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RAPID MARKETING APPRAISAL OF THE MARKETING OF FOUR VEGETABLE CROPS IN JORDAN

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Cooperative Agreement AID/DAN-1323-A-00-5093-00
USAID Science & Technology Agriculture

PIP GTS Report No. 97

July, 1988

Contract No. DAN-1323-B-00-6017-00, Delivery Order No. 04

Funded by USAID/Jordan



University of Idaho

College of Agriculture

In cooperation with

United States Agency for
International Development

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PREFACE

The Postharvest Institute for Perishables and Dr. Richard Schermerhorn, Head, Department of Agricultural Economics and Rural Sociology from the College of Agriculture, University of Idaho have been working with the Government of Jordan and USAID/Jordan to evaluate and improve the vegetable marketing system in Jordan. This report covers work performed from April 1 through June 8, 1988 under USAID Contract No. DAN-1323-B-00-6017-00. Delivery Order No. 4.

The authors of this report wish to acknowledge the in-country leadership and participation in this study provided by the Agricultural Marketing Organization. We especially express our appreciation to Mr. Jamil Zureikat, Mr. Ibrahim Oreikat and Mr. Mahmoud Hyari of the Agricultural Marketing Organization for their support and willingness to devote the necessary resources required to complete the study; to Mr. Marwan Haddadin who provided the leadership for the assessment team; and to Hassan Sahoury, Mohamed Aribaiat, Mohammed Khalil and Osama Al-Najdawi the members of the assessment team. Without the full cooperation and participation of these members of the Agricultural Marketing Organization this study could not have been conducted within the time and resource constraints associated with this project. Finally we wish to express our appreciation to Mr. Munther Azar from USAID for his assistance and guidance during the course of the study.

Rapid Marketing Appraisal of the Marketing of Four Vegetable Crops in Jordan

Chapter I Introduction

Background

Previous studies have concluded that Jordan has significant potential to increase its agricultural production, particularly the production of fruit and vegetables. Numerous problems, particularly related to marketing, have become constraints to the full development of this potential production capacity. These problems relate to inadequacies in the availability and use of postharvest loss prevention technology and inefficiencies in marketing institutions which have translated into lower producer prices and higher prices paid by consumers. In turn, this situation has become a disincentive to the expansion of fruit and vegetable production in Jordan.

While the symptoms of marketing system problems are evident (e.g. high postharvest losses, poor quality products, produce surpluses and deficits, decline in quantities entering the export market, decline in farm profits, relatively high marketing margins, etc.), the underlying causes are not well understood. As a result, interventions initiated to provide solutions have, at times, been inappropriate and in some cases have actually further aggravated the problem and the overall efficient functioning of the marketing system.

It has become very obvious that a need exists to provide fruit and vegetable production/marketing system participants (both public and private) with an assessment of the marketing system that will enable them to evaluate the effectiveness of alternative interventions, or lack thereof, needed to improve market performance.

In addition to the need to provide market assessment information to the Jordan Agricultural Marketing and Processing Company (AMPCO) and the many private marketing firms, it is important to recognize the following:

1. The Agricultural Marketing Organization (AMO), which has been mandated to provide leadership in identifying, analyzing and providing solutions to problems in the fruit and vegetable marketing system in Jordan, has limited resources and thus faces the need to prioritize the specific problem areas which need to be addressed.

2. The upcoming USAID Agricultural Marketing Development Project, which will focus on agricultural policy reform, market system improvements, and expanded participation for the private sector in marketing, needs market assessment information to assist in the overall identification of priority issues to be considered in the implementation of the project.

3. The two projects under which the Jordan Ministry of Agriculture is focusing its research and extension efforts to increase the production of fruit and vegetables (the Highland Agricultural Development Project and the Jordan Valley Agricultural Services Project) need, because of the limited resources, to prioritize the specific aims of project investment such that the greatest impact will be achieved on fruit and vegetable farmers' profitability.

Marketing system problems, which currently constrain the increased profitability and productivity of fruit and vegetable farmers and market intermediaries, need to be identified and addressed. Solutions need to be developed and implemented in order that Jordan will have an efficient and effective fruit and vegetable marketing system. This Rapid Marketing Appraisal (RMA) study was initiated to provide information to address these needs. The information developed by the study will be provided to all participants, institutions, projects, and programs involved in the production/marketing of fruit and vegetables in Jordan.

Objective of the Study

The overall objective of the RMA study is to identify and analyze the organization, operation, and performance of the fruit and vegetable production/marketing system in Jordan. More specifically the objectives are to:

1. Provide an overview of the production/marketing system for four selected vegetable crops.
2. Identify the problems and constraints to the efficient and effective marketing of these four crops from the Jordan Valley to the domestic and export markets.
3. Prioritize the major problem areas that warrant further research or in-depth investigation to facilitate adequate development and implementation of alternative solutions.
4. Formulate a preliminary design for the conduct of this research or those in-depth investigations which will result in the most

effective conduct of the Agricultural Marketing Development project and other activities carried out by AMO.

Study Methodology

In general, Rapid Marketing Appraisal studies are designed to identify food system problems, constraints and opportunities in a limited period of time under conditions of resource constraints. They rely on informal interviews with purposively selected food system participants, on direct observation of agricultural production/marketing functions and facilities, and on analysis of readily available secondary data and previous studies of the system.

This Rapid Marketing Appraisal is designed to collect, organize and analyze information relevant to planning, production, harvesting, postharvest handling, market preparation and marketing of tomatoes, potatoes, eggplant, and cucumbers from the Jordan Valley production region of Jordan.

The commodity systems approach is utilized for the study because it provides an understanding of the total process structure of the production/marketing system for a commodity -- from the supplier of inputs and information, through the production and marketing channels, to the ultimate consumer. It encompasses all the various functions that are performed during the process of producing, harvesting and moving the product to the ultimate consumer in the form, at the time, and to the place the consumer desires. The commodity systems approach is also an interdependent system in that it encompasses all the participants involved in the planning and production, processing, marketing, and support services of a commodity, including a diversity of public and private intermediaries.

Given the above characteristics of a Rapid Marketing Assessment study, utilizing the commodity systems approach, analysis at three distinct levels is required; 1) macro-environmental and public policy issues; 2) specific commodity system including participants, functions and marketing arrangements; and 3) micro, or firm level, including individual participants, functions, problems and needs.

Procedural Approach

An initial visit to Jordan was made in August 1987 to review existing studies of the marketing system and its performance in order to do the following: 1) secure background information on the fruit and vegetable system in

Jordan; 2) determine the appropriateness of the Rapid Marketing Assessment study approach to identify problems and/or opportunities in the fruit and vegetable production/marketing system in Jordan; and 3) determine the appropriateness of using personnel from the AMO as the marketing assessment team. It was felt that the RMA study was appropriate and that the AMO personnel would be appropriate to form the assessment team.

Use of the AMO personnel would also constitute a training function in that they would receive "on the job" training from participation in the study.

A second visit to Jordan was made in January 1988 when a presentation was made to GOJ officials at the Agricultural Marketing Policy workshop to orient them on assessment methodology, the expected outputs from the study, and, in general, the what, when, where, how and why of the study. The objective of this presentation was to provide a general understanding of how the RMA fits into the overall agricultural marketing program being proposed by USAID, and to gain participation by all government groups. Also during the second visit determination was made of the commodities to be included (tomatoes, potatoes, eggplant and cucumbers) and the area to be studied (the Jordan Valley).

In addition, an assessment team of AMO personnel was identified. The team consisted of the following:

Marwan J.Haddadin - team leader
Hassan Salman Sahoury - cucumber specialist
Mohamed Aribaiat - tomato specialist
Mohammed Ismail Khalil - potato specialist
Osama Mustafa Al-Najdawi - eggplant specialist

This team was briefed on the objectives of the study and the methodology to be used. The team was asked to begin, as time permitted, to assemble any type of available information (production costs, market prices, etc.) and to list various sources of information that might be useful to gain a better understanding of the production/marketing system for a commodity. They were also asked to review draft questionnaires in relation to possible revisions required to gain useful information in Jordan.

The main study commenced on the third visit to Jordan on April 1, 1988. The in-country study was completed on June 8, 1988. It is the result of this study which is presented in this report. The following outline delineates the remainder of this report.

Chapter II presents an overview of the production/ marketing situation (trends in production, exports, imports, prices, etc.) of

each of the four products (tomato, cucumber, potatoes and eggplant) included in the study.

Chapter III presents a discussion of the roles played by the various major marketing support organizations concerned with the fruit and vegetable production/marketing system in Jordan.

Chapter IV presents a summary of the analysis of the information collected from the retail and the farmer surveys conducted during this study.

Chapter V presents a listing of identified problems and constraints to efficient and effective production/marketing of fruits and vegetables in Jordan. Recommendations are made relative to the orientation of analysis of priority problems and evaluation of alternative solutions to these identified priority problems.

Chapter II

Commodity Analysis

At the outset it should be pointed out that various data sources yield contradictory results as regards the 'consumption' of fruits and vegetables in Jordan. The Marketing Studies Division of AMO has recently concluded a five month examination¹ of various data sources and has produced a series of balance sheets for the years 1974-87. It is on these data that the following observations are largely made, but the apparent anomalies can only be accounted for by the lack of veracity of some of the data. As is discussed in Chapter III of this study, the Ministry of Agriculture admits the lack of a firm base for some of its production data and regrets the non-existence of reliable consumption data with which to verify any assumed consumption figures. The Ministry consumption data are arrived at by calculating the difference between production plus imports (from the West Bank and Gaza, and elsewhere) and exports (Table 2.1 and Figure 2.1).

Production data and exports for all fruits and vegetables are shown in tables 2.2 and 2.3. It will be seen that there was a considerable surge in production for most commodities in 1981, with a corresponding rise in exports. These production levels continued to rise in the mid 1980's but have declined since for the major commodities, except for the level of potatoes, which in 1987 was almost six times the 1980 level. Exports have also declined for most commodities, again excluding potatoes of which exports were at record levels in 1987.

Table 2.4 shows, from 1974-87, the annual quantities sold and average prices realized in Amman wholesale market, the national production, exports, imports, and imports from the West Bank and Gaza for tomatoes, eggplant, cucumber and potato, which are the subjects of this study. Additionally, the quantities of tomatoes processed from 1982-87 and the Jordanian population for the years 1974-87 is shown.

Table 2.5 shows the monthly average prices and quantities of the four products sold in Amman market from 1974-87, and figure 2.2 shows the average annual prices of these commodities at the Amman wholesale market. Table 2.6 shows monthly average prices and quantities sold for Irbid wholesale market from 1974-79 and from 1981-87.

1. Unfortunately this is currently available only in Arabic, and therefore inaccessible to the authors of this report.

A series of balance sheets for the years 1978-86 was recently included in the Jordan Valley Impact Report by Shepley et al (11) and is included in this report as (Table 2.7). Figures 2.3 - 2.6 show the divergencies in Shepley et al of results from those constructed by AMO for consumption (disappearance) for the four commodities under study. It is interesting to note that both sets of balance sheets coincide in 1978 for all four commodities.

Tomatoes

The evolution of the tomato trade includes various apparently contradictory elements.

National production was reported to be about 185,000 tonnes in 1974, dropping back over the following two years, and rising to about 200,000 tonnes in 1980 -- a relatively steady progression. This domestic production was supplemented by West Bank imports, which rose from 0 in 1974 to 3-4,000 tonnes in 1980.

Exports fluctuated from about 88,000 tonnes in 1974, dropping back, like production, in the next two years to about 74,000 tonnes, and rising to 105,000 tonnes at the end of the decade. The consumption, or more properly "disappearance," total remained at around 100,000 tonnes. The weighted average price of tomatoes in Amman wholesale market had climbed steadily throughout the 1974-80 period from 47 fils/kg. to 109 fils/kg. without a corresponding rise in production.

In 1981, however, there was a total change, in that the disappearance total more than doubled over that of the previous year -- from 104,000 tonnes to about 227,000 tonnes as a result of a 60% rise in national production and a doubling of West Bank imports. Thus the total available was almost 349,000 tonnes in 1981 compared to 209,000 tonnes in the previous year. The government instituted a buying program from the beginning of May to the end of June in that year, paying 90 fils/kg. for first grade fruit, 70 fils/kg. for second grade and 40 fils/kg. for outgraded produce, delivered to the El Arda grading station. The packing facilities were reportedly inundated, and the program was quickly terminated. However, since the buying program was apparently not announced in advance, the sudden surge in production hardly appears to be attributable to this incentive.

The reported area from which this production came does not show a corresponding rise, staying relatively flat from 1978-81, rising during 1982-84, and declining again since then.

Furthermore, consumption, having risen to over 200,000 tonnes in 1981, remained above this figure until 1987 when it dropped back to 136,000 tonnes. This may have been a delayed response to the constantly falling prices in Amman from a high in 1984 of 138 fils/ kg. to 89 fils/kg. in 1987 an average price not seen since the mid 1970's.

Various explanations have been advanced for this rise in production at the beginning of the decade. It has been suggested that a number of irrigation schemes came on stream concurrent with extensive investment in plastic "green" houses (Table 2.8) and the expectation that the new processing plants in the Jordan Valley would provide a profitable outlet for tomatoes. It may be that the recent decline is explained not only by falling prices but also by the realization that the processing factory would not have the impact expected of it. In addition, the Ministry of Agriculture's cropping patterns were beginning to reduce production -- perhaps too deeply.

Table 2.8 Use of drip irrigation and plastic production in the Jordan Valley 1979 and 1983 (hectares)

	1979	1983	Rate of Increase
Plastic Tunnels	602	767	27%
Plastic Houses	74	674	810%
Drip Irrigation	1220	4267	249%

Source: Supply and Demand for Fruits and Vegetables in the Southern Mediterranean - Hogan and Bredaal.

Agricultural inputs in the form of seeds and fertilizers also showed increases in the late 70's and early 80's, declining again in 1984 and 1985. Table 2.9 shows the imports of fertilizers, pesticides and herbicides from 1977-1985.

Table 2.9 Jordanian Imports of Chemical Fertilizers, Pesticides and Herbicides 1977-85 (tonnes)

Year	Pesticides and Herbicides	Fertilizers
1977	1451	16708
1978	1350	27447
1979	1534	36956
1980	1850	31349
1981	1706	24436
1982	1143	42886
1983	844	67039
1984	920	31136
1985	606	30877

Source: Statistical Yearbook. 1986

Using the sales through the Amman market as proxy for national production, it appears that the lower volume through the market in 1981 compared to 1980, may be accounted for by the disastrous government buying program during the 1981 peak production months. This action reduced the quantities sold in Amman during May and June of that year and has persuaded farmers to spread their production season. Further, whereas the coefficient of variation for the twelve month deliveries was generally around 50 in the 1970's, it rose to 75 in 1982 and then came quickly down to 38 in 1983, with a slight rise during the following three years, and to 15 in 1987. This suggests that following the high investment in plastic houses and drip irrigation farmers produced the crop whose growing techniques they knew best already, namely tomatoes, and then started to master other products at this new level of technology.

Cost of production and marketing data for tomatoes are shown in tables 2.10 and 2.11. These are drawn from a study conducted by the Arab Organization for Agricultural Development in 1985. They serve to illustrate the high proportion of the total cost involved in marketing the crop. It will be noted that no cost has been charged for the farmer's time spent in accompanying his produce to market. If this were to be included then the 37% which the budgets show for marketing would clearly be higher. Furthermore, the commission charge of 7% is made up of 5% commission and 2% tax. While the 2% tax paid by the buyer is strictly speaking charged to him, it is not unreasonable to assume that this is discounted in the price received by the producer and thus reduces his revenue.

As seen in figure 2.3, the Shepley report does not show the same steep rise in consumption in 1981, but shows an even higher peak than the AMO result, viz. 283,880 tonnes in

1985 with a precipitous decline in 1985 to 147,400 tonnes in 1986. The Shepley consumption totals have been adjusted to exclude the tomatoes processed, which in 1986 reached their highest level of 45,600 tonnes. This pattern of fluctuation is not obviously explained by the prices realized in Amman, any more than that arrived at by AMO. This situation might warrant further investigation by AMO if the data is considered sufficiently reliable.

Eggplant

Eggplant production showed the same steep rise in production in the early 80's as did tomatoes, with a decline from 1983 to 1987. While exports rose slightly during the same period the balance left for 'consumption' rose, in 1982 to a figure more than twice that in the period 1976-79. Annual average prices in Amman reached their all-time peak in the same year, and never reached the peak production season lows of the previous two years, which would appear somewhat contradictory. There had been a constant rise in price throughout the latter part of the 1970's, which may have stimulated investment in the crop, but more recently prices have fallen back again. In 1987 the annual average price was slightly lower than that of 1977.

Exports of eggplant have also declined from a peak of almost 37,000 tonnes in 1982 to 25,000 tonnes in 1987.

West Bank imports have followed a similar pattern to East Bank production but at their peak in 1982 represented only some 6.5% of total supply available. They have followed a similar pattern of decline as the East Bank production and, in fact, 1987 imports were reported as zero.

Cost of production data (Tables 2.12 and 2.13) suggest that, whereas in the mid-80's the margins over production and marketing costs of 56 fils/kg. and 72 fils/kg. under surface and drip irrigation respectively were perhaps attractive at about 100 fils/kg., the position in 1987 had moved against the producer. With an average price of 83 fils/kg. in 1987 and with costs doubtless above those of 1985, the margin was slim. Again, as with tomatoes, whether the fall in production (and sharp reduction in area devoted to the crop) is a response to falling price or to the cropping pattern is not clear and could be the subject of further analysis by AMO.

Cucumber

Again, as with the two previous crops, cucumber production showed the same steep rise in production in the early 80's, from around 20,000 tonnes in the mid-70's to over 100,000 tonnes in 1981. Unlike tomatoes and eggplant, however, production levels have been maintained, and exports which ran at 4-6,000 tonnes in the mid 70's and rising to about 50,000 tonnes by 1982 have continued at about this level through to 1987. Thus, although 'consumption' has risen also, it is less spectacular than for tomatoes. Whereas the per capita consumption for cucumbers calculated on the crude basis of the 'disappearance' divided by the population suggests a rise from 8 kg/head in 1976 to 16-21 kg/head in 1986-87 and that for tomatoes is 45 and 47 kg/head for the same two periods, 'consumption' of tomatoes rose to 105 kg./head in 1983.

The Amman annual average price for cucumber, as with tomato and eggplant, has also fallen back from a peak in 1982 of 216 fils/kg. to 140 fils / kg. in 1987. Comparing this price with the cost of production and marketing data produced in 1985 (Table 2.14) would suggest that the farmer is losing money at the 1987 price levels. However, the budget presented in Table 2.14 is for one system of production only, and the assumptions upon which it is based were not clearly defined. Further analysis, outside the scope or resources devoted to the present study, would be required to draw firm conclusions as to the likely response of farmers to prevailing prices.

Potato

The production of potatoes in Jordan rose steeply from 2,500 tonnes in 1974 to 9,100 tonnes in 1975. Since the price data for 1973 are not available it is not clear whether this steep rise was in response to high prices in that year, or some other factor. Production remained relatively constant at about 8-10,000 tonnes until 1982 (with the exception of 1979 when there was a steep decline for that one year). In 1983, the domestic production more than doubled to about 26,000 tonnes following sharp price rises in 1980 and 1981 (1980 imports plummeted), at which level they stayed for the following three years.

The general trend of imports from 1974 has been erratic but upward, from almost 20,000 tonnes in 1974 to almost 40,000 tonnes in 1982. From this period import restrictions were imposed. The monopoly on imports was granted to the forerunner of the present AMPCO in 1983, and the potato production subsidy scheme was introduced in 1985². In 1983

2. Described in Chapter III

production more than doubled over the previous year, from 11,500 tonnes to almost 26,000 tonnes. This level was maintained for three years, and then in 1986 production rose to 38,500 tonnes, and to 48,200 tonnes in 1987. In 1988 the support prices paid in the previous two years were lowered. It remains to be seen what farmer response has been.

Imports during 1986 and 1987 were reported as 11,700 and 2,600 tonnes respectively with an additional 4,000 tonnes coming from the West Bank in each of these two years. It would appear that AMPCO purchases, under the subsidy program of 5,297 tonnes and 10,500 tonnes in 1986 and 1987, have persuaded farmers to increase production of this crop. AMPCO has exported some of the potatoes bought under this scheme in order not to depress domestic prices, with resultant losses to AMCO. Whether the subsidy program could now be withdrawn, and potato production allowed to find its own equilibrium, should perhaps be investigated. It would appear that farmers responded to the rising prices in the late 70's and early 80's. Prices decreased slightly when imports reached their peak in 1981 and 1982, recovered following import restrictions in 1983, and reached an all-time high of 145 fils/kg. in 1987. Perhaps the import restriction policy would have been a sufficient policy change without the addition of the subsidized buying program. Or, perhaps even import restrictions were not necessary, given that farmers had already geared themselves up to produce this crop.

The 1985 budget (Table 2.15) for the production and marketing of potatoes would appear to be a rather specialized one as the bulk of the Jordanian crop is not produced under drip irrigation. It is included as an illustration of the importance of marketing costs, as a proportion of the farmer's costs rather than the relationship between these costs and the support or market realization prices.

Market Prices

Tables of wholesale market prices for Amman and Irbid have been included in this report; the comments regarding prices received for the four commodities of this study have been based on prices reported from the Amman market. Time did not permit a detailed analysis of the relationships between prices in the two markets, although a cursory examination suggests that Irbid is, and has been, somewhat lower than Amman on the basis of the annual average prices. It would have been interesting also to examine the relationships between the retail prices set for the two areas based on the respective wholesale prices. Both the

above areas could be fruitful exercises for future research by AMO.

Conclusions

Even on the basis of this partial examination of the data for the four commodities which are the subject of this study, it is clear that many questions are left unanswered, and that perhaps the results of government policy have not been those intended, or have caused over-reaction on the part of producers.

Clearly, it is not possible to erase what has been done. However, to plunge even further into the mire of intervention by encouraging farmers to grow cereals and fodder with direct acreage payments (in addition to the current wheat subsidies) appears to risk more cost to the treasury, and probably more imbalances.

At the beginning of this commentary it was made clear that the data upon which it is based can be debated, and an analysis of the data from the Shepley report would probably result in different conclusions. It would seem desirable, however, that results of the latest AMO data examination should be made the subject of examination by all the interested bodies. The data should then be made available in English when there is some measure of agreement on their veracity. Inevitably some non-Arabic reading analysts will need data sources in the future, and a source broadly agreed as reasonably accurate, should be made available to them. It would also be preferable that the various Jordanian bodies involved in collecting, collating and publishing agricultural data should collaborate to produce reliable data in future.

