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Final Report
on

Citrus Sector

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- Opinions and judgments expressed are the authors' only. FAO proposes the text as basis for starting the discussion among scholars and policy makers on the issues related to the subject of the study.

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Senior staff of the Ministry of Agriculture and Agrarian Reform and of the Citrus Board provided large amounts of data and advanced many useful ideas.

Seven National Agricultural Policy Centre trainees were assigned to the study. They all worked with enthusiasm and commitment on programmes of data collection and information gathering. Much of the data in this report is the product of their endeavours.

A large number of farmers, traders and processors generously agreed to discuss their activities and the problems they face. Their openness, their views and their hospitality are greatly appreciated.

Finally, a special thanks goes to Asma Mattar, for her efficient interpretation, translation and assistance.

Mike Westlake.

I INTRODUCTION

Following a period of rapid expansion in national citrus production, the Government is concerned that a serious national surplus of citrus has emerged that will depress domestic prices and reduce farm incomes. It therefore sees the national citrus industry as a priority area for analysis and policy development.

1. STUDY OBJECTIVES

This study of the citrus sector is the second of a set of agricultural sector studies being carried out by the National Agricultural Policy Centre (NAPC). The establishment and initial work of this Centre is being supported by the FAO Assistance in Institutional Strengthening and Agricultural Policy Project (GCP/SYR/006/ITA).

The study has the multiple objectives of providing:

- practical policy recommendations for improving the efficiency of the citrus sector and ensuring its optimal development;
- a written description of the structure of the citrus sector and a well-analysed set of data that will serve as the basis for future work by NAPC staff and other analysts; and
- practical, on-the-job experience in policy analysis for seven NAPC trainees.

2. TIMING AND METHODS OF RESEARCH

This study was undertaken by an eleven-person task force comprising:

Mr. Hassan Katana, Director of Agricultural Affairs, Ministry of Agricultural and Agrarian Reform (MAAR)

Mr. Wafeeh Al Moue'e, Director of the Citrus Board

Dr. Zakaria Fadlieh, FAO National Consultant

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The study commenced in June 1999 with a two-week fact finding mission by the International Consultant, at the end of which he prepared research programmes for each of the seven trainees and draft terms of reference for the National Consultant. Following two months of part time research by the Trainees, the International Consultant returned to Syria in mid August for a further 32 days. During this period he worked closely with the Trainees, helping them finalise their research and also undertaking further fieldwork with them in Damascus and in the main producing areas.

On 22nd September 1999 a workshop was held in Damascus, chaired by the Deputy Minister, MAAR, at which the International Consultant presented the preliminary study findings. Some 80 people attended the workshop, including key Government staff, Centre staff and trainees, the FAO Representative, officials from the Chambers of Agriculture, farmers, traders and processors.

The International Consultant drafted this report in late September and early October 1999. It takes full account of comments and views expressed at the workshop.

II. NATIONAL CITRUS PRODUCTION

1. THE IMPORTANCE OF SYRIAN CITRUS

In 1998/99 Syria produced an estimated 740,000 tons of citrus with a domestic wholesale value of approximately SP11 billion (US\$240 million).

National citrus production accounts for some 5 percent of the value of national agricultural output and for 1.3 percent of GDP. In 1997, 20 percent of national fruit and vegetable export earnings and 1.9 percent of total national merchandise export earnings derived from citrus.

In 1997/98, Syria accounted for about 0.8 percent of the 90 million tons of citrus produced globally.

2. THE STRUCTURE OF PRODUCTION

(a) The Location of Production

Citrus production is concentrated in two governorates, Latakia and Tartous, where it grows on the coastal plain and on the lower slopes of the coastal hills up to 150 metres. Latakia and Tartous account, respectively, for approximately 77 percent and 23 percent of national citrus output. Small quantities of citrus are also produced commercially in Homs, Idlib, Dara', Deir Ezzor, Hama and Al Ghab.

(b) Types and Varieties of Citrus

Data on area planted, tree numbers and production is analysed in Table II.1 for the main citrus types and varieties for the years from 1996/97 to 1998/99. It will be seen that almost half the trees planted to citrus comprise various varieties of orange. Some 35 percent of trees comprise mandarin, 12 percent lemon, and 3 percent grapefruit. Farmers are currently switching into lemon, in response to high domestic market prices and the introduction of a new, high-yielding disease-resistant variety.

High yielding varieties introduced from abroad have progressively replaced local varieties which, in the case of oranges, are small in size, high in acidity, contain large numbers of seeds, and are relatively low yielding. Domestic consumers now prefer imported varieties such as Valencia. All the present varieties being distributed by the Citrus Board are based on imported stock. Source countries include California, Spain, Corsica and Sicily. Almost half the area planted to oranges now comprises Jaffa, while early-fruiting Naval comprise a further 30 percent. A detailed analysis of the relative importance of each type and variety of citrus will be found in Annex Tables II.1 and II.2.

The Citrus Board has been responsible for supplying citrus seedlings since their importation was banned in 1987. The Board currently uses 13 different rootstocks. Sour orange remains by far the most important rootstock on which other varieties are grafted. The Citrus Board is in the process of selecting a group of root stocks to be gradually incorporated in the seedlings production plan. In most producing countries, sour orange has proved to be susceptible to Citrus Tristeza Virus (CTV). There is currently no CTV in Syria, despite its presence in some nearby countries including Cyprus. The reason for this is not known. Since CTV kills trees, an outbreak in Syria could devastate the industry. The Board intends to examine whether Syrian sour orange, unlike that in other countries, is CTV resistant. It is essential that the Board gives priority to this work and to developing suitable alternative rootstocks.

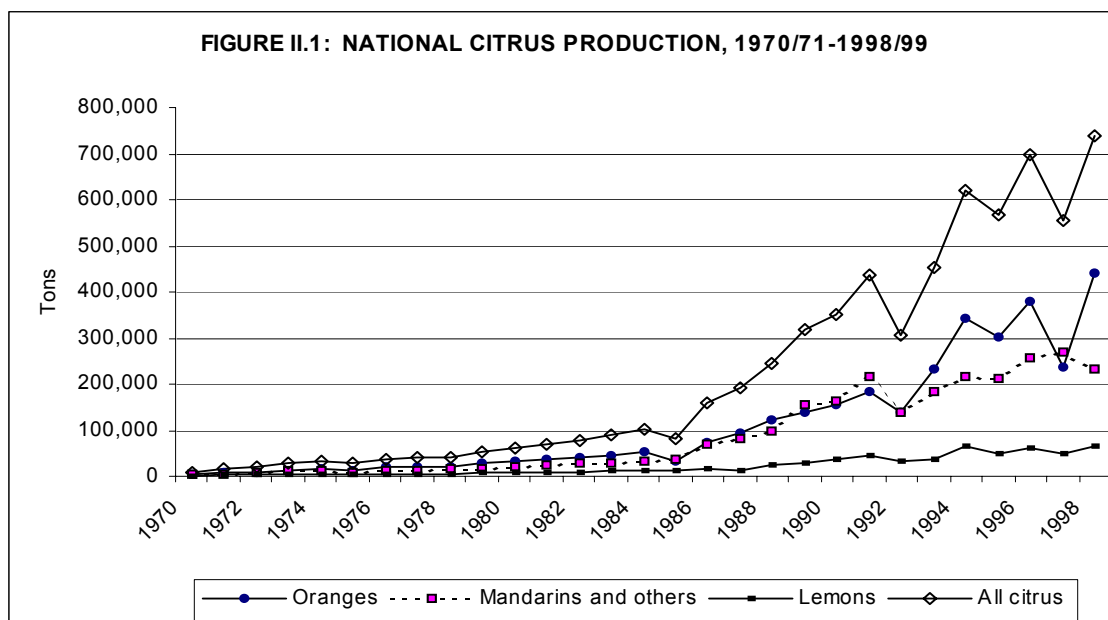
TABLE II.1: NATIONAL CITRUS AREA, TREE NUMBERS AND PRODUCTION ANALYSED BY VARIETY, 1996/97-1998/99

Type	Variety	1996/97				1997/98				1998/99			
		Area (ha)		Production (tons)		Area (ha)		Production (tons)		Area (ha)		Production (tons)	
		Trees total	In fruit	Trees total	In fruit	Trees total	In fruit	Trees total	In fruit	Trees total	In fruit	Trees total	In fruit
Lemon	Mayer	764	230,429	150,182	10,000	890	301,335	191,096	8,944	1,065	354,456	216,686	18,195
	Others	2,154	747,271	504,418	50,320	2,391	743,365	502,625	40,000	2,312	771,716	593,013	47,805
	Total	<u>2,918</u>	<u>977,700</u>	<u>654,600</u>	<u>60,320</u>	<u>3,281</u>	<u>1,044,700</u>	<u>693,721</u>	<u>48,944</u>	<u>3,378</u>	<u>1,126,172</u>	<u>809,699</u>	<u>66,000</u>
	Orange	3,633	1,322,258	991,374	104,036	3,819	1,349,788	1,053,896	75,702	3,973	1,381,735	1,118,041	100,000
	Jaffa	5,960	2,114,061	1,562,036	192,768	5,821	2,155,110	1,704,912	92,944	6,161	2,300,882	1,861,241	260,000
	Maurdi	452	177,745	118,068	12,882	535	181,912	134,955	11,152	558	187,221	126,473	13,000
	Baladi & Khetmali	1,355	502,769	373,733	34,178	1,437	514,794	399,303	28,062	1,228	427,417	336,785	35,000
	Valencia	1,206	416,767	297,129	32,449	1,284	425,256	314,380	30,513	1,368	456,615	333,293	32,000
	Total	<u>12,606</u>	<u>4,533,600</u>	<u>3,342,340</u>	<u>376,113</u>	<u>12,896</u>	<u>4,626,860</u>	<u>3,607,446</u>	<u>238,373</u>	<u>13,288</u>	<u>4,753,870</u>	<u>3,775,833</u>	<u>440,000</u>
Mandarin	Satsuma	3,735	1,220,317	1,011,102	104,905	3,476	1,230,429	1,060,725	100,392	3,414	1,221,851	1,046,327	77,000
	Clementine	4,013	1,589,532	1,167,682	88,711	3,924	1,446,679	1,187,594	107,255	3,857	1,427,622	1,201,776	87,000
	Late varieties	2,091	731,385	548,211	50,008	2,404	735,912	574,276	40,065	2,070	724,483	592,691	50,000
	Total	<u>9,840</u>	<u>3,541,234</u>	<u>2,726,995</u>	<u>243,624</u>	<u>9,803</u>	<u>3,413,020</u>	<u>2,822,595</u>	<u>247,712</u>	<u>9,340</u>	<u>3,373,956</u>	<u>2,840,794</u>	<u>214,000</u>
Grapefruit	White	338	117,480	83,398	9,272	342	62,377	42,127	13,000	361	126,033	92,578	12,000
	Red	164	59,960	39,184	3,416	170	120,592	87,256	6,000	182	63,879	44,494	7,000
	Pummelo	62	22,126	13,623	711	65	23,582	15,677	1,000	74	26,244	16,418	1,000
	Total	<u>564</u>	<u>199,566</u>	<u>136,205</u>	<u>13,400</u>	<u>577</u>	<u>206,551</u>	<u>145,060</u>	<u>20,000</u>	<u>617</u>	<u>216,156</u>	<u>153,490</u>	<u>20,000</u>
Grand Total	<u>25,928</u>	<u>9,252,100</u>	<u>6,860,140</u>	<u>693,457</u>	<u>26,557</u>	<u>9,291,131</u>	<u>7,268,822</u>	<u>555,029</u>	<u>26,622</u>	<u>9,470,154</u>	<u>7,579,816</u>	<u>740,000</u>	

Source: Ministry of Agriculture and Agrarian Reform and Citrus Board

(c) Past Development of Production

Data on annual citrus production since 1970 are presented in Table II.2 and shown in Figure II.1, below. These data are based on information that extension officers collect annually in June from all citrus farms.



Citrus production was relatively unimportant until recently. Output is currently almost 100 times that of 1970. The rapid expansion of citrus output over the past 30 years resulted from a deliberate effort by the Government to establish citrus as an important crop. This was achieved through the introduction and certification of new, higher yielding varieties, through programmes of publicly provided and subsidised land preparation, seedlings, and inputs, through the provision of interest-free long-term credit from 1977 to 1993, through free extension assistance, and through the introduction of integrated pest management. This package of measures, coupled with high domestic market prices, made citrus very profitable.

The incentive to expand citrus was reinforced by a comprehensive system of national production planning. Under this system, each village prepared a production plan reflecting broad government guidelines. These village level plans were aggregated progressively through the MAAR structure and finally presented to the Supreme Agricultural Council for approval. Enforcement of the plan was through a set of farmer-specific cultivation targets that a farmer was required to follow in order to qualify for government support, including subsidised credit from the Agricultural Bank. Although this planning system remains in place, it is no longer enforced to the same extent. Farmers have discretion over the type and variety of citrus that they plant, although their options are constrained by the set of seedlings that are available from the Citrus Board. The production of seedlings by the Board is now the most powerful instrument for guiding plantings by farmers. However, there is no control of regrafting which allows farmers to switch from one type and variety of citrus to another.

The rate of area expansion has decreased in recent years following a Government decision to reduce the rate of new planting from 1,100 ha per year to 650 ha per year (400 ha in Latakia and 250 ha in Tartous). This has resulted in the rate of *net* area expansion falling sharply from a high of some 2,000 ha per annum in 1986/87 to a current rate of around 300 ha per annum. This decline, coupled with the greater number of tree deaths associated with the larger population of mature trees, has resulted in the rate of increase in tree numbers also falling sharply (see Table II.2).

TABLE II.2: NATIONAL CITRUS AREA, TREE NUMBERS AND PRODUCTION, 1970/71 to 1998/99

Crop Year Commencing	Lemons			Oranges			Mandarins & Other*			Total					
	Area (ha)	Trees ('000)		Production (tons)	Area (ha)	Trees ('000)		Production (tons)	Area (ha)	Trees ('000)		Production (tons)			
		total	In fruit**			total	In fruit**			total	In fruit**				
1970	386	148	77	1,435	1,208	475	280	3,868	688	230	121	2,186	856	481	7,760
1971	447	171	94	2,517	1,289	504	303	8,063	753	252	123	4,672	929	523	15,718
1972	670	232	125	2,913	1,823	634	366	7,517	1,116	419	249	8,008	1,286	743	18,513
1973	717	260	132	4,258	1,957	674	411	12,822	1,158	433	262	10,558	1,369	808	28,029
1974	744	266	136	4,034	2,087	737	409	14,607	1,235	462	273	11,623	1,467	821	30,617
1975	802	281	143	4,356	2,217	781	431	13,259	1,336	489	289	8,502	1,553	867	26,819
1976	841	284	145	4,511	2,246	772	436	19,478	1,367	567	268	10,632	1,623	852	35,550
1977	931	332	168	5,203	2,305	770	438	22,048	1,409	436	292	12,980	1,649	900	41,181
1978	1,076	385	181	5,024	2,571	956	522	18,986	1,549	573	335	15,393	1,915	1,041	39,789
1979	1,191	427	207	7,181	3,030	1,093	605	28,383	1,779	668	387	17,684	2,190	1,203	54,436
1980	1,391	489	237	8,632	3,543	1,257	681	31,434	2,218	820	459	21,804	2,568	1,381	63,025
1981	1,308	459	259	9,091	3,740	1,279	752	35,447	2,436	904	516	24,593	2,644	1,531	70,320
1982	1,507	518	268	9,947	4,151	1,460	807	40,389	2,873	1,061	552	27,232	3,042	1,633	78,948
1983	1,489	545	289	11,350	4,128	1,600	900	45,455	3,153	1,269	610	29,944	3,416	1,806	88,418
1984	1,652	598	330	13,241	4,607	1,741	961	53,758	4,009	1,574	680	33,163	4,432	2,055	102,387
1985	1,807	646	341	10,294	5,290	1,989	990	34,618	4,577	1,796	718	35,970	4,432	2,055	80,789
1986	1,969	695	365	15,861	6,169	2,399	1,021	72,954	5,529	2,158	790	70,609	5,256	2,181	158,847
1987	2,132	738	403	12,925	6,804	2,591	1,179	94,455	6,379	2,452	978	83,550	5,785	2,566	189,823
1988	2,281	870	462	23,676	7,362	2,795	1,224	122,403	7,169	2,729	1,052	99,619	6,394	2,744	246,582
1989	2,246	905	539	29,141	7,923	3,057	1,362	139,247	8,345	3,214	1,369	154,314	7,175	3,275	318,942
1990	2,485	989	548	34,847	8,692	3,320	1,485	153,651	8,984	3,152	1,565	164,845	20,147	7,463	360,355
1991	2,646	1,048	605	43,788	9,573	3,588	1,622	181,781	9,820	3,752	1,811	215,543	22,030	8,387	435,426
1992	2,604	1,037	647	32,035	11,071	4,061	2,024	138,511	10,403	3,995	2,124	138,720	24,101	9,100	406,326
1993	2,519	826	481	37,155	11,873	4,291	2,788	233,150	9,754	3,532	2,349	184,382	24,146	8,649	454,687
1994	2,661	865	537	63,337	12,101	4,371	2,932	341,146	9,937	3,590	2,522	214,872	24,699	8,826	619,355
1995	2,819	920	603	49,577	12,326	4,445	3,184	303,086	10,085	3,638	2,564	213,037	25,230	9,003	565,700
1996	2,918	955	655	60,321	12,607	4,534	3,342	377,762	10,404	3,741	2,863	258,238	25,929	9,229	696,321
1997	3,281	1,045	694	48,944	12,896	4,627	3,608	238,373	10,080	3,620	2,968	267,712	26,257	9,291	555,029
1998	3,378	1,126	810	66,000	13,248	4,754	3,776	440,000	9,957	3,590	3,000	234,000	26,582	9,470	740,000

Source: Ministry of Agriculture and Agrarian Reform and Citrus Board.

* Includes grapefruit.

** Defined by the Citrus Board as six years and older.

(d) Yields and Production Instability

The Syrian climate leads to relatively low yields but to good flavour. The mature yields of all four types of citrus grown in Syria have increased markedly over time with the introduction of imported varieties, and a progressive improvement of husbandry.

Oranges yield significantly more per tree and per hectare than other varieties, especially mandarins (see Annex Table II.3). In 1998/99, oranges accounted for almost 60 percent of national citrus output (see Annex Table II.2).

Despite being irrigated, national production varies markedly from year to year. Even though there has been a strong upward trend in production capacity, annual citrus output has twice fallen by over 20 percent during the past decade. The per-hectare yield of oranges tends to be less stable from year to year than the yield of the other citrus types due to a strong biennial yield pattern. Orange production fell by an estimated 37 percent in 1997/98, rising subsequently by 85 percent in 1998/99. The high level of production instability can be seen from Figure I.1.

The time of harvest varies with type and variety, leading to the harvest season for citrus as a whole running from September to June. The citrus harvest commences with Satsuma and early mandarin hybrids in September and ends with the Valencia harvest, which runs from April to June. The main orange varieties each have about a two-month harvest season. The dominant Jaffa variety is harvested in February and March. Some lemon varieties produce fruit almost continuously.

(e) Farm Ownership and Size

Other than for three government farms, all commercial citrus production takes place on privately owned and operated farms. There are over 27,000 such farms, of which roughly two-thirds are in Latakia and one-third in Tartous.

The size structure of Syria's citrus farms is shown in Figure I.2. This figure is based on data on the size structure of farms in Latakia and Tartous summarised in Annex Table II.4. These data are, in turn, based on an analysis undertaken by the Study Task Force of primary data of the Ministry of Agriculture and Agrarian Reform (MAAR). The data are routinely collected by the Ministry's front-line extension staff, but the details on size structure are lost as the data are aggregated from the level of the village upwards through the Ministry's administrative structure. Consequently, to undertake the analysis we had to assemble and process primary data held at the village level on the full population of individual citrus farms in the two governorates.¹

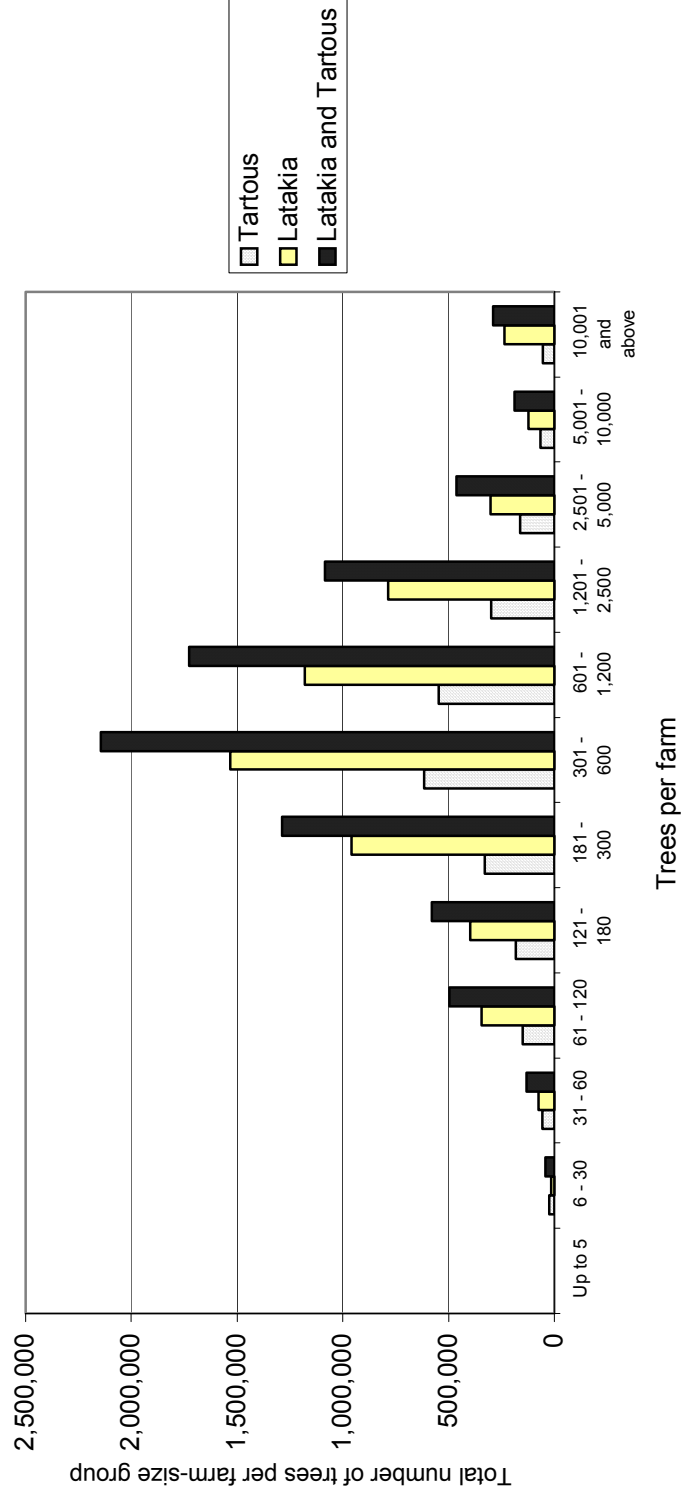
It will be seen from Annex Table 3 that some 89 percent of all Syria's citrus farms have less than 600 trees. Such farms all have less than the equivalent of twenty donnum² planted to citrus. More than half of all citrus farms have between 61 and 300 trees, with planted areas of from about two to nine donnum. There are about 3,000 farms with over 600 trees, of which some 43 have more than 5,000 trees.

The bulk of Syria's citrus output comes from relatively small farms that have from 180 to 1,200 trees. These farms account for over 60 percent of all trees. Very small farms with less than 180 trees account for about 15 percent of the national tree total. Almost one quarter of all trees are located on the 3 percent of farms that have more than 1,200 trees.

¹ The raw data for this analysis was assembled by NAPC Trainee Akram Shehaideh. These data may be obtained from Mr. Shehaideh or directly from the NAPC.

² One donnum is equal to 0.10ha.

FIGURE II.2: NUMBERS OF CITRUS TREES IN TARTOUS AND LATAKIA GOVERNORATES ANALYSED BY FARM SIZE



(f) Irrigation, Cultural Practices and Disease Control

- irrigation

Citrus production is almost entirely irrigated. Traditionally irrigation was mainly from boreholes. The majority of farmers have now switched to water supplied from public irrigation schemes that draw water from reservoirs constructed and developed during the past 10 years. The management of irrigation water from these reservoirs has proved difficult due to the wide variety of crops grown.

An estimated 10 percent of citrus is under drip irrigation, which is gradually replacing the traditional open furrow irrigation. Drip irrigation roughly halves water use, reduces weeds, fungal disease and salinity, requires less labour, and tends to lead to better quality, juicier fruit. However, farmers report being unable to use government irrigation water for drip irrigation due to its high silt content.

A small number of farmers located near the sea suffer from high salinity, and some farmers report that their older trees are being killed by water-logging caused by leakage of irrigation water and poorly designed drainage systems.

National usage per hectare of citrus averages about 9,000 cubic metres, supplemented by a similar volume of rainfall. Up to the year 1996 farmers used to pay a fixed rate of SP 108 per donnum which has been raised to SP 250 in 1999 and SP 350 in 2000. There is no metering of usage. Farmers therefore are encouraged to use water from public schemes rather than well water and also tend to over use public irrigation water. In addition to wasting water, over use leads to increased fungal growth on the bark of citrus trees and to an increased usage of chemical fungicides.

- tree spacing and regrafting

The spacing of mandarin and orange trees is normally 5x5, giving some 350-450 trees per ha. Some lemon varieties can be spaced more closely, down to 3x4 meters.

In recent years some farmers have responded to market price changes by regrafting trees with those types and varieties that are currently fetching relatively high prices. It takes some three years for regrafted trees to come back into fruit. There are no data on the number of regrafted trees. Estimates of the percentage of the current citrus tree population that has been regrafted range from as little as one percent (Citrus Board) to as high as six percent.

- disease control

The Citrus Board has been progressively introducing biological control since it successfully used a parasite to control an outbreak of white fly in 1992. The Board distributes biological control material to farmers free of charge. Farmers who face a particular problem can apply to the Board for suitable control material. In addition to white fly, the Board now has biological controls for red, soft and wax scale, mealy bugs, citrus leaf miner and red mite.

The Board's biological control programme has met with considerable success. The uptake of biological control by farmers has been impressive and many farmers reportedly now rely solely on biological means to control insect pests. However, some farmers report that such control is not always effective and must be supplemented with chemical insecticides.

Limited individual farmers still use chemical fungicides and herbicides, especially on larger farms. However, and since virtually all farmers use chemical fertilisers, Syria's citrus production can not yet be considered as organic. The main advantages of the biological control programme are that it avoids environmental pollution and has the potential for significantly cutting production costs by reducing the need for insecticides. In the absence of completely chemical-free production, the

existence of biological control is unlikely to be of major importance in the marketing of Syrian citrus.

3. INPUTS AND CREDIT

(a) Input Supply

Citrus plants are provided principally by the Ministry of Agriculture from nurseries operated by the Citrus Board. All primary nurseries are operated by the Board. Private nurseries receive a part of the seedlings from the Ministry's nurseries and produced the other part themselves. The Board sells its seedlings through cooperatives for SP12 and directly to farmers for SP13. The Board's production of plants peaked at 2.3 million in 1980. In recent years it has produced about 750 thousand plants annually.

Virtually all citrus farmers use chemical fertilisers. Recommended usage is based on findings from citrus centres around the world. Neither the Citrus Board nor MAAR has undertaken fertiliser trials to establish suitability for Syrian conditions. Directives from the Ministry are based on identified soil deficiencies, but few farmers have had their soil tested. Most would seem to base usage on trial and error. One farmer visited during the course of the study was using specialised soluble fertiliser for granular top dressing.

The Agricultural Cooperative Bank has a legal monopoly of fertiliser supply. Small farmers acquire this on credit through state-run cooperatives. However, there are reportedly also a number of small-scale local traders. These apparently acquire their fertiliser supplies from farmers. They tend to be more expensive sources of supply and are used by farmers when fertiliser supplied by the state is late arriving or insufficient. Fertiliser is not formally subsidised but is imported at the exchange rate SP46 per US\$. This represents a 10-15% subsidy compared with imports made at the commercial rate.

