

Agricultural Policy Implementation Project

Ministry of Agriculture, General Directorate for Development Planning and Agricultural Investments (DGPDI)
Project Office: Boite Postale 24, 1003 Cité El Khadra, Tunis, Republic of Tunisia • Telephone: (216-1) 681-570/573

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EXPORT COMMODITY STUDY CITRUS

ITHACA INTERNATIONAL LIMITED

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Prime Contractor: Abt Associates Inc., 4250 Connecticut Avenue N.W., Suite 500, Washington, D.C. 20008 • (202) 362-2800
Subcontractors: Institut Supérieur de Gestion, 41, Avenue de la Liberté, Cité Bouchoucha, Le Bardo, Tunis, Republic of Tunisia • (216-1) 260-378/261-854
Ithaca International Limited, 707 Cayuga Heights Road, Ithaca, New York 14850 • (607) 257-2541
University of Wisconsin International Agriculture Programs, 240 Agriculture Hall, Madison, Wisconsin 53706-1562 • (608) 262-1271

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Executive Summary

The Government of Tunisia (GOT) has an on-going program for agricultural sector structural adjustment. Priority has been given to the promotion of agricultural exports. Citrus products were one of the five export commodities chosen for analysis in 1988/1989 under the GOT/AID Agricultural Policy Implementation Project. Part A of this study was directed toward assessing the key factors affecting the export potential for Tunisian citrus fruits. Part B of the study investigated the prospects for increasing citrus export to the North American market. The results of Parts A and B were used to develop strategic marketing recommendations for the Tunisian citrus sub-sector of the Tunisian agricultural economy.

Part A: Citrus Competitiveness Study

Commercial citrus production has been practiced in Tunisia for 70 years. By 1986, there were approximately 3.4 million citrus trees on about 13.2 thousand hectares of land. The Maltese orange, a round blood orange of high quality and taste but medium yield, is by far the most important product in export markets. For climatic reasons, Tunisia is the premium production zone in the world for Maltese oranges.

Production Issues and Recommendations

There are two critical production problems that must be addressed in order to allow for the expansion of the Tunisian citrus industry. The most important of these is the need for disease-free citrus stock from local nurseries. The second problem involves determining the best adapted irrigation system for citrus in Tunisia. The balance of evidence favors properly designed individual irrigation systems. In any case, basin (flood) irrigation is generally judged to be the most inefficient way to apply water. For this reason alone, Tunisia should give serious consideration to other forms of irrigation.

The pruning, pest control, soil management, windbreaks, and variety selection practices of Tunisian citrus growers should also be reviewed for improvement. In many instances, production practices in Tunisia are out of step, or simply behind, those of the citrus industry in the rest of the world. More in-depth study of the technical aspects of citrus production techniques is called for by an outside citrus expert.

Marketing Issues and Recommendations

The overarching marketing issue regarding the feasibility of export marketing of Tunisian Maltese oranges is **quality**. Although the Maltese orange has historically commanded approximately a one franc per kilogram premium in France over competing oranges, it is also true that when the difference becomes greater than one franc, Maltese sales drop dramatically. For this reason, it is essential that Tunisian exporters keep quality at high levels while minimizing marketing costs.

A number of opportunities exist that may reduce marketing costs. Nearly all importers interviewed reported that packaging can be improved. Many wooden boxes, for example, are still used for orange export. These boxes lead to higher handling costs as well as sub-optimal appearance. Orange containers were reported to have often arrived in Mar-

seille in damaged or dirty condition containing an inordinate amount of deteriorated merchandise. Poor pallets were also cited as needing improvement; in general, unitizing and banding were not practiced. These packaging concerns point not only to appearance problems but to factors that contribute to high product losses and, consequently, higher than necessary marketing costs.

Consistency, an important aspect of quality, was also a problem. This comes in part from lack of strict grading which, in turn, leads to malformed fruit and/or bruised, scraped skin. However, perhaps the most crucial factor affecting both quality and consistency is the lack of refrigeration in Tunisia. Only four of the nineteen citrus packer/exporters in Tunisia have a facility for refrigeration after packing, and exporter interviews have indicated that much of the time these refrigerated storage rooms are not employed for citrus. Moreover, neither the trucks to port nor the boats to Marseille are refrigerated or even ventilated. Although the adoption of extensive refrigeration would undoubtedly add to marketing costs, the additional benefit in higher returns due to the reduced product loss and improved quality would be likely to justify the investment. Further investigation of the technical aspects of refrigeration on Maltese oranges should be given high priority.

Government Policies and Export Potential

Three additional conditions in the current citrus marketing system affect citrus export potential. First, the totally independent system of exporting--essentially each exporter currently deals with a different independent "licensed" importer--may leave room for efficiency improvements. Given the relatively small total volume of product, some type of collective sales agency or government administered organization has the potential to better coordinate sales, promotion and delivery schedules. Government administered marketing boards have been successful in numerous African countries.

Second, there is intense competition for the Maltese orange in the Tunisian domestic market, especially at the end of the season when export prices are the highest. As long as producers can earn greater returns by selling their products locally, the rational producer will not participate in the export trade despite the most vigorous encouragement by GOT. Efforts might be taken by GOT to encourage diversifying current production to include other fruit products or even to importing other fruit.

Finally, Tunisia's policy to cap retail food margins at 20 percent is intended to assure consumers of reasonably priced food. The incentive that are transmitted to producers as a result of this policy, however, have impacts on the export market as well. Retailers compensate for their limited ability to raise margins by mixing qualities and selling at a relatively low, fixed margin level. The result is poor quality for consumers and, generally, an inability for consumers to even express a preference for higher quality since the products are not differentiated with price/quality dimensions at the retail level. Allowing for at least some flexibility in retail pricing--perhaps for perishable products as a separate category--might go a long way in transmitting to producers the vital signals to improve quality.

Part B: Citrus Export Market Analysis

World production and marketing of oranges is extremely complex. To understand the complexities of international trade of this commodity and, in particular, the North American market, numerous tables and statistical trends of world and North American citrus trade are detailed in the text of the report. Generally, the signals do not appear strong enough to

warrant further investigation of the North American market at this time. The main points below elaborate the conclusion.

The North American market requires long distance and extensive shipping, quality standards are stricter than those in Europe, steep promotional support is necessary, and, perhaps the most limiting factor, there are very stiff phytosanitary restrictions. At this point in the development of the Tunisian citrus industry, these conditions would appear to make Maltese orange exports to North America prohibitive. These conclusions, elaborated in the analyses in the text of the report, lead to the following marketing strategies:

- **Give first priority to expansion in European and Middle Eastern markets.**

When and if production levels increase to a level that export quantities can be sustained to non-French markets, the first priority for expansion should be in the European countries joining France, especially those already indicating high consumption of citrus (e.g., Holland, Belgium, and England) and perhaps the other Arabic Persian Gulf countries.

- **Develop and exploit special market niche opportunities in Canada and perhaps the United States.**

Although, as indicated, the costs of entering the North American markets are high, it is also true that consumer tastes for high quality and exotic fruit appear sufficiently strong that high margin market niches for modest volumes of Maltese oranges may be able to be developed. Factors which must be overcome, however, are current uneven fruit quality, poor packaging, unknown and poor labels, and phytosanitary problems. Further, conditions appear somewhat more favorable in Canada than in the U.S.

- **Quality improvement is essential.**

Each export shipment regardless of destination, should be of uniform quality. Some form of inspection to insure uniformity is vital. Durability and appearance of shipping cartons must be improved and pallets must be sturdy and banded. Cooling facilities in the packing houses and refrigerated transportation are essential.

- **Promotional activities must accompany all export activity.**

Promotion directed to the wholesale/retail buyer, not the consumer is essential. Both the volume of fruit involved and likely budgets are too small to justify consumer level advertising and promotion.

- **Extend the harvest season.**

The harvest season for Maltese oranges should be extended in order to take advantage of the holiday season market in Europe. Harvest season extension would also make it more feasible and profitable to enter market niche opportunities in North America. Although such extension would require substantial investments in new technology and long range planning, it is imperative that such long range thinking be adopted in order to ensure the survivability of the Tunisian citrus industry.

MAIN REPORT

**Part A Study
Citrus Competitiveness Study**

**AGRICULTURAL POLICY IMPLEMENTATION PROJECT
EXPORT COMMODITY STUDY**

**Part A
Citrus Competitiveness Analysis**

**March 1989
FINAL REPORT**

Preface

This Part A study of the citrus production and marketing in Tunisia was requested by the Government of Tunisia (GOT), in the context of its on-going economic structural adjustment program for the agricultural sector. The research was funded through the Tunisia Agricultural Policy Implementation Project -- Project No. 664-0343 -- which is jointly sponsored and funded by the GOT Ministry of Agriculture (MOA) and the United States Agency for International Development (USAID). The prime technical assistance contractor for this project is Abt Associates, Inc. of Washington, D.C. and Cambridge, Massachusetts. Sub-contractors for the project include the University of Wisconsin, Madison, Wisconsin; the Institut Supérieur de Gestion (ISG), Tunis, Tunisia; and Ithaca International Limited, Ithaca, New York.

The Part A Commodity Report on citrus was researched and written during the period from May to October 1988 by a team of six agricultural specialists from the Direction General de la Developpement, du Plannification, et des Investissements Agricole/General Direction for Planning, Development and Agricultural Investment (DGPDIA) of the Ministry of Agriculture in Tunis, Tunisia, and Ithaca International Limited of Ithaca, New York. These specialists were:

DGPDIA

Abdel Hakim Khaldi
Abdel Rachman Chaffai
M'Nasri Belgacem

Ithaca International Limited

Edward W. McLaughlin
Jack W. King, Jr.
John H. Eriksen

The team's research efforts in Tunisia were greatly facilitated by the assistance and guidance provided by the Director and staff at the DGPDIA; the resident APiP project manager, Dr. Roger Montgomery; and the USAID project manager, Dr. Shirley Pryor. The director and staff of the Groupement Intraprofessionnel des Agrumes et des Fruits (GIAF) provided us with invaluable insights into the current situation in the citrus sub-sector in Tunisia. In this, they labored long hours to respond to the team's general questions and requests for clarifications on specific points. Finally, team members conducted numerous interviews in the field with citrus producers, nurserymen, export packers, and government officials -- all of which added new perspectives and information for this final report.

Upon completion of the draft final report, the text and tables were professionally reviewed and critiqued separately by Dr. Max Brunk, Professor-Emeritus of Agricultural Marketing at Cornell University; Dr. Ronald W. Ward, Professor at the University of Florida; and Drs. Roger Montgomery and Mark Newman of Abt Associates, Inc.. To the maximum extent possible, their comments and suggested revisions were incorporated into this report.

The team wishes to thank all of the Tunisian citrus specialists and sub-sector participants for their sincere efforts on our behalf and for their assistance with the production of this final report.

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List Of Acronyms

CAP	Common Agricultural Policy
EC	European Community
GIAF	Groupement Intraprofessionnel des Agrumes and des Fruits
GOT	Government of Tunisia
MOA	Ministry of Agriculture
OTD	Office des Terres Dominiales (Office of State Lands)

I. Introduction

A. General Characteristics of the Citrus Sub-sector

Although citrus cultivation has been practiced in Tunisia since at least 1881, it was not until after 1918 that demand from both Tunisian and French consumers brought about a serious increase in commercial production. By 1926, there were approximately 350,000 citrus trees, of which about one-third were located on the Cap Bon peninsula. Once the French market opened up to the North African colonies in 1936, citrus production expanded rapidly. By 1941, 1,600,000 trees were in production and the Cap Bon peninsula, with nearly 75 percent of the total, had become the principal citrus producing region of the country. The citrus tree census of 1962/1963 counted 3,200,000 trees on nearly 9000 hectares.

In 1986, there were approximately 3,400,000 citrus trees apparently spaced more widely on about 13,200 hectares of land (GIAF, 1987). This represented an increase in tree numbers (13 percent) but a slight decrease (- 4 percent) in land surface since the last census in 1975. In both censuses, approximately 80 percent of the area in citrus plantations was on the Cap Bon peninsula and well over 90 percent was privately owned. Although there are approximately 10,000 citrus producers in Tunisia, most are smallholders and do not benefit greatly from current production technologies and/or modern marketing methods. In 1986, 85 percent of all citrus growers had less than 2 hectares in trees.

The Maltese, a blood orange of high quality and taste but medium yield, is by far the most important product in export markets. For climatic reasons, Tunisia is the premium production zone in the world for Maltese oranges. However, several other types of citrus are marketed in domestic markets, including navel oranges, valencia oranges, clementines, mandarins, tangerines, lemons, and other lesser known varieties. In general, citrus plantations in Tunisia have been aging over the past 10 to 15 years because of the slow rate of replanting. For example, only 1.5 percent of all Maltese varieties are non-bearing -- less than 5 years old -- whereas approximately 30 percent are greater than 40 years old, a point at which trees generally become less healthy and less productive (GIAF, 1987).

In 1986/1987, total production of citrus fruit is estimated to be approximately 250,000 metric tons, divided as follows: Maltese oranges, 25.8 percent; clementines, 12.8 percent; mandarins, 5.2 percent; lemons, 7.2 percent; and other varieties, 16.0 percent. Although varying widely by variety, total production of citrus has experienced substantial growth in the past decade. In recent years, 40,000 to 50,000 metric tons of citrus have been exported, with the remainder being consumed locally. Well over 90 percent of total citrus exports are Maltese oranges.

II. Citrus Production

A. Description of Citrus Production Capacity

The Tunisian climate is Mediterranean in the north and arid in the south. In the northern citrus growing region, rainfall occurs in winter from September to March, with ten inches of precipitation being typical. The most important climatic hazard for citrus is wind. Prevailing coast winds are cited as one serious problem. However, the hot, dry Sirocco winds from the desert, which occur only in the summer, are most damaging when they aggravate the problem of June blossom/fruit drop.

Citrus can be grown in most of the regions of Tunisia. However, except for some oasis production in the extreme south, all of the commercially significant citrus plantings are found in the northern part of Tunisia. The most important citrus producing areas are on the Cap Bon peninsula near Soliman, Menzel Bou Zelfa, Grombalia, and Beni Khaled. Other major plantings are found on the southern side of Cap Bon near Hammamet, Nabeul, and Beni Kriar; and near Tunis.

Moisture is the most important constraint to increased citrus production in Tunisia. Whereas other tree and vine crops commonly grown in Tunisia -- e.g. grapes, almonds and olives -- are known for their drought tolerance, citrus does poorly under drought stress. When sufficient moisture is available, citrus can be highly profitable. Currently, only table grapes, among perennial crops, can compete with oranges and clementines in terms of profitability.

Citrus does not tolerate low temperatures. Citrus fruit freezes at about -2 to -3 degrees Centigrade when exposed for several hours. However, low temperatures are required to produce good flavor and color in citrus. It is the presence of cold, not freezing, temperatures which is essential to a region well-adapted to the production of table citrus. Lemons and Maltese oranges are among the citrus crops which are most susceptible to freezing injury. Both of these crops do well in Tunisia.

Annex A Table 1 shows the regions of citrus adaptability by variety in Tunisia. As can be seen from this table, the central coast is well-adapted to citrus production. There is, however, a serious water constraint in this area. Moreover, the area around Tunis (Governorate de Grand Tunis) is well-adapted to citrus production but urban expansion precludes citrus in most of this area. Consequently, it is expected that any significant increases in areas planted to citrus will take place on the Cap Bon peninsula and in the governorates of Bizerte, Beja, and Jendouba.

B. Unique Characteristics and Types of Citrus Grown

The Maltese orange is the most common citrus grown in Tunisia, where the name "Maltese" is used for several varieties of oranges. Thomsen navels and Valencias are also important varieties.. Other citrus grown in significant quantities in Tunisia are lemons, clementines, and mandarins.

The following are descriptions of some of the most important varieties produced in Tunisia. Besides comparatively recent introductions and known varieties, which have been traditionally important, the older Tunisian citrus groves are rich in genetic variants.

The extension manual, Agrumes, published by the Ministry of Agriculture in 1982 recommends that farmers plant Clementines, Wilking, Maltaise Demi-Sanguine, Valencias, Washington Navels, and Eureka Lemons. The Wilking, which is a type of mandarin, is not generally recommended in most other citrus growing countries.

A 1988 report by Groupement Interprofessionel des Agrumes et des Fruits (GIAF) recommends that Tunisia specialize in Maltaise Demi-Sanguine and Eureka lemons. From a production standpoint, this is good advice since both of these varieties produce fruit of excellent quality in Tunis.

1. Maltese Oranges

The Maltaise Sanguine orange of Tunisia is considered by connoisseurs to be the best sweet orange in the world. It is a very old variety of unknown origin and belongs to the same group of half-blood oranges, which includes the renowned Sanguinella moscata of Italy (Ciba-Geigy Agrochemicals, Technical Monograph No. 4). The latter variety is sometimes referred to as a "Portuguese," but it should be included in the Maltaise Sanguine population. In Tunisia, "Portuguese" refers to a tree with a more upright growth habit and fruit which is more oval in form. Approximate hectares devoted to Maltaise and all other varieties are included in Annex A, Table 2.

The term Maltaise -- i.e. Maltese in English -- has been applied to a wide range of completely unrelated varieties of oranges. Of the oranges so designated, only the Maltaise Sanguine has had any direct historical connection with the island of Malta. Maltaise Sanguine oranges are grown in many parts of the world and are sometimes referred to as blood oranges.

To clarify the terminology, the following varietal descriptions are presented from The Citrus Orange, Volume 1 and Chapot, H. Sur L'Appellation de "Maltaise" Pour Une Orange.

The Maltaise Sanguine orange, also called Maltaise Demi-Sanguine, is the variety most closely identified with Tunisia. It is in Tunisia where the special characteristics of this orange are most strongly expressed. Even within Tunisia, however, there is a wide variability in this variety. For instance, the date of maturity for the fruit can vary widely. Consequently, it would be more correct to say that Maltaise Sanguine oranges in Tunisia are a population, rather than a variety.

The Maltaise Sanguine orange varies in shape, but it is usually slightly oblong in appearance. The skin is of medium thickness and usually easy to remove. It does not ship well when fully mature. The flesh is deep orange with crimson red spots or lines. Trees are not very productive and have a tendency to be alternate bearers.

While the eating quality and fragrance of the Maltaise Sanguine are generally recognized as superior, the development of the blood red coloration can be highly variable. External red coloration does not necessarily indicate internal coloration and, in some instances, both are lacking.

The Maltaise Blonde orange is another variety cultivated primarily in Tunisia. It has high quality flesh, which is yellow-orange in color. It lacks the scarlet flecks and lines of the

Maltaise Sanguine. It is sometimes referred to as the little "Jaffa" orange because of the similarity of the tree to the Jaffa orange tree. The fruit is small, uniformly round and generally it ships well.

The **Meski** orange, also called the Sweet Maltaise, is a variety identical to the Maltaise Blonde, except that its flesh is very light in color and almost totally lacking in acidity. Production and utilization of this minor orange is confined to Tunisia. It plays a very minor role in the citrus industry.

2. Thomson and Washington Navels

The Thomson navel matures ten days earlier than the Washington navel. It does not hold well on the tree. The flesh has good flavor and texture. The color is not as deep as that of the Washington navel. Neither the Thomson nor the Washington navel has seeds.

The Thomson navel originated in Duarte, California in about 1891. Because it was early and attractive, it was widely planted in California, as well as in Mediterranean and South American countries. However, within a few years, planting was stopped because its faults became so evident. Beside poor holding and shipping characteristics, the trees are less vigorous and smaller than those of the Washington navel. It also lacks the heat and cold resistance of the Washington navel.

The Washington navel matures in about nine months and is harvested from early winter through early to mid-spring. Fruit keeps well on the trees, but if fruit quality is to be preserved through mid to late-spring, gibberellic acid should be used.

The Thomson navel is no longer of commercial importance to the worldwide citrus industry. It is produced only in Tunisia and, possibly, in Chile. In Tunisia, most written recommendations now indicate the superiority of the Washington over the Thomson navel. The Thomson navel, however, is still very popular with growers.

3. Valencia

This is the late season orange of Tunisia. It is best known for the outstanding quality and quantity of its juice. The Valencia, however, is also suitable as a table orange. It keeps well on the tree; and both stores and ships well. Despite its name, it did not originate in Spain, but rather from the Portuguese Azores.

It takes from twelve to fifteen months for Valencia oranges to mature. Valencias are harvested from early spring through mid-summer. The fruit holds better on the tree than it does for most other commercially important citrus. Consequently, the harvest can be extended without the use of growth regulators.

4. Eureka Lemon

The Eureka lemon produces fruit throughout the year under local conditions, although it bears most heavily in the spring. Lemons of excellent quality are grown in the cooler, coastal regions of Tunisia. The fruit has a great deal of juice and is of medium size and uniform shape. The Eureka is also commonly grown in the coastal regions of California. It originated in the Los Angeles area as a mutant seedling grown from a lemon of Italian origin.

The Eureka lemon sets fruit at the tips where they are vulnerable to sunburning and wind scarring. Despite the desirability of increasing lemon production in Tunisia, production is declining because of problems with the disease Mal Seco.

The Eureka lemon, along with the Maltese Demi-Sanguine orange, are the two varieties GIAF is recommending should be emphasized in future citrus plantings in Tunisia. Given the quality of Eureka lemons and Maltese Demi-Sanguine oranges, this is a technically sound recommendation.

5. Clementines

The Clementine is a type of mandarin orange. In Tunisia, it is grown primarily for domestic consumption. The fruit has deep orange flesh and peel. It is small and is slightly flattened to round in shape. The fruit has excellent flavor and will hold on the tree without puffing. Unless it is cross-pollinated, the Clementine does not have seeds. One of the major advantages of Clementines is that they are harvested early -- i.e. October to January -- and thus are usually highly profitable to the producer.

6. Wilking Mandarin

This variety is appreciated in Tunisia because its fruit is ripe in March and April when Clementines are not available. However, it has some disadvantages. It tends to be an alternate bearer and, most seriously, it is a strong pollinator. If planted in the proximity of Clementines, it will induce seed in this normally seedless variety. In Morocco, the Wilking had an excellent reputation for coming into production early, producing high yields, having good flavor, and ripening late. However, due to its effect on Clementines, it is now illegal to grow the Wilking Mandarin in Morocco. Consequently, all the trees of this variety have either been uprooted or topworked.

7. Total Citrus Produced

Data from GIAF for a 1986 citrus tree census are presented in Annex A Table 2. As can be seen from this table, per hectare densities average 262 trees and yields average 19 tons per hectare. The GIAF report (GIAF, 11 May 1988) does not differentiate among varieties for purposes of determining planting densities or yields.

Since 1966, total annual citrus production has increased from 96,000 tons to 250,000 tons and average yields have increased from 7.5 tons to 19 tons per hectare. These increases are attributed to three factors:

- young groves coming into production;
- development of water resources; and
- improved cultural techniques.

GIAF's goal is to gradually improve average yields to 40 tons per hectare. By 1996, a desired goal is that average yields will have reached 30 tons per hectare. In order to accomplish that objective, the GIAF report states that, in the short term, it will be necessary to improve the availability and management of irrigation water; improve fertilizer practices; prune trees regularly; and improve plant protection practices. In the long term, systematic replanting of groves will be undertaken because many are currently afflicted with phytophthora, viruses, and nematodes. The report further states that, because of the diseased condition of older

groves, it is unlikely that average citrus yields will increase beyond thirty tons/hectare without development of new citrus production areas outside the Cap Bon peninsula.

C. Key Factors Affecting Citrus Production

1. Yields

The overall impression conveyed by Tunisian growers is one of private groves, rather than commercial farms. Even the larger commercial plantings are subdivided into smaller parcels by windbreaks. Trees are planted at high per hectare densities so that even when heavily pruned, the ground is shaded by the overlapping branches. Since family labor is relatively cheap, farmers tend to pay a great deal of attention to their trees. Some of this extra attention makes sense with cheap labor but a lot of it is wasteful or even counter-productive (for example, in the case of excessive pruning, see page 8).

GLAF's recommended production practices appear to suggest that a grower should give his trees as much personal attention as possible. Whereas high quality vineyards and olive orchards are common in Tunisia, we saw no truly outstanding citrus orchards. Given the field conditions, we observed it is difficult to believe reported citrus yields. Growers commonly claim yields of 40 to 60 tons per hectare yields and some reported occasional yields of up to eighty-five tons per hectare. Both the climate and soils are good for citrus; but it is clear that yields could still be increased significantly by improved cultural practices.

Current cultural methods for citrus in Tunisia are said to be adapted to unique local conditions. To a certain extent, this may be true but the local citrus industry still suffers from a widely recognized diseased nursery stock, weak trees, and poor soil and water management practices. The GOT is aware of this problem but has been unable to control the problem despite efforts in the direction. The fact is that the Tunisian citrus industry has not been challenged by the discipline of rigorous international competition and thus is far behind countries like Spain and Morocco in its current citrus production practices.

2. Pests and Diseases

Major citrus pests in Tunisia are California red scale and the Mediterranean fruit fly; other pests include black and purple scale. While these pests require careful control, the most important factor adversely affecting citrus production in Tunisia is virus diseases, due to poor cultural practices at the nursery level. Fungus diseases are also common. Cultural practices, such as improper pruning and allowing soil and debris to cover the graft bud, contribute to the disease problem. However, poor nursery practices, which result in the transmission of viruses in nurseries, are the most important source of diseased citrus trees in Tunisia.

The following have been identified by Tunisian citrus specialists as the most serious diseases in Tunisia. All of the diseases listed are frequently observed, except for exocortis. Disease problems are most commonly present in older plantings. All of the diseases, except for Stubborn disease and Mal Seco, are viruses, i.e., Psorosis, Blind Pocket, Exocortia, and Cachexia-Xyloporosis. Although *Phytophthora* (brown rot) was observed in groves, only one fungus disease, Mal Seco, was mentioned as being a serious problem. For further descriptions of these diseases, see Annex C.

The most obvious means of controlling virus diseases is to use only virus-free, young trees from certified nurseries. While virus diseases may still be carried by insect vectors, the probability of infection is greatly reduced if certified virus-free trees are used. The government controls recommended for such a program, along with indexing, isolation practices and detailed descriptions of facilities and personnel required to combat the problem of citrus viruses are to be found in Meijneke, Politique et Plan d'Action Pour le Controle et la Certification "Virus-Free" des Arbres Fruitiers, C.A.R., 1987.

Tristeza is not a serious problem in Tunisia. One of the consequences of this is that the Tunisians are able to use Sour Orange widely as a rootstock in grafting. Since many Tunisian soils are light in texture and freezing temperatures are not often a problem, Rough Lemon is also used as a rootstock for lemons and grapefruit. Finally, the Cleopatra Mandarin, which has only an average productive life span and is slow in reaching full productivity, is used as a specialized rootstock in areas with saline soils.