Table 2.1 Commodity Balance Sheets for Tomato, Eggplant, Cucumber and Potato 1974-86

	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Tomato														
Production (tonnes)	184.9	151.8	145.3	155.7	201	195.3	206.2	341.4	375.4	408.2	354.6	392.3	305.9	268.4
West Bank "	0	0.2	2.2	2.2	4.8	4.5	3.2	7.3	15.2	10.8	20.2	21.7	16.1	4.6
Imports "	0	0	0.05	0.03	0.5	0	0.09	0	0	0	0	0	0	0
Exports "	87.9	52.9	61.9	46.5	82.9	91.2	105.2	122.1	147.9	123	134	104.5	98.2	92.6
Processed									27.1	27.1	38.4	45.6	19.2	44.6
Consumers "	97.0	99.1	85.7	111.4	123.4	108.6	104.3	226.6	215.6	268.9	202.4	263.9	204.6	135.8
Area (dunums)	120470	133746	110221	110909	137262	132085	136643	132547	156485	162073	155623	137067	91405	78116
Eggplant														
Production (tonnes)	62.7	85.8	44	49.1	48.6	69.4	81.4	99.3	110	93.9	73.7	76.2	80	48.9
West Bank "	0	0	0.5	1	0.7	1.6	1.7	4.7	7.1	2.3	1.7	3.3	1.9	0
Imports "	0	0	0	0.06	0.1	0.03	0	0	0	0	0	0	0	0
Exports "	22.2	21.8	16.7	19	16.4	27.2	26.4	32.3	36.9	28.5	37.5	35	31.9	24.9
Consumers "	40.5	64.0	27.8	31.2	33.0	43.8	56.7	71.7	80.2	67.7	37.9	44.5	50.0	24.0
Area (dunums)	38496	35141	28318	29125	26765	33785	34202	42765	64264	56141	28125	27162	27330	16149
Cucumber														
Production (tonnes)	11	17.1	18.4	21.6	22.6	44.5	64.2	106.2	87.4	108.2	99.1	124.7	92.7	110.7
West Bank "	1.8	1.6	3.5	3.7	4.6	3.9	1.4	2.9	2.3	0.5	0.3	0.2	0	0
Imports "	0	1.6	0	0.1	0.2	0	0	0	0	0	0	0	0	0
Exports "	3.9	4.4	6.3	4.8	14.7	12.1	23.7	39.3	50.6	53	58.3	61.6	43.8	47.0
Consumers "	8.9	15.9	15.6	20.6	12.7	36.3	41.9	69.8	39.1	55.7	41.1	63.3	48.9	63.7
Area (dunums)	12817	12024	17118	15367	17009	25258	30346	42765	32026	40899	34426	64817	21602	24345
Potato														
Production (tonnes)	2.5	9.1	8.5	7.6	10.2	4.6	8.4	9.1	11.5	25.7	26.6	26.2	38.5	48.2
West Bank "	0.5	0.4	0.8	0.3	0.9	0	0.9	1.6	2.5	3.9	4.9	4.4	3.9	6.3
Imports "	19.8	15.3	17.1	27.5	14.1	13.8	1.9	38.3	39.3	25.2	20.6	11.6	11.7	2.6
Exports "	1.2	1.4	2.6	1	1.2	0.1	1	3.2	4.8	2.4	5.7	8.7	1.9	10.6
Consumers "	21.6	23.4	23.8	34.4	24.0	18.3	10.2	45.8	48.5	52.4	46.4	33.5	52.2	46.5
Area (dunums)	2720	3653	5944	5851	6876	3618	5928	3160	7468	7777	12568	15504	15234	21471
Population (000's)	1753.2	1823.3	1896.7	1972.1	2050.9	2133	2218.3	2307	2399.3	2495.5	2595.1	2698.9	2806.9	2919.1

Source: Agricultural Marketing Organisation, 1988

Table 2.2 Jordan Production of Main Fruits and Vegetables, 1975-1987 (tonnes)

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
tomato	151819	145309	155655	201486	195358	206193	341362	375427	408214	354581	392268	305900	268435
eggplant	85821	44011	49149	48573	69412	91445	99321	110018	93942	73671	76232	80000	48861
cucumber	17095	18377	21658	22582	44544	64189	106179	87454	108194	99141	124748	92685	110700
squash	17163	18611	18074	21365	27529	24958	33972	73842	83096	78692	69525	51950	47508
gr-beans	16569	7149	8228	12829	13932	7313	9043	6807	27310	7788	9954	19940	10535
onions	7254	5289	7696	8014	4303	7751	11680	30150	24623	8880	13656	21385	18052
potato	9128	8531	7583	10226	4558	8391	9071	11536	25660	26614	26199	38550	48179
cauliflower	35860	19011	15651	15332	15272	15674	24290	44585	57285	41271	35408	36560	31707
cabbage	15081	16020	13427	8927	19317	16722	15355	20646	30567	57459	28914	27935	20092
peppers	6284	6780	6980	6684	10823	12322	13187	15049	32495	27750	27534	26775	30806
br. beans	16569	7149	8228	12829	13932	7323	9043	6807	27310	7788	9954	6495	6500
watermelon	50244	62767	36294	25646	3480	27087	19355	25157	73632	46568	65011	60625	91208
citrus	57200	69707	70338	67792	50367	59529	86941	126977	123461	95202	158270	108664	108841
grapes	39143	36318	33747	43247	36691	43485	45911	40664	51881	38742	52637	58121	54302
Total	525230	465029	452708	505532	509518	582382	824710	983119	1167670	964147	1090310	935585	895726

Source: AMO

Table 2.3 Jordan Exports of Main Fruits and Vegetables, 1975-1987

(tonnes)

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
tomato	52902	61937	46542	82908	91168	95165	122099	142909	123038	134012	104494	98182	92210
eggplant	21772	16870	21393	24849	27213	26357	32343	36978	28456	27502	24987	31954	24985
cucumber	4394	6257	4756	14681	12076	23686	37518	50640	53050	58277	61587	43796	48001
squash	7298	7595	10442	14599	18073	19587	26540	37047	32570	22045	26308	19778	15931
gr-beans	1468	2095	792	1722	2716	4333	5759	6758	7991	7667	7763	7794	8414
onions	1547	2679	437	3610	5091	5971	8738	5769	5767	3707	4155	1723	1202
potato	1361	2595	968	1198	112	994	3159	4823	2439	5741	8690	1946	10647
cauliflower	2290	5064	5161	7849	4870	10676	10943	11190	17402	16328	12826	13972	11679
cabbage	2973	2780	2556	4639	4605	5248	7202	9077	9445	13400	10060	9878	7818
peppers	3332	3362	3839	4958	8113	6493	9255	12092	17939	20239	21413	20352	22871
br. beans	2209	6022	6478	4966	2200	3786	2938	4111	4411	1099	1839	523	761
watermelon	3030	1597	76	149	81	485	305	83	2674	5961	8088	6587	7265
orange	113392	124692	112438	114147	73691	99496	98251	105647	72024	76648	86806	54827	51543
grapefruit	1098	2368	746	1596	0	1271	3149	1685	2158	1083	971	1261	487
lemon	7062	4583	8664	9381	8975	11074	12814	15624	17490	21620	27018	21476	18551
mandarin	6530	5063	7779	13453	9710	10210	12101	17290	17211	20909	22151	8928	13684
grapes	8142	5374	1541	4277	5822	5456	6345	5999	6270	4883	2016	1015	892
Total	244800	260933	234608	308982	274516	330288	399459	467722	420335	441121	431172	343992	336941

Source: AMO

Table 2.4 Average Annual Amman Wholesale Price and Quantity, and Annual Production, Exports, Imports of Tomatoes, Eggplant, Cucumber, Potatoes, 1974-1987

		1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Price Amman Market	Tomato	47	54	76	96	103	101	109	96	97	129	138	111	94	89
	Eggplant	45	43	55	89	89	93	111	114	123	111	108	97	109	83
	Cucumber	69	86	110	162	17*	184	192	185	216	210	250	168	183	140
	Potato	56	63	93	73	87	96	117	116	108	127	136	145	134	145
Production	Tomato	184.9	151.8	145.3	155.7	201	195.3	206.2	341.4	375.4	408.2	354.6	392.3	305.9	268.4
	Eggplant	62.7	85.8	44.0	49.1	48.6	69.4	81.4	99.3	110.0	93.9	73.7	76.2	80.0	48.9
	Cucumber	11	17.1	18.4	21.7	22.6	44.5	64.2	106.2	87.5	108.2	99.1	124.7	92.7	110.7
	Potato	2.5	9.1	8.5	7.6	10.2	4.6	8.4	9.1	11.5	25.7	26.6	26.2	38.6	48.2
Quantity Amman Market	Tomato	40.8	33.6	47.9	42.7	37.6	44.2	52.8	44.5	83.9	68.4	73.1	92.4	81.7	91.0
	Eggplant	9.3	8.0	9.3	10.3	12.1	12.2	13.9	16.4	23.2	23.6	25.4	29.6	25.1	25.6
	Cucumber	7.5	10.6	13.1	12.0	14.1	18.1	25.5	38.2	47.2	47.4	36.1	55.7	42.3	41.9
	Potato	13.1	15.1	14.3	17.7	12.6	12.9	15.1	19.9	33.1	23.3	27.1	27.8	22.3	27.9
Exports	Tomato	87.9	52.9	61.9	46.5	82.9	91.2	105.2	122.1	147.9	123	134	104.5	98.2	92.6
	Eggplant	22.2	21.8	16.7	19	16.4	27.2	26.4	32.3	36.9	28.5	37.5	35	31.9	24.9
	Cucumber	3.9	4.4	6.3	4.8	14.7	12.1	23.7	39.3	50.6	53	58.3	61.6	43.8	47.0
	Potato	1.2	1.4	2.6	1	1.2	0.1	1	3.2	4.8	2.4	5.7	8.7	1.9	10.6
Imports	Tomato	0	1.6	0	0.1	0.2	0	0	0	0	0	0	0	0	0
	Eggplant	0	0	0	0.06	0.1	0.03	0	0	0	0	0	0	0	0
	Cucumber	0	1.6	0	0.1	0.2	0	0	0	0	0	0	0	0	0
	Potato	19.8	15.3	17.1	27.5	14.1	13.8	1.9	38.3	39.3	25.2	20.6	11.6	11.7	2.6
WB Imports	Tomato	0	0.2	2.2	2.2	4.8	4.5	3.2	7.3	15.2	10.8	20.2	21.7	16.1	4.6
	Eggplant	0	0	0.5	1	0.7	1.6	1.7	4.7	7.1	2.3	1.7	3.3	1.9	0
	Cucumber	1.8	1.6	3.5	3.7	4.6	3.9	1.4	2.9	2.3	0.5	0.3	0.2	0	0
	Potato	0.5	0.4	0.8	0.3	0.9	0	0.9	1.6	2.5	3.9	4.9	4.4	3.9	6.3
Processed Tomatoes										27.1	27.1	38.4	45.6	19.2	44.6
Population		1.753	1.823	1.896	1.972	2.050	2.133	2.218	2.307	2.399	2.495	2.595	2.698	2.806	2.919

Sources: Various sources of GOJ

Table 2.5 Annan Central Market Sales, Quantity and Wholesale Price for Tomatoes, Eggplant, Cucumber, Potatoes, 1974-87

		January		February		March		April		May		June		July		August		September		October		November		December		Total Qty	Avg. Price
		Qty	Prc	Qty	Prc	Qty	Prc	Qty	Prc	Qty	Prc	Qty	Prc	Qty	Prc	Qty	Prc	Qty	Prc	Qty	Prc	Qty	Prc	Qty	Prc		
1974	Tomato	1051	58	3609	32	4364	56	5216	75	4819	36	5196	28	3035	46	2922	45	3968	52	4071	26	1785.5	66	768	91	40805	47
	Eggplant	426	40	518	50	341	72	269	87	805	72	1084	45	1241	34	1033	35	1015	45	782	43	982.5	35	796	33	9293	45
	Cucumber	0	0	14	230	41	217	480	137	1003	82	1360	63	2297	46	846	46	454.5	87	810	70	205	102	10	143	7521	69
	Potato	440	55	1031	50	1486	55	1216	54	1015	48	1024	55	1190	58	721	62	1733.5	64	820.5	54	2166.5	57	290	52	13134	56
1975	Tomato	1010	95	2501	58	3040	65	3085	93	3138	63	3959	56	3765	35	3796	18	3832	19	2370	35	1460	100	1568	113	33624	54
	Eggplant	716	38	535	39	366	57	365	65	672	63	579	45	816	26	644	40	738	42	760	47	1094	42	721	38	8006	43
	Cucumber	0	0	6.5	320	140	212	1092	152	2566.5	84	1934	75	1865	54	810	71	714	96	1043	73	454	111	24	158	10649	86
	Potato	1028	68	1277	64	1174.5	70	1220	73	1151	57	1566	68	1138	56	1023	64	1971	61	992	57	2228	59	429	74	15108	63
1976	Tomato	2595	78	5875	60	6308	66	8538	105	4878	74	4336	80	3498	58	3232	56	2696	55	2440	62	1531	100	1454	119	47881	76
	Eggplant	465	49	261	78	264	113	432	114	900	91	677	72	852	43	1087.5	35	902	37	870	40	958	42	1673	46	9342	55
	Cucumber	26	319	173	258	600	75	1773	151	3172	112	2637	88	1884	98	879	95	831	87	711	104	293.5	163	85.7	217	13065	110
	Potato	1311	92	2341	86	627	92	757	80	710	80	1094	82	1027	96	1578	98	1057	95	1093	105	1942.5	105	703	94	14251	93
1977	Tomato	1677	134	3665	122	5800	124	7761	118	7526	64	4707	83	2815	82	2417	65	1856	59	2142	60	1298	106	1031	148	42695	96
	Eggplant	489	65	506	97	495	140	595	147	1654	108	721	118	1006	46	751	93	618	78	909	66	1157	83	1404	65	10305	89
	Cucumber	119	355	381	268	512	274	2038	179	2088	170	2054	157	1947	109	568	135	753	68	615	111	423	168	509	242	12007	162
	Potato	1515	84	1727	77	2047	59	832	93	1017	85	763	93	1007	88	1415	82	494	80	2908	70	1862	55	2138	57	17725	73
1978	Tomato	2249	135	3340	151	4966	149	3359	89	7580	50	4565	65	2320	123	1921	142	2226	76	2197	48	1458	135	1444	217	37625	103
	Eggplant	857	104	720	114	563	128	741	134	1368	90	1194	90	1410	91	1347	65	728	63	816	84	641	61	1732	81	12117	89
	Cucumber	527	246	643	302	964	286	3107	160	2275	158	1618	136	914	145	1084	118	469	164	910	144	773	106	832	229	14118	171
	Potato	241	56	941	78	1028	113	874	98	647	90	1068	80	2848	98	1402	73	436	91	1463	86	397	65	1251	72	12596	87
1979	Tomato	2455	157	4908	118	7075	108	7605	70	3651	86	3771	64	3857	72	3182	72	3015	79	1850	154	1206	252	1660	201	44235	101
	Eggplant	1006	72	594	92	1089	115	1382	111	796.5	85	507.5	84	952	78	811	83	779	124	923	139	1476	65	1836	84	12152	93
	Cucumber	616	305	842.5	319	1745	280	2527	162	1171	215	1913	101	1706	135	747	160	1001	195	1968	166	2750	141	1075	249	18062	124
	Potato	1665	73	713	92	482	100	611.5	97	511	99	374	100	1341	100	759	100	2135	100	1387	100	1641	100	1241	101	12861	96
1980	Tomato	3225	180	3642	159	5933	152	4009	139	8849	89	8919	78	4385	113	2912	83	3092	89	3171	69	2938	72	1700	130	52775	109
	Eggplant	1059	107	487	329	559	214	532	234	1837	178	1407	131	1660	62	1132	49	1188	85	1427	78	1071	56	1516	51	13875	111
	Cucumber	1122	302	840	422	1568	402	2259	284	3183	186	2844	177	3092	125	1085	106	1702	162	2348	149	3068	115	2410	153	25521	192
	Potato	748	174	442	180	1252	160	354	100	442	120	2288	99	3497	111	933	97	2528	115	0	0	1262	96	1313	112	15059	117

1981	Tomato	2263	123	2571	128	5221	146	5914	147	7364	61	8808	47	4676	47	2352	27	2838	56	2229	127	1165	183	1097	305	44498	96
	Eggplant	1662	58	733	107	774	182	1234	165	2947	113	1131	110	1162	63	1020	67	955	156	1053	116	1438	90	2267	151	16376	114
	Cucumber	2324	238	1970	382	3534	279	5053	160	5083	174	3469	169	1976	100	533	96	2010	180	4022	133	5174	128	3041	224	38189	185
	Potato	3038	122	1648	135	0	0	993	93	2242	110	442	111	1985	105	1519	95	2186	92	1555	106	1798	128	2292	151	19898	116
1982	Tomato	2518	202	4593	132	17072	82	15527	93	14073	102	8711	62	3866	146	4314	65	3717	59	4600	70	2984	129	2112	229	83887	97
	Eggplant	1807	105	1372	153	2128	158	1506	166	3604	136	2172	115	1527	104	1442	78	1245	109	1706	95	1978	104	2728	126	23215	123
	Cucumber	1992	413	3205	346	4578	277	5929	211	6887	197	3011	199	2354	192	1774	167	3184	185	6376	154	5978	134	1970	251	47237	212
	Potato	2426	100	1731	110	3035	121	1094	139	1850	165	4186	130	4284	91	4130	82	1838	97	2146	103	3362	94	3034	113	33116	108
1983	Tomato	2946	179	3278	163	6074	181	9041	222	7832	106	10313	61	5182	85	5414	82	4007	111	4803	127	4567	109	4919	158	68376	129
	Eggplant	2000	158	508	218	585	242	1011	239	2568	148	2621	117	2450	63	2318	73	2135	83	2397	116	2466	66	2491	67	23551	111
	Cucumber	1131	598	874	522	1833	373	3567	293	6197	157	5794	177	3179	106	1912	239	3037	251	7385	235	7449	151	5026	138	47384	210
	Potato	1640	105	1905	119	2232	112	1548	157	2438	106	1466	174	1634	141	1417	120	1666	120	2361	120	2608	130	2335	141	23250	127
1984	Tomato	6198	122	9886	107	7515	276	11154	124	7684	128	6409	144	5370	139	5751	65	474	68	5065	69	4645	128	2934	285	73085	138
	Eggplant	1991	74	1472	87	1305	146	2645	123	2310	125	2121	138	2384	73	1636	89	1401	111	2095	137	2882	84	3082	113	25404	108
	Cucumber	3913	298	395	249	371	287	412	224	4827	255	4013	219	3560	146	2432	210	2502	318	5016	300	6300	199	2312	376	36056	250
	Potato	1638	136	1877	152	1501	151	2674	129	5404	96	2823	96	972	135	1822	182	1409	179	1504	171	2662	166	2774	141	27120	136
1985	Tomato	6250	128	5837	126	13682	121	14953	120	9533	111	9131	52	7429	59	5525	50	6020	112	4580	214	5142	135	5366	145	92448	111
	Eggplant	3389	93	1502	126	2494	128	2050	138	3063	103	2086	71	2648	65	1688	66	1911	137	3369	110	2602	78	2749	69	29551	97
	Cucumber	2762	316	4372	181	6352	135	6893	127	7318	112	5962	87	3993	132	2200	231	2890	291	4204	249	5227	174	3509	217	55682	168
	Potato	1889	175	2357	152	4223	125	4051	113	3459	120	2339	113	1432	173	1112	212	1764	196	845	180	2121	175	2200	144	27802	145
1986	Tomato	5307	117	5368	113	15627	72	11853	96	6761	68	5822	69	6760	76	5375	43	6515	68	5634	124	3024	197	3665	237	81711	94
	Eggplant	2247	78	1301	106	1919	134	2184	110	2221	145	2045	97	2494	86	1796	78	1828	109	2271	152	2517	99	2262	117	25085	109
	Cucumber	2956	264	2680	268	3811	175	3869	180	5609	133	4878	97	4651	118	2565	168	2887	209	4451	222	2725	240	1199	375	42311	183
	Potato	2216	135	1922	120	2402	105	2468	113	2899	106	2188	104	777	113	939	150	1579	161	2041	180	1110	191	1811	184	22272	134
1987	Tomato	6590	151	7597	84	9307	110	10291	91	7113	100	8069	61	7612	66	6277	62	6882	109	6977	92	7030	67	7271	80	91016	89
	Eggplant	1373	137	1310	126	2195	73	2836	89	2012	144	2422	108	2641	59	1865	70	2935	79	2243	55	1952	53	1837	42	25621	83
	Cucumber	1679	279	3498	155	4001	132	5141	122	4801	95	4866	104	4452	104	2071	163	2739	182	3980	145	2051	193	2596	175	41875	140
	Potato	3005	148	1573	159	2423	116	3387	107	2794	110	4126	149	1949	134	1336	161	1919	169	1504	183	1445	216	2418	159	27899	145
Avgs.	Tomato	3295	137	4769	108	8035	117	8450	114	7200	86	6408	68	4612	80	3956	60	3653	77	3724	95	2874	117	2642	165	59619	100
	Eggplant	1392	92	844	121	1083	133	1270	133	1911	123	1483	102	1660	67	1326	68	1313	93	1544	100	1658	74	1935	86	17421	97
	Cucumber	1369	315	1421	273	2146	223	3153	177	4013	155	3311	136	2705	116	1393	165	1798	208	3134	193	3062	159	1757	219	29263	182
	Potato	1629	118	1550	114	1708	109	1578	109	1899	105	1838	113	1792	107	1438	111	1623	118	1466	117	1900	116	1731	126	20149	113

Table 2.6 Iribid Central Market Sales, Quantity, and Wholesale Price, Tomatoes, Eggplant, Cucumber, Potatoes, 1974-1987