The supreme Agricultural Council determines the input prices and adds the administrative costs of the Agricultural Cooperative Banks and other institutions. If any loss is incurred, it is covered by the body identified by the Government. The Bank has only resorted to the compensatory fund in one recent year. Typically, the Bank makes profits on selling inputs, and uses these to cover losses which it makes on lending.

Under its biological control programme, the Citrus Board supplies predatory insects to farmers free of charge. However, farmers buy insect traps from the market for SP25. Two traps are recommended per donnum. Agricultural chemicals are imported by both public and private sectors. Herbicides and chemicals imported by the public sector are subject to the SP 46 per US \$, whereas other chemical imported by the private sector are subject to the market rate. Most farms use a combination of family and hired labour. Labour is normally paid a daily wage, and works six days a week.

(b) Credit

Finance for farmers is provided by the Agricultural Cooperative Bank. The Bank keeps a record of all borrowers on the crop level, but the data related to the percentage of citrus borrowers to total borrowers are unavailable. The assessment of senior Bank staff is that some 90 percent of citrus farmers make use of its loans.

The Bank provides fertiliser and other seasonal inputs in kind through a network of outlets in the farming areas. For strategic crops, for which single channel marketing systems operate, loans are repaid through deduction from the payout for the crop. In the case of citrus, for which marketing is dominated by private firms, farmers repay in cash.

The Agricultural Cooperative Bank provides credit to farmers according to a schedule determined by a committee comprising the Bank itself, the Central Bank, the MAAR, the Peasant Federation and the Peasant Bureau. Credits are provided under an annual production plan of the Ministry, which is subject to the approval of the Supreme Agricultural Council. This plan contains estimates of the inputs required for each crop, translated into loan amounts for each farmer. Loans are offered according to the annual demand schedule determined by a committee composed of representatives of all the authorities concerned and farmers are not entitled to any more amounts.

For all fruit tree cultivation, long-term credits are exempted from repayment for the first five years, but annual interest is charged from year one. Repayment is made over years 6 to 10. Medium and long-term borrowing must be supported by appropriate documentation and is subject to inspection and approval by a local committee comprising Agricultural Cooperative Bank and other government officials.

In mid 1999, the Agricultural Cooperative Bank was charging the following interest rates for loans to farmers:

TABLE II.3: AGRICULTURAL COOPERATIVE BANK INTEREST RATES

	<u>Cooperative Sector</u>		<u>Private Sector</u>	
	Under SP50,000	Over SP50,000	Under SP50,000	Over SP50,000
Short-term	5%	6%	5.5%	7.5%
Medium and long term	4%		5.5%	

Unlike in the past, the low rate of domestic price inflation means that interest rates are now positive. However, the rates charged for agricultural loans are set at below those charged to traders and industrialists, including agricultural processors.³ They almost certainly embody a significant element of subsidy, but this cannot be estimated with any accuracy given the Government's dominance of the financial sector.

Security for loans is given either in the form of land or a personal guarantor. The Bank reports that the repayment default rate has been low for loans for citrus, but that recently defaults have increased because of lower real citrus prices. If a farmer diverts a loan to some other use he must repay the loan and is charged double the rate of interest until repayment is made.

4. COSTS OF PRODUCTION

The Government analyses citrus production costs by assuming that there is a distinct 6-year establishment period during which there is no yield or income followed by a 25-year period during which yields are constant. The establishment costs are then spread equally over each year of the 25-year period. Such analysis ignores the timing of expenditures and income. This was of less

³ Agricultural processors borrow from the Industrial Bank. The basic rate for Industrial Bank loans is 10 percent per annum, but large loans reportedly cost a total of about 13 percent per annum due to stamp fees and the need for the Industrial Bank to borrow the necessary funds from the Central Bank. Packers and processors report that they can borrow from the Bank of Kuwait at 8 percent per annum.

importance when real interest rates were negative, but is unsatisfactory now that the decline in inflation has resulted in farmers paying positive interest rates on both short and long-term loans.

As part of this study, separate detailed estimates were made for Latakia and Tartous Governorates of the 1998/99 cost of producing oranges, mandarins, lemons and grapefruit on small, medium and large-scale farms under five types of irrigation (dams with gravity feed onto the farm, dams with the farmer needing to pump, rivers with and without the farmer needing to pump, and wells). This gave a total of 120 different cost models.⁴

The basic cost data employed in the analysis was obtained from the Agricultural Economics Sections of the MAAR Agricultural Directorates in Latakia and Tartous. The data were discussed with officials from the Department of Planning and Economics, and the Citrus and Irrigation Departments of the Directorates. Interviews were also held with 16 farmers in each governorate to obtain data on family labour use and consumption and to validate the MAAR data. The unit costs employed are those estimated to have been incurred by typical farmers in each size group in Latakia and in Tartous.

Farm revenues are based on MAAR data on mean wholesale market prices for each type of citrus from November to March in Damascus, Aleppo, Homs, Latakia and Tartous. These were reduced by 30 percent to adjust them back to farm-gate values in accordance with the practice currently adopted by MAAR.

The cost models explicitly take account of the time lag between production and first yield and between first yield and maturity by calculating separate per donnum costs and revenues for each year until full maturity. The analysis includes an estimate of the financing situation of the farmer at the end of each year and of the amount of annual interest that he/she must pay on outstanding debts incurred during the establishment period.

Estimated 1998/99 yields and profits from mature citrus on typical small farms of from one to eight donnum located in Latakia and Tartous are summarised in Table II.4, overleaf. The data in this table reflect that in Annex Table II.5 for oranges in Latakia and in similar tables for Tartous and for different types of citrus⁵. The estimates in these tables are the mean of the estimates for each type of irrigation weighted by the area covered by each type.

A key conclusion from the analysis is that a typical small-scale farmer with *mature* orange and lemon trees was able to make substantial profits in 1998/99. This was despite the fact that, for oranges, domestic market prices were generally lower in real terms than at any time during the decade (see the analysis of wholesale prices Section III.3.b). The high profitability of oranges per donnum stemmed principally from the high output per tree, especially in Latakia. The profitability of lemons was due mainly to the high domestic market prices. It should be noted that the margins shown are net of all costs, including financing and an imputed cost for family labour.

Typical small-scale farmers made no significant return from mature mandarins and grapefruit in 1998/99, other than for a return to family labour of some SP3,000-4,000 per donnum. For mandarins, the poor return was due to a combination of a lower per-kg market price than for oranges and a much lower yield per donnum. For grapefruit, the cause was principally the exceptionally low domestic market price.

⁴ The detailed spreadsheets containing these models may be obtained from the Centre trainee who carried out the analysis, Mr. Samir Jrad, Planning and Statistics Department, MAAR.

⁵ The Annex Table II.5 Table for oranges in Latakia is provided as an example of the source data. This table is, in turn, based on the detailed spreadsheet models (see footnote above). The only difference between summary Table II.4 and the source data in Annex Table II.5 is in the treatment of home citrus consumption. Table II.4 values all citrus at its estimated market value, including citrus consumed on farm. In the annex table, the value of citrus consumed on farm is excluded from the estimated value of the farm's citrus.

For the larger citrus farms, the pattern of profitability was similar, with large farms being slightly more profitable than small farms in the case of oranges and lemons, but slightly less profitable in the case of mandarins. As expected, the extent to which irrigation water has to be pumped influenced the level of profitability, with gross margins being highest for farms with gravity fed irrigation and lowest for those using wells. However, it should be noted that none of the cost models embodied drip irrigation. The combination of wells with drip irrigation would be likely to increase profitability above the levels that we have estimated for irrigation from wells.

TABLE II.4: ESTIMATES OF THE PROFITABILITY OF MATURE CITRUS TREES ON A TYPICAL SMALL CITRUS FARM, 1998/99

	Latakia				Tartous			
	Oranges	Mandarins	Lemons	Grapefruit	Oranges	Mandarins	Lemons	Grapefruit
Production per tree (kg)	147	80	97	131	111	85	99	105
Trees per donnum	35	35	33	40	35	35	33	40
Production per donnum (kgs)	5,145	2,800	3,201	5,240	3,885	2,975	3,267	4,200
Price per kg (SP)	8.90	7.44	14.19	4.64	8.90	7.44	14.19	4.64
Value of production per donnum (SP)	45,791	20,832	45,422	24,314	34,577	22,134	46,359	19,488
Cost per donnum including family labour* (SP)	23,260	18,695	19,413	24,480	21,671	18,142	18,535	23,068
Margin per donnum (SP)	22,531	2,137	26,009	-166	12,906	3,992	27,824	-3,580
Cost per kg (SP)	4.52	6.68	6.06	4.67	5.58	6.10	5.67	5.49
Margin per kg (SP)	4.38	0.76	8.13	-0.03	3.32	1.34	8.52	-0.85

* Family labor valued at the wage rates for hired labor.

From Annex Table II.5 it will be seen that, at 1998/99 prices, it would take small-scale farms until the sixth year after planting orange seedlings before they produced sufficient fruit to produce a positive net income. It would take a further two years before sufficient revenue would be earned to pay off the full cumulative costs of establishing and maintaining the immature trees. Thus, the high profitability of mature oranges comes at the cost of a six-year period during which annual expenditure exceeds annual revenue plus a further two-year period when farmers have yet to recoup their full investment.

For lemon, the shorter immature period and the high 1998/999 prices means that newly planted trees yield a positive net income from the third year after planting and generate sufficient income by the fourth year to allow investment costs to be recovered in full.

Despite a short immature period, mandarins would not yield a positive net income until the sixth year after planting, and it would take small-scale farms a further seven years to earn sufficient income to cover the full costs of establishment. This is the situation if no funds are taken from the net income to pay family labour. Large farms would take much longer to recover their establishment costs due to their use of little or no family labour.

At 1998/99 prices, grapefruit would not be profitable even at full maturity. Consequently, the initial investment in planting and maintenance of immature trees would never be recouped.

The above analysis applies to typical farms selling at estimated mean 1998/99 wholesale prices. In practice, costs of production differ markedly between farms due to differences in soils, micro climates, ease of access to irrigation water, local availability of labour, and the technical and managerial skills of the farmer. Moreover, market prices differ over time within a season, between wholesale markets in different towns, and between wholesale markets and other outlets. Consequently, within the main citrus producing areas there is great variability between farmers in profitability both above and below that shown by our models.

There is a need for much more detailed analysis of variations in costs and profitability and of the causes of these variations. Such analysis will be essential if the Government is to improve its ability to assess the desirability of expanding the production of citrus (see Section VI).

5. PROJECTIONS OF NATIONAL PRODUCTION

(a) Methodology

Citrus trees normally produce their first crop two years after planting. Mandarins, lemons and grapefruit reach their full mature yield some six years after planting. Oranges only reach full maturity about 12 years after planting.

To date, medium-term projections of national citrus production in Syria have been based on the assumption that all citrus does not yield until six years after planting and thereafter yields at its fully mature level. As part of this study, we have attempted to develop a more realistic projection model which includes a gradual, year-by-year build-up of yield. Yield and death rate coefficients for the model were developed by the Study's FAO National Consultant and a Centre Trainee.⁶ These coefficients were based on their findings from field visits to 160 farms in Latakia and Tartous Governorates undertaken between June and August 1999.

⁶ Details of this work, as well as general information on citrus growing in Syria can be found in the separate report of the national consultant, Dr. Zakaria Fadlieh. This is available in both Arabic and English. Readers interested in the details of the projection model can obtain the spreadsheets from the trainee who worked on the model, Ms. Mayada Hamoud, Department of Agriculture, Tartous.

The model was used to make two separate sets of projections for the period 1999/00 to 2009/10. The first set assumes that there is no further planting of citrus trees. It thus shows projected output from the 1998/99 stock of trees. The second assumes that future annual plantings will be equal to those contained in the Government's present development plan (see subsection (b), below). 'Projections' were also made for 1998/99 to allow comparison with Government estimates of production in that year.

A major problem encountered in making projections of citrus production is a lack of information on both the extent to which unproductive trees are replaced and the speed with which they are replaced. Consequently, for each set of projections, we have made minimum and maximum projections based on extreme assumptions regarding replacement. The minimum projections assume that there is no replacement of unproductive trees; the maximum projections assumes that as soon as trees become unproductive they are replaced by trees that immediately have the level of yield of healthy trees of the age replaced. This, in effect, assumes that there are no tree deaths whatsoever.

These assumptions, coupled with our two sets of assumptions relating to future planting, give a total of four sets of projections. These are shown overleaf in Table II.5 and Figure II.3 for all citrus. The projections are based on the separate projections for oranges, mandarins, lemons and grapefruit contained in Annex Tables II.7 to II.10.

(b) Planned Increase in Capacity

The current Government plan is to maintain the present rate of annual planting of 650 additional hectares to citrus in each year to 2005. The types and varieties to be planted will be largely determined by the seedling production programme of the Citrus Board. In recent years the Board has grown about 1.5 million sour orange seedlings annually from which it has successfully established some 700,000 grafted citrus plants.

During the 1990s the Board has progressively increased its production of lemon plants, for which demand has been exceptionally strong due to high domestic market prices for lemons. In 1999/2000, lemons will comprise some 57 percent of all grafted plants produced by the Board. The Board's 1999/2000 plant production plan is shown in Table II.6.

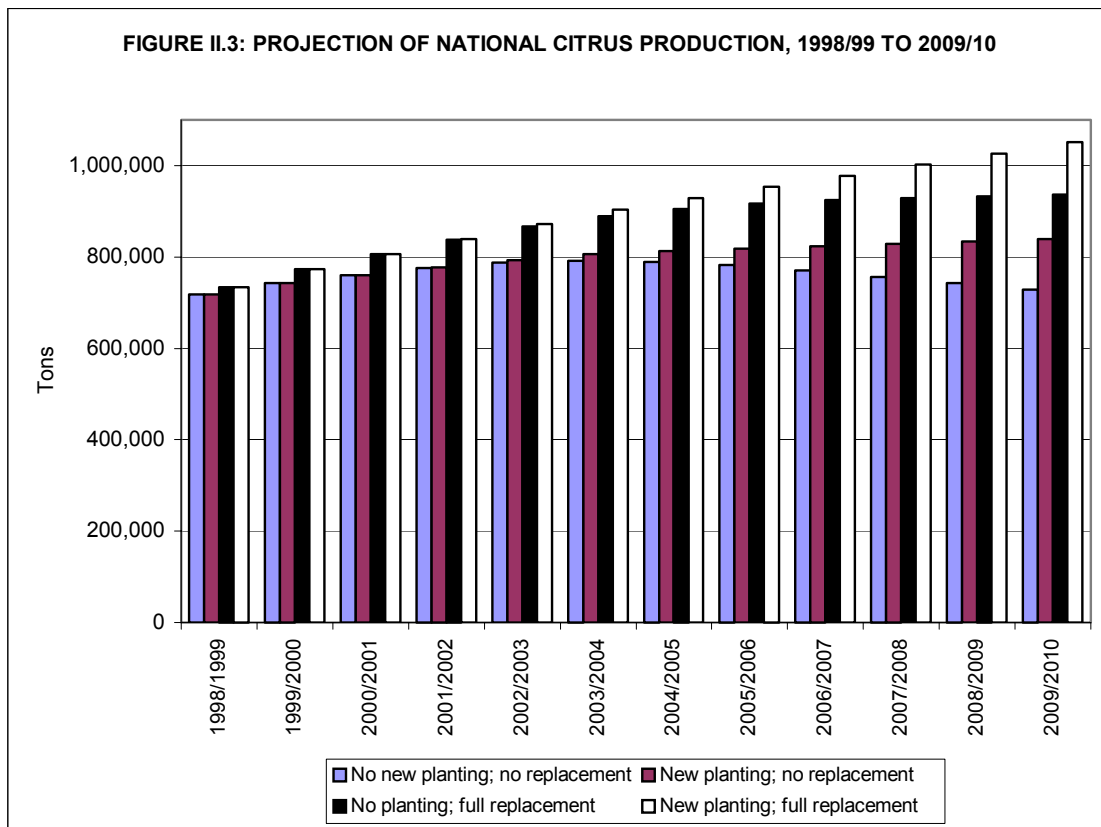
TABLE II.6: CITRUS BOARD PLANT PRODUCTION PLAN, 1999/2000

TYPE	VARIETY	NUMBER (‘000s)	TYPE	VARIETY	NUMBER (‘000s)
Lemon	Myer	180	Mandarin	Clementine	20
	Interdonato	100		Others	25
	Monalko	100		<u>TOTAL</u>	<u>45</u>
	Others	50	Grapefruit	Red	36
	<u>TOTAL</u>	<u>430</u>		<u>TOTAL</u>	<u>36</u>
Orange	Valencia	100	Other	<u>Shaddock</u>	<u>9</u>
	Navel	80			
	Jaffa	25			
	Blood	25			
	<u>TOTAL</u>	<u>230</u>	<u>ALL CITRUS</u>		<u>750</u>

TABLE II.5: PROJECTION OF NATIONAL CITRUS PRODUCTION, 1998/99 TO 2009/10

	Tons				Annual growth (%)			
	A	B	C	D	A	B	C	D
1998/1999	718,019	718,019	734,101	734,101				
1999/2000	742,911	742,911	773,934	773,934	3.5	3.5	5.4	5.4
2000/2001	759,741	759,741	806,306	806,306	2.3	2.3	4.2	4.2
2001/2002	776,183	777,446	838,596	840,304	2.2	2.3	4.0	4.2
2002/2003	787,295	792,677	866,754	872,621	1.4	2.0	3.4	3.8
2003/2004	792,015	805,797	889,833	904,191	0.6	1.7	2.7	3.6
2004/2005	789,382	812,205	906,036	929,535	-0.3	0.8	1.8	2.8
2005/2006	782,431	818,563	917,932	954,891	-0.9	0.8	1.3	2.7
2006/2007	770,842	822,696	925,027	978,073	-1.5	0.5	0.8	2.4
2007/2008	755,695	828,107	928,998	1,002,619	-2.0	0.7	0.4	2.5
2008/2009	742,882	833,493	933,790	1,027,160	-1.7	0.7	0.5	2.4
2009/2010	727,947	839,290	937,205	1,052,331	-2.0	0.7	0.4	2.5

- A: No new planting; no replacement
- B: New planting; no replacement
- C: No new planting; full replacement
- D: New planting; full replacement



(c) Annual projections to 2009/10

(c) oranges

All but 6 percent of Syria's orange trees are more than two years old and therefore are in bearing. However, an estimated 51 percent of oranges have yet to reach twelve years of age and are not fully mature. Consequently, even if there were to be no further planting of orange trees, orange production would grow strongly for a number of years. Without any new planting or replacement, the production of oranges would rise to a projected 483,000 tons in 2003/04, before commencing a slow decline (Annex Table II.7). With planned plantings, orange production would rise throughout the projection period, even if there were no replacement of trees that die. We project that the production of oranges in 2009/10 under present planting plans will range between 521,000 and 641,000 tons, depending on the extent of replanting. These represent increases over the eleven year projection period of 26-52 percent. This compares with a projected national population growth over this period of 32 percent.

Orange production exhibits a strong biennial pattern. Yields were exceptionally high in 1998/99 and are expected to be accordingly lower in 1999/2000. The Citrus Board is projecting orange output to fall from the 440,000 tons recorded in 1998/99 to only 355,000 tons in 1999/2000. It should be noted that our projections are of trend values and do not take account of the biennial bearing pattern.

- mandarins

In the late 1980s, the national area planted to mandarins exceeded that of oranges. During the 1990s, farmers have switched their planting of citrus from mandarins to other types, due to relatively low domestic market prices for mandarins. As a consequence, about 95 percent of all existing mandarin trees are now fully mature. In the future, in the absence of further large-scale mandarin plantings, the impact on production of deaths from the large stock of mature trees will outweigh the impact of yield increase by the small remaining number of immature trees. In the absence of any further planting or replacement, mandarin production would fall at an accelerating rate, dropping by about 20 percent over the eleven-year projection period. With planned new plantings and full, immediate replacement, production would increase gradually in each year of the projection period. By 2009/10, production would be some 19 percent above its trend 1998/99 level (see Annex Table II.8). With planned production and no replacement, mandarin production would fall over the replacement period by a projected 6 percent to 197,000 tons. Since farmers will be less inclined to replace mandarin trees that die than more profitable orange and lemon trees, the likelihood is that mandarin production will indeed fall gradually or, at best, remain at current levels.

- lemons

Lemon plantings have accelerated sharply in the past two years. About 34 percent of existing trees are immature and 14 percent are less than two years old and have yet to commence bearing. Thus, even in the absence of further planting or replacement, lemon production would increase until 2005/06, rising to 90,000 tons from 74,000 tons in 1998/99 (Annex Table II.9). With planned planting and full, immediate replacement, production would rise by 56 percent to a projected 119,000 tons in 2005/06. At the current high lemon prices, farmers are likely to purchase and plant all available lemon seedlings. However, domestic market prices are likely to fall as lemon production expands at a greater rate than domestic demand. This fall is likely to be sharp since domestic demand for lemons is likely to be much less price elastic than the demand for oranges and mandarins. This is because lemons form an essential part of important national dishes, whereas oranges and mandarins are mainly consumed on their own and can be substituted for other fruits as supply increases and their price falls. As the price of lemons falls, the growth in lemon planting is likely to decline. This likely change in planting behaviour means that projections B and

D are likely to be most relevant in the initial years, but that production may be closer to that shown in projections A and C in later years.

- grapefruit

About half of all grapefruit trees are immature. Production will trend upwards in the absence of further planting or replacement, peaking at a projected 26,000 tons in 2003/04. With planned planting and full, immediate replacement, production would continue to rise throughout the projection period, reaching 36,000 tons in 2009/10 (Annex Table II.10). This represents an increase of 64 percent over the trend level in 1998/99.

- all citrus

The combined impact of the above projections on citrus output as a whole is shown in Table II.5 and Figure II.3, above. This is analysed in greater detail in Annex Table II.6. For each year to 1999/2000, this table also shows the projected *cumulative* growth compared with the base year. The last column shows the cumulative rate of national population growth projected on the assumption that population continues to grow at the rate of 2.54 percent per annum projected for 1995-2000 by the Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat. In practice, the demand for citrus is likely to grow at a rate higher than the rate of population growth, since (a) the income elasticity of demand for citrus is almost certainly positive and (b) *per caput* incomes are projected to expand as the national economy responds favourably to the recovery in world oil prices.

The projections in columns A and B and in columns C and D are identical until 2000/01, reflecting the fact that the first of the planned plantings, made in 1999/2000, will not yield until 2001/2002.

The projected 1998/99 outputs of 718,000 tons (assumptions A and B) and 734,000 tons (assumptions C and D) are below the Government estimate for that year of 740,000 tons. Conversely, the projected 1999/2000 outputs of 743,000 tons and 774,000 tons are above the Government's projection for 1999/2000 of 709,000 tons. These differences are due to the fact that 1998/99 production was above the annual growth trend due to the biennial production pattern for oranges. Production in 1999/2000, conversely, is expected to be below trend, as the production of oranges responds adversely to the high 1998/99 output.

Projected production from the present tree stock is shown in columns A and C of Table II.5 and Annex II.6. With no new planting and no replacement of trees that die, production would grow from a trend value of 718,000 in 1998/99 to a peak of 792,000 tons in 2003/04, before falling back to 728,000 tons in 2009/10. With no new planting but full, immediate replacement, production would grow throughout the projection period, reaching 937,000 tons in 2009/10. This represents a total growth of 27.7 percent, less than projected growth of Syria's population.

If the Government planting targets to 2005 are achieved in full, production would grow throughout the projection period, even if there were no replacement of dead trees. However, the rate of growth would be less than the rate of population growth. Total projected growth to 2009/10 would be some 15 percentage points less than the growth in population.

If the Government planting targets are achieved in full and if it is assumed that all the trees that die are replaced with trees that immediately produce their mature yield, citrus production would expand strongly to 1.052 million tons in 2009/10. Growth until 2005/06 would be above the rate of population growth and would be roughly equal to it thereafter. However, even with this extreme assumption, it will be seen that projected production would expand per annum at less than an average of 2 percentage points more than the rate of population growth over the period to the end of the present production plan in 2004/05.

In practice, production is likely to trend upwards at between the rates of growth projected under assumptions B and D. Thus, the recent explosive growth in Syrian citrus production is unlikely to continue. Production can be expected to expand at a rate only slightly greater than the projected rate of population growth. Thus, with some likely growth in demand *per capita* and with the additional demand from the recently established processing plant (see below), there is unlikely to be a significant increase in the surplus available for export unless there is an upward revision of planned planting.

(d) the situation in 1999/2000

The period of greatest expansion in the area planted to citrus was between 1983 and 1991. Trees planted during this period are already producing near or at their maximum. The rate of citrus planting has slowed since 1994. Since 1995, when the citrus expansion target was reduced from 1,100 hectares to 650 hectares, the annual rate of area expansion has been only about 2.5% of the existing tree stock.

As noted above, the main reason for the very high crop in 1998/99 was the fact that it was an excellent growing year for oranges, leading to record yields per hectare. The Citrus Board is forecasting that production will fall by about 30,000 tons this year as the yield of oranges falls back.

With a population growth of over 3 percent, domestic demand is increasing by 15,000 to 20,000 tons per year. In addition, a large citrus processing plant was commissioned earlier this year that could well add 60,000 tons or more to demand (see Section V). Consequently, there could be up to 100,000 tons less for sale in the domestic fresh citrus market in 1999/00 than in 1998/99.

- long-term production potential

There are an additional estimated 23,000 hectares of uncultivated land that are suitable for citrus production mainly using irrigation water from the government schemes. Most of this land is in Tartous Governorate and in parts of Homs Governorate. If all the available land were planted to citrus, the national citrus area would almost double to approximately 50,000 hectares.

III. INTERNAL MARKETING AND DOMESTIC CONSUMPTION

1. HARVESTING, GRADING AND PACKING

The citrus marketing season starts in early October with the harvesting of satsumas and early hybrid mandarins. The mandarin harvest runs through until March, with the most important variety - clementines - being harvested from November to January. The orange harvest starts with the Navel variety, which is picked from November to January. The main Jaffa variety is harvested in February and March. The Valencia harvest runs from April to June. Grapefruit are harvested from November to February. Lemons are picked throughout the year.

Thus, significant quantities of citrus are harvested in each month from September through to June, with the bulk of the crop being harvested from December to March. The main mandarin harvest precedes the main orange harvest, but there is considerable overlap. For example, Navel oranges are harvested up to four months before late hybrid mandarins.

Citrus can be stored on the tree for a number of months, and farmers often delay harvesting the full crop in the hope of obtaining higher prices later in the season. However, storage on the tree is risky. It may result in losses and there is normally some deterioration in quality. It is particularly risky for most of the mandarin crop since it involves exposing the fruits to possible frost.

Waxing and storage allows the domestic marketing season for oranges to be extended until August. The price advantages of waxing and storage are becoming increasingly recognised, especially by the larger farmers. There has been an acceleration in the installation of waxing lines over the past year. Notwithstanding this, most farmers still deliver to a wholesale market on the day of harvest.

Farmers normally harvest, pack and market their citrus themselves, using either family labour only, a combination of family and hired labour or, in the case of a few large farmers, hired labour only. A minority of farmers sell their crop on the tree to a packer or processor. In this latter case, the buyer normally provides the labour for harvesting and packing. This helps to ensure that the crop is available at the time that the buyer needs it and also allows the buyer to control the quality of picking and to minimise the amount of fruit that must be rejected during sorting.

There are no national grades and standards for citrus. Farmers grade their output on the basis of their prior marketing experience, with the aim of maximising its sales value net of the cost of grading. Farmers sort into from two to four grades. Sorting is principally on the basis of size, with medium-sized fruits normally being graded highest. Fruit is usually cleaned on the farm with water or with water and detergent. Smaller, less sophisticated farmers often only wash their fruit if it is muddy.

Some large farms have their own automated packing lines that include washing, drying, waxing and grading equipment. A small number of citrus farms also have cold storage. Farmers with such facilities wax and store their own crop and also store for other farmers for a fee.

Sturdy plastic crates holding about 22kg are used for on-farm collection. Following sorting, citrus is packed into smaller, less substantial polystyrene or plastic crates holding 13-14kg. Some farmers use plastic for first grade citrus and polystyrene for lower grades.