3. Irrigation

Water is the most important limiting factor for agriculture in Tunisia. On-farm deep wells often go dry in summer. Salinity in the irrigation water is often a problem and the utility of the irrigation water from government projects is often diminished for growers by both the poor timing of deliveries and inappropriate quantities available.

Drip irrigation was at one time seen as a means of improving the efficiency of water use by citrus. In practice, however, results have not been encouraging. Drip irrigation failed chiefly because of inadequate monitoring and maintenance of the emitters, the poorly timed delivery schedules for irrigation water, the prevailing light soils, and the small surface areas watered. Individualized irrigation systems -- but not drip irrigation -- do have important potential for improving the efficiency of citrus irrigation in Tunisia.

Evidence of the amount of water being put on the surface of the soil by a drip system emitter is a poor indicator of the total water being delivered to the trees. Unless the emitters are monitored very conscientiously, variations in the output of irrigation water can develop throughout an orchard. In extreme cases, defective performance by an emitter may not be noted until the effects are seen in the declining health of the tree itself. Emitters often become blocked when water has a high mineral content or when filter systems are not properly functioning. The former was indicated as the primary source of emitter blockage in Tunisian groves.

During the summer months, many citrus groves in Tunisia are, at least, partially dependent on water drawn from government-supervised irrigation canals. This water is usually available to growers only in large quantities over short periods of time. Such a system for water supply scheduling is not adapted to drip irrigation systems. These systems operate by supplying the citrus tree with small quantities of water over a long period of time and, thus, need a constant source of irrigation water over time.

Citrus trees are shallow rooted and most Tunisian citrus groves are planted on light soils. Applied irrigation water tends to move down through the soil profile without spreading laterally. When water is applied by drip irrigation at a single, very small point on the surface and moves down through the soil quickly, the amount of water available in a shallow rooting zone is very limited.

Although one properly functioning drip system was observed on the Cap Bon peninsula, most drip systems have either been abandoned or else modified on-site, usually by taking a common nail and enlarging the emitter opening. However, other types of individualized irrigation systems could still save significant amounts of water under good management. The most likely solution would seem to be a fogger or mini-sprinkler with the capacity to deliver large quantities of water in a broad spray pattern. The performance of such a system could be more easily monitored by growers.

Furrow and basin irrigation are two commonly used irrigation systems in Tunisian citrus groves. Basin irrigation is the most popular system. It is common to see groves where the entire soil surface is covered with large basins around each tree. The chief advantage of both furrow and basin irrigation is that, when canal water is available, it is possible to put large quantities of water on a grove quickly. In a Tunisian basin system, water losses, due to seepage, are large, given the light soils on which citrus is grown. In a furrow system, the water losses are even larger. Another major problem with these systems is that they provide as much water to weeds as to the trees.

4. Soil Fertility Management

The soils used for citrus production in Tunisia tend to be light in texture and calcareous. Assuming good irrigation water, citrus can be grown on soils with up to 12 percent active calcium. As can be seen in Appendix C, nitrogen, phosphorus, calcium, and micro-nutrients are recommended, as well as applications of manure and green manure. For citrus production, it is asserted that the last two inputs are required because of the light soils. Consequently, water and nutrient retentions are poor, unless soil organic matter levels are maintained at high levels. Some growers apply as much as 40 tons of manure per hectare on their groves every other year. At approximately \$ 20.00 per ton, these manure applications can cost up to \$ 800.00 per hectare per year.

Although the recommended cropping calendar calls for planting a legume as a green manure crop, most groves observed were just using volunteer annual weeds for this purpose.

It is difficult to believe that animal manure applications justify their cost in citrus production. However, if maintaining organic matter in the soil is as important as Tunisian growers think it is, given their light soils; then more effort should be made to make skilful use of green manure crops, rather than using very expensive animal manures. Moreover, if green manure crops are going to play a major role in Tunisian citrus production, then use of individualized irrigation systems would also need to be reconsidered since one of their present advantages is that they water only the tree and not the adjacent weeds.

5. Pruning

In Tunisia, citrus is considered to be well-tended if pruned regularly. Comments to the effect that this might not be necessary are seen not so much as wrong as heretical. Tunisian farmers strongly believe that it is necessary to prune young trees at two to three years of age in order to keep the foliage canopy balanced with the root system. Other prunings are necessary for mature trees to protect the fruit against the wind; to assure that the trees are open and fruiting properly; to keep the trees clean; to rejuvenate the tree; and to make sure that fruit is of the desired size. In spite of all of this attention to pruning for correct tree shape, it is common to see citrus trees with intertwining main branches and practically no trunks.

Lemons, Clementines, and Maltese oranges all require some pruning. However, where pruning is involved, the growers' attitude seems to be that if a little is good, then a lot must be better. Pruning is practiced as an end in itself without careful consideration for what is or is not being accomplished. Excessive pruning, therefore, is one area of Tunisian citrus production where an enterprise expenditure is -- in our opinion -- not only unprofitable but, in many cases, actually counter-productive.

6. Windbreaks

Windbreaks are considered essential to citrus production in Tunisia. As can be seen from the crop calendar in Annex C, as much time and money is often spent in growing good windbreaks, as in growing the citrus crop itself. The most commonly used trees for windbreaks are cyprus. However, tamarack, casuarina, and sesbania are used as well. Windbreaks are usually planted at 100 meter intervals perpendicular to prevailing winds. Normally six to eight meter spacings are used between the windbreak and the outer rows of citrus on either side. Windbreak requirements for land area, water and fertilizers are similar -- or, in some cases, higher -- than those for the citrus trees themselves.

D. Key Factors Affecting Citrus Quality

1. Pests

Most of the citrus observed on the market in the spring of 1988 had good color and appearance except for occasional evidences of rind damage by scale.

2. Varieties

At least two varieties of orange widely grown in Tunisia, the Maltese Demi-Sanguine and the Thomson navel, are not noted for good post-harvest keeping characteristics. This, combined with the fact that adequate post-harvest cooling facilities are not always available, means that much of the citrus fruit on the market in Tunisia is soft. This reputation for softness follows Tunisian fruit when exported.

3. Climate

On the whole, the climate in the major citrus growing regions of northern Tunisia is well-adapted not only to citrus generally, but to some of the most demanding varieties of citrus. However, one problem with the climate is the presence of almost constant wind which severely scars the fruit if precautions are not taken in tree protection.

E. Key Factors Affecting Costs of Production at Farm Level

1. Irrigation

Presently, poor practices in the management of available irrigation water are seen to be a major cost problem in citrus enterprises. Following standard irrigation practices, savings of up to 30 percent in irrigation water should be attainable by introduction of individualized irrigation systems. It is also possible that, taken in the context of an entire system of

well-adapted cultural practices, there might still be a role for improved basin irrigation technologies in Tunisian citrus production.

2. Input Use

The big question here is the advisability of using such large quantities of costly animal manures on citrus. Even if its effects on soil and trees are all that they are claimed to be, manure applications costing an average of \$ 400.00 per hectare per year are a substantial investment, which should be evaluated closely and, of course, compared with chemical fertilizer equivalents.

3. Pruning

This is one example of a desirable cultural practice carried to extremes due, in part at least, to the availability of relatively cheap family labor. As labor costs rise, however, one of the first enterprise savings in citrus production should be a sharp reduction in unnecessary pruning operations.

F. Comparative Advantage and Position of Citrus Production Relative to Other Alternatives

1. Fruit Crops

In our field interviews with citrus growers and other farmers, we were told that table grapes are currently as profitable or slightly more profitable than citrus. However, we could not obtain any competent enterprise budgets based on on-farm surveys to verify such statements. It is clear, however, that table grapes have the disadvantage of being even more perishable in marketing than citrus. There is also the suspicion that table grapes may have a more restricted domestic market than citrus, due to their narrower distribution channels and high cost to consumers. If this is the case, production of large quantities of table grapes over a short marketing period could result in saturation of domestic markets and sharp breaks in prices received by growers.

2. Off-season Irrigated Vegetable Crops

Given the right climate and access to high income markets in Europe and elsewhere, irrigated winter vegetables could prove to be more profitable than citrus. However, both the inherent risks and management levels required in such enterprises are much higher than with citrus. There are also many areas in Tunisia where citrus could be grown, but which would not be suitable climatically to winter vegetables.

G. Prospects for Improved Production of Citrus

1. Maltaise Demi-Sanguine Oranges and Eureka Lemons

Given the present high quality of these citrus products in both domestic and international markets (see next section), Tunisian efforts to increase production and exports seem well-founded.

2. Disease Control

The problem of virus-infected nursery stock is one that is universally recognized as critical by people acquainted with the Tunisian citrus industry. Determination and discipline on the part of the Tunisian government and citrus industry are required to adequately monitor citrus stock production in certified private sector nurseries.

3. Irrigation

If it can be shown that individualized irrigation systems are suited to the unique conditions prevailing in Tunisia relative to soil conditions and water availability, then a change to more modern irrigations systems would result in savings of water and improved weed control.

III. Citrus Marketing

A. Description of Sub-Sector Participants' Roles In Citrus Domestic and Export Marketing

A great number of actors and channels play roles in the production and marketing of fresh citrus products in Tunisia. In general, citrus firms may be characterized as small scale, fragmented operations although, as pointed out above, coordination is facilitated considerably by two geographic factors. The first is that nearly all the citrus production is located in close proximity to Tunis, the largest single domestic market and the export port. The second is that the principle production area on the Cap Bon peninsula is small enough that the various citrus sector actors can interact easily and effectively.

Annex B, Figure 1 shows the key marketing channels and the participants in the Tunisian citrus industry. Although the citrus grower is clearly responsible for putting together all the necessary factors for production, the citrus sub-sector understood broadly begins well in advance of the producer. In Tunisia, there are numerous institutions and agencies that contribute to the viability of the production sector. These may be separated into three basic groups.

First, GIAF is a quasi-governmental institution that performs many of the functions of a trade association. In addition to its headquarters in Tunis, GIAF has regional offices in the major fruit producing regions, specifically, on the Cap Bon peninsula for citrus. These regional offices provide growers with selected materials, grafted trees, fertilizers, pesticides and some technical assistance. One of GIAF's most important roles is the gathering and dissemination of market information on the citrus industry. This is done both for the domestic marketing system and for European export markets from the regional office in Marseille.

Second, the Ministry of Agriculture (MOA) has broad responsibility for the well-being of the citrus industry and provides technical assistance, agricultural extension agents, organizational aid and research support for the citrus production and marketing system.

Third, there are a number of private sector firms that play important roles in the citrus production and marketing system. These firms generally operate in parallel to government institutions and often provide similar services. Pesticides, fertilizers and nursery stock are often available, for example, from both government and private sources.

The production sector of the citrus industry is described in detail elsewhere in this report. In summary, citrus sub-sector activities are concentrated on the Cap Bon peninsula where, in 1986/1987, 9,675 growers cultivated citrus trees on approximately 13,200 hectares. The average grower maintains 1.36 hectares in citrus production; 69 percent have less than 1 hectare. In 1986/1987, total citrus production was 252,000 tons, of which 147,000 tons (58 percent) was Maltese oranges; 31,400 (13 percent) clementines; 18,400 (7 percent) Mandarins; and 18,000 (7 percent) lemons. The remaining 15 percent was accounted for by various smaller citrus varieties.

Although Maltese oranges constitute the largest single citrus commodity and account for over 90 percent of all citrus exports, replanting of this variety has not kept pace with market demand. As a result, orchards of these oranges are becoming older and not producing at optimal levels.

The marketing system for citrus fruits, like the production system, is characterized by many small operators and fragmentation. Citrus makes its way to markets in one of three principal ways. First, the traditional marketing method, whereby the producer sells the product at the farm level to an itinerant buyer, still accounts for a large portion of all initial farm marketings, perhaps 40 to 50 percent of all sales. The buyer then takes responsibility for all the necessary marketing functions including grading, packing, conditioning and transporting. In some cases, these "field buyers" also assume some harvesting responsibility. Buyers negotiate sales either with secondary wholesalers, small retailers or, occasionally, hotel and restaurant operators.

Second, many growers harvest and then transport their own citrus to local and/or national (Tunis) secondary markets. The national wholesale market in Tunis serves as a central pricing market for twenty regional wholesale markets. Approximately 40 percent of all citrus marketed domestically passes through the Tunis wholesale market. This sales approach accounts for perhaps another 40 to 50 percent of total citrus sales. Growers generally move the citrus in their own small trucks, which are not refrigerated. Sales with wholesalers in the respective markets are negotiated as a function of the supply in the market on the given day.

Finally, a smaller portion of citrus fruit -- up to 20 percent -- is delivered by the grower directly to a nearby packer/shipper for resale. In most but not all cases, this marketing method is used citrus destined for export.

B. Timing and Consistency of Citrus Availability for Export

Although Tunisia produces several different varieties of citrus products, Maltese oranges constitute the only real export commodity, comprising well over 90 percent of all citrus exports. Over the past ten years, approximately 95 percent of total Maltese orange production has been exported. Annex A, Table 3 shows the volume of Maltese orange exports to France, the major importing market, by week for a recent and typical marketing season -- i.e. 1983/1984. This table shows that, like other recent marketing years, the Maltese season begins about 1 January, reaches peak shipping during the months of March and April, and generally falls off precipitously by the beginning of May.

For the same year, Annex A, Table 4 shows the size distribution of the Maltese oranges exported to Marseille and the average prices by size. Note that the combined size category -- 75/88 -- received the highest average price and accounted for the largest portion of overall size categories. In general, French fruit importers pay price premiums for the larger sizes of fruit (75/88 and larger) but, in most years, 60 percent or more of total Maltese exports are size 100 and smaller. Annex A, Table 4, where less than 50 percent of total sizes are smaller than 100, demonstrates that 1983/1984 was unusual in that respect.

C. Description of the Sub-Sector's Capacities In Citrus Preparation, Packaging and Product Differentiation

Maltese oranges move through distinctly different channels depending on their ultimate destination, export or domestic. The large majority of oranges destined for local consumption move directly from farm, or occasionally from itinerant handlers, to regional and national wholesale markets with very little or, often, no additional preparation or packaging value added. The fruit is most often not graded by size or quality and is delivered in non-refrigerated, field-run pallet boxes.

The fruit destined for export markets, by contrast, is treated by a considerably more sophisticated system. After harvest, the product is passed through a packing house where it is graded by size and quality, treated for fungus and disease, generally waxed, and packed for export. Packaging material is approximately 50 percent cardboard cartons and 50 percent wooden boxes. The latter are more often employed during the later, hotter months of the marketing season, since they are said to offer better protection from the heat. The cartons are loaded on an unrefrigerated flatbed truck and delivered to the Port of Tunis for export. At the port they may remain, again unrefrigerated, for perhaps as long as a day, before they are loaded onto pallets and placed into an unrefrigerated, unventilated container for boat shipment to Marseille and other foreign ports.

D. Description of Existing Export Markets for Tunisian Citrus with Quantities Exported, Prices Received, and Characteristics of the Produce Exported

The Maltese orange has constituted more than 90% of all Tunisian citrus exports for the past ten years. Thus for practical purposes, citrus exports mean Maltese orange exports. Annex B, Figure 2 shows Maltese orange production, exports, and domestic consumption for the past decade. Domestic consumption appears to be a residual remaining after exports in most years, yet this is not always the case. Although total Maltese production and exports have been erratic during this recent period, there has been a discernable upward trend in both since approximately 1981. Accompanying Annex A, Table 5 shows, for example, that production increased nearly steadily from 1981/1982 to 1986/1987 but fell slightly in 1987/1988 and exports followed the same trend. Exports in the most recent marketing season -- 1987/1988 -- were some 42,000 metric tons -- or 35 percent of total production. Annex A, Figure 3 demonstrates that exports are also gaining on domestic consumption in terms of their share of total production. Whereas exports constituted about 20 percent of production in the early 1980s, they have accounted for approximately 35 percent of production in the past two marketing seasons.

The majority of Maltese exports are destined for the French market via the Port of Marseille. France received between 82 and 100 percent of Maltese exports between 1979/1980 and 1984/1985 (Annex A, Table 6). The past three years, however, in response to GOT efforts to diversify export market opportunities, 15 to 20 percent of all exports have been sent to several Eastern European countries.

These latter export transactions have been conducted largely as barter sales in return for goods as diverse as matches, starch, yeast and wooden packaging materials. These barter

sales have employed generalized volume contracts with the Eastern countries. One of the attractive features of these contracts is that the Eastern European importers are willing to receive small size fruit that is generally either unacceptable or heavily discounted in Western European markets. However, Tunisian exporters have not always been able to honor all the terms of the contracts. The production shortfall in 1987/1988, for example, resulted in an inability or unwillingness on the part of the Tunisian Maltese industry to meet the agreed-upon export volume goals --e.g. 10,000 tons to Yugoslavia -- with the Eastern European countries. The reasons for this are unclear but several government officials speculated that the traditional strong export ties with French importers result in a higher proportion of all exports being sent to traditional markets during short supply periods.

Eighteen packers-exporters account for virtually all of the export capacity for Maltese oranges (Annex A, Table 7). Although some of these are cooperatives, most are individual, private firms. Despite a relatively few number of exporters, the industry could not be characterized as unduly concentrated: the top four firms only account for 40 percent of total sales. This is considered low, relative to many other industries where often a few firms control a majority of industry sales. However, it is probably true that when four firms control 40% of total sales, a modest amount of market power is probably conveyed. These packers export to approximately 29 different importers -- see Appendix D -- in France; these importers must first be approved by GOT before conducting business with Tunisia agriculturists.

Annex A, Table 5 shows that Maltese annual export prices in Marseille display considerable variance in the past decade. Moreover, the table suggests that these price variations cannot be explained by volume differences alone. Industry interviews suggested that quality, timing and competition all play important roles in explaining export price variation. Moreover, given at least some substitutability among oranges, one would expect Maltese orange prices to be influenced by the supplies of all other oranges. Annex A, Table 8 shows that in general the domestic orange price increases as the season progresses into March, April and, generally, May. This corresponds to improvements in fruit quality. Fruit maturity improves and higher levels of sweetness are achieved late in the marketing season.

These same price trends are observed for export fruit. Annex B, Figure 4 points to the steady upward price trends for two recent and fairly typical years. Although the majority -- approximately two-thirds -- of Tunisian oranges are marketed in February, March and April; the export price continues to rise steeply well into May. Whereas many citrus exporters reported that great difficulty is encountered in attempting to export Maltese oranges as late as May in the marketing year -- e.g. high spoilage rates, advent of other competing fruit on European markets, severe bruising and poor overall quality -- the fact remains that these high price levels in Europe appear to be market signals that more oranges are required before markets become saturated. Interviews with importers in Marseille indicated that this may even be true without greatly compromising the attractive price levels.

Price levels in France appear to substantiate the view that the Maltese orange is regarded as a gourmet product on the French market. During their marketing season, Tunisian Maltese oranges obtain higher prices than any oranges from the relevant competing countries (Annex A, Table 9). In the two most recent years, for example, Maltese oranges received nearly a 25 percent price premium over the average price of oranges from all relevant competing countries. Some of this difference can be attributed to a higher quality thus higher valued product and part of it to the higher margins required by importers to cover the higher risks associated with handling Maltese oranges.

The enlargement of the European Community (EC) is likely to effect Maltese orange exports in several ways. In a study entitled, "The Effect of Enlargement of the EC on Tunisia Fruits and Vegetables", Claude Falgon estimates that the increased supply on EC markets expected from Spain is likely to dampen exports of all oranges from other Mediterranean third countries. Although Maltese oranges are likely to continue to enjoy a modest premium as a function of their specialty crop status, Annex A, Table 10 estimates the likely price impacts of the EC enlargement.

E. Cost Structure of Citrus Exports FOB Tunis and CIF in Major Markets

The costs of marketing Maltese oranges are determined almost entirely on whether the oranges are destined for the domestic or the export market. Whereas domestically marketed oranges go through very few additional channels or operations after harvest -- except transit to local markets, a considerable number of additional costs must be included with exported oranges. These costs are displayed in Annex A, Table 11 for the most recent marketing year. Note that the marketing cost structure for Maltese oranges may be separated into three principal categories: packing and shipping costs, dock costs (FOB) in Tunis, and dock costs (CIF) in Marseille. Furthermore, categories I and III account for approximately 96 percent of all marketing costs. It should be pointed out that picking and local hauling costs are included with production, not marketing costs.

Although a detailed analysis is required of each of the categories in Annex A, Table 11 to determine the feasibility of reducing each of these costs, three costs were continually identified by the sector participants interviewed for this study: wooden box costs, handling costs and commission fees for importers. These three costs together account for nearly half of all marketing/export costs.

Although certain exporters point to the extra layer of insulation and protection that the wooden cases presumably provide, in fact, many importers report that this package type is outmoded, presents a poor image to wholesale buyers, and is overly bulky. Various types of waxed, corrugated cardboard are the current worldwide industry standard. Second, many interviewees maintain that "handling" costs are excessive and could be or should be reduced. Part of this process would require, however, that more packaging--pre-weighing, for example--and other labor-saving tasks be performed at producer or packer/shipper levels. Thus the actual cost would not be eliminated but only shifted to a different place in the system. Many of these marketing tasks, if they were effectively performed at packer/shipper level, might result in increased systemwide efficiency, as it is likely that overall loss rates might decline and that labor rates to carry out these tasks would be lower at production level in Tunisia than at market levels in Tunis or France. Finally, many exporters suggest that the 7 percent commission rates for Maltese oranges are higher than for certain other imported products in Marseille and thus are an unfair burden that their competitors do not have to bear. Importers admit that margins are indeed higher for Maltese oranges but add that this is necessary to accommodate the higher risk they must bear in handling a product with such highly variable quality and arrival condition. French retail prices are usually 50 percent higher for Maltese oranges than for other oranges; only a small portion of the price premium is a result of superior quality. Irrespective of the reasoning, however, it is clear that the higher retail margins that accompany Tunisian oranges on the French market result in a negative impact on final consumer demand.

F. Competition Between Citrus Exports and Domestic Consumption

Annex A, Table 5 and Annex B, Figure 2 show that while total Maltese orange production varies, domestic consumption tends to absorb more of the quantity variation than do exports. It is in this sense that domestic consumption may be considered a residual to the now higher priority export market. Further, in the past several years, the export market has captured an increased share of total production, approaching 35 percent compared to approximately 20% in the late 1970s and early 1980s.

However, the prices of the competing markets, domestic versus export, are such that a producer/exporter is often better served by selling his product locally rather than on the export market. Again, refer to Annex A, Table 5. Although the details of this situation are incomplete, many producers and marketers pointed out that in earlier years the wholesale price in Tunis was actually superior to the export price CIF Marseille. This was true even before adjusting for the additional export marketing costs. After adjusting for these additional costs, many exporters reported that their net returns were indeed greater by selling locally.

One of the principal reasons explaining these higher internal prices is the preference of Tunisians for oranges in general and the Maltese orange specifically. Tunisian per capita consumption of oranges is among the highest in the world and is growing. Annex A, Table 12 indicates that current per capita consumption is approximately 25 kilograms per year -- or nearly five times the total fresh orange consumption (all varieties) in the United States. Moreover, Tunisian preferences appear to be strongest during the late season when the orange is sweeter. However, this also corresponds to the period in France when export prices are highest. This phenomenon partly explains why the efforts by GOT and GIAF to expand the revenues from citrus exports have not progressed more rapidly.

G. Assessment of Marketing Information Available to Exporters on International Markets for Tunisian Citrus

The information available to Tunisian citrus exporters on international market opportunities is mixed. On the one hand, GIAF disseminates a variety of relevant and timely information regarding the internal and external production and marketing situations on citrus and other fruit products. Each year these data are compiled into an annual report -- i.e. *Rapport d'Activite* -- that summarizes the latest statistics and marketing strategies with respect to fruit products. The quality of this report is quite high and its timeliness is impressive: it is generally printed and ready for dissemination to the industry within months of the completion of the marketing season.

Additionally, GIAF has a permanent representative in Marseille who collects and transmits market information on a daily and weekly basis regarding the market situation in France. About 20 importers in Marseille handle nearly all of the fruit imported from Tunisia and the GIAF representative is in nearly daily contact with all of them. This information is transmitted not only to the main office in Tunis, but to the regional fruit offices around the country.

One major omission in the current market information program of the citrus industry is new markets, outside of France. Tunisia has an expressed objective to expand citrus exports to

new markets -- both in Europe and North America -- but currently it lacks the information to make the appropriate decisions regarding these markets. This is not a situation that the GIAF is unaware of, however, with scarce resources, budget limitations have precluded carrying out the requisite marketing studies.

The same observation may be made regarding information flows in the opposite direction, that is, advertising and promotion of Tunisian products. An advertising and promotion campaign was begun for the first time in 1987/1988 and, according to GIAF officials, the preliminary results indicate that it was quite successful. This first program was restricted, however, to France. In the future, if new markets for Maltese oranges are to develop, consumer awareness of the product must be created in other countries.

H. GOT Policies Affecting the Citrus Sub-Sector

The majority of GOT policies that affect the citrus sub-sector operate on the production part of the system. Numerous government supported technical assistance and subsidy systems, for example, are in place that have a direct impact on the performance of citrus production: Ministry of Agriculture and GIAF agricultural extension agents, financial aid for irrigation systems, etc. These were addressed earlier in this report.

There are, however, several interventions by the government that have an impact on the performance of the citrus industry. On the negative side are the fixed retail margins not to exceed 20 percent of the wholesale price of food products. This margin level was established by the government in accordance with its overall policy goal of maintaining low food prices. Irrespective of the value of low food prices as an overall policy objective, implementation of the policy has had several unfortunate consequences for the domestic sales of citrus products.

First, since 20 percent is not likely to be adequate to cover all costs of the retail merchant for procurement and merchandising of citrus products, retailers develop secondary, "black market," distribution systems that avoid direct governmental surveillance but often result in deteriorated products since these parallel channels do not benefit from modern handling and packaging techniques. Moreover, this secondary system introduces still another market intermediary into the system.

Second, according to many interviewees and trade sources, retailers have responded to these fixed margins by mixing different qualities of fruit in such a way that the "average" margin on the mixed qualities results in a greater than 20 percent return to the retailer. Although this is apparently accomplished by false manipulation of wholesale receipts, the result is that consumers are not able to pay more to receive higher quality fruit. In turn, incorrect price/quality signals are sent back through the marketing channels to producers since no one in the channel is compensated for producing or handling superior quality. Of course, although this is domestic regulation directed at the retail level to benefit consumers, in fact, the unintended consequence is that producers are not provided incentives for producing better quality. This situation has direct and important implications for the quality of the fruit that reaches the export market.