	January		February		March		April		May		June		July		August		September		October		November		December		Total	Avg.	
	Qty	Prc	Qty	Prc	Qty	Prc	Qty	Prc	Qty	Prc	Qty	Prc	Qty	Prc	Qty	Prc	Qty	Prc	Qty	Prc	Qty	Prc	Qty	Prc	Qty	Prc	
1974 Tomato	398	59	1012	33	333	51	104	97	1582	46	2354	24	639	41	215	42	151	43	606	36	524	42	529	53	8447	39	
Eggplant	192	42	62	48	24	54	15	61	77	40	300	43	587	33	159	41	476	34	495	34	536	32	498	36	3421	36	
Cucumber	0	0	0	0	5	201	8	151	130	71	486	48	127	48	48	48	27	50	198	50	23	67	0	0	1052	53	
Potato	356	60	383	71	342	68	446	54	385	42	465	42	254	53	184	57	380	63	222	64	391	59	98	51	3906	57	
1975 Tomato	207	74	309	65	310	54	116	103	1425	56	704	49	286	34	605	21	666	23	641	35	410	72	211	91	5890	50	
Eggplant	305	42	145	39	56	60	60	53	126	50	66	41	224	26	188	41	301	43	305	40	480	68	417	47	2673	47	
Cucumber	0	0	0	0	0	0	0	0	68	108	12	69	0	0	0	0	0	0	0	0	0	0	0	0	0	80	102
Potato	107	54	267	71	291	80	553	69	530	50	195	74	262	55	388	53	190	67	212	50	499	65	173	67	3719	63	
1976 Tomato	277	82	392	65	334	68	182	88	1403	59	1562	69	626	48	294	47	314	59	440	63	420	87	336	102	6580	67	
Eggplant	104	54	27	60	33	138	32	125	286	104	509	81	275	81	407	132	261	138	388	59	276	90	247	44	2845	90	
Cucumber	0	0	0	0	21	195	24	166	253	108	401	75	85	94	35	107	91	102	146	80	12	140	0	0	1118	94	
Potato	585	90	310	85	239	84	177	82	404	69	210	70	54	97	357	102	216	88	282	101	294	102	160	94	3288	88	
1977 Tomato	0	0	672	117	515	126	389	97	2211	50	1951	74	970	57	482	67	617	63	706	64	429	87	261	116	9203	73	
Eggplant	0	0	55	109	28	125	12	108	110	113	202	96	448	38	275	69	501	57	583	47	477	69	425	60	3116	62	
Cucumber	0	0	16	272	26	266	37	186	155	144	220	129	215	78	167	118	0	0	121	96	39	155	0	0	996	123	
Potato	0	0	910	88	790	62	239	90	316	66	310	57	291	94	354	94	0	0	1294	67	1078	47	644	47	6226	67	
1978 Tomato	102	130	128	136	169	135	814	100	2711	54	3283	49	1102	74	630	113	641	69	932	53	377	94	25	189	10914	67	
Eggplant	118	88	18	108	65	100	64	130	164	111	445	91	489	57	438	50	308	45	406	52	292	57	303	70	3110	67	
Cucumber	18	292	23	204	60	240	117	210	209	173	241	118	184	108	253	86	53	81	28	159	34	138	0	0	1220	138	
Potato	1324	46	462	59	450	93	310	86	182	84	69	87	412	70	402	65	78	85	133	90	0	0	151	77	3973	66	
1979 Tomato	141	160	113	135	161	109	376	72	498	85	1157	50	1497	57	1206	61	1286	64	856	110	160	152	60	177	7511	2	
Eggplant	247	71	67	87	64	102	86	89	272	103	470	66	844	54	388	47	377	74	353	130	366	98	275	72	3809	76	
Cucumber	0	0	2	295	48	274	110	183	83	202	178	100	501	24	303	146	73	147	18	192	0	0	51	202	1367	146	
Potato	355	68	61	123	112	106	136	91	212	85	88	12	0	0	0	0	15	100	0	0	0	0	0	0	979	78	
1980 Tomato																											
Eggplant																											
Cucumber																											
Potato																											

1981	Tomato	118	154	147	167	136	184	148	152	636	68	1593	46	565	58	168	44	192	86	233	135	127	149	7	244	4068	78
	Eggplant	100	79	33	113	45	144	53	117	65	118	204	85	283	109	57	140	79	132	190	94	386	68	244	142	1739	102
	Cucumber	46	263	49	366	90	325	175	166	209	140	114	131	97	94	161	96	71	151	132	135	161	134	68	140	1373	158
	Potato	322	110	325	135	32	125	61	122	136	95	327	110	303	106	272	106	409	100	271	102	331	113	360	124	3149	112
1982	Tomato	150	185	264	138	376	108	307	120	431	101	1012	78	430	127	419	89	800	66	249	86	628	129	423	119	5489	102
	Eggplant	264	120	157	125	302	132	118	157	103	149	306	81	316	74	340	63	332	100	763	113	717	125	405	153	4123	113
	Cucumber	50	214	59	258	165	244	340	168	355	166	369	186	315	180	332	161	218	181	630	192	587	170	38	326	3458	183
	Potato	356	112	271	130	111	123	183	132	215	162	294	134	211	95	353	98	412	96	971	116	900	111	865	120	5172	116
1983	Tomato	424	203	521	168	608	184	334	261	1946	103	4515	73	2378	72	2595	78	2365	95	3288	115	2236	117	1714	121	22922	102
	Eggplant	198	174	19	235	21	277	5	233	332	165	1139	116	1285	81	977	78	1023	77	1126	99	897	79	609	76	7631	94
	Cucumber	31	619	14	569	154	390	737	244	1797	148	2391	165	1267	90	465	182	321	215	1092	177	1336	154	621	226	10226	170
	Potato	912	131	1084	141	1003	155	554	178	556	202	245	196	354	174	622	123	729	140	751	134	633	136	576	154	8019	150
1984	Tomato	2077	119	2476	76	1983	101	1768	123	2345	116	1813	170	1274	147	2701	59	2220	66	2350	71	1664	108	540	219	23221	103
	Eggplant	467	93	234	78	118	139	199	125	475	118	556	145	784	84	717	103	564	113	334	140	924	94	627	106	5999	107
	Cucumber	319	282	529	221	510	243	570	204	809	228	965	201	1017	102	632	147	323	212	757	221	886	142	165	244	7482	190
	Potato	659	153	822	162	891	267	854	146	1236	110	569	121	333	145	329	120	345	80	241	170	549	131	844	138	7642	149
1985	Tomato	1454	114	1441	98	1305	120	1554	94	2025	76	2166	39	2066	44	1880	44	2204	109	1916	217	1875	134	1696	118	21582	99
	Eggplant	638	104	285	112	184	120	147	127	325	90	615	62	683	60	472	65	323	134	680	138	608	92	621	84	5581	94
	Cucumber	194	206	698	160	1137	128	1005	130	1528	95	1218	65	731	95	300	171	285	241	482	220	682	134	539	166	8797	128
	Potato	618	173	1029	140	1008	123	804	115	775	117	481	132	329	156	127	200	456	192	272	180	451	180	541	140	6891	144
1986	Tomato	1214	108	1336	105	1958	85	1991	73	1879	49	1756	43	1946	65	2113	36	2743	65	2524	118	773	162	618	222	20851	81
	Eggplant	319	43	143	93	284	101	201	94	339	126	395	77	645	75	522	92	488	140	487	204	520	125	361	102	4708	109
	Cucumber	396	142	354	181	528	141	662	145	1040	116	767	79	661	104	330	177	407	219	594	204	285	222	92	363	6136	148
	Potato	414	143	712	95	626	102	831	107	827	108	693	113	534	115	101	138	162	156	424	162	258	193	311	184	6093	122
1987	Tomato	984	151	1562	77	1425	103	1794	84	1449	83	2372	58	2331	65	2042	66	2378	116	2916	92	2561	60	2838	75	24653	82
	Eggplant	125	132	135	121	291	78	207	106	290	123	420	81	800	52	602	66	920	100	748	69	605	69	628	86	5771	81
	Cucumber	103	279	412	140	640	132	1090	98	1246	87	1121	87	945	95	456	157	452	206	858	156	458	207	443	194	8161	130
	Potato	379	184	672	158	970	114	1287	102	580	106	729	140	587	140	530	181	572	194	499	180	269	243	84	278	7714	148

Source: AMO

Table 2.7 Commodity Balance Sheets for Tomato, Eggplant, Cucumber and Potato 1978-86

		1978	1979	1980	1981	1982	1983	1984	1985	1986
Tomato										
Production	(tonnes)	201.51	171.8	162.92	204.51	195.31	212.34	290.90	413.27	220.56
West Bank	"	4.81	4.51	3.25	7.27	15.21	10.72	20.15	21.7	21.81
Imports	"	0.51	0	0	0	0.11	0	0	0	0
Exports	"	82.91	105.51	110.31	127.97	152.31	125.52	134.01	104.49	94.97
Processed	"	0	0	0	0	27.1	27.1	38.4	45.6	19.2
Consumers	"	123.02	70.80	55.86	83.81	31.22	70.44	146.72	283.88	128.20
Eggplant										
Production	(tonnes)	48.61	53.11	52.37	58.91	45.41	90.45	73.68	76.23	50.67
West Bank	"	0.7	1.61	1.76	4.71	7.1	2.28	1.71	1.8	3.31
Imports	"	0.11	0.03	0	0	0	0	0	0	0
Exports	"	16.41	31.71	27.38	33.61	37.6	28.46	37.51	37.5	26.99
Consumers	"	33.01	23.04	26.75	30.01	14.91	64.27	37.88	40.53	26.99
Cucumber										
Production	(tonnes)	22.61	20.11	33.08	43.68	55.02	76.71	99.14	206.75	64.26
West Bank	"	4.61	3.91	0	2.91	2.28	0.47	0.25	0.17	0.41
Imports	"	0.21	0	0	0	0	0	0	0	0
Exports	"	14.71	17.11	24.86	43.26	54.74	59.11	58.27	61.50	39.65
Consumers	"	12.72	6.91	8.22	3.33	2.56	16.07	41.12	143.34	33.02
Potato										
Production	(tonnes)	10.21	6.51	12.85	7.41	7.61	10.21	16.75	26.19	18.98
West Bank	"	0.91	0	0.94	1.61	2.51	0.91	4.96	4.38	3.93
Imports	"	14.11	25.31	31.03	40.11	42.41	14.11	29.58	11.61	13.37
Exports	"	1.21	0.11	0.83	1.91	1.21	1.21	5.8	8.69	1.77
Consumers	"	26.02	31.71	43.99	47.22	51.32	24.02	36.49	33.49	34.51

Source: Jordan Valley Impact Assessment: Shepley, et. al 1988
 Modified by the deduction of processed tomatoes

Table 2.10 Cost of Production and Marketing per Dunum of Tomato Under Surface Irrigation, North and Middle Ghors

Items	JD	% of Total	Qty
Inputs			
Seeds (gms.)			80
Seedlings (No.)	2.820		
Organic Ferts. (Cu.M)	-		-
Chemical Ferts.	19.080		0.29
Protection	6.390		
Water (Cu.M.)	2.610		870
Mulch & Hose Dep	-		-
subtotal	30.900	19	
Mechanical			
Cultivation (hrs.)			
Land Preparation	3.120		1.01
Husbandry	1.980		0.98
subtotal	5.100	3	1.99
Manual Labour (hrs.)			
Land Preparation	1.460		3.60
Sowing	2.440		7.00
Husbandry	15.130		43.80
Harvesting	12.540		42.50
subtotal	31.570	20	96.90
Interest on Capital	2.700	2	
Land Rent	31.000	19	
Total Prodn. Cost	101.270	63	
Marketing Costs			
Packaging	31.900		80
Transport	8.900		
Commission (7%)	18.850		
subtotal	59.650	37	
Grand Total	160.920	100	

Crop yield :- 2.04 tonnes/dunum

Source: The Arab Organization for
Agricultural Development - 1985

Table 2.11 Cost of Production and Marketing per Dunum of Tomatoes Under Drip Irrigation, North and Middle Ghors

Items	JD	% of total	Qty
Inputs			
Seeds (gms.)	11.850		47
Seedlings (No.)	-		-
Organic Fert. (Cu.M)	20.890		2.04
Chemical Fert.	12.740		121
Protection	11.800		-
Water (Cu.M.)	1.310		435
Mulch & Hose Depn.	32.840		-
sub-total	91.430	33	
Mechanical			
Cultivation (hrs.)			
Land Preparation	4.100		1.2
Husbandry	3.420		1.6
sub-total	7.520	3	2.8
Manual Labour (hrs.)			
Land Preparation	5.130		12.9
Sowing	3.140		9.4
Husbandry	11.900		28.6
Harvesting	15.780		55
sub-total	36.000	13	105.9
Interest on Capital	5.370	2	
Land Rent	31.000	11	
Total Prodn. Cost	171.320	63	
Marketing Costs			
Packaging	50.700		166
Transport	16.600		
Commission (7%)	35.210		
sub-total	102.510	37	
Grand Total	273.830	100	

Crop yield :- 3.82 tonnes /dunum

Source: The Arab Organization for Agricultural Development - 1985

Table 2.12 Cost of Production and Marketing
per Dunum of Eggplant Under
Surface Irrigation

Items	JD	% of Total	Qty
<hr/>			
Inputs			
Seeds (gms.)	2.230		98
Seedlings (No.)	-		140
Organic Ferts. (Cu.M)	3.470		0.4
Chemical Ferts.	15.640		155
Protection	7.180		
Water (Cu.M.)	3.180		1061
Mulch & Hose Dep	-		-
subtotal	31.700	16	
Mechanical			
Cultivation (hrs.)			
Land Preparation	3.460		1
Husbandry	2.380		1.2
subtotal	5.840	3	2.2
Manual Labour (hrs.)			
Land Preparation	2.430		6.4
Sowing	2.320		6.7
Husbandry	19.690		51.3
Harvesting	11.920		37.7
subtotal	36.360	18	102.
Interest on Capital	2.960	1	
Land Rent	31.000	16	
Total Prodn. Cost	107.860	54	
Marketing Costs			
Packaging	41,120		236
Transport	23.600		
Commission (7%)	26.200		
subtotal	90.920	46	
Grand Total	198.780	100	

Crop yield :- 3.54 tonnes/dunum

Source: The Arab Organization for
Agricultural Development - 1985

Table 2.13 Cost of Production and Marketing per Dunum of Eggplant Under Drip Irrigation

Items	JD	%of total	Qty
Inputs			
Seeds (gms.)	9.780		33
Seedlings (No.)	-		947
Organic Fert. (Cu.M)	28.330		2.7
Chemical Fert.	10.820		19
Protection	9.520		
Water (Cu.M.)	1.590		530
Mulch & Hose Depn.	23.320		
subtotal	83.360	28	
Mechanical			
Cultivation (hrs.)			
Land Preparation	3.420		1
Husbandry	3.880		1.7
subtotal	7.300	2	
Manual Labour (hrs.)			
Land Preparation	4.760		
Sowing	2.640		
Husbandry	12.990		
Harvesting	20.900		
subtotal	41.290	14	
Interest on Capital	5.280		
Land Rent	31.000		
Total Prodn. Cost	168.230	56	
Mkting Costs			
Packaging	73.190	278	
Transport	27.800		
Commission (7%)	30.890		
subtotal	131.880	44	
Grand Total	300.110	43.9	

Crop yield :- 4.17 tonnes/dunum

Source: The Arab Organization for
Agricultural Development - 1985

Table 2.14 Cost of Production and Marketing per Dunum of Cucumber Under Drip Irrigation, North and Middle Ghors

Items	JD	% of total	Qty
Inputs			
Seeds (gms.)	7.100		350
Seedlings (No.)	-		-
Organic Ferts. (Cu.M)	27.500		2.6
Chemical Ferts.	9.160		75
Protection	11.100		-
Water (Cu.M.)	0.720		240
Mulch & Hose Depn.	32.840		-
subtotal	88.420	43	
Mechanical			
Cultivation (hrs.)			
Land Preparation	3.93		0.9
Husbandry	1.8		0.8
subtotal	5.730	3	1.7
Manual Labour (hrs.)			
Land Preparation	4.310		9.7
Sowing	3.460		8.5
Husbandry	5.740		14.3
Harvesting	9.900		39.8
subtotal	23.410	11	72.3
Interest on Capital	4.700	2	
Land Rent	31.000	15	
Total Prod'n. Cost	153.260	74	
Marketing Costs			
Packaging	24.250		78
Transport	7.800		
Commission (7%)	21.200		
subtotal	53.250	26	
Grand Total	206.510	100	

Crop yield :- 1.41 tonnes/dunum

Source: The Arab Organization for
Agricultural Development - 1985

Table 2.15 Cost of Production and Marketing per Dunum of Potato Under Surface Irrigation, North and Middle Ghors

Items	JD	% of total	Qty
Inputs			
Seeds (gms.)	65.900		264
Seedlings (No.)	-		-
Organic Ferts. (Cu.M)	14.450		1.5
Chemical Ferts.	15.220		175
Protection	5.970		-
Water (Cu.M.)	1.440		480
Mulch & Hose Depn.	-		-
subtotal	102.980	47	
Mechanical			
Cultivation (hrs.)			
Land Preparation	3.820		1.3
Husbandry	2.750		1.5
subtotal	6.570	3	2.8
Manual Labour (hrs.)			
Land Preparation	2.170		4.1
Sowing	2.300		5.6
Husbandry	11.920		30.7
Harvesting	12.160		28.2
subtotal	28.550	13	68.6
Interest on Capital	5.510	2	
Land Rent	31.000	14	
Total Prodn. Cost	174.610	79	
Marketing Costs			
Packaging	12.600		81
Transport	13.280		
Commission (7%)	20.280		
subtotal	46.160	21	
Grand Total	220.770	100	

Crop yield :- 2.03 tonnes/dunum

Source: The Arab Organization for
Agricultural Development - 1985

Figure 2.1

Consumption 1974-87

(Production + imports - Exports)

