

From Melon Patch to Market Place:
How They Learned to Export a Non-Traditional Crop¹

by

Kerry J. Byrnes²

June 1, 1991

¹This is a revised version of a report originally prepared for an Agency for International Development-sponsored Trade and Investment Workshop, held November 13-14, 1989, and organized by A.I.D.'s Center for Development Information and Evaluation (CDIE) and Bureau for Latin America and the Caribbean. The report was prepared under a CDIE contract with Labat-Anderson Incorporated. The author wishes to acknowledge with appreciation all of the persons interviewed who shared their melon growing and exporting experiences; various employees of FEPROEXAAH, CAAP, and PROEXAG who assisted the author in contacting the melon growers and exporters who were interviewed and in providing background information on the development of the melon export industry in Central America; and the following who provided useful comments and guidance during the development of the study: James Fox, Cressida McKean, Pat Vondal, John Lamb, Pam Michel, Scaff Brown, Gale Rozell, Tom Mooney, and Stephen Lack. However, the views and interpretations expressed are those of the author and should not be attributed to A.I.D., Labat-Anderson Incorporated, or Chemonics International. The author bears sole responsibility for any factual errors that may appear in the text.

²This study was carried out while the author was Senior Social Science Analyst, Program and Policy Evaluation Division, Center for Development Information and Evaluation, Agency for International Development. Currently the author is Agricultural Research, Extension and Education Advisor, Latin American and Caribbean Agriculture and Rural Development Technical Services Project (LAC TECH), Chemonics International.

Table of Contents

Table of Contents	i
List of Boxes	ii
List of Figures	ii
List of Annexes	ii
List of Acronyms	iii
EXECUTIVE SUMMARY	iv
Introduction	1
Overview of Melon Exports to the U.S. from Central America	4
Development of Melon Exports from Three CBI Countries	9
Honduras	9
Guatemala	11
Costa Rica	12
Critical Tasks in Achieving Success in Non-Traditional Agricultural Exports	15
Learning Processes in Exporting	18
Attending the School of Hard Knocks	19
Experimentation (Adaptive Research)	20
Staying on Technology's Cutting Edge	22
Buying the Technology	22
Buying Technical Expertise	22
Consulting with Technical Specialists	22
Keeping an Eye on the Market	23
Informal Searching for Market Information	23
Formal Searching for Market Information	23
Acquiring Feedback on Results of Decisions Made	24
Taking Collective Action	24
Role of Learning Catalysts in Export Learning	26
Some Conclusions and Implications	29
A Favorable Macroeconomic and Policy Environment	29
A Pool of Entrepreneurial Talent	30
A Market and Technology Base	32
Potential and Limits of a Learning Catalyst	36
References	40
Annexes	41

List of Boxes

Box 1. Critical Tasks in Achieving Success in Non-Traditional Agricultural Exports. 17

Box 2. Learning Processes in NTAE Learning. 25

List of Figures

Figure 1. Melon Exports to the United States from Central America. 6

Figure 2. Boxes of Cantaloupe Exported by United Fruit (PATSA) from Honduras (1975-1989). 7

Figure 3. Melon Exports to the United States from El Salvador, Guatemala, Honduras, and Costa Rica (1978/79-1989/90). 8

Figure 4. A Typology of Learning Processes Impacting on Export Learning by Entrepreneurs. 18

Figure 5. Theoretical Impact of a Learning Catalyst on the Export Learning Process and the Risk of Business Failure Faced by a Grower-cum-Exporter. 27

List of Annexes

Annex A. List of Firms Studied and Respondents Interviewed. 42

Annex B. Areas in Which Growers, Exporters, and NTAE Organizations Have Obtained Information from PROEXAG during the 1987-1989 Period. 43

Annex C. Examples of Ways in Which Growers, Exporters, and Export Promotion Organizations Have Obtained Information from PROEXAG during the 1987-1989 Period. 44

Annex D. The Stages of Evolution of Non-Traditional Export Crops: From the Perspective of an Export Support Project Organization. 49

List of Acronyms

ACA	Agro-Business Corporation of America
APROEXMEH	Honduran Melon Growers and Exporters Association
Básico	Promotora Agrícola Básico Ltda.
CAAP	Consejo Agropecuario Agroindustrial Privado (Private Agricultural and Agroindustrial Council)
CAPCO	Productos Agrícolas Centroamericanos, S.A.
CAPINC	Central American Produce Inc.
CBI	Caribbean Basin Initiative
CDIE	Center for Development Information and Evaluation
COAGROVAL	Cooperativa Agropecuario del Valle Limitada
CREHSUL	Cooperativa Regional de Horticultores Sureños
DAISA	Desarrollo Agrícola Industrial, S.A.
FEPROEXAAH	Federación de Asociaciones de Productores y Exportadores Agropecuarios y Agro-Industriales de Honduras
FHIA	Fundación Hondureña de Investigación Agrícola
GREMIAL	Guild of Non-Traditional Product Exporters
ICTA	Agricultural Science and Technology Institute
NTAE	Non-Traditional Agricultural Export
PATSA	Productos Acuáticos y Terrestres, S.A.
PROEXAG	Non-Traditional Agricultural Export Support Project
ROCAP	Regional Office for Central America and Panamá
USAID	United States Agency for International Development

EXECUTIVE SUMMARY

Melons have developed rapidly in recent years as one of the leading Central American exports. Melon exports rose tenfold between 1982 and 1989, from US\$3 to US\$30 million. The projected 89/90 winter season plantings indicated that melon exports were likely to reach US\$40-50 million. Yet attempts to grow melons in the Central American region for export to the U.S. can be traced back to the early 1960s, long before the U.S. Agency for International Development (A.I.D.) launched its non-traditional agricultural export (NTAE) initiative began in the region. How did Central America's melon export industry develop and what role if any has A.I.D.'s NTAE support initiative played in the industry's development? This study, in attempting to identify the factors underlying the success of Central America's melon export industry, attempts to answer this question.

The study reviews the evolution since the early 1960s of the export melon industry in Central America, and how entrepreneurs in three Central American countries (Honduras, Guatemala, and Costa Rica) learned to export melons. This NTAE crop was chosen for study because it provides a case of a successful export industry that could be studied across countries that varied in their degree of success in exporting melons and the rate at which this success was obtained. The study is based on interviews with more than 20 entrepreneurs who have had varying success exporting melons.

For the early melon entrepreneurs learning how to grow and export melons successfully was not a quick study. Indeed the technology generation and transfer process involved in nailing down the correct technology to grow and export melons has been evolving over the past three decades, with lessons learned having implications for the design of a technology generation and transfer strategy for other crops having non-traditional agricultural export (NTAE) potential. The process began in the late 1950s and the melon export industry was already on its way to being developed by the time A.I.D. became involved in NTAE crops during the 1980s. More recently, the accelerated export learning that has taken place (e.g., Costa Rica) was not achieved simply by establishing export support projects and export promotion organizations to provide technical assistance and training to entrepreneurs who wanted to grow and export melons. Rather, these projects and organizations were able to build on a foundation of market links, agricultural technologies, and melon growing and exporting expertise that had been developed over the preceding 10-15 years.

In recent years, the process of accelerating export learning has been achieved through technical assistance provided by persons and organizations who already had proven they could grow and export the crop on which they were providing technical assistance. In the case of melons, AID/ROCAP's Non-Traditional Agricultural Export Support Project (PROEXAG) was able to provide Costa Rican farmers access to the melon growing and exporting expertise of that project's post-harvest handling and marketing specialists, although the strong suits of long-term advisors were complemented in some cases by more specialized expertise provided by short-term consultants.

In short, in the best case scenario, if technical assistance is to be useful to entrepreneurs who seek to learn how to grow and export a non-traditional crop, it must be provided by persons or organizations having practical growing and exporting experience in that or a similar crop. On the other hand, at each stage of the learning process, the entrepreneur must keep in mind that he is operating in a complex system involving multiple actors--input suppliers, growers, packers, truckers, shippers, sales agents, among others. These various actors range from individual firms to multinationals, each having varying degrees of information, knowledge, and experience that may or may not be relevant to the entrepreneur's objectives, needs, and circumstances. But the individual entrepreneur, lacking information, knowledge, experience, and often also resources, is in a weak position to sort all this out in a meaningful way.

However, while this sorting out process does occur, more quickly and effectively for some entrepreneurs than for others, it does entail costs in terms of resources (time, money, etc.) expended by the entrepreneur. The analysis presented in the paper looks at this sorting out process in terms of five learning processes that had an impact on the speed at which entrepreneurs were able to learn how to grow and export melons: (1) attending the school of hard knocks, (2) experimentation (or adaptive research), (3) staying on technology's cutting edge, (4) keeping an eye on the market, and (5) taking collective action. Examples are provided of how entrepreneurs obtained (or failed to obtain) information through each of these sources.

Based on these five learning processes, three essential conditions for a takeoff in an NTAE crop are identified: (1) a market and technology base, (2) a pool of entrepreneurial talent, and (3) a favorable macroeconomic and policy environment. Once these conditions are in place, learning catalysts, be these export support projects or export promotion organizations, with staff having practical experience in growing and exporting non-traditional crops, can play an effective role in accelerating the learning process both for entrepreneurs seeking to learn how to grow and export a non-traditional crop as well as for established firms seeking to change their marketing objective or strategy (e.g., diversify product line from honeydew to cantaloupe to seedless watermelon, or increase the number of sales agents through which the grower-cum-exporter markets his or her crop).

Neither A.I.D. nor development assistance more generally can create a pool of entrepreneurial talent. But a development assistance program or project can help countries having the potential to grow NTAE crops to further develop the market links, technological base, and macroeconomic and policy environment that provide incentive for entrepreneurs to invest in growing and exporting non-traditional crops. Where such an incentive exists or has been created, learning catalysts can facilitate as well as accelerate the export learning process. A learning catalyst can play this role by helping entrepreneurs (1) to gain access to technology needed to grow and export non-traditional crops; and (2) to identify and evaluate potential deals with reputable sales agents who are in a position to market the crop. Where a learning catalyst reduces an entrepreneur's actual and perceived costs and risks, this increases not only the incentive to grow and export non-traditional crops but also the likelihood that the entrepreneur will make sound technical and business decisions as compared with poor decisions that lead to disaster and failure.

Finally, the history of the Central American melon export industry suggests that continuing successful development of an NTAE market will to a great extent depend on growers having access to improved technology. NTAE technology has thus far been borrowed from other regions and adapted by private growers, often with great financial losses on the part of growers; further, as may be seen the case of melons, the required technology evolved over a relatively long period, and still is being developed and refined (e.g., drip irrigation vs. gravity flow irrigation). A key element in this process has been ongoing adaptive research that began in Honduras as early as 1957. This was given a major impetus by United Fruit in the mid-1970s. During the late 1970s, Dave Warren conducted extensive melon trials in Guatemala, building on the early 1970s' melon growing experience of John Guy Smith.

Despite the importance of adaptive research, the long period of time required to develop and adapt melon growing technology, and the continuing problems (e.g., pre- and post-harvest pest and disease management) such research could solve, formal adaptive research on melons currently does not exist in any of the countries reviewed. More generally, a recent cross-cutting evaluation of agricultural crop diversification and export promotion also noted the lack of ongoing adaptive research in the Central American region:

Research and extension are the essential foundation for long-term successful agronomic performance in any agricultural system, especially in a non-traditional system. Strong, ongoing research and extension programs were not in evidence in any of the A.I.D.-supported countries studied by the team. Nor, for the most part, were such programs satisfactorily contemplated or integrated in the A.I.D. projects under review (Lack et al., 1989, III-25). . . .

The host countries' and A.I.D.'s partial answer to inadequate and insufficient research...has been to contract consultants to identify and act on [crop diversification/non-traditional agricultural export] initiatives and problems. While in no way a satisfactory substitute for ongoing research and extension, this approach is not unreasonable. What is unreasonable is the belief that a "complement" of short-term consultants can provide sufficient, enduring input, much less influence the future of research and extension in the host countries (Lack et al., 1989, III-26-27).

A.I.D. will not be operating forever in most countries, much less will it be continuing its current level of support for [crop diversification/non-traditional agricultural exports]. Host country public sector institutions responsible for research, however, will continue to function. A.I.D. should make every effort now to help them to function effectively (Lack et al., 1989, III-27).

However, whether research capability is to be developed in the public or private sectors, the point is that it takes resources and time to carry out productive adaptive research; yet little attention is being addressed in Central America to allocating resources and time to adapt technology for NTAE crops. As Gale Rozell (personal communication) notes: "This new [NTAE] industry cannot survive without indigenous agronomic support capable of identifying and remedying diseases, pest infestations, and productivity constraints." Even where an NTAE technology has been developed, a period of time will be needed to adapt that technology to the growing environment, and a novice grower-cum-exporter likely will need time (from several seasons to several years) to learn how to grow and export the crop successfully.

As Central America moves into the 1990s, the region faces a much more favorable market base in terms of market demand and established market links than was the case when the region moved into the 1960s. Also, there is drastically improved communication (e.g., FAX machines) and transportation (e.g., ocean and air freight) infrastructure. What has not progressed anywhere near as rapidly has been the region's ability to develop and adapt the technology required to grow NTAE crops successfully.

The lack of strong public sector or even private sector adaptive research programs for non-traditional crops has meant that entrepreneurs interested in growing and exporting these crops (e.g., asparagus) have had to make their own investments in the adaptive research required to identify the technology to grow such crops in the agro-climatic conditions of Central America. Given the lack of appropriately identified technology for growing asparagus in Guatemala, PROEXAG has undertaken adaptive research trials in collaboration with private sector farmers interested in growing this crop for export. But despite the many production problems (fertilization, irrigation, disease and pest control) faced by the region's melon grower-cum-exporters, a comparable adaptive research program for melons has yet to emerge.

One cannot deny the importance which technology development and adaptation played in the development of Central America's melon export industry. The recent dramatic increases in melon exports from the Central American region is based on a long history of adaptive research to develop the required technology for growing melons successfully. A similar takeoff in other NTAE crops is unlikely without the development of appropriate technology, and this is unlikely without long-term support for adaptive research. Hence, in the absence of public or private research to develop and adapt the technology needed to grow other NTAE crops successfully in the Central American region, it is doubtful that a takeoff in exports, similar to that for melons during the past five years or so, will occur any time soon.

A takeoff in exports of non-traditional crops cannot be launched simply by importing the required technology. The required technology for growing any NTAE crop successfully must be sensitive to the agro-climatic conditions of the region or even the specific farm on which the crop is to be grown. Adaptive research is needed to adjust the technology to the growing environment's agro-climatic realities, and this requires time. Even if imported, the technology must be tested and adapted; and this is not necessarily carried out most efficiently by simply following the informal approach to technology adaptation that largely characterized the development of Central America's melon export industry.