A recent government incentive which has tended to have more favorable impacts on the citrus industry is the subsidy -- now up to 50 percent -- on transportation costs to new markets. Maltese oranges have traditionally been restricted to the French market; although other European, Mediterranean and perhaps North American markets may have great

potential. Thus the GOT, through GIAF, has for the past two years offered a transportation subsidy for any exported product to one of the "non-traditional" markets. This provision does not, however, extend to the recent barter sales in Eastern Europe.

IV. Conclusions

A. Production Constraints

There are two production problems that should be considered critical by the Tunisian citrus industry. The most important of these is the need for disease-free citrus stock from local nurseries. The second problem involves determining the best adapted irrigation system for citrus in Tunisia. The balance of present evidence favors properly designed individual irrigation systems. Efficient use of basins and cover crops may also be worth considering if water can only be made available in large amounts at widely spaced intervals and green manure crops can improve the productivity of the light soils.

The pruning, pest control, soil management, windbreaks, and variety selection practices of Tunisian citrus growers should also be reviewed.

An individual who would be very effective in analyzing Tunisian citrus production practices is Dr. Heinz Wutscher of the United States Department of Agriculture's horticultural laboratory in Orlando, Florida. He speaks French and is a highly respected authority on citrus production. He would be able to draw very instructive historical and geographical comparisons to Tunisia's current production practices.

In many instances, Tunisians think that they are using methods specifically adapted to their circumstances when in fact their methods are different only because they have not progressed as far as the rest of the citrus-producing world. A clear authoritative definition of the goals and means for improving production practices by an outside specialist would constitute a major contribution to the Tunisian citrus industry.

B. Quality Factors As They Affect Citrus Export Potential

Although the Maltese orange is clearly recognized by all importers as a distinctive, differentiated product, and deserving of a price premium over competing oranges as a result, there is a price level above which the Maltese orange loses competitiveness. Experience in France over the past several years, for example, shows that consumers will continue to pay a premium of approximately one franc per kilogram for the specialty Maltese orange, however, when the difference between Maltese oranges and other competing oranges becomes greater than one franc, Maltese sales drop dramatically. As one importer put it, "Above a certain price, an orange is an orange." For this reason, it is essential for Tunisian exporters to keep their marketing costs as low as possible.

Section III. E. discussed the marketing costs for Maltese oranges and concluded that a number of opportunities exist to reduce current marketing costs. The Tunisian industry has been slow to move to improved packaging material. Perhaps as high as 50 percent of all export shipments are still made in wooden boxes rather than contemporary cardboard cartons. This has not only led to higher handling costs, due to the additional weight of wood, but to higher product loss as well. Moreover, nearly all importers interviewed reported that the physical appearance of the Maltese box is unappealing from a merchandising perspec-

tive: it is often damaged, dirty and contains an inordinate amount of deteriorated merchandise.

The preceding paragraphs refer to the uneven arrival condition of Maltese oranges in France. A number of factors may be cited to explain these quality problems. As suggested, many opportunities exist to make improvements in packaging and presentation. Importer interviews suggested that when compared to oranges from the major competing countries, Morocco and Israel, Tunisian oranges do not compare favorably. This issue is both packaging and product quality. The exterior of the cardboard cartons from competing countries are thought to be more appealing in color and design in the wholesale markets than the Tunisian package. Many also cite the poor condition of the pallets from Tunisia and generally the lack of unitization of the load with banding material. This is not only an appearance problem but also an important factor contributing to high losses.

Inconsistent grading of export oranges, primarily malformed fruit and/or bruised, scraped skin, is an important constraint on expanding export potential. Perhaps the most critical factor affecting quality, however, is the lack of refrigeration throughout the marketing channel. Only four of the nineteen citrus packer/exporters have any facility for refrigeration after packing and exporter interviews indicated that much of the time these refrigerated storage rooms are not employed for citrus. In one case, for example, the exporter reported that his overall returns are higher when dates are held in these rooms instead of oranges. Moreover, neither the trucks to port nor the boats to Marseille are refrigerated or even ventilated. Thus the oranges are often delivered to Marseille without benefit of any refrigeration for perhaps as long as six to seven days. The economic consequences of the resulting deterioration in the product's physical appearance and reduction in its shelflife are substantial, if perhaps inestimable.

While the lack of refrigeration is not a new problem, the increasing sophistication of the European shopper with respect to the quality demanded in fresh foods has intensified the problem. Whereas Tunisian oranges may have been able to compete against other oranges in the past, now most competing oranges are distributed through refrigerated systems -- often from field level onwards. There is a need for Tunisia to improve the quality of its fruit distribution system or lose markets to the countries that have. International citrus trade, in particular in the Mediterranean basin, has become fiercely competitive over the last decade and Tunisia must innovate simply to retain their current small share of the market.

There does not appear to be recognition of the severity of this quality problem in Tunisia. Exporters are quick to point out that there is "no other orange in the world that competes against the unique Maltese". This belief may obscure their vision to the realities of the contemporary marketing system. When asked about the feasibility of introducing refrigeration, many in the GOT and in the export sector reported that the Maltese orange is an extremely delicate product that does not hold up well in refrigerated conditions. Moreover, past experiments, they suggest, proved unsuccessful. While there appears to be validity in these claims, there is also widespread agreement among post harvest physiologists that all citrus products, including blood oranges, benefit substantially from refrigerated distribution. One exporter went so far as to rationalize not using refrigeration by explaining that the ability to hold the fruit in storage longer would lead European consumers to doubt the freshness of the product!

Whereas the adoption of extensive refrigeration would undoubtedly add marketing costs, the additional benefit in higher returns due to the reduced product loss and improved quality would be likely to justify the investment. However, since this issue has not received much study, more post harvest experimentation with various refrigeration techniques is required

before a definite recommendation can be made. A first step might be to investigate the impact of partial refrigeration in the most critical, immediate post harvest days or to introduce more ventilation in boat transport. These types of pilot studies could be conducted at low cost and are certain to gain quick support of the importers.

C. The Present Citrus Marketing System and Government Policies as They Affect Export Potential

Three conditions in the current citrus marketing system affect citrus export potential. The first is the totally independent system of exporting. That is, currently about nineteen exporters make separate sales agreements with nearly an equal number of "licensed" importers in France. Although they do this with the general sanction and support of GIAF, the latter is only a quasi-governmental agency and has no actual authority to negotiate terms of sale. With such a relatively small total volume of product -- most of the exporters handle less than 2,500 tons each -- some type of collective sales agency might make the sales transaction into more of an efficient process. Government administered marketing boards have had long history in African and Middle Eastern agricultural marketing. Israel, South Africa, and the Ivory Coast are successful examples. Similarly, organization on the buying side could also deliver benefits with respect to coordinating research studies, advertising and promotion programs, and rationalizing delivery and warehousing functions in ports of arrival.

Second, this report has also drawn attention to the competition for Maltese export markets by the domestic market. This competition is especially keen at the end of the season when export prices are highest. As long as producers can earn greater real returns by selling their products locally, the rational producer will not participate in export trade despite the most vociferous encouragements by the GOT. To the extent that the very high domestic citrus consumption in Tunisia is caused by the absence of competing fruits, efforts may be taken by GOT to encourage diversifying current production to include other fruit products or even to importing other fruit.

Finally, as described above, Tunisia's policy to cap retail food margins at 20 percent is intended to assure consumers of reasonably priced food. The incentives that are transmitted to producers as a result of this policy, however, have impacts on the export market as well. Retailers compensate for their limited ability to raise margins by mixing qualities and selling at a relatively low, fixed margin level. The result is poor quality for consumers and, generally, an inability for consumers to even express a preference for higher quality since the products are not differentiated with price/quality dimensions at the retail level. Since producers are not remunerated for higher quality, they have no incentive for producing it. This mentality spills over into the fruit that goes into the export market as well. Allowing for at least some flexibility in retail pricing -- for perishable products or, perhaps, within certain margin ranges -- might go a long way in transmitting to producers the vital signals to improve quality.

ANNEX A

Statistical and Other Tables

Annex A - Table 1
Regions of Citrus Adaptability In Tunisia

VARIETY	Northern Valleys	Hot Regions	North Coast	Central Coast
Clementine	Good	Excellent	Excellent	Excellent
Maltaise Demi-Sanguine	Poor	Good	Excellent	Good
Wilking Mandarine	Good	Good	Good	Good
Valencia	Excellent	Poor	Good	Good
Eureka Lemon	Good	Excellent	Good	Excellent
Washington Navel	Excellent	Good	Good	Excellent

Source: Ministry of Agriculture, *Agrumes, MOA, Tunis, Tunisia, 1982*

Annex A - Table 2
Major Citrus Varieties In Tunisia In 1986
Tree Numbers and Hectarage

VARIETY	Number of Trees	Number of Hectares
Oranges	2,250,459	8,590
(of which Maltaise)	(1,624,015)	(6,199)
Clementines	575,049	2,195
Mandarines	215,658	823
Lemons	194,144	741
Bigaradier	127,614	487
Other Varieties	98,000	374
Total	3,461,010	13,210

Source: "2^{ème} Recensement des Agrumes" in GLAF, *Rapport d'Activites 1986/87, GLAF, Tunis, Tunisia, 1988*

Annex A - Table 3
Maltese Orange Exports in Tons Per Week
Port of Marseille
1983-1984 Season

WEEK	Metric Tons	Percent
1/2 - 1/8	1,575,400	5.77
1/9 - 1/15	1,263,561	4.63
1/16 - 1/22	2,005,506	7.35
1/23 - 1/29	364,465	1.34
1/30 - 2/5	496,740	1.82
2/6 - 2/12	819,236	3.00
2/13 - 2/19	1,242,206	4.56
2/20 - 2/26	1,439,933	5.20
2/27 - 3/4	2,175,145	7.97
3/5 - 3/11	1,623,465	5.95
3/12 - 3/18	1,904,271	6.98
3/19 - 3/25	2,012,920	7.38
3/26 - 4/1	1,659,853	6.09
4/2 - 4/8	1,497,415	5.50
4/9 - 4/15	1,640,198	6.02
4/16 - 4/22	1,866,120	6.84
4/23 - 4/29	1,887,164	6.93
4/30 - 5/6	847,752	3.11
5/7 - 5/13	416,697	1.53
5/14 - 5/20	380,823	1.40
5/21 - 5/27	95,377	0.35
5/28 - 6/3	54,330	0.20
Entire Marketing Period	27,268,577	100.00

Source: *GLAF, Rapport d'Activites 1986/87, GLAF, Tunis, Tunisia, 1988*

Annex A - Table 4
Average Prices for Maltese Oranges by Size
Port of Marseille
1983-1984 Season (January-April)

SIZE CLASS ¹	Percent in Size Class	Average Price
	(%)	(FF/Kg)
Bagged	0.60	1.83
Size 63	3.32	3.35
Size 75/88	48.32	4.01
Size 100	23.18	3.49
Size 108	16.69	3.17
Size 126	7.31	2.86
Size 144/162	0.58	2.72
All Sizes	—	3.62

¹Sizes refer to the number of oranges contained in a standard size 15 kilogram carton, thus, larger numbers refer to smaller sized fruit.

Source: GLAF, Rapport d'Activites 1983/84, GLAF, Tunis, Tunisia, 1984

Annex A - Table 5
Maltese Orange Situation in Tunisia: 1978/79 to 1987/88

CATEGORY	YEAR				
	1978/79	1979/1980	1980/81	1981/82	1982/83
	<i>(in thousands of metric tons)</i>				
Production	109.0	87.9	136.0	88.2	76.7
Exports	33.1	31.1	26.7	18.1	15.0
Domestic Consumption	75.9	56.8	109.3	70.1	61.7
Producer Price (in Dinars/ton)	100	133	120	166	183
Export Price ¹ (in FF/kg)	2.50	3.00	2.94	3.47	5.37
(in Dinars/ton)	87	159	191	208	310
Wholesale Price ² (in Dinars/ton)	124	162	125	189	192

¹ CIF Marseille

² Tunis wholesale market

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Annex A - Table 5 (Continued)
Maltese Orange Situation in Tunisia: 1978/79 to 1987/88

CATEGORY	YEAR				
	1983/84	1984/85	1985/86	1986/87	1987/88
	<i>(in thousands of metric tons)</i>				
Production	128.7	124.0	151.5	147.0	120.0
Exports	31.6	41.0	45.4	53.3	42.0
Domestic Consumption	97.1	83.0	106.1	93.7	78.0
Producer Price (in Dinars/ton)	N/A	N/A	N/A	150-400	150-300
Export Price ¹ (in FF/kg)	3.59	5.68	3.97	3.92	N/A
(in Dinars/ton)	224	355	248	245	N/A
Wholesale Price ² (in Dinars/ton)	141	289	109	188	N/A

¹CIF Marseille

²Tunis wholesale market

Sources: GLAF, *Rapport d'Activites 1978/79 - 1986/87*, GLAF, Tunis, Tunisia, 1987 and GLAF, "18^{eme} Reunion de la Commission de Suivi des Exportations d'Agrumes et d'Abricots, GLAF, Tunis, Tunisia, 2 Mai 1988.

Annex A - Table 6
Tunisian Maltese Orange Exports by Destination

IMPORTING COUNTRY	YEAR						
	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82
	<i>(in thousands of metric tons)</i>						
France	24.8	24.0	43.2	23.9	25.5	23.3	18.0
Yugoslavia	3.0	6.9	8.0	8.2	5.4	1.6	-
Czechoslovakia	-	-	-	-	-	-	-
Hungary	-	-	-	1.1	-	1.7	-
Germany	0.3	0.01	1.2	0.1	0.1	0.02	0.03
Holland	0.02	-	0.2	-	-	-	0.1
Others	0.08	0.09	0.02	0.2	0.1	0.1	0.03
Total Exports	28.20	31.00	52.80	33.10	31.10	26.70	18.20

IMPORTING COUNTRY	YEAR					
	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88
	<i>(in thousands of metric tons)</i>					
France	14.9	27.3	37.6	29.8	32.5	30.6
Yugoslavia	-	2.7	-	5.9	10.0	5.9
Czechoslovakia	-	-	-	2.7	2.3	2.6
Hungary	-	-	-	1.0	2.0	1.9
Germany	-	0.4	0.6	-	-	-
Holland	-	0.1	1.2	3.7	4.1	0.8
Others	-	1.1	1.6	2.3	2.4	1.0
Total Exports	14.9	31.6	41.0	45.4	53.3	42.8

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Annex A - Table 6 (Continued)
Percentage of Maltese Orange Exports to France
and Eastern European Countries

IMPORTING COUNTRY	YEAR						
	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82
France	87.9	77.4	81.8	72.2	82.0	87.3	98.9
Eastern European Countries	10.6	22.4	15.2	28.1	17.4	12.3	0.0

IMPORTING COUNTRY	YEAR						
	1982/83	1983/84	1984/85	1985/86	1986/87	1987/8	
France	100.0	86.4	91.7	65.6	61.0	71.5	
Eastern European Countries	0.0	9.8	0.0	21.1	28.7	24.3	

Sources: *GLAF, Rapport d'Activites 1978/79 - 1986/87, GLAF, Tunis, Tunisia, 1988; and GLAF, "18^{ème} Reunion de la Commission de Suivi des Exportations d'Agrumes et d'Abricots, GLAF, Tunis, Tunisia, 2 Mai 1988*

Annex A - Table 7
Maltese Orange Exports by Major Exporter
1986-1987

EXPORTER	Metric Tons of Exports	Percent of Total
Societe Mami	7,765	14.9
Societe Ag. Golfe	4,337	8.3
Societe Skouri	4,666	9.0
Societe Boujbel	4,198	8.1
Societe Hamada Freres	4,224	8.1
Namouchi	4,280	8.2
SCAAM	3,901	7.5
Slim	3,541	6.8
SICOPRIM	2,708	5.2
O.Hammamet	2,344	4.5
CEPA	2,248	4.3
O T D	2,013	3.9
COSAB	1,985	3.8
SCCOPAK	1,551	3.0
SGGEF	1,101	2.1
Etablissement Thimar	997	2.0
Modulo-Export	85	0.2
Hedhili	30	0.1
Total	51,974	100.0

Source: GLAF, *Rapport d'Activites 1986/87*, GLAF, Tunis, Tunisia, 1988

Annex A - Table 8
Maltese Oranges: Quantities Sold and Prices Received in
Tunis Wholesale Market

YEAR	MONTH					
	December	January	February	March	April	May
<i>(Quantity in Metric Tons and Prices in Dinars per Metric Ton)</i>						
1983-1984						
Quantity	1,565.3	3,004.4	4,369.3	6,526.8	4,763.6	3,952.2
Price	71	92	109	103	145	173
1984-1985						
Quantity	1,341.0	3,290.1	3,718.7	2,203.5	1,231.6	383.4
Price	156	123	154	174	162	232
1985-1986						
Quantity	1,073.2	3,619.0	4,125.5	4,888.3	4,097.2	1,995.6
Price	125	113	115	95	124T179	
1986-1987						
Quantity	1,044.3	3,139.1	4,095.4	3,528.0	3,063.1	798.4
Price	126	109	142	241	309	331
1987-1988						
Quantity	865.7	2,705.0	2,462.03,139.2	TN/A	N/A	
Price	124	132	183	235	N/A	N/A

YEAR	MONTH					
	June	July	August	September	October	November
<i>(Quantity in Metric Tons and Prices in Dinars per Metric Ton)</i>						
1983-1984						
Quantity	985.6	99.9	58.3	56.3	56.	577.2
Price	213	177	173	167	202	184
1984-1985						
Quantity	175.2	27.7	2.4	1.5	74.2	319.0
Price	227	256	314	154	139	166
1985-1986						
Quantity	501.8	46.2	55.1	34.9	39.8	387.7
Price	140	198	237	162	163	154
1986-1987						
Quantity	48.7	1.8	0.4	0.0	14.4	271.9
Price	251	213	294	--	257	158
1987-1988						
Quantity	N/A	N/A	N/A	N/A	N/A	N/A
Price	N/A	N/A	N/A	N/A	N/A	N/A

Source: GLAF, *Rapport d'Activites*, GLAF, Tunis, Tunisia, selected years

Annex A - Table 9
Comparison of Orange Prices in French Markets
Among Major Competing Exporters
January 1986 to Mid-May 1987

EXPORTER	1986		1987	
	Metric Tons	Average Price (FF/Kg)	Metric Tons	Average Price (FF/Kg)
Spain	225,700	3.01	238,100	2.93
Morocco	90,700	2.97	60,800	3.38
Tunisia	29,500	3.85	33,000	3.77
Italy	23,500	2.21	13,900	2.16
Israel	10,500	3.44	22,000	3.57
Cyprus	11,400	2.89	14,500	3.36
Algeria	500	2.77	4,400	2.40
Greece	2,200	2.32	2,300	1.85
Total	394,000	3.04	389,000	3.09

Source: GLAF, Rapport d'Activites 1986/87, GLAF, Tunis, Tunisia, 1988

Annex A - Table 10
Projected Effects of European Community Enlargement
on Equilibrium Prices for Tunisian Oranges

PERIOD	CHANGE	
	Minimum	Maximum
	<i>(percent¹)</i>	
October 15 - November 30	- 4.9	- 5.5
December 1 - January 31	- 2.1	- 2.7
February 1 - March 31	- 1.6	- 2.0
April 1 - April 30	- 0.6	- 0.8
May 1 - May 15	- 0.2	- 0.3
May 16 - May 31	0.0	- 0.2
June 1 - June 30		- 0.3

¹Percent of recent average seasonal price levels.

Source: Falgon, C., "The Effect of Enlargement of the European Community on the Export Prospects for Tunisian Fruits and Vegetables", Ministry of Agriculture, Tunis, Tunisia, undated

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Annex A - Table 11
Maltese Orange Export Marketing Costs
for the 1987-1988 Marketing Season

I. Packing and Shipping Costs	<i>(in Dinars per Metric Ton)</i>
Wooden cases	50.00
Pallets	8.00
Corrograted materials and staples	1.00
Packaging paper	5.20
Wax	3.60
Export labels	1.50
Export stickers	4.00
Water, electricity and telephone	4.00
Handling	33.00
Transport	5.00
Depreciation on field bins	4.00
Depreciation on packing line material	5.00
Miscellaneous expenses	7.00
Sub-Total	131.30
II. Dockside Costs in Tunis	<i>(in Dinars per Metric Ton)</i>
a. Lading Cost	2.42
Export Tax at 14.29 percent	0.34
Toll	0.24
Extra expenses	1.60
H.A.M.	0.46
Export stamp	0.10
b. Transit costs	4.00
Weight tax	0.75
c. T.C.A.	2.00
Sub-Total	11.93
III. Dockside Costs in Marseille	<i>(in French Francs per Metric Ton)</i>
Freight	176.00
Unloading	117.60
Transit costs	172.00
Weight tax	50.00
Port tolls and taxes (2,700 x 5)/100	135.00
Commission (4000 x 7)/100	280.00
Sub-Total	930.60
Total (in Dinars per Ton)	275.37

Source: GLAF, personal communication, unpublished data, 1987/88

Note: Exchange rate 10 FF = Dinars 1.400

Annex A - Table 12
Tunisian Per Capita Consumption of Maltese Oranges
Selected Years

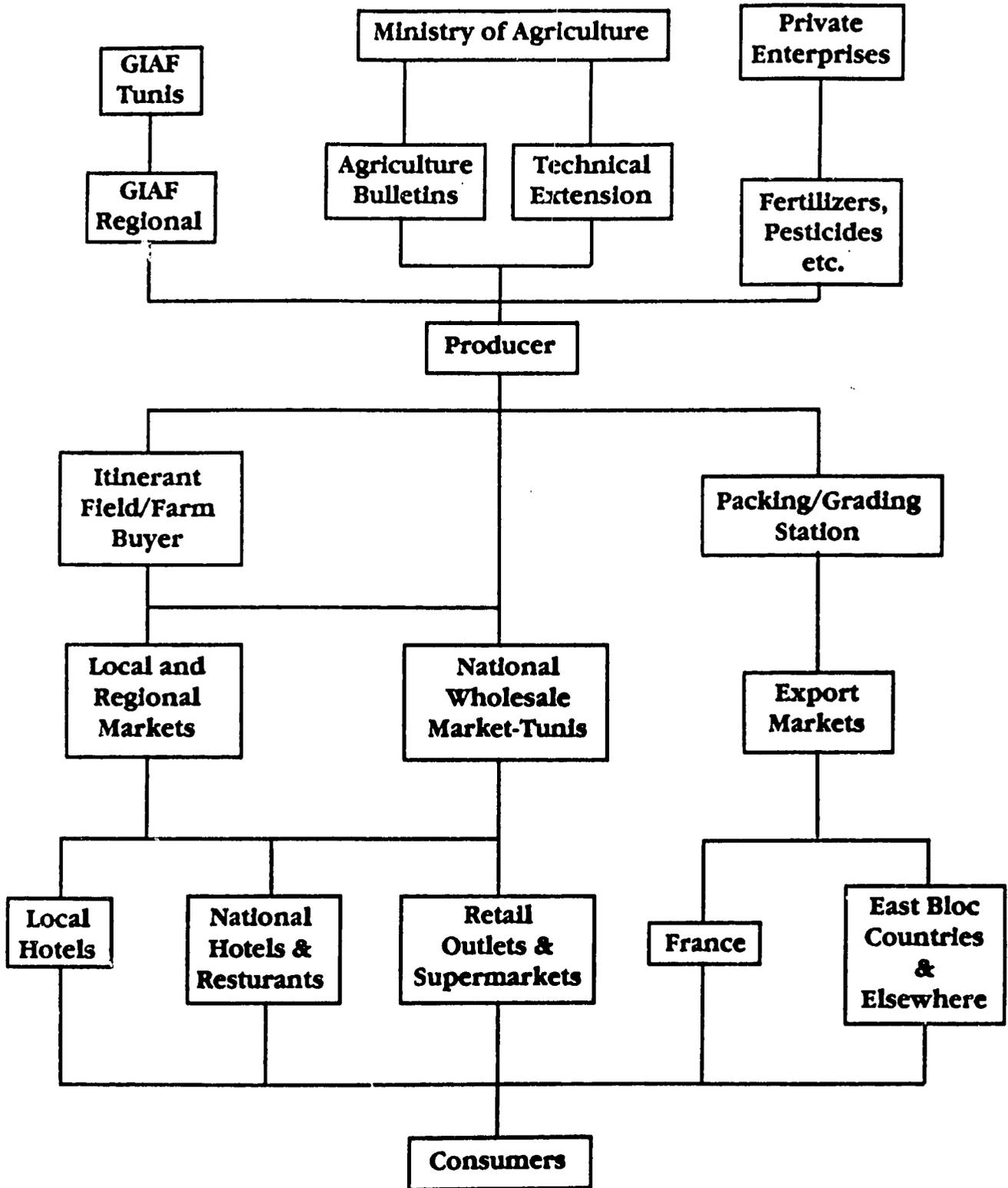
YEAR	Per Capita Consumption in Kilograms
1975	15.8
1981	21.0
1985	25.1

