10G	kg
7. D1-Brome	lt	8. Thiodan	lt
9. Marlata	lb	10. Lanate	lt
11. Phosphamidon (Demecron)	lt	12. Stylet Oil	gal
13. Fusilade (Herbicide)	lt	14. Triton CS7	lt
15. Gramoxone	lt		

2. Export Cucumber Trial Material List (Continued)-

	Unit
c. Miscellaneous-	----
1. Wire #16	lb
2. Plastic Twine (Banana)	lb
3. Stakes	ea
4. Harvesting Buckets	ea
5. Motorized Sprayer	ea
6. Knapsack Sprayer (2)	ea
7. Stylet Oil Sprayer	ea
8. Knife (Banana De-handing Knife)	ea
d. Seed (2 lbs each)-	
1. Poinsett 76	
2. Tropic-Cuke	
3. Dasher II	
4. SliceNice	
5. Any other	

We would require the following information for most of the above items:

- | | |
|-------------------------|-------------------|
| 1. Name of supplier(s): | 2. Manufacturer: |
| 3. Package size: | 4. Cost per unit: |

3. List of suggested farm equipment (200-250 acres).

Item	Brand	Description	#	US\$	Total
1 Tractor	JDeere	Model 2040; 60-70 HP; Hydraulic Connections; 4WD w/ furrow irrigation	1	\$18,000	\$18,000
2 Rome Plow	JDeere	7 ft wide; 20 in disc; hydraulic piston	1	\$8,000	\$8,000
3 Disc Plow	Burch	3 disc; reversible; a moldboard plow is ok	1	\$5,000	\$5,000
4 Disc Bedder		18 in double set; pair	2	\$1,000	\$2,000
5 Bed Press	Kenco	single bed; adjustable pg 10	1	\$2,000	\$2,000
6 Hoppers	Cole	fertilizer bins ground wheel	2	\$1,000	\$2,000
7 Sprayer	Kenco	300 gpm; hi-press w/ accessories; drops	1	\$5,000	\$5,000
8 Tool bar	Any	2 1/4 Diamond; 3 mt 3 pt hitch	2	\$500	\$1,000
9 Plastic Layer		4 ft plastic	1	\$750	\$750
10 Land Plane		4 mt	1	\$10,000	\$10,000
11 Seeder Planet Jr		toolbar w/ accessories	1	\$500	\$500
			1	\$100	\$100

4

5. Schedule of consultant's activities.

Date	Day	Time	Location	Activity
05Jun88	Sun	1130	Orange Walk	Depart for Airport
		1530	Belize City	Leave Belize
		1630	El Salvador	Arrive Airport
		1730	San Salvador	Arrive City
06Jun88	Mon	0830	FUSADES	Locate office
		0900	FUSADES	Meet Managers & Technicians
		1030	Zapotitan	Visit Experimental Plot
				Visit AGRIDSA Packing Plant
		1500	FUSADE	Meet Technical Director
1600	San Salvador	Meet Foundation Chile Personnel		
07Jun88	Tue	0900	FUSADES	Meet AGRIDSA Personnel
		1000	FUSADES	Meet Isreali Advisor
		1030	Santa Anna	Visit Experimental Area
		1300	Santa Anna	Visit highland production area
		1800	FUSADES	AGRIDSA
08Jun88	Wed	0830	FUSADES	Report Preparation
		1730	FUSADES	Discussions
09Jun88	Thu	0800	FUSADES	Material List Preparation
		1800	FUSADES	Discussions
10Jun88	Fri	0630	San Salvador	
		0730	El Salvador	
		0830	Guatemala	
		0900	PROEXAG	Discussion & Report Preparation
		1730	PROEXAG	Report Preparation
11Jun88	Sat	0600	PROEXAG	Report Preparation
		0900	PROEXAG	Report Preparation
		1400	PROEXAG	Administrative Details
		1900	PROEXAG	
13Jun88	Mon	0830	PROEXAG	Presentation of Report
		1730	PROEXAG	Departure
14Jun88	Tue	0600	Guatemala	
		0930	Belize	
		1230	Orange Walk Town	