There is a potential role for public sector research to play in carrying out research on NTAE crops. This has been recognized to a limited extent by the Asian Vegetable Research and Development Center (AVRDC), in the emerging mandates of regional agricultural research centers (CATIE in Costa Rica and CARDI in the Eastern Caribbean), and in a proposal to the Consultative Group on International Agricultural Research (CGIAR) for an International Vegetable Research Institute (Winrock International, 1986).

However, research on non-traditional agricultural export (NTAE) crops generally has not fallen within the traditional mandate of either the International Agricultural Research Centers (IARCs) or National Agricultural Research Systems (NARS). In general, the donor community continues to target funding support for agricultural research on basic food crops, this being facilitated by the creation and functioning of the CGIAR, through the CGIAR's role in marshaling and coordinating donor funding for agricultural research on basic food crops. But no comparable group has been created to marshal and coordinate funding for research on non-traditional agricultural export (NTAE) crops.

In the LAC region A.I.D. has been reallocating its resources away from the support of research on traditional food crops for domestic consumption and toward research on NTAE crops that can earn foreign exchange. But there is uncertainty about whether this approach, in the long run, will contribute to or be counter-productive to A.I.D.'s stated development assistance goal--"to increase the income of the poor majority and expand the availability and consumption of food, while maintaining and enhancing the natural resource base." Specifically, it is not clear how quickly or extensively smaller farmers will be able to begin to share in the income stream from growing and exporting non-traditional crops.

On the other hand, there is a growing global market for horticultural exports from the developing countries (Islam, 1990). Also, there is some evidence that NTAE crops hold potential as a means whereby small farmers can increase their income-earning potential (von Braun, et al., 1989) beyond that possible with the traditional food crops that usually comprise the agenda of most IARC and NARS research programs. Overall, donors such as A.I.D. that seek to stimulate development of NTAE crops can help to make this a reality by facilitating, over the long run, coordinated development of public and/or private adaptive research on NTAE crops. As noted by the cross-cutting evaluation (Lack et al., 1989), continued NTAE growth requires a long-term strategy appropriately emphasizing adaptive research, training, and technical assistance. Lessons learned from countries (e.g., Chile and Mexico) that have experienced success with NTAE crops reconfirm the need for long-term (30 years or more) support to ensure developing sustained success.

The private sector will, to a limited extent, take on some of the research challenges, namely, those offering potential for profit through the sale of inputs (e.g., seeds) that embody the technology developed through research. However, the private sector will not take on all of the research that may be needed, especially on problems requiring more applied or basic research (e.g., collection and preservation of germplasm).

These considerations raise questions that merit consideration in discussions aimed at strategy formulation for agricultural and rural development, including:

1. To what extent is smallholder production of NTAE crops dependent on the farmer first being able to increase yields (i.e., productivity) of traditional food crops?
2. Where there is potential for smallholder producers of traditional food crops to grow and export NTAE crops, should the mandates of the IARCs and NARS be broadened to authorize a greater allocation of public resources for research aimed at tapping this potential?
3. How can agricultural research on NTAE crops be more effectively funded, implemented, and coordinated in a manner consistent with farmer needs, market opportunities, and existing public and private sector structures for carrying out agricultural technology generation and transfer?

I. Introduction

The Agency for International Development (A.I.D.) has, in recent years, assisted various countries, especially in Latin America and the Caribbean, to market non-traditional agricultural export (NTAE) crops. To this end, A.I.D. has worked in these countries (1) to improve the macroeconomic and policy environment, (2) to support private agricultural research and/or export promotion organizations, and (3) to fund projects that provide development assistance to support NTAE initiatives. Yet an evaluation of A.I.D.-funded crop diversification and NTAE projects concluded that the "most effective assistance in export marketing invariably comes from the market itself" (Lack et al., 1989:1-6).³

³John Lamb, team leader of USAID/ROCAP's Non-Traditional Agricultural Export Support Project (PROEXAG), comments that he does not agree that the most effective source of marketing assistance invariably comes from the market itself. Lamb (personal communication) notes that the advice given by PROEXAG marketing specialist, Ricardo Frohmader, "is usually equal to and often better than that given by receivers, because he has the same experience but no financial interest." He notes that Frohmader regularly is a "marketing mentor" to many of the melon growers interviewed for this study--CREHSUL, Miguel Molina, and COAGROVAL in Honduras, Ricardo Alfaro and Dale Krigsvold in Guatemala, and participants in the Guanacaste pilot melon project in Costa Rica. Also, Lamb notes, "nearly all the growers" in El Salvador turn to Frohmader for advice. Further, he often serves as a friendly intermediary between growers/exporters and importers/receivers. Lamb notes that Frohmader

did better than the market would have in the...Sun World/[growers] seedless watermelon cases and the Vendome/Transcave specialty vegetable cases, where the deals were constantly on the verge of falling apart. ...of course RF is not infallible, and there is only one RF, so even if you agree I am not sure what it means in terms of your analysis and extrapolation from it. But I do suggest that you observe that the generalization may be true, but the term "invariably" is not.

The author would ask: Where did Frohmader come from? For nearly 20 years, Frohmader has been an employee of private sector firms active in the development of the Central American melon export industry. He currently is employed by a private sector firm, Chemonics International, the PROEXAG contractor, and previously was employed by United Fruit. PROEXAG is part of an overall A.I.D. effort to work more closely with the private sector, i.e., the market. The "generalization" may not be "invariably" true but the Frohmader case suggests that "invariably" may not be far from the truth.

Here "market" refers to product receivers (sales agents), including brokers, importers, and distributors, who, "because of their keen interest in obtaining product, take pains to ensure that producers/exporters have and can use market information, materials, production technology and financing (Lack et al., 1989:I-6). Generally, the evaluation found that

the most consistent cross-cutting finding in NTAE marketing activities...was that most successful agribusinesses and agribusinessmen have very little, if anything, to do with A.I.D. or A.I.D.-sponsored projects.it was learned from the "successful" [agribusinesses and agribusinessmen] that in their view A.I.D. tends to complicate things, is bureaucratic and rarely provides adequate long-term technical assistance from professionals with real "hands-on" experience. . . . A starting point for improvement...is for A.I.D. to seek out, learn from and work with more of these agribusinessmen than it has in the past (Lack et al., 1989:III-17-18).⁴

In the spirit of this recommendation, A.I.D. commissioned a study of agribusinessmen and agribusinesses who have been successful in exporting an NTAE crop, namely, melons, from one region: the Central American countries of Honduras, Guatemala, Costa Rica. The study sought to identify how entrepreneurs learned to grow and export melons, information sources used while learning how to export, and factors influencing investment decisions, especially whether entrepreneurs used services provided by A.I.D.-funded export support projects or export promotion organizations.

⁴This evaluation, which covered all A.I.D. NTAE projects up to that time, found they were heavily skewed in terms of resource allocation toward financing rather than technical assistance. Lamb (personal communication) notes that entrepreneurs "are likely to mention financing as a major factor in discussing how they got started, and how easily, but not while discussing why they got started or how they learned to be successful. It is quite possible that A.I.D.'s most effective leverage may be to fund PROEXAG-type projects with very competent consultants with long histories within the industry. PROEXAG was just getting rolling when Steve Lack's team wrote their report so [they] could not say anything definitive [about PROEXAG]."

PROEXAG's Pam Michel (personal communication), cautions that not all "channel captains" are willing to show "the way to the end of the rainbow." But PROEXAG has marshalled the support of private sector market-experienced expertise (e.g., post-harvest handling specialist John Guy Smith, marketing specialist Ricardo Frohmader; Lindemann Produce Company in California opened its facilities for PROEXAG to conduct a training course on harvesting, packing, and shipping of cantaloupe melons; etc.).

To gain access to agribusinessmen and agribusinesses who have been successful in growing and exporting melons, CDIE invited key export promotion organizations to assist in the data collection process, as follows: FEPROEXAAH (Federación de Asociaciones de Productores y Exportadores Agropecuarios y Agro-Industriales de Honduras) in Honduras; PROEXAG (USAID/ROCAP Non-Traditional Agricultural Export Support Project) in Guatemala; and CAAP (Consejo Agropecuario Agroindustrial Privado) in Costa Rica.

Each organization arranged appointments to conduct in-depth semi-structured interviews to elicit details on enterprises that have succeeded in growing and exporting melons.⁵ Based on the interviews, the author wrote a case study on each enterprise. In some cases, biographies were written on persons who played a key role in the development of the region's melon export industry. The case studies and biographies comprised the data base for this report.⁶

⁵Annex A lists the respondents interviewed. The interviews, about 1.5-2.0 hours in length, were conducted in Spanish or English during a three-week period (9/18/89-10/10/89), assisted in Costa Rica by Claudio Zumbado and Javier Arriola of CAAP and in Honduras by Medardo Galindo of FEPROEXAAH. The author's notes were supplemented by and checked against notes taken by FEPROEXAAH and CAAP representatives. No small independent or agrarian reform farmers were interviewed, although such farmers do grow and export melons through co-ops (e.g., CREHSUL in Honduras) or under contract with multinational subsidiaries (e.g., United Fruit's Promotora Agrícola Básico in Guatemala). The author did interview managers of the co-ops and multinational subsidiaries through which small growers export melons. The reader should note that this study cannot represent the entire Central American region because two other country cases (El Salvador and Panamá), each having its own unique history, were not studied. Also, it should be noted that even two hours of interviewing per case is little time to capture a complex life and enterprise history.

⁶To ensure the accuracy of the case studies (or biographies), the author provided each respondent a copy of the case study (or biography) written from the interview data; feedback from each respondent was used to correct the corresponding case study or biography.

II. Overview of Melon Exports to the U.S. from Central America

Melons have developed rapidly in recent years as one of the leading Central American exports. Melon exports rose tenfold between 1982 and 1989, from US\$3 to US\$30 million. The projected 89/90 winter season plantings indicated that melon exports were likely to reach US\$40-50 million. Yet attempts to grow melons in the region for export to the U.S. can be traced back to the early 1960s, long before A.I.D.'s non-traditional agricultural export (NTAE) initiative began in the region. How did Central America's melon export industry develop and what role if any have A.I.D.'s NTAE support initiatives played in the industry's development? This study, in attempting to identify the factors underlying the success of Central America's melon export industry, attempts to answer this question.

In attempting to understand the evolution of the melon export industry in Central America, it is important to consider the current stage of development of the fresh fruits and vegetables market.⁷ This market is huge (\$8.8 billion at the producer level, and \$35 billion at the retail level). An industry this big, growing steadily at 2% per year, generates a significant market "pull" for incremental production to meet consumer demand. The total U.S. market for melons has risen at a similar pace, spurred on by rises in per capita consumption and assisted by efforts to supply year-round demand. The resulting pull effect on melons has differentially affected the various production regions, impacting most on winter season producers.

According to the USDA, total U.S. melon imports rose steadily from the 1984 level of \$56 million to a 1987 level of \$91 million. While imports dropped to \$85 million in 1988, the September 1989 Horticultural Products Review projects over \$105 million in melon imports for 1989. Imports of cantaloupes and other melons from Honduras, Guatemala, Costa Rica, and El Salvador were \$15.9 million in 1988 and \$27.5 million in 1989. Thus, the growth in Central American melon production is part of a marked trend toward globalization of sourcing in the production industry. Ricardo Frohmader, PROEXAG marketing specialist, cites two specific factors that contributed to the takeoff in melon production in Central America: (1) increased productivity (i.e., hybrid melon varieties); and (2) the decline of Mexico (caused by disease problems) as a reliable source of supply of melons from February to April. Thus, there also was a significant "push" effect that responded to and completed market pull.

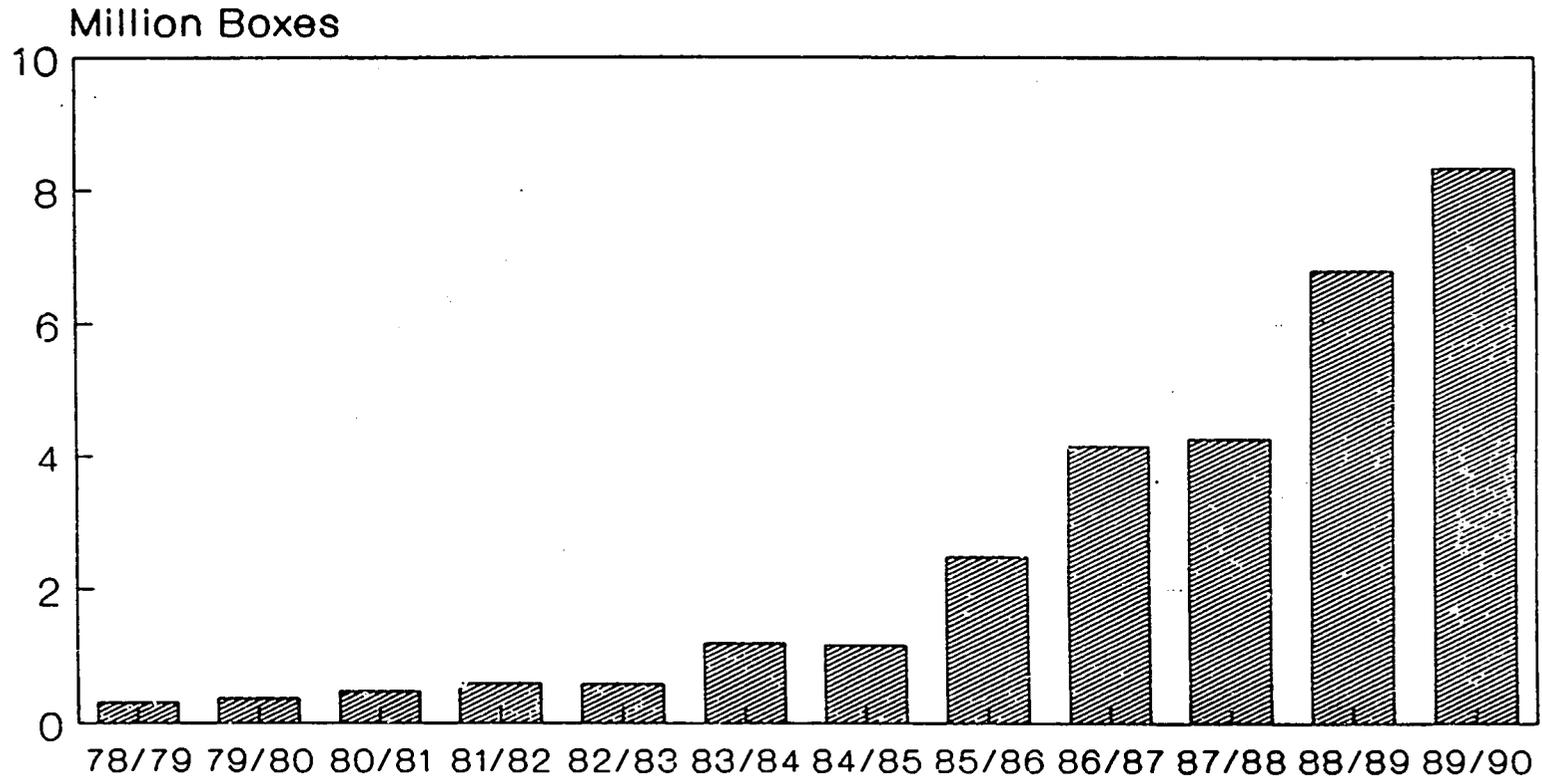
⁷The information in this section draws on review comments provided by PROEXAG staff--John Lamb (team leader), Ricardo Frohmader (marketing specialist), and Pam Michel (transportation specialist).