Source: GLAF, various publications

ANNEX B

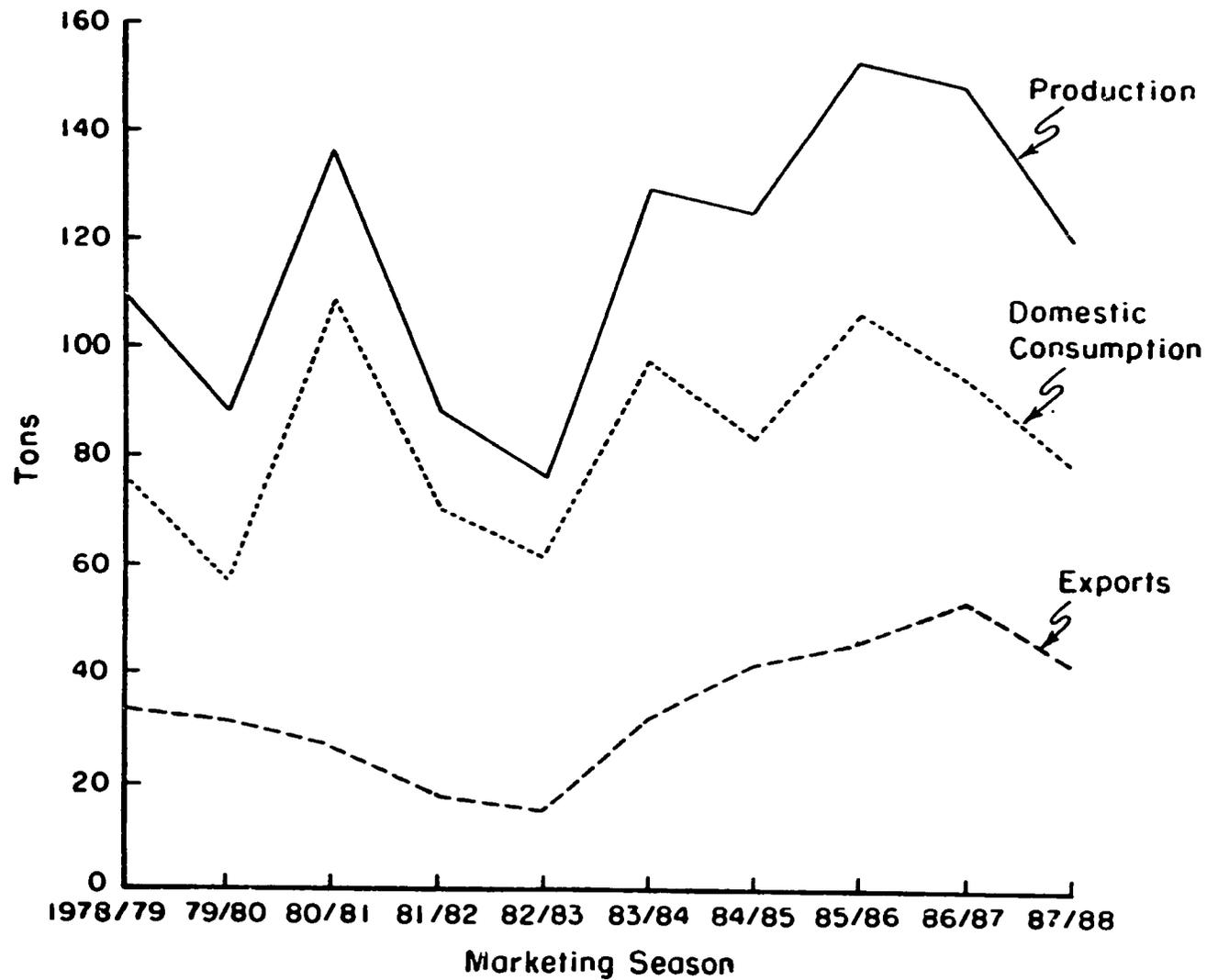
Figures and Charts

**ANNEX B FIGURE 1
PRINCIPAL MARKETING CHANNELS: TUNISIAN CITRUS SECTOR**



45'

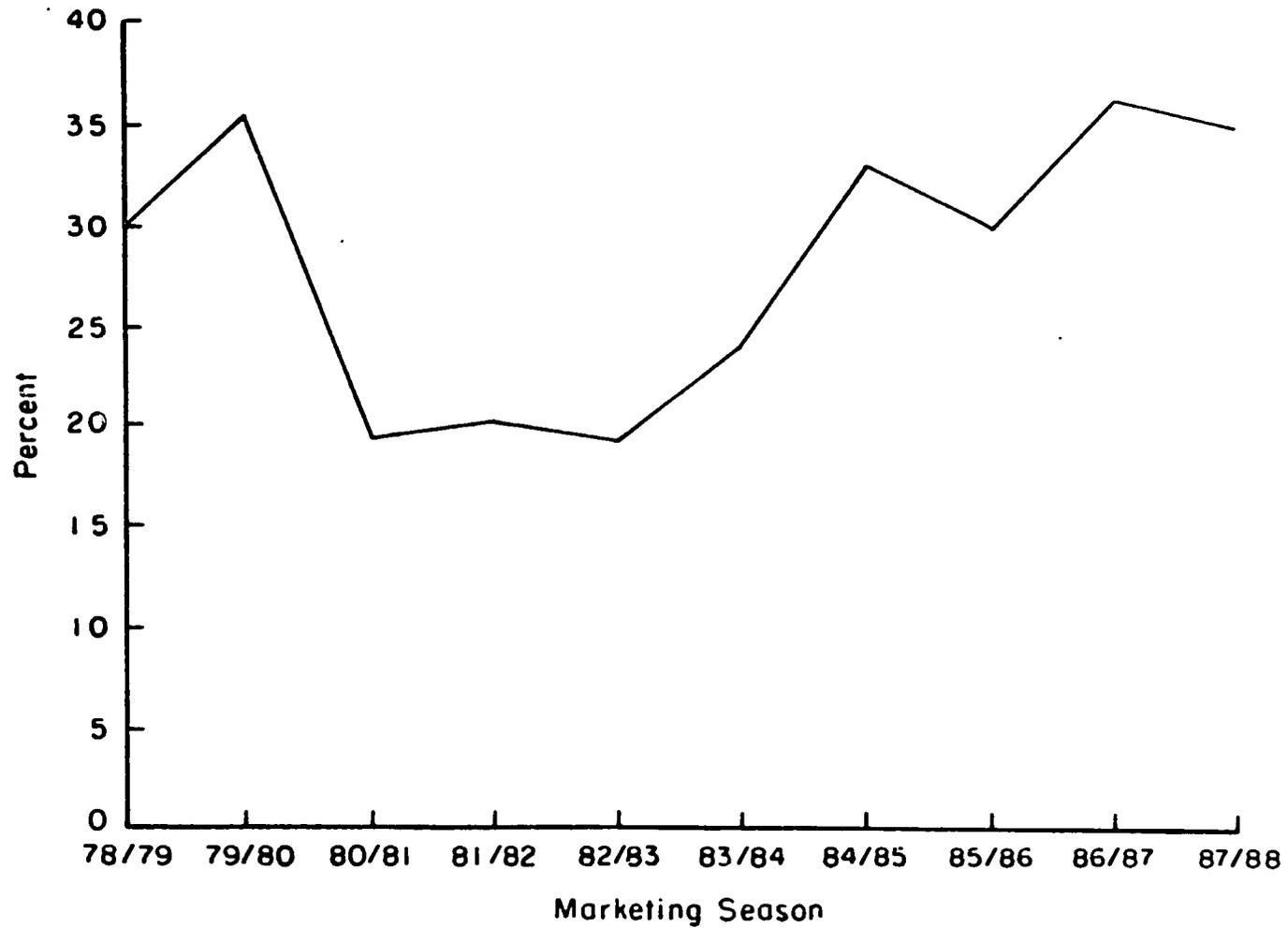
ANNEX B FIGURE 2
PRODUCTION, CONSUMPTION, AND EXPORTS OF TUNISIAN
MALTESE ORANGES
1978/1979 TO 1987/1988



4/16

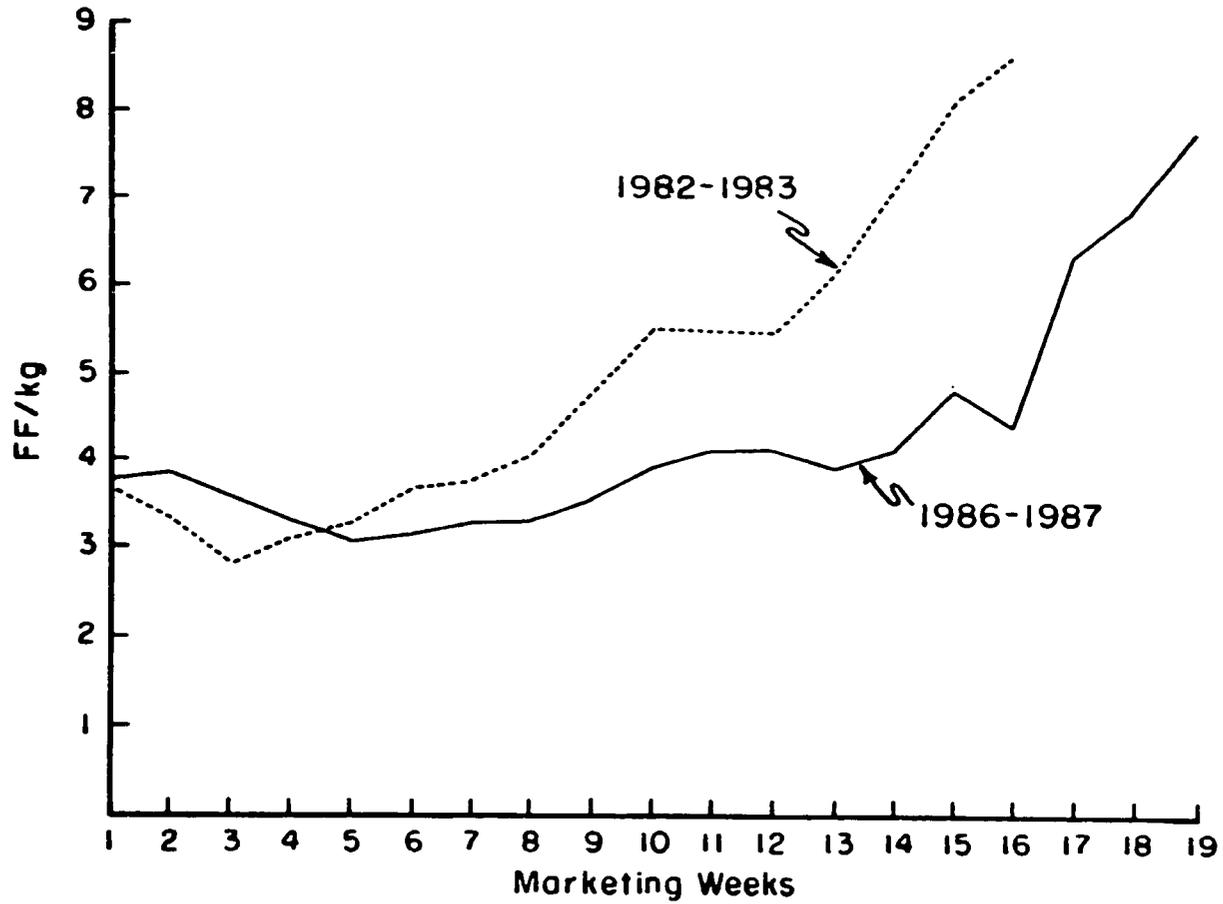
175

ANNEX B FIGURE 3
MALTESE ORANGE EXPORTS AS A PERCENT OF PRODUCTION
1978/1979 TO 1987/1988



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**ANNEX B FIGURE 4
AVERAGE MALTESE ORANGE WHOLESALE PRICES IN
THE PORT OF MARSEILLE**



ANNEX C

Recommended Practices in Citrus Production

Citrus Crop Calendar

<i>Month</i>	<i>Activity</i>	<i>Comments</i>		
SEPTEMBER				
Fertilization	Recommended levels for a grove which has not benefitted from manure, green manure, or nutrient applications during intercropping	<u>Years</u>	<u>Clementines</u>	<u>Others</u>
		1	75	50
		2	150	100
		3	225	150
		4	300	200
		5	375	250
		6	450	300
		7	525	350
		8	600	400
		9	675	450
	10 +	750	500	
	Zinc and Mn deficiency	200 to 300 grams/100 liters of water		
	Spray Zinc Oxide on new growth	February, June and September		
	Spread on soil	100 grams of ZNSO ₄ and 100 grams of MnSO ₄ per tree in autumn		
Pesticides	Apply in the early morning or the late afternoon	Amount per 100 liters of water		
	For aphids			
	One of the following three chemicals:			
	Ultracide 40	150 cc.		
	Folimat So	150 cc.		
Decis	100 cc.			
plus Fumagine	10 to 15 liters of mixture per tree sprayed at 20 kilograms per square centimeter of pressure			
		Wait one week after spraying to harvest early varieties		
	For fruit fly			
	Thoroughly soak the foliage of windbreaks at 1,000 liters per hectare and the cuvettes	Dimethoate 100 cc. per liter		

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<i>Month</i>	<i>Activity</i>	<i>Comment</i>
	Apply once every two weeks until mid-November. Follow warnings published by the plant protection station protection station	40% AI with 300cc Lysatex Trichlorphon: 150 grams of 80% AI with 0.3 liter of hydrolysate of protein Fenthion 50% at 100 cc. per 100 liters of water with 300 cc. of Lysatex Malathion 50% AI per 100 liters of water and 300 cc. of Lysatex
Pruning	Two year old lemons after harvest	
Harvest	Lemons	

OCTOBER

Irrigation	Windbreaks 1 to 2 years old	Once every two weeks
	Windbreaks 3 years or older	Once every month
	Citrus 1 to 2 years old	Once per week on light soil Once every 10 days on loam
	Citrus 3 years or older	Once every 15 days on light soil Once every 25 days on loam
Green Manures	Sow green manure	100 kilograms of feveroles per hectare
Pesticides		Stop all applications against cochennilles
	For fruit fly	Same as September
	For bud thryps, especially on lemons	Amount per 100 liters of water
	10 to 15 liters of mixture per tree sprayed at 20 kilograms per square centimeter pressure. Apply twice at an interval of one month if the grove was not treated in spring and summer	Wettable sulfur 450 grams of 80% AI
	Sulfur gives the best results.	Chlorobenzilate (Gesakar)
	If there is scale use Ultracide before	125 grams of 25% AI
Pruning	Trim 2 year old trees	

<i>Month</i>	<i>Activity</i>	<i>Comment</i>
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Harvest	Lemons Clementines	
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NOVEMBER

Pesticides	-- For fruit fly	Same as September
Grove Maintenance	Weeding	
Fertilization	Apply manure	20 tons per hectare for all groves regardless of age
Soil preparation for new plantings on loam soils	Basic fertilizers to be incorporated into the top 30 cms. of soil	Manures at 20 tons per hectare Triple Superphosphate at 800 kilograms per hectare Potassium sulphate at 500 kilograms per hectare
	Harrow	
	Stake trees	Spacing of 6 by 4 meters
Harvest	Lemons Do not harvest pomelos because they will be sour and flavorless Clementines	
Planting Windbreaks		<u>Quantity per meter of hedge</u>
	Apply Triple Superphosphate	250 grams
	Apply Potassium Sulphate	100 grams

DECEMBER

Preparing holes for tree planting on light or sandy soils	Make holes and put the fertilizer mixture in the bottom of the hole. Mix	<u>Fertilizer per hole</u> Manure: 20 kilograms Triple Superphosphate: 2 kilograms Potassium sulphate: 1 kilogram
Harvest	Lemons	

Month	Activity	Comment
	Do not harvest either Maltaise oranges or pomelos because they are still sour and flavorless	
	Clementines	
	Mandarines	
	Washington Navels	

JANUARY and FEBRUARY

Harvest	Lemons
	Do not harvest pomelos. They are still sour and flavorless.
	Clementines
	Mandarins
	Washington Navels
	Maltaise blonde
	Maltaise demi-sanguine
Planting Citrus	Fill holes two weeks before planting and make a basin. Water two times.
	The day of planting make a little hole for the tree.
	Plant without burying the trunk or the bud.
	Put an individual shelter in place. Protect the trunk from the sun. Irrigate once a week.
Grove Maintenance	Weeding
	Incorporate green manure by the end of the month at the latest.
Fertilization	Spread nitrogen one week before bloom.

	<u>Years</u>	<u>Clementines</u>	<u>Others</u>
	1	225	150
Recommended levels for a grove which has not benefitted from manure, green manure, or nutrient application.	2	450	300
	3	675	450
	4	900	600
	5	1,125	750
	6	1,350	900
	7	1,575	1,050
	8	1,800	1,200
Ammonium Nitrate (33% N)	9	2,025	1,350
	10 +	2,250	1,500

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<i>Month</i>	<i>Activity</i>	<i>Comment</i>																																	
	Spread fertilizer with a tin can.																																		
	Nitrogen with manure or green manure or an intercrop receiving fertilizer	Grams of Ammonium Nitrate per tree per Tree																																	
		<table border="1"> <thead> <tr> <th><u>Years</u></th> <th><u>Clementines</u></th> <th><u>Others</u></th> </tr> </thead> <tbody> <tr><td>1</td><td>150</td><td>100</td></tr> <tr><td>2</td><td>300</td><td>200</td></tr> <tr><td>3</td><td>450</td><td>300</td></tr> <tr><td>4</td><td>600</td><td>400</td></tr> <tr><td>5</td><td>750</td><td>500</td></tr> <tr><td>6</td><td>900</td><td>600</td></tr> <tr><td>7</td><td>1,050</td><td>700</td></tr> <tr><td>8</td><td>1,200</td><td>800</td></tr> <tr><td>9</td><td>1,350</td><td>900</td></tr> <tr><td>10+</td><td>1,500</td><td>1,000</td></tr> </tbody> </table>	<u>Years</u>	<u>Clementines</u>	<u>Others</u>	1	150	100	2	300	200	3	450	300	4	600	400	5	750	500	6	900	600	7	1,050	700	8	1,200	800	9	1,350	900	10+	1,500	1,000
<u>Years</u>	<u>Clementines</u>	<u>Others</u>																																	
1	150	100																																	
2	300	200																																	
3	450	300																																	
4	600	400																																	
5	750	500																																	
6	900	600																																	
7	1,050	700																																	
8	1,200	800																																	
9	1,350	900																																	
10+	1,500	1,000																																	
	Ammonium Nitrate (33% N)																																		
	For zinc deficiency																																		
	Spray zinc oxide on new growth at the rate of 200 to 300 grams of zinc oxide per 100 liter of water.																																		
Pesticides	Thryps, especially on lemons	Same as October																																	
	Scale	Same as September																																	
Pruning	Trim 2 year old trees																																		
	Prune clementines and Washington Navels after harvest.																																		
Harvest	Oranges																																		
	Mandarins																																		
	Lemons																																		
	Maltaise Blonde																																		
	Maltaise demi-sanguine																																		
	Pomelo																																		
	Wilking Mandarin																																		

MARCH

Planting Trees	Finish planting by the end of the month at the latest.	See January and February
Fertilization	Spread ammonium nitrate one month before bloom for the varieties which did not receive fertilizer in February. See February for instructions.	

<i>Month</i>	<i>Activity</i>	<i>Comment</i>
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	Apply ammonium nitrate to windbreaks at 30 grams per meter of hedge.	
Irrigation	Irrigate the trees planted in February and March on light soil once per week at 50 liters of water per hole.	
Pesticides	Thrips and scale Treat for scale before bloom.	Same as February
Pruning	Trim 2 year old trees Prune Maltaise after harvest but before flowering. Clementines girdle only every other year. First incision when petals fall. Second incision after 2 to 3 at 5 centimeters lower.	
Harvest	Lemons Maltaise demi-sanguine Pomelo Wilking Spray gibberilic acid when petals start to fall. Apply once per year at low pressure and dose of one tablet BERELEX and 25 cc. per 10 liters of water per tree and Adhesol per 100 liters of water.	

APRIL

Irrigation	For windbreaks 1 to 2 years old, irrigate once every two weeks. For windbreaks 3 years and older, irrigate once per month. For citrus 1 to 2 years old on light soil, irrigate once per week; once per 10 days on loam. For citrus 3 years and older, irrigate once per 15 days on light soil and once per 25 days on loam.
Pesticides	Aphids

53

<i>Month</i>	<i>Activity</i>	<i>Comment</i>
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Preferably use one of the products below after bloom. There is a danger of poisoning bees. Preferably use systemic chemicals and those with a long residual effect. Avoid spraying dimethoate on limes, lemons and bigaradiers.

Product	Dose in CC. per hectare	%AI	Days Before Harvest
Dimethoate	75	40	7
Phosphamidon	150	20	21
Oxydemeton-Methyl	100	25	21
Pirimicarne	75	50	7
Isolan	100	30	15
Vamidothion	125	40	30

MAY

Irrigation	<p>For windbreaks 1 to 2 years old, irrigate once every week.</p> <p>For windbreaks 3 years or older, irrigate once per month.</p> <p>For citrus 1 to 2 years old, irrigate once per week on light soil; once per 10 days on loam.</p> <p>For citrus 3 years and older, irrigate once every 15 days on light soil; once every 25 days on loam.</p>	
Pruning	Prune Wilking manderins, Valencia oranges and pomelos after harvest.	
Insecticides	For aphids	Same as April
Harvest	Lemons Late Valencias	

JUNE

Irrigation	<p>For windbreaks 1 to 2 years old, irrigate once every two weeks.</p> <p>For windbreaks 3 years or older, irrigate once every month.</p>
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Month	Activity	Comment
	<p>For citrus 1 to 2 years old, irrigate once every week on light soil; once every 10 days on loam.</p> <p>For citrus 3 years or older, irrigate once every 15 days on light soil; once every 15 days on loam.</p>	
Fertilization	<p>Ammonium nitrate on varieties receiving treatments in February and March.</p> <p>Spread ammonium nitrate on windbreaks at 30 grams per meter of hedge.</p> <p>For Clementines, apply a foliar spray of potassium nitrate to trees which have been girdled at a rate of two kilograms per 100 liters of water or spread 500 grams of potassium sulphate per tree on the soil.</p>	
Pruning	<p>Trim 2 year old trees</p> <p>Prune Valencias after harvest</p>	
Pesticides	<p>Spray for thryps early in the morning or late in the evening -- i.e. before 10 AM or after 4 PM -- as per instructions for October.</p>	
	Scale	Same as October
Harvest	<p>Lemons in second half of the month.</p> <p>Do not use oleoparathion on Late Valencias at this time.</p>	

JULY

Irrigation	<p>For windbreaks 1 to 2 years old, irrigate once every two weeks.</p> <p>For windbreaks 3 years or older, irrigate once every month.</p> <p>For citrus 1 to 2 years old, irrigate once per week on light soil; once every 10 days on loam.</p> <p>For citrus 3 years or older, irrigate once every 10 days on light soil; once every 15 days on loam.</p>
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- 57'

Month	Activity	Comment
	Pesticides	For scale, spray early in the morning or late in the afternoon. Do not use oleoparathion during this time.
	Herbicides	Apply herbicides for Bermuda grass and nut sedge as 10 liters of Roundup per hectare per year mixed properly. Spray under low pressure on windless days. Avoid spraying trees. For weed regrowth, use Roundup at 3 liters per hectare. If Gramoxone is used, same precautions as for Roundup apply.
	Harvest	Lemons

AUGUST

Irrigation	For windbreaks 1 to 2 years old, irrigate once every two weeks. For windbreaks 3 years or older, irrigate once per month. For citrus 1 to 2 years old, irrigate once per week on light soil; once every 10 days on loam. For citrus 3 years or older, irrigate once every 10 days on light soil; once every 15 days on loam.	
Soil Preparation for New Plantings	Plow fields to destroy Bermuda grass. Subsoil or deep plow loams.	
Pesticides	Scale	See September
Harvest	Lemons	

Source: Ministry of Agriculture, Agrumes, MOA, Tunis, Tunisia, 1982

Citrus Diseases In Tunisia

The most important factor adversely affecting citrus production in Tunisia is diseases. The main problem revolves around viruses and poor cultural practices at the nursery level. However, fungus diseases are also common and cultural practices, such as pruning and allowing soil and debris to cover the bud on citrus trees, contribute to the disease problems. Five viruses and one fungus disease have been identified by Tunisian citrus specialists as the most prevalent diseases. Comments on the importance of the diseases in Tunisia are from Jamoussi, B., "Inventaire des Viroses et des Maladies a Mycoplasmes des Agrumes en Tunisie", in Rendu de la Reunion Scientifique sur la Selection Sanitaire des Agrumes, Comite Maghrebien des Agrumes et Primeurs/Commission Agro-Technique, Algiers, Algeria, 1974. All of the diseases listed here are frequently seen in Tunisia, except for Exocortis, which is seldom observed. Disease problems are most commonly found in older citrus groves. All of the following diseases, except for stubborn and mal seco, are viruses. Disease descriptions are from Klotz, L.J., Color Handbook of Citrus Diseases, University of California Citrus Research Center and Agricultural Experiment Station, Riverside, California, 1973.

Psorosis

This virus disease is referred to as "scaly bark" in California. In addition to the symptom observed on the bark, the disease causes light colored spots along the veins of the leaf. Psorosis also occurs in Florida citrus but in that state, the term "scaly bark" refers to leprosis. The virus is transmitted by budding, grafting, natural root grafting, sap and dodder. Leaf and bark symptoms are seen on sweet oranges, grapefruit, mandarins, and tangelos. Only leaf symptoms are seen on most other varieties of citrus. Control is accomplished by using disease-free budwood and rootstock. On infected trees, bad branches should be removed and lesions scraped. This prolongs the economic life of the tree but does not cure the disease. In Tunisia, symptoms of psorosis generally appear in trees of 10 to 15 years of age. Vulnerable varieties in Tunisia are Maltaise demi-sanguine, Maltaise blonde, Thomson Navel, Beldi Lessanasfour and Bourouhine.

Blind Pocket

The symptoms of blind pocket are abrupt concavities on the trunk and, occasionally, coarse shelling lesions. It is transmitted by budding, grafting, and natural root grafting. Citrus trees which are vulnerable to blind pocket are sweet oranges, lemons and mandarins. Control is accomplished by means of using only disease-free budwood and rootstocks. In Tunisia, this disease is very common on the Maltaise blonde variety.

Exocortis

The symptoms of exocortis differ according to the type of citrus tree infected. Trifoliate citranges and Rangpur limes show cracking and scaling of bark. Some citrons show leaf and stem epinasty, cracking and callousing of underside of midveins, yellow blotches and cracks on shoots. In all cases, severe stunting of the tree can occur. Exocortis is spread mechanically by cutting tools, fingers, and, possibly, by scratching and gnawing of animals. It can also be transmitted by

budding, grafting, dodder and sap. Susceptible varieties are trifoliates, citranges, Rangpur limes, other mandarin limes, sweet limes, some lemons and citrons. Control is accomplished by using seed and budwood from disease-free sources, avoiding susceptible rootstocks, and sterilizing cutting tools between use on different trees.

Exocortis is very rare in Tunisia because the rootstocks which are vulnerable to this disease are rarely used in grafting. However, it has been observed on Thomsen Navels with unknown rootstocks. Exocortis has also been seen on citrus in oases in southern Tunisia. In this case, blood oranges have been grafted on a local root stock "Lime Cheiri", which is vulnerable to exocortis.

Cachexia-Xyloporosis

The symptoms of cachexia are lens-shaped pits on trunk with or without gumming and pegs on inner bark surfaces. It is spread by budding and grafting. Susceptible varieties are sweet limes, mandarins, mandarin limes and tangelos. Control is accomplished by using seed and budwood from disease-free sources and avoiding susceptible rootstocks.

Cachexia is often observed in Tunisia in conjunction with the disease concave gum on clementines and the mandarin variety "Arbi". It has also been observed on the mandarin variety "Wilking". Cachexia is a very serious disease in Tunisia. In cases where the infection is severe, it causes the death of trees.