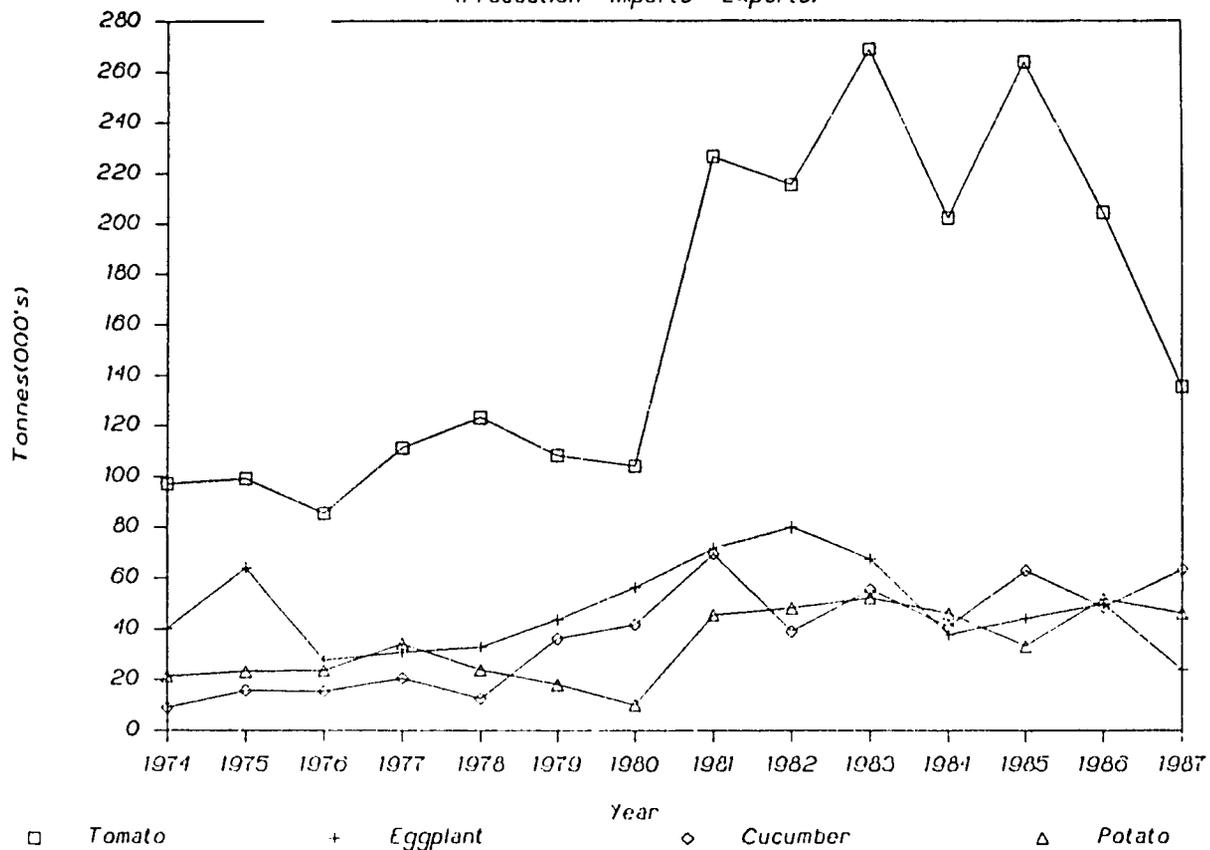


Figure 2.2

Average Prices; Amman Market 1974-87

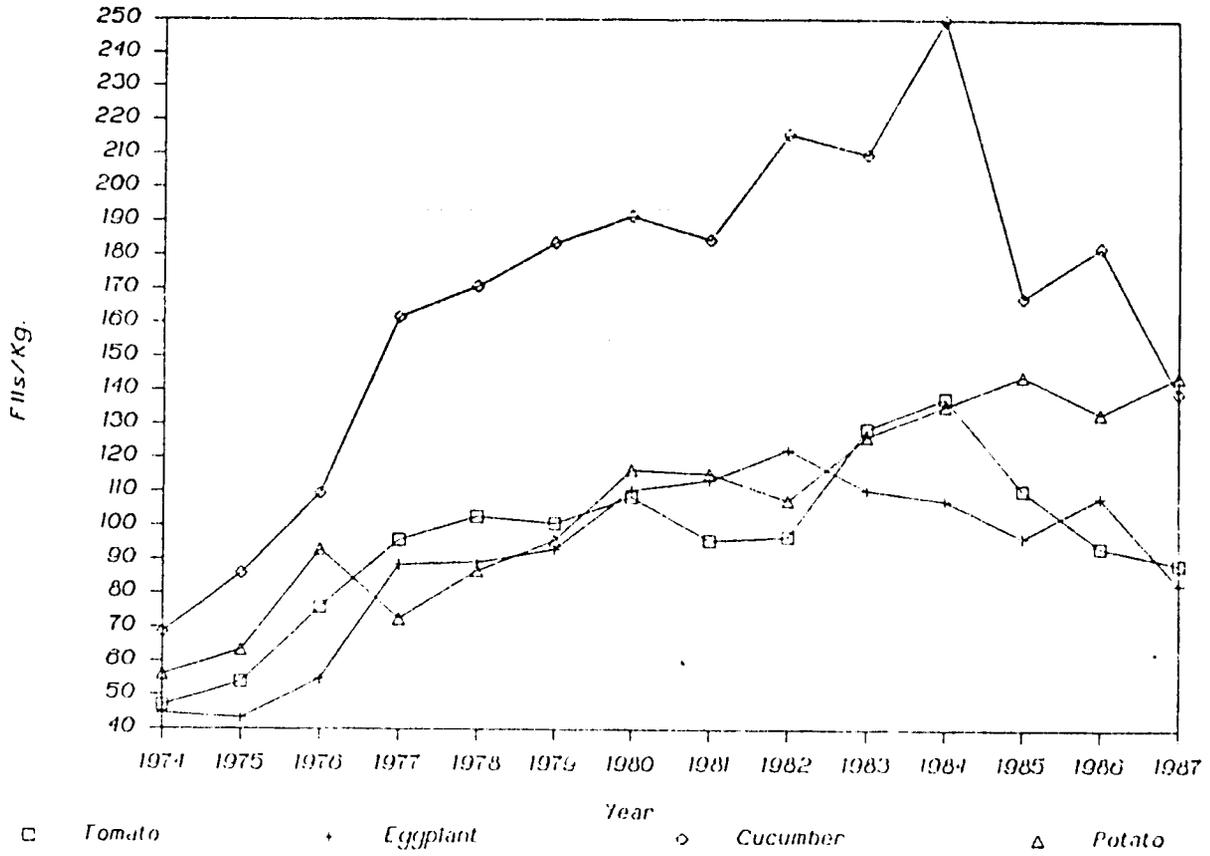


Figure 2.3

Two Tomato Balance Sheets Compared

1978-86

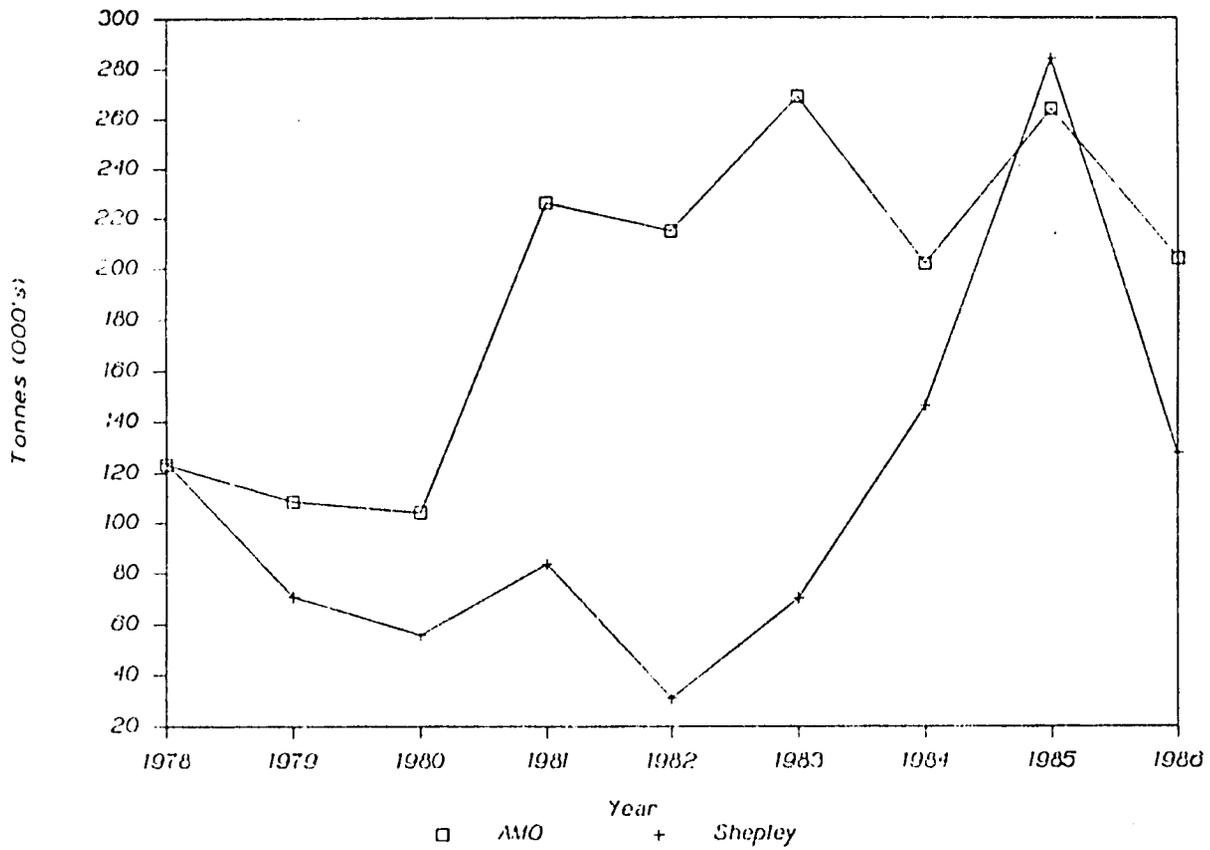


Figure 2.4

Two Eggplant Balance Sheets Compared

1978-86

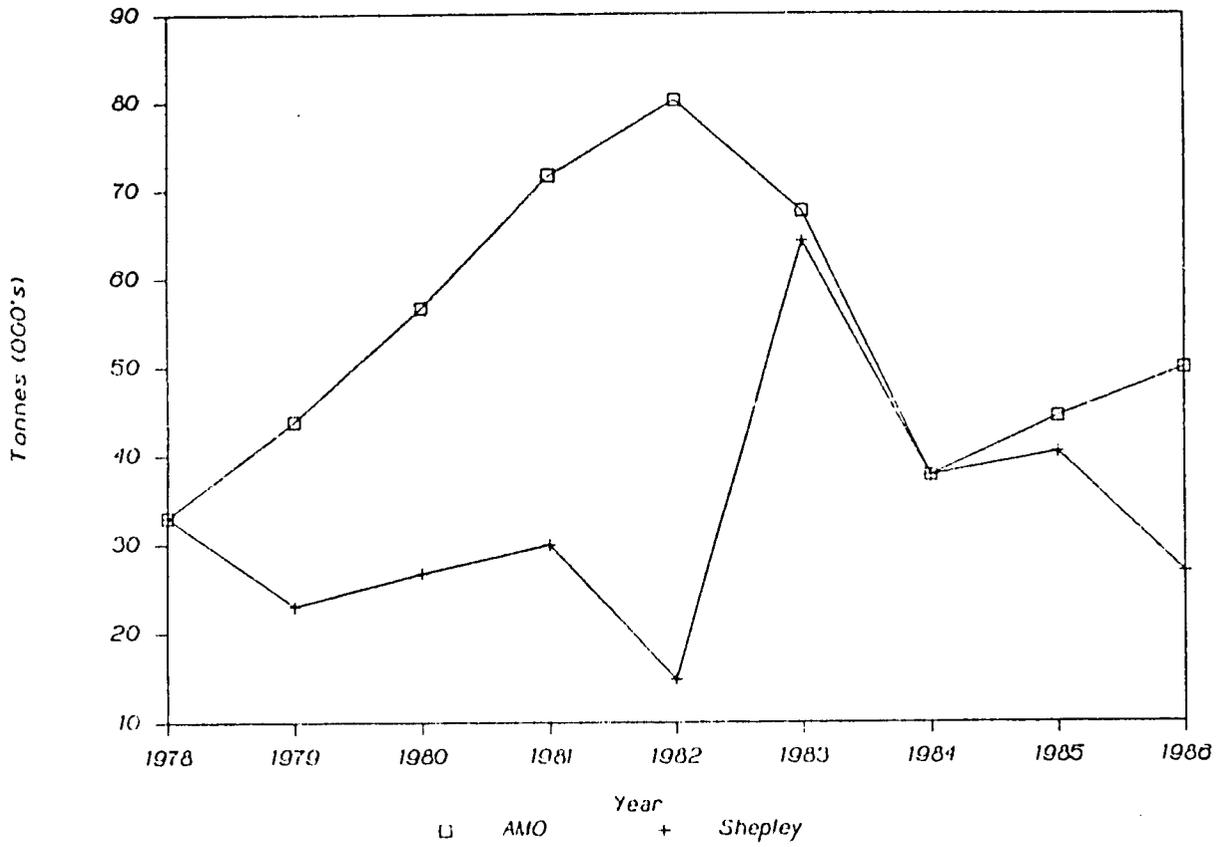


Figure 2.5

Two Cucumber Balance Sheets Compared

1978-88

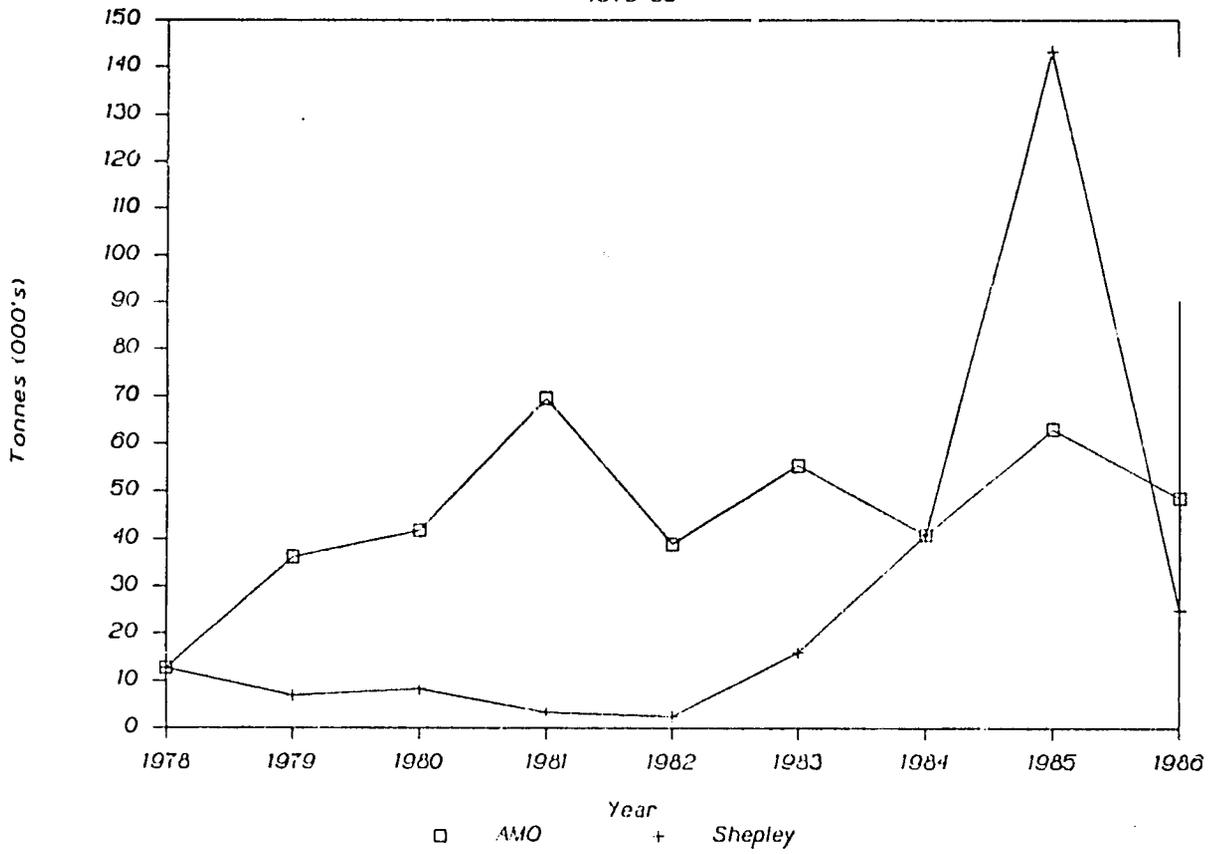
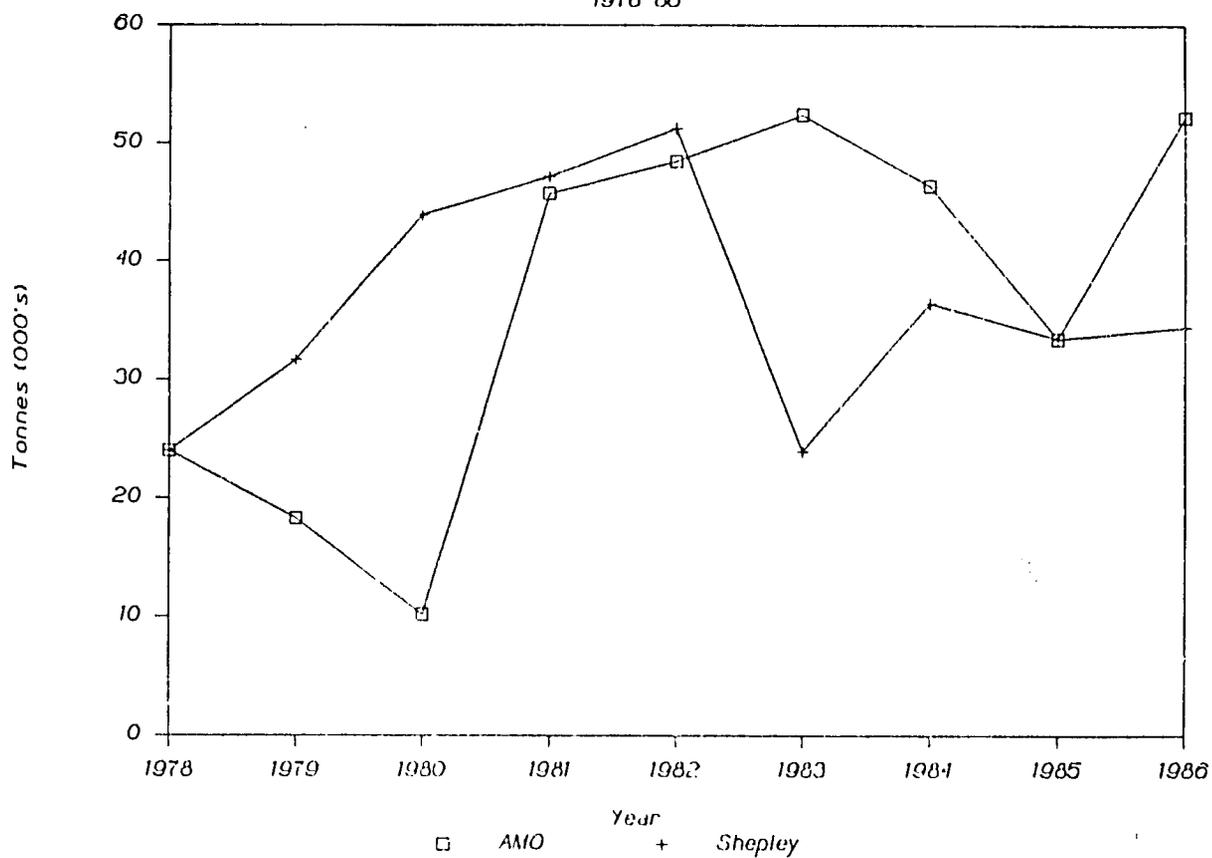


Figure 2.6

Two Potato Balance Sheets Compared

1978-86



Chapter III

Marketing Support Institutions

An array of governmental and quasi-governmental bodies is concerned with supporting and controlling fruit and vegetable marketing in Jordan. Over the last few years a number of reports have examined and described the role and actions of these bodies. However, the situation is constantly evolving, and this chapter of the report aims to bring together information from previous reports and update some of that information.

Ministry of Agriculture

Import and Export Controls

The Ministry of Agriculture was responsible for issuing permits for imports, both from the West Bank and Gaza and from elsewhere, and for export permits. This responsibility has now been transferred to the Agricultural Marketing Organization. Sanctioning imports from the West Bank and Gaza is still the responsibility of the Ministry. Permits are based on farm size and the assumption that 50% of production will be consumed in the West Bank and Gaza. Inspectors are based on the borders to enforce the import quotas at the three bridges across the Jordan river. All produce must be marketed at Amman wholesale market. The driver of the delivery vehicle receives a permit to return across the river on leaving the market. This method simplifies control as far as the Ministry is concerned but does not provide for a responsive marketing system. Imports from Gaza have to be exported, and a deposit is made against these goods which is recoverable at the border exit point.

Cropping Control

The Ministry is also responsible for administering cropping controls. Planned cropping aimed at optimizing the use of water had been examined for some years before cropping patterns were imposed for totally different reasons in 1985. They were introduced then in an attempt to regulate perceived marketing constraints rather than to optimize resource use.

The supply/demand imbalances which produced low prices and surpluses in 1984 were considered to be due to domestic and external explanatory factors. The domestic

causes were: technology transfer and increased investment in hybrid seeds, agricultural inputs, and greenhouses with resulting increased yields and new development projects which brought new areas under irrigation. This latter factor applied particularly to the Jordan Valley, but there was development of the Highland areas also. The external causes were decreases in exports to Jordan's traditional Gulf markets due to an increase in production and competitiveness of vegetables from Turkey, Greece, Bulgaria and Cyprus; increased production by the Gulf states themselves, sometimes selling at prices lower than the same produce was selling for in Amman concurrently; and the failure of Jordanian produce to satisfy the rising quality demands of Gulf consumers which other countries were providing for.

In 1984-85 prices were felt to have reached such low levels that government action was required. The response was the imposition of area ceilings on irrigated production of tomatoes, cucumbers, squash, and eggplant. Concurrently there was (and still is) a desire on the part of the authorities to increase production of other crops, particularly potatoes, fodder and cereals.

The methodology for deciding cropping patterns has been described in some detail in a recent (January 1988) report on agricultural policies (2). Area quotas are based on the responses to questionnaires sent to the Regional Directors of Agriculture who canvass the intentions of a small sample of farmers. Tweeten reports that the sum total of the intentions has generally exceeded the total area requirements estimated by the Ministry of Agriculture's Economics and Planning Division (but analysis of the actual planted area shows that it falls short of the licensed area). These data, combined with the estimated local consumption, exports, and processing requirements (in the case of tomatoes), and in-flow from the West Bank and Gaza result in an estimate of the total production required from Jordanian farmers. On the basis of estimated yields the area allocations are made.

The Ministry of Agriculture admits, however, that without reliable demand data, based on a consumer survey and without yield data derived from systematic sampling, the calculation of the required acreage of a crop is called into question. Shepley, et al, (11) report that they found farmers and extension agents who believed the "crop-mix limits are quotas requiring full land allocation up to the amount specified, even though they preferred to plant less rather than more of the specified items." Tweeten, on the other hand compares data on licensed areas with those planted in 1985/6 and 1986/7 and concludes that "farmers have responded by devoting to these crops even lower area than the government deemed necessary to meet local and

export demand." The reported production and area decline shown in the Commodity Balance Sheets (Chapter 11) appears to bear this out.

Tweeten appears more positive than Shepley about the effect and effectiveness of the cropping pattern policy, concluding that the initial purpose of the cropping pattern policy has been achieved. Tweeten proposes reforms; the first consists of removing policing duties from the extension agents and speeding the licensing system; the second is that the cropping pattern be stripped of its compulsory nature and licenses not be given to farmers allowing them to plant certain crops but that timely and reliable information be provided so that they can make those choices themselves; the third is that the planting control would be voluntary and concentrated on large holdings. Shepley questions the effectiveness of using other than market forces to regulate agricultural production decisions. The report suggests a better strategy would be to "use a combination of import restrictions, improved market information dissemination, and perhaps price incentives to effect changes in producer resource allocation for desired crop-mix alignment."

It is difficult to say to what extent farmers would have realigned their crop-mix in response to falling prices in 1984/85 had cropping patterns not been introduced. The fact that, in the main, planted areas were lower than licensed areas might suggest that farmers had already made their own decisions about the need to reduce the areas devoted to the four crops in question based on financial considerations. It can be said that in response to the support price/import ban policy for potatoes, production of this crop increased to a level of self-sufficiency. The Ministry of Agriculture has not, however, examined the relative rewards to the farmer nor the economic rationale of alternatives to the four regulated crops. In this case the policy of stimulating cereal and fodder production appears less than an economically rational policy. Tweeten warns that having embarked on planned cropping "the pressure will mount for the government to back its area limitations with some assured minimum prices" and adds "If this step is taken, things will get more complicated" and that "many countries are nowadays looking for ways of terminating [these costly programs]."

The Ministry of Supply

This ministry is responsible for the retail price control system which applies to fruit and vegetables.

A four man committee representing the Ministry of Supply, the Ministry of Agriculture, the Agricultural

Marketing Organization and the Municipality of Amman meets at 11 a.m. in one of the wholesale market offices and decides the retail prices for the following day. A similar body meets in Irbid, Karak and Salt. An "upper" and "lower" retail price for fruits and vegetables is determined each day for application the following day on the basis of information recorded by the inspectors in the respective markets.

Tweeten, in his analysis of agricultural policies (2), says that the prices recorded are the "highest," "lowest," and "most representative" and that no rigorous method is used to determine these levels, the most recurrent price in each range being chosen irrespective of quantities. As Tweeten points out, the "most representative" (or "dominant" price, as the Ministry of Agriculture terms it) is not necessarily linked to quantities and is therefore the modal price.

Tweeten reports that the committees rely mainly on their members' "market experience" and "personal judgement;" hence the margins do not represent fixed proportions of the wholesale prices. The range of mark-ups varies substantially from one commodity to another and from day to day. Enochian in 1984 (3) said that the prices were set to allow a 10-30% mark-up but that discussions with wholesalers, and the results of one study, had indicated that, in some cases, the upper price allowed was from much less than 10% to over 200% mark-up. He reported, and it is commonly agreed by Jordanians, that in times of shortage when the mark-up is lowest, retailers hold back quality produce for favored clients or sell secretly at higher than the upper price. The survey of retailers during the present study revealed that 60% were in favor of the abolition of price control, feeling that it would allow prices to reflect quality, both in the upper and lower ranges. This would allow more affluent customers to satisfy their quality preferences and poorer clients to obtain products at favorable prices. Some retailers also complained not only that prices were fixed so that margins might be much less than 10% as Enochian reported, but also that they were sometimes fixed below the wholesale price. Some Ministry of Agriculture officials also agree with the view that until price is free to reflect quality farmers will not have a sufficient incentive to grade, especially for the domestic market.

The prices published for the four localities (Amman, Irbid, Karak and Salt) vary, but whether they are consistent with the respective wholesale prices and the different distribution costs in urban and rural areas cannot be determined without further analysis. The retail prices for tomatoes on the May 12, 1988, for example, were:

Amman & Zarqua	60-90	fils/kg.
Irbid	70-110	" "
Salt	70-100	" "
Karak	80-110	" "

The corresponding wholesale prices on May 11 were:

	High	Low	Dominant
Amman	70	30	50
Zarqua	70	40	50
Irbid	80	30	70

The prices for Salt and Karak are not reported to AMO.

For slightly less than three months, in late 1985 and early 1986, price controls were abolished, but an evaluation by the Ministry of Supply concluded that wholesale prices had declined and that retail prices and margins increased. This was judged to have had a negative impact on both producers and consumers, so the system was reimposed. Tweeten concluded that the evaluation had perhaps reached the wrong conclusions since the market had not had time to adjust to the new situation, and that a longer term test was needed, and that a strong marketing information system had also to be instituted to monitor developments.