The legislation of the Caribbean Basin Initiative (CBI) in 1983 provided additional impetus to the overall NTAE industry. The press and development hype that surrounded the CBI caused a flurry of interest in exporting non-traditional crops from the CBI countries to the U.S. While many non-traditional crops could enter the U.S. duty free without CBI, under the Generalized System of Preferences, the side effect of the rhetoric surrounding CBI helped generate interest in growing and exporting non-traditional crops. As a result, more potential growers-cum-exporters began to look at the option of investing in NTAE crops. Further, removal of tariff barriers raised the competitiveness of CBI countries relative to Mexico and the U.S. itself. At the same time, a 35% ad valorem duty on melons from Mexico that had been waived through 1986 expired late that year, and was not rescinded until January 1989; thus, for three seasons the CBI legislation helped CBI countries while a duty hurt Mexico.

In short, the economic and market context described above set the stage for and influenced the rate of development of the Central American NTAE industry. Within this context, the growth in melon exports to the U.S. from Central American countries is evident in Figure 1.⁸ This figure illustrates that a dramatic increase in Central American melon exports has occurred since 1978/79. But caution should be exercised that, in interpreting Figure 1, one does not mistakenly conclude that the increases in exports since 1983 resulted from events that occurred at or since the time the CBI was launched. While certain events (CBI) gave impetus to exports of melons and other NTAE crops, the dramatic increases in exports ultimately may owe as much, if not more, to events that occurred long before CBI.

Specifically, referring to Figure 2, to what extent can the take-off in United Fruit (PATSA) exports of cantaloupe from Honduras beginning in the 1983/84 season be attributed to the CBI? More generally, referring to Figure 3, why did it take Honduras nearly ten years to achieve the same increment in melon exports that Costa Rica was able to achieve in only three years? Stated somewhat differently, did melon exports from Honduras languish during the 1970s because of the lack of a more favorable market environment such as that created by the CBI?

⁸The reader should note, as a point of clarification, that the melon growing season (or marketing year) in Central America is spread over the last quarter of one calendar year (e.g., 1989) and the first quarter of the next calendar year (e.g., 1990). Hence melon export data are often reported, as in Figures 1 and 3, in terms of a season (e.g., 89/90 marketing year) spread over two calendar years rather than falling within one calendar year.



1990 is Projected

Figure 1. Melon Exports to the United States from Central America. (Source: CDIE/LAC Non-Traditional Agriculture Export Study).

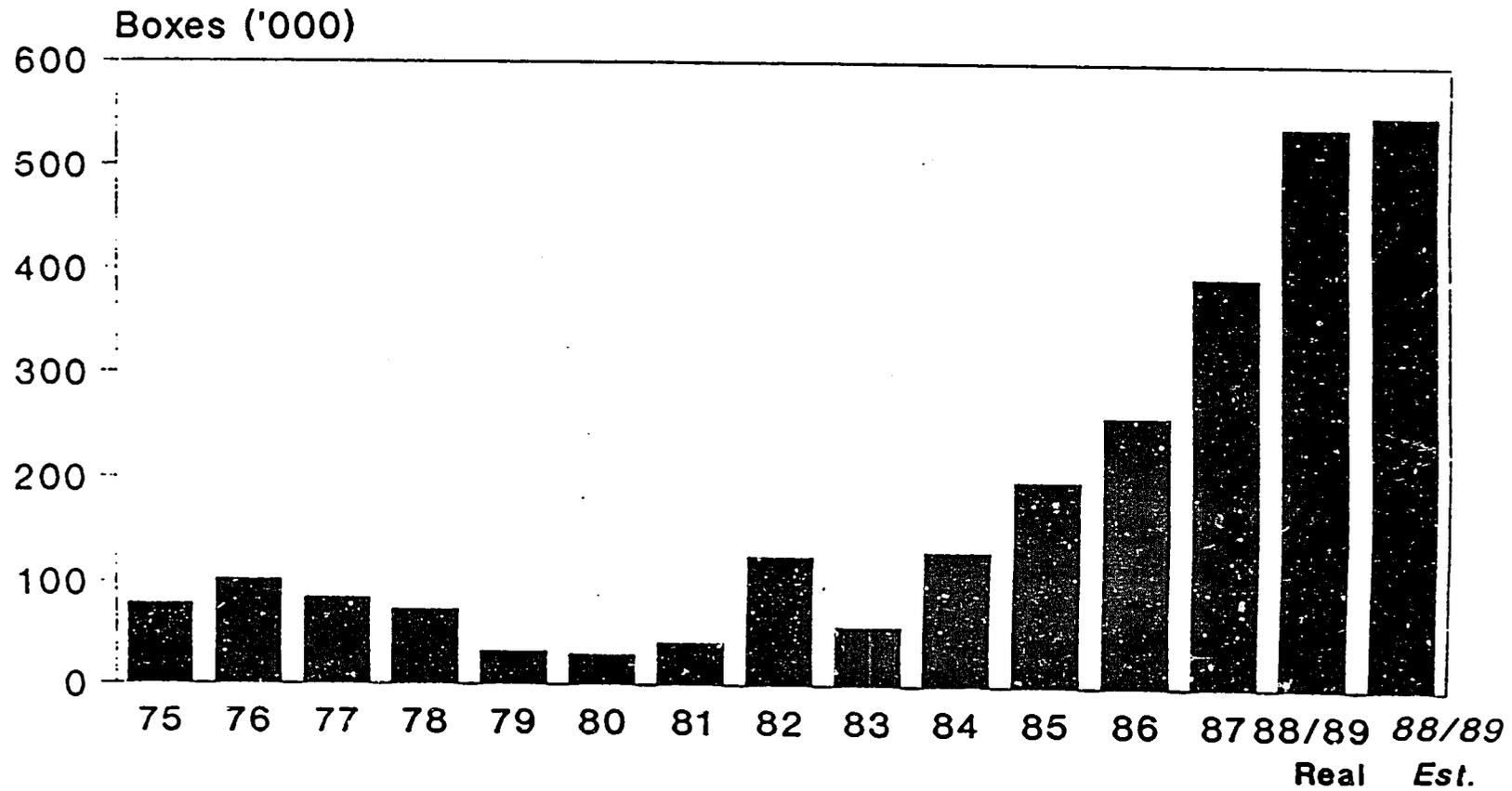
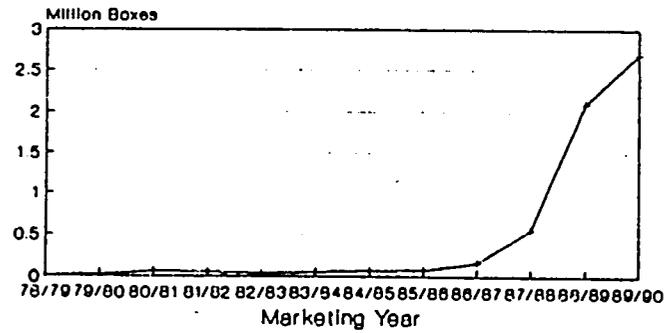
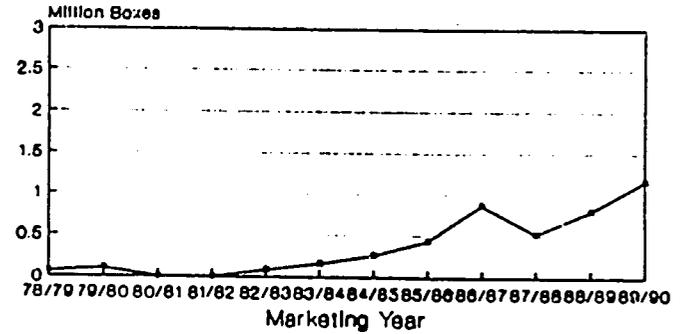


Figure 2. Boxes of Cantaloupe Exported by United Fruit (PATSA) from Honduras (1975-1989).
(Source: United Fruit's PATSA, Choluteca, Honduras).

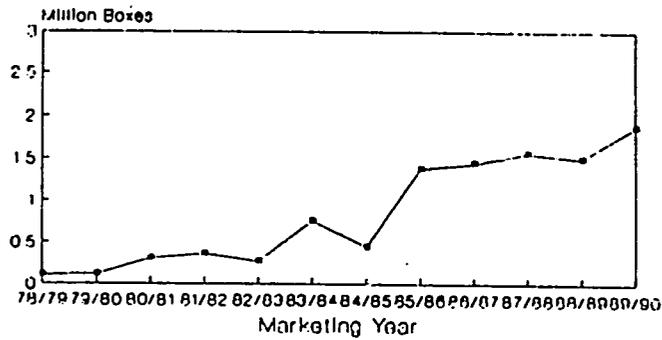
**COSTA RICA
MELON EXPORTS TO U.S.A.**



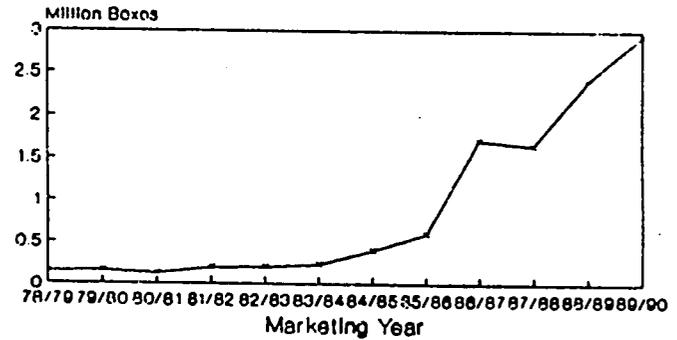
**EI SALVADOR
MELON EXPORTS TO U.S.A.**



**GUATEMALA
MELON EXPORTS TO U.S.A.**



**HONDURAS
MELON EXPORTS TO U.S.A.**



1990 is Projected

Figure 3. Melon Exports to the United States from El Salvador, Guatemala, Honduras, and Costa Rica (1978/79-1989/90).

In all of this, what role, if any, have export support projects and export promotion organizations played in facilitating and accelerating the growth in exports of melons and other fruits and vegetables over the past decade? This report attempts to provide answers to these questions and, in doing so, to identify areas in which A.I.D. could play a more effective role in stimulating accelerated development of NTAE crops in the Central American region. But one must first go back to the early 1970s, more than a decade before the CBI. For a moment, let's retrace some of the major events, beginning in the early 1970s, that led to the takeoff in CBI melon exports to the U.S. in the early 1980s.

A. Development of Melon Exports from Three CBI Countries

This section presents the events and major players shaping the development of the melon industry in the three CBI countries reviewed in this report--Honduras, Guatemala, and Costa Rica.

Honduras--Some early melon trials were begun in Honduras as early as 1957 under STICA (Servicio Técnico Internacional de Cooperación Agrícola), a cooperative research service supported jointly by the U.S. and Honduran governments. But the big push to grow and export melons did not come until 1974, when an United Fruit subsidiary, Productos Acuáticos y Terrestres, S.A. (PATSA), began melon trials in Choluteca. Even as PATSA was organizing melon growing by Choluteca's farmers, United Fruit launched an adaptive research program on melons, drawing on the scientific talent in the company's banana research station in La Lima, Honduras. Over a period of at least four years (1975-76, United Fruit's melon research team adapted melon production technology to Choluteca's agro-climatic conditions.

While PATSA continues as Honduras' major exporter of melons, over time farmers growing melons for PATSA became less and less happy about the fixed price they received. This led growers in the late 1970s to organize into CREHSUL (Cooperativa Regional de Horticultores Sureños), a cooperative that could represent the member growers in negotiating with PATSA for a better fixed price. CREHSUL also provided the growers with a single representative to sell, in the local market, melons that PATSA rejected as not of export quality. CREHSUL eventually became sufficiently organized that the coop's members began to pack their own melons, to make their own contacts with sales agents in the U.S., and to contract commercial carriers to transport the melons by truck from the packing shed to the port and by vessel from the port to the States. CREHSUL, in learning how to bypass PATSA, became an independent exporter. During this period, USAID/Honduras' "model coop" project provided CREHSUL with technical assistance on how to grade and pack melons for exports. This assistance was provided by a U.S. melon importing company.

During the 83/84 season, melon (cantaloupe) exports began to increase dramatically (Figure 2) as the result of three developments. First, growers for exporters such as PATSA began to use hybrid varieties (they previously had used open-pollinated varieties). The new varieties were higher yielding and retained their quality longer between the time of picking and being sold to the consumer. Second, growers and exporters moved away from relying solely on one large, centralized, packing shed and toward packing melons in sheds built closer to existing and new growing areas. This enabled growers to reduce the length of time between picking and packing. Third, these remote packing sheds stimulated bringing new fields, many irrigated, into production.

But just as CREHSUL learned to export melons independently of PATSA, one co-op member, a Nicaraguan farmer named Miguel Molina (Agropecuaria Montelíbano) began exporting melons independently of CREHSUL. Molina learned the same steps CREHSUL had learned-- contacting and contracting with a sales agent, building a packing shed, growing melons, harvesting and packing them, and contracting for transport. While exporting to a sales agent offers the potential for greater earnings than selling to CREHSUL or PATSA, this option increases the grower's risk as well as the costs he must absorb. But as a land owner, Molina had the collateral required to get bank loans. Also, as Honduran farmers already had shown they could grow and market quality melons, Molina was able to get advances (cash, seed, fertilizer, packing cartons) from sales agents. These advances and bank loans, supplemented by family loans, provided Molina the capital needed to finance melon production and building and equipping a packing shed.

During 1987, PATSA (multinational), CREHSUL (co-op), and Agropecuaria Montelíbano (independent grower) were joined by another grower, Sur-Agro, a subsidiary of Seaboard Corporation, parent company of Seaboard Marine, a major ocean freight carriers in the Caribbean. Seaboard had access to the capital required to start a melon growing and exporting operation. Also, Seaboard Corporation made space available onboard Seaboard Marine's vessels to transport the melons. Seaboard established another subsidiary to handle the sale of the melons in the States. On the technology side, Sur-Agro has been aggressive in adapting existing technology to the agro-climatic conditions of the Sur-Agro farm.