2. PRIMARY MARKETING AND MARKET INFORMATION

(a) Marketing Outlets

Reportedly, only very small citrus farmers sell to local traders. The vast majority of farmers sell at a wholesale market in a major urban centre to which they transport their produce in small trucks, typically of 3-5 tons. Trucks are usually hired, although some better-off farmers own their own transport. The head of the farm household or a family member normally travels to the market with the truck. Hired transport is reportedly easy to obtain and the supply competitive. Small farmers occasionally transport jointly with others if they have insufficient citrus and other produce to fill a truck. On arrival at the market each farmer's produce is usually sold separately.

The Government established a General Company for Fruits and Vegetables in 1977. Its main functions are to act as a buyer of last resort at Government-administered prices and to distribute produce to remote areas. The company has a citrus packing line in Latakia although this is reportedly little used. The company now plays only a small role in citrus marketing. Farmers and traders are reluctant to use its facilities due to the complex bureaucratic procedures involved and, in particular, because there are substantial delays of uncertain duration before the company makes payment.

(b) Wholesale Markets

There are 14 major fruit and vegetable wholesale markets in Syria located in the major cities and towns. Most of the produce sold at these markets is owned by the producing farmer up to the point of sale in the market. On occasion, a wholesale market trader may arrange to buy citrus at the farm gate and transport it to his market for sale.

At the Damascus market there are some 250 traders, of who about 60 deal in citrus. The organisation of trading is informal and opportunistic. Traders act as commission agents arranging sales between farmers and buyers. A commission of 5 percent is reportedly charged for this service. Traders may also act as wholesalers, buying from farmers and selling on their own account. The main buyers at the wholesale markets are so-called semi-wholesalers and retailers. Exporters and processors also buy from the wholesale markets, although they prefer to contract directly with larger farmers. Traders pay a market fee of SP40,000 per year that gives them the right to occupy a small office and storeroom.

The Damascus wholesale market is open 24 hours a day. Prices are determined by negotiation after the produce has reached the market, with no prior agreement. Buyers may purchase a full lorry load or a part of a load only. The normal procedure is for the produce to be sold on the day of delivery with no overnight storage. Produce is held overnight only if a buyer cannot be found at an acceptable price. Price risks and physical losses are borne by the farmer. Farmers normally use the same trader at a particular market. This is sometimes because the trader has provided loans to the farmer, but also reflects trust in a particular trader, developed over a number of years. In return for a loan, farmers may occasionally agree to sell to or through a particular trader up to, say, 6 months ahead of harvest.

Fruits and vegetables are not graded further at the market. Traders judge quality by eye. Citrus is normally sold in the plastic or polystyrene crate in which it is delivered. Traders often repurchase crates from retailers and sell them back to farmers.

Farmers are normally paid cash at the time of sale. Exceptionally, a farmer may request a trader to arrange waxing and/or cold storage should he not be able to obtain an acceptable price on the day of delivery.

(c) Market Information

There is no formal market information system for fruits and vegetables.⁷ Farmers typically telephone commission agents at a number of markets to get an idea of likely prices before deciding where to deliver. This has the disadvantage that agents have a vested interest in painting a favourable picture of conditions at their particular market with the aim of encouraging the farmer to deliver to them.

MAAR data on wholesale market prices show large differences between markets in mean monthly prices, well in excess of those that can be explained by transport cost differences (see subsection 3b, below, and Annex Tables III.2 and III.3). This suggests that farmers do not have access to the price information necessary to ensure that they always deliver to the market that will yield the highest net return.

There is a clear need for a formal market information system under which data on prices at each major wholesale market are collected, analysed and rapidly disseminated. The basis of data collection for such a system would appear already to be in place (see sub-section 3b, below).

The wholesale markets do not have weighbridges and no records of throughput are collected by the market authorities.

3. DOMESTIC CONSUMPTION AND PRICES

(a) Apparent Consumption

The vast majority of the harvested crop is used for human consumption in fresh form within Syria. In recent years, a small proportion has been exported (see Section V), and from one to two percent has been used for processing into juice that has been consumed mainly within Syria (see Section IV).

Government production estimates refer to the crop on the tree. The Citrus Board estimates that about 10 percent of this production is not harvested or is unusable because of on-farm damage and deterioration. Thus, of the 740,000 tons produced in 1998/99, around 666,000 tons would have been successfully harvested. Of this amount, about 10,000 tons was used for processing, leaving a net amount of 656,000 tons. Citrus loses weight with desiccation. Traders report an average weight loss from desiccation and other causes of about 5 percent between purchase on farm and the product leaving their packhouse. Assuming that the average rate loss for all Syrian citrus is a similar 5 percent between the farm and the point of purchase by final consumers or export, this reduces the 656,000 tons available for consumption to 623,000 tons. Assuming further that exports from the 1998/99 crop were 40,000 tons (see Section V), this leaves 583,000 tons that were consumed within Syria, either on farm or by consumers in general. With an estimated mid 1998/99 population of 15.9 million, this gives an estimated 1998/99 *per caput* consumption of citrus of 36.7 kg.

⁷ At the main project workshop, one participant stated that fruit and vegetable prices are broadcast several times a week on the radio. This was not mentioned during any of the discussions that the consultant and trainees held with wholesale market officials, farmers and traders, and government officials involved in collecting market prices. No other participant at the workshop, including farmers, traders and officials of the Chamber of Agriculture, were apparently aware of such broadcasts. It was generally agreed at the workshop that there is currently no effective market information service.

(b) Prices

- **sources of citrus price data**

Since 1985, the Department of Agricultural Economics (DAE) of MAAR has routinely surveyed the prices of fruits and vegetables in the main wholesale markets in 14 major cities and towns. It has also surveyed retail prices in shops in these towns. It does not collect prices at other points in the domestic marketing chain. For citrus, separate prices are collected for oranges, lemons and mandarins.

Staff from the Department survey wholesale markets and retailers twice weekly, on Saturdays and Wednesdays. Mean prices for the two days are calculated on Thursdays and faxed by each governorate to Ministry headquarters in Damascus. Prices are collected for first grade produce only. For oranges, the Department surveys Navel prices between November and April and Valencia prices from May to October. The Valencia surveyed have usually been stored, especially in the later months.

Retail prices are collected by the same enumerators from a sample of 6 to 7 shops. The same shops are visited twice per week. When reporting, the enumerators take a price that they consider typical, rather than the mean. If a shop is selling neither Navel nor Valencia it is dropped from the sample.

For use in its analytical work, the Ministry estimates farm-gate producer prices by multiplying wholesale prices by 0.70. For the past two years, the Ministry has estimated annual producer prices from average wholesale prices in the peak selling season only. Previously, average prices for the entire year were used.

Annual average wholesale and retail prices are sent once a year to the Central Bureau of Statistics. Prices are also sent routinely to the Minister who forwards them to the Supreme Council for Agriculture. This latter exercise is designed mainly for Government action on strategic crops and is of less importance for fruits and vegetables. No other use is reportedly made of the wealth of data collected.

The Ministry of Supply and Home Trade also collects wholesale market price data. Unlike the data collected by the MAAR, that collected by the Ministry of Supply reportedly refers to the price paid by wholesalers to farmers. This is used as a basis for determining prices for inclusion in a list of official fruit and vegetable market prices that is revised every two days and posted in each market. These official prices have no function in the formation of wholesale market prices for citrus, since market prices are based solely on supply and demand. Their main use is in the enforcement of maximum retail prices derived from the published wholesale prices. For citrus, these prices are reportedly set at 25 percent above the published market prices. Higher margins are set for more perishable fruits and vegetables. Retailers found to be charging prices above the legal maximum prices are deemed to have committed an offence and are punished accordingly.

In addition to the two ministries, staff of the Wholesale Market Commission⁸ also collect market prices under the supervision of the Ministry of Supply and Home Trade. Prices are collected once every two days and are used once in every 15 days as a basis for a Government committee to set official wholesale prices for export quality fruits and vegetables. These prices are then increased by 70 percent to give an estimated fob price for customs valuation.

⁸ This Commission acts as a representative of traders and exporters. The day-to-day running of the markets is the responsibility of each Governor's office.

- inter-year changes in domestic citrus prices

Mean annual wholesale market prices from 1991 to 1998 are analysed for oranges, lemons and mandarins in Annex Table III.1. This analysis is summarised in Table III.1, below. The data in the table, are based on the mean of monthly prices at the five key markets of Damascus, Homs, Aleppo, Latakia and Tartous. The data, which are expressed as indices to the base 100 in 1998, have been deflated by the national wholesale price index with the aim of eliminating the impact of general inflation. It will be seen that the inflation-adjusted prices of both oranges and mandarins fell steeply in 1995 in response to sharp increases in national production in 1994/95.⁹ Prices recovered partially in 1996 following a downturn in production in 1995/96, only to fall again in 1997 as output reached record levels in 1996/97. The poor, frost-affected orange crop of 1997/98 led to a recovery in both orange and mandarin prices.

From Table III.1 it will be seen that the mean inflation-adjusted market prices of both oranges and mandarins have been substantially lower over the past four years than earlier in the decade. This almost certainly reflects the impact of the very large increases in output in 1993/94 and 1994/95 that significantly increased supply to the domestic market. Since these years, production has continued to trend upwards, but at a slower pace (see Figure II.1).

These year-to-year price changes indicate that domestic prices are sensitive to changes in domestic supply. This, in turn, suggests that the country has yet to reach the position of a mature exporter, where changes in prices in the domestic market are caused principally by price changes in export markets rather than by shifts in domestic supply.

Although the mandarin crop was poor in 1998/99, both farmers and traders report that the very large orange and lemon crops had the effect of reducing domestic market prices for oranges and mandarins substantially. We attempted to verify this using DAE price data for the five major wholesale markets in the main citrus seasons in 1997/98 and 1998/99 (see Annex Table III.2). Although this analysis shows that mean monthly wholesale prices were generally lower in 1998/99 than in 1997/98 for most of the main season, they were higher for oranges and mandarins in some markets in both December and February.

The evidence of a price fall in response to an upward shift in supply is much stronger for lemons. Compared with the same months in the prior crop year, the wholesale prices of lemons were lower in all major markets in each month from November 1998 to March 1999.

TABLE III.1: INDICES OF DEFLATED MEAN NATIONAL CITRUS WHOLESALE PRICES, 1991-1998

(1998 = 100)

	Oranges	Mandarins	Lemons
1991	130	145	112
1992	140	131	138
1993	148	132	156
1994	146	143	107
1995	99	96	111
1996	128	111	150
1997	94	97	149
1998	100	100	100

Source: Annex Table III.1.

⁹ Note that the citrus harvest season commences before the end of the calendar year, but that the bulk of production and sales are in the first half of the year. Thus, for example, production in the 1994/95 crop year has its principal impact on prices in 1995.

Inflation-corrected wholesale lemon prices have been more unstable from year to year than the prices of oranges and mandarins, but there has been no noticeable downward trend in these prices. As noted above, lemons are an important integrated component of much of the national cuisine. Conversely, oranges and mandarins tend to be consumed on their own and can be substituted with other fruits. Thus, the demand for lemons is almost certainly less price elastic than that for oranges and mandarins. This is likely to be the main explanation for the greater instability in annual wholesale prices, since national lemon *production* would appear to have been no more unstable than that of oranges and mandarins (see Table II.3).

- price variation between wholesale markets

Annex Table III.3 shows indices of 1998 monthly prices for oranges, mandarins and lemons in Syria's major wholesale markets. These, indices show the level of prices in each market relative to those in Damascus. The 'Average' index shown at the foot of the data for each city market is the unweighted mean of the markets surveyed, excluding Damascus. As one would expect, for all three types of citrus, wholesale prices in Latakia and Tartous are generally substantially lower than in Damascus and in other markets. With the exception of the start of the season, mandarin prices are substantially higher in Damascus than in most other towns and cities in Syria other than remote Dair-Ezzor. We could find no explanation for this. Orange prices tend to be higher in Damascus during the main harvest season but lower in the months of May to October. This may be due to the fact that the bulk of cold storage facilities are in Damascus, making oranges relatively plentiful in the capital during the off-season. Generally, there are substantial differences between towns in monthly wholesale prices, but no obvious pattern. As noted above, this suggests that the national market is not well integrated.

- wholesale and retail margins

There is reportedly no attempt within Government to integrate or cross-check the separate price data collected from wholesale markets by the MAAR and the Ministry of Supply and Home Trade. Consequently, there is no readily available source of consistent data from which to estimate wholesale margins. The assessment of the Department of Agricultural Economics (DAE) of the MAAR is that the wholesale margin for citrus averages a very high 20-25 percent.

The DAE estimates that retail margins for citrus average 15-20 percent. Annex Table III.4 contains an analysis for Damascus and Latakia markets of retail margins in each month of 1998, based on MAAR wholesale and retail price data. These estimated margins exhibit a very wide range. For example, monthly margins for lemons in Damascus range from 16 percent to 45 percent. Given that retailing is almost wholly small scale and is consequently relatively competitive,¹⁰ it would seem unlikely that such large month-to-month variation exists in practice.

¹⁰ There are reportedly some 25,000 retail outlets that sell fruits and vegetables in Damascus alone.

IV PROCESSING

1. BACKGROUND

In 1994, the Government banned the importation of all fruit juice concentrates, including citrus juice. This ban was modified in April 1996 to permit natural juice extraction and packing establishments to import tropical juice concentrates not produced domestically, such as pineapple, mango and banana concentrates. The ban on the importation of citrus juice remains.

The Modern Fruit Juice Factory, located in Homs, began producing small amounts of single strength citrus juice in 1993. In 1995, in response to the protection afforded by the ban on imported citrus concentrates, the factory imported an evaporator and commenced producing orange and grapefruit concentrates. In 1998, the Government encouraged a second soft drinks firm, the Future for Food Industry Company, located near Latakia, to establish a capacity to produce citrus concentrates. The company began producing citrus concentrate in March 1999, towards the end of the main 1998/99 citrus harvest. To date the plant has operated for a total of about two months.

2. TYPES OF CITRUS JUICE

In developed countries, the market price that citrus juice can command is a function of how the juice has been processed. The lowest priced juices are those made from concentrate. Single strength juices that have been extracted in the source country but have not been concentrated fall into an intermediate price category. Such not-from-concentrates (NFCs) sell at significantly higher prices in developed-country markets than juice reconstituted from concentrates. The highest-priced juices are those that have been freshly squeezed in the consuming country from imported citrus. In the United Kingdom, the lowest quality orange juices made from concentrate currently retail at as low as £0.30 per litre, whereas freshly squeezed juice typically sells at over £2 per litre.

The bulk of the citrus juice market in Western Europe is for concentrates, although higher-quality products are becoming progressively more important. The market for freshly squeezed juice is currently dominated by the rapidly expanding market in the United Kingdom.

3. THE WORLD MARKET FOR CITRUS JUICE

(a) Production and Exportation

The World market for citrus juice is dominated by Brazil and the USA. Together, exports from these countries account for about 95 percent of world trade. Brazil is by far the largest producer and exporter of concentrated orange juice. The other main exporters are South Africa, Mexico, Cuba and Morocco. Florida is the largest producer and exporter of NFC orange juice. For lemon juice, Argentina, Italy and Greece are the main exporters. Florida, Belize, Argentina, South Africa and Israel are the main exporters of grapefruit juice. Spain, Italy, Pakistan and Argentina export small amounts of mandarin juice..

All citrus juice is transported by truck and ship. The main Brazilian companies have made major investments in storage and transport both in Brazil and in Western Europe, where they own a total of six large terminals including facilities at Gwent, Antwerp, Amsterdam and Rotterdam. All transport and storage from processing plants in Brazil through to packing plants in Europe is in bulk, with the concentrate being stored under a carpet of nitrogen at -10 to -12 degrees centigrade. Storage at these low temperatures is possible because orange juice remains suitable for pumping at -10°C. The operating costs of bulk storage and transport are much less than for the alternative of using barrels (which must be kept at the lower temperature of -18°C). However, *total* cost

differences are not known because there are no readily available data on the investment costs of the storage and transport facilities that have been established by Brazil.

Exporting countries other than Brazil use barrels for storage and transport. This is the system currently in use in Syria. A rule of thumb used in the trade is that a factory needs to produce at least 10,000 tons of concentrate for it to be worth moving to bulk storage. In the case of Syria, the threshold output necessary to justify bulk storage would be substantially greater. This is because the majority of production would need to be exported, and investment would therefore also need to be made in bulk domestic transport by truck and in bulk storage and handling at one of Syria's ports.

Transport costs from Brazil to Western Europe are not known. Transport in barrels from Florida is around US\$130 per ton and from South Africa US\$70 per ton. Transport from Syria to Western Europe could be expected to be at least US\$70 per ton, probably substantially more. By comparison, the cost of overland transport from Spain to other Western European countries is very low.

(b) Importation, Reconstitution, Packing and Retailing

The large Brazilian processors normally sell directly to European packers from their facilities located at European ports. For exports from a non-Brazilian source, the most common marketing chain for concentrate imported into western Europe is: producing country processor – agent – packer -supermarket.

Some exports are sold forward, but increasingly trade takes place on a spot basis. Exporters normally finance the product through to sale free-on-truck in western Europe. For effective marketing, concentrate needs to be held near the point of sale, not in the producing country. This may often involve a significant period of refrigerated storage in Rotterdam or one of the other ports with the necessary facilities. Such storage currently costs some Dutch Florins 25 (US\$ 12) per ton per month.

The European market is highly integrated. There are about 30 major agents in Europe, most of who are also involved with other agricultural commodities. Agents may occasionally take ownership, but normally charge a seller a fee for identifying customers and for providing other services to the exporter, such as assisting potential purchasers to obtain a line of credit. Agents normally charge a commission of about 4 percent. A Syrian processor would find it extremely difficult to sell directly to packers and would need to employ an agent. The agency fee on annual exports of, say, 4,000 tons would be around US\$120,000. This would be as cheap as establishing and operating a one-person sales office in Europe and would give access to the full set of clients, expertise and services offered by the agent.

About 80 percent of the juice imported into Western Europe is sold as pure juice, including all the better qualities that are imported. Much of the pure juice sales comprise a mix of juices aimed at achieving a particular consistent flavor. The majority of the remaining juice imports is used in the manufacture of aerated drinks, with small amounts being used in cordial production, confectionery and a variety of other products.

Due to the high cost of transporting single strength, packed juice, virtually all packing of juice for retail sale is done in importing countries rather than in the country of origin. Within Western Europe there is considerable trade in packed juice between countries. The packing of citrus juice in Western Europe tends to be dominated by a small number of large firms. There are four main firms in the UK, two in Denmark, four in Italy and two in Portugal. The largest consumers, France and Germany, each have about 20 large packers, and Germany also has around 150 medium-sized

packers. The European market is highly integrated both organisationally and in the movement of products between countries.

In the United Kingdom, supermarkets account for about 70 percent of all sales of citrus juice. Some 70 percent of these sales are made under the supermarket's own brand. In the rest of Europe the proportion is lower, probably 40-50 percent in France and Germany. With the exception of France, supermarkets buy through agents rather than importing directly. However, the supermarkets take a great interest in the products that they sell and they work closely with their agents to ensure that their specifications are met precisely.

(c) Quality and Prices

Juice is normally concentrated down to about 66° brix. Quality is a function of (a) brix (b) acidity, (c) colour, which is tested against standard OJ colour tubes (mid-coloured juice which is neither too light nor too dark is preferred in the market), (d) flavour, and (e) pulp content. A key determinant of quality is the ratio between brix and acidity.

Brazil can produce a whole range of juice qualities. Brazilian juice normally sells in Europe at price premiums of 5-10 percent over juice of similar quality from other origins. This is the result of its market dominance, its ability to guarantee a regular supply of large quantities with consistent characteristics, and the ease with which its concentrate can be accessed from its storage facilities at Western European ports. There is little evidence of individual countries being able to sell concentrated orange juices at prices above those obtained by Brazil, although Israel is reportedly able to sell its Jaffa concentrate at a small premium.

For lemon concentrate, Syria would similarly meet strong competition from Argentina. There is no dominant supplier of mandarin juice, but the world market for such juice is small.

Both expectations of and the actual performance of the Brazilian and Florida crops drive world prices for orange juice. For lemon and grapefruit prices the key factors are the performances of, respectively, the Argentinean and Florida crops.

There is a futures market for concentrated orange juice in New York, but this is little used, and is not suitable for hedging by European traders or packers. The standard price indicator for orange juice is the US\$ cost per ton of Brazilian concentrate 66° brix frozen bulk, free-on-truck Netherlands. In recent years, this price has ranged from US\$800 to US\$2,400 with a likely future mean value of US\$1,200-1,300. Prices for lemon juice are currently at a low of US\$600 per ton compared with a past maximum of US\$1,800 per ton, and are expected to average around US\$1,000 per ton in the future. Grapefruit concentrate prices have ranged from US\$600 to US\$1,800 per ton, and are expected to average US\$1,200 to US\$1,400 per ton in the future.

(iv) Potential Export Prices for Syrian Frozen Concentrate

There are no marked seasonal variations in the world prices of citrus juice that Syria could exploit.

There is no possibility of Syria obtaining a premium in export markets through advertising and retailing its juice as originating from Syria. This is because establishing a Syrian brand would be astronomically expensive and not justifiable given Syria's low level of production.

As noted above, no concentrated orange juices sell on the world market at large price premiums over regular Brazilian juice, even if they are used for blending. Syrian producers would find it difficult, if not impossible, to export frozen orange concentrate at a premium over landed Brazilian prices, due to Brazil's marketing advantages. The most likely situation is that Syrian orange juice concentrate would sell free-on-truck Western Europe at a discount to the price of standard Brazilian

juice. Should Syrian concentrate be judged by the trade to be of high quality, or to have a particular unique taste, the best that would be likely to be achievable would be a price similar to that fetched by standard Brazilian concentrate. This has been the experience of other producers, such as South Africa and Morocco that produce very high quality Valencia concentrate but have to sell at around a 5 percent discount to the Brazilian price.

Thus, the highest price at which Syria would be likely to be able to sell its concentrated orange juice into the major Western European market would be at the projected price of Brazilian concentrate of some US\$1,300 per ton. Prices possibly up to US\$200 per ton higher could be obtained in markets in the Middle East, reflecting the additional cost of transporting Brazilian concentrate from Western Europe to these markets in barrels. On the assumption that the transport of Syrian frozen concentrate to these markets would cost US\$50 per ton, this would give an ex-factory unit value for Syrian concentrate of US\$1,450 per ton.

4. SYRIAN PRODUCTION OF CITRUS JUICE

(a) The Modern Fruit Juice Factory at Homs

In addition to the processing and packing of citrus juice, this plant produces tropical fruit drinks made from imported concentrate and soft drinks (including orange and lemon drinks) made from combinations of chemicals.¹¹

The plant's juice extraction machinery can process oranges and grapefruit of all sizes, but during a particular processing run it requires citrus of similar size. The plant cannot process mandarins because their skin is too soft. The plant has a capacity to process four tons of citrus per hour. In recent years it has processed 4,000-5,000 tons of citrus annually, of which about 80 percent has been oranges and 20 percent grapefruit. This level of throughput has meant that the plant has operated at about only one-third of its capacity. However, its output has been sufficient to meet domestic demand and to give a small surplus for export to Lebanon.

The plant acquires roughly 40 percent of its citrus from the Homs, Hama, Aleppo and Damascus wholesale markets and 60 percent directly from farmers. The failure of farmers to sort their citrus adequately into size groups reportedly leads to considerable inefficiency in the juice extraction process.

About 10 percent of the factory's juice production is not concentrated. This single strength juice is packaged and sold to meet immediate demand at the time of processing. The remaining 90 percent is concentrated and stored at the plant in drums at -20° Centigrade. It is subsequently mixed with water and packaged as required to meet orders during the remainder of the year. Such concentration greatly reduces storage costs, both directly because of the much smaller volume but also because single strength juice must be stored at the lower temperature of -30° Centigrade leading to higher refrigeration costs. All the juices prepared at the plant are packed into either 250ml or one litre waxed plastic Tetra Briks imported from Sweden.

Valencia would be the best orange variety for the plant due to its high juice content. However, the high price of this variety on the domestic market means that it is more efficient to use cheaper local varieties with a lower juice content that averages 37 percent. With such varieties it takes some 17 tons of fruit to produce one ton of concentrate of 60-62° brix. Based on a mean annual throughput of 4,500 tons of citrus, this gives annual production in recent years of some 265 tons of concentrate.

¹¹ Tropical concentrates are subject to an import duty of 29 percent. This gives an additional degree of protection to Syrian citrus over and above that afforded by the banning of imports of citrus concentrates.

Once packed into Tetra Briks, both the NFC and the juice produced from concentrate have shelf lives of six months, after which its visual appearance deteriorates. Since consumers in the domestic market do not differentiate between these two types of juice, all the juice is sold in Tetra Briks marked 'made from orange juice concentrate'. Sales are made directly from the plant to retailers. Current retail prices are, respectively, SP15 and SP 50 for the 250ml and one litre packs.

The company sells very small amounts of fresh juice to Lebanon at a loss, packed in the same Tetra Briks used for retail sale in the domestic market.

(b) The Future for Food Industry Company Plant at Latakia

The company is a major bottler and packer of soft drinks for the domestic market. It also produces and exports freeze-dried fruits and vegetables. Its citrus processing line was established together with an evaporator and a second line for processing tomatoes. The citrus line cannot be used for processing any other produce, but the company plans to use the evaporator for other fruits, such as apricots, in addition to making concentrated citrus juice and tomato paste. The two processing lines and the evaporator, together with buildings and associated investments, reportedly cost around US\$15 million, of which US\$7 million was financed by a long-term interest-free Government loan. This reportedly carries a grace period for repayment of 3 years and a subsequent 10-year repayment period. The loan is free of interest for its full 13-year term.

All the machinery and equipment for washing, sorting, drying and extraction was imported new from Italy. The plant is fully automated. The citrus line has two sets of machinery, one for processing large and one for small fruits. The line has a current total capacity to process 25-30 tons of citrus per hour, i.e. some 100,000 tons if operated at full capacity, 24-hours per day for a five-month processing season. The equipment is reportedly also suitable for processing lemons, mandarins and grapefruit. Lemons will not be processed until their domestic price has fallen to well below its present level. The plant has facilities for the flash freezing of citrus juice to -40°C and for storage at -20°C. Extraction rates are expected to be similar to the Homs plant. Thus, at full capacity, the plant could produce about 5,900 tons of citrus concentrate.

The largest investment is in the evaporator and in the packing machinery. These can be used for non-citrus products. It should be possible to employ them throughout the year, producing concentrated cherries, apricots, tomatoes, etc. Thus, the citrus-specific investment is relatively small compared with the total US\$15 million cost.

Citrus must be processed rapidly after picking to prevent deterioration in the quality of the juice. Thus, to maintain a plant at full capacity, the factory must receive regular supplies of fresh oranges. The company plans to buy principally from large-scale citrus farmers, turning to the wholesale market only as a last resort. It plans to purchase whole fields of citrus, sending in its own pickers with the aim of ensuring the necessary smooth flow of citrus to its plant.

Orange juice will be concentrated down to 65° brix, mandarin juice to 60° brix. As with the Homs plant, sales to the domestic market will be made in 250ml and one litre Tetra Briks. In addition an orange drink consisting of orange juice and a number of other ingredients will be packaged and sold to the domestic market in 330ml cans. These latter cans will have a two-year shelf life. Citrus products will be sold directly to retailers using the company's established marketing network for soft drinks.

The juice processed at the end of last season was sold on the domestic market at approximately the same retail prices as the output of the Homs plant. The 330 ml cans of orange-based drink sold at SP 20.

Recognising the small size of the domestic market, the company intends to export the majority of production. The possibility of exporting concentrate to Lebanon is being investigated, but no firm export sales had been negotiated by September 1999.

(c) Industry Prospects

The prospects for Syria's citrus processing industry are bleak. Syria has a comparative advantage in producing citrus for fresh consumption, not for processing. The industry faces the fundamental problem that citrus prices in Syria are high due to the demand for fresh citrus in the domestic market and in the region.

At a physical conversion rate of 16,¹² a US\$1,450 price of Brazilian orange concentrate delivered to nearby markets (see sub-section 3d, above) is equivalent to a price for fresh oranges of US\$0.0906 per kg. Converted at the approximate September 1999 open market exchange rate of SP53 per US\$, this gives a price for fresh oranges of only SP4.80 per kg.

The Latakia plant has the capacity to extract oil from the skin of the citrus processed for juice. Normally at least 0.25 percent of the total weight of an orange comprises oil, of which about 80 percent can be extracted commercially.