Stubborn Disease (mycoplasma, not virus)

The symptoms of stubborn disease are stunted trees; low yields; distorted, eccentric or acorn shaped fruits; stylar-end greening and blue albedo; seed abortion; stiff, upright, multiple twigs and buds; small chlorotic or mottled leaves; premature defoliation; and dieback in severely affected trees. Stubborn disease is transmitted by budding and grafting. Susceptible varieties are sweet oranges, sour oranges, grapefruit, mandarins, tangelos, lemons, limes, Rough lemons, citrons and most other varieties, regardless of rootstock. Control is accomplished by using disease-free budwood.

In Tunisia stubborn disease is one of the most serious citrus disease problems. It has been observed on Maltese demi-sanguine oranges, Late Valencia oranges, Meski oranges and Clementines. It probably also infects the mandarin variety "Arbi".

Relative to controlling virus diseases in citrus Klotz states that "Citrus registration and certification programs, pioneered in California and designed to secure the best disease-free propagative materials, are being put into effect in much of the citrus-growing world". It should be noted here that Tristeza, a common citrus virus in many parts of the world, has never been observed in Tunisia.

Klotz also comments with respect to control psorosis and some other virus diseases that "The obvious step in controlling psorosis and some other virus diseases of citrus is to use only virus-free plant materials for propagation. This does not assure the grower that trees will remain free of all virus diseases since insect vectors can carry some viruses that infect even carefully selected materials. The method is effective, however, against psorosis and other diseases that are transmitted mostly by union of living tissues such as artificial budding and grafting, or natural root grafting, and against vectored diseases in areas where vectors are absent. Psorosis virus is rarely transmitted through seeds or by root grafting. Many (California) nurserymen, under the proce-

ANNEX D

A List of EC Importers Authorized by the GOT

Official Approved Importers of Tunisian Produce In France by City in 1987-1988

City	Name	Address	Telephone	Telex
Paris	Europfruits	15 Avenue de la Republique 91600 Savigny sur Orge	996-11-82	
Paris	S.I.I.M.	Bat. E2 et D2 Rue du Chateaurenard 94150 Rungis	(1) 46872501	202 868 F
Paris	R. Malet- Azoulay	M.I.N. de Paris Rungis Bat. D2 53 Rue de Montpellier Fruileg 337/94622 Rungis Cedex	(1) 687.24.41	
Paris	Roger Boutin	M.I.N. de Paris Rungis Bat. D3-1 Rue de Perpignan Fruileg 379 94632 Rungis Cedex	(1) 686.40.90	
Paris	Supergros	26 Avenue de Bretagne Fruileg 152-94522 Rungis Cedex	33 (1) 4687.23.90	270 996 SUPGROS
Rouen	Prim Import	54 Rue des Bulins 76130 Mont-Saint-Aignan	(35) 71 35 41	770 015
Nice	L. Vidal et Compagnie	Marche Gare de St. Augustin 06042 Nice Cedex	83 17 06	
Strasbourg	Sapam	Marche Gare Box 12 a 18 67200 Strasbourg	(88) 27 12 27 (88) 27 07 67	880 423
Chambery	Castaner et & Homas	Avenue de la Houille Blanche 73000 Chambery	(79) 34 04 75 (79) 36 76 39	
Perpignan	F.I.D. Fruitiere Internationale de Distribution	Marche International de Saint Charles Magasin: 93.94.95 66000 Perpignan	(68) 54 27 54	500 517
Plan D'Orgoa	Roland Lacour Sud-Est	49 Chemin du Roussignon 13750 Plan D'Orgoa	(90) 72 10 64 (90) 73 12 58	432 260
Marseille	W.A.C.O.	100 Boulevard des Dames Marseille	(91) 91 12 68	440 943
Marseille	Pomona-Import	2 Quai de la Joliette 13002 Marseille	(02) 17 07	440 537

City	Name	Address	Telephone	Telex
Marseille	J. Brousse D. Vergerz	2 Quai de la Joliette 13002 Marseille	(91) 91 92 36	440 037
Marseille	A.G.R.U.S.U.D.	M.I.N. les Arnavaus Bat. B Box 408-419 420 13323 Marseille Cedex 14	(91) 98 05 40 (91) 97 02 99	440 726 440 726
Marseille	Armand Fabre	94-96 Chemin du Merlan 13014 Marseille	98 20 08	Box: 440 920 Bur: 420 266F
Marseille	Camille Fornieris	230 Quai du Port 13002 Marseille	90 70 52 90 85 42	Bur: 440 896 Comm: 440 086
Marseille	Faus-Pomexport	Box 1 et 2 Quai du Lazaret 13235 Marseille Cedex 02	(91) 90 93 45 (91) 91 07 47	440 025
Marseille	P.R.I.M.E.X.	2 Quai de la Joliette	91 13 42	440 660
Marseille	So. Me. Prim	1 Quai du Lazaret 13002 Marseille	(91) 90 70	204 344 Rungis
Marseille	Compagnie Fruitiere Import	73 Boulevard de Lesseps BP = 354 13309 Marseille Cedex 14	(91) 02 70 46	410 027 Cable Fabreco
Marseille	S.I.I.M.	40 Boulevard de Dunkerque 13002 Marseille	(91) 91 39 77	401 337 F
Marseille	S.I.C.	"Le Grand Pavois" 25 Boulevard E. Herriot 13008 Marseille	(91) 71 45 89	430 750 F SIC MARS
Marseille	S.I.C.O.P.	Box 516 M.I.N. 13323 Marseille Cedex 14	(91) 98 00 96	400 817
Lyon	Cledor	Marche de Gros de Lyon Bat. C4 Magasin 20.21.22 Rue Casimir-Perier 69297 Lyon Cedex 02	(78) 42 44 25	330 389
Lyon	Buiret, Serret	Marche de Gros de Lyon Bat. 66 Magasin 14,15,16 17-69297 Lyon Cedex 02	(78) 42 19 60	330 059 F Buirser
Lyon	Primeurs du Sud-Est	Marche de Gros de Lyon Bat. C1 Cases: 4,5,6,7 69297 Lyon Cedex 02	(78) 37 43 18	330 590
Lyon	Establisements Casals	Marche de Gros de Lyon Bat. C2 Magasin la5 Bat. R1 Magasin let2 69297 Lyon Cedex 02	(78) 42 22 75	330 057 F
Lyon	Cie Fruitiere	M.I.N. de Lyon 69297 Lyon	(78) 38 19 39	310 944

ANNEX E

**Terms of Reference
Citrus Part A Study**

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Terms Of Reference

Citrus Export Commodity Study

I. Introduction

As part of its on-going agricultural sector structural adjustment program, the Government of Tunisia has given priority to the promotion of agricultural exports. This effort will only be effective if Tunisian exporters can maintain and increase the competitiveness of their products in their traditional markets and exploit new market opportunities, particularly in North America. It will be necessary, therefore, to understand the essential factors determining the competitiveness of Tunisian agricultural commodities entering world markets and to assess the key constraints affecting the availability, quality and export costs for these products. Effective strategies for releasing these constraints need to be developed and existing market advantages exploited, enhanced and consolidated.

This study is one of five export commodities analyses to be conducted in 1988/1989 under the GOT/AID Agricultural Policy Implementation Project. The commodities to be covered by these analyses are olive oil, wines, citrus, dates and nuts, and marine products. Each study will be composed of a Part A and a Part B. Each Part A sub-study will deal with analysis of the key factors affecting the exportability of the Tunisian agricultural commodity - i.e. its competitiveness in export markets FOB Tunis. Each companion Part B will investigate the requirements of importers in key markets and the prospects for increasing Tunisian exports. Finally, the results of the Part A and B studies will be used to develop strategic marketing recommendations for Tunisian agents involved exporting the agricultural commodities being studied.

In the particular case of citrus, the study approach will be to assess how to maintain Tunisia's traditional market share in existing European markets while finding new strategies to penetrate or expand non-traditional markets, particularly in North America.

The terms of reference for the citrus export study is presented in the sections below. The Part A sub-study deals with the analysis of conditions in Tunisia which affect the competitiveness of Tunisian citrus and the Part B sub-study concerns itself with the receptiveness of potential importers to the available products.

Part A Sub-study Citrus Competitiveness Analysis

I. General Description Of The Part A Study

The objective of the Part A commodity competitiveness sub-study is to present a clear and concise description of the key factors affecting the exportability of Tunisian citrus - particularly Maltese oranges - to world markets.

To accomplish this objective, the Part A study team will review the history of the competitive performance of Tunisian citrus as export commodities in its traditional markets and determine the key factors affecting the level of this performance. The study will analyze Tunisian production of citrus and trace domestic citrus production through its different stages of sorting, packaging, storage and export marketing. At each stage, the team will examine export performance and the factors affecting handling efficiencies and suitability with respect to available quantities, qualities and prices of the Tunisian citrus.

II. The Terms Of Reference As Described In Official Documents

The Abt Associates' prime contract contains a one paragraph description of what is required of this study on page 10.

The AID Project Paper contains no scope of work for this study beyond the one paragraph description included in the prime contract.

The World Bank report on the Agricultural Structural Adjustment Loan Program - i.e. Report P-4368-TUN, Volume II - of 3 September 1986 contains a three page scope of work for an Export Promotion Study.

The Abt Associates' Response to the AID Request for Proposals dated 7 August 1987 contains a two page description of our approach.

Relevant sections of the three documents are appended to this Terms of Reference as Attachment A.

IV. The Objectives Of The Overall Study With Specific Questions

The ultimate objective of the overall citrus export study is a set of concrete recommendations directed toward increasing the export competitiveness of Tunisian citrus. The results of the competitiveness study - Part A - together with its companion export marketing study - Part B - will be used to present a detailed export marketing plan which will be both realistic and cost effective.

In order to arrive at these recommendations, a logical process must be followed of findings, conclusions and recommendations. The following sub-sections deal with the topics to be analyzed by the study team.

A. Factual Information to be Gathered

1. Identify and describe for Tunisia the different types of citrus produced and the different stages in domestic citrus production, handling, packaging and export marketing.
2. Identify the key factors determining the quality of domestic citrus for export - i.e. varieties grown, handling methods, packaging, cold storage techniques and taste factors - and causing any variations in quality.
3. Assess the timing and consistency of citrus availability for export by type.
4. Assess the process of handling and packaging of the domestic citrus for export and identify any local brand name products.
5. Identify the most important existing markets for Tunisian citrus, the quantities presently exported to each market, and, as available, the prices and quality conditions demanded in those markets.
6. Identify, from existing sources, the different costs involved in domestic citrus production, handling and export processing as well as any constraints experienced at each stage of export marketing.
7. From this information, evaluate the export position of the Tunisian citrus products and identify their comparative advantages, if they exist, and key constraints on their competitive position.

B. Conclusions Required

1. Assess whether or not the financial costs of production in growing and processing citrus in Tunisia constitute a handicap affecting the competitiveness of these commodities for export.
2. Assess whether or not the quality of the citrus produced constitutes a handicap or an advantage in present export markets.
3. Assess the technologies currently being used in Tunisia for the processing of citrus and their impact on the quality of the export products.
4. Analyze the Tunisian system of commercialization and marketing of citrus and assess the degree of market information available to the Interprofessional Group on Citrus and Fruit Products and regarding world markets and export distribution channels.
5. For Tunisian citrus producers, evaluate marketing performance and any innovations they have made in overcoming their marketing difficulties with respect to adaptation of their products' quality and packaging, market information, publicity and promotion.
6. In a general manner, assess the effects of government policies and interventions on the competitiveness of Tunisian citrus with particular respect to the activities of the Interprofessional Group on Citrus and Fruit Products and the involvement of private and parastatal enterprises in export marketing.

C. Recommendations to be Made as a Result of the Overall Study

1. Propose, as appropriate, recommendations for enhancing existing competitive advantages of domestic citrus, if they exist, and for correcting factors reducing competitiveness in export markets.
2. Indicate the implications of these actions for the following actors/agencies in the citrus marketing chain:
 - The Government of Tunisia
 - The Interprofessional Group on Citrus and Fruit Products
 - Domestic Citrus Producers and Exporters
3. Sketch out a strategic action plan of practical measures for implementing the proposed recommendations with details, insofar as possible, of the plan, timing and responsibilities for implementation.

V. Methodology To Be Employed

The following general methodology will be employed by the study team in Tunisia.

- A. A document search and review will be done by the entire study team to profit from previous studies, including case studies of agro-industrial companies done by the Graduate Institute for Management (ISG), the Interprofessional Group on Citrus and Fruit Products, and/or private exporters. A critical synthesis of these studies will enable their findings and recommendations to be used as inputs for this Part A study and to define what additional information needs to be collected.
- B. Study findings will also be based upon interviews in Tunisia with key persons in government, at Interprofessional Group on Citrus and Fruit Products, and with citrus producers and exporters.
- C. Collection and study of published statistics for Tunisia on the production and marketing of local citrus, with particular attention to existing information on the structure of costs, will be reviewed by the team.
- D. Tunisian team members will conduct, as feasible, case studies of a number of selected, representative Tunisian citrus growers and exporters.

VI. Key Agencies To Be Contacted In Tunisia

The key agencies to be contacted in Tunisia are:

- A. The Interprofessional Group on Citrus and Fruit Products
- B. Citrus Producer Cooperatives and Companies.
- D. Citrus exporting firms.

ANNEX F

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Report Bibliography

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**AGRICULTURAL POLICY IMPLEMENTATION PROJECT
EXPORT COMMODITY STUDY**

**Part B
Citrus Export Marketing Analysis**

**March 1989
FINAL REPORT**

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Preface

This Part B study of Tunisian citrus export marketing was requested by the Government of Tunisia (GOT), in the context of its on-going economic structural adjustment program for the agricultural sector. The research was funded through the Tunisia Agricultural Policy Implementation Project (APIP) -- Project No. 664-0343 -- which is jointly sponsored and funded by the GOT Ministry of Agriculture (MOA) and the United States Agency for International Development (USAID). The prime technical assistance contractor for this project is Abt Associates, Inc. of Washington, D.C. and Cambridge, Massachusetts. Sub-contractors for the project include the University of Wisconsin, Madison, Wisconsin; the Institut Supérieur de Gestion (ISG), Tunis, Tunisia; and Ithaca International Limited, Ithaca, New York.

The Part B Export Marketing Report on citrus was researched and prepared during the period from May to October 1988 by a team of nine agricultural specialists from Ithaca International Limited of Ithaca, New York. These specialists were:

ITHACA INTERNATIONAL LIMITED

Principal Authors

Enrique E. Figueroa
Olan D. Forker
David R. Lee
Edward W. McLaughlin
Daniel G. Sisler

Other Contributors

Harry deGorter
John H. Eriksen
Jack W. King, Jr.
Steven Kyle

The team research effort was greatly facilitated by the support activities of several graduate student assistants at Cornell University and contract technical and secretarial staff. These people labored long hours in response to the team members' requests for draft revisions, graphs and statistical tables. Without such staff cooperation, this report could not have been produced in the time allotted.

Finally, individual team members and graduate student assistants conducted numerous interviews in many parts of the United States and Canada. The data, opinions and insights collected from the interviewees -- citrus producers, nurserymen, importers, distributors, and government officials -- added new perspectives and information to and enriched the content of this final report.

Upon completion of the draft final report, the text and tables were professionally reviewed and critiqued separately by Dr. Max Brunk, Professor-Emeritus of Agricultural Marketing at Cornell University; Dr. Ronald W. Ward, Professor, University of Florida; and Drs. Roger Montgomery and Mark Newman of Abt Associates, Inc.. To the maximum extent possible, their comments and suggested revisions were incorporated into the final report.

The team wishes to thank all of these specialists for their sincere efforts on our behalf and for their assistance with the production of this final report.

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LIST OF ACRONYMS

CAP	Common Agricultural Policy
CBI	Caribbean Basin Initiative
EC	European Community
GLAF	Groupement Intraprofessionnel des Agrumes and des Fruits
GOT	Government of Tunisia
MOA	Ministry of Agriculture
POP	Point of Purchase

MAIN REPORT

Part B Study Citrus Export Market Analysis

I. World Market Conditions

A. Production and Trade

World production and marketing of oranges is extremely complex. There are many varieties of oranges produced and they are distributed and marketed in a variety of ways. Tunisia produces and markets primarily Maltese or blood oranges. If we are to understand the potential for expanding Tunisian exports of these oranges, however, we must examine the production and movement of all oranges and other competing citrus.

Annex A Tables 1 and 2 present statistics on world production and exports of oranges, tangerines and mandarins. Average production of these fruits between 1980 and 1986 was 46,073,000 metric tons. World production of oranges is surprisingly stable, due in part to offsetting production trends in different countries. The United States is the largest producer of oranges, accounting for approximately 18 percent of world orange output. The U.S. share of world orange production has declined, however, falling from 25 percent in 1980 to 15 percent in 1986. Spain is the second leading producer of oranges with output averaging approximately 6 percent of the world total. Italy and Mexico are the next most important producers of oranges, accounting for 6 and 3 percent of world output, respectively, in 1986.

Between 1980 and 1986, an average of 5,202,000 tons of oranges, tangerines and mandarins entered the world market. Spain is by far the leading exporter of fresh oranges, capturing approximately 30 percent of the world market in the period 1980 to 1986. The next leading exporter of oranges is still Morocco. Its share of the world market, however, has fallen recently, dropping from 15 percent in 1980 to 9 percent in 1986. Israeli citrus marketings exhibit a similar trend, falling from approximately 10 percent of world trade in 1980 to 6 percent in 1986. The U.S. share of world orange exports has fluctuated between 7 to 10 percent in the period 1980 to 1986, averaging about 8 percent. Together, these four countries have accounted for roughly 60 percent of world orange exports in the 1980s.

Total world exports of oranges have risen modestly in the period 1980 to 1986, from 5.1 million to 6 million metric tons. During this period, exports have remained 11 to 12 percent of production. Spain is the principal determinant of variability in the world market. Its exports have ranged from 1,335,000 tons to 2,298,000 tons in the following year.

Tunisia's Maltese orange production and exports constitute an extremely small share of total world citrus output and trade. This is true whether Tunisia's production and trade are compared with world production of commonly produced oranges (Valencias and navels) or world production and trade of specialty oranges: mandarins, tangerines, tangelos and temple oranges.

Citrus fruits are utilized for both fresh consumption and production of orange juices. Orange juices are processed into both ready-to-serve juices and frozen concentrate. While this report focuses on the fresh markets, it is useful to recognize the importance of the processed industry. The two largest citrus producing nations, i.e., U.S. and Brazil, process the bulk of their oranges. Hence, their roles in competing in the fresh markets is considerably less than implied by their dominance in production. However, the linkage between

processed and fresh consumption should not be ignored. The U.S. market for orange juice is reasonably mature whereas the European market is still developing. Any long term marketing and restructuring plans must recognize these distinctive dimensions of the orange industry.

B. The North American Market

To better understand Tunisian prospects for increasing exports of Maltese oranges to the United States or Canada, it is important to understand the present market conditions in the two countries. Annex A Table 3 shows U.S. production of round oranges (Valencia and Navel) between 1970 and 1986. The table is divided so as to present changes in production of Valencia and Navel oranges over time and in the proportions of orange production from the states of Florida, Arizona, and California.

Florida is the leading American orange producing state. In 1986, Florida produced 70 percent of total U.S. round oranges; and California produced 28 percent. In absolute terms, Florida produces the largest quantity of both Navels and Valencias. Navels constitute slightly more than 50 percent of total U.S. round orange production. Navel oranges have accounted for 59 percent of California production in recent years.

Annex A Table 4 presents information on the marketings of fresh round oranges between 1970 and 1986. From 1980 to 1986, marketings of fresh oranges averaged approximately 25 percent of total production and there was a distinct difference in the fresh fruit marketings between Florida and California. California markets about 75 percent of the fresh round oranges sold in the United States. Florida supplies nineteen percent of fresh oranges, but since Florida processes around 94% of orange production, its 19 percent share of the U.S. fresh orange market represents only 6% of its share. All other states produce the remaining 6 percent of fresh oranges in the U.S. California, therefore, is clearly the dominant force in the marketing, distribution and pricing of fresh oranges, both Navels and Valencias.

The oranges that would compete directly with Maltese oranges if they were to be imported from Tunisia. These include tangerines, tangelos, honey tangerines, temples and K-earlys. Annex A Table 5 presents U.S. production of specialty oranges. In 1975, production was 1,686 million pounds (766,364 metric tons). Production in the early 1980s was relatively stable averaging about 1,370 million pounds (622,727 metric tons). Production fell sharply to a low of 919 million pounds (417,727 metric tons) in 1985 and recovered to a level of 1,128 million pounds (512,727 metric tons) by 1986. As is the case in round orange production, Florida is the leading producing state in terms of specialty oranges. Production changes in Florida specialty oranges cause most of the volatility of U.S. production. California production of specialty oranges remains relatively constant, averaging about 204 million pounds (92,727 million tons) between 1980 and 1986.

Annex A Table 6 is of particular interest since it shows the utilization of specialty oranges as fresh fruit. Fresh utilization of specialty citrus averaged 547 million pounds (20,909 metric tons) from 1980 to 1986. This is approximately 46 percent of total specialty citrus production. Slightly more than 50 percent of these fruits are used in juice and other processed products. It is very interesting to note that, in California, approximately 75 percent of specialty citrus production is used for fresh consumption. In striking contrast, Florida production, which is considerably higher, is used primarily in processed form. Only 40 percent of Florida's specialty citrus production enters the fresh market. Shipping distances from Tunisia to the East Coast of the United States would be considerably less than shipping

to American markets in the Midwest or West. Florida's substantial production of specialty citrus for juice consumption might complicate Tunisian export marketing prospects if fresh orange market prices increase substantially above processing orange prices. However, rigid grades and standards exist for citrus entering the fresh market, and therefore, the volume of product entering the fresh market would be limited.

Another important factor to consider in assessing Tunisia's potential exports of Maltese oranges to the United States is seasonality. Tunisia's oranges become ripe in late December and marketings reach a peak in February to March. Some Maltese oranges from Tunisia are marketed through the beginning of April. The European market for Tunisian Maltese oranges is quite lucrative during the early part of the harvest season. Later, however, it may be more desirable to market these oranges in Tunisia. At the end of the season, oranges can again be profitably exported into the European market. This marketing strategy by Tunisia is in part dictated by the fact that large marketings of oranges from Spain and Portugal depress European prices in mid-winter. At this time, the market for oranges in Tunisia is strong and domestic marketing may be more lucrative than exporting.

Annex B Figure 1 graphically presents the seasonal pattern of total fresh orange marketings in the United States. U.S. marketings of fresh citrus start in September and reach a peak in the month of December. They fall off in January and again peak in March and April, with a sharp decline in June. The December peak of fresh fruit marketings results primarily from Florida shipments and the second peak in March is attributable in large measure to marketings from California. It would appear that the months of January and February would be the time when fresh fruit from Tunisia could come into a less-saturated U.S. fresh orange market. However, further investigations regarding the demand for fresh citrus must be undertaken to determine the more specific causes for the changes in shipments.

Related to the above, specific information on the seasonal pattern of specialty citrus marketings would be helpful to Tunisia's marketing strategy. Annex A Table 7 presents information concerning monthly shipments of specialty oranges from Florida. Unfortunately, a detailed breakdown of California's shipments of specialty oranges is not available. Since Florida is the largest producer of specialty oranges and has the capacity to transfer a significant quantity of oranges from processing to fresh use, it is important to consider the seasonal pattern of Florida shipments. For the first week immediately after Christmas, a shipment holiday is generally in place and shipments are prohibited via the market orders.

Florida shipments of tangerines peak in December, as do tangelos. Temples peak in January and marketings of K-earlys are highest in October. Adding together shipments of specialty citrus fruits from Florida reveals an interesting pattern. In October, total Florida marketings averaged 80 million pounds (36,364 metric tons). In November, they rose to 154 million pounds (70,000 metric tons) and in December they peaked at 256 million pounds (116,364 metric tons). In January they were also high at 240 million pounds (109,091 metric tons). During February they fell to 119 million pounds (54,091 metric tons) and in March they were 67 million pounds (30,455 metric tons). Based on Florida shipments, it would appear that the greatest market opportunities would be in the months of February and March. Tunisian exporters, however, must be cognizant of the extreme seasonality of U.S. marketings when making decisions concerning prospects for expanding exports.

C. U.S. Market Prices

To better understand the potential of marketing Tunisian oranges in the United States, it is

useful to examine seasonal price movements. Two marketing years, 1984/1985 and 1985/1986, have been selected to illustrate recent monthly orange price movements in the United States. The marketing year starts in September and ends in August. Annex A Table 8 presents monthly FOB prices for round oranges (Valencias and Navels) for the two crop years. Annex A Table 9 reports similar monthly price movements for specialty oranges, i.e., tangerines, temples and tangelos. The tables present monthly prices for individual states and a weighted U.S. national price.

The data illustrate strong seasonal price movements, which vary somewhat by variety of oranges and by producing state. Florida and California are the principal shipping states for both round and specialty oranges.

Annex A Table 8 shows distinctly different seasonal marketings and price movements in California and Florida. The weighted U.S. price of round oranges in the 1984/1985 marketing year was higher than in 1985/1986. Seasonal price variability was also greater in the 1984/1985 marketing year. In that year, the U.S. round orange prices in August were only 58 percent of October prices, while in 1985/1986, the low price month was 70 percent of the high priced month. In both crop years, round orange prices were substantially higher in the early months of the crop year before shipments peaked. In 1985/1986, for example, monthly orange prices averaged \$14.03/box in September/November and only \$11.87/box in June/August. In the months of January and February, when marketings of potentially competitive Tunisian oranges reach their peak, U.S. orange prices were at intermediate seasonal levels in both 1985 (\$18.39/box) and 1986 (\$13.65/box). Potential Tunisian imports would likely appear, therefore, to miss seasonal U.S. price highs for round oranges but would also escape seasonal lows.

The story appears somewhat different with respect to specialty oranges. The data presented in Annex A Table 9 reflect the striking seasonal availability of these products. Marketings of tangerines and tangelos from Florida begin in October and continue through January. Tangerines from California become available in November and are marketed through May. Temple oranges from Florida are marketed in the January through March period. Price trends appear to be highly variable across products in the two years; however, some observations can be made. California tangerine prices trend strongly downward from November through May. A similar price movement is noted for Florida specialty oranges, but the trend is not as well developed. In general, then, the Florida prices for specialty oranges, particularly temples and tangelos, are lower than the price of California tangerines. Of much greater significance to Tunisia is the increased planting of mandarin type oranges on cold resistant stock replacing much rough lemon root stock of earlier years. Much of this fruit planted since 1985-1986 will be attractive for the fresh market and more directly competitive with Maltese varieties.