The last Honduran growers to be noted here are members of a co-op called COAGROVAL in Valle. Before establishing their own co-op, Valle farmers sold melons to PATSA and then to CREHSUL. But the growers wanted their own co-op and to export melons directly to a U.S. sales agent. COAGROVAL asked FEPROEXAAH (USAID/Honduras-supported export promotion organization) to assist the co-op. At the time, FEPROEXAAH was promoting joint ventures of U.S. firms and Honduran growers. FEPROEXAAH helped work out a deal between COAGROVAL and a Washington, D.C. firm, Agro-Business Corporation of America (ACA). But ACA did not live up to its side of the

deal (e.g., ACA could not get the packing shed built in time, did not return to the co-op its share of the proceeds on the melons sold). As a result, COAGROVAL decided to seek another investor who could finance the upcoming 89/90 season and who had contacts with a sales agent (Lindenmann Farms, a California company originally introduced to Central America by PROEXAG).⁹

Guatemala--Two early pioneers in melon growing and exporting in Guatemala were a Salvadoran (Ricardo Alfaro Castillo) and an American (John Guy Smith). Alfaro spent three years learning how to grow and export melons from El Salvador, before his enterprise began to earn a profit. While he already grew melons for the local market, he had to learn how to contact sales agents, and was aided in this by contacts with an export company operating in El Salvador. When Alfaro moved to Guatemala in 1979, he was an established exporter. His business has grown, in part, because he is exporting melons to three or four sales agents in different regions of the United States. His son also plays a substantial role in the firm and has begun to diversify into other crops.

When Smith began growing melons for export, he started from scratch. He had decided to get his firm (Básico) out of consulting and into exporting, with melons appearing to be the most promising opportunity available. When he began to plant melons in Zacapa, he was not aware of the region's agro-climatic limitations. As a result, the melon growing technology that he had imported from California led to low yields and an investment loss. Only after studying the reasons underlying this failure, and adjusting the technology, was Smith able to grow and export melons successfully. In 1980, he sold Básico to a United Fruit. In the following year, United Fruit's banana operations ran into losses; after a bad melon harvest in 80/81, Básico was shut down.

Between 1984 and 1986, United Fruit in Honduras was contracting with two growers in Guatemala, managing the contracts through PATSA in Honduras. In 1986, United Fruit decided to restart Básico in Guatemala. This was in line with a company decision to strengthen melon sourcing in Central America and the Caribbean (Honduras, Guatemala, Dominican Republic). Also, United Fruit decided to work with a larger number of smaller growers, aiming to diversify sources of supply and reduce dependence on larger growers who might decide to become independent exporters, as CREHSUL and Molina had done in Honduras.

⁹Time limitations precluded interviewing SHEMESH, another major melon exporter in Honduras. SHEMESH began operations in Honduras during the 84/85 season, bringing in the company's own imported drip irrigation technology which has worked, albeit at a high cost. SHEMESH now exports considerable volume.

Another successful melon exporting venture in Guatemala has been CAPCO, started by Dave Warren. Earlier in his career, Warren had run successful agricultural produce firms in the U.S. He then was hired by ROCAP to work on market development in the Central America region. When his contract ended, he decided to start a melon growing and exporting operation in Zacapa. Over the first few years of this venture, Warren adapted the melon production technology (being used by other melon growers such as Smith).

The technology adaptation process entailed melon trials that were carried out in collaboration with agronomists from the Guatemalan Institute of Agricultural Science and Technology (ICTA), assisted by a Texas A&M plant breeder (Dr. Mayo Correa). From one season to the next, Warren further adapted the technology by contracting specialists in soil fertility and disease and insect control. (These specialists continue to work with Warren on a retainer basis.) At the same time, Warren worked on the import side to develop a produce importing business, Central American Produce Inc. (CAPINC) in Pompano Beach, Florida. Today, CAPINC is one of the largest importers of produce from the Caribbean Basin region, with imports from Costa Rica, the Dominican Republic, Guatemala, and Honduras. CAPINC imports melons, pineapples, sugar snap peas, baby vegetables, and other crops.

The last melon grower and exporter interviewed in Guatemala was Chuck Chambers (Productos Frescos). Chambers got into growing melons for export following retirement from the Foreign Service. After a number of business ventures, he started an ornamental export business that eventually led him into growing melons for export. After initial success in exporting and in capitalizing his business (i.e., equipping a packing shed, installing a slush ice machine), during the past two seasons he encountered production problems. Excessive rains created problems in growing melons, severely cutting into his ability to supply melons to his U.S. sales agent (Tavilla Marketing). In turn, the agent would not make new advances required to finance growing melons during the next season. As a result, Chambers decided for the 89/90 season to grow melons for CAPINC, this being the only financing source willing to provide the money Chambers needed to plant. Further, as Chambers will deliver the melons from the field to the CAPCO packing plant in Zacapa, he shut down his own plant.

Costa Rica--While Costa Rica only recently became a major player in Central America's melon export industry, this did not occur overnight. Melon trials were begun in Costa Rica as early as 1960 under the Servicio Técnico Internacional de Cooperación Agrícola, a cooperative research service of the U.S. and Costa Rican governments. However, it was not until nearly 20 years later, in 1979, that the Costa Rican government launched DAISA (Desarrollo Agrícola Industrial, S.A.), a melon growing and exporting venture in Guanacaste. After only three seasons, DAISA failed because of inadequate technology and other problems.

Yet the possibility of growing melons for export continued to intrigue Guanacaste farmers who were looking for a crop that would bring them a greater profit in the dry season. One farmer, John Brealey (of English descent), began to conduct melon trials to identify the technology required to grow melons in Guanacaste. He also entered a partnership with his uncle to form an export company (EXPORPACK). After studying the sales agent market, Brealey selected CAPINC, Dave Warren's company, to be EXPORPACK's sales agent, based largely on that company's technical support program. While Brealey left this partnership in 1988, EXPORPACK continues as a successful business, and Brealey has started a new melon growing and exporting operation. When Brealey was starting his first melon exporting venture, Guanacaste farmers looked on with interest. Many farmers asked Brealey for assistance but he was reluctant to do so while he was still learning how to grow and export melons.

Consequently, several farmers requested the USAID/Costa Rica-funded export promotion organization (CAAP) for assistance in learning how to grow and export melons. CAAP, with technical assistance from PROEXAG (post-harvest handling specialist John Guy Smith and marketing specialist Ricardo Frohmader), organized a pilot melon project to work with seven growers who each planted 2-3 hectares during the 87/88 season. For that first season, the growers sold their melons to EXPORPACK, and approximately 110 trailers were exported, surpassing the farmers' goals of about 70 trailers. For the 88/89 season, the project helped the growers to identify three potential marketing agents and to evaluate each agent's proposed deal. As a result, the growers decided to sell their melons to United Fruit (Chiquita), although they insisted that Chiquita buy the melons on a fixed price basis. When the growers saw that United Fruit could sell the melons at a much higher price than they had accepted, they decided for the 89/90 season to abandon the fixed price option and accept United Fruit's offer to sell the grower's melons on consignment.

During this same period, another group of farmers and business entrepreneurs was learning how to grow and export melons. This group is comprised of growers (e.g., Jose Antonio Urgelles of Frutas de Parrita and Marco Tulio Bonilla of Melones de Costa Rica) who are producing melons using a drip irrigation systems sold by an Israeli company (Ravit). The impetus for this group of growers came from Jay Nichols Inc., a U.S.-based produce marketing firm seeking to expand its melon sourcing in Central America. Jay Nichols Inc. approached farmers with a proposal that they grow melons for export by Jay Nichols Inc. Under the proposed arrangement, Jay Nichols Inc. would enter into joint ventures with the growers, assisting them in acquiring the needed technology, including the drip irrigation systems sold by Ravit. In turn, growers would consign their melons to Jay Nichols Inc., with profits being split between the partners.

Where the earlier Costa Rican growers (e.g., Brealey) took several seasons to adapt and learn the technology for growing melons for export, these later growers acquired the technology fairly quickly and began to increase the areas planted and the number of boxes exported. It should be noted that these growers were all independent farmers (or businessmen) who could obtain capital from within their families or businesses or could provide the collateral needed to obtain bank loans. Further, they were well educated and cosmopolitan (knew English, had traveled to other countries, etc.). Most had studied in other countries (e.g., Zamorano in Honduras or undergraduate degrees from universities in the U.S. or Mexico). These entrepreneurs were not small farmers or agrarian reform peasants.

Another multinational (Del Monte) came on the scene in 1988. Del Monte had decided to expand its line of tropical products beyond bananas and pineapples, in effect, to diversify its product line to include melons, asparagus, and berries. But Del Monte's tact to enter the melon export business was to buy a company already in the business. Accordingly, Del Monte purchased Jay Nichols Inc., with the result that Del Monte became a joint venture partner with the growers who previously were exporting their melons through Jay Nichols Inc. In 1989, Jay Nichols and Del Monte separated; now Del Monte works with about five farmers.

But the story of the development of the Costa Rica's melon export industry would not be complete without briefly commenting on two other growers. The first, Melones del Pacífico, grew out of the desire of MATRA, a company selling imported goods, to look for new profit-earning opportunities and to ensure that the company would not ever find itself in a position of not being able to access dollars (a problem that exists for businessmen in Ecuador and Honduras).

Having seen the success of Melones de Costa Rica during the 87/88 season, MATRA decided in 1988 to invest in growing melons for export. MATRA created Melones del Pacífico, a subsidiary that grew and exported melons for the first time during the 88/89 season. The company's initial success prompted a decision to expand. While preparing to expand the company's melon growing operations for the 89/90 season, MATRA realized that the company had ventured into an area completely beyond MATRA's expertise; the company's basic activity is not in agriculture. Also, the manager of Melones del Pacífico (Mario Castillo) admits that he knows little to nothing about agriculture. This realization led to a decision to sell the venture to Melones de Costa Rica, a firm that already had grown and exported melons during several seasons. Thus, the fear of a potential failure provided one of the incentives for MATRA to sell Melones del Pacífico to Melones de Costa Rica.

But another company (Tico Melon) was not able to get out before disaster struck. Tico Melon is a subsidiary of the largest poultry business (Pipasa) in Costa Rica. Pipasa was approached by ACA (the same company previously discussed in the case of COAGROVAL in Honduras) in 1988. ACA proposed that Pipasa and ACA enter into a joint venture to grow and export melons. While Pipasa knew nothing about growing or exporting melons, ACA promised to provide the needed technology, and Pipasa created a subsidiary called Tico Melon. ACA provided the technology to Tico Melon through a melon expert from California's Imperial Valley, who was presented to Tico Melon as the "dios de los melones" ("the god of the melons").

But the technology proved disastrously unsuitable, with Tico Melon losing 75% of the melon plants the first (88/89) season. Just as imported California melon technology had failed John Guy Smith in Guatemala in the 72/73 season, so too imported technology failed Tico Melon 16 years later in the 88/89 season. Also, while Tico Melon exported some melons, ACA never returned to Tico Melon any returns on their sale. While Tico Melon's manager was able to identify why the technology had not worked, the losses from that first (88/89) season left Tico Melon in a position of not knowing whether the company will plant melons for the 89/90 season. Tico Melon's fiasco resulted from incompetence--both corporate (ACA didn't understand the produce business) and individual (ACA's melon "expert" just didn't know how to produce melons in Central America).

B. Critical Tasks in Achieving Success in Non-Traditional Agricultural Exports

What emerges from this brief review of the development of the melon exporting industry in Honduras, Guatemala, and Costa Rica is a picture of a dynamic process involving basically two actors: (1) firms such as the multinationals or independent sales agents in the U.S. that seek sources of supply of melons for the U.S. market; and (2) entrepreneurs (farmers or businessmen) who seek markets for the melons they grow or export. On the demand side, importers seek top quality melons at the lowest possible cost, without having to assume the production risks (weather, insects, diseases, etc.) growers face. However, in many cases, importers (sales agents) will assist growers with technical assistance (to solve production problems) and/or advances (cash or inputs). On the supply side, growers and exporters seek to capture as much as possible of the value added to the melons by virtue of packing, shipping, and selling them in destination markets. Yet, on the demand side, importers have relatively little control over the production of the melons; while, on the supply side, growers and exporters have relatively little control over the marketing of the melons.

The net result is that each party--albeit the importer or the grower-cum-exporter--seeks to strike a deal that is judged by each party to be beneficial, given each party's objectives (e.g., earn profits) and the party's ability and willingness to assume the associated risks. The lesson of this dynamic process is that (1) not all growers are equally capable of producing a quality product for export, and (2) not all receivers are equally capable of receiving and marketing produce. In other words, growers and receivers often fail in their basic economic function. Further, not all parties are equally skilled in making good deals. There is always a risk that a bad deal will be made because one of the parties may lack the knowledge and experience required to know, with certainty and confidence, which deals are good and which, being bad, should be avoided. In each country reviewed, entrepreneurs who lacked the needed knowledge and experience to grow and export melons had to acquire this knowledge and experience. They had to learn how to solve various problems, some specific to growing and exporting melons, most probably generic to exporting any non-traditional crop.

By identifying these problems, as well as the process(es) through which entrepreneurs learned how to solve these problems, one can begin to focus on areas in which development assistance can most effectively serve to stimulate entrepreneurs to learn how to grow and export non-traditional crops. Based on the history of melon exporting in Honduras, Guatemala, and Costa Rica, there are basically four problems that an entrepreneur needs to learn how to solve in order to grow and export a non-traditional crop successfully. These problems are summarized in Box 1.

Further, there is a sequence of steps that the entrepreneur must learn in order to grow and export successfully a non-traditional crop. At each step, problems must be solved or constraints overcome. Failure to solve any of these problems or to overcome any of these constraints likely will spell DISASTER! Thus, if an entrepreneur is to be successful in growing and exporting melons, he must work out every step in the process and be prepared to deal with any problem or constraint that might arise. Several persons interviewed indicated that, given the complexity of the task, an entrepreneur needs at least four or five years to learn how to grow and export melons successfully. Yet, a mistake made at any of the steps along the way, during any one of those years, can put the aspiring melon entrepreneur out of business.

Box 1. Critical Tasks in Achieving Success in Non-Traditional Agricultural Exports.

* Identifying Market Opportunities and Comparative Advantage

What crop should I export?

* Identifying the Right Technology

What production and post-harvest technology is needed to grow and export the crop I choose to export?

* Gearing Production to a Specific Market

How do I sell the product to (or through) a sales agent in a selected market and transport the product to that market?

* Keeping Production in the Melon Patch in Step with the Demand in the Market Place

What changes may be occurring in:

- production and/or post-harvest technology?
- transportation technology available (routes, carriers, schedules, and implications for production and post-harvest handling)?
- destination markets (geographical location, product preferences, and handling practices in the marketing chain)?
- the policy (including regulatory) environment, including destination markets and in the country where I will be growing the crop?

III. Learning Processes in Exporting

Each of the three countries reviewed (Honduras, Guatemala, and Costa Rica) varied in how quickly the country's melon exports grew. Also, within and across countries, entrepreneurs varied in terms of how early they got into melon exporting and how quickly they learned to grow and export melons. In the final analysis, some growers and exporters succeeded while others failed, with success or, as the case may be, failure having come more quickly for some than others. At times successes followed initial failures. Yet, as recently as the 88/89 season, one may observe growers and exporters who are on the verge of failure.