Orange oil is the lowest priced of all the common essential oils. Cold pressed Brazilian orange oil is currently selling in bulk in Western European markets for approximately US\$800 per ton. At such a price, the extractable oil in one kg of oranges is worth approximately US\$0.0016. This is equivalent to SP 0.085 at a rate of exchange of SP53 per US\$.

Even if the Latakia plant could sell its orange oil at five times this price into local and regional markets, it would generate only a further SP0.43 per kg of oranges processed. Thus, the unit value of Syrian oranges when converted into frozen concentrate and sold in nearby markets is likely to be a maximum of SP 5.23 per kg (i.e. SP4.80 plus SP0.43 per kg). This compares with a 1999 wholesale value of fresh Syrian oranges in the Saudi Arabian and Gulf markets of some SP 30 per kg.

To operate profitably, the sales value of the juice and oil would need to cover all the processor's costs from the purchase of fresh citrus at the farm gate or at wholesale markets to the points of sale in nearby markets. Processors were naturally reluctant to provide the study task force with detailed cost data. However, it is evident that, after deducting transport, storage and processing costs, the net amount that a processor could pay to an orange producer at the farm gate would be well below SP5.23 per kg, probably below SP4 per kg.¹³

Such prices would be insufficient to cover even the annual costs of operating a farm comprising *entirely mature* orange trees.

¹² The Latakia plant should be able to achieve at least this conversion rate provided that it is able to acquire oranges with a reasonably high juice content.

¹³ Transport of fresh citrus to the factory would likely to cost a minimum of SP0.30 per kg. The transport of frozen juice to nearby markets would be likely to be at least SP.40 per kg of fresh fruit equivalent. Thus, transport alone would cost a minimum of SP0.70 per kg of fresh fruit equivalent, reducing the net price to cover processing, storage and payment to the farmer to SP4.53 per kg of fresh fruit equivalent.

(d) Solutions

Syria clearly does not have a comparative advantage in the production of oranges for juice. The Government should ensure that no further licences are issued for the importation of juice processing equipment.

However, it is possible that the production of juice could be viable as a small component of a citrus sector geared principally to the production of fresh citrus for domestic consumption and export. In such a sector, the two established plants would acquire and process the lowest quality oranges only, paying prices commensurate with their low quality. At present this is not possible, due to the small-scale of national citrus farms and the lack of an efficient assembly market for citrus. The only way that citrus processing in Syria has a chance of being profitable is through the establishment of a more efficient domestic marketing system that would allow low-quality citrus to be selected and bulked at points close to the farmer. Recommendations for an assembly system that would provide for this are developed in Section VI.

It is also possible that the Latakia processing plant could operate profitably if it were to specialise in the extraction of mandarin juice.¹⁴ Little is known about the international market potential for mandarin juice and a specialised investigation of this was beyond the resources of this study. However, on the evidence available it would seem likely that processing mandarins would be more profitable than processing oranges. This is for two reasons. First, there is no dominant supplier of mandarin juice on the world market. This could make it easier for Syria to establish a market presence. Second, the domestic per kg prices for Syrian mandarins tend to be below those for oranges. It will be important that Future for Food Industry Company undertakes an investigation of possible markets for mandarin juice at the earliest possible date.

¹⁴ The plant at Homs cannot produce mandarin juice because its equipment is not suitable for soft-skinned citrus.

V. FOREIGN MARKETS, EXPORTING AND EXPORT POTENTIAL

1. THE WORLD CITRUS ECONOMY

Data on the world citrus economy are given in Annex Tables V.4. The production of fresh citrus is concentrated in the Mediterranean region and North, Central and South America. Within the Mediterranean region, Spain, Italy and Egypt are the largest producers. Oranges account for roughly two-thirds of world citrus production, tangerines for 17 percent, lemons and limes for 10 percent and grapefruit for 5 percent.

World-wide, roughly one-tenth of fresh citrus production is exported. By far the biggest exporter is Spain, which accounts for some 30 percent of all citrus exports. Other major exporters are the United States, South Africa, Morocco and Greece.

France and Germany are the two largest citrus importing countries, followed by the Netherlands (much of which is re-exported), Japan and the United Kingdom.

The above summary and the annex tables refer to fresh citrus only. A description of world production and trade in citrus juice will be found in Section IV.

2. REGIONAL PRODUCTION AND TRADE

(a) Production and Exports

FAO data on recent production and exports of the main citrus producing countries in the eastern Mediterranean region are shown in Table V.1. Egypt is the largest producer in the region, with a total citrus output roughly four times that of Syria. Some 70 percent of Egyptian citrus production comprises oranges. Turkey is the second largest producer, with an output more than double that of Syria. It is the largest producer of mandarins in the region. Egypt and Turkey both produce substantial quantities of lemons. Lebanon produces about half as much citrus as Syria, principally oranges. Israel is also a significant producer of oranges and grapefruit. However, both its production and exports have been on the decline, and it does not compete in the regional market.

For most types and varieties of citrus, Syria faces strong competition in the Saudi and Gulf markets, especially from Turkey and Egypt. Navel and Valencia oranges face competition during their main seasons, but Syria has the market largely to itself for 20-25 days at the start and end of the Valencia season, when this variety tends to be highly profitable for Syrian exporters. Otherwise, the best prospects in the Saudi and Gulf markets are for Jaffa oranges, which are not widely available from February to May from sources other than Syria.

The regional mandarin market is small compared with that for oranges. For mandarins, Syria's main competitor is Turkey. Syria has a transport cost advantage over Turkey in the key Saudi Arabian and Gulf markets. Syria faces less competition from Egypt in the market for mandarins than in the market for other types of citrus.

(b) Imports

The latest available data on imports of citrus into Saudi Arabia refer to 1996. In that year, Saudi imports of fresh citrus totalled 292,000 tons, comprising 209,000 tons of oranges, 44,000 tons of mandarins, 34,000 tons of lemons and limes and 39,000 tons of other citrus. Based on these figures and the official 1996 Syrian export figures, Syria had only about a one percent share of the Saudi market for citrus. There are no readily available data on imports into other Gulf countries.

TABLE V.1: MEAN ANNUAL PRODUCTION AND EXPORTS OF THE MAIN REGIONAL CITRUS PRODUCERS 1995/96-1997/98

('000 tons)

	Production	Exports
Total		
Egypt	2,659	271
Turkey	1,644	326
Syria	606	11
Lebanon	358	60
Oranges		
Egypt	1,861	255
Turkey	790	66
Syria	306	4
Lebanon	185	50
Lemons & limes		
Egypt	436	n.a.
Turkey	329	95
Syria	53	0
Lebanon	n.a.	n.a.
Mandarins		
Egypt	359	n.a.
Turkey	456	114
Syria	246	7
Lebanon	n.a.	0
Grapefruit		
Egypt	n.a.	n.a.
Turkey	69	51
Syria	11	0
Lebanon	n.a.	n.a.

Note: where the figure is zero or not available (n.a.), production/ exports are negligible.

3. SYRIAN TRADE

(a) Imports

A few years ago, when local lemon prices were high, quantities entered by passengers from Lebanon were relatively high, whereas other citrus inflow was little due to the fact that local production consumption. However these quantities have significantly decreased do to the sufficient local production.

(b) Exports

Exports of citrus from Syria in each of the past three years are analysed by destination in Annex Tables V.1 to V.3. The data in these tables were extracted from information collected by the Ministry of Foreign Trade held at the MAAR Department of Planning and Statistics. The tables show levels of exports that are lower than those indicated by interviews with exporters. Moreover, they show that the weight of exports of mandarins was double that of oranges in both 1997 and 1998, whereas all traders interviewed in the course of this study reported that their exports of

mandarins have been small compared with their exports of oranges. They attributed this to the rapid deterioration of mandarins after harvest, especially in the hot weather conditions experienced in the Gulf.

Regarding the official statistics on exports of citrus, it should further be noted that the export values reported are theoretical values employed for customs valuation and are not actual values that reflect eventual net realisations from sale in foreign markets. These theoretical values are based on estimated current unit values at wholesale markets increased by 70% (see Section III.3.b).

The official data show that in 1997 and 1998 mandarins accounted for over 60 percent of the total value of citrus exports, with oranges accounting for about 30 percent. In 1996, oranges were the most important type, accounting for almost half the total tonnage exported and slightly more than half the total value. The remaining exports comprised principally grapefruit. In each of the past three years, lemons accounted for less than 2 percent of the value of citrus exports.

The export of citrus is dominated by sales to Saudi Arabia and the Gulf countries. Together, these countries have recently accounted for around 90 percent of the value of all citrus exports. The only other important destination is Russia. Exports to Eastern Europe and other parts of the former Soviet Union have been negligible, as have exports to Western Europe and to countries elsewhere in the World.

Saudi Arabia is by far the largest importer of Syrian citrus, accounting for approximately 50 percent of the value of all citrus exports in 1997 and 1998. The official data show that it has become a particularly important market for mandarin exports, for which it accounted for over two-thirds of national exports in 1997 and 1998. Kuwait is Syria's second most important market. It accounted for 16 percent of the value of citrus exports in 1998, for 11 percent in 1997 and for 28 percent in 1996.

Over the period from 1996 to 1998, citrus exports to Russia have averaged some 7.5 percent of the value of citrus exports to all destinations. Exports to Russia have reportedly fallen away in recent years as a result of the cessation of exports under its debt repayment agreement with Syria.

As yet there are no consolidated official data for exports of citrus produced during the most recent 1998/99 season. However, it is evident that there has been a large increase in the quantity exported. All the exporters interviewed confirmed the much higher level of exports.¹⁵ One exporter whom we interviewed claimed to have exported 14,500 tons of citrus during 1998/99. This is greater than the official figure of total national exports in calendar year 1998. Our assessment is that exports of citrus could well have exceeded those in 1998/99.

There are three main reasons for this sharp increase. First, the record national crop pushed domestic prices down to a level that made exporting attractive.¹⁶ Second, crops in competing exporting countries in the region were affected by adverse growing conditions, reducing competition in the Saudi Arabian and Gulf markets. Third, Syrian exporters increased their capacity to wax, pack attractively and otherwise prepare citrus for export.

The major increase in exports in response to market conditions shows a remarkable ability on the part of exporters to rapidly expand their capacity to prepare, transport and sell citrus in foreign markets. This is almost certainly the result of the tradition of packing and exporting mixed shipments of fruits and vegetables. Other than for waxing facilities, exporters can readily divert their packhouse capacity to the preparation of citrus. They can also transport increased quantities of citrus simply by increasing the percentage in each truck dispatched. In addition, the practice of

¹⁵ Amongst the exporters who were prepared to provide the task force with hard data, their combined exports had risen from under 4,000 tons in 1997/98 to about 19,000 tons in 1998/99.

¹⁶ We note in Section III that the available official data on market prices do *not* give strong support to the widely accepted view that market prices were sharply lower in 1998/99.

selling at wholesale markets means that increased amounts can be marketed without the need to develop relationships with buyers.

4. STRUCTURE OF SYRIA'S PRESENT CITRUS EXPORT TRADE

(a) Numbers, Location and Capacity of Exporters

There are thought to be almost 50 fruit and vegetable traders that export citrus, most of whom are based in Damascus. There is only one specialist citrus exporter who regularly exports consignments consisting solely of citrus.¹⁷ The typical citrus exporter owns and operates a packhouse where a range of fruits and vegetables are graded, prepared and packed into crates by hand. These exporters invariably export mixed 17-ton truck loads of fruits and vegetables, of which citrus comprises one or two tons. The lack of specialisation has the advantage that the packhouse can be operated throughout the year, spreading overhead costs and allowing the retention of a core labour force. It also allows price risks to be spread in the volatile regional export markets (see below).

At least three exporters have automatic citrus preparation, sorting and waxing lines consisting of machinery for washing, drying, waxing and sorting by size. In addition to waxing their own citrus, they also undertake waxing for other exporters for a fee. Most of the larger fruit and vegetable exporters have their own cold stores which they use for their own produce and for storing the produce of farmers and other exporters. Citrus is stored short periods while transport is being arranged. Oranges are also stored speculatively for up to three months in anticipation of higher prices during the summer off-season.

The majority of export packhouses are based in Damascus. The specialist citrus exporter is based near Latakia in the heart of the citrus producing area. At least one large citrus farmer, located near Tartous, has an on-farm cold store and a packhouse with a washing, waxing and packing line.

A final category of exporter comprises businessmen who do not have their own packhouse but nevertheless export citrus to benefit from the associated foreign exchange conversion privileges (see below). These businessmen in effect employ a packhouse owner as their agent to assemble, prepare and export citrus on their behalf.

There are no hard data on national citrus packing capacity. It is thought that automated facilities dedicated to citrus have the capacity to pack a total of about 40,000 tons per season. Total national citrus packing capacity is well in excess of this since the manual preparation, sorting and packing facilities used for other fruits and vegetables can readily be switched to citrus. It would seem likely that the present manual and automated packhouses could deal together with a throughput of well in excess of 100,000 tons of citrus during a full season.

(b) Acquisition of Citrus

Exporters either acquire citrus directly from farmers or buy at the wholesale markets. Direct purchases from farmers are made on the tree, at the farm gate or at the packing house gate. Arrangements for direct purchase from farmers may be made by a wholesale market commission agent or directly as a consequence of a farmer visiting a packhouse. When buying directly from a farmer, the exporter may buy the whole crop or only good quality fruit. Direct purchase has the advantage that the exporter can send in his own picking team or, at least, can supervise picking and thereby have some control of picking quality. The most critical requirement is to ensure that the citrus are picked from the tree and are not knocked down and collected from the ground.

Direct purchase has the additional advantage that the exporter can buy the crop from the farmer and then choose the time at which he harvests. He can thus hold the crop on the tree and make spot

¹⁷ This exporter specialises in two commodities: citrus and potatoes.

purchases when local market prices are low, retaining his pre-purchased citrus on the tree until market prices are particularly high. The existence of this possibility also gives the exporter an additional bargaining chip in price negotiations with farmers.

The purchase of the crop on the tree is limited by the generally small size of Syrian citrus farms, by the small size of export shipments, and by the fact that it is only cost effective for relatively large purchases. Consequently, the majority of the citrus purchased for export is acquired either at wholesale markets or directly from farmers at the packhouse. In general, exporters are not prepared to buy a crop on the tree unless it amounts to at least 40 tons. However, they will buy consignments which farmers deliver to them down to 500kg.

The larger exporters use their own trucks for transporting citrus from farms and wholesale markets.

(iii) Preparation and Sorting for Export

Exporters normally sort citrus into from three to five sizes. Mid-sized fruits fetch the highest prices in the Saudi and Gulf markets. Some traders only export mid-sized fruits, while others report exporting all sizes. Between 5 and 30 percent of the weight of the crop is rejected during sorting as unsuitable for export, with the percentage tending to be highest at the end of the season. Rejected fruit is repacked and sold at the local wholesale market at low prices. Exporters outside Damascus report that they often send this citrus to one of the smaller wholesale markets where it tends to sell at higher prices due to the predominance of unsophisticated low-income consumers. In addition to the citrus rejected during sorting, there is a further 4-7 percent loss between the farm-gate and export packhouse, due principally to desiccation.

Exporters are increasingly waxing their citrus before export. Waxed citrus sells at a price premium in the Gulf and Russian markets of up to 25 percent, and also maintains its weight and quality better. Both oranges and mandarins are waxed. However, waxing is not able to prevent the susceptibility of mandarins to rapid deterioration in the hot Saudi and Gulf climates. Some exporters store speculatively but most aim to buy and dispatch daily.

Exports are made in cardboard boxes and also in wooden and plastic crates. The standard for the key Saudi Arabia market is a 9-10kg box. The larger exporters have their own citrus-specific boxes printed with their brand name, package design and details of the number of citrus contained in the box.

There is a specification for Syrian citrus, but export quality control is unavailable. However, the reputation of Syrian citrus has reportedly improved over the past two years due to an increase in waxing and an improvement in preparation.

The introduction of sets of Syrian grades and standards for each type of citrus could do much to improve further the reputation of Syrian citrus in export markets. It would also facilitate forward contracting between farmers or groups of farmers and exporters. Consequently, the routine use of accepted sets of grades and standards would be an important component of the improved system of marketing proposed in Section VI.5, below.

(d) Transport

Other than for the infrequent exports made to England and northwestern Europe, all citrus exports are carried by refrigerated truck. These trucks hold a total of 17-18 tons of fruits and vegetables. The Syrian Government prohibits empty foreign trucks from entering the country, which, due to a lack of refrigerated overland imports, in effect means that exports must be made in Syrian trucks.¹⁸ These trucks are permitted to transit Saudi Arabia to other countries, but exports destined for Saudi Arabia must be transferred into Saudi Arabian trucks at the Saudi border. This raises the shipment cost directly and also leads to losses. All exports must transit either Jordan or Turkey, both of which levy transit fees. Transport costs are increased further by a lack of backloads requiring refrigeration. Exports normally take from three to five days between dispatch from the packing house and delivery at a wholesale market in the Gulf. Selling the citrus at the wholesale market may take several further days.

Losses in transit are reported to be a major problem, especially for imports into Saudi Arabia when changing trucks at the Saudi border. Exporters report losses during this operation of up to 35 percent. The extent of such border problems in the region tends to vary with the state of bilateral diplomatic relationships between Syria and the country concerned, with the levels of delay and damage falling as relationships improve.

There are some 2,000 refrigerated trucks registered in Syria. This fleet is reported by exporters to be just adequate in capacity for the current total level of fruit and vegetable exports. Virtually all the trucks are old, with many dating from the early 1970s. This has two disadvantages. First, their capacity is less than that of most modern refrigerated trucks, leading to higher unit shipment costs. Second, all goods in the truck can only be maintained at one temperature, leading to damage to some components of mixed shipments. An additional problem stems from the fact that there are no large transport companies in Syria – most trucks are owned either by exporters or by individuals. While this may increase competition, it leads to higher maintenance and operating costs due to a lack of economies of scale.

Importers are currently permitted to import only trucks of one year old or less. The high cost of such trucks, coupled with high import tariffs and difficulties in obtaining foreign exchange, means that there has been little addition to the truck fleet in recent years. A short-term solution for exports to countries to the north of Syria would be to allow more modern, higher-capacity Turkish trucks to enter Syria. There are reportedly ninety Turkish truck companies located in the town of Antakya, which is just 40 km from the Syrian border and only 90 km from Latakia. The obvious long-term solution is to allow transporters to import refrigerated trucks without the present restrictions on age. The most appropriate arrangement would be to allow the importation of refrigerated trucks that meet TIR (see below) requirements. This would have the effect of allowing the importation of trucks up to an age of about five years.

Syria signed the Transport Internationaux Routiers (TIR) agreement on 14th January 1999, with a scheduled effective date of 15th July 1999. The agreement has yet to become operational due to the need for Syria to finalise to the satisfaction of the TIR Commission domestic administrative arrangements for information gathering and enforcement. The Ministry of Transport expects that it will take until early December 1999 for Syria to complete all the necessary arrangements.

Syrian membership of the TIR agreement will reduce transport costs to Europe and Russia, since Syrian trucks will not be subject to separate transit fees through each country. Saudi Arabia and the

¹⁸ At the request of exporters, the Ministry of Transport may exceptionally allow the use of Lebanese and Jordanian trucks at peak export periods when there is a demonstrable shortage of Syrian trucks.

Gulf countries are not members of TIR and transit fees through these countries will continue as at present to be determined under the provisions of the Arab Transit Agreement.

For citrus, the key issue is whether TIR membership will have an impact on transit fees through Jordan. Although Jordan is a member of TIR, it has reportedly yet to implement the agreement's provisions. It is likely that, even after Syrian TIR membership becomes operational, Jordan will levy transit fees on Syrian trucks in response to Syria charging fuel-price difference fees and other levies on Jordanian trucks transiting Syria. It is important that the Syrian Government takes the opportunity created by the momentum of TIR membership to negotiate the reduction and, if possible, the elimination of Jordanian transit fees on Syrian trucks.¹⁹

Unlike for shipments to the Gulf, for shipments to Eastern Europe and the FSU, Syria has a significant transport cost disadvantage compared with Turkey. Syrian exporters incur additional costs per ton of US\$70-100 compared with their Turkish counterparts due to the longer transport distance, fees for transiting Turkey and the fact that most Turkish refrigerated trucks are more efficient because they have an additional 25 percent capacity. Implementation of the TIR provisions for Syria will reduce these disadvantages, but the basic problem of being further from European and FSU markets will remain.

Shipments to England and NW Europe are made by sea in refrigerated containers. Obtaining containers has reportedly become more difficult in recent years due to a reduction in inward refrigerated goods, partly as a result of reduced imports of beef resulting from concern over BSE.

(e) Destination Markets, Price Determination and Price Stability

The markets for citrus in Saudi Arabia and the Gulf countries are strongly segmented. There is a high quality market through which citrus is supplied to supermarkets and other quality conscious buyers, such as hotels, and a market for lower qualities for sale principally through traditional retail outlets. The high-quality market has standards as high as those in western Europe. Sales methods are also similar, relying principally on long-term agreements and forward contracts. The traditional market outlets are supplied through wholesale markets.

All Syrian sales of citrus to Saudi Arabia and other Gulf countries are currently through wholesale markets. Exporters use commission agents in these markets in the same way that they are used in Syria's markets. The country and city selected for sale are based on current market prices and on expectations of price developments over the period of shipment. Exporters report that they have no problem in determining current market prices. They do this simply by contacting their local marketing agent by telephone.

Prices in the Gulf markets tend to be highly unstable in the short-term, varying sharply from day to day. This is principally due to the fact that exporters in all the major supplying countries take their decision on export destination at least three days before the product reaches its destination and is sold. This makes the markets inherently unstable because a price increase in a particular market leads to a flood of exports to that market causing prices to fall sharply a few days later. This is likely to pose problems for exporters, but it also gives them the opportunity to occasionally make very high profits. Exporters interviewed during the course of this study provided a wide range of assessments of the extent and speed of price change, and of whether or not they felt they lost or gained from price instability over the long-term. The level and impact of price instability in nearby markets is an area that needs to be investigated systematically.

¹⁹ Since some ten times as many Jordanian trucks transit Syria as Syrian trucks transit Jordan, it should be possible to negotiate an agreement with Jordan that eliminates fees on Syria trucks transiting Jordan but only reduces fees on Jordanian trucks transiting Syria.

The high temperatures and the lack of access to cold storage at markets in the Gulf means that exporters must sell quickly at the ruling price no matter how low this price is. This means that exporting carries a high price risk and, as noted above, is a major reason why Syrian traders spread the risk that they face by exporting mixed fruit and vegetable consignments.

Exports to Eastern Europe and the FSU are sold either at wholesale markets or directly to traders, usually by means of a forward contract. The much larger populations in these countries means that the quantities supplied and demanded are larger than in the Gulf and that prices are consequently more stable in the short term. Moreover, the lower temperatures at most of these markets mean that exports can be stored for a number of days if local prices are unusually low and are expected to recover. However, unlike for sales to the Middle East, exporters experience payment problems and face transport costs that are significantly above those of competing Turkish exporters.

(f) Foreign Exchange and Export Tax Concessions for Fruit and Vegetable Exporters

- **foreign exchange**

Syria operates a multiple exchange rate regime, which is gradually being modified towards a system with a single rate for all currency transactions. The set of rates ruling in each year since 1993 is shown in Table V.2.

TABLE V.2: MEAN EXCHANGE RATES, 1993 to 1998 (SP per US\$)

	1993	1994	1995	1996	1997	1998
Official	11.25	11.25	11.25	11.25	11.25	11.25
Promotion	41.00	43.00	43.00	45.00	45.00	46.00
Neighbouring countries	43.00	43.00	43.00	45.00	45.00	46.00
Market Beirut	49.67	51.20	51.00	51.00	51.00	51.00

The official and promotion rates are now used only for government imports of items such as baby foods and essential pharmaceuticals. The so-called ‘neighbouring countries rate’ applies to most other government imports and exports and to private export earnings that are converted through Government banks. The Beirut market rate is the estimated mean rate at which Syrian Pounds are traded unofficially outside the formal system

All exporters are now permitted to retain 75% of their export earnings. The remaining 25% must be cashed at a Government bank at the neighbouring countries rate of SP46 per US\$. Exporters can use their retained earnings to purchase imports on the Government’s approved list (which includes some consumer goods as well as investment goods, but excludes a list of some 280 important items). Alternatively, they can sell their foreign exchange to potential importers. The rate of exchange for such sales is determined by supply and demand with no Government interference. However the Government should be notified of the sale due to the fact that exporters have to pay symbolic fee to the Government against that sale. Since the Government is unable to meet the demand of importers for foreign exchange at the official rate, the free market rate is invariably above the official rate. The free market rate tends to be slightly higher in winter than in summer, due to the pattern of remittances and earnings from tourism during the summer. It is also normally a few percent above the unofficial rate, reflecting the risks involved in trading in the unofficial currency market. The free-market rate in August 1999 was reported to be some SP 53 per US\$.

Since 1992, fruit and vegetable exporters have received preferential treatment regarding the conversion and use of their foreign exchange earnings. As an incentive, they are permitted to retain 100% of their export earnings instead of only 75%. This means that the earnings of fruit and

vegetable exporters are converted at an effective exchange rate that is higher than that available to exporters of other commodities.

The export incentive for fruit and vegetable exporters is re-enforced by a further concession that allows them to use their foreign exchange to import pickups. The Government is the only other permitted importer of these vehicles. Unlike cars, pickups are subject to a low rate of import tax. This, coupled with their restricted domestic supply, means that fruit and vegetable exporters can sell the pickups that they import at inflated prices thereby in effect converting their export earnings at a substantially higher rate than the free market rate.

The rationale for these foreign exchange concessions is reportedly the perishable nature of fruits and vegetables, the perceived existence of surpluses, and a desire not to allow part of the crop to be spoilt. Whether, the concessions will be effective in the long term would seem questionable, since the increased demand for citrus to export stemming from higher SP export prices will raise prices in the domestic market thereby stimulating production, reducing domestic demand and generating further 'surpluses'.²⁰

- **export tax**

Agricultural products are subject to export tax which ranges between 9 – 12.5 percent. This tax is being progressively eliminated and it is expected that all products will be free of the tax shortly. All fruits, vegetables and olive oil have been exempt from the tax for over two years and cotton was exempted in early 1999. Thus, fruits and vegetables currently receive a degree of preferential export tax treatment compared with some agricultural exports but this is likely to be eliminated in the near future as the preferential treatment is extended to other commodities.

5. COSTS AND EXPORT PARITY PRICE STRUCTURES

(a) The Nature and Purpose of Parity Price Estimation

Table V.3 contains an estimate of the 1998/99 parity price structure for the export of oranges from a Damascus packhouse to Saudi Arabia. This was the most common form of citrus exportation in 1998/99 and is likely to remain so for the foreseeable future. The left-hand column of the table refers to the citrus acquired by packers that are actually exported. The right-hand column refers to citrus that are rejected during grading at the packhouse and sold back into the domestic market.

The price and cost data are based on meetings that the international consultant and Centre trainees had with exporters. These data are typical values rather than the exact values reported by a single exporter. Exporters face large variations in sales prices at markets in Saudi Arabia and the Gulf countries. Consequently, in the absence of more detailed information on prices for Syrian citrus in these markets, the analysis cannot be used to draw conclusions on the competitiveness of Syrian exports. The main purpose of this analysis is to examine the importance of the different cost items facing exporters to determine on which areas attempts to cut costs should be focussed.

²⁰ The notion of surpluses is discussed in Section VI.1.

(b) Selling Prices

First, the overriding importance of the selling price must be emphasised. This is the most important variable in the price structure. For example, if the selling price is reduced by one third to SP20,000 per ton, the farm-gate unit value falls from over SP8 per kg to under SP2 per kg. If it is increased by one-third to SP40,000 per ton, the farm-gate unit value increases to almost SP15 per kg.

Measures to maximise the selling price in export markets should clearly be accorded priority. This requires a combination of measures to improve quality of harvested fruit, to improve, grading packing and presentation, and to otherwise improve the perception of Syrian citrus in export markets.