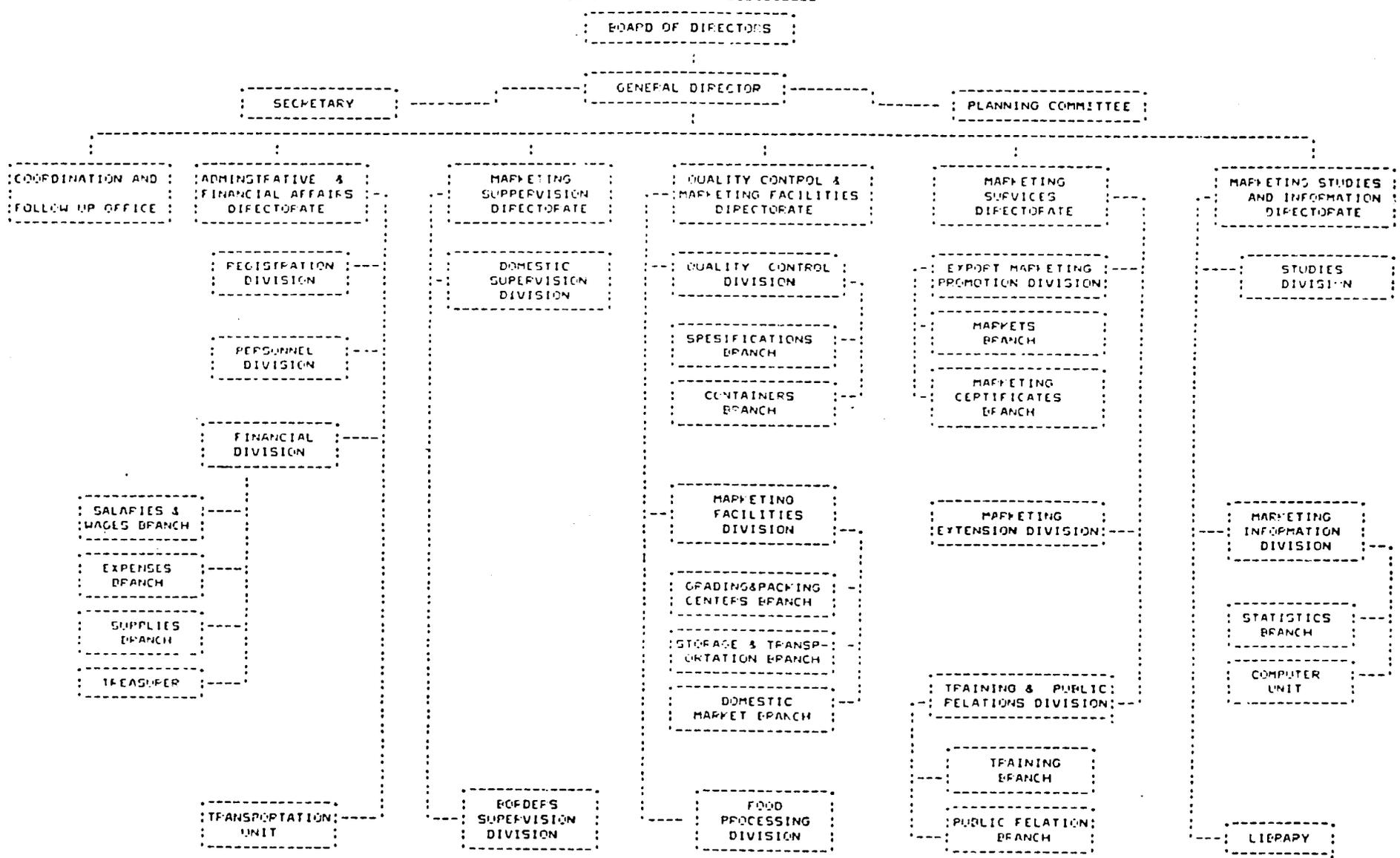
The Agricultural Marketing Organization (A.M.O.)

In his recent (August 1987) institutional analysis, Dr. R. Schermerhorn (6) described in detail the A.M.O. mandate proposed functions and the staffing at that time. The translation of Law no. (15) for the year 1987 (The Agricultural Marketing Organization Law) was annexed to the report.

The current structure of the A.M.O. is shown in figure 3.1. The organization is divided into six directorates, of which four are described below. The functions of the Administrative and Financial Affairs Directorate are self-explanatory, as are those of the Coordination and Follow-up Office.

The following section is a brief description of the activities of A.M.O. currently and its proposed activities.

Figure 3.1
AND ORGANIZATIONAL CHART



The Marketing Services Directorate

This directorate is divided into three divisions:

Export Marketing Promotion Division, which is further subdivided into the Markets Branch and the Marketing Certificates Branch;

The Training and Public Relations Division, which is divided into two branches concerned with these two topics; and

The Marketing Extension Division.

Marketing Certificates Branch

The regulation of imports and exports is a role that AMO took over from the Ministry of Agriculture on September 1, 1987.

The decisions on the issuance of import and export certificates are the ultimate responsibility of the Technical Committee for Fresh Fruit and Vegetable Imports and Exports. The composition of the committee, whose chairman is the Director General of AMO, is one member representing each of the following organizations:

- The Ministry of Agriculture;
- The Ministry of the Occupied Territories;
- The Ministry of Supply;
- The Jordan Agricultural Marketing and Processing Company;
- The Ministry of Trade and Manufacture;
- The Jordan Valley Cooperative Organization;
- The Jordan Valley Farmer's Association; and
- The Agricultural Marketing Organization.

Since the Minister of Agriculture is Chairman of A.M.O., he is responsible for endorsing the decisions of the committee.

As its name implies, the committee has the responsibility for deciding policy regarding fresh fruit and vegetable external trade flows. The two basic concepts for this policy are that exports should be allowed to develop unhindered as far as possible, and that imports should be restricted to those necessary to satisfy demand without damaging Jordanian interests.

The committee meets once per month and makes decisions based on a quarterly plan which is compiled from Ministry of

Agriculture information on expected production levels, from AMPCO on stocks, and from AMO on the state of the market.

Basically, as regards imports, restrictions apply to four major crops, namely potato, onion, garlic and apple. On these four crops AMPCO has an import monopoly. Dates are sometimes controlled, as are some medicinal plants, but these crops may be imported by private traders.

In the case of potatoes, which is one of the products included in the present study, imports have been tightly restricted in latter years and confined mainly to the months of September to December (see Commodity Balance Sheets - Chapter 11). Seed and ware potatoes are differentiated, licensing imports of the former being the responsibility of the Ministry of Agriculture.

Import licenses are issued for an estimated tonnage, and the exact amount actually brought in is later reported to AMO for future guidance as to import requirements and policy. The cost of import licenses is 1JD for each tonne of product applied for.

Export licenses are issued by AMO against the name of the individual applicant and for the destination nominated by him. The license is general in terms of the composition of the shipment and quantity, but the duplicate copy must be returned to AMO after shipment has been made, specifying commodities and quantities of each. The cost of the license is 50 fils.

The Markets Branch of the Export Marketing Promotions Division and the Training and Public Relations Division.

These above organizations are effectively all in one at present due to lack of staff. This branch and division are responsible under the functions guidelines of the AMO enabling legislation for, inter alia, conducting marketing trials domestically and abroad, assisting in setting up export agreements, establishing contacts with marketing organizations in other Arab countries, advertising and promoting at home and abroad, establishing contacts with information offices in foreign markets and publicizing the organization's activities. The training branch's responsibilities include in-house extension service training as well as training in connection with the needs for heightening farmer and trader awareness.

The achievements so far in the above areas have been limited by the lack of human and physical resources. As explained under the extension section, in-house training of marketing extension service staff has been undertaken, but the scope for widening this is currently limited by the need

for training staff and audio-visual material. The division has taken an active role in coordinating the USAID funded visits to European markets, and members of the AMO staff have visited Gulf states to establish contacts there as required under AMO's mandate.

Future actions of this type will be developed as resources become available, and as expertise builds training will be disseminated to the producing and trading community.

The Marketing Extension Division

Currently this division has a staff of four agricultural engineers and three assistants who hold diplomas in agriculture. All are based in Amman. At present the staff is engaged in preparing material for seminars planned for the end of 1988 and early 1989 -- three in the Northern Jordan Valley and one in Ghor Safi. One seminar has been held in Ghor Safi at which there were over one hundred farmers and extension workers. In-office training on harvesting methods, packing and transport are being given to the AMO extension staff by senior staff of the organization. Advisory booklets showing correct harvesting and handling techniques are also in course of preparation.

The Quality Control and Marketing Facilities Directorate Quality Control Division

The Quality Control Division has two branches, the Specifications Branch and the Containers Branch. Currently the two separate branches exist more on paper than in fact since the division chief has but two assistants who are frequently required for other duties elsewhere. They therefore share both topics among them according to availability.

The Specifications Branch is concerned with establishing grades and standards for fruit and vegetables. The Jordanian Standards are based on those of the Arab League. These vary slightly from those of the EEC, and will necessitate training in both systems for the inspectorate and publicity aimed at potential exporters to make them aware of the different requirements. Publication of the standards is the responsibility of the Standards Directorate of the Ministry of Commerce whose authority is needed for them to be generally applied. However, the current situation is that farmers' and exporters' produce is inspected at the entrances to the markets and at the border crossings by AMO staff (imports from the West Bank and Gaza are not inspected at the border since they must go through Amman market where inspection takes place). The present

inspection system checks only for uniformity and soundness of the product within any one package, but produce is not labelled to signify its having satisfied a particular grade. The main aim currently is to reduce the incidence of "topping" packs with superior produce to hide inferior quality below (a world-wide phenomenon despite the impression given by many reports that it is confined to Jordanian producers). Sanctions practiced currently against carriers of produce not reaching a reasonable standard of conformity are that initially the person is turned away to regrade and, on subsequent occasions, fined and required to regrade.

It is envisaged that, at a later stage, standards will be made compulsory for export produce. However, until the retail price fixing mechanism is abolished, or prices are related to grades, which would be extremely cumbersome, applying compulsory standards to domestically marketed produce is considered impracticable.

The Containers Branch proposes to develop standards for fruit and vegetable packaging. As yet this work is not very far advanced, but the Marketing Studies and Information Directorate recently undertook a survey of packaging manufacturers, and the Royal Scientific Society is undertaking strength tests on polystyrene packages. It is intended that this latter work will lead to recommendations for a more suitable container than those in current use (A copy of the packaging survey questionnaire is included as Appendix A).

The Marketing Facilities Division

This division includes three branches, the Grading and Packing Centers Branch, the Storage and Transportation Branch, and the Domestic Market Branch. Currently the head of the division undertakes the functions of all three and, is about to include the Processing Division as part of his responsibilities.

In regards to storage, meetings have been held with the public sector interests in the Ministry of Supply, the Ministry of Agriculture and the municipal authorities in Amman and Irbid, as well as private sector cold store operators. The objective was to inventory the storage capacity of the country from the technical point of view, as well as in terms of location and capacity, in order to assess the optimum use of this resource. For the future, AMO's function will be that of verifying that stores meet the legal specifications regarding management and that the mix of stored products and temperature controls are being observed (summary of the regulations and a table of current storage facilities is included as Appendix B). This

regulatory aspect of the work will, of course, be the responsibility of the Market Supervision Directorate. The branch still has to develop instructions and recommendations on the storage conditions demanded by different commodities, particularly fruit and vegetables. It is hoped that some research into the particular needs of vegetable storage in Jordan can be developed in cooperation with the University of Jordan. A particular example cited is that of potatoes which, in Jordan, are harvested in hot weather and frequently immature, resulting in reported high losses in storage.

AMO also sees a role for itself as expert consultants in the event of dispute between cold store owners and the owners of stored produce and in advising on cold store construction, siting, capacity, needs, etc.

All storage in Jordan is currently ambient or refrigerated. There are no controlled atmosphere stores.

The problems of transport, particularly refrigerated, are also the subject of a recent report. The follow-up actions proposed are the resolution of difficulties by means of mixed loads with differing temperature needs, ethylene generation, transpiration and respiration rates. The problems created by the insulating properties of the commonly used polystyrene boxes are also a subject for examination.

The Grading and Packing Centers Branch has really not moved very far. The question of grading and packing goes concurrently with quality control and the perception of the farmers that it is in their interest to grade and invest in facilities for doing so. Until now the approach in Jordan has been to construct grandiose, underutilized facilities which, with the exception of two private facilities, are in the hands of AMPCO. Exporters grade produce for the different markets which they supply, but in one example seen in the course of the present study, no facilities, not even a simple grading table, were available. Grading was done squatting down, transferring produce directly from box to box. This method seemed, from inquiry, to be the common practice. It should perhaps be added that the company concerned had branches in Turkey and Lebanon where it was claimed they had installed grading lines. The feeling in the Marketing Facilities Division at AMO is that the grading and packing philosophy has to begin at farm level, given the right economic incentives combined with extension work.

The Domestic Markets Branch has also limited achievements to show up to the present. The exact current situation regarding wholesale markets is not known since the situation is dynamic and changes constantly. In the immediate future it is proposed that a survey will be done,

in conjunction with the Studies Division of the Marketing Studies and Information Directorate, of all the domestic wholesale market facilities. From this a better knowledge of the domestic marketing network will emerge as a basis for future advisory and control responsibilities.

At a seminar in June 1987, Dr. Suleiman Arabiat of the University of Jordan, reported that there were four local wholesale assembly markets in the Jordan Valley. These were at Ghor Safi, El Arda, Wadi El Yabes and South Shouneh, all managed and administered by AMPCO. Of the two markets, Karama and Swalha, which he reported as being replaced by El Arda, Karama still functions, specializing in tomatoes.

Dr Arabait also reported that there were five central wholesale markets, in Amman, Irbid, Zarqua and two newly established at Salt and Karak. Since then a further wholesale market has been established at Mafraq.

The Amman market is administered by the municipality of Amman with about 55 commission agents trading there. The municipality charges a fee of four percent of the value of the produce traded. This market handles by far the greatest volume of all the markets in Jordan. Estimates of proportion that the throughput of this market represents of the whole Jordanian marketed produce varies. Arabait estimated 50%, Shepley et al 62%, and Tweenen claimed that up to 90% of some produce from the Jordan Valley passed through Amman market. Frequent references are made to the supposed oligopoly in the Amman market. It was not the aim of this study to discover whether this exists or not, but table 3.1 shows the value of trade through each wholesaler's stand in 1986. This shows that out of 53 wholesalers 19 had throughputs in excess of one million dinars, which suggests a fairly even spread of trade.

The Irbid market, built in 1968, was reported to have 21 stores. Arabait reports that it is managed and inspected by the municipality but it is understood that the daily market management is leased, by auction, to an individual. Arabait reports that 8% of central market sales pass through Irbid.

The Zarqua market, established in 1972, is reported to have 18 stores. Of the total main wholesale market sales, Arabait claims 15% passes through Zarqua, with three wholesalers dominating the market.

The Processing Division recently lost its director and, as mentioned above, the director of the Marketing Facilities Division is also undertaking the work of this division. Processing plants are mainly the responsibility of AMPCO. A table of these plants is included as Appendix C.

Table 3.1 Value of Sales in Amman Wholesale Market, 1986

Stand Number	Value of Sales	Stand Number	Value of Sales
17	107,623.875	51	722,342.625
20	1,959,017.375	52	639,184.750
22	2,419,021.875	53	2,387,679.625
24	1,032,502.620	54	352,173.250
25	868,408.250	57	737,830.875
26	762,374.125	59	523,934.375
27	862,926.875	60	587,588.875
28	1,719,009.750	61	680,187.750
29	76,048.000	63	1,040,448.375
30	455,413.000	64	872,098.500
32	922,768.125	65	276,221.625
43	262,541.000	66	928,194.750
35	220,789.375	67	256,054.875
37	246,550.250	68	823,100.000
83	1,163,471.125	69	1,275,662.250
39	1,343,310.625	70	2,072,070.750
41	3,022,835.750	71	1,641,937.125
42	920,159.620	72	643,454.375
43	701,051.875	73	1,106,923.500
44	649,289.500	74	2,194,488.750
40	1,038,394.625	75	1,878,587.750
46	1,801,372.625	76	1,041,989.125
47	1,036,493.250	77	803,886.875
48	307,998.375	78	259,779.500
49	334,197.250	79	210,204.750
50	284,009.625	80	2,902.125
		81	372,960.875

No. of Commission Agents	53
Total turnover	48,849,472.740
Largest turnover	3,022,835.750
Smallest turnover	2,902.125
Average turnover	921,688.165
Sales by AMPCO	872,098.500
Sales by J.C.O.	928,194.750
Sales by Karak South Ghors Co	210,204.750
Percentage of total Ampco	1.79
Percentage sale by Coops	2.33

Source: Amman Market Annual Report 1986

The Marketing Studies and Information Directorate

This directorate includes two divisions and the library.

The Marketing Information Division consists of the Statistics Branch and the Computer Unit. The work of the former branch falls into three main areas:-

Collecting statistical data concerning the handling of agricultural produce in the domestic markets including local production, imports, exports and quantities entering from the West Bank and Gaza district.

II. Organizing and filing the data.

III. Analyzing statistical data and publishing data analyses.

I. Data Collection

a. Local production, including area and production by season and by district for each crop - supplied by the Ministry of Agriculture.

b. Quantities entering from the West Bank and Gaza, commodity type and quantity - supplied by the Ministry of Agriculture.

c. Exports according to type, quantity and destination -- these data come from AMO's own records from the border offices as the licensing agency.

d. Imports according to type, quantity and time -- these data similarly flow directly from AMO border offices.

e. Domestic market flows according to type, time and wholesale price - supplied directly from AMO officers in these markets.

II. Data Organization and Filing

a. Local production - filed yearly according to kind, area, and quantity produced.

b. Quantities entering from the West Bank and Gaza - filed monthly according to the kind and quantities.

c. Exports - filed monthly according to the kind, quantity, country of destination and time.

d. Imports - filed monthly according to kind, quantity, country of origin and time.

e. Domestic Market Flows - filed monthly according to market, kind of commodity, wholesale price, and time.

III. Data Analysis and Publication.

a. There is as yet no direct data analysis done to obtain useful indicators for market operators. There is at present a severe limitation imposed by the lack of sufficient computing capacity.

b. Publication is limited by the lack of resources up to now. Furthermore, the delay in obtaining data decreases their usefulness.

Goals

I. In the Field of Data Collection

a. Estimation of local produce flows by kind and quantity through precisely organized marketing channels.

b. Collection of data concerning kinds and quantities passing through the processing channel.

c. Collection of data concerning kinds and quantities in storage and information on storage times.

d. Speeding up data collection using tele-fax facilities.

II. In the Field of Data Analysis

Quick analysis of statistical data, mainly consumption, disposal, and market demand forecasting through the effective use of computers and qualified staff.

III. In the Field of Publishing

Establishing proper publishing facilities, such as a press unit, and small radio stations in the central markets with qualified staff. Also, the creation of a network of AMO agents in the Gulf countries to provide exporters with information concerning those countries' markets.

The Studies Division

This division currently has three graduate staff. Two members of staff have bachelor's degrees, one in economics and one in agricultural economics. The division head has a

bachelor's degree in animal production and a masters degree in agricultural economics. Other technical staff can be called upon from the Marketing Information Division, with whom they also share the limited computing capability of AMO.

The responsibilities of the division are:

1. To perform studies and market research on internal markets for the purpose of regulating and aiding the evolution of the marketing system.
2. To perform studies of the external markets for the same purposes.
3. To formulate suggestions for policies and programs concerning the marketing of agricultural products and determining procedures and approaches for their execution.
4. Cooperation with other related Jordanian institutions to perform economic studies concerning agricultural products from the aspect of production seasons and choosing optimal agricultural production patterns.
5. Cooperation in performing economic studies concerning food industries and Jordanian agricultural production and examining the needs of external markets for Jordanian products.

The 1988 Program of Work:

A. Research by the Studies Division itself.

I. Analyzing the potential for and the problems involved in exports of fresh fruit and vegetables to the Gulf markets (other departments are involved to the extent that some staff who will conduct the field research are taken from other departments).

II. Developing new procedures for estimating the consumption of fresh fruit and vegetables.

III. Estimating the needs of the Kingdom for wholesale markets for fresh fruit and vegetables.

IV. Part 1. Conducting a preliminary study, which has been completed, on the fresh vegetable processing industry.

Part 2. Conducting an analytical study of the demand for processed fruits and vegetables. Mainly,

this part of the study will evaluate consumer attitudes to national processed products vis-a-vis imported products. (This study may not be undertaken in 1988, but depends on available resources.)

V. Studying of marketing transport costs. (Again this might have to be delayed until 1989.)

B. Research in conjunction with other departments.

I. Conducting a container survey - an examination of the present and future status of fresh fruit and vegetable containers and how this should be developed.

II. Estimating the cold storage needs of the Kingdom.

III. Estimating the grading and packing station needs of the Kingdom.

The Marketing Supervision Directorate

This directorate is divided into two divisions, the Domestic Supervision Division and the Borders Supervision Division.

The former division has as its mandate supervising the established organizational principles for the activities of the division; supervising the specifications set for agricultural commodities and those for containers in use; supervising the resolutions, regulations and instructions issued by AMO and taking the necessary measures against their violation; providing statistical information concerning trends of agricultural produce in domestic markets; and identifying marketing problems prior to bringing them before AMO specialists to find solutions.

The Borders Supervision Division, as its name implies, is concerned with supervising the implementation of fruit and vegetable import/export plans, together with any other instructions issued by the organization, and collecting the required fees; supervising the regulation of specifications concerning fruits and vegetables and containers; supervising the implementation of regulations, resolutions and instructions issued by AMO and taking the necessary measures against violators; and providing statistical information concerning the imports and exports of fruits and vegetables.

Present Situation.

The border inspectorate has six staff on the Syrian border, two on the Iraqi border, and seven on the Saudi Arabian border at three locations. In addition there are two inspectors at the Amman Customs office and one at the

Queen Alia airport. Of these, three hold agricultural degrees.

The Domestic Supervision Division has 20 inspectors at the Amman market, five at Irbid, two at Zarqua, one at Karak and three at El Arda. In addition to the above there are five inspectors who service exporters at the Amman market. Of the inspectors in the Domestic Division, eleven hold degrees in agriculture.

The Jordan Valley Authority (JVA)

This body was responsible for the overall economic development of the Jordan Valley, which included infrastructure such as roads, irrigation projects, electricity generation, and agricultural infrastructure.

In the field of agricultural marketing the JVA was responsible initially for the development and management of the grading and packing plants, marketing centers, cold storage facilities and processing plants. It was intended that most of these facilities would be handed over to the Jordan Valley Farmers' Association (JVFA). However, due to financial constraints, JVFA proved unable to shoulder this responsibility, and the facilities were subsequently turned over to the Agricultural Marketing and Processing Company (AMPCO).