This prompts the question: "Why do some succeed, where others fail?" While there may be competing explanations, this paper offers one hypothesis, namely, that, for various reasons, some persons (or firms) are better able to learn how to grow and export a new crop (such as melons) than others. Paraphrasing John Houseman's commercial for Smith Barney, the former class of entrepreneurs "make their money (success) the old-fashioned way: They learn it!"

If the process of learning how to export is a key element in determining whether an individual or firm will be successful in growing and exporting melons, then facilitating or accelerating this learning process potentially could have a significant impact on the speed at which entrepreneurs are able to learn how to grow and export non-traditional agricultural crops successfully.

Based on the case studies of successful (and not so successful) melon growers and exporters, Figure 4 proposes a typology of learning processes that appear to have played a role in helping Central American entrepreneurs to learn how to successfully grow and export melons. The typology is loosely based on the idea of a learning curve, as illustrated in Figure 4.

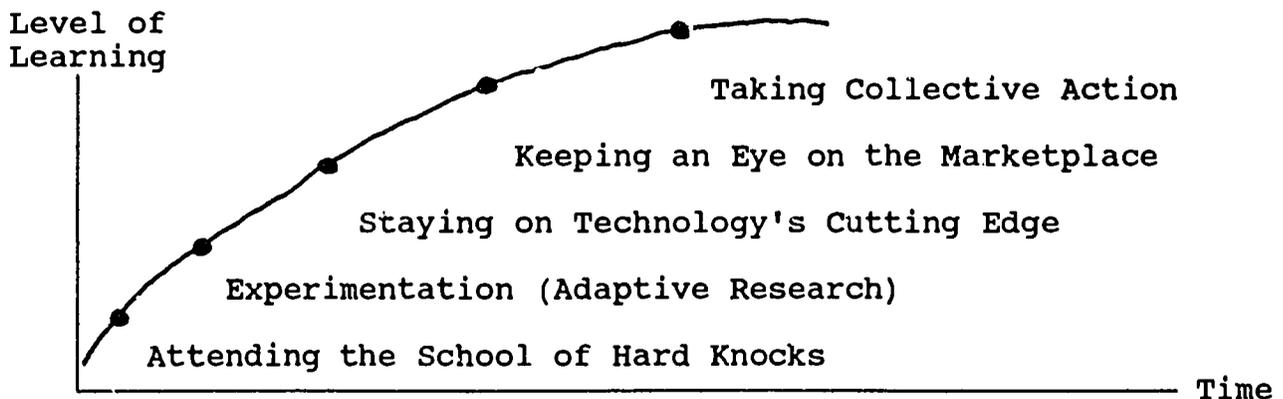


Figure 4. A Typology of Learning Processes Impacting on Export Learning by Entrepreneurs.

The typology outlined in Figure 4 posits five learning processes that appear to have operated as entrepreneurs proceeded to learn how to grow and export melons. These five learning processes are described by the following:

- * Attending the School of Hard Knocks
- * Experimentation (Adaptive Research)
- * Staying on Technology's Cutting Edge
- * Keeping an Eye on the Marketplace
- * Taking Collective Action

In the following, evidence of the operation of these learning processes will be illustrated by reference to the experience of specific growers and exporters interviewed for this study. Space limitations preclude lengthy elaboration of examples.¹⁰

A. Attending the School of Hard Knocks

When one hears, in one interview after another, references to learning by "golpes duros" ("hard knocks"), it doesn't take long to realize that many growers and exporters learned their lessons in the "school of hard knocks." Now, this learning process has its advantages where the learner is aware, up front, that he is proceeding in a "learning by doing" mode, that he is following a "trial and error" approach, and that adequate precautions have been taken that this approach will not result in disaster. Even where a mistake is made, a person who has learned something useful from the mistake can look back and say, as respondents did, that "experience was the best teacher." But where a farmer lacks the requisite expertise, he may too late discover that he has been working with the wrong entrepreneur, the wrong technology, or the wrong sales agent.

¹⁰There is no doubt that individual capacity to learn is a critical factor in starting and running an NTAE business, whether it is melons or any other crop. However, it should be noted that individual capacity to learn is only one potential determinant of success, and the case studies on which this report is based cannot prove that capacity to learn is the most important success determinant. Other studies of entrepreneurship have focused on personality traits (e.g., achievement orientation, the need for self-realization, desire for control or power, etc.), business context (e.g., trends in a given industry, general economic trends, lack of alternatives), and support systems and structures (e.g., policy environment, social infrastructure).

The Wrong Entrepreneur--A clear example of the failure of growers to link up with the right entrepreneur (exporter) occurred in 1982 in Costa Rica, when the government's DAISA operation failed because of the lack of appropriate melon growing technology and a lack of experience in terms of knowing how to export melons.

The Wrong Technology--Examples of a novice grower or exporter working with the wrong technology may be seen as early as 1972 in Guatemala, when John Guy Smith found that imported California technology didn't work in Zacapa; and as recently as 1989 in Costa Rica, when Tico Melon found ACA's "dios de los melones" did not know how to grow melons in Guanacaste's heavy soils.

The Wrong Sales Agent--In 1987 in Honduras, FEPROEXAAH linked COAGROVAL up with an inexperienced sales agent (ACA), despite the advice of PROEXAG not to go ahead with the deal. In 1988 in Costa Rica, Tico Melon agreed to acquire its melon technology from ACA, despite a warning by CAAP that melons should not be planted in the heavy soils of Tico Melon's farm.

Learning by "attending the school of hard knocks" has pitfalls, particularly when the novice is caught up in a situation where "the blind are leading the blind" or becomes a victim of "funny bunnies." In the former case, the novice makes the mistake of placing himself at the mercy of others who lack technical knowledge or experience to be of any real assistance. In the latter case (i.e., "funny bunnies"), the novice finds all too late that the vested interests of others took priority over those of the grower or exporter, with the result that others have gained but not the grower or exporter.

B. Experimentation (Adaptive Research)

This approach to learning how to grow and export melons is more systematic than simple "learning by doing" in that it takes a rational or scientific approach to what otherwise might be nothing more than random "trial and error." In this approach, the entrepreneur takes a deliberately cautious approach to working out the steps required to successfully grow and then export a crop.

In the case of Guatemala, Dave Warren took a careful approach to starting up the growing (CAPCO) and importing (CAPINC) sides of his melon exporting venture. He traced out each link in the growing and exporting chain, and then took steps to ensure that no problem or constraint would become an obstacle to success. This is not to say that he didn't make mistakes or encounter failures along the way; however, it is to say that he approached the problem with a philosophy that predisposed him to be ready to deal with obstacles as they arose. In Costa Rica, Brealey also followed a cautious approach to nail down the technology required to make his growing and exporting venture (EXPORPACK) a success.

This learning process also was used by PROEXAG in assisting CAAP to work with the Costa Rican farmers who wanted to export melons. PROEXAG's John Guy Smith (post-harvest technology specialist) advised CAAP to work with a small number of farmers, with each farmer planting only 2-3 hectares. Smith assisted growers in identifying each step of the production and post-harvest handling process that the growers would need to follow, and CAAP's melon specialist worked closely with growers during their first season. Also, PROEXAG marketing specialist Ricardo Frohmader assisted the growers in contacting potential sales agents and evaluating the deals proposed by the agents, with the growers finally deciding to sell their melons to Chiquita.

A clearer example of this learning process (experimentation) would be a formal adaptive research program on melons. Normally, such a program might be conducted by a public organization having a mandate to carry out research to support a country's agricultural development. But this type of research was not being carried out on melons by any public organization (government or university) in any of the three countries reviewed.¹¹

But the Central American region does provide examples where the private sector financed adaptive research on melons as an NTAE crop. A first example is the adaptive research program on melons financed by United Fruit in Honduras, where PATSA launched a series of research trials on melon that drew on the scientific talent available at the company's La Lima banana research station. The initial program was carried out over at least four years, with technological spinoffs to other countries where United Fruit sources melons--Promotora Agrícola Básico in Guatemala, and Chiquita Tropical Products Company in Costa Rica.

¹¹In Honduras, the Fundación Hondureña de Investigación Agrícola (FHIA), a USAID/Honduras-supported private research organization, has conducted a limited amount of research on melons, mainly in Comayagua, but also in La Lima, La Entrada, and Choluteca, as a part of FHIA's vegetable research program. However, as FHIA's Director General clarifies, FHIA has not included melons among the organization's top priorities for centrally-funded research

because the growers already were obtaining technical assistance from U.S. expertise with satisfactory results so there was no reason [for] FHIA to spend its resources for that purpose. On the other hand, we did offer the growers our help to solve researchable problems at a fee to cover costs and they refused. ...when they feel the need they will finance the research[,] something that would be in line with FHIA's plans for sustainability (Fernando Fernández, personal communication).

A second example was the series of melon trials that Warren conducted during CAPCO's early years in Zacapa (Guatemala). In support of these trials, Warren hired a plant breeder (Dr. Mayo Correa) to visit Guatemala periodically to assist in designing and carrying out trials to determine the technology required to increase the productivity of growing melons in Zacapa.

C. Staying on Technology's Cutting Edge

This method of learning entails judicious investment in one or more of three methods of acquiring technology, knowledge, or information: (1) buying the technology; (2) buying technical expertise; and (3) consulting with specialists.

Buying the Technology--Suppliers of specialized technology (e.g., drip irrigation equipment, hybrid seed) have a vested interest in ensuring that customers are satisfied and will return for repeat purchases. In the case of Del Monte's growers, all of whom use the drip irrigation system sold by an Israeli company (Ravit), Ravit's sales representatives (Israeli) and Del Monte agronomists (both Israeli & Costa Rican) assist growers in learning how to grow melons using the drip irrigation technology properly. As another example, suppliers of hybrid seed, which a grower must buy each season, organize tours for growers to visit the company's seed producing facilities in the U.S. (e.g., Tico Melon's Rudiger Lohrengel visited Petoseed in Texas).

Buying Technical Expertise--While working with Central American Produce Inc. (CAPINC), Ricardo Frohmader set up a system to provide CAPCO growers with access to specialists (e.g., in soil fertility) hired by CAPINC on a retainer basis. Three of these consultants came to be known among CAPCO growers as "los tres sabios" ("the three wise men"). The consultants assist growers each season in solving technical production problems, with the cost of this assistance being shared between the growers and CAPINC. CAPINC charges a 12% commission on sales, with 2% of this fee being used to cover the cost of retaining consultants and paying for their international travel between their Florida residences and the country where growers are assisted. The growers cover the cost of food, lodging, and local transport during a consultant's stay in-country.

Consulting with Technical Specialists--Larger independent growers (e.g., Ricardo Alfaro, Agrícola La Aurora, Guatemala) and management personnel of companies (e.g., Rudiger Lohrengel, Tico Melon, Costa Rica) travel on occasion to Texas and California to consult with university-based scientists who have developed specialized expertise in melon growing. During 1987, melon packing house managers from the Central American region went to California to learn grading, packing, and quality control through a hands-on training program organized by AID/ROCAP's Non-Traditional Export Support Project (PROEXAG) in collaboration with Lindemann Farms.

D. Keeping an Eye on the Market

This learning process entails three components: (1) informal searching for market information; (2) formal searching for market information; and (3) acquiring market information through feedback on the results of decisions made by the grower or exporter.

Informal Searching for Market Information--Potential growers or exporters looking into the possibility of growing and exporting an NTAE crop engage in a process of looking around at what other farmers are growing in their own country (or other countries). This process also occurs when potential growers or exporters attend export promotion meetings (e.g., yearly CBI conference), where they can establish contact with potential business clients. Carlos Rodriguez of CREHSUL first met John Williams (working with a sales agent named Tavilla), at the CBI conference; CREHSUL subsequently began exporting melons to Tavilla Marketing.

During the process of informal searching, the information seeker may be employed in a field other than agriculture but yet looking at growing a non-traditional crop for export. Thus, informal searching can be an important means of acquiring information when the potential grower-cum-exporter is trying to decide which NTAE crop offers the most promising prospects for earning a profit, given the agricultural resource base to which that entrepreneur has access. Examples of entrepreneurs involved in such an informal search process include John Guy Smith (Básico) in the early 1970s in Guatemala, Rolando Pretto in the early 1980s in Honduras, and MATRA in the late 1980s in Costa Rica.

Alternatively, potential melon grower-cum-exporters already may be growing traditional crops (e.g., rice) and be searching for alternative crops that have higher profit potential. This was the case with all of the growers in Guanacaste, Costa Rica (from John Brealey in the late 1970s to Alfredo Apéstegui in the late 80s). Similarly, a potential exporter of one NTAE crop already may be growing another NTAE crop and be looking either for a more profitable crop or simply to diversify operations. An example of such an exporter is Productos Frescos (Chuck Chambers who switched from ornamentals to melons).

Formal Searching for Market Information--This process occurs at both the individual (entrepreneur) and institutional levels. To illustrate the former, an exporter might contract a study to identify potential sales agents, develop agent selection criteria, screen the agents against the identified criteria, and decide on the agent that best meets the agent selection criteria. This was done by EXPORPACK's John Brealey who hired a consultant to conduct a agent selection study. As a result, Brealey decided to work with Dave Warren's CAPINC in Florida.

Search for market information also may be facilitated at the institutional level, although sometimes with less than favorable results. For example, in Honduras, FHIA conducted a market study to identify the crops on which to focus FHIA's research program. But melons were not identified as a crop for priority research. This has disappointed melon growers who believe that there is a need for specialized melon research in several problem areas (e.g., fertility, insect control, fungus and disease control).

A positive example of the search for market information at the institutional level is PROEXAG. This project searches for data on the export melon market and draws upon this resource in working with PROEXAG's clients, who range from individual growers such as Ricardo Alfaro in Guatemala and Miguel Molina in Honduras to institutions such as CAAP in Costa Rica.

Acquiring Feedback on Results of Decisions Made--This process occurs as decisions are made, results observed, and future courses of action defined. This is a form of "learning by doing." But the process is facilitated to the extent that the exporter already knows how to grow and export melons and/or is willing to take advantage of assistance available through the marketplace (e.g., drawing upon services and/or advice available through projects like PROEXAG or NTAE support organizations like CAAP). On the other hand, potential or actual exporters may fail to take advantage of these sources of technology, information, and expertise, or even may refuse to heed the advice of knowledgeable experts (e.g., Tico Melon ignoring CAAP's advice not to plant melons in heavy soils, or FEPROEXAAH and COAGROVAL failing to heed PROEXAG's advice not to work with ACA). Further, as melon growing and exporting firms become established, they develop and maintain ongoing links with information sources throughout the industry (e.g., sales agents). In all of the countries reviewed, this process increasingly is aided by modern communication facilities such as the telephone and facsimile machines.