(c) Sorting Ratios

The net value to the exporter, and therefore to the farmer, of citrus rejected and resold into the domestic market is very low (see the right-hand column of the table). This is partly because citrus are most commonly rejected only during sorting at the packhouse. The net value of rejects is consequently reduced not only as a result of their low intrinsic value but also because of the double transport and handling costs incurred in moving them first to the packhouse and then to a wholesale market. Thus the need is twofold. First the number of low-quality fruits must be minimised through better cultivation and harvesting practices. Second, these fruits need to be isolated at or near the farm to minimise transport and handling costs to the point of final sale. This requires the development of efficient citrus assembly markets at which fruit is sorted into grades for separate delivery to export packhouses, wholesale markets and domestic processors. It additionally requires that any citrus that remains to be rejected at packhouses be sold and transported directly to juice processors.

(d) Costs

It will be seen from Table V.3 that the cost of moving oranges from the packhouse to the wholesale market in Riyadh is by far the largest operating cost incurred by exporters, equal in magnitude to the value of payments to the farmer. This cost amounts to almost SP9,000 per ton compared with only SP750 per ton for transport to the packhouse and SP5,250 for all packhouse costs including waxing. This indicates that the greatest returns to measures too minimise costs are likely to be in the area of international transportation.

TABLE V.3: PARITY PRICE ESTIMATIONS FOR THE EXPORT OF ORANGES TO RIYAD, 1998/99

(SP/ton)

Exports	Rejects
<u>Sale price at Riyad wholesale market</u>	<u>Sale price at Damascus wholesale market</u>
Commission of market agent	Commission of market agent
<u>Net sale price</u>	<u>Net sale price</u>
Unloading at Riyad wholesale market	Transport from packhouse to Damascus wholesale market
Transport from Saudi border to Riyad wholesale market	<u>Unit value packed for domestic market ex-Damascus packhouse</u>
Clearance fee and change of truck at Saudi border	Repacking cost
<u>Unit value at Saudi border</u>	<u>Unit value into-Damascus packhouse</u>
<u>Unit value at Saudi border after losses (10%)</u>	<u>Unit value into-Damascus packhouse net of 5% losses</u>
Transport from Damascus packhouse to Saudi border	
Total of charges for transit through Jordan	
Syrian customs charges	
<u>Unit value packed for export ex-Damascus packhouse</u>	
Other packhouse costs	
Packing labour	
Export box (printed cardboard)	
Waxing cost*	
<u>Unit value into-Damascus packhouse</u>	
<u>Unit value into-Damascus packhouse net of 5% losses</u>	
<u>Unit value into-Damascus packhouse (80%)</u>	<u>Unit value into-Damascus packhouse (20%)</u>
<u>Combined unit value into-Damascus warehouse</u>	
Transport from farm to packhouse	
<u>Farm-gate unit value</u>	

* It is assumed that the packhouse has a waxing line. If not, transport from the farm to the packhouse must be via a packhouse with a waxing line. This adds Some SP0.50 per kg in transport costs. Waxing on commission is currently charged at SP 1.75 per kg compared with a reported cost of SP 1.00 per kg.

VI KEY ISSUES AND POLICIES

1. THE NATURE OF SYRIA'S SURPLUS OF CITRUS

(a) The lack of an Observable Surplus

Citrus is a perishable crop that can only be stored for short periods without marked deterioration. Consequently, unlike for commodities such as wheat, stocks of citrus cannot be carried over from one year to the next. To prevent part of the citrus crop being spoiled, it is essential that all that is produced during a crop year is sold in that year. This, in turn, requires that prices in the domestic market be allowed to fluctuate to ensure that the quantity supplied by farmers is equal to the quantity demanded.

This is indeed what happens in Syria. There is no effective Government intervention to control citrus prices. In this situation, a physical surplus will be observed only if domestic market prices are insufficient to cover farmers' harvesting and marketing costs with the result that farmers leave their citrus to spoil on the farm. Citrus prices have never fallen to such levels in Syria. Consequently, other than for damage and loss during the course of harvesting and marketing, all citrus produced is utilised productively. Most is consumed in the domestic market in fresh form, small quantities are utilised for domestic processing, and small quantities are exported. There is no observable unutilised physical surplus.

(b) Perceptions of the Citrus Surplus

Despite this, the notion persists in Syria that there is currently an annual surplus of several hundred thousand tons of citrus. One common explanation of this relies on a 'surplus' being defined as *the amount by which domestic production exceeds the domestic requirement of the population*. This definition of surplus is based, in turn, on the assumption that there is an ideal annual *per caput* consumption of citrus. Multiplying this *per caput* consumption by the size of the national population gives a national citrus requirement that is below the level of national production. This, it is argued, demonstrates that there is a national surplus. Such a planning notion of surplus is inappropriate for Syrian citrus, since it does not reflect the fact that market forces determine the quantities of citrus consumed.

There are two definitions of surplus that are consistent with the way that the Syrian citrus economy functions. These are based on the two *observable* indicators of surplus in a market economy, namely export quantity and market price. The first such definition of surplus is: *the amount by which national production (net of harvesting and marketing losses) actually exceeds domestic consumption*. This is equal to the quantity exported. Such an export-based definition is the conventional means of specifying a surplus in market economies. However, the tonnage exported from Syria has been only a fraction of the size of the perceived surplus.

The second definition of surplus is: *actual production minus the level of production necessary for ideal prices in the domestic market*. Since, elimination of a surplus would raise prices, the implication of this definition is that domestic prices are lower than ideal. It would seem that it is this price-based definition of surplus that is underpinning the Government's concern for changes in citrus policy. Ultimately, this concern stems from a desire to improve the profitability of citrus farming.

(c) Means of Improving the Profitability of Citrus Production

Within Syria, an increase in exports is viewed as the key means of reducing supply to the domestic market, raising domestic prices and improving the profitability of production.

An increase in exports does indeed reduce supply to the domestic market. However, an increase in exports is dependent upon exports being profitable. This, in turn, requires that exporters can buy citrus in the domestic market at prices that are sufficiently low to allow them to make profits. Thus, the need is not to increase exports *per se*. Improvements in the profitability of citrus farming requires increases in efficiency throughout the production and marketing chain, from the supply of inputs to farmers through to the points of final sale in the domestic and export markets.

Improvements in *the efficiency of exporting* will raise the level of prices in the domestic market at which exporters can acquire citrus and still export profitably. Competition in the domestic market between exporters, and between exporters and traders buying for sale in the domestic market, will result in improvements in exporting efficiency leading to higher domestic market prices and thus to higher prices at the farm gate and to improvements in the profitability of farming. Improvements in *the efficiency of domestic marketing and processing* will result in domestic market prices being translated into higher farm gate prices thereby further raising the profitability of citrus farming. Profitability will be increased further still through improvements in *the efficiency of citrus farming* itself.

Thus, the solution to the present 'surplus' problem lies in improving efficiency in the Syrian citrus economy as a whole. An increase in the volume of exports will be one manifestation of this improvement. This report's recommendations focus on means of achieving the necessary increases in efficiency.

2. THE INSTABILITY OF EXPORT SURPLUSES

Currently, all but a small proportion of national citrus production is consumed domestically. Under present government plans for new planting, domestic production may expand more rapidly than domestic consumption. However, even under the most extreme assumptions, exports are still unlikely to account for more than about one quarter of production by 2009/10.²¹

The geographic concentration of Syrian citrus means that, despite being fully irrigated, production varies greatly from year to year (see section II.2.d). Production variability, coupled with a situation in which most production is consumed domestically, will mean that the surplus available for export will vary markedly from year to year.

For Syria's processing plants to work efficiently at full capacity, they will need to process a fixed quantity of citrus in each year. The annual extraction of a fixed tonnage of citrus from the domestic market will exacerbate year-to-year instability in the quantity of citrus available for export.

²¹ For example, if it is assumed (a) that domestic consumption in 1998/99 was only 600,000 tons, (b) that domestic prices do not fall further than in 1998/99 and that there is no growth in *per caput* incomes, (c) that consumption from this base therefore grows at only the projected rate of population growth, and (d) that production expands at the upper limit of the projected rates (see column D of Table II.5), then domestic consumption in 2009/10 would be 790,000 tons and national production would be 1.052 million tons. The export surplus would be 25% of domestic production.

3. ON WHICH EXPORT MARKETS SHOULD SYRIA FOCUS?

It is important that exporters focus their efforts on those markets that are likely to prove most profitable. The Government, in turn, should focus its support efforts on such markets. The Government must also take a view on which markets are likely to prove to be the most remunerative so that it can formulate production policy in the context of projected demand in these markets.

Syria currently exports its citrus principally to wholesale markets in Saudi Arabia and the Gulf countries. This is not an accident. These markets are highly suited to the current state of development of the Syrian citrus sector. This is for the following reasons:

- they do not demand a high quality, uniform product. This makes them compatible with Syria's small-farm production base, from which it is difficult to extract large volumes of uniform fruits;
- they do not depend on forward contracting. This makes them suitable to the likely situation where the amount of citrus available for export will vary markedly from year-to-year;
- they are already the main destination for other fruit and vegetable exports from Syria. This has two advantages for exporters: (i) it allows them to ship mixed loads, thereby spreading price risks, and (ii) it allows exporters to vary the quantity of citrus that they ship from year-to-year without creating capacity utilisation problems in their packhouses;
- the countries of the Gulf have stable exchange-rate regimes that eliminate currency risks; and
- Syria has a transport cost advantage for exports to the Gulf. Unlike in other markets, this gives it an edge over major competing countries, especially Turkey.

Other than for exchange-rate stability, western European markets have none of these advantages. Even if the Syrian Government were to negotiate favourable import terms into these markets, including a relaxation of the EU's restrictive entry price system, Syrian exporters would be extremely unlikely to be able to compete effectively. They could not assemble the large consignments of high, uniform quality fruits demanded by the agents of the large supermarket chains, and they could not guarantee a regular annual supply. The alternative of selling through an agent at a wholesale market would mean targeting the low-priced end of the market. Given the cost of shipping, this would be unlikely to be anything like as profitable as selling into the Gulf market and it would also involve price uncertainty.

Any export opportunities that do arise in western Europe are likely to be the result of Syrian exporters exploiting small windows of opportunity that arise as a result of the Syrian harvest being slightly ahead of harvests in the citrus-producing EU member countries. Since the EU's restrictive entry price system is designed to protect farmers in member countries during their main harvest season, this system is unlikely to be a major problem for Syria because its provisions will not be in place at the time that Syria exports.

Compared with western Europe, there is more potential for Syrian traders to export to Eastern Europe and the FSU, because the quality and consistency requirements are lower. However, for Syria, these markets lack the transport cost advantages of the Gulf. Exporters also face major exchange rate and payment risks. There is also a problem with physical security and with losses from theft. Exports to this region are likely to remain opportunistic and, compared with regular shipments to the Gulf, relatively infrequent.

Although Saudi Arabia is the main destination for Syrian citrus exports, Syria supplies only a small fraction of total Saudi Arabian citrus imports of around 300,000 tons per year. Based on data for 1995/96 - the latest year for which official data on Saudi citrus imports are available²² - total Syrian citrus exports were equivalent to only 5 percent of Saudi citrus imports. Even if Syrian exports were as high as 50,000 tons in 1999, and assuming 50 percent went to Saudi Arabia, Syria would have accounted for only about 8 percent of Saudi imports. There are no readily available data on total citrus imports into the other Gulf countries, but the assessment of exporters is that Syria currently accounts for no more than 5 percent of citrus imports into these countries.

There is great scope for Syria to expand its exports to Saudi Arabia and the Gulf simply by cutting marginally into the market shares of other suppliers. An important need is for Syria to assess the likely development of exports to these markets by the main suppliers, Egypt and Turkey (see Annex 1, Project Profile 1).

In summary, individual exporters will doubtless continue to investigate markets in terms of potentiality and consistency with the production season. It is recommended that government resources be focussed on measures like grading, preparation and packaging and identify the suitable export periods that help maximize profitability. A clear the export area in which Syria has a comparative advantage is Saudi Arabia and the Gulf countries, but this does not preclude investigating markets in Europe and the FSU.

Over the long-term, Syria should aim to expand its exports into the high-quality segment of the Saudi and Gulf markets. This should be possible once the domestic assembly market has developed and exporters are able to acquire reliably sufficient supplies of high quality produce to allow them to make the necessary forward contracts.

4. LONG-TERM PRODUCTION AND EXPORT STRATEGY

There is considerable potential for expanding citrus production in Syria, especially on land that is being developed through new irrigation schemes.

Current producer prices do not provide an adequate basis for farmers to judge the desirability of planting additional land to citrus. This is because current prices are still influenced principally by the relationship between domestic supply and demand. Consequently, they give a misleading indication of the profitability of production in the future, when producer prices are likely to be more strongly influenced by net realisations from export markets. Given the long time lags between planting and mature yield, it will be essential that the Government takes a view on the likely future profitability of citrus relative to alternative crops and ensures that farmers, to the extent possible, make rational planting decisions.

Our analysis of the costs and profitability of production in 1998/99 shows that mature oranges and lemons were highly profitable but that mature mandarins and grapefruit yielded little or no profit. Coupled with the apparent large increase in orange exports in 1998/99, this indicates that there is likely to be potential for the profitable production of oranges for export but that there may be little potential for mandarins and grapefruit. In the case of lemons, production was profitable because imports have been banned in a situation in which the country has yet to attain self-sufficiency. Since there were virtually no exports of lemons in 1999, no conclusions can be drawn on the profitability of lemon production for export.

Before the Government decides upon a firm policy relating to the expansion of citrus production, further detailed research and analysis will be required. In particular, there is a need for *variety-specific* market analysis that enables export prices to be projected well into the future. This will allow new planting to be focussed on those varieties of oranges that can be sold in export markets at prices that

²² See the FAO data presented in Annex Tables V.4.

yield the highest profits for farmers. It will also be necessary to examine whether *specific varieties* of mandarin and grapefruit may be profitable and whether there is likely to be potential for the profitable production of lemons for export.

The foundation of such estimation must be detailed study of market potential. Section VI.3 discusses the geographic focus of such study. The coverage of a suitable study is proposed in Project Profile 1 in Annex 1.

Once this study is complete, the Government will need to make a detailed analysis of the potential profitability of citrus over, say, the next twenty years, and to develop an appropriate planting plan. Until this is done, it will be prudent for the Government to retain its present modest planting plan. This is likely to lead to production expanding at around the rate of expansion of domestic demand (see Section II.5.c).

5. THE NEED FOR A MARKETING SYSTEM SUITED TO A SITUATION OF SURPLUS

Citrus production in Syria is dominated by small farms that normally grow more than one type of citrus and often several varieties of each type. Harvesting of particular varieties typically spans a two-month period. In the case of lemons, the crop is harvested over most of the year. Coupled with a need for a regular flow of income, these characteristics of Syrian citrus production mean that most farmers market very small amounts of citrus frequently throughout the main harvest season.

Normally, such situations lead either to the creation of marketing cooperatives or to the establishment of a class of small traders that assemble the product. This has not happened in Syria. Consequently, most farmers are forced to transport their citrus to urban wholesale markets themselves.

This has a number of disadvantages. First it means that farmers spend an inordinate amount of their time selling their crop. This causes them to be away from their farm during a period when the need for labour and management are at a premium. Second, the small quantities marketed mean that citrus is normally transported in small trucks or pickups at relatively high unit cost. Third, it forces every farmer to take time investigating market conditions in an attempt to ensure that he delivers his crop to the most remunerative market. Fourth, it means that the farmer has little market power in a system that depends heavily on personal negotiation of selling prices. Fifth, grading and preparation of the product must take place on every farm rather than at specialised facilities. Sixth, only a small number of farmers have sufficient citrus for sale at any point in time for it to be in the interest of an exporter or processor to purchase from them directly. The number of such farmers would be even smaller if, unlike at present, instead of sending all their harvested citrus to a single destination, farmers were to divide it into grades suitable for processing, export and domestic consumption.

The existing crop assembly and marketing system clearly has important deficiencies even for the past situation where virtually all production was consumed domestically as whole fruit. It will be wholly inappropriate for the emerging situation where a significant proportion of the total crop will need to be channeled efficiently to exporters and processors. It is highly inefficient for exporters to acquire citrus from wholesale markets, to grade it and then to re-supply the non-exportable quality back to wholesale markets. Even if exporters buy directly from farmers, it is important that the citrus that they buy has already been graded effectively at or near the farm, thereby preventing the double handling and transport of non-exportable quality that takes place at present. Equally, it is essential that citrus is graded prior to delivery to processing plants to ensure that the processing plants use only the low-quality citrus that is least suited to domestic consumption and export.

The grading of citrus on farm and its subsequent separate delivery to exporters, processors and wholesale markets would be feasible for Syria's largest citrus farmers. However, at best, this would apply to only the 3.1 percent of Syrian citrus farmers that have over 1,200 citrus trees. These account for some 24 percent of national production (see Annex Table II.4). More probably, it would only be feasible for the 0.7 percent of citrus farmers that have over 2,500 trees. These account for only 11 percent of national production.

The need is for a system where the crop grown by small citrus farmers is (a) assembled locally, (b) graded locally into qualities suitable for export, domestic consumption and processing, (c) prepared and packed locally in a form suitable for each market, and (d) transported in bulk to packhouses, wholesale markets and processing plants. This would eliminate all six drawbacks of the existing system.

The most appropriate arrangement would be for farmers to group into local associations that would own simple premises at which citrus would be assembled, sorted, prepared and packed. The necessary investment in physical facilities would be relatively small. The only essential structures would be small stores, sorting tables, and a covered area for workers involved in sorting and preparation. The association would not need to own vehicles since it could use hired transport for both assembly and delivery.

On past experience, farmers associations are unlikely to develop spontaneously. If the Government tries to stimulate them, there is a danger that the association will become absorbed by or closely linked with Government. Possibly the only feasible way of establishing the right sort of farmers association is through assistance from a donor. The donor could provide seed money for the establishment of pilot associations, say, one in Latakia and one in Tartous. The donor could also provide technical support until the associations were up and running effectively. If successful, farmers in other villages would be likely to replicate the pilot schemes using their own or borrowed resources. A possible feasibility study for donor assistance for establishing citrus farmers' associations is outlined in Project Profile 2 in Annex 1.

At the very least, it will be a number of years before the majority of Syria's citrus is sorted at or near the farm, with selected qualities being channeled directly to exporters and processors. Moreover, even when this is achieved, exporters are likely to undertake further sorting leading to additional amounts being rejected as unsuitable for exporting. The recycling of low-quality citrus rejected by exporters is currently particularly inefficient because the majority of exporters are located in Damascus, whereas the largest processor is located near Latakia in the main producing area and the second processor is located at Homs, between the producing areas and Damascus. To minimise transport costs, it will be essential that as much packhouse capacity as possible is located in or near the major producing areas. Thus, it is important that the Government takes action to minimise the constraints both on the operations of existing packhouses in the producing areas and on the establishment of new packhouses.

6. MARKETING EXTENSION AND MARKET INFORMATION

In addition to knowledge of technical aspects of citrus growing, farmers need to make a large number of commercial decisions. Annually, they must take long-term investment decisions on the types and varieties to grow and, throughout the harvest season, they must take short-term management decisions on the harvesting, preparation and sale of their produce. To make such decisions effectively, they must develop business and market-related skills, they must acquire knowledge of appropriate harvest and post harvest techniques, and they must have access to timely market information and analysis. The MARR extension system currently gives farmers less support in these areas than in the area of cultivation.

(a) Investment Decisions

The Government is still the main supplier of fertiliser and credit. Consequently, it can influence farmers' planting decisions through incentive packages that change fertiliser prices and affect interest rates and credit repayment terms. It can also restrict farmers' planting of citrus to certain types and varieties through the supply of plants. However, ultimately the farmer is left with (a) a choice of whether to plant, (b) a (restricted) choice of what to plant, and (c) a choice of whether to switch to a new type or variety through regrafting. As noted above, the long time lag between planting or regrafting and achieving mature yield makes this decision extremely difficult for farmers.

In the absence of advice, there is a danger that the majority of farmers will simply choose to plant and/or switch into the type and variety that is currently providing the highest gross margin. During the present period of transition for each type and variety from import deficit through self-sufficiency to export surplus, this is unlikely to lead to farmers as a group producing the optimal mix of output that is most suited to meeting future domestic demand and maximising the return from exports.

Consequently, it will be essential that the Government provides farmers with advice on market prospects and on how to assess which type and variety of citrus is likely ultimately to prove to be the most profitable.

(b) Harvesting and Post-Harvest Activities

Farmers will also need advice on the most appropriate means of harvesting, grading, preparing and packing their citrus and on selection of the best marketing outlet. They will also benefit from advice on the potential advantages of storage, both on the tree and in rented cold stores. Advice on storage and also to a lesser extent on grading, preparation and packing will need to reflect the conditions existing during the season in question and will need to be specific to each citrus type and, to the extent possible, to each variety.

To provide farmers with such advice, two actions will be required. First, front-line MAAR staff must be given a basic training in marketing extension. Second, there must be regular analysis of market conditions and potential plus a system for disseminating the findings through to farmers. The dissemination system could be centred on the extension system itself, with MAAR staff being briefed on market conditions periodically prior to briefing farmers. Alternatively, MAAR could provide market briefings directly to farmers, either through periodic radio or TV programmes, newspaper articles or written briefing material that farmers could access through the extension service.

It is recommended that the Government consider requesting a donor to support the establishment of an appropriate marketing extension system for citrus. The necessary preparatory actions would be: (a) identification of the main areas in which farmers need marketing extension support, (b) evaluation of the extent to which such support is provided by the present extension system, (c) development of proposals for supplementing the present system, and (d) identification and costing of the training and investment requirements. It is possible that a donor would be prepared to finance each of these actions.

(c) Market Information

The need for a market information system is highlighted in Section II.2.b. Section II.3.b describes the market information that the Government collects at present.

Substantial resources are currently devoted to wholesale market price collection by two separate ministries, MAAR and the Ministry of Supply and Home Trade. The need is to employ these resources effectively in a system in which prices are collected, analysed and disseminated rapidly to farmers. The scope of work for a short project to design a fruit and vegetable market information system will be found in Annex 1 Profile 3.

7. GOVERNMENT ANALYSIS AND STATISTICS

This study has highlighted the need for more comprehensive and improved statistics on the citrus sector. There is also need for the creation of capacity within Government to use these statistics to underpin Government policies and actions.

(a) Improving Statistics on the Citrus Sub-Sector

Establishment of the market information system recommended above would lead to more comprehensive and accurate data on wholesale market prices. This would leave to two key areas in which there is a need to improve the availability of data for the analysis of citrus policy:

- the age structure of trees

Accurate projection of citrus production requires data on the age structure of the national tree stock. Separate data are needed for original and for re-grafted trees.

Since there has now been large-scale planting of citrus for two decades and also a degree of re-grafting, indirect methods of estimating the age structure of the tree population are unsatisfactory. Moreover, data on the tree population need to be disaggregated by type and variety if they are to serve as a useful input into production planning.

The only means of obtaining such detailed data is for MAAR to undertake a census of citrus trees. For each type and variety of citrus, such a census would aim to establish the number of trees of each age. MAAR could undertake this census at relatively low incremental cost using its front-line extension staff, since these staff already undertake an annual census of tree numbers. The most appropriate time for this census would be the summer of 2000.

- export data

As an input into the formulation of citrus production policy the Government needs data on the variety of citrus exported as well as simply the type. These data could be collected either directly from exporters or by increasing the detail recorded by customs at the point of export. The Government needs to decide on which system would be most cost effective and to develop and introduce it at the earliest possible date.

(b) Improving the Capacity of the Government to Undertake Citrus Policy Analysis

Once fully established, the NAPC will provide much of the capacity necessary for broad strategy formulation for the citrus sector. However, in addition much detailed citrus-specific analysis will need to be undertaken regularly if optimal decisions are to be taken routinely on, for example, the quantity, types and varieties of citrus plants to be produced by the Citrus Board. There will also be a need for regular situation and outlook analysis of the sector to underpin the marketing extension advice to be given routinely to farmers.

Such analysis will be most effective if it is undertaken by a citrus unit staffed by one or more Government economists who specialise solely in citrus. The unit would be responsible for:

- routinely collecting and analysing secondary data on the citrus industry;
- developing detailed recommendations for improved data collection;
- preparing situation and outlook reports;
- designing and analysing the results of a census of the age structure of citrus trees;
- making short-term and updating long-term production projections;
- organising, overseeing and processing periodic *ad hoc* surveys; and
- undertaking specific pieces of research and analysis needed as the basis for government decision-making.

There are two possible locations for the unit. It could be situated at the Citrus Board. This would have the advantage of allowing close liaison with the Board's Extension and Training Department and its Trees and Seedlings Division. Alternatively it could be located at MAAR Governorate Headquarters in Latakia. This would have the advantage of closer integration into Government planning and decision-making machinery. It would also allow easier liaison with staff working on competing crops. Donors may be prepared to provide technical assistance for the design and establishment of such a unit and for the training of staff.

VII RECOMMENDATIONS

This section summarises recommendations that are developed in sections II to VI of the report. Annex 1 contains brief project profiles for possible donor support of three key recommendations.

The recommendations are arranged by topic. The subsections shown in parenthesis after each recommendation indicate where in the report the recommendation is developed.

1. PRODUCTION

It is recommended that the Government:

- (i) retains its present planting targets pending development of a new planting plan following completion of the detailed examination of export markets outlined in Annex 1 Project Profile 1 (Section VI.4);
- (ii) ensures that the Citrus Board gives priority to establishing whether Syrian sour orange rootstock is resistant to *citrus tristeza virus* and to developing suitable alternative rootstocks (Section II.2.b);
- (iii) introduces the metering of irrigation water from Government schemes to increase the efficiency of water use and to minimise disease and other problems created by over use (Section II.2.f);

2. DOMESTIC MARKETING

It is recommended that the Government:

- (i) makes the cornerstone of its policies towards the citrus sector the creation of an efficient assembly market for citrus under which citrus is sorted at points near the farm gate into grades for export, grades for sale to the domestic fresh citrus market, and grades for processing into juice and citrus oil (Sections IV.4.d and V.4.c and VI.5);
- (ii) seeks donor support for the establishment of pilot farmers associations for local assembly, sorting and preparation of citrus (Section VI.5);
- (iii) takes a decision on whether to encourage the establishment of national grades and standards for citrus following completion of the detailed examination of export markets outlined in Annex 1 Project Profile 1 (Section V.3.c);
- (iv) establishes an effective marketing extension system, possibly with donor support (Section VI.6.b);
- (v) establishes an effective market information system for citrus and other fruits and vegetables, possibly with donor support. A project profile for this and the scope of work of a short preparation mission will be found in Annex 1 Profile 3 (Sections II.2.b, II.3.b and VI.6.c).

3. PROCESSING

It is recommended that the Government:

- (a) limit licences issued for the importation of citrus processing equipment till significant surplus is produced to be absorbed by processing and the commodity value added increased. (Section IV.4.d);
- (b) the Government should entrust a specialized body to carry out a study on citrus juice and oil markets in order to support exporters and inform them of the potential markets. (Section IV.4.d).

4. EXPORTS

It is recommended that the Government:

- (a) conduct an overall study on all potential markets with specific attention given to the improvement of products' quality to maximize profitability. Special attention should also be given to the markets of Saudi Arabia and the Gulf markets to benefit from the comparative advantage. (Section VI.3);
- (b) permits Syrian citrus exporters, as a short-term measure, to use trucks registered in Turkey (Section 5.3.d).(b);
- (c) Release the importation of refrigerated trucks that are less than five years old provided they meet TIR standards. (Section 5.3.d);
- (d) should *not*, in trade negotiations with the European Union, place high priority on obtaining quotas for citrus access that is free from the Union's entry-price system (Section VI.3);
- (e) minimises constraints to the establishment and operation of packhouses located in the main producing areas (Section VI.5);
- (f) undertakes a survey of all potential markets for citrus including Saudi Arabia, Gulf, Western Europe, Eastern Europe and others to identify the requirements of these markets and consider the possibility of maximizing profitability. The scope of work for such a study will be found in Annex 1, Profile 1. (Section VI.3 and VI.4).

5. STATISTICS AND ANALYSIS

It is recommended that the Government:

- (a) increases its capacity to undertake the regular statistical and economic analysis necessary for public decision-making in the citrus sector and for providing effective financial management and marketing extension advice to farmers (Section VI.7.b);
- (b) undertakes a national census of citrus trees to establish the age structure of trees of each type and variety (Section VI.7.a);
- (c) establishes a system for accurately collecting data on the monthly tonnage of each type and variety of citrus exported (Section VI.7.a).