Now the JVA function has shrunk and it is mainly responsible for potable water and irrigation as a division of the Ministry of Irrigation and Water.

The Jordan Valley Farmers' Association (JVFA)

This organization was described by Enochian in his 1984 report (3) as potentially important in fruit and vegetable marketing in the Jordan valley. There were 5,000 members out of an estimated 6,000 farmers eligible. Despite having a remit to provide extension services with the Ministry of Agriculture and assisting with agricultural operations, including harvesting, transport, grading, packing, and even purchasing of produce to be sold to wholesalers on behalf of members, Enochian concluded that its marketing activities were weak or non-existent.

JVFA subscribed to 7.5% of the stock of the AMPCO marketing company when it was created as a joint venture between government and the private sector.

Shepley et al (11) describe the JVFA as operating with an extreme cash flow problem which severely curtails its extension activities. When AMPCO became a parastatal JVFA

had no role in the marketing field. It has granted no cash credit since 1983 but does accord credit for input supply. It also loans sprayers, the farmer providing the sprays and the labor, except for the driver.

The Jordan Cooperative Organization (JCO)

The Jordan Cooperative Organization is the umbrella organization for cooperatives throughout the Kingdom. Enochian reported that the JCO included agricultural marketing activities but that these activities were rather weak.

The organization operates retail stores and has a wholesale stand on Amman wholesale market. The retail stores typify most bureaucratically run retail outlets and provide neither example nor competition for the private sector. The wholesale stand, according to the Amman Market 1986 report, had a turnover of 928,195 JD, which, together with the Karak South Ghor Cooperative (which also has a stand and sales of 210,205 JD), amounted to 2.33% of the total market turnover that year. It would seem reasonable to conclude that the trading activities of JCO in the agricultural field have little impact on the marketing scene.

JCO also has a role in extension but, as does JVFA, has budgetary problems due to the large number of outstanding loans to farmers which limit its scope. JCO was a major supplier of agricultural inputs but this is now declining. Shepley et al reported that JCO's share of the fertilizer trade fell from 26% in 1980 to 7% in 1986. (Table 3.2)

Table 3.2/ Input Supply Distribution. (tonnes)

	JCO	%	JVA	%	Private	%	Total

1980							
Ferts.	8061	25.83	8845	28.34	14,300	45.82	31,206
Pesticide	152	8.22	77	4.16	1,621	87.62	1.850
1986							
Ferts.	2770	6.99	4332	10.92	32,554	82.09	39,656
Pesticide	43	3.06	73	5.19	952	67.81	1,404

Sources: JVFA & CO records

Zahlan, A.B. The Agricultural Sector in Jordan
 Central Bank of Jordan Monthly Statistical Bulletin: Vol 23
 No. 5, May 1987.

The Jordan Agricultural Marketing and Processing Company
(AMPCO)

Created in 1984 as a government/private sector joint venture, AMPCO subsequently became wholly government owned. The major reason for the total nationalization decision was that private sector market operators saw AMPCO as a threat and were perceived as making its operation impossible.

AMPCO acquired all the markets, packing and grading facilities and the processing plant formerly owned by JVA. The collection market at El Arda is well used, but the other centers at Safi, Wadi El Yabes and South Shouneh are little used. Similarly, the grading and packing facilities and the processing plants are running at well below capacity and represent an enormous idle investment.

AMPCO exports fruit and vegetables to Europe, and the Gulf States, reputedly at a loss, but no detailed examination of this has been undertaken within the present study. AMPCO also has the monopoly on imports of potatoes, onions, garlic and apples.

Since 1985 AMPCO has been responsible for executing the potato buying scheme which aimed at achieving self-sufficiency in potatoes. In 1981 and 1982 imports of potatoes reached the record levels of about 38-39,000 tonnes per annum according to AMO data. The foreign exchange cost of these imports prompted the buying program under which AMPCO contracts with farmers. The price, delivered to the AMPCO grading station, but with AMPCO providing sacks or plastic crates, is guaranteed in advance, and was set originally above the going market price (Table 3.3).

Table 3.3 Price of Potatoes Delivered Packhouse (fils/kg)

	1985-87	1988
First Grade	150	130
Second Grade	130	100
Third Grade	110	70

Source: AMPCO

The quantities purchased, stored, exported and the losses in storage during the years 1986-1988 are shown in Table 3.4:

Table 3.4 Quantity of Potatoes Purchased, Stored, Export Losses in Storage, 1986-88. (Tonnes)

Year	Received	Stored	Exported	Losses
1986	5297	5297	46	243
1987	10500	10260	4600	265
1988	7500	6186	1314	?

Source: AMPCO

Tweeten in his 1988 analysis of agricultural policies (2) estimated that for potatoes the gain to AMPCO of the implicit tax derived from charging more than the import price on the domestic market amounted to 318,702 JD in 1986. Producers gained 775,422 JD from higher prices and additional output, but these together were less than the 1,325,711 JD loss to the consumers, so the national income lost an estimated 234,587 JD. Tweeten concluded that distortions were relatively minor in the case of onions, apples, and garlic.

The losses on potato exports, however, are also considerable. Jordan has been paying farmers 130 fils/kg. last year and 110 fils/kg. this year, which at current exchange rates is equivalent to US \$390 and \$330 per tonne. To add to this is the cost to AMPCO of providing crates and sacks, grading, packing, transport, administration, capital costs, etc. Egypt currently delivers c.i.f to Gulf states at US \$120/tonne. Thus the cost to the Jordan economy of exporting the potato subsidies must be considerable. There are few places where government organizations can trade successfully in perishables, and when they are used as instruments for implementing policy they are even more handicapped in operating commercially. In addition to the apparent overshoot in stimulating potato production, one has to examine the quality of the produce that is being imported under the monopoly. From personal observation in the course of this study, for example, it must be said that the apples being imported from Lebanon by AMPCO were of very poor quality, would have been outgraded in most markets, and would have difficulty in finding a buyer had alternative sources been permitted. It is not clear what role AMO inspectors have in the case of such produce.

Tweeten observes that Jordan has not had, nor does it have plans to follow a policy of import substitution and self-sufficiency to save foreign exchange. However, its policy of encouraging farmers to grow more potatoes through

the subsidized buying program and exporting at a loss had, as part of its motivation, to save foreign exchange and achieve self-sufficiency. The decline in imports through controls and expansion of production had already begun, however, before AMPCO started its buying program for storage and subsequent export.

Chapter IV

Retail and Producer Survey

The Retail Survey

Few studies of fruit and vegetable marketing in Jordan have addressed the attitudes of the retailer and consumer. Clearly, within the time-frame of the present study, a meaningful consumer survey could not be undertaken. However, it was felt that a survey of the business practices of retailers would not only reveal their perceptions of constraints in the system but also reflect, to a limited extent, consumer preferences and attitudes. A copy of the questionnaire used for this study is included in Appendix D.

Questions were posed on the retailer's view of the quality of the produce he received and how he felt this could be improved. The cost implications of suggested improvements and whether his customers would be willing to bear extra cost was also asked in order to maintain a sense of realism in his responses.

A series of questions on transport, container types and their suitability, and the need to repackage and regrade before sale was intended to reveal the amount of handling to which the product was subjected and to reflect the degree to which producers and/or wholesalers were catering to customers' needs. On the subject of grading, a question was included on the degree to which the retailer perceived an impact on quality from AMO's recently introduced inspection system.

A reflection of customer preferences was sought through the questions on the determinants of their purchasing choices. This was loosely linked to social status through questions on the general income levels of the retailer's clients and their perceived priority of price versus quality. These priorities are probably blurred by the officially fixed retail pricing system, so questions on the retailer's view of this practice were asked, as well as whether he would seek better quality if this were abolished, and on what basis he would then fix prices.

A final question on the retailer's views on the major problems in production and marketing gave each respondent the chance to air his grievances, which can often be very revealing.

The Retail Survey Sample

There are eight governorates on the East Bank, with a total population, in 1985, of 2,693,700 people (Table 4.1). Of these, 41% were living in Amman and 24% in the governorate of Irbid and a further 21% in the governorates of Zarqa and Balqa. These are the administrative areas which contain the largest urban conurbations, the remaining 21% of the population in the other four governorates being in smaller towns and villages.

TABLE 4.1 ESTIMATED POPULATION OF THE EAST BANK BY GOVERNORATE AND SEX FOR 1985

GOVERNORATE	Female	Male	Total
<u>East Bank</u>	<u>1284600</u>	<u>1409100</u>	<u>2693700</u>
Amman	529950	584600	1114550
Zarqa	185530	204120	389650
Irbid	318220	338480	656700
Mafrag	46120	49350	95470
Balqa	89680	97550	187230
Karak	55200	60900	116100
Tafiela	19100	20900	40000
'a'an	40800	53200	94000

As issued in the Official Newsletter No. 3343 dated 1 Oct. 1985, and No 3359 dated 16 Dec. 1985.

Since Amman is the major center of consumer demand, the concentration of the retail survey clearly had to be here. It was felt that to obtain a representative range of opinions reflecting the marketing difficulties throughout the country one other governorate containing a considerable urban population should be included as well as two "rural" governorates. For the former, Irbid was chosen in preference to Zarqa and Balqa since it is some distance from Amman, has its own wholesale market and, being nearer to the north end of the Jordan Valley, probably draws from a different range of farmers.

To obtain the views of retailers in the smaller conurbations and those outside the major Jordan Valley/Amman marketing circuit, the governorates of Mafrag and Karak were selected. Mafrag is a town with a small wholesale market but not involved in the export trade; Karak is well removed from the Jordan Valley/Amman marketing circuit and has a production area close by at Safi.

The total sample of retailers, apart from the Jordan Valley itself, is 80 (20 outlets for each commodity). This number was allocated between the four governorates according to the relative populations and adjusted slightly to make the number in each governorate divisible by four:

Amman	44
Irbid	24 (of which 6 in Remtha and 6 in Jerash)
Mafrag	4
Karak	8
Jordan Valley	12
Total	92

In Amman the sub-sample was distributed among different areas of the city to reflect different income levels and distances from the wholesale market. Specifically, the areas chosen and the number of respondents were:

Downtown	10
Jebel Amman	10
Al Wahdat	10
Wadi Seer	3
Suweileh	4
Al Baqua	3
Sport's City	4
Total	44

The Downtown district is divided between a lower income area which is close to the retail markets and a medium income area. Jebel Amman, Wadi Seer, Suweilah and the Sports City area are medium to high income areas. The Al Wahdat and Al Baqua areas are low to medium income districts, the former being situated relatively close to the wholesale market. Although Al Baqua is actually in the governorate of Balqua, it forms part of the urban conurbation of Amman and so was included in the Amman sample.

In Irbid the sample was drawn from different areas of the city on a similar basis to that in Amman, but six in each of the towns of Remtha and Jerash were included to reflect the differences in smaller towns and rural areas.

In the cases of Mafrag and Karak, the choice of respondents also aimed to reflect the diversity of sources of supply open to the retailer.

The Jordan Valley was considered a special case in that the retailer would be catering to customers who had a source of fruit and vegetables on their doorstep. Twelve retailers were interviewed in three towns -- North Shouneh, Swalha and South Shouneh. Unfortunately, at this time of year direct roadside selling by farmers is not much in evidence, being a more common practice in the summer months.

The number of questionnaires for each product was not exactly even, and the 92 responses were divided:

Tomato	24
Eggplant	21
Potato	22
Cucumber	25

The Retail Survey Results

This section summarizes the major findings of the retail survey. A more detailed analysis of the survey classified by individual commodity (e.g. potatoes, eggplant, tomatoes and cucumbers) is included as Appendix E of this report. This summary is an attempt to report the differences and similarities in various retailer practices and attitudes relative to the four products included in the survey.

Ninety-two retailers were included in the survey, about one fourth of whom handled each of the four products of the study. Eighty percent of the retailers handled fruits and vegetables only, while the rest also handled other products. Only nine of the ninety-two retailers purchased products directly from farmers in addition to purchasing from a wholesale market. Sixty percent of the retailers included in the study purchased vegetables at the Amman wholesale market, and about two-thirds purchased at the Irbid market. Other wholesale markets at which retailers purchased vegetables (no more than 4% of the respondents in any of these markets) include Karak, Mafrag, Jerash, El Arda, Muadi, South Shouneh and Al Baqua.

Average weekly sales of the four products by the retailers handling the individual products were:

Eggplant	(21 retailers)	205 kgs.
Potatoes	(22 retailers)	154 kgs.
Cucumber	(25 retailers)	406 kgs.
Tomatoes	(24 retailers)	427 kgs.

The following is a summary of the responses of the 92 retailers regarding their various operating practices and their attitudes to various aspects of the marketing system for the four products examined in this study.

1. Generally the quality of all four products when purchased by the retailer was fair to good. Quality was lowest for tomatoes, followed by eggplant, with cucumbers and potatoes being the best overall. This relates well with the degree of perishability of these products. The major reasons for the quality condition of these products, as expressed by the respondents are:

- a. The practice of topping by farmers (all four products).
- b. The lack of grading at the farm level and wholesale level which results in products being sent to market with harvesting damage (all four products), broken stems (eggplant), disease and/or insect infestation (all four products), and discolored product (eggplant, cucumber and tomatoes).
- c. Low price levels, which encourage farmers to market anything they have (all four products).
- d. High temperatures during transport and while in the wholesale market sitting in the sun, which results in a high degree of wilting (eggplant and tomatoes).
- e. Low quality seed which results in poor quality fruit (egg plant).
- f. Filing fruit too high in containers which results in bruising (tomatoes and eggplant).

Retailers suggested various practices which, if carried out, would reduce, and perhaps eliminate, much of the poor quality products. These practices are as follows:

- a. Initiate strict grading programs at both the farm and wholesale levels designed to outgrade damaged, wilted, discolored, immature products from the marketable products. This practice would eventually lead to the elimination of the topping practice.
- b. Provide education to farmers on improved harvesting methods and postharvest technology.

c. Develop varieties which would produce more uniform sized fruit.

d. Improve packaging materials which could withstand stress and reduce effects of high temperature during transport.

Retailers also stated that their customers would be willing to pay the added costs resulting from the adoption of the above solutions in order to secure higher quality products. They also suggested that the government retail price fixing system must allow consideration of these costs in the price structure. This suggestion was made because respondents in the survey generally felt that the retail price fixing system, as now implemented, does not allow for consideration of quality.

2. Over 80% of the respondents leased vehicles to transport their products from the wholesale market to their retail shops. The average distance between the wholesale market and the retail outlet was 20 kms., with a range from 0.5 km. to 130 kms. The average cost of transport was estimated to be 5.9 fils/kg.

3. Of the 92 respondents, 77% said they were not satisfied with the method of packing and the packaging materials used to ship products from the farm to the retail shop. The major problems were topping by farmers, inconsistency of weight of product in the container (over- or underfilled), use of polystyrene containers which are easily broken and heat the produce in hot weather, and, in general, the lack of grading before packing which results in poor quality in the container. Generally, eggplant and cucumbers were removed from the polystyrene container at the retail shop to be displayed on shelves for the customer; tomatoes are left in the original container for display; and potatoes are removed from sacks and placed on shelves for display.

4. Eighty percent of respondents regraded produce at the retail shop (eggplant 80%, cucumbers 90%, tomatoes 87%, and potatoes 65%). The primary reason for regrading all four products was to remove infected and damaged fruit and to sort the produce into two classifications -- one, of the best quality, to be sold at the maximum fixed price, and one classification for lower quality. Potatoes were graded primarily by size and shape; eggplant by color (black preferred) and size (large for cooking and small for pickling); tomatoes by size (medium preferred) and color (deep red preferred); and

cucumbers by size (small preferred) and color (green preferred, no yellowing).

5. When asked if respondents were aware of the Ministry of Trade specification for produce, only 5% were aware of them. All respondents, however, indicated they would apply the specification if the farmer would do the same at his level, and if the government retail price fixing practice were eliminated, or if it took into consideration the specification so that quality was reflected in the prices.

6. The frequency of product purchases by retailers at the wholesale markets reflected the degree of perishability of the product. Potato purchases averaged three times per week; eggplant and cucumber averaged four times per week; and tomatoes five times per week. Storage at the retail outlet also varied by product. About 50% of retailers stored potatoes before display (average length of storage was 3 days); 70% stored eggplant (average 1-2 days); 50% stored cucumbers (average 1-2 days); 30% stored tomatoes (average was 1 day). None of the 92 respondents had temperature or humidity controlled storage. Shelf life, as would be expected, was reported to vary according to the product: for cucumbers, 1-2 days in the summer and 3-4 days in winter; eggplant, 1-3 days in summer and 4-5 days in winter; potatoes 3-7 days; and tomatoes 1-3 days.

7. Respondents indicated that product loss was experienced during their ownership, as follows:

a. Eggplant losses ranged from 10-33%, with an average of 16%.

b. Potato losses ranged from 3-30%, with an average of 13%.

c. Cucumber losses ranged from 10-25% with an average of 16%.

d. Tomato losses ranged from 10-33%, with an average of 20%.

The main reasons for losses were:

a. Lack of ability to control the temperature during storage and on display (all four products).

b. Broken stems (eggplant).

- c. Defects or infection not visible at the time the retailer purchased the product (eggplant, potatoes and cucumbers).
- d. Display in the sun (tomatoes, eggplant, cucumber).
- e. Handling by customers while on display (all products) and tasting by customers (eggplant).
- f. Less than expected demand resulting in spoilage before consumer purchase (potatoes).

8. Respondents indicated that the most important criterion for consumer purchase was quality -- for eggplant (100%), cucumber (90%), and tomatoes (80%). For potatoes price was the most important criterion (60%). The major specific quality indicators preferred by consumers include:

- a. Size - medium size for potatoes and tomato, small size for cucumber and for eggplant for pickling, large size for eggplant for cooking.
- b. Color - mature red for tomatoes, green for cucumbers (no yellowing), white for potatoes, polished black for eggplant.
- c. Taste - no bitterness for eggplant and cucumber, normal for potatoes, acid for tomatoes.
- d. Maturity - fully mature for all products, immature seeds in eggplant.
- e. Blemishes - absent in all products.

9. Respondents were asked their opinion of the suitability of the government price fixing system. Overall, the retailers surveyed were about evenly split in favor and against. Major criticisms of the system, as expressed by retailers, include:

- a. The system does not allow pricing based on quality,
- b. The price does not take into account the cost of production,
- c. The practice of setting tomorrow's price on the basis of today's wholesale price and market conditions many times does not accurately reflect today's market situation relative to supply and

demand, quality on the market, etc. The result is that, at times, the fixed retail price is lower than the purchase cost to the retailer. This situation leads to many retailers limiting daily purchases because of speculation over the next day's price/cost relationship. This, of course, is evidenced by the number of times that retailers go to the wholesale market per week, creating a situation where retailers incur the expense of more market visits than would be the case if speculation were minimized.

The positive factors of the system, as expressed by the respondents, include:

- a. Bargaining between retailer and customer is eliminated,
- b. Consumers are protected from unrealistically high prices.

10. Almost all the respondents indicated that if the government retail price system were terminated they would attempt to purchase and sell higher quality produce than they do now. When asked what factors they would consider in setting prices in the absence of the government program, the following factors were given:

- a. Level of product quality,
- b. Retailer purchase cost,
- c. Competitive practices and prices of neighboring retailers,
- d. Reasonable mark-up for profit. Mark-up margins suggested by the respondents ranged from 10-35%, with the average of all responses being 25%.

11. The retailers included in this survey indicated the following practices are followed in order to minimize losses between purchasing the product and selling it to a customer:

- a. Protect fruit from direct exposure to the sun by covering with an awning or paper,
- b. Remove damaged and infected fruit regularly from the display,
- c. Ensure the product is aerated(ventilated) during storage and display.

d. Display products on open shelves during periods of high temperature (remove from the polystyrene boxes).

12. The respondents considered the major problems constraining efficient production and marketing in Jordan include:

Production

- a. Disease and insect infestation of the produce when sent to market,
- b. Topping practices followed by the farmers,
- c. Harvesting before maturity,
- d. Poor handling methods during harvest,
- e. Lack of farmer compliance with cropping patterns, which adversely affects supply,
- f. Weak, inadequate extension programs in production and lack of extension programs designed to provide education and assistance in the use of postharvest technology.

Marketing

- a. Lack of a grading and classification system which results in the inability of quality demands to be reflected through the system,
- b. Government retail price fixing program which does not reflect pricing by quality,
- c. Level of competition between export and domestic market (especially for eggplant and cucumbers) which decreases the supply of product on the domestic market. In addition, desired quality characteristics may be different for the export market, which causes confusion in product pricing,
- d. Use of poor packing materials and incorrect size of containers for transport,
- e. Lack of adequate storage facilities, particularly precooling and cold storage,

f. Lack of consistent, year-round supply of products and irregular demand, and the resulting impact on price,

g. Practice of reporting prices paid in the wholesale market at lower levels than actually paid by the retailers (to reduce tax obligation), which, at times, results in the retail price being set below purchase price.

The Farm Survey

The farm survey was split into two sections because it was felt that the number of topics to be covered resulted in a questionnaire which was too long for an individual respondent. Copies of these questionnaires are included in Appendix F.

The first questionnaire concerned production, harvesting and dispatch of the produce to market.

The section concerning production was designed to identify those factors in the production process which affected the harvested product. Questions on cultivation practices, seeds and seedlings, varieties, fertilizer use and types, and phytosanitary precautions were included.

The questions on harvesting covered timing, methods, tools and containers, whether the farmer was aware of better harvesting methods and why they were not adopted, and causes of losses at this stage. Farm grading was also investigated and questions included the reasons and criteria for grading, the extent of market differentiation in preparing produce for market, and the impact of the recently initiated A.M.O. market inspection system. Questions on storage and precooling were included to determine the holding time on farms and the conditions in which the product is held. These questions, together with those on harvest timing, were also aimed at determining the farmer's awareness of the need to remove field heat and maintain a low temperature as far as was possible. Finally, the section on transport sought to determine whether the farmer himself undertakes the transport function, at what time of day, and the distances involved, as well as, the farmer's view of the losses involved and how they could be prevented.

The Extension/ Credit/ Marketing Decisions questionnaire concentrated on the institutional framework within which marketing is performed and the farmer's decision making process. Questions on extension sought to determine the sources of technical information and the extent and sources of post-production advice. Credit is a

matter of concern in many reports. Although relatively superficial, the enquiry aimed at finding out the extent to which credit was used and whether this determined marketing decisions. The section on market choice probed the reasons for the farmer's choice of market channel. Questions were included on sources of market information and the adequacy of those sources.

Sample Size and Distribution

The farm sample consisted of twenty respondents for each type of questionnaire and five respondents for each product, making a total farm sample of forty.