E. Taking Collective Action

Many problems involved in developing a melon exporting venture can be solved by the individual grower-cum-exporter. But this is not the case for all problems. Some problems that growers or exporters face can only be solved collectively, that is, by the growers and/or exporters joining together to take collective action. Many of the growers in Honduras realized this early on and formed their own cooperative (CREHSUL) to enhance their bargaining position in selling exportable melons to PATSA and reject melons locally.

More recently, melon growers in the Central American region, faced by a shortage of transport came together from each of the countries in the Central American region to convince the Central American Liner Association to rescind a 10% increase in freight rates. In Honduras, the prior existence of APROEXMEH (Asociación Productores Exportadores de Melon de Honduras) was instrumental in helping this organization's member growers and exporters to form their position on the transport problem. A melon growers' association has now begun to emerge in Costa Rica, while some of the melon growers in Guatemala are affiliated with the Guild of Non-Traditional Product Exporters.

The learning processes discussed are summarized in Box 2.

Box 2. Learning Processes in NTAE Learning.

A. Attending the School of Hard Knocks

Learning you are the "wrong entrepreneur"
 Learning you are using the "wrong technology"
 Learning you have the "wrong sales agent"

B. Experimentation (Adaptive Research)

Trials conducted by a grower
 Trials conducted by a commercial firm
 Trials conducted by a research institution

C. Staying on Technology's Cutting Edge

Buying the Technology
 Buying Technical Expertise
 Consulting with Technical Specialists

D. Keeping an Eye on the Market

Informal Searching for Market Information
 Formal Searching for Market Information
 Acquiring Feedback on Results of Decisions Made

E. Taking Collective Action

Organizing into growers associations

F. Role of Learning Catalysts in Export Learning

Ideally, the role of A.I.D.-supported initiatives such as ROCAP's Non-Traditional Agricultural Export Support Project (PROEXAG) and A.I.D.-supported NTAE organizations (e.g., FEPROEXAAH in Honduras and CAAP in Costa Rica) is to accelerate the process of export learning by entrepreneurs. This can be achieved by helping growers and exporters to avoid having to learn their lessons the hard way and by increasing the speed at which they are able to identify the right production and post-harvest technology and to learn how to negotiate deals with sales agents. Further, as learning must be ongoing, a learning catalyst can assist growers and exporters in staying on technology's cutting edge, in keeping an eye on the changing marketplace, and in taking collective action on problems they cannot individually solve. Finally, a regionally-based learning catalyst (such as PROEXAG) can play a role in strengthening the ability of national-level organizations such as CAAP and FEPROEXAAH to play this catalyst role vis-a-vis growers and exporters of NTAE crops, especially after a project such as PROEXAG has ended.

Export learning catalysts can provide entrepreneurs with technology, knowledge, and information that increase the speed at which they learn how to grow and export NTAE crops. At the same time, such catalysts decrease the likelihood that an entrepreneur makes a disastrous mistake. If learning how to grow and export an NTAE crop normally would take the period of time indicated by curve A in Figure 5, the intervention of a learning catalyst should have the effect of shifting this curve upward (e.g., to curve B), whereby the grower-cum-exporter can move to a higher performance level (e.g., boxes of melon exported) in a shorter period of time. Over time the probability of success rises and risk of failure falls for later entrants into the industry. The export learning curve (B) rises and the risk of failure curve (D compared with C) falls more quickly relative to time because later entrants learn from what earlier entrants have done rather than repeating the same experiential trial and error learning. The accelerated learning that is possible for a later entrant as compared with an earlier entrant may be seen by comparing the slope of the Costa Rican melon export curve in Figure 3 with the slopes of the Honduran and Guatemalan melon export curves. Thus, the increment in melon exports achieved in about three years (86/87-88/89) by a later entrant (Costa Rica) took an earlier entrant (Honduras) about six years (81/82-87/88) or twice as long to achieve.

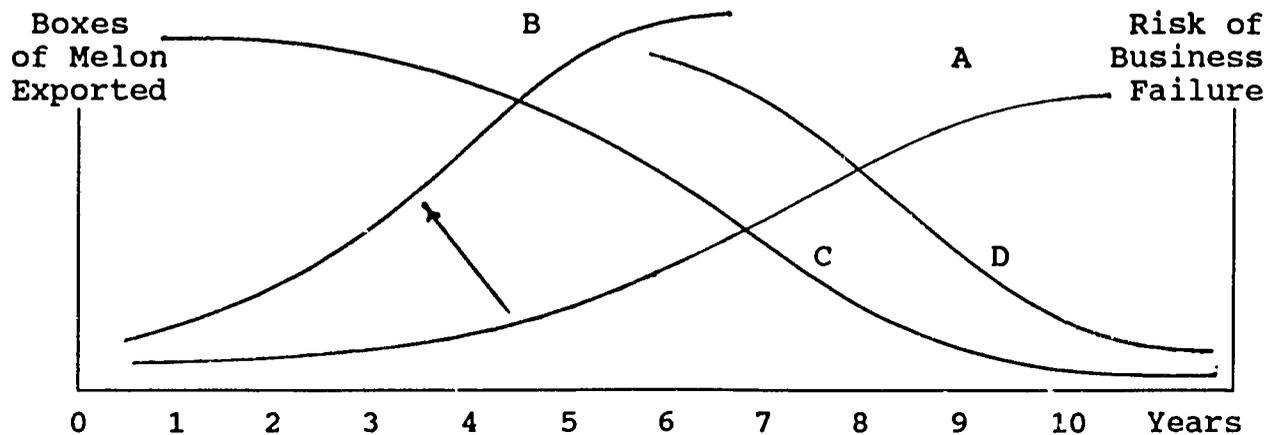


Figure 5. Theoretical Impact of a Learning Catalyst on the Export Learning Process and the Risk of Business Failure Faced by a Grower-cum-Exporter.

While the role of specific export support projects (PROEXAG) and export promotion organizations (FEPROEXAAH and CAAP) was not always immediately apparent in the interviews with respondents, there is clear evidence that PROEXAG, FEPROEXAAH, and CAAP have provided growers and exporters additional information sources in an environment where there are major obstacles to learning how to grow and export NTAE crops. First, in each of the countries reviewed, there is little or no public support for agricultural research on non-traditional crops. Specifically, there is almost a total lack of government or university support for research on melons. Second, with the exception of the few major independent sales agents (e.g., CAPINC) that have emerged, the melon export industry has been dominated by multinationals. As a result, an entrepreneur either could try to grow and export melons on his own or could export melons under contract to a multinational.

But the entrepreneur who attempted to learn on his own, without assistance of either a multinational, a major independent such as CAPINC), or more recently, a PROEXAG or an NTAE organization, ran the risk of encountering major difficulties. This has happened to COAGROVAL in Honduras, Productos Frescos in Guatemala, and Tico Melon in Costa Rica, largely because these grower-cum-exporters failed either to tap into knowledgeable information sources or to heed the advice that such sources tried to provide. By comparison, more successful growers in each of the countries have depended on multinationals (e.g., United Fruit) or independent sales agents (e.g., CAPINC) to acquire information, while the presence of a learning catalyst (an export support project such as PROEXAG or an export promotion organization such as CAAP) has served to increase the range of information sources available to entrepreneurs. As a result, during the past few years, melon entrepreneurs have been more readily able to access information needed to learn how to grow and export melons.

Annexes B and C provide illustrative, not exhaustive, lists of areas in which melon growers or exporters and country-level NTAE programs (FEPROEXAAH and CAAP) have been able to gain access to needed information from PROEXAG over the past three years (1987-89).¹² It is conceivable that specific kinds of information within any of the areas listed in Annex B could be provided by firms in a competitive information market. But such a competitive market in the Central American context is at best only in an incipient stage, with information generally provided by an organization directly involved in melon marketing (e.g., United Fruit or CAPINC). These businesses, which developed over time and are now well established, have a vested interest in ensuring that the information needs of client growers are well served. But this has not been the case with other information sources, such as ACA or the early FEPROEXAAH, that were inexperienced and lacked the specialized expertise needed by grower-cum-exporters.

On the other hand, learning catalysts such as PROEXAG or CAAP have recognized that the information needs of entrepreneurs will vary depending on the stage of evolution of the particular NTAE crop (Annex D) that a client is trying to grow for export. Thus, for example, where the melon industry is young (Costa Rica), PROEXAG and CAAP aimed their information services at helping new melon growers to learn how to grow melons for export. On the other hand, in countries where the melon export industry is well established (e.g., Guatemala and Honduras), PROEXAG has tailored its services to the more specialized information needs of growers and exporters (e.g., helping growers to negotiate a deal with Sun World to produce seedless watermelon for that firm).

Conceivably, as private sector firms directly involved in the melon export industry expand operations, they may develop ability to market information services to clients beyond their own growers. But these sources cannot serve all growers or exporters and some individuals or firms certainly may have reservations about assisting competitors. Here, A.I.D.-supported initiatives like PROEXAG and NTAE organizations can play a dual role. On the one hand, these initiatives can continue, in the short run, to be an alternative source of information for growers and exporters not linked to the multinationals or independent sales agents.

¹²PROEXAG provided the author with access to the project's files on technical assistance to clients in Honduras, Guatemala, and Costa Rica. Annex D, based on review of PROEXAG documents (trip reports, contact reports, FAXs) relating to the project's clients in these three countries, provides a list of areas in which PROEXAG has provided information services. Annex E, based on personal communication with PROEXAG chief of party John Lamb, provides specific examples of ways in which PROEXAG has helped specific project clients (i.e., melon growers and exporters).

On the other hand, an initiative like PROEXAG can focus some of its energy on institutionalizing its information services in appropriate organizational contexts. Some of the information services currently provided by PROEXAG eventually could be absorbed by an NTAE organization, a producer association, or a combination of these. For example, a melon grower association potentially could leverage sufficient resources (through a check off system on each box of melons exported) to be able to provide specialized information services or to contract a private sector firm (either an NTAE organization or another private enterprise) to provide the needed information service.

IV. Some Conclusions and Implications

At the outset, attention was directed to the dramatic increases in melon exports from Central America since 1983. It was noted that, while certain events (e.g., CBI) may have given an impetus to exports of melons and other NTAE crops, the dramatic increases in exports ultimately may be influenced as much, if not more, by events that occurred long before. One cannot discount that CBI played a role in creating or advertising an incentive for entrepreneurs to grow and export non-traditional crops. But the dramatic increases in melon exports would not have been possible without three conditions being in place: (1) a favorable macroeconomic and policy environment; (2) a pool of entrepreneurial talent; and (3) a market and technology base. Let's briefly review each of these requirements.

A. A Favorable Macroeconomic and Policy Environment

In each of the countries reviewed, the macroeconomic and policy environment (exchange rate policy, import tariff policy, investment incentives policy, etc.) conditions the incentive that the grower-cum-exporter has to invest in growing and exporting a non-traditional crop such as melons. For example, in each of the countries reviewed, an entrepreneur who wants to export a given crop (e.g., melons) can obtain a permit that provides an exemption from taxes on the import of inputs required to grow and export that crop. Each country varies in terms of the mix of policy-determined incentives and disincentives for investing in non-traditional agricultural exports.

Further, each country faces external transport constraints in terms of availability and affordability of timely and adequate transport to move cargo from packing sheds to ports, between ports, and between ports and destination markets. Also, while melon growing is a highly labor intensive crop, it also is highly demanding in terms of capital. For small farmers who have little or no collateral, the lack of access to capital sources (bank loans) is a constraint. This has particularly been a problem for smaller growers in Honduras and Guatemala.

Implication: In view of the importance of the macroeconomic and policy environment in determining an entrepreneur's incentive to invest in growing and exporting non-traditional crops, development assistance agencies should continue to work with host country governments to ensure the continued development of macroeconomic and policy environments that make it attractive and feasible for entrepreneurs to enter risky growing and exporting ventures in non-traditional crops.

B. A Pool of Entrepreneurial Talent

There is a saying in marketing that nothing happens until somebody sells something to somebody. This saying applies to launching an NTAE exporting venture--nothing will happen until some entrepreneur makes it happen. In other words, potential grower-cum-exporters are not going to invest in growing and exporting non-traditional agricultural crops until some entrepreneur shows that such a crop can be grown and exported successfully. Hence the importance of entrepreneurs (risk-takers) such as Ricardo Alfaro (El Salvador), John Guy Smith and Dave Warren (Guatemala), and John Brealey (Costa Rica). These individuals had a vision that they could grow and export melons and worked to make that vision a reality. They had a certain orientation as well as the determination and discipline to succeed. Finally, they were willing to take risks.¹³

The importance of human capital became clear in the course of talking with individuals such as Alfaro, Smith, Warren, and Brealey. With few exceptions, all of the growers-cum-exporters interviewed had backgrounds that proved to be influential in increasing the chances that they would be successful in growing and exporting an NTAE crop. Generally, respondents were fluent in English, had studied in universities in the United States or technology-oriented schools or universities in other countries (e.g., Zamorano in Honduras). Many had studied in fields (e.g., engineering) other than agriculture.

¹³Any of a number of factors may motivate an entrepreneur to invest in melon growing and exporting. Based on the biographies and case studies, as well as observations by John Lamb (personal communication), any of the following could be motivating factors: perception of opportunity to make a profit (especially a profit in dollars); desire to strike out in a different direction from the family business while staying within agriculture; desire to make use of idle land; diversification of crops within an agribusiness enterprise; desire to engage in off-season agriculture; desire to make a mark on the world; "getting on the bandwagon" of a prestigious new line of business; desire to take a risk (i.e., the "risk-taker" personality); and because it's fun and exciting! Pam Michel cites one grower-cum-exporter who gave as his reason: "Por la mística!" ("For the mystique!").

Implication: An important element in developing the capability to grow and export NTAE crops is getting entrepreneurs committed to learning how to grow and export these crops. The basic skill required is not so much a knowledge of agriculture but rather a task orientation that places a priority on succeeding in whatever you set out to do. Even if only one entrepreneur can demonstrate that a crop can be successfully grown and exported, this will attract others to growing and exporting ventures for the same crop.

There is no simple formula to follow to create entrepreneurs! However, a development assistance program can facilitate entrepreneurial access to knowledge and information about growing, packing, and exporting NTAE crops. Facilitating such access reduces actual and perceived costs and risks of entry to the industry, thereby increasing the incentive for entrepreneurs to enter the market. It also increases the chances that entrepreneurs will succeed in the risk-taking ventures in which they invest.

This study identified five learning processes that impact on the rate at which entrepreneurs learn how to export. The learning process can be accelerated by improving the entrepreneur's access to information sources that facilitate experimentation (adaptive research), staying on technology's cutting edge, keeping an eye on the market, and taking collective action. Information sources that can support export learning include:

- Export development support projects (e.g., PROEXAG)
- NTAE organizations (e.g., FEPROEXAAH, CAAP)
- Adaptive research organizations (e.g., FHIA, ICTA)
- Universities (e.g., export business courses)
- Multinationals (e.g., United Fruit, Del Monte)
- Independent sales agents (e.g., CAPINC)
- Transport companies (e.g., CCT, Seaboard, Sea-Land)
- Cooperatives (e.g., CREHSUL, COAGROVAL)
- Producer associations (e.g., APROEXMEH)
- Independent growers (e.g., Molina, Alfaro, Brealey)
- Equipment vendors (e.g., for irrigation, for packing)
- Input vendors (e.g., seed, fertilizers)
- Projects to strengthen farmer organizations.