ANNEX 1
PROJECT PROFILES

PROJECT PROFILE 1

REVIEW OF THE SAUDI ARABIA AND GULF MARKETS FOR CITRUS

1. BACKGROUND

Saudi Arabia and the Gulf countries are currently by far the most important markets for Syrian exports of citrus, yet Syria accounts for only a small proportion of their total citrus imports. These countries have the potential to absorb large increases in Syrian exports. They are likely to remain the most profitable destinations for Syrian citrus for the foreseeable future.

It is vital that both the Government and exporters have clear, detailed information on the present structure and operation of these key markets, their likely direction of development, and the extent of potential competition from Egypt, Turkey and other sources of supply.

2. OBJECTIVE

To provide information on the Saudi Arabian and other Gulf markets for citrus necessary for (a) strategic planning of the development of the citrus sector by the Government and (b) efficient investment planning by Syrian traders and packhouses.

3. SCOPE OF WORK

The review will cover Saudi Arabia and each other country in the Gulf region that is a significant importer of citrus. It will cover each important supplier to the region, including Egypt and Turkey. It will be essential that the review covers oranges, mandarins, lemons and grapefruit separately, and that it distinguishes between key varieties of each. This is because, *inter alia*, the review will serve as an input into Government planning of production at Citrus Board nurseries.

The review will:

- (a) Determine the current size and structure of each national market.
- (b) Determine seasonal delivery and price patterns.
- (c) Assess the magnitude of short-term price instability and its impact on exporters.
- (d) Investigate, describe and assess methods of price formation and trading, other than at wholesale markets.
- (e) Survey perceptions of Syrian citrus among buyers.
- (f) Estimate the quantities of each type and variety supplied to each market by each exporting country.
- (g) Review the production and export prospects of each major competing exporting country, taking account of the projected development of the exports of these countries to other destinations.
- (h) Use the above information and analysis to assess market growth prospects for each type and variety and to make projections of prices in key markets for all four major types and for each important variety grown in Syrian.
- (i) Recommend means of improving the prices fetched by Syrian citrus.
- (j) Evaluate the advantages of introducing a set of Syrian grades and standards and a quality certification procedure.
- (k) Assess the possibility and benefits of storing at destination.

4. RESOURCES

Horticultural export marketing specialist with prior knowledge of Middle East citrus production and markets (3 months).

Provision for the specialist to make two visits to Syria, and single field visits to Saudi Arabia, other Gulf countries, and the main competing suppliers, including Turkey and Egypt.

5. REPORT DISTRIBUTION

The government will employ the report for its own use and will also distribute copies to registered citrus exporters and chambers of agriculture.

PROJECT PROFILE 2

FEASIBILITY STUDY OF PILOT MARKETING ASSOCIATIONS FOR SMALL-SCALE CITRUS FARMERS

1. BACKGROUND

Syria has over 27,000 citrus farmers. The vast majority of these have small farms that are planted to a variety of citrus types and varieties. There is no rural market for citrus under which the output of farmers is assembled locally prior to transport to urban markets. Consequently, small-scale farmers typically transport small lorry loads to urban wholesale markets several times per week throughout the marketing season. This has the following disadvantages:

- it means that farmers spend an inordinate amount of their time selling their crop. This causes them to be away from their farm during a period when the need for labour and management are at a premium;
- the small quantities marketed mean that transport is normally in small trucks or pickups at relatively high unit cost;
- it forces every farmer to take time repeatedly investigating market conditions in an attempt to ensure that he always delivers the crop to the most remunerative market;
- it means that the farmer has little market power in a system that depends heavily on personal negotiation of selling prices;
- grading and preparation of the product must take place on every farm rather than at specialised facilities; and
- only a small number farmers have sufficient citrus for sale at any point in time for it to be in the interest of an exporter or processor to contract to purchase from them directly.

One possible means of efficiently assembling farmers' produce would be through the creation of farmers' associations.

2. OBJECTIVES

- (a) Develop recommendations for the appropriate role, structure, size and number of possible citrus marketing associations in the main citrus producing areas.
- (b) Assess the net benefits of forming such associations.
- (c) Prepare detailed terms of reference for a mission to prepare a project to establish pilot marketing associations for citrus farmers.

3. SCOPE OF WORK

- (a) Examine in detail how small-scale farmers currently grade, prepare, pack and transport their citrus. Assess the advantages and disadvantages of these current methods.
- (b) Recommend the optimal size of each association in terms of numbers of farmers and catchment area, and estimate the total number of associations necessary for full coverage of the main citrus areas.
- (c) Recommend the post-harvest activities that the association should undertake, and assess whether the activities of the association should be limited to citrus or should embrace other agricultural commodities.
- (d) Determine and cost the physical infrastructure needed by each association.
- (e) Recommend an organisational structure for each association and for control of the association by its members.

- (f) Recommend and cost an appropriate staff structure for the organisation.
- (g) Devise and recommend a system for determining the net payment to be made to each association member for citrus sold through the association.
- (h) Recommend the number and approximate location of pilot marketing associations.
- (i) Prepare detailed terms of reference and estimate the cost of a mission to prepare a project to establish pilot marketing associations for citrus farmers.

4. RESOURCES

One Team Leader/Marketing Economist (five weeks) and one Citrus Marketing Specialist with experience in horticultural cooperatives and technical aspects of citrus grading and preparation (three weeks).

Provision for accommodation and travel within Syria.

PROJECT PROFILE 3

DESIGN OF A FRUIT AND VEGETABLE MARKET INFORMATION SYSTEM

1. BACKGROUND

The majority of Syria's fruits and vegetables are sold through urban wholesale markets. Farmers typically deliver their produce directly to these markets. Roads between the main horticultural producing areas and urban markets are good and hired transport is readily available. Consequently farmers seek to deliver to the market likely to yield the highest net returns.

Prices at wholesale markets change markedly from day to day. Currently farmers telephone market traders to get an indication of the prices ruling in different markets. However, traders are not always a reliable source of price information since it is in their interest that farmers deliver to the market at which they are based.

The Ministry of Agriculture and Agrarian Reform and the Ministry of Supply and Home Trade both routinely collect prices at Syria's urban wholesale markets. However, there is no effective system in Syria that makes this information available to farmers on a daily basis.

Creation of an effective system would be likely to raise the net returns of farmers and would lead to greater market efficiency.

2. OBJECTIVE

To prepare a detailed proposal for a fruit and vegetable market information in Syria.

3. SCOPE OF WORK

- (a) Review the present collection of fruit and vegetable market prices by the Government and describe the uses that are made of the data collected.
- (b) Assess the resources devoted to the present price collection exercises.
- (c) Assess the need for fruit and vegetable market information, and determine the types of information that are most needed by potential users, including farmers and traders.
- (d) Recommend where a possible fruit and vegetable information system should be placed organisationally within Government.
- (e) Recommend:
 - a set of fruits and vegetables to be covered by an information system;
 - the frequency with which prices should be collected and disseminated;
 - whether the system should focus on wholesale market prices only or also on prices at other points in the marketing chain;
 - the number and location of the markets that the system should cover;
 - methods of price collection, including time of day, types and numbers of traders to be surveyed, and means of arriving at an indicative price for each type of produce;
 - means of dealing effectively with variations in the quality of the produce marketed.
- (f) Recommend means of transmitting data from each governorate to Damascus.
- (g) Recommend systems for routinely entering and processing data.
- (h) Assess and make recommendations on the most appropriate means of disseminating information to farmers and other users.

- (i) Make detailed recommendations for *ex post* data analysis and for periodic dissemination of consolidated information.
- (j) Assess and make recommendations on whether information other than daily prices should be routinely disseminated, such as situation and outlook reports and period reviews of market prospects.
- (k) Assess the requirements for staff training, and recommend training programmes.
- (l) Make estimates of the cost of each element of the system, including the cost of staff and equipment. Compare the estimated total cost of the system with estimates of the current combined costs incurred by the Ministry of Agriculture and Agrarian Reform and the Ministry of Supply and Home Trade in collecting and analysing fruit and vegetable prices.

4. RESOURCES

Economist with experience in the development, operation and evaluation of agricultural market information systems (six weeks).

Provision for accommodation and travel within Syria.

ANNEX TABLES

1.1 FRESH CITRUS FRUIT: World production by country¹

Total citrus

	1970/71 1978/79 average	1980/81 1988/89 average	1994/95	1995/96	1996/97	1997/98 preliminary
	(thousand tons)					
WORLD	48,204	57,529	78,487	83,972	85,034	89,896
Northern Hemisphere²	35,125	39,874	56,281	58,261	58,949	61,659
United States ³	11,910	10,292	13,565	13,509	14,689	15,280
Mediterranean Region	11,926	14,316	17,787	17,911	17,895	18,076
Greece	656	884	1,259	1,142	1,265	1,349
Italy	2,713	3,102	2,847	3,348	3,402	3,142
Spain	2,729	3,472	5,168	4,679	4,418	5,506
Israel	1,571	1,408	920	967	902	886
Algeria	479	287	275	269	268	...
Morocco	858	1,098	1,065	1,378	1,193	1,552
Tunisia	151	214	194	221	211	212
Cyprus	232	304	281	259	288	224
Egypt	956	1,402	2,472	2,472	2,818	2,689
Lebanon	319	349	307	349	358	366
Turkey	870	1,205	1,924	1,755	1,795	1,381
Syria	27	319	619	566	696	555
Former USSR	144	287	103	127	133	127
Japan	3,768	3,221	1,685	1,764	1,554	1,904
Cuba	216	676	605	654	799	...
Mexico	1,989	2,480	4,894	5,028	4,950	5,200
China	685	1,708	6,397	7,639	7,991	8,761
India	1,721	1,894	3,005	3,150	3,152	...
Southern Hemisphere⁴	13,079	17,655	22,205	25,711	26,086	28,248
Argentina	1,446	1,468	2,007	2,092	2,127	2,460
Brazil	7,486	11,399	14,814	17,868	17,872	20,658
Uruguay	84	148	230	250	290	359
Venezuela	277	390	603	552	523	...
United States	864	876	737	713	837	1,043
Australia	447	538	523	711	699	408
South Africa	619	708	987	1,173	1,221	1,044

Source: FAO, *Citrus Fruit Processed and Fresh: Annual Statistics 1998*, CCP: CI 98/CRS.1, Rome.

1. Crop-year totals include the northern hemisphere harvests starting in the autumn of the year shown and the southern hemisphere harvest of the following year. The world, hemisphere and Mediterranean totals include estimates of production in other producing countries not shown in the table. The data on Syria have been added to the original FAO table.
2. The season extends approximately from October/November to May/June.
3. Excluding California Valencia orange production which is included in the summer season (southern hemisphere) totals.
4. The season extends approximately from April/May to November/December.

1.2 FRESH CITRUS FRUIT: World production by country¹

Oranges

	1970/71 1978/79 average	1980/81 1988/89 average	1994/95	1995/96	1996/97	1997/98 preliminary
	(thousand tons)					
WORLD	31,441	38,624	51,794	55,649	56,559	60,375
Northern Hemisphere²	21,308	23,607	33,471	33,884	34,833	36,757
United States ³	7,914	6,754	9,738	9,740	10,762	11,621
Mediterranean Region	7,906	9,039	10,820	10,984	10,592	10,791
Greece	465	661	1,030	900	995	1,100
Italy	1,584	1,929	1,809	2,119	2,181	2,000
Spain	1,860	1,885	2,759	2,512	2,248	2,806
Israel	1,049	816	365	440	367	397
Algeria	335	187	140	140	140	...
Morocco	630	774	705	960	766	1,091
Tunisia	94	152	136	162	149	160
Cyprus	138	156	128	132	133	115
Egypt	748	1,150	1,890	1,890	1,910	1,784
Lebanon	207	227	137	180	185	190
Turkey	535	689	970	790	840	740
Syria	28	59	341	303	378	238
Former USSR	123	287	103	127	133	127
Japan	335	348	144	136	124	131
Cuba	133	395	350	283	482	480
Mexico	1,324	1,602	3,570	3,590	3,500	3,700
China	392	407	1,633	1,727	1,850	2,086
India	1,223	1,327	2,005	2,080	2,080	...
Southern Hemisphere⁴	10,133	15,017	18,323	21,765	21,726	23,619
Argentina	772	628	712	788	703	841
Brazil	6,084	10,531	13,460	16,520	16,973	18,972
Uruguay	43	71	127	141	166	185
Venezuela	259	387	594	543	514	...
United States	837	876	737	713	837	1,043
Australia	344	433	416	589	559	369
South Africa	495	565	770	930	970	970

Source: FAO, *Citrus Fruit Processed and Fresh: Annual Statistics 1998*, CCP: CI 98/CRS.1, Rome.

1. Crop-year totals include the northern hemisphere harvests starting in the autumn of the year shown and the southern hemisphere harvest of the following year. The world, hemisphere and Mediterranean totals include estimates of production in other producing countries not shown in the table. The data on Syria have been added to the original FAO table.
2. The season extends approximately from October/November to May/June.
3. Excluding California Valencia orange production which is included in the summer season (southern hemisphere) totals.
4. The season extends approximately from April/May to November/December.

1.3 FRESH CITRUS FRUIT: World production by country ¹

Tangerines

	1970/71 1978/79 average	1980/81 1988/89 average	1994/95	1995/96	1996/97	1997/98 preliminary
	(thousand tons)					
WORLD	6,730	8,745	12,808	14,322	14,303	15,576
Northern Hemisphere ²	6,058	7,788	11,595	13,060	12,923	14,161
United States	381	353	389	416	540	443
Mediterranean Region	1,628	2,508	3,879	3,973	3,818	4,141
Greece	34	52	80	85	100	80
Italy	324	413	468	528	505	540
Spain	600	1,053	1,749	1,639	1,509	1,956
Israel	63	112	130	122	112	117
Algeria	149	90	111	111	111	...
Morocco	177	302	342	398	403	438
Tunisia	26	39	40	38	44	39
Egypt	86	108	358	358	360	360
Turkey	105	219	430	510	490	368
Syria	18	100	215	213	258	268
Japan	3,396	2,873	1,539	1,626	1,428	1,773
Cuba	13	29	6	6	6	6
Mexico	143	123	192	265	260	270
China	235	1,136	4,423	5,509	5,730	6,250
Southern Hemisphere ³	672	957	1,213	1,262	1,380	1,425
Argentina	240	258	346	380	336	410
Brazil	284	471	560	560	670	753
Uruguay	18	38	50	82	88	108

Source: FAO, *Citrus Fruit Processed and Fresh: Annual Statistics 1998*, CCP: CI 98/CRS.1, Rome.

1. Crop-year totals include the northern hemisphere harvests starting in the autumn of the year shown and the southern hemisphere harvest of the following year. The world, hemisphere and Mediterranean totals include estimates of production in other producing countries not shown in the table. The data on Syria have been added to the original FAO table.
2. The season extends approximately from October/November to May/June.
3. The season extends approximately from April/May to November/December.

1.4 FRESH CITRUS FRUIT: World production by country ¹

Lemons and limes

	1970/71 1978/79 average	1980/81 1988/89 average	1994/95	1995/96	1996/97	1997/98 preliminary
	(thousand tons)					
WORLD	4 180.4	5 817.3	8 409.3	8 483.3	9 198.1	9 299.2
Northern Hemisphere ²	3 476.3	4 654.0	6 317.5	6 395.8	6 831.2	6 689.1
United States	782.4	857.7	802.9	887.9	768.9	836.9
Mediterranean Region	1 613.6	2 127.4	2 388.8	2 298.3	2 784.6	2 547.6
Greece	166.8	166.3	140.0	148.0	160.0	160.0
Italy	777.8	752.9	565.0	699.0	713.9	600.0
Spain	214.2	520.4	622.8	499.3	641.0	723.0
Israel	40.4	57.8	25.6	20.0	16.9	20.0
Algeria	10.9	7.4	21.2	15.7	14.5	15.4
Morocco	6.2	14.9	15.0	15.0	20.0	20.0
Tunisia	17.1	19.5	12.5	15.1	11.0	12.5
Cyprus	30.1	45.5	41.7	35.0	41.6	26.9
Egypt	72.7	141.5	221.0	221.0	544.5	544.5
Turkey	154.9	270.3	469.7	390.0	385.0	212.0
Syria	7.2	12.8	63.3	49.6	60.3	48.9
Cuba	12.2	48.4	18.5	15.0	15.0	...
Mexico	336.7	640.7	972.0	928.0	960.0	985.0
China	12.8	50.1	166.7	200.8	203.6	206.6
Southern Hemisphere ³	704.1	1 163.3	2 091.8	2 087.5	2 366.9	2 610.1
Argentina	267.7	422.4	741.0	720.0	871.0	980.0
Brazil	143.6	353.0	732.0	726.0	780.0	871.0
Chile	59.9	64.1	110.0	120.0	160.0	...
Uruguay	10.6	31.9	44.4	36.5	51.0	53.0
Australia	36.3	39.7	32.0	40.0	38.0	39.0
South Africa	27.2	56.8	63.0	71.0	74.0	74.0

Source: FAO, *Citrus Fruit Processed and Fresh: Annual Statistics 1998*, CCP: CI 98/CRS.1, Rome.

1. Crop-year totals include the northern hemisphere harvests starting in the autumn of the year shown and the southern hemisphere harvest of the following year. The world, hemisphere and Mediterranean totals include estimates of production in other producing countries not shown in the table. The data on Syria have been added to the original FAO table.
2. The season extends approximately from October/November to May/June.
3. The season extends approximately from April/May to November/December.

1.5 FRESH CITRUS FRUIT: World production by country ¹

Grapefruit

	1970/71 1978/79 average	1980/81 1988/89 average	1994/95	1995/96	1996/97	1997/98 preliminary
	(thousand tons)					
WORLD	3 875.9	4 343.4	5 475.3	5 518.3	4 974.8	4 646.6
Northern Hemisphere ²	3 427.1	3 825.7	4 897.5	4 922.0	4 361.6	4 052.0
United States	2 512.4	2 327.2	2 635.1	2 464.5	2 619.1	2 379.4
Mediterranean Region	561.6	641.8	698.2	655.9	700.9	584.6
Italy	2.0	6.4	5.0	2.0	2.0	2.0
Spain	6.0	13.5	36.4	29.0	20.0	21.0
Israel	421.9	422.1	400.3	385.0	406.6	352.0
Algeria	4.3	2.6	2.4	2.5	2.2	1.5
Morocco	11.8	6.7	3.0	4.0	3.0	3.0
Tunisia	4.0	4.9	5.7	5.8	7.8	...
Cyprus	59.0	98.2	100.9	78.0	93.1	66.0
Turkey	12.0	25.9	54.0	65.0	80.0	61.0
Syria					13.4	20.0
Cuba	26.5	203.7	230.0	350.0	296.0	300.0
Mexico	96.6	114.0	160.0	245.0	230.0	245.0
China	65.1	114.4	173.8	201.8	207.7	218.2
Southern Hemisphere ³	448.9	517.7	577.8	596.3	613.2	594.6
Argentina	161.6	160	208	204	216.4	229.2
Brazil	32.2	44.7	62	62	62	...
Australia	19.3	31.6	16	20	20	...
South Africa	76.9	86.7	154	172	177	177

Source: FAO, *Citrus Fruit Processed and Fresh: Annual Statistics 1998*, CCP: CI 98/CRS.1, Rome.

1. Crop-year totals include the northern hemisphere harvests starting in the autumn of the year shown and the southern hemisphere harvest of the following year. The world, hemisphere and Mediterranean totals include estimates of production in other producing countries not shown in the table. The data on Syria have been added to the original FAO table.
2. The season extends approximately from October/November to May/June.
The season extends approximately from April/May to November/December.

2.1 FRESH CITRUS FRUIT: World exports by country ¹

Total citrus

	1970/71 1978/79 average	1980/81 1988/89 average	1994/95	1995/96	1996/97	1997/98 preliminary
	(thousand tons)					
WORLD	6 462.0	7 192.9	8 986.6	9 062.2	8 978.3	9 383.0
Northern Hemisphere	5 916.9	6 458.8	7 765.9	7 610.7	7 510.3	7 913.6
United States ²	775.4	887.0	1 214.0	1 152.0	1 227.0	1 173.0
Mediterranean Region	4 688.3	4 704.3	5 262.7	5 152.8	5 136.0	5 221.2
Greece	216.3	255.0	434.1	410.4	436.0	455.0
Italy	396.0	265.9	179.0	249.0	148.9	140.0
Spain	1 602.0	2 006.1	2 850.5	2 502.9	2 675.4	2 871.0
Israel	904.1	587.9	328.5	337.0	331.2	347.5
Algeria	93.9	13.7	2.0	-	1.5	...
Morocco	578.2	584.9	400.8	619.8	513.8	700.1
Tunisia	31.3	35.1	24.5	21.7	16.1	25.0
Cyprus	177.0	215.1	137.4	175.0	148.4	118.7
Egypt	145.5	153.2	262.6	262.6	274.5	274.5
Lebanon	164.6	96.9	60.8	60.8	59.0	...
Turkey	120.3	221.8	399.3	324.9	368.2	285.0
Cuba	73.4	399.5	97.0	62.0	46.0	45.0
China	82.2	78.9	141.9	153.6	152.0	151.0
Southern Hemisphere ³	545.0	734.1	1 220.7	1 451.5	1 468.0	1 469.4
Argentina	47.6	116.2	258.0	312.5	339.4	341.0
Brazil	57.4	77.8	92.2	92.2	92.0	...
Uruguay	16.9	50.6	136.6	119.3	84.4	...
Australia	24.3	35.1	91.5	133.8	129.5	89.0
South Africa	322.6	398.5	581.0	753.0	817.0	712.0

Source: FAO, *Citrus Fruit Processed and Fresh: Annual Statistics 1998*, CCP: CI 98/CRS.1, Rome.

1. On a crop year basis.
2. On a November-October crop year basis.
3. Data refer to the calendar year, second part of split year.

2.2 FRESH CITRUS FRUIT: World exports by country ¹

Oranges

	1970/71 1978/79 average	1980/81 1988/89 average	1994/95	1995/96	1996/97	1997/98 preliminary
	(thousand tons)					
WORLD	4 017.9	4 025.3	4 679.4	4 686.2	4 590.7	4 842.6
Northern Hemisphere	3 599.8	3 501.0	3 849.4	3 707.6	3 566.0	3 842.6
United States ²	343.4	399.8	576.0	508.0	601.0	590.0
Mediterranean Region	3 002.6	2 644.8	2 810.6	2 762.6	2 615.8	2 721.2
Greece	140.0	189.8	374.8	330.4	355.0	360.0
Italy	142.4	133.4	122.0	135.0	89.4	85.0
Spain	994.1	918.5	1 300.2	1 124.1	1 162.0	1 244.0
Israel	630.7	387.0	179.7	171.8	165.9	175.0
Algeria	70.7	10.3	2.0	-	1.5	...
Morocco	447.7	419.6	238.6	416.1	301.1	460.0
Tunisia	27.5	34.7	24.5	21.7	16.1	25.0
Cyprus	101.5	107.3	46.1	89.0	65.2	54.0
Egypt	144.6	151.0	250.0	250.0	258.7	258.7
Lebanon	119.2	61.8	50.0	50.0	50.0	0.0
Turkey	20.2	49.7	129.3	80.3	60.1	58.0
Cuba	52.5	244.5	40.0	20.0	15.0	15.0
China	55.0	46.0	16.5	16.0	17.0	16.0
Southern Hemisphere ³	418.1	524.3	830.0	978.6	1 024.7	1 000.0
Argentina	20.9	49.4	83.0	84.2	89.3	99.0
Brazil	54.6	69.9	82.0	82.0	82.0	...
Uruguay	11.3	31.9	87.9	68.5	66.0	...
Australia	19.3	29.6	80.0	117.0	114.0	85.0
South Africa	267.5	310.8	445.0	595.0	668.0	668.0

Source: FAO, *Citrus Fruit Processed and Fresh: Annual Statistics 1998*, CCP: CI 98/CRS.1, Rome.

1. On a crop year basis.
2. On a November-October crop year basis.
3. Data refer to the calendar year, second part of split year.

2.3 FRESH CITRUS FRUIT: World exports by country ¹

Tangerines

	1970/71 1978/79 average	1980/81 1988/89 average	1994/95	1995/96	1996/97	1997/98 preliminary
	(thousand tons)					
WORLD	878.0	1 235.5	1 984.1	2 006.4	1 995.0	2 210.5
Northern Hemisphere	871.5	1 214.1	1 923.0	1 928.7	1 935.0	2 125.9
United States ²	14.0	14.6	19.0	22.0	23.0	21.0
Mediterranean Region	754.7	1 069.3	1 581.0	1 531.8	1 607.3	1 694.7
Italy	13.5	8.3	24.0	74.0	27.0	29.0
Spain	466.4	747.2	1 195.7	1 033.6	1 109.6	1 210.0
Israel	5.9	28.5	29.8	36.1	38.3	44.5
Algeria	22.4	3.4	-	-	-	-
Morocco	129.1	163.6	162.0	203.1	212.6	240.0
Tunisia	2.5	0.3	-	-	-	-
Lebanon	10.9	16.9	-	-	-	-
Turkey	25.6	52.1	81.1	85.4	131.1	124.0
Japan	21.3	22.9	6.0	6.0	5.0	6.0
Cuba	1.2	5.6	-	-	-	-
China	21.3	28.7	117.0	130.0	135.0	135.0
Southern Hemisphere ³	6.6	21.3	61.1	77.7	60.0	84.6
Brazil	1.6	5.6	8.0	8.0	9.0	9.0
Uruguay	1.4	5.8	18.8	31.4

Source: FAO, *Citrus Fruit Processed and Fresh: Annual Statistics 1998*, CCP: CI 98/CRS.1, Rome.

1. On a crop year basis.
2. On a November-October crop year basis.
3. Data refer to the calendar year, second part of split year.

2.4 FRESH CITRUS FRUIT: World exports by country ¹

Lemons and limes

	1970/71 1978/79 average	1980/81 1988/89 average	1994/95	1995/96	1996/97	1997/98 preliminary
	(thousand tons)					
WORLD	853.6	1 012.3	1 202.2	1 197.4	1 275.2	1 244.0
Northern Hemisphere	818.9	931.6	1 017.5	961.4	1 032.9	997.9
United States ²	191.6	148.6	132.0	122.0	123.0	122.0
Mediterranean Region	610.4	723.0	613.6	594.8	655.7	581.3
Greece	73.2	63.1	40.1	60.0	48.0	60.0
Italy	239.6	123.2	32.0	39.0	31.5	25.0
Spain	139.1	334.4	335.6	327.3	386.3	400.0
Cyprus	24.0	33.2	27.5	24.0	23.6	16.0
Turkey	69.3	104.9	135.7	103.8	123.0	60.0
Cuba	1.3	14.6	2.0	2.0	2.0	...
Mexico	4.2	21.6	155.0	149.0	150.0	155.0
Southern Hemisphere ³	34.8	80.7	184.7	236.0	242.3	246.1
Argentina	13.3	31.9	111.0	165.0	178.0	175.0
Uruguay	3.5	10.8	23.7	15.1	15.8	...
South Africa	13.8	28.1	38.0	43.0	44.0	44.0

Source: FAO, *Citrus Fruit Processed and Fresh: Annual Statistics 1998*, CCP: CI 98/CRS.1, Rome.

1. On a crop year basis.
2. On a November-October crop year basis.
3. Data refer to the calendar year, second part of split year.

2.5 FRESH CITRUS FRUIT: World exports by country ¹

Grapefruit

	1970/71 1978/79 average	1980/81 1988/89 average	1994/95	1995/96	1996/97	1997/98 preliminary
	(thousand tons)					
WORLD	712.4	919.7	1 120.9	1 172.2	1 118.4	1 085.9
Northern Hemisphere	626.8	812.1	976.0	1 013.0	976.4	947.2
United States ²	226.4	324.0	487.0	500.0	480.0	440.0
Mediterranean Region	320.6	267.2	257.5	263.6	257.2	224.0
Spain	2.4	6.1	19.0	17.9	17.5	17.0
Israel	246.4	150.8	116.5	124.8	125.5	125.0
Cyprus	50.7	73.1	54.3	50.0	48.1	37.7
Turkey	5.2	15.0	53.2	55.4	54.0	43.0
Cuba	18.5	134.9	55.0	40.0	31.0	30.0
Honduras	8.3	15.0	9.8	15.4
Southern Hemisphere ³	85.6	107.7	144.9	159.2	142.0	138.7
Argentina	13.3	28.7	37.0	36.3	34.3	29.4
South Africa	41.3	59.6	98.0	115.0	105.0	105.0

Source: FAO, *Citrus Fruit Processed and Fresh: Annual Statistics 1998*, CCP: CI 98/CRS.1, Rome.