The current marketing season for Tunisian oranges appears to almost exactly coincide with the availability--and, to a lesser extent, low prices--of domestic U.S. specialty oranges. Barring the development of early or late-maturing Maltese orange varieties in Tunisia, these trends suggest that the coinciding seasonality in specialty oranges presents a significant obstacle to Tunisian exporters in capturing a part of the citrus market in North America.

D. U.S. and Canadian Imports

To understand Tunisia's potential for competing successfully in the North American market, it is important to understand the pattern of U.S. and Canadian fresh citrus imports and the

shares already held by the major exporters. Annex A Tables 10 and 11 summarize the volumes and values of fresh citrus imported into the U.S. for selected years between 1970/1971 and 1986/1987. The volume of U.S. imports increased roughly 48 percent over this period, i.e., from nearly 50,000 metric tons to 73,560 metric tons. Much of this growth occurred in the early to mid-1980s. In value terms, the expansion of imports was even more substantial--rising 137% from 9.2 million dollars in 1970/1971 to nearly 22 million dollars in 1986/1987.

Despite significant changes over time in the volumes or value and imports from specific countries, three exporters have dominated the market over the entire period. They are Latin America (principally Mexico), Israel and Spain. In the 1970s, imports from Mexico and Israel accounted for virtually all measurable fresh citrus imports. By the early 1980s, Spain had joined these exporters as one of the top three actors in the U.S. markets, and by 1986/1987, Spain had captured one-third of the import market, as measured by value. In that year, these three exporters accounted for 90 percent of total U.S. citrus imports in value terms.

In the 1980s, North Africa has emerged as a minor and intermittent supplier of fresh citrus to the U.S. market. Morocco, by far the major African exporter, accounted for nearly 12 percent of U.S. fresh citrus imports in terms of value in 1984/1985, although its role, both before and since, has been negligible. If U.S. fresh citrus imports continue to rise, North African countries, including Tunisia, may be able to supply part of this growing market. They will, however, face a formidable competitor in Spain which has greatly expanded its citrus exports to the U.S. in the past several years. It must be kept in mind that severe freezes in December 1983 and January 1985 greatly reduced production in Florida. Many groves in Central and North Florida were destroyed. Of an estimated acreage loss of 140,000, only 30,000 acres have been replanted, and much of this has been in Mandarin type fruit. Much of this fruit is on sweet orange stock and suitable for the fresh market.

Unlike the United States, Canada is totally dependent on imports to meet domestic demand for fresh citrus. As shown in Annex A Tables 12 and 13, the U.S. is the dominant source of Canadian imports. Over the 1970/1986 period, U.S. exporters consistently accounted for 70 to 80 percent of Canadian imports. The U.S. share of Canadian imports in value terms declined slightly in the 1980s--from 75 percent in 1980 to 70 percent in 1986--due primarily to the increasing value of the U.S. dollar and declining export competitiveness of U.S. citrus relative to alternative suppliers. However, given the locational advantages of U.S. suppliers, the U.S. is expected to continue to maintain a large share of the Canadian import market.

Among alternative suppliers to the Canadian market, Japan, Morocco, and Spain are the most important. Spain has greatly expanded fresh citrus exports to Canada in the 1980s. These exports nearly tripled in volume and value between 1982 and 1985. Unlike the U.S. market, Morocco has exported continuously to Canada throughout the 1980s; and by 1986 had the second largest import market share. Japan's fresh citrus exports to Canada have been relatively stagnant in recent years. Overall, growth in the Canadian import market has been similar to that in the U.S., with the volume of fresh citrus imports expanding by 42 percent between 1970 and 1986.

E. North American Consumption

Annex A Table 14 presents apparent per capita consumption of fresh citrus products in the U.S. and Canada for the period 1970/1986. Due to differences in the two reporting systems,

statistics between the two countries are not directly comparable. In the U.S., per capita consumption of oranges, tangerines and tangelos has been relatively stable over the past two decades. Per capita orange consumption averaged 14.8 pounds (6.8 kilograms) per person in 1970/1973 and 13.5 pounds (6.1 kilograms) per person in 1983/1986. Total U.S. fresh citrus consumption, likewise, has declined slightly over this time period. By contrast, Canadian per capita consumption of oranges has increased modestly over the same time period, while total fresh citrus consumption has expanded significantly. From an average of 43.8 pounds (19.9 kilograms) per person in 1970/1972, total fresh citrus consumption rose 37 percent to 60.2 pounds (27.4 kilograms) per person in 1982/1984. Mandarins from Japan and Clementines from the Mediterranean are the two fresh citrus products that have increased total fresh citrus consumption.

F. Trade Restrictions

U.S. import duties on fresh oranges are \$0.01 per pound, except for C.B.I. countries, which are granted duty-free access to the U.S. market. Selected developing countries (not including Tunisia), however, pay a reduced tariff rate of \$0.003 cents per pound. Canada permits free entry of orange imports.

EC trade restrictions on orange imports are based on a complex system of tariffs, minimum reference prices and countervailing duties, all of which are designed to support prices and incomes for domestic citrus producers. The EC reference prices are the minimum prices for third-country citrus imports EC markets. They are set by a complex mechanism based on historic prices, production costs, transportation costs, and other factors. When entry prices fall below reference price levels, a countervailing or variable duty is applied, in addition to the customs duty, to bring the total entry cost up to the reference price level. Sweet oranges are subject, in theory, to the reference price system from December 1 to May 31 of each marketing year. In practice, the World Bank reports that the reference price system is rarely applied to EC citrus imports.

A common customs tariff is also applied to citrus imports. Tunisia, as a party to the Maghreb agreement, is subject to reduced tariffs for Maltese oranges at the following levels:

April 1-30:	2.6%
May 1-15:	1.2%
May 16-October 15:	0.8%
October 16-March 31:	4.0%

Orange imports are also subject to quality restrictions and, in theory, quantitative import restrictions. Indeed, some participants in the Tunisian citrus industry believe it is very clear that the EC will impose a quota of 28,000 tons on Maltese oranges beginning in 1992. Quantities above 28,000 tons are expected to be subject to the "reference price" which would effectively prohibit export to the EC.

G. Phytosanitary Regulations in the U.S. and Canada

Annex C provides a listing of Tunisian fruits and vegetables currently admissible into U.S. markets. In addition, a copy of Section 319.S6-2d--Administrative Instructions For Cold Treatments of Certain Imported Fruits of The United States Department of Agriculture.

Animal and Plant Health inspection Service, Plant Protection, and Quarantine Code Book is included.

Currently, oranges from Tunisia can only be imported into Northeast ports and the oranges require a cold treatment before entry. The copy of Section 319.S6-2d in Annex C details all the treatment required. It behooves the Tunisians to further investigate how Maltese oranges hold up to cold treatment.

The Canadian government does not currently have phytosanitary restrictions on Tunisian orange imports.

H. Organizational Structure of Importers

Approximately 76% of all fresh fruits and vegetables marketed in the U.S. are sold through supermarkets. Foodservice channels account for essentially all of the remainder. The supermarket procurement system for fresh fruit and vegetables has advanced in scope and sophistication over the past decade; so that today most domestic fresh produce for both large and small supermarkets is purchased by large internal buying staffs directly from shippers. Traditional central wholesale produce markets are increasingly circumvented in favor of direct sales. As a consequence, terminal produce markets in the U.S. are a less important in negotiating sales agreements than they are in the most of the rest of the world. The same is true, but to a lesser degree, in Canada.

Central markets, however, still play an important role in importing and distributing foreign produce. Very few supermarket buyers buy produce directly from foreign growers. Instead, they rely on wholesalers and importers, who are often located at the terminal markets adjacent to the major ports of entry: Boston, Montreal, New York, Baltimore, Philadelphia, and Toronto.

Accordingly, major brokers and importers were contacted on the east coast of the U.S., at the Hunts Point Terminal Produce Market in New York City (the largest wholesale produce market in the U.S.) and in Montreal. Interviews with these brokers/importers regarding the feasibility of importing Maltese oranges and the requirements for sales form an important part of the strategic assessment and conclusions in the following section. Lists of citrus industry participants contacted in this study and key U.S. produce organizations are provided in the Annexes D and E.

J. Selected European Economic Community Market Conditions

Although the terms of this market assessment called for examination of the North America market exclusively, the opportunities for Tunisian citrus producers can only be fully understood when the current export market--France and other EEC countries--is considered.

There are a number of factors that point to the attractiveness of the EEC countries as a potential target for Tunisian export expansion. First, per capita consumption of citrus products in the twelve EEC countries averaged 63.6 pounds per capita (28.9 kg/person) in 1985/1986 (Annex A Table 15). Taken as an average, this level of consumption is higher than that of Canada and over twice that of the U.S. (Annex A Table 14). However, when examined by individual countries and even allowing for some possible data inconsistencies, the per capita consumption of a few countries, e.g., the Netherlands, is substantially above

the level of North America or the current export market of France. These relatively high EEC consumption levels suggest greater market penetration opportunities than in North America in addition to lower transportation costs that would accompany the EEC market proximity to North Africa.

Second, Annex A Table 16 shows that several European countries where per capita consumption is high are large net importers. This includes several EEC member countries such as the Netherlands, Belgium/Luxembourg, and the United Kingdom as well as several non-member countries such as West Germany, Switzerland, and Sweden. These conditions suggest opportunities for Tunisian exporters that are much closer to home than North America.

Third, although comprehensive price data in all relevant countries are not available, Annex A Table 17 shows some wholesale prices for oranges in the United Kingdom. The prices shown are for oranges from Tunisia's strongest competitors, that is, Spain and Israel, and shows that they were at levels that at least initially appear to cover the additional marketing costs of getting to the U.K. Although a much more thorough analysis needs to be conducted to determine the relative cost and returns of further market development in Europe, these preliminary data suggest that opportunities may exist.

II. North American Market Analysis

A. Market Potential Assessment

Except where otherwise noted, the conclusions and recommendations reached in this section are based on extensive personal interviews with various citrus industry participants in both the U.S. and Canada. A list of their names and firms/agencies is contained in Annex D.

1. The Canadian Market

Due to the lack of domestic citrus production capacity, Canada imports nearly four times the volume of fresh oranges as the U.S. Moreover, for all fresh citrus, Annex A Table 18 shows that:

- there are wide variations in the market (particularly annual changes representing 20-30,000 MT)
- there is a clear substitution between suppliers
- Morocco entered the Canadian market in 1981 and increased its share of imports in every year except the last
- compared to other perishable commodity markets, 10 percent annual changes in imports are not necessarily considered large.

The Canadian import market for oranges, mandarins, and tangerines generated \$174 million (Canadian) in 1986. This is seven times larger than the U.S. import market for similar products. Japanese mandarins--which are almost entirely consumed in western Canada--are the most expensive orange citrus products at \$17.50 per sixteen carton in 1986. U.S. and Moroccan orange cartons were priced at \$8.76 and \$8.16, respectively. This specialty market may be an attractive market opportunity for the Tunisians.

Canadian demand for oranges during the time period when the Maltese oranges are available for export--January to March--could be strong enough to absorb a significant share of Tunisia's total export volume. The available data suggest that new suppliers can enter the Canadian market and take market share away from existing suppliers. As Annex A Table 15 indicates, the percentages changes in Canadian citrus imports are rather large. The "swings" present Tunisia with export opportunities particularly because Israeli exports have progressively declined since 1985. During the three month market window, January affords the highest import prices.

2. The United States Market

There are approximately 110 bearing acres of blood oranges in the U.S. at present. According to some in the California citrus industry, this acreage is expected to triple within the next five years. Frieda's Finest Food in Los Angeles, California handles a significant amount of the blood oranges currently brought to market. However, most brokers contacted felt that domestic blood oranges were of low quality and could not compete directly against high quality, juicy, blemish-free maltese orange imports.

Most citrus industry participants feel that a strong, limited, profitable U.S. market exists for blood oranges. Such oranges should be placed in the market as a specialty, high quality product with attractive packaging. If possible, oranges should be available for the December holiday season. One packer, for example, obtained \$52.00 per carton for oranges sold during this Passover and indicated he could not meet demand. Several importers agreed that \$20 to \$25 CIF per carton might be a reasonable wholesale price to expect in the New York City market for a high quality Maltese orange.

Most importers indicated that, if Tunisian Maltese oranges were placed in U.S. markets, exporters would need to allocate promotional funds to stimulate sales. Promotions are needed at the distributor and consumer levels. It is difficult to estimate an amount for such promotion at this time, but \$75,000 to \$100,000 per year is our preliminary forecast.

In addition, price discounts would be needed to induce supermarket chains to feature Tunisian oranges in special sales. Point-of-purchase materials and advertising would also need to be negotiated. These costs could amount to \$1.00 per carton.

Without exception, the importers indicated that they would handle the product only on consignment terms; but that an arrangement could possibly be made for a floor price. After two or three years in the market, FOB sales might be a possibility. Container loads of 1000 cartons are the minimum amount that would be of interest. Air freight may also be needed. However, these additional transportation expenses would be likely to require retail prices much higher than those for competing oranges.

In general, then, the U.S. market for Maltese oranges appears to be quite limited. It tends to be oriented towards persons of European descent or those consumers who have spent time in Europe and have had prior exposure to this type of citrus. As such, current market opportunities would seem to lie mainly with small specialty produce outlets and, possibly, with upscale restaurants located primarily in major metropolitan areas. Although a few chains recently have made a speciality of exported exotics, in the short run, Tunisian exporters would find little enthusiasm evidenced by most chain stores.

B. Quality and Quantity Requirements of the U.S. and Canadian Markets

In the U.S., importers indicated that the most desirable orange sizes would be between 56 and 88 count per carton, with as much blood color as possible on both the skin and in the flesh. Several brokers expressed displeasure with the small sizes and poor color of the blood oranges they typically receive from California.

Currently, Maltese oranges are being exported from Tunisia to Europe in 15 kilogram cardboard and wire bound wooden crates. While wooden crates could be used to export oranges to the U.S., it would be more prudent to use cardboard crates exclusively for three reasons. First, like the oranges, any wooden crates imported would be subject to phytosanitary inspections for potential pest problems. Second, wooden crates result in increased product damage or prove to be more difficult to stack in transit. Third, cardboard cartons, preferable with removable tops, allow for easier inspection of the product and provide better opportunity for attractive advertising on the carton.

Given the demographic characteristics of the U.S. market, brokers were asked if packaging small lots within a full carton might increase marketing opportunities. However, no interest

was expressed in this type of secondary consumer packaging. Brokers agreed that loose, bulk retail presentation of Maltese oranges would be the only suitable way to market this type of specialty product.

In transit, crates, not wooden pallets, with both netting and banding should be used, as they would result in increased protection for the oranges. No interest in the use of slip sheets was indicated by brokers.

Most brokers felt that any means of improving the appearance of the shipping carton would increase marketing potential. Given the uniqueness of the product, point-of-purchase (POP) materials targeted at shoppers, along with possible trade promotion and/or consumer advertising, would be desirable. Because of a limited consumer familiarity with the product and promotional funds, POP advertising, particularly pricing cards, is likely to prove to be the most cost effective advertising vehicle. In addition, if a wider retail campaign was envisaged, promotional materials directed at both wholesale brokers and consumers would be necessary.

The current advertising and promotional funds of two of the largest U.S. citrus marketers are presented for reference purposes. In the U.S., the two major promoters of domestic fresh citrus are the Florida Citrus Commission and Sunkist Growers, Inc. During 1987/1988, the Florida Citrus Commission spent approximately \$5.5 million on advertising and promotion of fresh citrus. Of that amount, approximately 35 percent was promotion of fresh oranges (\$1.9 million). Of this latter amount, approximately \$200,000 was directed at POP promotions.

During 1987/1988, Sunkist Growers, Inc. allocated \$5.6 and \$4.4 million for promotion of fresh Navel and Valencia oranges, respectively. Of that amount, \$2.3 and \$1.2 dollars were spent on trade promotion and \$450,000 and \$200,000 were spent on POP promotions.

These promotional costs are obviously much larger than those which would be needed to promote Tunisian orange sales. This is particularly so if Maltese oranges were not initially targeted for supermarkets, where promotional costs are very high. It should also be noted that, while both entities have been increasing their total promotional budgets for fresh oranges, POP expenditures have been declining relative to other forms of promotion. The reason cited was an inability to motivate retailers to use the POP materials offered to them. A representative from the Florida Citrus Commission indicated that the most widely used, and arguably the most effective, of the POP materials was the price card.

A number of issues were identified by broker/importers as possible constraints to U.S. imports of Maltese oranges. First, several brokers were concerned about the problems which might be caused by the 5 to 6 day delay required for federal inspections of the product upon entry into the U.S. Part of their complaint seemed to stem from a general dislike of the regulatory process; but they also indicated that the delay presented scheduling problems for them. Uncertainty concerning the expected times of delivery reduce their ability to guarantee product availability to their customers on a predetermined and timely basis. Logically, one solution to this problem would be an on-sight inspection at the point of origin, in addition to the use of non-wooden crates and skids.

Second, cold treatment of imported citrus is necessary to control the Mediterranean fruit fly. This process requires that the product be stored in cold storage at a maintained temperature of 32 to 36 degrees Fahrenheit for a period of ten to sixteen days. Cold treatment could be performed on board ship during the approximately 21 day transit time.

Given lack of knowledge of the effect of cold storage on Maltese oranges, quality deterioration could also be a major problem in shipments to the U.S. Experts in post harvest handling indicate that such a problem already exists for Florida grapefruit exported to Japan. Further, they felt that given the thin skin and high juice content of Maltese oranges, quality was likely to be negatively affected by cold treatment.

Third, in differing with Canadian brokers, some U.S. brokers expressed concern that even a market as large as metropolitan New York could not absorb an entire container load of Maltese oranges before product deterioration set in. However, shipment in containers holding 1000 4/5 bushel cartons is necessary for the required cold treatments.

Finally, by federal regulation, fresh citrus cannot be imported into any citrus-producing state or one that borders a citrus producing state. The market potential within the U.S. is thus further constrained.

C. Potential Importers and Terms of Trade

Annex E provides the names of the major U.S. importers of citrus. Several have been identified specifically because they have had experience with importing North African and/or Mediterranean citrus in the past. Virtually every importer interviewed for this study indicated a willingness to import Tunisian Maltese oranges, subject to several general conditions.

First, importers in the U.S. and Canada were unanimous in requiring that the terms of sale be on a consignment basis only. That is, importers would receive the product and agree to sell it for prices prevailing in the market at the time of arrival. They then deduct their normal selling charges (approximately 10-15%) and remit the remaining receipts, if any, to Tunisian shippers/exporters. This is, of course, a risky practice for Tunisian shippers who, at least initially, lack indepth understanding of the North American market. Several importers also indicated that after a few years of successful relationships, they would probably be willing to take title to the product in Tunisia at FOB sale prices. Nearly all the Canadian importers mentioned that they would probably require exclusive distribution rights for Maltese oranges within Canada, but the American importers did not place as high a priority on such a sales arrangement.

Although not likely to be the initial target market, some Canadian supermarket chains are apparently willing to guarantee an average season price for oranges, provided tonnage commitments are made. Most importers estimated that their minimum shipment requirement would be one container load. One Canadian importer speculated that the Canadian market alone would be able to absorb as many as 150 containers (50,000 cartons) in a three week period. These containers, however, must be refrigerated and the expected cost the refrigerated container transport by ship from Tunis to Montreal is estimated to be \$3.00 to \$4.50 per carton. To arrange January shipments, negotiations would have to be completed the preceding November. Samples were viewed as highly desirable, but given Tunisia's extremely short marketing season, this condition might be waived by the importers.

In 1987, one Canadian importer--Importation Socodis Canada, Inc.--imported 100 cartons of Maltese oranges from Tunisia. Although quality was reported as good, movement was apparently slowed by lack of promotional funds. Both American and Canadian importers indicated that "marketing development" funds have become increasingly important in promotion of any imported product and particularly so for any new product.

III. Conclusions And Marketing Strategies

Several conclusions can be drawn from the preceding analysis. These conclusions lead to some marketing strategies.

- **Give First Priority to Expansion In European Markets.**

When and if production levels increase to a level that export quantities can be sustained to non-French markets, the first priority for export market expansion should be in the European countries joining France, i.e., Holland, Belgium, Germany, and England. The current production volume and volume available for export is not adequate to serve all markets together: the domestic market, the French market, and the North American market. Also the North American market, because of distance, phytosanitary restrictions, and market conditions, will be a far more costly market to penetrate.

- **Develop and Exploit Special Market Niche Opportunities Canada and perhaps the United States.**

Although the costs of entering the US and Canadian markets are high, consumer tastes for high quality and exotic fruit appear sufficiently strong so that high margin market niches for modest volumes of Maltese oranges can probably be developed. Market niche opportunities are most likely in New York City, Atlanta, Boston, New Orleans, Chicago, Dallas, Miami, Toronto, and Montreal. These cities are selected because they have large ethnic and European populations, are growing in population, and the economies appear sound and expanding. Atlanta, New Orleans, Dallas, and Miami are currently restricted markets because of USDA phytosanitary regulations. Factors that must be overcome or corrected to make successful entry possible include uneven fruit quality, poor packaging, unknown and poor labels, and phytosanitary problems. If these problems can be addressed, a North American exclusive agent/importer should be designated to arrange and oversee the market development activity.

- **Quality Improvement Is Essential.**

In order to further develop export markets special attention must be given to improving all aspects of quality. Each export shipment should be of uniform quality. Some form of inspection to insure uniform quality in export volume is vital. The durability and appearance of shipping cartons must be improved. Pallets must be new and sturdy and banded. Cooling facilities in the packing houses and refrigerated transportation are essential. In fact quality control needs to be started during production through controlled cultural practices and continue through harvesting.

- **Promotional Activities Must Accompany All Export Activity.**

Promotion is essential in the development and maintenance of a strong market position. To be most effective, this promotion should be directed to buyers and distributors in the trade channels, not to consumers. Both the volume of fruit involved and likely Tunisian budgets are too small to justify consumer level advertising or promotion.

A display booth and demonstration at produce trade shows in European countries should have first priority. When adequate volumes of high quality fruit are available for shipment to North America, displays could be placed at the United Fresh Fruit and Vegetable Confer-

tion. These are usually held in February each year and coincide with the time when Maltese quality is near peak.

- **Extend the Harvest Season.**

The harvest season for Maltese oranges should be extended in order to take advantage of the holiday season market opportunities in Europe. Harvest season extension would also make it more profitable to enter market niche opportunities in North America. This would require long range planning and investments. In order to develop these early and late varieties, chemicals would probably need to be used to hold fruit longer on the tree, and refrigeration would be required for improved storage.

Strategic Action Plan For Citrus

The Maltese orange is clearly recognized as a distinctive, differentiated product. It demands and receives a price premium in the French market and is in strong demand in the domestic market. But above certain prices, Maltese oranges face stiff competition. Thus, even though the Maltese orange is considered unique and special, Tunisia must develop a plan to reduce costs of production and distribution and develop a stronger quality image of not only the product but the packages in which they are shipped. Lower costs and a higher quality image with importers are essential for the industry to be competitive. In addition, it is necessary to have a pricing structure from the consumer through the wholesaler to the producer which enables the preferences and interests of domestic consumers and foreign consumers to be passed on to Tunisian citrus growers.

A strategic action plan that will assist in providing for a profitable and competitive Tunisian citrus industry should include elements in production technology, market quality, and export expansion.

Production Technology

Several elements of a strategic plan would reduce costs and further improve market quality.

- **Use Only Disease Free Nursery Stock.**

Probably the most important element in the long-run is the establishment of certified nurseries and a control system that will guarantee disease-free citrus stock in all new plantings. The use of only disease-free stock will increase yields and reduce costs in the future.

- **Develop Individual Irrigation Systems.**

Present evidence favors properly designed individual irrigation systems for citrus. This strategy should be used only if a uniform flow of irrigation water is available. If availability of irrigation water is not possible, growers should continue to use basin irrigation. However, research and experimentation should be conducted to determine the most appropriate irrigation and cover crop arrangements.

- **Improve Pruning Practices.**

In general, Tunisian citrus groves tend to be over-pruned. An extensive education program should be implemented to establish more appropriate and economical pruning practices.

- **Invite in an Expert Consultant on Pruning, Pest Control, Soil Management, Windbreaks, and Variety Selection.**

Several cultural practice improvements are possible which would reduce costs and improve the quality of the fruit. The person should speak French and be a highly respected authority on citrus production.

Market Quality

Quality is a severe problem. Severe losses of product occur between the time the product is harvested and reaches the consumer. This is especially true in the export market. The packaging materials used in exporting lack durability and are unattractive. The storage and transport containers do not provide for proper ventilation or refrigeration. In the domestic market, the fixed wholesale and retail margins in marketing citrus fail to provide incentives for sellers to provide domestic consumers with a range of price/quality choices.

Important elements of a strategic action plan to improve market quality and reduce per unit marketing costs include the following.

- **Eliminate the Restriction On Importation of Quality Packaging Materials Through Greater Use of the Offshore Export Licensing Arrangement.**

This restriction is part of the reason that relatively low quality packaging materials are used. High quality packing materials are currently available only from foreign sources. Concurrent with the elimination of this restriction, the public and the private sector should begin to utilize only corrugated cardboard cartons and pallets with banding for export. They should also begin to use attractive and informative labels on the improved cartons.

- **Impose Strict Grading Controls on Export Shipments.**

This control can be exercised only by the government. Uniform and high quality fruit must reach the final consumer if Tunisia's export market is to grow. Quality control should result in less product loss and more satisfied customers. This will reduce costs and increase sales and profits.

- **Conduct Experiments to Determine the Quality and Cost Implications of Using Precorling Equipment in All Packing Sheds and of Using Refrigerated Transport Equipment for Exports.**

Conventional wisdom seems to be that a cool environment is either unnecessary or would destroy the quality of the Maltese orange. This is contrary to practices used in the transport of citrus and fruit products in other parts of the world. Although the thin Maltese skin may pose problems, we would strongly suggest that all Maltese shipments be in refrigerated containers at least on an experimental basis. However, some relatively inexpensive experiments should be conducted to determine the cost and quality benefits, if any, before major investments are made.

- **Eliminate the Fixed Wholesale and Retail Margin on Domestic Sales of Citrus Products.**

The current policy of limiting the wholesale and retail margins limits consumer quality/price options and results in "black market" activities. These activities, in turn, increase the costs of marketing through duplication of marketing operations and inefficiencies in pricing. The elimination of these fixed margins would make possible for consumers to elect to pay higher prices for higher quality fruit. These higher prices, when passed back to wholesalers and producers would provide a signal to them to increase the production and distribution of higher quality fruit.