Each source can provide some of the information an entrepreneur may require in order to learn how to grow and export a non-traditional crop; few, if any, sources can provide all the information needed. Since information is not a free good, the entrepreneur faces the additional problem of how to acquire information most efficiently. If the entrepreneur seeks to remain independent, he does so at the risk that he may fail before ever learning how to succeed. On the other hand, if he cuts a deal with a multinational, he may learn quickly how to export but, in the interim, will need to accept a level of returns below the maximum return, with the difference being the cut that the multinational requires for services rendered and an acceptable profit on those services.

The important point to recognize is that an integrated system of technology transfer has been established in terms of a number of ongoing relationships between growers, exporters, and sales agents. On the side of the multinationals, United Fruit as a buyer and importer of melons has deals with melon growers or exporters in all three countries (PATSA in Honduras, Básico in Guatemala, and Chiquita in Costa Rica). On the side of the independents, Dave Warren's CAPINC has deals with melon growers in each of the three countries (EXPORPACK in Costa Rica, CAPCO and Productos Frescos in Guatemala, and Agropecuaria Montelíbano in Honduras). In terms of facilitating export learning, these deals provide a framework within which there are incentives for transferring production technology and market information to growers. Development assistance agencies should seek to strengthen the capability of this system to facilitate export learning among a broader range of potential participants.

C. A Market and Technology Base

The increased exports of melons from Central America to the U.S. obviously could not have happened without the U.S. demand for melons. The existence of a market is essential if an entrepreneur is going to export any non-traditional crop successfully. Further, growers-cum-exporters obviously need to establish market links with sales agent who can sell the crop in destination markets. But this is only part of the battle; the other part is nailing down the technology needed to grow and export the crop. As one A.I.D. official notes, "NTAE technology has thus far been borrowed from other regions and adapted by private producers, often with considerable financial losses on the part of producers" (conversation with Gale Rozell).

Thus, the history of Central America's melon export industry suggests that continuing successful development of an NTAE market will depend on growers having access to improved technology. As the melon case also shows, the required technology evolved over a relatively long period, and is still being developed and refined. A key element has been ongoing adaptive research that began in Honduras as early as 1957. This was given a major impetus by United Fruit in the mid-1970s. During the late 1970s, Dave Warren conducted extensive melon trials in Guatemala, building on the early 1970s' melon growing experience of John Guy Smith.

Despite the importance of adaptive research, the long period of time required to develop and adapt melon growing technology, and the continuing problems (e.g., pre- and post-harvest pest and disease management) such research could solve, formal adaptive research on melons currently does not exist in any of the countries reviewed. More generally, a recent cross-cutting evaluation of agricultural crop diversification and export promotion also noted the lack of ongoing adaptive research in the Central American region:

Research and extension are the essential foundation for long-term successful agronomic performance in any agricultural system, especially in a non-traditional system. Strong, ongoing research and extension programs were not in evidence in any of the A.I.D.-supported countries studied by the team. Nor, for the most part, were such programs satisfactorily contemplated or integrated in the A.I.D. projects under review (Lack et al., 1989, III-25). . . .

The host countries' and A.I.D.'s partial answer to inadequate and insufficient research...has been to contract consultants to identify and act on [crop diversification/non-traditional agricultural export] initiatives and problems. While in no way a satisfactory substitute for ongoing research and extension, this approach is not unreasonable. What is unreasonable is the belief that a "complement" of short-term consultants can provide sufficient, enduring input, much less influence the future of research and extension in the host countries (Lack et al., 1989, III-26-27).

A.I.D. will not be operating forever in most countries, much less will it be continuing its current level of support for [crop diversification/non-traditional agricultural exports]. Host country public sector institutions responsible for research, however, will continue to function. A.I.D. should make every effort now to help them to function effectively (Lack et al., 1989, III-27).

However, whether research capability is to be developed in the public or private sectors, the point is that it takes resources and time to carry out productive adaptive research; yet little attention is being addressed in Central America to allocating resources and time to adapt technology for NTAE crops. As Gale Rozell (personal communication) notes: "This new [NTAE] industry cannot survive without indigenous agronomic support capable of identifying and remedying diseases, pest infestations, and productivity constraints." Even where an NTAE technology has been developed, a period of time will be needed to adapt that technology to the growing environment, and a novice grower-cum-exporter likely will need time (from several seasons to several years) to learn how to grow and export the crop successfully.

As Central America moves into the 1990s, the region faces a much more favorable market base in terms of market demand and established market links than was the case when the region moved into the 1960s. Also, there is drastically improved communication (e.g., FAX machines) and transportation (e.g., ocean and air freight) infrastructure. What has not progressed anywhere near as rapidly has been the region's ability to develop and adapt the technology required to grow NTAE crops successfully.

The lack of strong public sector or even private sector adaptive research programs for non-traditional crops has meant that entrepreneurs interested in growing and exporting these crops (e.g., asparagus) have had to make their own investments in the adaptive research required to identify the technology to grow such crops in the agro-climatic conditions of Central America. Given the lack of appropriately identified technology for growing asparagus in Guatemala, PROEXAG has undertaken adaptive research trials in collaboration with private sector farmers interested in growing this crop for export. But despite the many production problems (fertilization, irrigation, disease and pest control) faced by the region's melon grower-cum-exporters, a comparable adaptive research program for melons has yet to emerge. Indeed, at the time this study was conducted, melons were not even included in the applied or adaptive research program of the private Honduran Agricultural Research Foundation (FHIA).

One cannot deny the importance which technology development and adaptation played in the development of Central America's melon export industry. The recent dramatic increases in melon exports from the Central American region is based on a long history of adaptive research to develop the required technology for growing melons successfully. A similar takeoff in other NTAE crops is unlikely without the development of appropriate technology, and this is unlikely without long-term support for adaptive research. Hence, in the absence of public or private research to develop and adapt the technology needed to grow other NTAE crops successfully in the Central American region, it is doubtful that a takeoff in exports, similar to that for melons during the past five years or so, will occur any time soon.

A takeoff in exports of non-traditional crops cannot be launched simply by importing the required technology. The required technology for growing any NTAE crop successfully must be sensitive to the agro-climatic conditions of the region or even the specific farm on which the crop is to be grown. Adaptive research is needed to adjust the technology to the growing environment's agro-climatic realities, and this requires time. Even if imported, the technology must be tested and adapted; and this is not necessarily carried out most efficiently by simply following the informal approach to technology adaptation that largely characterized the development of Central America's melon export industry.

There is a potential role for public sector research to play in carrying out research on NTAE crops. This has been recognized to a limited extent by the Asian Vegetable Research and Development Center (AVRDC), in the emerging mandates of regional agricultural research centers (CATIE in Costa Rica and CARDI in the Eastern Caribbean), and in a proposal to the Consultative Group on International Agricultural Research (CGIAR) for an International Vegetable Research Institute (Winrock International, 1986).

However, research on non-traditional agricultural export (NTAE) crops generally has not fallen within the traditional mandate of either the International Agricultural Research Centers (IARCs) or National Agricultural Research Systems (NARS). In general, the donor community continues to target funding support for agricultural research on basic food crops, this being facilitated by the creation and functioning of the CGIAR, through the CGIAR's role in marshaling and coordinating donor funding for agricultural research on basic food crops. But no comparable group has been created to marshal and coordinate funding for research on non-traditional agricultural export (NTAE) crops.

In the LAC region A.I.D. has been reallocating its resources away from the support of research on traditional food crops for domestic consumption and toward research on NTAE crops that can earn foreign exchange. But there is uncertainty about whether this approach, in the long run, will contribute to or be counter-productive to A.I.D.'s stated development assistance goal--"to increase the income of the poor majority and expand the availability and consumption of food, while maintaining and enhancing the natural resource base." Specifically, it is not clear how quickly or extensively smaller farmers will be able to begin to share in the income stream from growing and exporting non-traditional crops.

On the other hand, there is a growing global market for horticultural exports from the developing countries (Islam, 1990). Also, there is some evidence that NTAE crops hold potential as a means whereby small farmers can increase their income-earning potential (von Braun, et al., 1989) beyond that possible with the traditional food crops that usually comprise the agenda of most IARC and NARS research programs. Overall, donors such as A.I.D. that seek to stimulate development of NTAE crops can help to make this a reality by facilitating, over the long run, coordinated development of public and/or private adaptive research on NTAE crops. As noted by the cross-cutting evaluation (Lack et al., 1989), continued NTAE growth requires a long-term strategy appropriately emphasizing adaptive research, training, and technical assistance. Lessons learned from countries (e.g., Chile and Mexico) that have experienced success with NTAE crops reconfirm the need for long-term (30 years or more) support to ensure developing sustained success.

The private sector will, to a limited extent, take on some of the research challenges, namely, those offering potential for profit through the sale of inputs (e.g., seeds) that embody the technology developed through research. However, the private sector will not take on all of the research that may be needed, especially on problems requiring more applied or basic research (e.g., collection and preservation of germplasm).

These considerations raise questions that merit consideration in discussions aimed at strategy formulation for agricultural and rural development, including:

1. To what extent is smallholder production of NTAE crops dependent on the farmer first being able to increase yields (i.e., productivity) of traditional food crops?
2. Where there is potential for smallholder producers of traditional food crops to grow and export NTAE crops, should the mandates of the IARCs and NARS be broadened to authorize a greater allocation of public resources for research aimed at tapping this potential?
3. How can agricultural research on NTAE crops be more effectively funded, implemented, and coordinated in a manner consistent with farmer needs, market opportunities, and existing public and private sector structures for carrying out agricultural technology generation and transfer?

E. Potential and Limits of a Learning Catalyst

The evidence reviewed suggests that the technology generation and adaptation process involved in acquiring the technology to grow and export melons successfully was extremely difficult. The process began in the early 1960s; by the time A.I.D. became involved in NTAE crops, the process was already well developed. This made it possible for the export promotion projects and export promotion organizations providing technical assistance and training to build on what had already been achieved in terms of technology generation and transfer for melon growing and exporting. But the acceleration in export learning was not achieved simply by establishing export support projects or export promotion organizations to provide training and technical assistance to entrepreneurs who wanted to learn how to grow and export melons.

Indeed, if technical assistance is to be useful to entrepreneurs who seek to export a non-traditional crop, it must be provided by persons or organizations having practical growing and exporting experience. Ideally, the technical assistance must be provided by persons who already have proven they can grow and export the crop on which they are providing technical assistance to entrepreneurs. Otherwise, there is a great risk that one will achieve nothing more than having "the blind leading the blind."¹⁴ Looking back, it often was the melon entrepreneur who carried out the adaptive research required to generate and/or adapt the technology required to grow melons. However, most export promotion projects or export support organizations are staffed by persons having limited practical or commercial experience with NTAE crops. Further, these projects or organizations generally have limited capability to conduct adaptive research on NTAE crops. Moreover, few countries (e.g., Honduras) have private sector organization (e.g., FHIA) dedicated to carrying out research on NTAE crops, and these organizations also are struggling to find ways to sustain themselves financially.

At each stage of the learning process, the entrepreneur must keep in mind that he is operating within a complex system involving a multiplicity of actors--input suppliers, growers, packers, truckers, shippers, and sales agents, among others. These various actors range from individual firms to multinationals, with each having varying degrees of information, knowledge, and experience that may or may not be relevant to the entrepreneur's objectives, requirements, and circumstances. But the individual entrepreneur, lacking information, knowledge, experience, and sometimes also resources, is in a weak position to sort all this out in a meaningful way.

¹⁴PROEXAG's Pam Michel (personal communication) notes other attributes that have had a bearing on the success which PROEXAG has been able to achieve: a unique team of "doers" combined with a chief of party who knows A.I.D. and can manage; ample short-term technical assistance to complement strong suits of the long-term advisors; a mixed client group (growers, shippers, producer associations, and export federations); a "deal making" orientation as compared with a traditional study and/or extension orientation; hands-on training and growers tours; strengthening of existing institutions rather than building new institutions; market linkages (e.g., trade conventions, ability to consult references such as the Redbook and Bluebook); a regional orientation to complement bilateral initiatives; and flexibility within the funding agency (ROCAP) to adapt.

However, while this sorting out process does occur, more quickly and effectively for some entrepreneurs than for others, it does entail costs in terms of resources (time, money, etc.) expended by the entrepreneur. The analysis presented in the paper looked at this sorting out process in terms of five learning processes that have had an impact on the speed at which entrepreneurs have been able to learn how to grow and export melons: (1) attending "the school of hard knocks," (2) experimentation (or adaptive research), (3) staying on technology's cutting edge, (4) keeping an eye on the market, and (5) taking collective action. Examples were provided of how entrepreneurs obtained (or failed to obtain) information through each of these sources.

Based on the paper's analysis of these five learning processes, three essential conditions for a takeoff in an NTAE crop were identified: (1) a favorable macroeconomic and policy environment; (2) a pool of entrepreneurial talent, and (3) a market and technology base. A favorable macroeconomic and policy environment, combined with continuing support for the development and adaptation of improved technology for non-traditional export crops, and improvement in the access of entrepreneurs to knowledge and information about growing, packing, and exporting non-traditional crops, will serve to facilitate entrepreneurs to learn how to export more rapidly. If these conditions are in place, a learning catalyst (export support project or export promotion organization) can play an effective role in accelerating the learning process both for entrepreneurs seeking to learn how to grow an NTAE crop as well as for established firms seeking to change their marketing strategy (e.g., to diversify product line from honeydew to cantaloupe to seedless watermelon or to increase the number of sales agents with which the grower-cum-exporter deals).

Now a development assistance agency cannot create a pool of entrepreneurial talent. But such an agency can help a country with NTAE potential to develop the technology base and favorable macroeconomic and policy environment that provide incentive for entrepreneurs to invest in growing and exporting NTAE crops. Where such incentives exist or have been created, a learning catalyst, albeit an export promotion project or export support organization, staffed by professionals with experience in growing and exporting NTAE crops, can facilitate and accelerate the export learning process. A learning catalyst can play this role by helping entrepreneurs (1) to gain access to the technology needed to grow and export non-traditional crops; and (2) to identify and evaluate potential deals with reputable sales agents who can market the crop in destination markets. Where a learning catalyst reduces the grower-cum-exporter's actual and perceived costs and risks, this increases not only the incentive for entrepreneurs to grow and export non-traditional crops but also the likelihood that they will make sound technical and business decisions as compared with poor decisions that lead to disaster and failure.