1. On a crop year basis.
2. On a November-October crop year basis.
3. Data refer to the calendar year, second part of split year.

3.1 FRESH CITRUS FRUIT: World imports by country ¹

Total Citrus

	1970/71 1978/79 average	1980/81 1988/89 average	1993/94	1994/95	1995/96	1996/97
(thousand tons)						
WORLD	6 346.6	6 834.3	8 129.5	7 781.4	7 829.0	7 806.2
Northern Hemisphere	6 316.9	6 805.2	8 096.6	7 747.5	7 787.9	7 687.9
Canada	354.4	391.1	387.8	387.0	390.9	421.5
United States	48.7	57.3	112.9	189.0	193.0	198.0
Mediterranean Region	1 420.0	1 436.6	1 247.7	1 269.4	1 267.5	1 206.9
France	1 009.0	1 146.6	1 049.5	1 057.4	1 032.7	1 051.1
Former Yugoslavia	125.2	78.5	83.1	92.6	126.3	...
Belgium-Luxembourg	231.6	253.8	383.5	471.2	482.2	416.4
Denmark	55.9	54.4	58.5	35.5	51.8	58.4
Germany	1 828.3	1 126.9	1 106.9	850.4	1 234.6	1 117.1
Netherlands	392.1	498.8	788.7	701.0	632.3	735.2
United Kingdom	556.5	604.4	640.5	644.2	645.6	540.5
Austria	131.1	136.6	159.4	141.4	140.1	135.8
Norway	70.4	60.1	60.1	60.9	57.0	59.6
Sweden	122.2	122.7	134.9	132.6	108.1	134.2
Switzerland	133.1	123.2	98.1	100.8	92.9	88.7
Former USSR 2/ 3/	410.3	488.2	808.6	634.8	598.0	578.6
Bulgaria 2/	23.2	49.4	99.8	87.8	39.2	...
Czechoslovakia 2/	139.8	151.8				
Czecho Rep. 2/			102.2	106.5	86.7	...
Slovakia 2/			42.3	43.1	39.6	...
Hungary 2/	64.5	57.3	69.7	62.5	53.6	59.5
Poland 2/	150.1	84.4	252.9	278.5	297.8	95.6
Romania 2/	64.2	57.7	59.5	86.2	54.8	58.8
Japan	240.1	403.4	551.0	543.2	485.3	545.0
Saudi Arabia 2/	81.5	233.1	346.1	344.8	291.8	...
China - Hong Kong 2/	137.9	164.3	264.7	266.6	279.4	...
Malaysia 2/	12.3	30.4	54.9	61.7	33.0	...
Singapore 2/	45.0	47.2	47.8	53.9	50.9	...
Southern Hemisphere	29.7	29.1	32.9	33.9	41.1	119.1

Source: FAO, *Citrus Fruit Processed and Fresh: Annual Statistics 1998*, CCP: CI 98/CRS.1, Rome.

1. Except where otherwise noted, data refer to the trade period October-September.
2. Data refer to calendar year, second part of split year.
3. 1995/96 and 1996/97: Russian Federation.

3.2 FRESH CITRUS FRUIT: World imports by country ¹

Oranges

	1970/71 1978/79 average	1980/81 1988/89 average	1993/94	1994/95	1995/96	1996/97
	(thousand tons)					
WORLD	4 090.4	3 884.6	4 302.5	4 036.7	3 953.8	3 758.3
Northern Hemisphere	4 061.1	3 860.2	4 279.3	4 011.5	3 923.7	3 652.8
Canada	245.6	261.4	209.0	199.4	202.4	227.1
United States	36.9	16.2	16.0	18.0	23.0	30.0
Mediterranean Region	891.0	758.0	573.2	558.7	565.0	480.8
France	615.5	591.9	498.9	474.5	474.3	452.5
Former Yugoslavia	79.8	44.1	49.0	53.7	68.5	...
Belgium-Luxembourg	161.6	156.5	178.1	236.5	249.4	200.9
Denmark	36.5	29.0	27.9	18.1	23.1	25.5
Germany	675.1	619.9	468.2	292.6	588.0	499.0
Netherlands	278.0	324.3	440.0	422.0	342.8	374.4
United Kingdom	356.7	339.5	350.6	342.5	337.3	215.9
Austria	71.8	66.5	78.0	62.8	68.2	65.2
Norway	53.6	38.3	37.5	38.2	34.2	32.7
Sweden	81.9	71.6	77.0	74.9	60.6	68.9
Switzerland	101.2	89.5	67.0	71.1	63.6	59.7
Former USSR 2/ 3/	314.2	312.4	538.1	438.0	347.8	322.2
Bulgaria 2/	11.1	22.5	67.8	59.6	25.8	23.8
Czechoslovakia 2/	89.6	84.4				
Czecho Rep. 2/			76.4	79.2	63.7	...
Slovakia 2/			28.0	29.7	25.5	...
Hungary 2/	29.4	31.2	58.0	51.0	41.7	48.9
Poland 2/	64.1	29.7	91.3	108.5	95.9	95.6
Romania 2/	37.2	31.4	42.8	65.6	37.5	40.8
Japan	25.4	102.0	189.0	181.6	154.0	171.0
Saudi Arabia 2/	61.1	161.3	250.4	253.7	209.2	...
China - Hong Kong 2/	114.8	132.1	183.8	179.3	188.5	...
Malaysia 2/	12.3	30.1	54.3	60.3	31.1	...
Singapore 2/	43.1	46.5	45.5	50.8	47.4	...
Southern Hemisphere	29.3	24.5	23.2	25.2	30.1	105.5

Source: FAO, *Citrus Fruit Processed and Fresh: Annual Statistics 1998*, CCP: CI 98/CRS.1, Rome.

1. Except where otherwise noted, data refer to the trade period October-September.
2. Data refer to calendar year, second part of split year.
3. 1995/96 and 1996/97: Russian Federation.

3.3 FRESH CITRUS FRUIT: World imports by country ¹

Tangerines

	1970/71 1978/79 average	1980/81 1988/89 average	1993/94	1994/95	1995/96	1996/97
	(thousand tons)					
WORLD	689.7	1 083.1	1 711.2	1 579.9	1 721.0	1 834.0
Northern Hemisphere	689.7	1 082.9	1 710.8	1 578.3	1 720.2	1 833.9
Canada	2.2	31.2	69.5	75.8	80.1	80.6
United States	-	4.9	19.0	9.0	11.0	9.0
Mediterranean Region	206.3	313.2	360.6	388.2	377.3	416.6
France	199.2	297.8	306.9	330.2	312.1	330.4
Former Yugoslavia	3.4	0.8	14.0	16.3	23.3	19.9
Belgium-Luxembourg	32.0	47.4	64.5	78.3	80.6	80.5
Denmark	8.3	12.7	18.8	8.2	19.5	20.6
Germany	205.9	269.0	442.6	343.3	414.1	406.0
Netherlands	51.2	84.1	155.1	107.5	110.1	126.7
United Kingdom	54.3	126.7	154.7	164.9	167.5	208.6
Austria	27.7	35.0	44.8	38.7	41.7	42.6
Finland	12.5	23.3	33.4	27.2	29.9	30.2
Norway	12.5	18.1	18.9	18.9	18.9	22.5
Sweden	26.9	35.5	41.0	41.3	31.4	47.0
Former USSR 2/ 3/	21.3	12.1	86.6	80.3	123.6	127.6
Saudi Arabia 2/	7.1	34.2	47.0	44.4	44.3	...

Source: FAO, *Citrus Fruit Processed and Fresh: Annual Statistics 1998*, CCP: CI 98/CRS.1, Rome.

1. Except where otherwise noted, data refer to the trade period October-September.
2. Data refer to calendar year, second part of split year.
3. 1995/96 and 1996/97: Russian Federation.

3.4 FRESH CITRUS FRUIT: World imports by country ¹

Lemons and limes

	1970/71 1978/79 average	1980/81 1988/89 average	1993/94	1994/95	1995/96	1996/97
	(thousand tons)					
WORLD	837.2	974.6	1 046.5	1 145.3	1 100.4	1 129.4
Northern Hemisphere	836.9	972.3	1 044.8	1 142.9	1 097.8	1 127.8
Canada	18.3	24.3	33.6	35.4	36.3	38.9
United States	6.6	33.5	62.9	149.0	144.0	146.0
Mediterranean Region	157.5	175.4	146.5	156.5	160.0	128.7
France	108.4	125.5	113.5	126.2	118.2	123.5
Former Yugoslavia	36.7	28.7	18.9	21.1	32.1	...
Belgium-Luxembourg	19.8	23.1	42.7	54.1	40.3	31.7
Denmark	6.9	7.2	7.0	5.8	5.6	8.7
Germany	149.8	148.0	124.7	134.6	134.2	130.7
Netherlands	17.9	29.5	99.6	85.8	81.0	104.9
United Kingdom	38.7	50.1	58.4	57.5	51.3	51.5
Austria	25.2	27.8	30.3	31.5	24.5	21.0
Switzerland	17.2	20.8	20.1	19.1	18.4	18.3
Former USSR 2/ 3/	69.4	100.3	103.0	96.5	105.9	107.8
Bulgaria 2/	7.5	13.3	19.1	18.8	8.4	...
Czechoslovakia 2/	48.7	55.2				
Czecho Rep. 2/			18.1	18.2	15.2	...
Slovakia 2/			7.7	9.1	7.8	...
Hungary 2/	33.3	20.0	10.4	10.5	10.3	9.6
Poland 2/	76.9	37.0	66.3	74.3	78.0	...
Romania 2/	25.1	23.0	11.5	12.9	10.7	10.8
Japan	88.1	117.6	89.0	90.0	87.2	94.0
Saudi Arabia 2/	13.3	37.7	44.7	41.9	33.5	...
Southern Hemisphere	0.2	0.6	1.7	1.8	1.7	2.4

Source: FAO, *Citrus Fruit Processed and Fresh: Annual Statistics 1998*, CCP: CI 98/CRS.1, Rome.

1. Except where otherwise noted, data refer to the trade period October-September.
2. Data refer to calendar year, second part of split year.
3. 1995/96 and 1996/97: Russian Federation.

3.5 FRESH CITRUS FRUIT: World imports by country ¹

Grapefruit

	1970/71 1978/79 average	1980/81 1988/89 average	1993/94	1994/95	1995/96	1996/97
	(thousand tons)					
WORLD	729.2	891.9	1 069.3	1 019.5	1 053.8	1 084.5
Northern Hemisphere	729.2	889.8	1 061.7	1 014.8	1 046.2	1 073.4
Canada	88.3	74.1	75.7	76.4	72.1	74.9
United States	5.2	2.7	15.0	13.0	15.0	13.0
Mediterranean Region	165.3	190.0	167.4	166.0	165.2	180.8
France	85.9	131.4	130.2	126.5	128.1	144.7
Italy	37.9	45.9	35.8	38.0	34.7	34.1
Former Yugoslavia	5.2	5.0	1.2	1.5	2.4	...
Belgium-Luxembourg	18.1	26.9	98.2	102.3	111.9	103.3
Denmark	4.2	5.6	4.8	3.4	3.6	3.6
Germany	101.3	90.1	71.4	79.9	98.3	81.4
Netherlands	45.0	60.9	94.0	85.7	98.4	129.2
United Kingdom	106.8	88.2	76.8	79.3	89.5	64.5
Austria	6.4	7.2	6.3	8.4	5.7	7.0
Finland	5.9	6.4	3.9	3.1	3.9	3.5
Sweden	6.4	7.1	5.0	5.8	5.6	6.9
Switzerland	14.6	12.9	11.0	10.6	10.9	10.7
Former USSR 2/ 3/	5.4	63.4	80.9	20.0	20.7	21.0
Bulgaria 2/	1.3	12.0	1.3	1.6	1.5	...
Czechoslovakia 2/	1.5	12.3				
Czecho Rep. 2/			7.7	9.1	7.8	...
Slovakia 2/			3.4	3.3	4.0	...
Hungary 2/	1.8	6.1	1.3	1.0	1.6	1.0
Poland 2/	5.5	16.9	18.4	23.0	29.8	...
Japan	126.6	183.8	273.0	271.6	244.1	280.0

Source: FAO, *Citrus Fruit Processed and Fresh: Annual Statistics 1998*, CCP: CI 98/CRS.1, Rome.

1. Except where otherwise noted, data refer to the trade period October-September.
2. Data refer to calendar year, second part of split year.
3. 1995/96 and 1996/97: Russian Federation.

ANNEX TABLE II.1: NATIONAL IMPORTANCE OF EACH VARIETY FOR EACH TYPE OF CITRUS, 1996/97-1998/99 (PERCENT)

Type	Variety	1996/97			1997/98			1998/99			
		Area (ha)	Trees total	Production (tons)	Area (ha)	Trees total	Production (tons)	Area (ha)	Trees total	Production (tons)	
Lemon	Mayer	26.2	23.6	22.9	16.6	27.1	27.5	18.3	31.5	26.8	27.6
	Others	73.8	76.4	77.1	83.4	72.9	72.5	81.7	68.5	73.2	72.4
	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Orange	Navel	28.8	29.2	29.7	27.7	29.6	29.2	31.8	29.9	29.1	22.7
	Jaffa	47.3	46.6	46.7	51.3	45.1	47.3	39.0	46.4	48.4	59.1
	Maurdi	3.6	3.9	3.5	3.4	4.1	3.7	4.7	4.2	3.9	3.3
	Baladi & Khetmail	10.7	11.1	11.2	9.1	11.1	11.1	11.8	9.2	9.0	8.9
	Valencia	9.6	9.2	8.9	8.6	10.0	8.7	12.8	10.3	9.6	8.8
	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Mandarin	Satsuma	38.0	34.5	37.1	43.1	35.5	37.6	40.5	36.5	36.2	36.0
	Clementine	40.8	44.9	42.8	36.4	40.0	42.1	43.3	41.3	42.3	40.7
	Late varieties	21.3	20.7	20.1	20.5	24.5	20.3	16.2	22.2	21.5	23.4
	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Grapefruit	White	59.9	58.9	61.2	69.2	59.3	29.0	65.0	58.5	58.3	60.0
	Red	29.1	30.0	28.8	25.5	29.4	60.2	30.0	29.4	29.6	35.0
	Pummelo	10.9	11.1	10.0	5.3	11.3	10.8	5.0	12.0	12.1	5.0
	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Table II.1

ANNEX TABLE II.2: NATIONAL IMPORTANCE OF EACH TYPE AND VARIETY IN TOTAL CITRUS, 1996/97-1998/99 (PERCENT)

Type	Variety	1996/97				1997/98				1998/99			
		Area (ha)		Production (tons)		Area (ha)		Production (tons)		Area (ha)		Production (tons)	
		Area (ha)	Trees total	in fruit	(tons)	Area (ha)	Trees total	in fruit	(tons)	Area (ha)	Trees total	in fruit	(tons)
Common	Mayer	2.9	2.5	2.2	1.4	3.4	3.2	2.6	1.6	4.0	3.7	2.9	2.5
	Others	8.3	8.1	7.4	7.3	9.0	8.0	6.9	7.2	8.7	8.1	7.8	6.5
	Total	11.3	10.6	9.5	8.7	12.4	11.2	9.5	8.8	12.7	11.9	10.7	8.9
Orange	Navel	14.0	14.3	14.5	15.0	14.4	14.5	14.5	13.6	14.9	14.6	14.8	13.5
	Jaffa	23.0	22.8	22.8	27.8	21.9	23.2	23.5	16.7	23.1	24.3	24.6	35.1
	Maurdi	1.7	1.9	1.7	1.8	2.0	2.0	1.9	2.0	2.1	2.0	1.7	1.8
	Baladi & Khetmali	5.2	5.4	5.4	4.9	5.4	5.5	5.5	5.1	4.6	4.5	4.4	4.7
	Valencia	4.7	4.5	4.3	4.7	4.8	4.6	4.3	5.5	5.1	4.8	4.4	4.3
Total	48.6	49.0	48.7	54.2	48.6	49.8	49.6	42.9	49.9	50.2	49.8	59.5	
Tangerine	Satsuma	14.4	13.2	14.7	15.1	13.1	13.2	14.6	18.1	12.8	12.9	13.8	10.4
	Clementine	15.5	17.2	17.0	12.8	14.8	15.6	16.3	19.3	14.5	15.1	15.9	11.8
	Late varieties	8.1	7.9	8.0	7.2	9.1	7.9	7.9	7.2	7.8	7.7	7.8	6.8
	Total	38.0	38.3	39.8	35.1	36.9	36.7	38.8	44.6	35.1	35.6	37.5	28.9
Lemon/Lime	White	1.3	1.3	1.2	1.3	1.3	0.7	0.6	2.3	1.4	1.3	1.2	1.6
	Red	0.6	0.6	0.6	0.5	0.6	1.3	1.2	1.1	0.7	0.7	0.6	0.9
	Pummelo	0.2	0.2	0.2	0.1	0.2	0.3	0.2	0.2	0.3	0.3	0.2	0.1
Total	2.2	2.2	2.0	1.9	2.2	2.2	2.0	3.6	2.2	2.3	2.0	2.7	
Grand Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	

Source: Table II.1.

ANNEX TABLE II.3: NATIONAL CITRUS YIELDS AND PRODUCTION, 1970/71 to 1998/99

Crop Year Commencing	Lemons				Oranges				Mandarins & Other*				Total			
	Tons/ha	Kg per Tree		Production (tons)	Tons/ha	Kg per Tree		Production (tons)	Tons/ha	Kg per Tree		Production (tons)	Tons/ha	Kg per Tree		Production (tons)
		Total	in fruit**			Total	in fruit**			Total	in fruit**			Total	in fruit**	
1970	3.7	9.7	18.6	1,435	3.2	8.1	13.8	3,868	3.2	9.5	18.1	2,186	3.4	9.1	16.1	7,760
1971	5.6	14.7	26.7	2,517	6.3	16.0	26.6	8,063	6.2	18.6	38.0	4,672	6.3	16.9	30.1	15,718
1972	4.3	12.6	23.4	2,913	4.1	11.9	20.5	7,517	7.2	19.1	32.1	8,008	5.1	14.4	24.9	18,513
1973	5.9	16.4	32.3	4,258	6.6	19.0	31.2	12,822	9.1	24.4	40.3	10,558	7.3	20.5	34.7	28,029
1974	5.4	15.2	29.8	4,034	7.0	19.8	35.7	14,607	9.4	25.1	42.5	11,623	7.5	20.9	37.3	30,617
1975	5.4	15.5	30.5	4,356	6.0	17.0	30.7	13,259	6.4	17.4	29.4	8,502	6.1	17.3	30.9	26,819
1976	5.4	15.9	31.2	4,511	8.7	25.2	44.7	19,478	7.8	18.8	39.7	10,632	8.0	21.9	41.7	35,550
1977	5.6	15.7	31.0	5,203	9.6	28.6	50.4	22,048	9.2	29.8	44.4	12,980	8.9	26.8	45.8	41,181
1978	4.7	13.1	27.7	5,024	7.4	19.9	36.4	18,986	9.9	26.9	46.0	15,393	7.7	20.8	38.2	39,789
1979	6.0	16.8	34.7	7,181	9.4	26.0	47.0	28,383	9.9	26.5	45.7	17,684	9.1	24.9	45.3	54,436
1980	6.2	17.7	36.4	8,632	8.9	25.0	46.2	31,434	9.8	26.6	47.5	21,804	8.8	24.5	45.6	63,025
1981	7.0	19.8	35.1	9,091	9.5	27.7	47.2	35,447	10.1	27.2	47.7	24,593	9.4	26.6	45.9	70,320
1982	6.6	19.2	37.1	9,947	9.7	27.7	50.0	40,389	9.5	25.7	49.3	27,232	9.2	26.0	48.3	78,948
1983	7.6	20.8	39.2	11,350	11.0	28.4	50.5	45,455	9.5	23.6	49.1	29,944	10.1	25.9	49.0	88,418
1984	8.0	22.1	40.2	13,241	11.7	30.9	55.9	53,758	8.3	21.1	48.8	33,163	10.0	26.2	51.8	102,387
1985	5.7	15.9	30.2	10,294	6.5	17.4	35.0	34,618	7.9	20.0	50.1	35,970	6.9	18.2	39.3	80,789
1986	8.1	22.8	43.5	15,861	11.8	30.4	71.4	72,954	12.8	32.7	89.4	70,609	11.6	30.2	72.8	158,847
1987	6.1	17.5	32.1	12,925	13.9	36.5	80.1	94,455	13.1	34.1	85.5	83,550	12.4	32.8	74.0	189,823
1988	10.4	27.2	51.3	23,676	16.6	43.8	100.0	122,403	13.9	36.5	94.7	99,619	14.7	38.6	89.9	246,582
1989	13.0	32.2	54.0	29,141	17.6	45.6	102.2	139,247	18.5	48.0	112.8	154,314	17.2	44.4	97.4	318,942
1990	14.0	35.2	63.6	34,847	17.7	46.3	103.5	153,651	18.3	52.3	105.3	164,845	17.4	46.9	97.2	350,355
1991	16.5	41.8	72.3	43,768	19.0	50.7	112.1	181,781	21.9	57.5	119.0	215,543	19.8	51.9	107.6	435,426
1992	12.3	30.9	49.5	32,035	12.5	34.1	68.4	138,511	13.3	34.7	65.3	138,720	12.8	33.8	64.1	307,926
1993	14.7	45.0	77.3	37,155	19.6	54.3	83.6	233,150	18.9	52.2	78.5	184,382	18.8	52.6	80.9	454,687
1994	23.8	73.2	118.1	63,337	28.2	78.0	116.4	341,146	21.6	59.9	85.2	214,872	25.1	70.2	103.4	619,355
1995	17.6	53.9	82.3	49,577	24.6	68.2	95.2	303,086	21.1	58.6	83.1	213,037	22.4	62.8	89.1	565,700
1996	20.7	63.2	92.1	60,321	30.0	83.3	113.0	377,762	24.8	69.0	90.2	258,238	26.9	75.4	101.5	696,321
1997	14.9	46.8	70.6	48,944	18.5	51.5	66.1	238,373	26.6	74.0	90.2	267,712	21.1	59.7	76.4	555,029
1998	19.5	58.6	81.5	66,000	33.2	92.6	116.5	440,000	23.5	65.2	78.0	234,000	27.8	78.1	97.6	740,000

Derived from Table II.2 * Includes grapefruit. ** Defined by the Citrus Board as six years and older.

ANNEX TABLE II.4: SIZE STRUCTURE OF FARMS IN LATAKIA AND TARTOUS

Latakia

Number of Trees	No.	Farms		Total Number of Trees		
		%	Cum. %	No.	%	Cum. %
Up to 5	14	0.1	.1	49.00	0.0	0.0
6 – 30	744	4.1	4.2	15,238	0.3	0.3
31 – 60	1,683	9.2	13.4	76,013	1.3	1.5
61 – 120	3,677	20.2	33.5	344,771	5.8	7.3
121 – 180	2,572	14.1	47.7	398,556	6.7	14.0
181 – 300	4,036	22.1	69.8	959,519	16.1	30.2
301 – 600	3,498	19.2	90.0	1,531,509	25.7	55.9
601 - 1,200	1,412	7.7	96.7	1,178,718	19.8	75.7
1,201 - 2,500	482	2.6	99.3	785,846	13.2	88.9
2,501 - 5,000	91	0.5	99.8	301,372	5.1	94.0
5,001 - 10,000	18	0.1	99.9	120,975	2.0	96.0
10,001 and above	12	0.1	100.00	236,204	4.0	100.0
Total	18,239	100.00		5,948,768	100.00	

Tartous

Number of Trees	No.	Farms		Total Number of Trees		
		%	Cum. %	No.	%	Cum. %
Up to 5	173	1.9	1.9	449.00	0.0	0.0
6 – 30	1,193	13.1	15.0	25,286	1.0	1.0
31 – 60	1,190	13.1	28.1	55,528	2.2	3.3
61 – 120	1,640	18.0	46.1	150,779	6.1	9.3
121 – 180	1,174	12.9	59.0	180,772	7.3	16.2
181 – 300	1,382	15.2	74.2	328,073	13.2	29.8
301 – 600	1,452	16.0	90.1	613,855	24.7	54.6
601 - 1,200	657	7.2	97.4	546,578	22.0	76.6
1,201 - 2,500	180	2.0	99.3	298,249	12.0	88.6
2,501 - 5,000	48	0.5	99.9	161,569	6.5	95.1
5,001 - 10,000	10	0.1	100.0	67,094	2.7	97.8
10,001 and above	3	0.0	100.0	54,881	2.2	100.0
Total	9,102	100.0		2,483,114	100.00	

Latakia and Tartous

Number of Trees	No.	Farms		Total Number of Trees		
		%	Cum. %	No.	%	Cum. %
Up to 5	192	0.7	0.7	500.50	0.0	0.0
6 – 30	1,937	7.1	7.8	40,524	0.5	0.5
31 – 60	2,873	10.5	18.3	131,541	1.6	2.1
61 – 120	5,317	19.4	37.7	495,550	5.9	7.9
121 – 180	3,746	13.7	51.4	579,328	6.9	14.8
181 – 300	5,418	19.8	71.3	1,287,592	15.3	30.1
301 – 600	4,950	18.1	89.4	2,145,363	25.4	55.5
601 - 1,200	2,069	7.6	96.9	1,725,296	20.5	76.0
1,201 - 2,500	662	2.4	99.3	1,084,094	12.9	88.8
2,501 - 5,000	139	0.5	99.8	462,941	5.5	94.3
5,001 - 10,000	28	0.1	99.9	188,069	2.2	96.6
10,001 and above	15	0.1	100.0	291,085	3.5	100.0
Total	27,346	100.00		8,431,885	100.00	

Source: Primary data on individual farms held by MAAR at the village level.