In order to limit the resource demand of the study the survey was conducted at the wholesale markets of Amman and El Arda. Although contacting farmer respondents at the market risked omitting farmers who did not use this marketing channel, it was considered that their numbers were limited and that to have them represented would have required a much larger sample taken at farm level. This would have necessitated much more travelling and time.

In total, 40 farmer questionnaires were completed (20 of each type). Of these, 30 were completed in the Amman wholesale market. However, in order to obtain the views of farmers not necessarily using this market as a channel for their produce, two questionnaires were completed by respondents at Arda market in the Jordan Valley, and six on-farm interviews were conducted in the Balqua area.

It would probably have been enlightening to obtain interviews in other wholesale markets, but time constraints prevented this.

The Farm Survey Results

This section summarizes the main findings of the farm survey based on the two questionnaires. A more detailed analysis of the survey classified by individual commodities is included as Appendix G.

Farm Production Harvesting and Market Despatch

Twenty farmers were interviewed, five for each product. Two interviews were conducted at El Arda market. They concerned eggplant and potato only. The twenty farms ranged in size from 30 dunums to 4,000 dunums, with average areas devoted to eggplants (30 dunums), cucumber (91 dunums), tomato (10 dunums) and potato (112 dunums), which represented between 13 - 25% of the average sizes of the

farms. It would appear that the farmers spread their risk widely (with one exception, where the farmer had his entire 40 dunums in eggplant). Of the twenty farmers, seven rented their farms. Of the potato farmers, although four of the five owned their farms, two of them rented land as well. Without exception farmers had plowed their land by tractor. There are apparently numerous machinery contractors in addition to the quasi-governmental services of JVFA. Subsequent cultivation and harvesting was performed manually except in the case of potato growers where more machinery was used, particularly sprayers. Plowing costs were estimated at one JD per dunum. The benefits of aeration appear to have been stressed by several respondents. It is not clear if this reflects a recent extension theme.

Production seasons were reported to be July-October for eggplant although large quantities were being marketed at the time of this study (April/May). Cucumber growers had a variety of target harvesting seasons ranging from October, throughout the winter months, to April. Similarly with tomatoes, three farmers aimed to produce in November, one in December and June, and a fifth in May. Of the potato growers two harvested in January and three in April/May, but one produced for both seasons.

Crop mix decisions were based on a stated desire to diversify, as well as seasonal spread.

The question on monoculture was intended to discover if crops were grown in association, but the concept appears to have been totally alien to interviewees and interviewers. The question drew a reiteration of the other crops on the farm.

Seedlings, purchased from private nurserymen, were usually used for the propagation of tomatoes and eggplant, although some farmers raised their own seedlings, and one grower appeared to be producing seedlings for sale, considering the amount of seed he purchased. The main complaint about seedlings appears to be that nurserymen supplied mixed varieties. This was confirmed by personal observations when the appearance of 'rogue' varieties in fields and mixed consignments in markets was explained similarly. Potato and cucumber growers produced their crops from seed. There were complaints about the price of planting material, but, with one or two exceptions, most had no complaint about quality. The cost of seed is a universal complaint by farmers. However, as a proportion of total input costs the cost of planting material, given its quality, is usually very small. None of the respondents saved seed from their own crop, although one farmer met during a visit to the Jordan Valley did save potato seed, storing it in an ambient temperature store in the highlands. It was not possible to judge to what extent disease carry-

over resulted from this practice. Farmers had few complaints about the availability of desired varieties, suggesting that the input suppliers were satisfying farmers' needs. Varieties were chosen on the criteria of high yield, suitability for the area and disease resistance, and marketability. While not asked to rank the criteria in general, these were listed in the above order.

The value of fertilizers is well recognized. Although the impression emerged that the use of nitrogen fertilizer was somewhat high, a more rigorous examination would be needed to confirm this. Several farmers were using farm yard manure; some complained that there was insufficient manure available. The question as to source of fertilizers drew responses varying from 'imported,' 'the local cooperative,' and 'private dealers.'

Phytosanitary products were universally used and a wide variety of products listed. Again, complaints about the cost of these products were voiced, in one case that there were too many types, but they appeared satisfied with the results.

The Jordan Valley Assessment study (11) concluded that farmers were over-using water, fertilizer, and seeds by 10-20%, the former because it is too cheap, and the latter two because insufficient research-based information on optimal use levels is available to farmers. Everitt (10) voiced concern in 1981 about spray residues on marketed produce, and personal observation confirmed that this problem persists.

In regards to harvesting methods, farmers were asked what containers they used to harvest. This varied according to commodity, with farmers harvesting directly into polystyrene market packs in some cases, but more usually into plastic buckets, plastic crates, or, in one case with potatoes, into wooden boxes. The state of maturity appears to be the main determinant for harvesting, with harvesting done mainly in the early morning before the heat of the day. From personal observation, it is clear that many farmers put their produce under a field shelter for grading and assembly.

Asked whether the present method of harvesting affected the quality, quantity, and value of the produce, most farmers felt that it did. In the case of eggplant, currently fruit is detached from the plant stem by twisting the stem. Most farmers felt that cutting with scissors would be preferable but that this would slow the harvesting process. At the same time they felt that there was a 2-5% product loss due to the present practice. One cucumber grower also felt that the use of scissors would be preferable for harvesting his crop. Incidentally, retailers

also complained of stem damage on eggplant. Potato growers felt that there was some damage from mechanical harvesting, and one grower, producing an early crop in January, harvested this manually, whereas he harvested the April/May main crop mechanically. Farmers expressed the view that they knew of alternative ways of harvesting but considered them too expensive for the Jordanian situation. Conversely, of the potato farmers, the smallest saw mechanized harvesting as better but unsuitable for small areas, whereas the largest (500 dunums of potatoes) felt that manual harvesting was preferable, although he harvested mechanically. Losses due to harvesting were put at 5-10% for tomatoes (most thought 5%); 1-10% for potatoes (one mentioned a 10% loss during the growing period and 4% by harvesting); and cucumber 2% due to poor handling by farm workers. In no case was the crop harvested all at the same time, according to the respondents, but clearly any particular potato crop is.

Questioned on grading, it was found that farmers graded potatoes, eggplant and cucumber at picking. In the case of the two latter commodities, fruits suitable for market demand were selected, but doubtless some further selection was made as the commodity was transferred to market boxes. Potatoes were graded in the field according to respondents. None reported washing their potatoes, although this is apparently common practice despite its negative effect on keeping quality. In the case of tomatoes, one farmer claimed that he did not grade, but subsequent replies suggested that he did in fact grade. Grading was generally on the basis of maturity, size, color (in the case of tomatoes and eggplant), freedom from blemishes, and disease and insect damage. The needs of the market were the main motivation for grading, and most respondents claimed to have done more grading since market inspections were instituted. It should be added that, given the quality of some of the produce being offered for sale at both wholesale and retail level, some farmers consider the market's demands very low, although equally there was also some superb produce. Culled produce in the case of eggplant, cucumber and potato is fed to livestock and so is not a total loss. Farmers admitted that if the market was very firm they would send the culls in the hope of a sale.

The pack used for transport to market was almost exclusively the polystyrene box for all products except potatoes, for which sacks were also used. Apart for reasons such as cheapness, lightness and its being readily available, almost everyone regarded this as what the market preferred. Some of the retailers surveyed and some wholesalers with whom discussions were held were critical of the polystyrene box, but there is no doubt that it now dominates the market. There is a trade in second-hand

containers. New containers cost about 180 fils and second-hand, 100-130 fils each.

For those who claimed not to package, the question why they didn't seems to have been interpreted as "Why were special packs not used," and the response was that there was no special pack for that commodity.

Precooling was not practiced. One farmer only claimed that he precooled by spreading his produce under a field shelter. Neither did anyone store produce -- it was dispatched to market soon after harvest.

Questions on transport to market revealed that, almost exclusively, farmers took their produce to market and that a considerable number used hired trucks. As might be expected, most delivered to market early in the morning, and some late in the afternoon/evening. Most were transporting to Amman (the majority of the respondents were interviewed in Amman, remember) and the cost was estimated at about 75-100 fils per container, with most saying 100 fils. This was estimated to approximate to 5 fils/kg. The farmers interviewed about eggplant were unaware of losses on the way to market, although given the way boxes are over-filled and then piled on top of one another, accelerated senescence must result. Similarly, no losses were reported by cucumber growers. Tomato growers, on the other hand, reported 3-4% loss caused by dehydration on the way to market, poor handling, crushing due to over-filled boxes, the fragility of the boxes, and long waiting times in the market.

Farm Extension/Credit/Marketing Decisions.

The questions regarding farm size and tenure were asked at the beginning of this questionnaire, as with the previous one. It was expected that the same respondents would not be prepared to answer both questionnaires. However, there were only three new respondents to this section.

Access to technical advice was virtually universal. In most cases, it was provided by the government extension service. Additionally, cooperatives, private merchants, a son who was an agronomist, and -- in the case of the respondent who farmed 4000 dunums and was himself a farmer/commission agent -- an agronomist was employed to manage the farm. Technical assistance on harvesting and postharvest technology was largely not available. The replies to this question would appear to bear out the Jordan Valley Assessment team's somewhat positive view of the extension service -- except in regards to postharvest technology educational activities.

The use of credit was exclusively for production. Institutionalized credit was not widely used, although tomato growers emerged as the heaviest users from the Agricultural Credit Corporation, their cooperatives, and the JVFA. Commercial bank loans were also used by some farmers. Informal credit arrangements were mainly with the commission agents, and friends and family. Most seemed to regard the loans from the commission agent as unsatisfactory, as they were obligated to sell their product to the agent, but some appeared satisfied. One farmer, who no longer borrowed from anyone, felt that the agents interest charges of 8-10% per annum, to be repaid in a limited time, were somewhat onerous, but he continued to market his produce through the agent from whom he had previously borrowed.

Farmers were asked if they had a contract or a firm commitment from the buyer who would be able to market a farmer's produce. None did. The response to this question generally related to whether the farmer was in debt to a commission agent and thus obligated to sell through him. On the other hand being in debt to the agent gave the agent a strong incentive to sell the produce to liquidate the debt.

In addition to the Amman wholesale market, farmers used the local market at El Arda, sold directly to exporters and wholesalers who collected at the farm, and, in the case of tomatoes, sent produce to the processing factory. Reasons for using these outlets in addition to credit obligations, were the fact that El Arda was close at hand, that sale to the factory reduced marketing costs, and that they were paid promptly by commission agents.

Many of the farmers were members of cooperatives, with a high proportion claiming to buy some inputs from their cooperative. None marketed through the cooperative, all claiming that their cooperative did not have a stand in the wholesale market. With the exception of the Karak South Ghor Cooperative, no individual cooperative has a market stand. The Jordan Cooperative Organization stand is established at the Amman market to service individual cooperative needs -- at a reduced commission -- but no cooperatives interviewed seems to be aware of it.

No one claimed access to institutionalized information, which was to be expected, but most received information from the markets, which they attended themselves or from neighbors. Most farmers felt the information adequate for their needs, but there were those who felt that the prices they heard were unrelated to quality, and some felt that longer term information was needed.

The main points to emerge from the survey appear to be the following:

- a. That farmers grow a wide range of crops, in which they are prepared to invest in purchased inputs.
- b. That in some cases there are better methods of harvesting, but the farmers do not currently see an economic benefit from using them.
- c. That the polystyrene pack, most commonly used, is perceived by the farmer as being what the market wants despite the fact that many retailers, wholesalers and, in fact, some farmers recognize the deficiencies in this pack in its fragility and heat-holding qualities.
- d. That precooling is not practiced, nor on-farm storage. Clearly it is best that produce is transported to market as quickly as possible. However, rapid reduction of field heat, even with morning harvesting, would contribute to slowing senescence. Simple devices for achieving this could probably be recommended. Similarly, during transport to market, simple means of keeping produce cool and lessening dehydration in Jordan's low humidity, would help produce quality.
- e. That while the extension service appears to have fair contact with farmers and farmers have access to knowledge from this source, there is little emphasis on the postharvest aspects of crop production. Appreciation on the part of extension workers -- that production is not an end in itself-- should be a major concern of AMO.
- f. That there is probably not a lot wrong with the credit system operated within the trade. The credit organizations and banks could probably give more thought to their role in assisting marketing instead of solely production.
- g. That the cooperative movement appears to have failed its members in the field of marketing. Individual cooperatives should certainly not trade in perishables, but could assist farmers to channel produce through the markets, especially since they have an existing wholesale structure.
- h. That farmers do not have adequate, constant access to information brought to them. They have to seek it. The price information farmers receive is partial, unrelated to quality or quantities, and historic.

i. That a lot of the farmer's time is spent marketing produce. It is not clear why farmers think it necessary to accompany their produce to market thereby denying the farm his expertise, supervision and labor. All of these are expensive resources, not exercised in driving a vehicle or waiting for produce to be sold. It is significant that when farm budgets are constructed and they include marketing costs, the labor costs for production are carefully measured, but the time spent marketing (from grading and packing through to sale) is not.

j. That the farmers sell by volume and the retailers sell by weight. If containers were used that contained a given weight when less than completely full, and not overfilled as most are now, much less damage would result.

k. That if various market operators, including auctioneers, would not walk over boxes of produce, further increasing the pressure on the lower levels, the quality of produce offered to final buyers would be improved.

l. That retailers expose produce for sale to the full sun in many cases. There is little point in educating the producer and market intermediaries to improve their practices if retailers fail to match them.

Chapter V

Problems, Constraints and Recommendations

Problems and Constraints

Numerous problems have surfaced in Jordan which have acted as constraints to further development of agricultural production, particularly that of fruits and vegetables. Many of these problems are a result of the imbalance of supply and demand for fruits and vegetables, the various government policies initiated to cope with and/or correct this imbalance, and adjustments (or lack of adjustments) by the agricultural marketing sector. This section is an attempt to identify these problems and constraints as related to the fruit and vegetable marketing system in Jordan.

The major basis upon which these problems are identified is the perception regarding problems by the various market participants included in the retail and producer surveys conducted in this study. In addition, problems identified in past studies and observations and discussions carried out by members of the Rapid Assessment team supplemented these perceptions. The following is a listing of the problems and constraints followed by a brief explanation:

1. Lack of quality control,
2. Inability to reflect desired quality characteristics
3. Lack of knowledge regarding the use of postharvest technology,
4. Lack of a formalized system to provide market information,
5. Lack of understanding of how the marketing system works,
6. Inability to bring supply and demand into balance,
7. Lack of an organizational structure and regulation of wholesale marketing activities.

1. Lack of quality control at all levels of the fruit and vegetable production/ marketing system. The result is diseased and infected produce entering the marketing channels, topping practices by farmers, high post-harvest losses, and inability to meet, in a consistent manner,

consumer demands -- particularly the demands of potential export markets.

2. Inability to reflect desired quality characteristics throughout the fruit and vegetable production/marketing system. Reflection of quality demands is normally achieved through the pricing system. In Jordan, due to the government retail price fixing program, price is not allowed to reflect these characteristics. In fact, the price fixing program actually acts as a disincentive to the establishment of any quality standards.

3. Lack of knowledge regarding the use of postharvest loss reduction technology at all levels of the production/marketing system for fruits and vegetables. The result is considerable product loss (estimated by some reports at 30% or more) due to poor methods of harvesting, packing, handling, storage, transport and display of fruits and vegetables.

4. Lack of a formalized system to provide market information to the fruit and vegetable production sector regarding market requirements and activities. Such items of information as product volume movements, types of product demanded, current price levels, pricing practices, price trends, and the overall supply and demand situation are not generally available to system participants. Some information is developed by government agencies, but it is used internally and generally not disseminated, at least in a usable form and on a timely basis, to producers and market intermediaries. Some information, such as current prices in the wholesale market, is available on an informal or individual basis, but to obtain this information the farmer must visit the market and meet face to face with market operators. This requires considerable time and travel expense on the part of the farmer. This lack of knowledge limits the ability of farmers to make appropriate and timely adjustments to their production and marketing activities which will optimize their profits. For example, farmers' decisions as to which crops to grow, when to plant, and in what quantities must be guided by reliable information on the requirements of the market -- this information is not available to the farmer in Jordan.

5. Lack of understanding of how the marketing system works and the nature of its cost structure has limited the ability of individuals and firms involved in marketing fruits and vegetables to respond and adjust to problems and/or opportunities in the system. This lack of understanding has also inhibited the ability of government to make appropriate policy decisions relating to improvement of the production/marketing system for fruits and vegetables.

6. Inability to bring supply and demand into balance due primarily to over-preoccupation with altering production levels without adequate attention to the market. Furthermore, various government policies (import restrictions, retail price fixing, cropping patterns, direct government market intervention, etc.) have been conflicting, self-defeating, extremely expensive, and, at best, confusing to participants in the production/marketing system. Support prices have encouraged surplus production, (tomatoes and potatoes), retail price fixing has inhibited quality pricing, cropping patterns are established without knowledge of consumption needs (tomato production depressed too much, resulting in increased prices), and direct government intervention (AMPCO tomato processing and underutilized packing facilities) has caused considerable cost to the treasury. None of these actions have brought balance to supply and demand.

7. Lack of organizational structure and regulation of wholesale market activities which has resulted in less than optimal market conduct and performance at the wholesale level. At present the Amman wholesale market, the major wholesale market in the country, is overcrowded, congested and inadequate for the volume of produce moving through it. There is speculation regarding collusion among the commission agents, oligopolistic tendencies, incorrect price reporting by commission agents, which, if true (the authors of this report have not been shown any proof of these activities), obviously do not lead to proper conduct or optimal market performance. In addition, various studies have pointed out that the current level of tax paid to the market authorities by buyers and sellers amounts to much more than the operating cost. The tax obviously reduces the incomes of farmers and raises the cost of food to consumers and that of exports. Nations competing with Jordan in the export markets are reputed to subsidize their exports, whereas Jordan, or more correctly the municipality of Amman, taxes them.

Recommendations

The recommendations proposed in this section are designed to provide an orientation to analysis of the priority problems and evaluation of alternative solutions to these problems. The purpose of this approach is to provide guidelines to AMO and its future activities relating to its mandated role in organizing, upgrading and monitoring agricultural marketing in Jordan and its role as the public sector implementing agency for the upcoming USAID Agricultural Marketing Development Project. In order of priority, the following recommendations of this study can be classified in five major areas.

1. Provision of Market Information and Intelligence
2. Reexamination of Government Policies Affecting the Production/Marketing System,
3. Evaluation of the Effectiveness of the Wholesale Markets,
4. Implementation of a Marketing Extension Program,
5. Implementation of a Quality Assurance Program.

1. Provision of Market Information and Intelligence to the participants in the fruit and vegetable production/marketing system, and to the policy makers who influence the system is an absolute prerequisite of any attempt to improve the performance of the system. Policies designed to assist in the development of an efficient and effective production/marketing system must be based upon adequate, accurate, and timely information with sound analysis and interpretation. Participants in the system, be they producers, market intermediaries, exporters or consumers also need such information.

The design process for a market information and intelligence system for Jordan must consider the following:

- a. The information must be collected, assembled and analyzed in a way that the results meet the needs of the end-user. This implies that the ultimate users should be encouraged to assist in the system design.
- b. The information collected must include all the factors that affect the market situation, including prices at all levels of the system, price variations, available and projected market supplies, costs of production, the status of competitors, etc. Once the type of information is determined, then a plan for its acquisition must be devised.
- c. Data collection must produce accurate and reliable information. This requires the identification of appropriate sources and the use of appropriate sampling methodology to ensure that representative data are secured. The result of this procedure will be one reliable set of data rather than the current situation where different data sets lead to totally different conclusions.
- d. Analysis and interpretation of the market information must either be provided to the users of the information, or they must have the ability to analyze the data themselves. This requires either

the establishment of an entity in AMO to do the analysis and/or the implementation of a program (marketing extension) to provide analysis training to potential users.

e. This information and/or intelligence must be disseminated to the end-users in a timely manner and in a form that can be understood.

2. Reexamination of Government Policies Affecting the Production/Marketing System for fruits and vegetables is an absolute must. In the past, and currently, government policies in regard to marketing have, in some instances, placed reliance on competitive forces to balance supply and demand and encourage efficiency in the system. However, at the same time the government has substantially intervened in other aspects of the marketing system with the view that the private sector could not adequately serve the national interest. The impact of these actions on the production/marketing system has not been evaluated, but must be in order to guide future decisions.

Specific policies which require reevaluation include irrigation water subsidies, cropping patterns, import controls, price stabilization (floor prices), retail price fixing programs, and direct government intervention (AMPCO's ownership of grading, packing and processing facilities, its involvement in the export market, and its monopolies on some imports). If any of these policies are found to be ineffective, measures should be initiated for their immediate elimination. Quite likely experimental deregulation may prove advantageous in facilitating policy reevaluation. For example, elimination of fixed retail prices for selected products may be necessary to evaluate impacts adequately. And it must be emphasized that the elimination must take place for a long enough period of time for adjustments to take place.

3. Evaluation of the Effectiveness of the Wholesale Markets is also a must. Since the wholesale market is the center of the fruit and vegetable marketing system, its competitiveness and the efficiency of product moving through the market greatly affects the entire system. There is a serious need to gain an understanding of the specific marketing activities carried out in the market as well as the inter-relationships among the various individuals and firms performing these activities.

A study should be conducted to gain this understanding, particularly regarding the factors affecting market competition. More specifically, these factors would include:

- market trading rules and regulations and their enforcement;

- relationships between commission agents that may affect competition and price levels;
- extent of purchases by commission agents for their own account and the impact of this practice on price;
- extent and nature of off-market activities of market operators which might have conflict of interest implications;
- extent of incorrect price reporting by commission agents and the impact of such practices on price levels in the retail price fixing system;
- effectiveness of the use of current auctioning methods of selling on product movement through the market as well as overall price levels as reflecting accurate supply and demand conditions;
- and the impact of municipal taxes on levels of farmers' profits and consumer prices in both the domestic and international markets. This impact should also be examined from the point of view of its effect on taxing the agricultural sector to the benefit of the Amman conurbation.

4. Implementation of a Marketing Extension Program will be critical in any effort designed to reduce postharvest losses and/or create a more effective and efficient production/marketing system for fruit and vegetables. Extension, by definition, is the activity which extends research results to potential users. In addition, and of most importance, extension instructs potential users on how, when, and where to apply research results. In Jordan, as traditionally around the world, extension programs are primarily production oriented, i.e., designed to increase production and perhaps increase efficiency of production. Seldom are extension programs designed to assist producers and others involved in the production/marketing system to reduce postharvest losses or to become more efficient in marketing products. Such is the case here in Jordan.