It should be noted that Central America is yet at a relatively early, albeit dramatic, stage in terms of the area's developing ability to market NTAE crops. As several respondents noted, the ultimate market potential (including the U.S., Europe, and Japan) is not known. Yet, while the future could be bright, one must exercise caution. The region now faces a major challenge to find ways to control melon virus. Thus, the final act in the history of melon growing and exporting in Central America has yet to be staged. It is not known how many more entrepreneurs will become successful melon exporters, or how many exporters who now appear to be successful may yet fail. Just as initial failure does not preclude eventual success, initial success does not preclude eventual failure.

References

Islam, Nurul

- 1990 Horticultural Exports of Developing Countries: Past Performances, Future Prospects, and Policy Issues. Research Report 80. Washington, D.C.: International Food Policy Research Institute.

Lack, Stephen, C. Kenneth Laurent, Conchita Espinoza, Arden Christiansen, and Donald Calvert

- 1989 Agricultural Crop Diversification/Export Promotion Cross-Cutting Evaluation: Final Evaluation Report. Washington, D.C.: Experience inc.

von Braun, Joachim, David Hotchkiss, and Maarten Immink

- 1989 Nontraditional Export Crops in Guatemala: Effects on Production, Income, and Nutrition. Research Report 73. Washington, D.C.: International Food Policy Research Institute.

Winrock International

- 1986 Research and Development of Vegetables in the Tropics. Summary Report of a Conference. January 9-12, 1986, Winrock International Headquarters, Morrilton, Arkansas. Morrilton, Arkansas: Winrock International Institute for Agricultural Development.

Annexes

- Annex A. List of Firms Studied and Respondents Interviewed.
- Annex B. Areas in Which Growers, Exporters, and NTAE Organizations Have Obtained Information from PROEXAG During the 1987-1989 Period (Source: PROEXAG files).
- Annex C. Examples of Ways in Which Growers, Exporters, and NTAE Organizations Have Obtained Information from PROEXAG During the 1987-1989 Period (Source: John Lamb, PROEXAG Team Leader).
- Annex D. The Stages of Evolution of Non-Traditional Export Crops: From the Perspective of an Export Support Project Organization (Source: PROEXAG).

Annex A. List of Firms Studied and Respondents Interviewed.

Biographies: John Guy Smith, Ricardo Frohmader, Rolando Pretto

Case Studies

Honduras

Productos Acuáticos y Terrestres S.A. (PATSA) (Jesus E. Coto V.)
 Cooperativa Regional de Horticultores Sureños (CREHSUL)
 (Oscar Narvaez, Reina Bernarda Moreno, Carlos Rodriguez)
 Agropecuaria Montelíbano S.A. (Miguel A. Molina)
 Sur-Agro (Andres Lardizabal and Vernan Pérez)
 Cooperativa Agropecuario del Valle Limitada (COAGROVAL)
 (Melido Reyes and Medardo Galindo)

Guatemala

Agrícola La Aurora (Ricardo Alfaro Castillo)
 Promotora Agrícola Básico Ltda. (Dale T. Kringsvold)
 Productos Agrícolas Centroamericanos S.A. (CAPCO S.A.)
 (Garrett DenBleyker and Dave Warren)
 Productos Frescos S.A. (Chuck Chambers)

Costa Rica

Desarrollo Agrícola Industrial S.A. (DAISA) (Claudio Zumbado A.)
 Corporación Agrícola Ganadera del Guanacaste S.A. (John Brealey)
 EXPORPACK S.A. (Jose Fidel Tristan)
 Chiquita Tropical Products Company (Carlos Barquero Quiros)
 Federico Apéstegui (independent grower)
 Del Monte Specialty Products S.A. (Alfredo Apéstegui)
 Frutas de Parrita S.A. (Jose Antonio Urgelles)
 Melones de Costa Rica S.A. (Marco Tulio Bonilla)
 Melones del Pacífico S.A. (Mario Castillo)
 Tico Melon (Rudiger Lohrengel, Camilo Rodriguez L.)

Other Key Informants

Honduras:

USAID Jose Antonio Carranza
 FEPROEXAAH Miguel Angel Bonilla, Medardo Galindo

Guatemala:

USAID Tully Cornick, Barry Lennon, Felipe Manteiga
 ROCAP Ron Curtis, Nancy Fong, Richard Clark
 PROEXAG John Lamb, John Guy Smith, Ricardo Frohmader,
 Bruce L. Brower, Pamela Michel (Washington, D.C.)
 Consultant Tom Mooney

Costa Rica:

USAID William Baucom, Richard Rosenberg
 CAAP Willie Loria, Claudio Zumbado, Javier Arriola
 Consultant Ing. Roberto Gurdian Golcher

Annex B. Areas in Which Growers, Exporters, and NTAE Organizations Have Obtained Information from PROEXAG during the 1987-1989 Period. (Source: PROEXAG files).

- * Setting up information (computer) systems and training personnel in the use of these systems.
- * Organizing and participating as technical experts and resource persons in training courses and seminars.
- * Identifying how country-level programs can support the development of the melon industry of the country.
- * Determining technical assistance needs in production, post-harvest handling, transport, and commercialization.
- * Providing technical assistance and/or linking the client with specialized technical assistance sources.
- * Designing, implementing, and evaluating product and post-harvest handling trials.
- * Providing counsel to the parties (growers, exporters, and sales agents) who are contemplating making a deal.
- * Estimating export intentions, availability of product in specified time periods, and transport requirements.
- * Identifying areas in which long-range study (e.g., potential for break-bulk shipping) is required.
- * Collecting and monitoring data on production and marketing costs.
- * Providing lists of approved pesticides and USDA/EPA/FDA regulations; keeping abreast of other developments in U.S. melon market.
- * Advising growers on steps they could take to better compete (marketing strategy options).
- * Developing and providing charts with information on market behavior.
- * Monitoring the start-up of production and packing operations, to detect any problems early on; witnessing melon shipments on arrival at U.S. ports and providing feedback to growers/exporters.
- * Explaining to sales agents the grower/exporter's need for advances on liquidations (so that grower/exporter can comply with export controls of Central Bank).

Annex C. Examples of Ways in Which Growers, Exporters, and Export Promotion Organizations Have Obtained Information from PROEXAG during the 1987-1989 Period. (Source: John Lamb, PROEXAG Team Leader).

Based on his review of the draft case studies of melon growers and exporters, John Lamb offered the observation that A.I.D.-financed programs have had a greater impact (sometimes positive, sometimes negative) on many of the melon enterprises studied than the entrepreneurs themselves revealed in the interviews. On the draft case studies, he states that

it was interesting to note the consistency and extent to which entrepreneurs showed a bias toward emphasizing the importance of their own actions and minimizing the impact of actions taken by others. . . . I suppose [this] overall tendency was to be expected, and may in fact be a good indication of the sense of self-sufficiency that entrepreneurs need to have to be successful (John Lamb, personal communication).

The validity of Lamb's comments, with respect to the extent that PROEXAG has served a wide range of clients (who did not always acknowledge this when being interviewed), was substantiated by the author's own review of PROEXAG's client files (see Annex C) as well as by this Annex's summary (below) of specific examples of PROEXAG assistance to melon growers and exporters.

Lamb (personal communication) interprets the summary of facts, outlined below, to indicate that PROEXAG

has intervened with many of the melon growers at key moments of crisis or opportunity, which is exactly the role we set out to perform after analyzing the relatively evolved state of the Central American melon industry. It is interesting that so many individuals involved have either forgotten or choose not to mention those interventions, yet I am sure if you asked them about any of the instances [noted below] they would say, "oh, yeah, that's true!". What this phenomenon means in terms of...the export learning process is not at all clear to me, but it should be duly noted somewhere.

Commenting on the draft of the present report, Lamb (personal communication) also notes that in a situation characterized by

a limited number of suppliers of product, where a CAPCO can make a big difference in NTAE crop mix and volume, [one should not] underestimate the impact of: personal backgrounds, preferences and biases; critical events in the life of an individual player; serendipitous contacts; and financial, technical or physical limitations.

Finally, Lamb cautions that one must recognize the limitations of anecdotal data in constructing a theory of export learning. At the same time, he proposes that where the number of A.I.D. projects in a given area has been small,

where the more promising projects began only recently, and where the size of technical assistance teams is small, [one] really can't underestimate the positive or negative impact that individuals managing or working within a project can have on the success of the project. As a case in point, in trying to interpret and extrapolate from PROEXAG's relative success..., I am having difficulty separating what has worked because we have great people on the team from what has worked because it is intrinsically the best approach (John Lamb, personal communication).

A summary of specific examples of PROEXAG assistance to the melon growers and exporters studied is now provided.

Honduras

PATSA--PROEXAG has relatively little contact with this self-sufficient operation, except for a marketing course (see below) and assistance provided when the gall midge crisis broke out.

CREHSUL--PROEXAG's first major contact with this co-op was to accept a co-op packing shed employee in a melon packing course held in California. Last season PROEXAG's marketing specialist helped convince Tavilla Marketing's John Williams to give CREHSUL an advance of seed in return for greater volume, and this worked out satisfactorily. During spring 1989, PROEXAG provided CREHSUL with a refrigeration consultant who recommended changes in the packing line's equipment and layout.

Agropecuaria Montelíbano--PROEXAG's marketing specialist and post-harvest handling specialist have a collegial relationship with Miguel Molina. Miguel frequently contacts the marketing specialist by phone and in person about marketing contacts and contracts. They exchange industry and technical information all the time. Molina sent his packing shed manager to the PROEXAG-arranged short course on melon packing in California. Molina himself participated in a melon marketing seminar PROEXAG's marketing specialist gave in mid-1987. The same specialist also persisted through two seasons until he had been able to help Molina and Sun World nail down a seedless watermelon deal. This specialist also accompanied Molina and his assistant on an orientation tour to the Chile produce industry. Also, PROEXAG sent the refrigeration specialist to Molina for a critical review of Montelíbano's cooling facilities.

Sur-Agro--This firm, a subsidiary of Seaboard/Chestnut Hill, has not, in that firm's view, needed PROEXAG's advice.

COAGROVAL--In May/June 1987, PROEXAG gave a course on Terms of Sale in San Pedro Sula, during which USDA's PACA law was explained. In September 1987, PROEXAG's marketing specialist was called in to give a seminar on melon marketing, but this came too late to rectify the coming ACA debacle, which the marketing specialist cautioned them to avoid but FEPROEXAAH's employee didn't want to hear about it. The marketing specialist later warned COAGROVAL that the packing shed would not be completed on time, and that they needed to nail down transport service that season. In April or May of 1989, PROEXAG sent a refrigeration specialist to COAGROVAL and he gave good recommendations with respect to refrigeration. More recently the project's marketing specialist helped the co-op to link up with the receiver Lindemann Produce. PROEXAG had previously brought this receiver down to Central America for the first time two season ago. COAGROVAL decided to ship all of the co-op's melons to Lindemann.

Guatemala

Agrícola La Aurora--Ricardo Alfaro Sr. and Ricardo Alfaro Jr. have had many contacts with PROEXAG's post-harvest handling and marketing specialists, in which collegial suggestions and the giving of second opinions occur informally.

Promotora Agrícola Básico--The same informal information exchange occurs here, mainly with PROEXAG's marketing specialist but also with the project's post-harvest handling specialist. Also, one of Básico's key employee attended a week-long training course on cantaloupe harvesting, packing, and shipping organized by PROEXAG in California in July 1987.

CAPCO--Informal consultation between Garrett DenBleyker and PROEXAG's marketing specialist occurs frequently. Also, CAPCO sent a key employee to the 1987 cantaloupe harvesting, packing, and shipping course organized by PROEXAG in California. (Lamb notes that Dave Warren of CAPINC is really the lead entrepreneur in the Central American melon industry, so he really neither needs nor requests help from PROEXAG.)

Productos Frescos--Chuck Chambers also sent a key field employee to the California short course organized by PROEXAG. Until Productos Frescos ran into trouble this past season, Chambers had fairly frequent informal contact with PROEXAG's marketing specialist. However, the specialist repeatedly cautioned Chambers not to plant in Zacapa after October 6 of 1988, but this advice was ignored and the firm suffered the consequences (yields were significantly reduced by excess moisture from rain). Subsequently, Productos Frescos linked up with CAPCO (also in Zacapa) and CAPINC; with this tie to an industry leader, Chambers has little reason to rely on PROEXAG.

Costa Rica

Independent Guanacaste Melon Growers--The contribution of PROEXAG to this group is well-documented in the present study (see main report).

Del Monte (previously Jay Nichols Inc.)--Del Monte's decision to diversify into tropical fruits in Central America was spurred on by the participation of the CEO of Del Monte Foods, Robert Carbonell, as Senior Advisor in PROEXAG's Annual Meeting (October 1987). This connection is based on a personal communication between Lamb and Robert Moser, VP of R&D, Corporate Offices, Coral Gables, in which Moser confirmed that the late 1987 decision by Del Monte to diversify had been influenced by Carbonell's participation in the PROEXAG Annual Meeting. Also, in November 1988, VP Moser was a guest speaker at a biotechnology conference sponsored jointly by PROEXAG-FEDEPRICAP-IICA, with A.I.D. funds from all three.

PROEXAG has continued to influence Del Monte's move into the NTAE field, as evidenced by Carbonell coming again to PROEXAG's May 1989 Annual Meeting, this time bringing six other senior managers (i.e., seven of 17 core worldwide staff). As a direct result of this meeting, Del Monte tried to get an exclusive agreement with Transfresh for modified atmosphere technology on strawberries, began searching for melon land in Zacapa (Guatemala), and began seriously looking to expand into asparagus.

Earlier Jay Nichols' field staff all attended PROEXAG's virus control seminar for melons in October 1988. Jay Nichols Inc. was in fact the only firm to subsequently buy and use a large quantity of stylet oil and apply this technology in Costa Rica, and in 1989 has not only increased its order but taken steps to register it in Costa Rica. (In early November 1989, a major IPM seminar for cucurbits will probably nail down the use of the technology for others in Costa Rica.) More recently PROEXAG has been working with VP Moser to get the ban on strawberries from Costa Rica to California removed.

Lamb notes that these facts indicate that A.I.D.-financed efforts like PROEXAG have more to do with increases in NTAE activity by a multinational (e.g., Del Monte) than is revealed by the data from the author's interviews.

Frutas de Parrita--PROEXAG post-harvest handling specialist and another PROEXAG employe (assistant marketing specialist) prepared the melon pesticide bulletin that CAAP provided to this firm's manager.

Tico Melon--Lamb notes that he warned CAAP's general manager and one of PROEXAG's own employees (who financed the deal through CABEI's A.I.D. funds) about ACA before consummation of the Tico Melon deal that subsequently went sour. But CAAP's general manager replied that it was not CAAP's role to issue independent opinions against a potential foreign investor, and PROEXAG's representative replied that as long as the guarantee was acceptable CABEI should not turn it down.

Annex D. The Stages of Evolution of Non-Traditional Export Crops: From the Perspective of an Export Support Project Organization. (Source: PROEXAG).