ANNEX TABLE II.5: ESTIMATES OF FARM COSTS, REVENUES AND NET INCOMES, 1998/99

(SP/donnum)

ORANGE: SMALL FARM LATAKIA (1-8 donnum)

Year	0	1	2	3	4	5	6	7	8	9	10	11	12
Total cost before finance	6,859	4,463	5,777	7,359	9,939	11,546	13,830	14,472	14,472	16,077	16,612	17,308	18,271
Finance cost	377	643	997	997	1,469	1,515	1,536	1,336	982	643	664	692	731
Total cost including finance	7,237	5,106	6,773	8,356	11,408	13,062	15,366	15,808	15,453	16,720	17,277	18,001	19,002
Sales revenue	0	0	3,756	6,248	12,166	14,970	19,642	23,380	29,922	32,725	35,840	39,890	45,497
Net income (family labour not costed)	-7,237	-5,106	-3,017	-2,108	758	1,908	4,277	7,572	14,468	16,005	18,563	21,889	26,494
Cost of family labour	1,190	863	1,266	1,389	1,962	2,126	3,088	3,257	3,553	3,680	3,821	4,004	4,258
Net income (family labour costed)	-8,427	-5,969	-4,283	-3,497	-1,204	1,189	1,189	4,315	10,916	12,325	14,743	17,885	22,237
<i>End-year financing situation</i>	-7,237	-12,343	-15,360	-16,766	-16,008	-14,099	-9,823	-2,251	11,094				

ORANGE: MEDIUM FARM LATAKIA (8 to 15 donnum)

Year	0	1	2	3	4	5	6	7	8	9	10	11	12
Total cost before finance	7,412	4,844	6,332	7,996	10,833	12,445	15,242	15,890	17,149	17,688	18,287	19,067	20,145
Finance cost	408	697	1,083	320	1,626	1,721	1,821	1,705	1,446	708	731	763	806
Total cost including finance	7,820	5,541	7,415	8,316	12,459	14,166	17,063	17,595	18,595	18,396	19,019	19,829	20,951
Sales revenue	0	0	3,934	6,426	12,344	15,148	19,820	23,558	30,100	32,903	36,018	40,068	45,675
Net income (family labour not costed)	-7,820	-5,541	-3,482	-1,890	-115	982	2,757	5,963	11,505	14,508	16,999	20,239	24,724
Cost of family labour	595	431	633	696	982	1,045	1,546	1,608	1,756	1,820	1,890	1,982	2,109
Net income (family labour costed)	-8,415	-5,972	-4,114	-2,586	-1,097	-64	1,211	4,355	9,749	12,688	15,109	18,257	22,615
<i>End-year financing situation</i>	-7,820	-13,360	-16,842	-18,732	-18,847	-17,865	-15,108	-9,145	2,360				

Value :

ORANGE: LARGE FARM LATAKIA (> 15 donnum)

Year	0	1	2	3	4	5	6	7	8	9	10	11	12
Total cost before finance	7,964	5,226	6,669	8,613	11,670	13,445	16,629	13,540	14,986	16,045	16,735	18,763	20,561
Finance cost	438	750	1,158	1,477	1,844	2,004	2,194	1,967	1,602	915	669	751	822
Total cost including finance	8,402	5,975	7,826	10,089	13,514	15,449	18,823	15,507	16,588	16,960	17,404	19,513	21,383
Sales revenue	0	0	3,969	6,461	12,380	15,183	19,856	23,594	30,135	32,939	36,054	40,103	45,710
Net income (family labour not costed)	-8,402	-5,975	-3,857	-3,628	-1,134	-266	1,033	8,086	13,547	15,979	18,650	20,590	24,327
Cost of family labour	0	0	0	0	0	0	0	0	0	0	0	0	0
Net income (family labour costed)	-8,402	-5,975	-3,857	-3,628	-1,134	-266	1,033	8,086	13,547	15,979	18,650	20,590	24,327
<i>End-year financing situation</i>	-8,402	-14,378	-18,234	-21,862	-22,996	-23,262	-22,229	-14,142	-595	15,384			

Value :

ANNEX TABLE II.6: PROJECTION OF NATIONAL CITRUS PRODUCTION SHOWING CUMULATIVE PRODUCTION AND POPULATION GROWTH

Year	Tons				Annual growth (%)				Cumulative Annual growth				Cumulative Population Growth*	
	A	B	C	D	A	B	C	D	A	B	C	D		
1998/1999	718,019	718,019	734,101	734,101										
1999/2000	742,911	742,911	773,934	773,934	3.5	3.5	5.4	5.4	3.5	3.5	5.4	5.4		2.5
2000/2001	759,741	759,741	806,306	806,306	2.3	2.3	4.2	4.2	5.8	5.8	9.8	9.8		5.1
2001/2002	776,183	777,446	838,596	840,304	2.2	2.3	4.0	4.2	8.1	8.3	14.2	14.5		7.8
2002/2003	787,295	792,677	866,754	872,621	1.4	2.0	3.4	3.8	9.6	10.4	18.1	18.9		10.6
2003/2004	792,015	805,797	889,833	904,191	0.6	1.7	2.7	3.6	10.3	12.2	21.2	23.2		13.4
2004/2005	789,382	812,205	906,036	929,535	-0.3	0.8	1.8	2.8	9.9	13.1	23.4	26.6		16.2
2005/2006	782,431	818,563	917,932	954,891	-0.9	0.8	1.3	2.7	9.0	14.0	25.0	30.1		19.2
2006/2007	770,842	822,696	925,027	978,073	-1.5	0.5	0.8	2.4	7.4	14.6	26.0	33.2		22.2
2007/2008	755,695	828,107	928,998	1,002,619	-2.0	0.7	0.4	2.5	5.2	15.3	26.5	36.6		25.3
2008/2009	742,882	833,493	933,790	1,027,160	-1.7	0.7	0.5	2.4	3.5	16.1	27.2	39.9		28.5
2009/2010	727,947	839,290	937,205	1,052,331	-2.0	0.7	0.4	2.5	1.4	16.9	27.7	43.3		31.8

* Annual population growth of 2.54 percent per annum.

ANNEX TABLE II.7: PROJECTION OF NATIONAL ORANGE PRODUCTION, 1998/99 TO 2009/10

	Tons				Annual growth (%)			
	A	B	C	D	A	B	C	D
1998/1999	412,936	412,936	421,376	421,376				
1999/2000	437,193	437,193	453,008	453,008	5.9	5.9	7.5	7.5
2000/2001	452,181	452,181	475,988	475,988	3.4	3.4	5.1	5.1
2001/2002	467,353	468,212	499,437	500,736	3.4	3.5	4.9	5.2
2002/2003	477,600	480,920	519,048	522,828	2.2	2.7	3.9	4.4
2003/2004	483,431	492,829	535,552	545,473	1.2	2.5	3.2	4.3
2004/2005	483,322	497,398	546,576	561,221	0.0	0.9	2.1	2.9
2005/2006	480,246	502,501	554,631	577,545	-0.6	1.0	1.5	2.9
2006/2007	476,212	506,061	561,726	592,317	-0.8	0.7	1.3	2.6
2007/2008	469,035	510,913	565,697	608,453	-1.5	1.0	0.7	2.7
2008/2009	462,799	515,754	570,490	624,584	-1.3	0.9	0.8	2.7
2009/2010	454,866	521,020	573,905	641,345	-1.7	1.0	0.6	2.7

A: No new planting; no replacement

B: New planting; no replacement

C: No new planting; full replacement

D: New planting; full replacement

ANNEX TABLE II.8: PROJECTION OF NATIONAL MANDARIN PRODUCTION, 1998/99 TO 2009/10

	Tons				Annual growth (%)			
	A	B	C	D	A	B	C	D
1998/1999	209,775	209,775	215,079	215,079				
1999/2000	207,492	207,492	218,015	218,015	-1.1	-1.1	1.4	1.4
2000/2001	205,018	205,018	220,706	220,706	-1.2	-1.2	1.2	1.2
2001/2002	202,167	202,421	222,964	223,221	-1.4	-1.3	1.0	1.1
2002/2003	198,883	200,219	224,735	226,087	-1.6	-1.1	0.8	1.3
2003/2004	195,071	197,998	225,901	228,864	-1.9	-1.1	0.5	1.2
2004/2005	190,787	196,577	226,500	232,361	-2.2	-0.7	0.3	1.5
2005/2006	186,340	195,439	226,835	236,044	-2.3	-0.6	0.1	1.6
2006/2007	181,681	195,743	226,835	241,196	-2.5	0.2	0.0	2.2
2007/2008	177,139	196,040	226,835	246,348	-2.5	0.2	0.0	2.1
2008/2009	172,711	196,329	226,835	251,500	-2.5	0.1	0.0	2.1
2009/2010	168,393	196,611	226,835	256,652	-2.5	0.1	0.0	2.0

ANNEX TABLE II.9: PROJECTION OF NATIONAL LEMON PRODUCTION, 1998/99 TO 2009/10

	Tons				Annual growth (%)			
	A	B	C	D	A	B	C	D
1998/1999	74,060	74,060	75,890	75,890				
1999/2000	76,121	76,121	79,786	79,786	2.8	2.8	5.1	5.1
2000/2001	78,958	78,958	84,467	84,467	3.7	3.7	5.9	5.9
2001/2002	81,995	82,145	89,408	89,559	3.8	4.0	5.8	6.0
2002/2003	85,072	85,595	94,470	95,000	3.8	4.2	5.7	6.1
2003/2004	87,601	88,623	99,066	100,100	3.0	3.5	4.9	5.4
2004/2005	89,496	91,514	103,130	105,173	2.2	3.3	4.1	5.1
2005/2006	90,419	93,583	106,331	109,534	1.0	2.3	3.1	4.1
2006/2007	88,158	93,536	106,331	111,804	-2.5	-0.1	0.0	2.1
2007/2008	85,954	93,489	106,331	114,074	-2.5	0.0	0.0	2.0
2008/2009	83,805	93,444	106,331	116,344	-2.5	0.0	0.0	2.0
2009/2010	81,710	93,400	106,331	118,614	-2.5	0.0	0.0	2.0

A: No new planting; no replacement

B: New planting; no replacement

C: No new planting; full replacement

D: New planting; full replacement

ANNEX TABLE II.10: PROJECTION OF NATIONAL GRAPEFRUIT PRODUCTION, 1998/99 TO 2009/10

	Tons				Annual growth (%)			
	A	B	C	D	A	B	C	D
1998/1999	21,249	21,249	21,757	21,757				
1999/2000	22,105	22,105	23,124	23,124	4.0	4.0	6.3	6.3
2000/2001	23,584	23,584	25,146	25,146	6.7	6.7	8.7	8.7
2001/2002	24,668	24,668	26,788	26,788	4.6	4.6	6.5	6.5
2002/2003	25,740	25,943	28,501	28,706	4.3	5.2	6.4	7.2
2003/2004	25,911	26,346	29,313	29,754	0.7	1.6	2.8	3.7
2004/2005	25,778	26,716	29,830	30,780	-0.5	1.4	1.8	3.4
2005/2006	25,426	27,041	30,134	31,768	-1.4	1.2	1.0	3.2
2006/2007	24,791	27,357	30,134	32,756	-2.5	1.2	0.0	3.1
2007/2008	24,171	27,665	30,134	33,744	-2.5	1.1	0.0	3.0
2008/2009	23,566	27,965	30,134	34,732	-2.5	1.1	0.0	2.9
2009/2010	22,977	28,258	30,134	35,720	-2.5	1.0	0.0	2.8

ANNEX TABLE III.1: DERIVATION OF DEFLATED WHOLESALE MARKET PRICES FOR ORANGES, MANDARINS AND LEMONS, 1991 To 1998

Oranges

Calendar Year	Mean Wholesale Price (SP/kg)	National Wholesale Price Index (1988=100)	Price in Constant 1998 SP/kg	Index of Deflated Price (1998=100)
1991	13.22	114	19.02	130
1992	14.62	117	20.49	140
1993	16.68	126	21.71	148
1994	18.94	145	21.42	146
1995	13.75	155	14.55	99
1996	18.31	160	18.77	128
1997	13.85	164	13.85	94
1998	14.66	164	14.66	100

Mandarins

Year	Mean Wholesale Price (SP/kg)	National Wholesale Price Index (1988=100)	Price in Constant 1998 SP/kg	Index of Deflated Price (1998=100)
1991	12.66	114	18.21	145
1992	11.77	117	16.50	131
1993	12.80	126	16.66	132
1994	15.92	145	18.01	143
1995	11.37	155	12.03	96
1996	13.62	160	13.96	111
1997	12.18	164	12.18	97
1998	12.59	164	12.59	100

Lemons

Year	Mean Wholesale Price (SP/kg)	National Wholesale Price Index (1988=100)	Price in Constant 1998 SP	Index of Deflated Price (1998=100)
1991	22.44	114	32.28	112
1992	28.50	117	39.95	138
1993	34.65	126	45.10	156
1994	27.29	145	30.87	107
1995	30.32	155	32.08	111
1996	42.37	160	43.43	150
1997	43.23	164	43.23	149
1998	28.94	164	28.94	100

Source: Department of Agricultural Economics, MAAR.

ANNEX TABLE III.2: WHOLESALE PRICES OF CITRUS IN MAJOR TOWNS DURING THE MAIN PRODUCTION SEASON, 1997/98 AND 1998/99

ORANGES	Nov	Dec	Jan	Feb	March	April	May	Mean Dec-April
1997/98								
Damascus	14.50	12.25	15.25	13.25	15.50	19.37	17.75	15.12
Homs	10.75	9.75	13.25	10.00	13.50	17.25	20.00	12.75
Aleppo	15.50	14.37	14.40	12.30	15.60	14.93		14.32
Latakia	15.00	15.00	12.30	11.50	12.00	16.00	17.00	13.36
Tartous	10.00	9.50	10.00	11.00	15.00	16.00	17.50	12.30
MEAN	13.15	12.17	13.04	11.61	14.32	16.71	18.06	13.57
1998/99								
Damascus	13.75	14.83	11.00	10.50	15.00	14.00	20.00	13.07
Homs	8.50	12.00	12.00	13.00	10.00	13.00	13.00	12.00
Aleppo		12.00	13.00	14.00	17.00	12.50	18.00	13.70
Latakia	11.00	15.00	11.00	10.00	9.50	12.00	15.00	11.50
Tartous	11.67	12.00	11.00	11.00	12.75	14.00	16.00	12.15
MEAN	11.23	13.17	11.60	11.70	12.85	13.10	16.40	12.48
Ratio 98/99 to 97/98								
Damascus	94.83	121.06	72.13	79.25	96.77	72.28	112.68	88.30
Homs	79.07	123.08	90.57	130.00	74.07	75.36	65.00	98.62
Aleppo		83.51	90.28	113.82	108.97	83.72		96.06
Latakia	73.33	100.00	89.43	86.96	79.17	75.00	88.24	86.11
Tartous	116.70	126.32	110.00	100.00	85.00	87.50	91.43	101.76
MEAN	90.98	110.79	90.48	102.00	88.80	78.77	89.33	94.17

MANDARINS	Nov	Dec	Jan	Feb	March	April	May	Mean Nov-Feb
1997/98								
Damascus	12.50	11.25	17.00	16.00	17.50		30.00	14.19
Homs	9.75	8.25	10.50	9.50	13.75			9.50
Aleppo	12.25	11.37	15.00	14.81				13.36
Latakia	11.00	9.00	11.66	11.00	12.00			10.67
Tartous	8.60	8.50	11.00	9.75	16.00			9.46
MEAN	10.82	9.67	13.03	12.21	14.81		30.00	11.43
1998/99								
Damascus	10.50	11.17	11.00	14.00	18.00			11.67
Homs	8.00	12.00	11.00	10.00	12.50			10.25
Aleppo	13.00	9.00	13.00					11.67
Latakia	9.60		9.00	9.00	13.00			9.20
Tartous	8.50	10.33	9.00	12.50	14.00			10.08
MEAN	9.92	10.63	10.60	11.38	14.38			10.63
Ratio 98/99 to 97/98								
Damascus	84.00	99.29	64.71	87.50	102.86			83.87
Homs	82.05	145.45	104.76	105.26	90.91			109.38
Aleppo	106.12	79.16	86.67					90.65
Latakia	87.27		77.19	81.82	108.33			82.09
Tartous	98.84	121.53	81.82	128.21	87.50			107.60
MEAN	91.66	111.36	83.03	100.70	97.40			96.68

ANNEX TABLE III.2: WHOLESALE PRICES OF CITRUS IN MAJOR TOWNS DURING THE MAIN PRODUCTION SEASON, 1997/98 and 1998/99 (CONTINUED)

LEMONS	Nov	Dec	Jan	Feb	March	April	May	Mean Nov-May
1997/98								
Damascus	50.00	33.75	33.75	24.50	27.50	30.62	30.00	32.87
Homs	24.25	30.00	29.00	26.00	29.00	30.00	30.00	28.32
Aleppo	30.25	29.75	34.62	32.25	33.00	35.00	40.80	33.67
Latakia	32.50	32.50	30.00	28.00	30.00	28.00	28.00	29.86
Tartous	24.50	29.50	26.50	22.75	22.75	23.33	24.75	24.87
MEAN	<u>32.30</u>	<u>31.10</u>	<u>30.77</u>	<u>26.70</u>	<u>28.45</u>	<u>29.39</u>	<u>30.71</u>	<u>29.92</u>
1998/99								
Damascus	21.62	25.00	20.00	19.00	22.00	31.00	31.00	24.23
Homs	14.75	25.00	20.00	20.00	21.00	27.50	32.00	22.89
Aleppo	24.37	20.50	23.00	19.00	21.00	36.00	32.00	25.12
Latakia	19.33	24.75	20.00	18.00	19.50	32.50	31.00	23.58
Tartous	16.66	20.00	15.50	16.00	17.00	26.00	23.00	19.17
MEAN	<u>19.35</u>	<u>23.05</u>	<u>19.70</u>	<u>18.40</u>	<u>20.10</u>	<u>30.60</u>	<u>29.80</u>	<u>23.00</u>
Ratio 98/99 to 97/98								
Damascus	43.24	74.07	59.26	77.55	80.00	101.24	103.33	76.96
Homs	60.82	83.33	68.97	76.92	72.41	91.67	106.67	80.11
Aleppo	80.56	68.91	66.44	58.91	63.64	102.86	78.43	74.25
Latakia	59.48	76.15	66.67	64.29	65.00	116.07	110.71	79.77
Tartous	68.00	67.80	58.49	70.33	74.73	111.44	92.93	77.67
MEAN	<u>62.42</u>	<u>74.05</u>	<u>63.96</u>	<u>69.60</u>	<u>71.16</u>	<u>104.66</u>	<u>98.41</u>	<u>77.75</u>

ANNEX TABLE III.3: COMPARISON OF MEAN MONTHLY PRICES IN PROVINCIAL WHOLESALE MARKETS WITH THOSE IN DAMASCUS, JANUARY TO DECEMBER 1998

(Index: Damascus = 100)

Lemon	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Damascus	100	100	100	100	100	100	100	100	100	100	100	100
Dar'a	112	146	121	126	100	97	103	91	67	96	118	96
Sweida	91	138	114	100	113	103	105	100	98	158	123	84
Homs	85	108	104	97	100	81	79	80	83	115	68	100
Hama	103	146	136	119	117	76	115	102	86	88	109	60
Latakia	88	117	107	90	93	78	77	68	60	77	86	100
Tartous	79	96	82	74	83	76	64	61	60	73	77	80
Idleb	97	125	114	100	127	108	108	91	90	112	105	72
Aleppo	103	133	118	113	137	114	108	100	86	100	109	84
Al-Raqqa	106	121	107	100	150		136	136	119	146	114	100
Al-Hassaka	103	146	125	113	133	130		114	114	135	132	100
Dair-Ezzor	118	138	118	129	127	108	113		95	154	127	100
Quneitra												100
Average*	99	128	113	106	116	97	101	94	87	114	106	90

Orange	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Damascus	100	100	100	100	100	100	100	100	100	100	100	100
Dar'a	80	92	88	79	100	117	125	156			93	100
Sweida	87	77	106	95	106	67					114	80
Homs	87	77	88	89	111			139	124	76	64	80
Hama	113	108	106	95	117	133	125	167	200	135	150	60
Latakia	80	92	75	84	94					94	79	100
Tartous	67	85	94	84	94			56		65	86	80
Idleb	80	92	100	105	100							73
Aleppo	93	92	100	79	111	111						80
Al-Raqqa	87	108	94	84	122	111		111	147	76	100	87
Al-Hassaka	113	131	113	105	111	133	125	150	176	165	86	80
Dair-Ezzor	93	108	113	84		178					86	67
Quneitra												87
Average*	89	97	98	89	107	121	134	130	162	102	95	75

Mandarin	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Damascus	100	100	100								100	100
Dar'a	71	75	94								100	100
Sweida	71	69	89								136	91
Homs	65	63	78								73	109
Hama	71	75	72								118	64
Latakia	71	69	67								91	0
Tartous	65	63	89								82	91
Idleb	71	50	89								100	82
Aleppo	88	94									118	82
Al-Raqqa	71	81	100								109	100
Al-Hassaka	76	88	94								100	118
Dair-Ezzor	76	113	122								91	91
Quneitra												100
Average*	72	76	89								102	93

Derived from data collected by the Department of Agricultural Economics, MAAR.

* Unweighted average, excluding Damascus.

ANNEX TABLE III.4: ESTIMATED RETAIL MARGINS FOR CITRUS IN DAMASCUS AND LATAKIA

(SP/kg)

LEMONS

		Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Damascus	W	34	24	28	31	30	37	39	44	42	26	22	25
	R	39	35	40	37	39	47	49	54	52	34	27	30
Latakia	W	30	28	30	28	28	29	30	30	25	20	19	25
	R	35	35	35	35	35	35	35	35	30	25	24	30
Damascus	R-W	6	11	13	6	9	11	10	10	10	9	5	5
	%	16	43	45	19	28	29	26	21	24	34	25	20
Latakia	R-W	5	7	5	7	7	6	5	5	5	5	5	5
	%	17	25	17	25	25	21	17	17	20	25	26	19

ORANGES

		Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Damascus	W	15	13	16	19	18	18	20	18		17	14	15
	R	19	19	21	25	23	23	25	25		22	18	18
Latakia	W	12	12	12	16	17					16	11	15
	R	16	16	17	20	25					20	15	19
Damascus	R-W	4	6	5	5	6	5	5	7		5	4	4
	%	26	42	34	26	31	29	25	39		30	27	24
Latakia	R-W	4	4	5	4	8					4	4	4
	%	32	35	42	25	47					25	36	25

MANDARINS

		Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Damascus	W	17	16	18		30						11	11
	R	23	21	22		38						13	15
Latakia	W	12	11	12								10	
	R	15	15	17								13	
Damascus	R-W	6	5	4		8						3	4
	%	34	33	24		25						25	31
Latakia	R-W	3	4	5								3	
	%	29	36	42								35	

W = wholesale R = retail % = 100(R-W)/W

ANNEX TABLE V.1: CITRUS EXPORTS ANALYSED BY COUNTRY OF DESTINATION, 1996

	ORANGES		MANDARINS		LEMONS		OTHER CITRUS		TOTAL		
	Tons	Value (SP)	Tons	Value (SP)	Tons	Value (SP)	Tons	Value (SP)	Tons	Value (SP)	
TOTAL	5,414	51,041,193	5,442	46,117,179	58	774,431	492	3,085,473	11,406	101,018,277	2,020,366
Middle East	5,125	47,986,231	5,347	45,612,724	39	517,195	466	2,913,792	10,978	97,029,942	1,940,599
Saudi Arabia	965	8,900,753	1,966	16,582,222	8	97,500	136	881,580	3,075	26,462,055	529,241
Jordan	771	6,820,976	23	88,351			1	4,232	795	6,913,559	138,271
Bahrain	86	786,788	595	4,962,384			10	65,137	691	5,814,309	116,286
Oman	1	82,229	10	81,184					11	163,413	3,268
Kuwait	1,806	16,571,649	1,279	11,199,883	6	78,152	74	594,786	3,165	28,444,470	568,889
Qatar	110	1,832,201	168	1,566,988			7	51,697	285	3,450,886	69,018
Egypt			2	10,881					2	10,881	218
Turkey				1,853						1,853	37
Iran	1	7,734	2	16,051					4	23,785	476
United Arab Emirates	1,386	12,983,901	1,302	11,102,927	26	341,543	238	1,314,346	2,951	25,742,717	514,854
Lebanon								2,014		2,014	40
E. Europe and FSU	286	3,017,640	76	324,383	19	240,964	24	161,635	405	3,744,622	74,892
Russia	215	2,468,325	6	53,343	14	180,000	2	15,423	237	2,717,091	54,342
Ukraine			40	42,445	4	44,629	3	17,446	47	104,520	2,090
Romania	2	22,031						2,611	2	24,642	493
Hungary	18	168,750							18	168,750	3,375
Armenia	16	147,937							16	147,937	2,959
Belarus			14	93,328					14	93,328	1,867
Latvia	19	126,729							19	126,729	2,535
Georgia	16	83,868			2	16,335	1	4,950	18	105,153	2,103
Poland							18	121,205	18	121,205	2,424
Czech Republic			16	135,267					16	135,267	2,705
Western Europe	2	21,023	2	18,753			1	10,046	6	49,822	996
Germany	2	21,023	2	18,753			1	10,046	6	49,822	996
Others	1	16,299	17	161,319					18	193,890	3,878
Afghanistan				5,046					0	21,318	426
Argentina	1	3,616	3	23,383					3	26,999	540
Peru			14	132,890					14	145,573	2,911

ANNEX TABLE V.2: CITRUS EXPORTS ANALYSED BY COUNTRY OF DESTINATION, 1997

	ORANGES		MANDARINS		LEMONS		OTHER CITRUS		TOTAL		
	Tons	Value (SP)	Tons	Value (SP)	Tons	Value (SP)	Tons	Value (SP)	Tons	Value (SP)	
TOTAL	2,986	25,719,769	5,194	48,862,398	41	513,045	257	2,289,417	8,479	77,384,629	1,547,693
Middle East	2,232	17,464,426	5,060	47,634,641	38	461,747	244	2,205,116	7,574	67,765,930	1,355,319
Saudi Arabia	725	6,635,081	3,358	31,559,788	18	189,805	178	1,237,513	4,278	39,622,187	792,444
Jordan	659	4,426,856	45	355,163					704	4,782,019	95,640
Bahrain	63	517,787	268	2,357,274			11	76,468	343	2,951,529	59,031
Oman	54	459,898	103	1,001,164			8	50,660	165	1,511,722	30,234
Kuwait	323	2,343,686	650	6,003,756	2	20,618	34	261,527	1,009	8,629,587	172,592
Qatar	68	625,627	51	493,177	5	14,670	8	49,634	131	1,183,108	23,662
Egypt			3	30,098					3	30,098	602
United Arab Emirates	299	2,285,046	577	5,764,704	14	236,654	6	529,314	896	8,815,718	176,314
Lebanon	40	170,445	5	69,517					45	239,962	4,799
E. Europe and FSU	716	7,985,029	134	1,227,757	2	34,243	13	84,301	866	9,331,330	186,627
Russia	688	7,697,420	58	498,354			9	56,334	755	8,252,108	165,042
Ukraine			37	383,734					37	383,734	7,675
Romania			2	17,765					2	17,765	355
Hungary	2	14,057							2	14,057	281
Armenia	19	195,673							19	195,673	3,913
Belarus	8	77,879	3	32,698	2	34,243	4	23,610	16	168,430	3,369
Georgia									1	4,357	87
Serbia			34	295,206					34	295,206	5,904
Western Europe					1	14,160			1	14,160	283
United Kingdom					1	14,160			1	14,160	283
Others	38	270,314				2,895			38	273,209	5,464
Libya	17	108,781							17	108,781	2,176
Sudan	4	50,821							4	50,821	1,016
USA						2,895				2,895	58
Burma	17	110,712							17	110,712	2,214

ANNEX TABLE V.3: CITRUS EXPORTS ANALYSED BY COUNTRY OF DESTINATION, 1998

	ORANGES		MANDARINS		LEMONS		OTHER CITRUS		TOTAL		
	Tons	Value (SP)	Tons	Value (SP)	Tons	Value (SP)	Tons	Value (SP)	Tons	Value (SP)	
TOTAL	4,317	35,689,162	9,228	77,952,168	167	2,050,525	724	5,402,601	14,437	121,094,456	2,421,889
Middle East	3,698	29,194,253	8,834	74,461,507	162	1,990,873	638	4,708,124	13,333	110,354,757	2,207,095
Saudi Arabia	1,430	11,426,034	5,863	49,680,653	41	381,877	369	2,737,087	7,703	64,225,651	1,284,513
Jordan	489	3,676,801	5	40,662	2	22,163	1	5,021	498	3,744,647	74,893
Bahrain	77	677,030	259	2,315,250	4	28,633	6	44,211	346	3,065,124	61,302
Oman	240	2,033,720	418	3,586,948	12	128,950	23	189,743	693	5,939,361	118,787
Kuwait	722	5,757,885	1,354	10,910,129	34	431,714	70	557,251	2,180	17,656,979	353,140
Qatar	195	1,538,670	197	1,674,707	11	116,871	10	64,919	413	3,395,167	67,903
Egypt	48	237,977	1	10,907					49	248,884	4,978
Turkey	1	6,451			49	734,719			50	741,170	14,823
Iran			3	26,133					3	26,133	523
United Arab Emirates	497	3,839,364	733	6,216,118	10	144,793	159	1,109,892	1,399	11,310,167	226,203
Lebanon		321				1,153				1,474	29
E. Europe and FSU	596	6,310,245	387	3,434,039	5	59,652	87	694,477	1,075	10,498,413	209,968
Russia	544	5,894,378	182	1,704,057			78	633,419	804	8,231,854	164,637
Ukraine	38	300,706	46	393,507					85	694,213	13,884
Uzbekistan	2	11,371							2	11,371	227
Romania	9	86,580	117	977,322	5	59,652	2	18,747	133	1,142,301	22,846
Hungary			15	126,311			7	42,311	21	168,622	3,372
Bosnia	1	10,117							1	10,117	202
Armenia	1	7,093	2	13,415					2	20,508	410
Slovakia			21	182,784					21	182,784	3,656
Czech Republic			4	36,643					4	36,643	733
Western Europe	2	11,498							2	11,498	230
Greece	2	11,498							2	11,498	230
Others	21	173,166	7	56,622					28	229,788	4,596
Djibouti	4	24,888	7	56,622					11	81,510	1,630
Thailand	17	148,278							17	148,278	2,966