Export Expansion

Some export expansion is likely to occur if and when the above suggestions are implemented. Higher quality fruit, with less loss, in better and more attractive cartons on stronger pallets will increase orange sales and decrease costs. This will increase the potential for higher returns to producers from the export market. All of the above elements of a strategic plan are necessary, but other conditions must be met to truly expand the export market.

First and foremost, there must be an adequate supply of fruit so export market commitments can be met and maintained. Current production has little surplus to allow export expansion. Moreover, it is essential that a supply be reliable and available from year to year so that the trade and consumers continue to recognize and appreciate the quality of the product. Assuming that an adequate supply can be forthcoming, the following elements must be included in any strategic plan.

- **First Priority Should Be Given to Developing the European Market.**

This is a much more natural extension of the distribution and marketing system than entry into the North American market. Rural France and the countries adjacent to France should be much easier to penetrate. Moreover, it is highly desirable to develop other markets reducing dependence on France. The North American market is more distant, the U.S. citrus industry, the largest in the world, is mature and strongly competitive, and the U.S. phytosanitary requirements are stringent. The Canadian market is much larger and more attractive than that of the U.S.

- **Establish a Budget and a System for Promotion in Target Markets.**

Promotional activities targeted at importers and distributors, not consumers, will probably be most fruitful. Although this type of trade promotion has already begun in France, it needs to be extended into other target countries.

Some form of promotional activity must accompany all export activity. A demonstration/display at target country trade shows or conventions represents a minimum promotion activity. Very high quality citrus in attractive cartons accompanied by very high quality printed materials are essential components of a successful exhibit.

In addition, very attractive and informative printed materials should be made available to importers and distributors in target countries. Available space on shipping cartons consistent with export trade regulations can and should be used for promotional activities as well. In fact, one of the first and most important promotional activities is the development of an attractive export carton and a professionally designed label on that carton.

- **Develop and Exploit Market Niches in Canada and Perhaps in the United States for Limited Volumes of High Quality Fruit.**

Although the costs of entry into the North American market are high, they are not prohibitive. Consumers tastes for high quality and exotic fruit appear sufficiently strong that high margin market niches for modest volumes of Maltese oranges can probably be developed. For the first several years, a North American exclusive agent/importer should be designated. Initially, fruit would have to be sold on consignment, which means that prices would be determined by how much the importer could get in the existing markets. Entry into the North American market would involve a substantial promotional activity in terms of high

quality printed materials and attractive cartons with eye-catching informative labels. Consideration should be given to "sticker" labels on individual pieces of fruit.

- **Extend the Harvest Season.**

Most of the opportunities for market expansion are in the early and late months of harvesting/exporting season. Demand and prices are high in December in the European and North American markets. This holiday month is also an excellent time to sell high quality and exotic items. Prices are also high in April and May, toward the end of the season for Maltese oranges. The harvest/export season can be extended backward by variety selection and appropriate cultural practices for early harvest.

ANNEX A
Statistical Tables

Annex A - Table 2
World Exports of Oranges, Tangerines, and Mandarins by Country of Origin,
1970-1986 (in 1000 metric tons)

COUNTRY	1970	1975	1980	1981	1982	1983	1984	1985	1986
Spain	1,441	1,512	1,336	1,354	1,400	1,238	2,026	1,335	2,298
Morocco	600	445	770	630	593	540	512	562	572
United States	266	481	482	443	353	497	374	412	417
Israel	588	656	521	619	539	463	393	408	378
Gaza Strip	NA	140	140	135	147	110	124	109	110
Greece	100	190	174	54	182	182	110	263	263
Italy	194	154	141	112	138	137	144	170	202
Egypt	104	210	110	114	102	150	161	161	165
Turkey	28	34	46	143	91	100	65	102	102
Mexico	50	30	31	31	38	29	18	7	19
Other	*	*	1,381	1,346	1,455	1,390	1,420	1,507	1,524
Total	*	*	5,131	4,981	5,037	4,836	5,347	5,035	6,048

Percent of World Exports Volumes of Oranges, Tangerines, and Mandarins by Country

Spain	26%	27%	28%	26%	38%	27%	38%
Morocco	15	13	12	11	10	11	9
United States	9	9	7	10	7	8	7
Israel	10	12	11	10	7	8	6
Gaza Strip	3	3	3	2	2	2	2
Greece	3	1	4	4	2	5	4
Italy	3	2	3	3	3	3	3
Egypt	2	2	2	3	3	3	3
Turkey	1	3	2	2	1	2	2
Mexico	1	1	1	1	0	0	0
Other	27	27	29	29	27	30	25
Total	100%						

Source: *FAO Trade Yearbook. Food and Agriculture Organization of the United Nations.*

Notes: *Data for the Gaza Strip are unofficial.*
**Data not collected.*

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Annex A - Table 1
World Production of Oranges, Tangerines, and Mandarins,
1970-1986 (in 1000 metric tons)

COUNTRY	1970	1975	1980	1981	1982	1983	1984	1985	1986
Spain	2,260	2,668	2,617	2,192	2,583	3,315	2,222	3,019	3,119
Morocco ¹	876	617	1,024	965	992	934	989	930	1,188
United States	7,900	9,913	11,490	10,078	7,426	9,189	7,027	6,515	7,192
Israel	938	1,052	1,075	871	1,199	993	1,049	1,035	855
Gaza Strip ²	NA	145	142	151	165	139	135	120	120
Greece ³	452	578	539	745	703	725	825	678	884
Italy	1,601	1,931	1,845	2,130	1,836	2,769	1,920	2,648	2,710
Egypt ⁴	680	953	991	969	1,315	1,349	1,312	1,274	1,278
Turkey	523	656	858	862	866	974	995	771	870
Mexico ⁵	1,020	2,478	2,130	1,935	2,139	2,197	1,832	1,202	1,533
Other	*	*	23,019	24,223	24,198	25,087	28,904	26,153	29,246
Total	*	*	45,730	45,121	43,422	47,671	47,210	44,345	48,995

Percent of World Production of Oranges, Tangerines, and Mandarins by Country

Spain	6%	5%	6%	7%	5%	7%	6%
Morocco	2	2	2	2	2	2	2
United States	25	22	17	19	15	15	15
Israel	2	2	3	2	2	2	2
Gaza Strip	0	0	0	0	0	0	0
Greece	1	2	2	2	2	2	2
Italy	4	5	4	6	4	6	6
Egypt	2	2	3	3	3	3	3
Turkey	2	2	2	2	2	2	2
Mexico	5	4	5	5	4	3	3
Other	50	54	56	53	61	59	60
Total	100%	100%	100%	100%	100%	100%	100%

Source: *FAO Production Yearbook. Food and Agriculture Organization of the United Nations.*

Notes: ¹Morocco data are unofficial. ²Data for the Gaza Strip are unofficial or estimates by the FAO. ³1985 is unofficial figure. ⁴1975 and 1984-86 are unofficial data. ⁵1975, 1980, and 1984-86 are unofficial data. *Data not collected.

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Annex A - Table 4
U.S. Fresh Utilization of Round Oranges, 1970-1986
(million lbs)

VARIETIES	1970-71	1975-76	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87
EARLY AND MID SEASON (including Navel)									
Arizona	46	44	51	54	69	36	46	62	
California	1,100	1,545	1,832	1,590	2,040	1,901	1,733	1,988	1,988
Florida	738	584	521	444	546	445	398	461	474
Texas									
LATE (Valencia)									
Arizona	52	48	75	105	122	77	99	92	
California	830	1,020	990	915	1,204	915	1,298	1,283	1,200
Florida	519	472	224	242	383	243	201	346	324
Texas									
U.S. TOTAL	3,551	3,975	3,935	3,632	4,647	3,735	3,773	4,255	4,221
STATE TOTALS									
Arizona	98	92	126	159	191	113	145	154	168
California	1,930	2,565	2,822	2,505	3,244	2,816	3,030	3,270	3,188
Florida	1,257	1,056	745	686	929	688	599	806	798
Texas	267	262	242	282	284	118	0	25	67

Notes: 1986-87 preliminary.

Sources: "Citrus Summary." Florida Agricultural Statistics Service. Various issues.

"Annual Statistical Report." Florida Citrus Mutual.

"Citrus Fruit Industry Statistical Bulletin." Sunkist Growers, Inc.

Annex A - Table 3
U.S. Production of Round Oranges, 1970-1986
(million lbs)

VARIETIES	1970-71	1975-78	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87
EARLY AND MID-SEASON (including Navel)									
Arizona	57	54	68	67	79	41	49	68	NA
California	1,343	2,123	2,906	1,988	3,015	2,528	1,965	2,475	2,588
Florida	7,389	8,892	9,504	6,660	6,318	6,273	4,950	5,778	5,922
Texas	NA								
LATE (Valencia)									
Arizona	210	147	127	162	206	94	135	172	NA
California	1,470	1,838	1,988	1,155	2,693	1,110	1,965	1,568	1,800
Florida	5,418	7,416	6,012	4,662	6,246	4,230	4,401	4,950	4,851
Texas	NA								
U.S. TOTAL	16,414	20,988	20,973	15,198	19,039	14,489	13,465	15,037	15,471
STATE TOTALS									
Arizona	267	201	195	229	285	135	184	240	236
California	2,813	3,960	4,894	3,143	5,708	3,638	3,930	4,043	4,388
Florida	12,307	16,308	15,515	11,322	12,564	10,503	9,351	10,728	10,773
Texas	527	519	368	505	483	213	0	26	74

Notes: 1986-87 preliminary.

Sources: "Citrus Summary." Florida Agricultural Statistics Service. Various issues.
"Annual Statistical Report." Florida Citrus Mutual.
"Citrus Fruit Industry Statistical Bulletin." Sunkist Growers, Inc.

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**Annex A - Table 6
U.S. Fresh Utilization of Specialty Oranges 1970-1986.**

PRODUCTS	1970-71	1975-76	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87
TANGERINES					<i>(million lbs)</i>				
Arizona	18	35	30	34	56	68	43	40	42
California	54	60	57	84	86	69	86	95	122
Florida	253	224	181	151	142	133	66	70	77
Texas									
TANGELOS									
Arizona									
California									
Florida	145	202	185	160	169	144	132	120	118
Texas									
HONEY TANGERINES									
Arizona									
California									
Florida	32	126	26	31	65	43	24	43	62
Texas									
TEMPLES									
Arizona									
California									
Florida	201	210	100	75	141	69	56	82	95
Texas									
K-EARLY									
Arizona									
California									
Florida		22	41	27	21	36	9	11	16
Texas									
U.S.TOTAL	702	879	619	563	678	561	416	461	531
STATE TOTALS									
Arizona/Calif. ¹	72	95	87	118	142	137	129	135	164
Florida ²	631	783	532	445	536	425	287	326	367
Texas ³	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes: ¹California and Arizona includes: Tangerines, Tangelos, Honey Tangerines, Tangor, Royal Mandarin, and Temples. ²K-Early excluded for 1970-7. ³Texas, no or little production. 1986-87 is preliminary.

Sources: "Citrus Summary." Florida Agricultural Statistics. "Citrus Fruit Industry Bulletin." Sunkist Growers, Inc.

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**Annex A - Table 5
U.S. Production of Specialty Oranges, 1970-1986**

PRODUCTS	1970-71	1975-76	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87
TANGERINES					<i>(million lbs)</i>				
Arizona	29	50	53	56	83	86	53	53	53
California	86	98	140	130	161	139	126	135	167
Florida	352	323	285	238	214	190	100	109	124
Texas									
TANGELOS									
Arizona									
California									
Florida	243	495	441	459	342	324	324	266	360
Texas									
HONEY TANGERINES									
Arizona									
California									
Florida	92	195	105	152	109	93	75	76	99
Texas									
TEMPLES									
Arizona									
California									
Florida	450	495	324	288	423	261	293	266	306
Texas									
K-EARLY									
Arizona									
California									
Florida		32	54	36	25	47	11	14	20
Texas									
U.S. TOTAL	1,251	1,686	1,401	1,350	1,357	1,139	981	919	1,129
State Totals									
Arizona/Calif ¹	115	147	192	177	244	225	179	188	220
Florida ²	1,137	1,539	1,209	1,173	1,113	914	803	731	908
Texas ³	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes: ¹California and Arizona includes: Tangerines, Tangelos, Honey Tangerines, Tangor, Royal Mandarin, and Temples. ²K-Early excluded for 1970-71.
³Texas, no or little production. 1986-87 is preliminary.

Sources: "Citrus Summary." Florida Agricultural Statistics. "Citrus Fruit Industry Bulletin." Sunkis: Growers, Inc.

Annex A - Table 7 (continued)
U.S. Fresh Shipments of Specialty Oranges by State, 1970-86
(million lbs)

YEAR	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
TANGELOS													
Florida													
1970-71	NA												
1975-76	1	14	50	87	31	3	0	0	0	0	0	0	186
1980-81	0	4	46	85	27	7	0	0	0	0	0	0	169
1981-82	0	6	38	78	17	3	0	0	0	0	0	0	143
1982-83	1	15	55	69	9	2	0	0	0	0	0	0	152
1983-84	0	1	38	81	13	2	0	0	0	0	0	0	135
1984-85	0	8	35	57	23	3	1	0	0	0	0	0	127
1985-86	0	4	29	58	20	3	1	0	0	0	0	0	115
1986-87	0	2	25	54	24	5	1	0	0	0	0	0	111
TEMPLES													
Florida													
1970-71	NA												
1975-76	0	0	0	9	89	71	17	1	0	0	0	0	187
1980-81	0	0	0	1	42	34	7	0	0	0	0	0	85
1981-82	0	0	0	4	40	21	3	0	0	0	0	0	67
1982-83	0	0	0	16	53	44	7	1	0	0	0	0	121
1983-84	0	0	0	0	25	27	4	0	0	0	0	0	57
1984-85	0	0	0	2	36	10	3	1	0	0	0	0	52
1985-86	0	0	0	2	41	22	10	2	0	0	0	0	77
1986-87	0	0	0	0	40	34	11	1	1	0	0	0	86

Notes: Zero value means less than half a million pounds.

Source: "Citrus Summary." Florida Agricultural Statistical Service.

Annex A - Table 7
U.S. Fresh Shipments of Specialty Oranges by State, 1970-1986
(million lbs)

YEAR	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
TANGERINES													
Florida													
1970-71	0	11	60	100	52	14	10	5	0	0	0	0	252
1975-76	6	26	52	93	54	42	38	13	3	1	1	0	330
1980-81	0	29	52	75	22	13	8	1	0	0	0	0	209
1981-82	1	24	39	64	17	13	7	0	0	0	0	0	165
1982-83	2	28	46	48	32	21	8	3	2	0	0	0	190
1983-84	0	15	51	69	10	14	14	3	0	0	0	0	176
1984-85	0	17	21	23	13	5	7	1	0	0	0	0	88
1985-86	0	12	22	28	18	12	13	4	1	0	0	0	110
1986-87	0	9	20	32	23	23	19	5	1	0	0	0	132
TOTAL SHIPMENTS OF TANGERINES (Florida and other states¹)													
1970-71	0	11	63	106	56	17	14	6	0	0	0	0	273
1975-76	6	26	54	100	54	42	38	13	3	1	1	0	339
1980-81	0	29	55	83	38	22	12	3	0	0	0	0	243
1981-82	1	24	42	69	28	26	20	5	2	0	0	0	216
1982-83	2	28	50	56	57	34	13	8	2	0	0	0	250
1983-84	0	15	52	70	11	14	14	3	0	0	0	0	179
1984-85	0	17	21	23	14	5	7	1	0	0	0	0	89
1985-86	0	12	22	28	19	13	13	4	1	0	0	0	113
1986-87	0	9	20	32	23	24	20	5	1	0	0	0	134

Notes: Zero value means less than half a million pounds.

¹California and Arizona fresh utilization of tangerines equals their fresh shipments.

Source: "Citrus Summary." Florida Agricultural Statistical Service.

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Annex A - Table 8
FOB Packed-Fresh Prices for Round Oranges
(dollars/box)

VARIETIES	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
NAVEL												
Arizona												
1984-85			20.30	17.70	16.90	18.30	14.40					
1985-86			21.10	16.80	15.40	11.40	12.80					
California												
1984-85			21.10	18.72	18.04	18.94	15.62	15.86	21.94			
1985-86			16.80	15.30	15.00	13.70	13.30	13.10	12.70			
Florida												
1984-85			17.40	18.10	16.80	19.50						
1985-86			12.80	14.10	10.90	10.90	10.50					
VALENCIA												
Arizona												
1984-85						21.30	15.90	12.90	15.60	13.60	11.30	
1985-86							14.20	12.50	12.60	11.40	10.70	
California												
1984-85	22.36	25.32	23.54				16.74	12.66	15.66	16.92	14.92	14.56
1985-86	13.90	13.70	12.30	12.00			10.70	10.90	12.60	12.50	10.70	12.40
Florida												
1984-85						19.50	16.00	15.60	15.50	15.20		
1985-86						10.90	10.50	10.00	10.00	13.20		

Note: Prices for Texas not available. An empty cell indicates that there were no shipments or no data. Box weights for oranges: California and Arizona: 75 lbs/box and Florida: 90 lbs/box.

Source: Agriculture Prices, Crop Reporting Board, USDA.

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Annex A - Table 7 (continued)
U.S. Fresh Shipments of Specialty Oranges by State, 1970-86
(million lbs)

YEAR	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
K-EARLY													
Florida													
1970-71	NA												
1975-76	9	11	0	0	0	0	0	0	0	0	0	0	20
1980-81	1	33	6	0	0	0	0	0	0	0	0	0	40
1981-82	2	23	3	0	0	0	0	0	0	0	0	0	27
1982-83	7	11	0	0	0	0	0	0	0	0	0	0	19
1983-84	0	23	11	0	0	0	0	0	0	0	0	0	35
1984-85	3	5	0	0	1	0	0	0	0	0	0	0	10
1985-86	0	9	1	0	0	0	0	0	0	0	0	0	10
1986-87	0	14	1	0	0	0	0	0	0	0	0	0	15

Notes: Zero value means less than half a million pounds.

Source: "Citrus Summary." Florida Agricultural Statistical Service.

**Annex A - Table 9
FOB Packed-Fresh Price for Specialty Oranges
(dollars/box)**

CROP	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
TANGERINES												
Arizona												
1984-85			26.80	17.30	21.10	20.30	20.20					
1985-86			21.40	21.10	12.80	19.70	21.60	18.40				
California												
1984-85			29.32	27.80	24.60	25.14	19.04					
1985-86			32.50	26.50	22.50	22.00	18.00	18.60	17.00			
Florida												
1984-85		30.00	30.00	30.00	32.00							
1985-86		31.00	30.00	27.00	23.00							
U.S.												
1984-85		30.00	29.83	27.38	23.93	23.76	19.43					
1985-86		31.00	29.70	25.70	22.90	20.80	20.00	18.50	17.00			
TEMPLES												
Florida												
1984-85					16.50	17.70	18.00					
1985-86					13.00	13.00	13.00					
TANGELOS												
Florida												
1984-85		24.00	19.00	16.50	17.50	21.50						
1985-86		14.00	12.50	14.80	13.00							

Note: Prices for Texas not available. An empty cell indicates that there were no shipments or no data. Box weights for tangerines: California and Arizona: 75 lbs/box and Florida: 95 lbs/box. Box weights temples and tangelos: Florida: 90 lbs/box

Source: Agriculture Prices, Crop Reporting Board, USDA.

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Annex A - Table 8 (continued)
FOB Packed-Fresh Prices for Round Oranges
(dollars/box)

VARIETIES	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
ORANGE												
Arizona												
1984-85			20.30	17.70	16.90	18.50	15.34	12.90	15.60	13.60	11.30	
1985-86			21.10	16.80	15.40	11.40	13.60	12.50	12.60	11.40	10.70	
California												
1984-85	22.36	25.32	21.29	18.72	18.04	18.94	15.65	15.15	16.61	16.92	14.92	14.56
1985-86	13.90	13.70	15.30	16.20	15.00	13.70	13.00	12.70	12.70	12.50	10.70	12.40
Florida												
1984-85			17.40	18.10	16.80	19.50	16.00	15.60	15.50	15.20		
1985-86			12.80	14.10	10.90	10.90	10.50	10.00	10.00	13.20		
U.S.												
1984-85	22.36	25.32	19.87	18.41	17.81	18.97	15.68	15.14	16.47	16.79	14.90	14.56
1985-86	13.90	13.70	14.50	15.30	14.10	13.20	12.60	12.20	12.30	12.50	10.70	12.40

Note: Prices for Texas not available. An empty cell indicates that there were no shipments or no data. Box weights for oranges: California and Arizona: 75 lbs/box and Florida: 90 lbs/box.

Source: Agriculture Prices, Crop Reporting Board, USDA.

Annex A - Table 11
Value of U.S. Fresh Citrus Imports by Country of Origin,
1970 - 1987 (in 1000 dollars)

YEAR¹	1970/71	1975/76	1980/81	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87
WORLD	9,286	9,293	14,661	17,339	7,896	18,042	20,900	25,572	21,990
CANADA	NA	NA	NA	0	0	22	23	131	31
LATIN AMERICA	NA	NA	NA	9,878	5,118	8,880	11,336	11,387	10,270
WESTERN EUROPE	NA	NA	NA	5,940	1,037	4,288	4,192	6,788	7,480
EC²	NA	NA	NA	17	218	95	4,190	6,788	7,480
Spain ³	NA	NA	287	5,922	819	3,599	4,127	6,776	7,427
Italy	NA	NA	NA	15	179	46	50	2	4
Greece	NA	NA	NA	0	0	6	0	3	3
France	NA	NA	NA	0	0	35	0	6	10
Portugal	NA	NA	NA	0	0	0	0	0	22
MIDDLE EAST AND ASIA	NA	NA	NA	1,345	1,112	3,976	2,752	7,256	4,174
Middle East⁴	NA	NA	NA	662	262	3,053	1,233	4,304	2,116
Cyprus	NA	NA	NA	0	0	0	0	0	37
Israel	2,278	2,184	1,588	662	262	3,043	1,233	4,304	2,080
Turkey	NA	NA	NA	0	0	10	0	0	0
OCEANIA⁵	NA	NA	NA	0	0	8	0	0	7
AFRICA	NA	NA	NA	109	606	869	2,586	11	28
Northern Africa	NA	NA	NA	109	586	869	2,485	0	28
Egypt	NA	NA	NA	0	0	0	0	0	28
Morocco	NA	191	NA	109	586	869	2,485	0	0

Notes: Zero can be interpreted as an insignificant quantity.
¹Reporting year runs from October through September.
¹For the period 1970-81, the figures include imports in prepared or preserved form.
 Also for 1970-81, the figure for Latin America = Mexico + Ecuador + Haiti + Jamaica.
²The number of member countries varies.
³Including Canary Island which is the primary production area.
⁴Mainly the Middle East including Israel.
⁵Australia and New Zealand.

Source: FATUS. USDA.

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Annex A - Table 12
Volume of Canadian Fresh Citrus Imports by Country of Origin,
1970 - 1986
(in metric tons)

COUNTRY	1970	1975	1980	1981	1982	1983	1984	1985	1986
World ¹	201,680	236,544	294,900	301,962	275,078	294,714	272,776	259,011	286,736
U.S. ¹	159,376	196,093	257,896	259,208	216,836	250,417	198,354	179,404	217,039
Japan		15,633	13,853	13,988	15,835	14,904	17,578	19,361	12,580
A.C.							10,236	12,263	13,207
Spain					4,784	1,052	9,415	11,859	
Israel					3	1,998	6,116	4,770	4,504
Morocco				9,535	9,692	12,307	19,227	20,377	17,827

Notes: Empty cells indicate data not available.
¹1970 includes oranges only.

Source: "Canada's Trade in Agricultural Products." Canada Department of Agriculture.

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Annex A - Table 13
Value of Canadian Fresh Citrus Imports by Country of Origin,
1970 - 1986
(in 1000 Canadian dollars)

YEAR	1970	1975	1980	1981	1982	1983	1984	1985	1986
World ¹	\$34,367	\$54,768	\$100,601	\$112,818	\$141,302	\$121,080	\$153,760	\$154,449	\$174,277
U.S. ¹	25,825	40,948	75,388	82,482	103,802	89,211	107,125	109,976	121,829
Japan	4,678	7,795	13,808	13,781	15,644	15,004	17,210	11,332	14,124
EC							7,619	9,618	11,900
Spain					3,274	873	7,216	9,338	
Israel					2	942	4,885	3,973	4,739
Morocco				5,842	4,784	7,776	7,198	7,573	9,300

*Notes: Empty cell indicate that the data are not available.
Imports are valued F.O.B. point of shipment and include volumes which are re-exported.*

¹*The figures for total import value and import from the U.S. are for the import of oranges.*

Source: "Canada's Trade in Agricultural Products." Canada Department of Agriculture.

Annex A - Table 14
U.S. and Canadian Per Capita Fresh Citrus Consumption,
1970 - 1986
(in pounds)

YEAR ¹	UNITED STATES				CANADA	
	Oranges	Tangerines	Tangelos	Total Fresh Citrus	Oranges	Total Fresh Citrus
1970	16.0	1.5	0.6	27.9	20.1	42.2
1971	15.3	1.7	0.7	28.2	19.8	43.9
1972	14.0	1.5	0.7	26.5	20.4	45.4
1973	14.0	1.6	0.6	26.5	20.3	47.7
1974	14.0	1.8	0.7	26.6	20.2	48.5
1975	15.4	1.9	1.0	28.4	22.2	53.9
1976	14.3	1.9	0.9	28.1	28.9	62.0
1977	13.0	1.7	0.9	25.3	31.2	63.2
1978	13.0	1.5	0.8	25.6	23.7	61.0
1979	12.1	1.5	0.7	23.7	22.4	59.9
1980	15.4	1.9	0.7	28.1	26.1	64.6
1981	13.1	1.2	0.8	24.2	26.4	67.0
1982	12.3	1.2	0.7	23.9	23.8	60.1
1983	15.6	1.3	0.7	28.2	25.3	61.6
1984	12.4	1.3	0.6	23.1	23.1	58.8
1985	12.0	0.8	0.5	21.8	NA	NA
1986	14.1	NA	NA	25.1	NA	NA

Notes: *Weight at retail.

¹For the U.S., the year corresponds to the end of the marketing year.

Sources: *Economic Research Service, USDA, Food Consumption, Prices and Expenditures, Statistical Bulletin No. 749, January 1987.*
Handbook of Food Expenditures, Prices and Consumption, Agriculture Canada, November 1986.

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Annex A - Table 15
Per Capita Citrus Consumption in EEC Countries,
1982/1983 - 1985/1986
(kg/person)

COUNTRY	1982/1983	1983/1984	1984/1985	1985/1986
Belgium-Luxembourg	19.2	21.9	16.8	23.1
Denmark	8.2	9.2	10.2	12.3
France	20.0	0.0	17.5	21.4
Germany	27.0	29.1	26.3	29.5
Greece	64.9	37.3	60.1	35.7
Ireland	13.2	14.5	14.7	15.8
Italy	34.4	41.3	33.5	41.5
Netherlands	93.1	80.0	81.6	84.0
Portugal	16.0	12.3	12.9	12.8
Spain	21.7	35.3	10.4	27.8
United Kingdom	12.9	14.4	13.5	14.5
EEC 12	27.1	25.8	24.3	28.9

Source: *Agriculture-Statistical Yearbook, Eurostat, 1988.*

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Annex A - Table 16
Imports of Oranges, Tangerines, and Clementines
Into European Countries,
1980 - 1985
(1000 metric tons)

COUNTRY	1980	1981	1982	1983	1984	1985
Albania	—	—	—	—	—	—
Austria	101	103	110	100	102	95
Belgium-Lux.	183	178	190	179	183	190
Bulgaria	20	21	29	24	28	27
Czech.	93	98	88	61	72	83
Denmark	37	37	39	38	41	38
Faeroe Is.	—	—	—	—	—	—
Finland	86	77	74	73	75	66
France	830	777	850	830	913	800
Germany DR	86	93	90	122	86	120
Germany FR	773	686	774	755	803	696
Greece	—	—	1	—	—	—
Hungary	38	29	32	32	40	39
Iceland	2	2	2	2	3	2
Ireland	27	27	29	29	32	29
Italy	5	3	3	4	1	3
Malta	5	5	5	3	6	6
Netherlands	369	333	366	361	392	393
Norway	56	59	59	56	56	54
Poland	64	13	18	18	19	25
Portugal	—	1	—	—	2	1
Romania	69	68	68	38	18	30
Spain	—	—	—	—	—	—
Sweden	109	103	109	101	102	98
Switzerland	101	91	100	105	103	100
U.K.	468	440	426	431	451	406
Yugoslavia	68	44	47	51	33	33
Total	3,591	3,290	3,510	3,413	3,562	3,335

Source: *FAO Production Yearbook, various years.*

Annex A - Table 17
Average Monthly Wholesale Prices of Sweet Oranges in the United Kingdom,
1986 -1987
(French francs¹ per 15 kg box)

SOURCE	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
SPAIN												
1986	52.17	54.51	55.11	56.84	55.32	53.49	56.33	69.83	---	---	65.77	61.71
1987	50.92	50.62	50.82	53.38	65.37	59.08	52.00	---	---	63.90	60.16	55.74
SOUTH AFRICA												
1986	---	---	---	---	---	62.63	61.61	63.84	63.94	62.52	54.61	52.68
1987	44.14	---	---	---	71.66	65.96	68.22	66.06	64.98	68.12	67.43	52.49
ISRAEL²												
1986	61.20	57.25	61.20	62.22	61.51	60.49	47.40	---	---	---	---	58.36
1987	57.31	57.80	54.26	53.38	70.28	70.48	61.93	---	---	---	55.34	58.29

¹ Prices were converted from British pounds at the following annual average exchange rates:

1986: 1 British pound = 10.15 French francs

1987: 1 British pound = 9.83 French francs

² 18 kg per box

Source: *Fruit and Tropical Products, Commonwealth Secretariat, 1987.*

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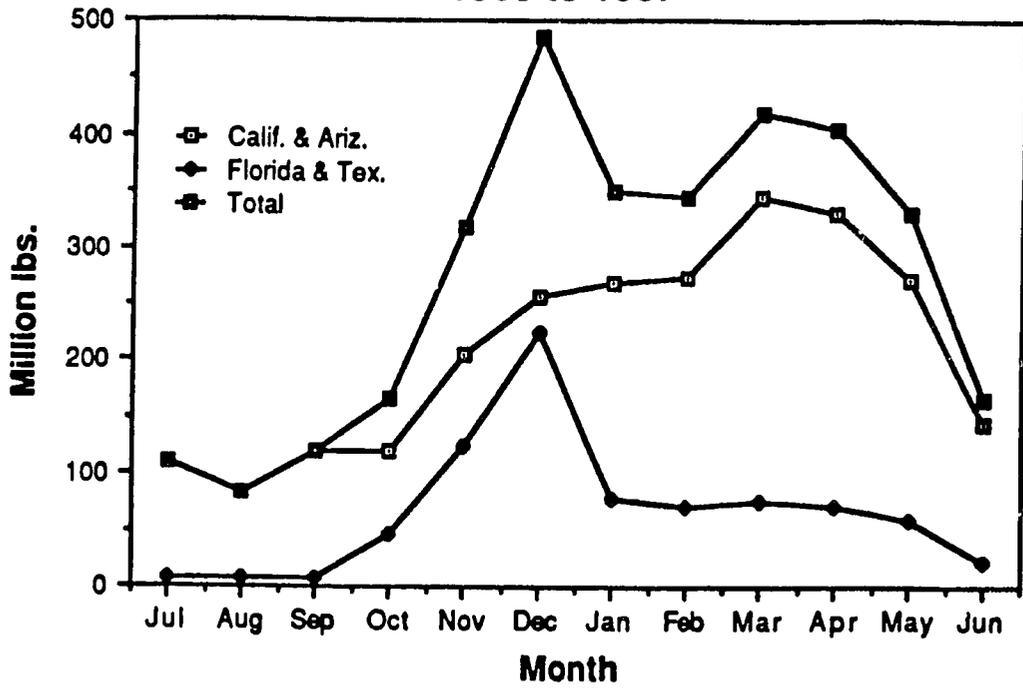
Annex A - Table 18
Percent Variations in Canadian Citrus Imports,
1980-1986

	SEASON					
	80/81	81/82	82/83	83/84	84/85	85/86
Total	+2.4%	-8.9%	+7.1%	-7.4%	-5.0%	+10.7%
U.S.	+0.5	-16.3	+15.5	-20.8	-9.6	+21.0
Morocco	-	+1.6	+27.0	+56.2	+6.0	-12.5
Japan	+1.0	+13.2	-5.9	+17.9	+10.1	-35.0

ANNEX B

Figures

ANNEX B FIGURE 1
Average U.S. Fresh Shipments of Oranges
1980 to 1987



ANNEX C

Phytosanitary Import Requirements

List Of Admissible Fruits And Vegetables From Tunisia

A. The following items are admissible from Tunisia into the entire United States (includes Continental United States, Guam, Alaska, Hawaii, Puerto Rico, and the Virgin Islands) **without** a USDA import permit.

- Cannonball fruit
- Coconut (without husk or without "milk")
- Cyperus Corm
- Lily bulb, edible
- Macadamia kernels (no husk or shell)
- Maguey
- Mushroom (fresh)
- Peanut (raw) (Prohibited from China, Phillipines, and Thailand)
- St. Johnsbread
- Tamarind bean pod
- Truffle (fresh)
- Waterchestnut
- Waternut

In addition to the above items, other food material including such items as dried beans and peas (except Vicia faba, Lens spp. and Lathyrus spp.), dried seeds, dried bamboo leaves, dried herbs, and similar commodities are admissible for food purposes and may be imported without permit from all sources into any port subject to inspection on arrival. Dried nuts without fleshy or leathery husk (except acorns, chestnuts, coconuts, and macadamia nuts) are enterable for food purposes without permit at all ports, subject to inspection.

B. The following items are admissible from Tunisia with a USDA import permit issued in advance of the shipment. Permits are issued only to U.S. importers.

1. Admissible into the entire United States (includes Continental United States, Guam, Alaska, Hawaii, Puerto Rico, and the Virgin Islands):
 - Banana
 - Chestnut (treatment required see 319.36-2b)
 - Ginger root
 - Palm heart
 - Pineapple (except Hawaii)
 - Yam (treatment required see 319.56-2(1))
2. Admissible into North Atlantic ports: Atlantic ports north of and including Baltimore; ports on the Great Lakes and the St. Lawrence Seaway; Canadian border ports east of and including North Dakota; Washington D.C. (including Dulles) for air shipments.
 - Items listed in paragraph B-1 and:
 - Asparagus
 - Cipollino

- **Enthrog** (treatment required see 319.56-2d, 319.56-2n, or T101(d)(3))
- **Grape** (treatment required see 319.56-2d and -2k or -2n or PPQ Treatment Manual T101(d)(2))
- **Grapefruit** (treatment required see 319.56-2d)
- **Orange** (treatment required see 319.56-2d)
- **Peach** (treatment required see 319.56-2d or -2n)
- **Pear** (treatment required see 319.56-2d or -2n)
- **Plum** (treatment required see 319.56-2d or -2n)
- **Tangerine** (treatment required see 319.56-2d)

- **Frozen fruits and vegetables:** Freezing is an acceptable treatment for most fruits and vegetables. The treatment involves an initial quickfreezing at sub-zero temperatures with subsequent storage and handling at no higher than 20° F at time of arrival.

* Special conditions of entry. Contact Permit Unit for details.

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ANNEX D

Individuals and Firms Contacted

Annex D

UNITED STATES:

The following individuals/agencies were contacted for this study.

Mr. Michael Angelo, President
Angelo's Markets
2205 McHenry Blvd.
Modesto, CA 95355
(209) 523-7997

Dr. Mary Lu Arpaia, Extension Subtropical Horticulturist
Batchelor Hall
University of California
Riverside, CA 92521
(714) 787-3335

Dr. A. Brooks
Horticultural Crops Institute
Agricultural Research Service
(301) 344-3338

Mr. Charlie Bettencourt
Sunset Produce
San Francisco Terminal Market
South San Francisco, CA
(415) 583-2900

Mr. Carl Campbell
Tropical Fruit Research Experiment Station
Homstead, FL
(305) 247-4624

Citrus Research and Education Center
700 Experiment Station Road
Lake Alfred, FL 33850
(813) 956-1151

W. Wardowski
G. E. Brown
W. S. Castle
L. Parsons
R. Muraro
J. Whitestone

Mr. William Cristy
Cristy Produce
San Francisco Terminal Market
South San Francisco, CA
(415) 566-9242

Florida Citrus Commission
1115 E. Memorial Blvd.
Lakeland, FL 33802
(813) 682-0171

Mr. Ricardo Gomez, Horticulture Specialist
National Extension, USDA
Room 3347 South Bldg.
Washington, DC
(202) 447-2471

Orie Lee
5005 Lillian Road
St. Cloud, FL 32769

Mr. David Marguleas, Manager
Corporate Relations and Merchandising
Sunworld
83203 Indio Blvd.
Indio, CA 92210
(619) 398-6181

Mr. William Martinet, Manager
Forecasting and Economic Planning
Sunkist Growers, Inc.
PO Box 7888
Van Nuys, CA 91409
(818) 986-4800

Phil Montgomery, Director
Market News Service, USDA
Hunts Point Terminal Produce Market
Bronx, NY

Tom Ross
D'Arrigo Brothers Company of New York, Inc.
315 New York City Terminal Market
Bronx, NY 10474
(212) 991-5900

Seymour Schnell
H. Schnell & Company, Inc.
New York City Terminal Market
Row B-238
Bronx, NY 10474
(212) 991-5050

Sunkist Growers, Inc.
14130 Riverside Drive
Sherman Oaks, CA 91423
Mailing address: PO Box 7888
Van Nuys, CA 91409
(818) 986-4800

U.S. Horticultural Research Laboratory
2120 Camden Road
Orlando, FL 32803
(407) 897-7355
Heinz K. Wutscher
Jack Hern

Jack Vandenberg, Produce Importer
(212) 409-9110

Mr. Perry Walker, Vice-President
Riverbend
15749 East Ventura Avenue
Sanger, CA 93657
(209) 787-2501

William Kopke Company, Produce Importer
(516) 328-6800

Canada:

The following individuals were contacted for this study.

Dr. Robert W. Anderson, Chief
Horticultural Unit
Agriculture Canada
Sir John Carling Bldg.
Ottawa, Ontario K1A 0C5
(613) 995-5880

Mr. Leo Arsenow, Consultant
Fruit Atlas International, Ltd.
630 Stinson
Ville St. Laurent, Quebec H4N 2E9
(514) 744-3540

Mr. Daniel Benamron, President
Importacion Socodis Canada, Inc.
300 Boul. Laurentine
116 St. Laurent, Quebec H4M 2L4
(514) 744-8354

**Mr. Eric Botner, President
Botner Fruits, Ltd.
775 Marche Central, Suite 21
Montreal, Quebec H4N 1K1
(514) 383-1717**

**Mr. Peter Bouris, Associate Director
Fresh Products Section, Dairy, Fruit, and Vegetable Division
Agriculture Canada
Hallon House
2255 Carling Avenue
Ottawa, Ontario K1A 0Y9
(613) 995-5433**

**Mr. Jacques Brazeau, President
Courchesne Larose Itee
1455 rue Bercy
Montreal, Quebec H2K 2V1
(514) 525-6381**

**Mr. Danny Dempster, Vice President
Canadian Fruit and Vegetable Wholesalers Association
310-1101 Promenade Prince of Wales
Ottawa, Ontario K2C 3W7
(613) 226-2984**

**Mr. Ron Greene, President
FBI Foods, Inc.
Montreal, Quebec
(514) 381-9181**

**Dr. Kenneth Harling, Associate Professor
Department of Agricultural Economics and Business
Guelph University
Guelph, Ontario N1G 2W1
(519) 824-4120 Extension 2100**

**Mr. Ariste Hebert, Head Buyer
Boni Fruit, A Division of the Oshawa Group
11281 Albert-Hudon
Montreal-Nord, Quebec H1G 3J5
(514) 324-6991**

**Mr. Guy Labranche, Produce Manager
H. Fine & Sons
1000 Belfast Road
PO Box 8332
Ottawa, Ontario K1G 3H8
(613) 236-4744**

Mr. Wolfgang E. Peschlow, President
Les Aliments Supra, Inc.
9238 Boulevard Pie IX
Montreal, Quebec H1Z 4H7
(514) 328-9856

Dr. Paul Quintana Sr., President
M.L. Quintana, Ltd.
Toronto, Ontario
(416) 741-9342

Mr. R.E. Ryan, President & General Manager
Rex Produce International, Ltd.
7765 rue du Marche Central
Room 400
Montreal, Quebec H4N 1K1
(514) 384-3600

ANNEX E

Leading U.S. Fresh Produce Marketing Associations

Annex E

A. Leading U.S. Fresh Produce Marketing Associations

1. **Produce Marketing Association**
PO Box 6036
Newark, DE 19714-6036
(302) 738-7100
 - Holds several annual produce marketing meetings including an International Trade Forum at its annual convention in October.
 - Publishes a Directory of International Fresh Fruit Trade.

2. **United Fresh Fruit and Vegetable Association**
727 North Washington Street
Alexandria, VA 22314
(703) 836-3410

Mailing address:
PO Box 1417 E35
Alexandria, VA 22313
 - Holds several annual produce meetings including its annual exposition in February.
 - Has an International Trade Division

B. The following companies represent the leading orange importers in the United States.

1. **CFS International**
100 S. Wacker Drive, Suite 212
Chicago, IL 60606

Contact: C. Norquist, Purchasing Manager
Phone: (312) 368-7239
Telex: 821824 CFSCGO
Bank: The First National Bank of Chicago
Business Type: Packer, supplier, distributor, manufacturer, exporter, importer

2. **Couture Farms**
Route 3, Box 825
Bakersfield, CA 93309

Contact: Stephen Couture, Partner
Phone: (805) 831-0439
Bank: Bank of America Corporate/Agribusiness, Kern County
Business Type: Grower, packer, shipper, importer

3. **Green Gold Packing Company, Inc.**
526 W. Aviation
Fallbrook, CA 92028

Contact: Frank Avila, President
Phone: (619) 728-0616
Bank: Fallbrook National Bank
Business Type: Packer, shipper

 4. **Marcom U.S.A., Inc.**
PO Box 1934
Woodland, CA 95695

Contact: E.A. Villasenor III, General Manager
Phone: (916) 666-3300
Telex: 755 311 MARCOM WDL D UD
Bank: River City Bank; Bank of America
Business Type: Shipper, broker, distributor, exporter, importer

 5. **Martini, Inc.**
7822 N. Keeler Avenue
Skokie, IL 60076

Contact: John N. Martini, Sr., President
Phone: (312) 675-6121
Bank: Skokie Trust & Savings
Business Type: Broker

 6. **Marvin Schwarz Produce**
220 N. Ohio Street
PO Box 152
Mercedes, TX 78570

Contact: Sales Office
Phone: (512) 565-3168
Telex: 595809
Bank: Hidalgo Bank, Mercedes, TX
Business Type: Grower, packer, shipper, supplier, distributor, exporter, importer

 7. **Squillante & Zimmerman**
2185 Lemoine Avenue
Fort Lee, NJ 07024

Contact: Ed Zimmerman, Vice President
Phone: (201) 592-1000
Cable: SIMFRECO
Telex: 710-991-9792
Bank: Marine Midland Bank, phone: (212) 991-6100
Business Type: Broker, distributor, exporter, importer

 8. **Sun World International, Inc.**
83-203 Indio Blvd. #2
Indio, CA 92201
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Contact: Gregg McWhorter, Import Produce Manager
Robert Nies, Vice President
Phone: (619) 347-8693
Telex: 289749 WORLD UR; 287604 SUNW UR
Bank: Bank of America, Bakersfield, CA
Business Type: Grower, packer, shipper, exporter, importer

9. Superior Farming Company
PO Box 9999
Bakersfield, CA 93389-1999

Phone: (805) 392-5050
Telex: 698-431
Bank: Security Pacific National Bank, CA; Mellon Bank
N.A., Pittsburgh
Business Type: Grower, packer, shipper, supplier, exporter, importer

10. United Fruit and Produce Company
51-77 Produce Row
St. Louis, MO 63102

Contact: Frederick C. Voegtli, Director, Import/Export Services
Phone: (314) 621-9440
Cable: UNITED COASTL
Telex: 424041 UNITED COASTL; 311262 UNITED COBSTL
Bank: Pioneer Bank & Trust
Business Type: Broker, supplier, distributor, transporter, exporter, importer,
wholesaler

11. Jac Vandenberg, Inc.
3805 East Tremont, Inc.
Bronx, NY 10465

Contact: David Schiro, Vice President
Phone: (212) 409-9110
Telex: RCA: 232156 FRUITBERG; WU: 125022 FRUITBERG
Business Type: Exporter, importer

12. Maritime Terminal, Inc.
Whaler's Wharf
PO Box F-745
New Bedford, MA 02740

Contact: R. Viall, Executive Vice President
Phone: (617) 996-8507
Telex: 929-422
Bank: Rhode Island Hospital Trust National Bank Business Type: Warehouse,
importer

C. The following three U.S. importers have had limited experience with North African and other Mediterranean citrus products.

1. **Barney McClore Associates**
San Francisco, CA
(415) 243-9583
 - experience with Moroccan oranges and Clementines

2. **Wayne Showers, Marketing Director**
Griffin & Brand
McAllen, Texas
 - Spanish oranges

3. **Sunworld International**
Indio, CA
 - the exclusive U.S. agent for Israeli Jaffa oranges 1985 and 1986

ANNEX F

**Terms of Reference
Citrus Part B Study**

Terms of Reference

Citrus Export Commodity Study

I. Introduction

As part of its on-going agricultural sector structural adjustment program, the Government of Tunisia has given priority to the promotion of agricultural exports. This effort will only be effective if Tunisian exporters can maintain and increase the competitiveness of their products in their traditional markets and exploit new market opportunities, particularly in North America. It will be necessary, therefore, to understand the essential factors determining the competitiveness of Tunisian agricultural commodities entering world markets and to assess the key constraints affecting the availability, quality and export costs for these products. Effective strategies for releasing these constraints need to be developed and existing market advantages exploited, enhanced and consolidated.

This study is one of five export commodities analyses to be conducted in 1988/1989 under the GOT/AID Agricultural Policy Implementation Project. The commodities to be covered by these analyses are olive oil, wines, citrus, dates and nuts, and marine products. Each study will be composed of a Part A and a Part B. Each Part A sub-study will deal with analysis of the key factors affecting the exportability of the Tunisian agricultural commodity - i.e. its competitiveness in export markets FOB Tunis. Each companion Part B will investigate the requirements of importers in key markets and the prospects for increasing Tunisian exports. Finally, the results of the Part A and B studies will be used to develop strategic marketing recommendations for Tunisian agents involved exporting the agricultural commodities being studied.

In the particular case of citrus, the study approach will be to assess how to maintain Tunisia's traditional market share in existing European markets while finding new strategies to penetrate or expand non-traditional markets, particularly in North America.

The terms of reference for the citrus export study is presented in the sections below. The Part A sub-study deals with the analysis of conditions in Tunisia which affect the competitiveness of Tunisian citrus and the Part B sub-study concerns itself with the receptiveness of potential importers to the available products.

Part B Sub-study Citrus Export Market Analysis

I. General Description Of The Part B Study

The objective of the Part B export marketing sub-study is to present a clear and concise description of the key factors affecting the importability of Tunisian citrus - particularly Maltese oranges - into North American markets.

To accomplish this objective, the Part B study team will review the key trends in United States and Canadian imports of citrus and place those trends in the context of the world market. The study team will analyze the key factors to be considered in exporting Tunisian citrus products into these markets - i.e. import restrictions, phytosanitary requirements, packaging requirements. It will also describe the requirements of the most important citrus importing firms in the North American market. The study team will develop a strategic appraisal of the prospects for Tunisian citrus to North America and a realistic market plan to permit such exports as are deemed feasible over the next five to ten years. Finally, the study team will project the macroeconomic impacts of successful implementation of the strategic marketing plan on the Tunisian economy using the World Bank economic model developed for this purpose.

III. The Objectives Of The Overall Study With Specific Questions

The ultimate objective of the overall citrus export study is a set of concrete recommendations directed toward increasing the export competitiveness of Tunisian citrus. The results of the competitiveness study - Part A - together with this companion export marketing study - Part B - will be used to present a detailed export marketing plan which will be both realistic and cost effective.

In order to arrive at these recommendations, a logical process must be followed of findings, conclusions and recommendations. The following sub-sections deal with the topics to be analyzed by the study team.

A. Factual Information to be Gathered

1. Identify and describe key trends in United States and Canadian imports of citrus products, including the changing importance of the North American market in world citrus trade, historical import trends, changing market shares of major importing countries, price and exchange rate trends.
2. Identify and describe major trends in imports, market shares, prices, etc., for selected alternative markets for major exporters (to the United States and Canada).

3. Analyze and describe key trends in total domestic United States and Canadian markets for citrus products in terms of price behavior, production, demand, and trade balance.
4. Characterize current import restrictions for citrus products, if any, including tariffs and quotas by country of origin.
5. Identify the phytosanitary requirements for importing citrus products into the United States and Canadian markets.
6. Develop a structural profile of the United States and Canadian citrus industry, including firm numbers, size distribution, market shares, degree of vertical integration, and other such factors.
7. Identify firms potentially interested in importing citrus products from Tunisia. Along with firm names, identify the names of key individuals within the firms to serve as contacts for Tunisian exporters.
8. Identify packaging requirements for importing citrus products into the United States and Canadian markets. Also, indicate potential package types that appear in greatest demand. Also indicate other possible constraints to importation of Tunisian citrus.
9. Identify and describe the grade requirements, along with corresponding price differentials, for importing citrus products into the United States and Canadian markets.
10. Determine the volume of fresh citrus production by region and by month in the United States.
11. Document the promotional and advertising budgets of the major citrus marketers - e.g. Sunkist and the Florida Citrus Commission.
12. Assess the potential impacts of government interventions, including policies on parastatal agencies and exchange rates, on the feasibility of exporting Tunisian citrus products.

B. Conclusions Required

1. Assess the import demand in the United States and Canadian markets for citrus and the changing structure of those import markets.
 2. Assess the market behavior of major exporters of citrus products to the United States and Canada in other selected major markets.
 3. Assess major citrus production trends in the United States and the relationships between domestic production and imports.
 4. Identify potential competitors, domestic and foreign, for Tunisian citrus exports. This assumes that certain months will be identified as the "market window" months for Tunisian fresh citrus exports.
 5. Estimate the approximate seasonal demand for fresh citrus - particularly Maltese oranges. These estimations will be made as a function of the quality of the data identified.
 6. Determine the minimum volume and minimum grades/standards required by the United States and Canadian regulations and, if different, by the potential private importing firms.
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7. Isolate the "most limiting" import barriers for Tunisian citrus exports.
8. Identify and rank the most feasible ports of entry for Tunisian citrus exports to the United States and Canada. Similarly, identify the most likely channels for ultimate distribution - e.g. retail, food service, etc..
9. Provide guidelines to Tunisian exporters regarding the type and amount and appropriate placement of promotional resources needed in order to penetrate the United States and Canadian markets.
10. Determine the potential benefits, if any, to Tunisia if the current California/Arizona citrus market order is voted out.
11. Assess the relative ease of likely penetration in the United States and Canadian markets.
12. Data from the above steps and estimates will be incorporated into the World Bank's multi-market economic model for Tunisia to estimate the macroeconomic impacts of recommended strategies for citrus product export expansion.

C. Recommendations to be Made as a Result of the Overall Study

1. Propose, as appropriate, recommendations for enhancing existing competitive advantages of domestic citrus, if they exist, and for correcting factors reducing competitiveness in export markets.
2. Indicate the implications of these actions for the following actors/agencies in the citrus marketing chain:
 - The Government of Tunisia
 - The Interprofessional Group on Citrus and Fruit Products
 - Domestic Citrus Producers and Exporters
3. Sketch out a strategic action plan of practical measures for implementing the proposed recommendations with details, insofar as possible, of the plan, timing and responsibilities for implementation.

V. Methodology To Be Employed

The following general methodology will be employed by the study team in Tunisia.

- A. A document search and review will be done by the entire study team to profit from existing studies done by government agencies in the United States and Canada, agro-industrial companies, and/or private citrus importers and trade associations. A critical synthesis of these studies will enable their findings and recommendations to be used as inputs for this Part B study and to define what additional information needs to be collected.
 - B. Study findings will also be based upon interviews in United States and Canada with key persons in government and with private citrus producers and importers.
 - C. Collection and study of published statistics for world and North American markets on the production and marketing of fresh citrus and, as relevant, citrus products, with particular attention to existing information on the structure of market costs, marketing requirements, and market demand will be reviewed by the team.
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ANNEX G

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