An effective marketing extension system needs to be designed to provide information in the following areas:

- a. Marketing methods, principles and functions, including product pricing, outlook and alternative marketing methods and channels, and their costs and benefits.
- b. Availability and use of harvest and postharvest loss reduction technology designed to minimize losses during harvest, handling, packaging, storage and transport.

In order to implement an extension program effectively in these areas it will be necessary either to reorient existing production based extension activities towards marketing, or initiate a new component of the existing extension organization, i.e., marketing extension. It is the feeling

of the authors of this report that reorientation of the existing production extension program is not feasible due to the lack of background training in marketing. However, it should be possible to reorient existing production extension personnel with minimal training so that they can carry out an effective educational effort to reduce postharvest losses at the farm level. A new program in marketing extension, however, must be developed. Whether the new marketing program should exist in the current extension organization or be placed under AMO will have to be decided by those designing the program.

5. Implementation of a Quality Assurance Program is a must before it will be possible to implement a successful fruit and vegetable export program fully. A quality assurance program is essential so that buyers and sellers understand what the buyer can expect, not only in terms of the commodity, but also its weight and quality. The standardization of weights and measures and the verification of weighing equipment is standard practice in many countries, especially those in which Jordan is attempting to develop a market (EEC); thus it will be necessary for Jordan to ensure that weights and measures conform to EEC standards. Further, a system of accurate grade standards which ensure that the buyer can adequately reflect requirements to the seller and that the product being sold meets the buyer's requirements is essential in international trade. In addition, standards for packaging materials is critical because the standards in the countries to which Jordan may export must be met.

Quality standards in Jordan are based on the Arab League standards. Since there are some differences between EEC standards and those of the Arab League, inspectors and exporters will have to be trained to grade according to both systems.

The development and use of uniform grades for fruit and vegetables and uniform standards for packaging materials can contribute significantly to creating a more efficient and effective marketing system in Jordan. At the present time producers do not receive clear signals of the relative value of different product qualities to guide their production, harvesting, packaging or marketing decisions. Frequently products that should have been discarded before entering the marketing channels move through the system only to be discarded at some later point. Thus, added costs have been incurred which will not be recouped because the product cannot be sold. Additional costs are incurred in the marketing system due to the need to regrade products at various points because participants have different perceptions as to the quality needs of their buyer. A uniform grades and standards program can greatly reduce these costs and lead to a more efficient marketing system

for all participants -- from the farmer through to the consumer. However, because of the time required to introduce a grading system where one does not already exist on an official basis and the need to educate not only farmers and market intermediaries but also consumers in the various attributes of the individual grades, it is felt by the authors that a quality assurance program for the domestic market can be given a lower priority in terms of problems that need attention.

PUBLICATIONS AND STUDIES REVIEWED

1. Jordan Fruit and Vegetable Marketing Issues, Suleiman Arabiat, Univ. of Jordan paper presented at seminar on Food and Agricultural Marketing - June 13-22, 1987 Amman.
2. Analysis of Selected Agricultural Policies Affecting Production and Marketing of Fruits and Vegetables in Jordan, Luther Tweeten, Rolundo Jiron and Bechir Rossas - January 1988.
3. Fruit and Vegetable Marketing Practices and Policies in Jordan and a Program for Improvement, Robert Enochian - August 1984.
4. Jordan Agricultural Sector Analysis: Part IV, Marketing of Agricultural Products in Jordan, C. Kenneth Laurent - Nov. 1985.
5. Supply and Demand for Fruits and Vegetables in the Southern Mediteranean: Volume V, Production and Marketing of Horticultural Commodities - Jordan, Hogan and Bredahl - October 1984 (draft)
6. Institutional Analysis of the Jordan Agricultural Marketing Organization, Schermerhorn - August 1987.
7. A Perspective on the Need for Investment in Wholesale Facilities for Fruits and Vegetables in Jordan, Marshall Godwin - Sept. 1984.
8. Report on Short-term Secondment to Jordan Valley Authority, Amman for Collection and Use of Economic Farm Data, Martin Dietz - June 1987.
9. The Marketing System, Suleiman Arabiat, "Agricultural Sector of Jordan" - 1985.
10. Report on the Improvement and Control of Vegetable and Fruit Quality in the Jordan Valley, Martin Everitt - Sept. 1982.
11. Jordan Valley Impact Assessment, the Dynamic Transformation 1973-1986, Steven Shepley, David Gaiser, Marcel Bitoun, Hind Nassif, and Vicki Schoen - January, 1988

APPENDIX A

APPENDIX A

Agricultural Marketing Organization
Amman

Fresh Fruit & Vegetables Containers Questionnaire

First: General Information

1. Factory Name
2. Licensing Number
3. Name of Owner
4. Location of Factory
5. Address:
6. Production Starting Date
7. Kind of Production

Plastic Polyestyrine Wood Carton

Second: Machinery & Equipment

	Kind	Qty.	Unit Price	Year of Purchasing	Production Life
1.					
2.					
3.					
4.					
5.					

Kind	Qty.	Unit Price	Year of Purchasing	Production Life
6.				
7.				
8.				
9.				
10.				

Third: Buildings

	Rent Per Year (J.D.)	Cost of Owner Building (J.D.)
For Administration		
For Production		
For Storage		
Total		

Fourth: Primary Materials Used (1987 Figure)

Production (Boxes)	Unit Price J.D.	Qty Used (Weight) Containers	Gross
1. Polystyrene			
2. Local Wood (New)			
3. Second Hand wood			
4. Imported Wood (Piles)			
5. Wooden Corners			
6. Masonite			
7. Nails			
8. Wires			
9. Iron Belts			
10. Other			

Fifth: Operational Expenses (1987 figures)

1. Employees and Laborers
 - a. Permanent
 - Number
 - Total Annual Salaries & Wages
 - b. Temporary Laborers
 - Man/month
 - Total Annual Wages
2. Fuel
3. Electricity
4. Other expenses (Insurance, Advertising etc.)
 - a. Custom rates on imported materials
 - b.
 - c.
 - d.
 - e.

Sixth: Production

1. Designed Production Capacity (Boxes/hr)
 2. Actual Production (1987 figures)
- | No. Produced in '87 | Dimensions from the Interior (cms) | Kind of Box |
|---------------------|------------------------------------|-------------|
|---------------------|------------------------------------|-------------|

3. Seasonality of Production (wood, polystyrene, plastic, carton)

Total Production in 1987

- Month (1)
- Month (2)
- Month (3)
- Month (4)
- Month (5)
- Month (6)
- Month (7)
- Month (8)
- Month (9)
- Month (10)
- Month (11)
- Month (12)

Seventh: Marketing & Method of Selling (wood, polystyrene, plastic, carton)

% of Dealings (Quantity)
in 1987

- 1. Through Contracts
- 2. Through Agents
- 3. Direct from factory
- 4. For Exporting

Eight: Cost of Production and Selling Price (wood, polystyrene, plastic, carton) - 1987 figures

Production (in Boxes)	Selling Price per Box	Estimated Cost Per Box	Kind of Box According to Dimensions
--------------------------	--------------------------	---------------------------	---

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

Ninth: Quantity Produced in the Last Five Years (wood, polystyrene, plastic, carton) - according to dimensions (size):

	Size	Size	Size	Size
Year 1982				
Year 1983				
Year 1984				
Year 1985				
Year 1986				
Total				

Tenth: Reasons for choosing to produce the present size boxes:

Eleventh: What is your opinion of the idea of enforcing the production of boxes with specified dimensions (unified)? and why?

Twelfth: Capability of factory to change dimensions of boxes produced (from a technical point of view)

Available

Not Available

Thirteenth: What are the factors (and give suggestions) that may help in developing the boxes' industry (wood, polystyrene, etc.)?

Fourteenth: Technical capability of factory to adopt new specifications (differ from the present production specifications) wood, plastic etc.

Exist

Does not exist

Fifteenth: State problems and obstacles facing you in both production and marketing:

1.

2.

3.

4.

5.

6.

7.

Sixteenth: Any other Comments:

APPENDIX B

APPENDIX B

Summary of Cold Storage Regulations

Resolution No.2

Article 1.

This will be called "Resolution for Organizing the Storage of Fresh Fruits and Vegetables in Cold Stores" for the year 1988. It will become effective from the date of its publication in the official gazette.

Article 2.

It will apply to all cold stores used for storing fresh fruit and vegetables.

Article 3.

The administration of every cold store should send to AMO a table every two weeks, which records the quantities entering and leaving the store.

Article 4.

Every cold store is to be equipped with the following necessary equipment:

A.

1. Cooling units which have sufficient capacity to ensure the recommended cooling temperatures in the rooms.
2. One, or more, stand-by compressors such as to ensure a cooling capacity not less than 35% of the power normally needed to run the cold store.
3. A stand-by generator to use in case of power failure.
4. An automatic control system to keep both temperature and humidity accurate and control them in all the rooms.
5. The necessary ventilation system, or other systems which give the same result.
6. An accurate mercury thermometer recording its reading every 8 hours.

B.

Any other equipment which AMO deems necessary for the cold stores.

Article 5.

Every store owner should provide the customers with a place for grading and packing their products. The place must satisfy the technical and health conditions required by other specialized official bodies.

Article 6.

Each cold storage room must be numbered and the input and output quantities of stored fruit and vegetables and their time of arrival and dispatch for each room must be recorded daily.

Article 7.

To put into store all fruit and vegetables as soon as they arrive. If this is not possible, they should be stored within a maximum eight hours of their arrival.

Article 8.

Except in the case of bulk storage, the following matters should be considered in storing inside the rooms:-

1. Different kinds of packages should be stacked on wooden or plastic pallets or in metal cages which allow the air to enter them easily, and to be at least 10 cms. from the floor.
2. The stack should be 15cm. from the wall and there should be 40-50cms. from the top of the stack to the ceiling.
3. A wide aisle should be left between the stacks to facilitate movement inside the rooms and to allow inspection procedures. The main aisles should not be less than 90cms. wide.
4. Stacking should not take place beneath the evaporator, and the nearest stack to it should be at least 50cms. from it.
5. Do not switch off the cooling system in any case if there are fruits and vegetables in the rooms, except in cases of emergency.
6. It is forbidden to store more than one kind of fruit or vegetable, unless the instruction from AMO permits it.

7. It is forbidden to package fresh fruits and vegetables in unsuitable packages, and packages must be clean and free from contamination.

Article 9.

Different kinds of fruits and vegetables must be stored within the determined temperature and humidity ranges listed in the instructions dispatched by the Director General of AMO.

Article 10.

When empty, the rooms must immediately be cleaned and purified with appropriate chemicals to remove moulds from the walls, ceiling and floor, then cleaned with water to remove the chemicals used.

Article 11.

To have a connecting chamber as an isolation area, or to use insulating materials, to avoid opening the doors of the cold rooms directly to the outside air, to prevent a rise in temperature in the cold rooms.

Article 12.

The Director General of AMO will dispatch suitable extension material to apply this resolution.

Article 13.

Those who do not comply with the items of this resolution will be subject to the penalties laid down in article 14 of the Law of AMO number 15 for the year 1987.

Fruit and Vegetable Storage Facilities

Name	Adminis- tration	Location	Capacity	Type
1- The Jordanian company industry, trade and refrigeration-Ritco.	private	Al-Rajeeb near Sahab	5000 t.	cold store.
2- Al-Shioky Cold store	private	El-Wahdat	5000 t.	cold store.
3- Abo-Sham Cold store	private	El-wahdat	1000 t.	cold store.
4- Union Cold Storage Co. Akad & Masre	private	Marka	14-1600 t	cold store.
5- Ashor Refrigerated Centre	private	Marka	1800 t.	cold store.
6- Hejazy & Gosha Company	private	Marka	150 t.	cold store.
7- Tamary Cold Store	private	Marka	1000 t.	cold store.
8- Ministry of Supply Cold Store	Govt.	Joeda nr.Sahab	7000 t.	cold store.
9- Ministry of Supply Cold Store	Govt.	Aquaba	1500 t.	cold store.
10- Ministry of Supply Cold Store	Govt.	Irbid	2000 t.	cold store.
11- Amman Central Mkt.	Municipal	El-Wahdet	800 t.	cold store.
12- Arda Cold Store	AMPCO	Jordan Valley	1000 t.	cold store.
13- Jordan Supermarket	private	Amman Marca	500 t.	cold store.
14- Katana Cold Store	private	Al.man Mahata	2000 t.	out of order 10 years
15- Zarka	Municipal	Zarka	3000 t.	out of order 3 years
16- Irbid	Municipal	Irbid	1150 t.	cold store.
17- Amman	Municipal	Amman	3000 t.	cold store.

Source: AMO

APPENDIX C

APPENDIX C

Processing Plants (Tomato products)

Name	Administration	Products	Throughput tonnes					
			'82	'83	'84	'85	'86	'87
El Arda	Ampco	Paste Chopped Juice	23.4	24.7	31.6	39.9	15.7	39.5
Safi	Ampco	Paste	0.0	0.3	5.76	0.62	3.39	5.12
Marka	Ampco	Paste	<u>3.7</u>	<u>2.0</u>	<u>0.92</u>	<u>4.77</u>	<u>0</u>	<u>0</u>
			27.1	27.1	38.3	45.3	19.1	44.6

Source: AMO

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APPENDIX D

Appendix D

Agricultural Marketing Organisation

Retail Outlet Questionnaire

1. Name of the shop owner:
2. Location of retail outlet:
3. Type of retail outlet: Fruit & Vegetables Only
Fruit & Veg. & other goods
Other, (specify)
4. Do you own or are you a partner in other businesses? Yes/No
If Yes:
Is this with a commission agent in the wholesale market?
or with other fruit and vegetable retail outlets?
or with other fruit and vegetable outlets and other goods?
5. Product
6. Where do you buy this product? Wholesale market
Direct from the farm
Other (specify)
7. Quantity of product sold per week: per year:
8. What condition is product when you purchase? Good/ Medium/Poor
 - a. If poor condition, why?_____
 - b. What types of improvements (or changes) are needed in produce handling from the farm to when you purchase the product?
 - c. Will this improvement be an additional cost? Yes/No
If Yes,
Would you be willing to pay for the added cost? Yes/No
Will your customers be willing to pay this added cost?Yes/No
9. How is your produce transported to your outlet?
 - a. Your own vehicle
Leased vehicle
Hired truck
Other (specify)
 - b. How far is product transported to your outlet? km.
 - c. Estimated cost of transport per unit
10. Is packaging of the product satisfactory? Yes/No
If No, why not?

11. Do you repackage your product before display to customers? Yes/No
 If Yes
 a. Why do you repackage?
 b. How do you repackage?
 c. What is the cost per unit of repackaging?
12. Do you regrade the product before display to customers? Yes/No
 If Yes
 a. Why do your regrade?
 b. How do you regrade?
 c. By what criteria is product regraded?
 d. Do you know that there is a specification for each product issued by the Ministry of Trade?
 e. Would you prefer to apply this specification?
13. How many times per week do you buy this product?
14. Do you store the product before display to customers Yes/No
 If Yes
 a. How long stored?
 b. What type of storage?
 c. Is storage temperature controlled? Yes/No
 d. Is storage humidity controlled? Yes/no
 e. What type of container do you use for storage?
 f. What is the per unit cost of storage?
15. What is the normal shelf life of the product? days
16. Do you experience product loss during your ownership of the product? Yes/No
 If Yes
 a. What % loss do you experience?
 b. Why does this loss occur?
17. Do your customers prefer specific quality features in your product? Yes/No
 If Yes, describe what features the customer is looking for:
 Preferred size
 Preferred variety
 Preferred color
 Preferred flavor
 Preferred degree of maturity
 Preferred degree of blemishes (none, few, etc.)
 Preferred type of package
 Preferred no. of units per package
 Other (specify)
18. Which is the more important to your customers?
 Quality
 Price

19. What percentage of your customers are:

High income
Middle income
Low income

20. What do you think of the government price fixing system?

21. If price fixing were removed would you be willing to buy better quality?

22. If price fixing were removed on what basis would you fix retail prices?

23. What specific practices do you follow to maintain the quality of your product until the customer sale is made?

24. What are the major problems constraining the efficient production and marketing of this product in Jordan?

APPENDIX E

APPENDIX E

RETAIL SURVEY

Potatoes

Twenty-two retailers handling potatoes were included in the survey. Twenty of these retailers handled fruits and vegetables only, while two handled other products in addition to fruits and vegetables. None of the retailers purchased potatoes directly from farmers; i.e., they purchased potatoes only at wholesale markets. Nine retailers purchased at the Irbid market, ten at the Amman market, one at the El Arda market, one at the Muadi market (Ghor), and one at the South Shuna market.

Weekly sales of potatoes by the twenty-two retailers ranged from 60 kg to 1000 kg with an average for the group of 154 kg per week. One retailer handled less than 100 kg of potatoes per week; 11 handled between 100 and 300 kg per week; eight handled between 300 and 600 kg per week; and two handled 750 and 1000 kg per week.

The following provides a summary of the responses of the twenty-two retailers in regard to various operating practices and attitudes regarding the marketing system for potatoes:

1. All retailers said they were able to purchase fair to good quality potatoes. If they could secure higher quality potatoes they would be willing to pay more, as would customers if the government would allow.
2. Ninety percent of the respondents leased vehicles to transport produce from the wholesale market to their retail establishment.
3. The distance potatoes were transported ranged from .5 km. to 130 km. with an average distance of 30 km. from the wholesale market to the retail establishment.
4. Estimated cost of transport ranged from .8 - 10.0 fils/kg. with an average cost of 5.6 fils/kg.
5. Sixty-five percent of the retailers manually regraded potatoes before displaying to customers. They felt this practice improved sales because they could provide a product that more nearly met consumer demands. About one-half of the retailers claimed regrading was necessary to remove infected and damaged fruit. Generally, potatoes

were regraded into two grades, primarily based on size and shape. The highest quality grade was sold for the maximum allowed official retail price while the low grade sold at the minimum price.

6. Over 80 percent of the respondents were unaware that the Ministry of Trade had quality specifications for potatoes. When asked if they would prefer to apply the specification to products they sell, about 80 percent said they would because it would facilitate grading, eliminate topping by the farmer and assure that the buyer got the quality he purchased. Those who did not want to apply the specifications felt they could do a better job of grading to meet the specific demands of their consumers because the specifications would be too general. Respondents also indicated that it would be necessary to eliminate the official retail pricing practice before use of specifications, or any grading practice, would facilitate quality in pricing.

7. Respondents indicated they purchased potatoes, on the average, three times per week, with the range from once per week (for those furthest from the wholesale market) to daily (for those located near the market).

8. About one-half of the respondents stored potatoes for up to one week (an average of 3 days) before displaying to customers. All storage took place within the retail store and none of the respondents had temperature and/or humidity controlled storage facilities. The potatoes were stored in either the sacks they were purchased in or transferred to polystyrene boxes. The cost of the storage function was considered to be negligible.

9. After the potatoes were put on customer display, the average shelf life was estimated to be 3 days with a range of 1-7 days.

10. All respondents experienced product loss during ownership. Losses ranged from 3-30 percent with an average of 13 percent. Product losses were attributed to the following causes in order of importance:

a. Need to grade out potatoes because of topping practice of farmers.

b. Demand did not materialize and thus potatoes spoiled before they were sold.

c. Lack of ability to control temperature while potatoes were in storage and on display.

d. Infection and damage of product when purchased.

e. Consumer sorting (handling) of potatoes while on display.

11. Almost 60 percent of the respondents indicated that their customers preferred specific quality characteristics in the potatoes they buy. Particularly important was consumer desire for medium size potatoes (60 percent of respondents) followed by a potato that is free from blemishes (41 percent), a mature potato (36 percent), normal flavor (36 percent), packaged in polystyrene container (32 percent), and white color (10 percent).

12. Fifty-nine percent of the respondents indicated that price was most important to their customers when purchasing potatoes, while 23 percent said both price and quality were important and 18 percent said quality was most important. A close correlation was found between the retailer response that price was most important to customers and the fact that the retailers served low income or a mix of low income and middle income customers. Fifty-nine of the respondents served low income or a mix of low income and middle income customers, while 45 percent served middle or a mix of middle and high income customers.

13. Respondents were asked what they thought of the government retail price fixing system. Thirty-six percent of the respondents favored the system, and 64 percent were not in favor of the system. Those who favor the system gave the following reasons:

- a. The consumer is protected from price manipulation by the middleman.
- b. Price bargaining between the consumer and the retailer is eliminated.

Those who were not in favor of the system gave the following reasons:

- a. Reflection of quality is not facilitated.
- b. Price does not reflect cost of production.
- c. Price at times is below the retailer's purchase cost due primarily to price setting on the previous day which does not reflect current day supply and demand conditions or quality of the product in the current day.
- d. Because of the minimum price, many low income customers could not afford to purchase some items. It was felt by respondents that if a free market situation existed they could charge higher prices for

top quality produce and be able to lower prices for lower quality. This would allow low income customers to purchase the product. This method of free market pricing could result in equivalent total profit, between the fixed price system and the free market situation, while at the same time offering lower prices to low income customers.

14. Eighty-six percent of the respondents indicated that they would concentrate on purchasing higher quality potatoes if the government retail price fixing system was terminated. In this case, respondents would establish the retail price on the basis of quality of the potatoes, purchase cost and a percentage markup for profit. When asked what percentage markup would be preferred an average of all respondents was 27 percent. The percentage of respondents indicating specific markups were as follows:

35 percent (35 percent of respondents)

30 percent (24 percent of respondents)

25 percent (17 percent of respondents)

20 percent (6 percent of respondents)

15 percent (18 percent of respondents)

15. The following summarizes the practices which respondents indicated they follow to maintain the quality of potatoes until the customer sale is made; following each practice is the percent of respondents following the practice.

a. Use shelter to protect the product from the sun (50 percent of respondents).

b. Remove damaged and infected product from the rest of the product (50 percent of respondents)

c. Ensure product is aerated during storage and display (14 percent of respondents).

It should be pointed out that 23 percent of the respondents indicated they did nothing to preserve quality.

16. All respondents were asked to give the major problems constraining efficient production and marketing potatoes in Jordan. The following is a listing of these problems in order of priority as indicated by the number of respondents giving the problem:

Production

- a. Topping
- b. Disease and insect infestation of product
- c. Harvesting before maturity
- d. Poor handling during harvest

Marketing

- a. Lack of grading and classification
- b. Government price fixing program
- c. Irregular demand
- d. Variable supply
- e. Use of poor packaging and wrong size packages
- f. Raising transportation cost
- g. Lack of adequate storage facilities
- h. Emphasis on exporting puts pressure on domestic prices.

Eggplant:

Twenty-one retailers handling eggplant were included in the survey. Seventeen retailers handled only fruits and vegetables while one participant was associated with a parallel market and two handled other products in addition to fruits and vegetables. One retailer owned and operated more than one retail outlet. Two retailers purchase direct from farmers in addition to purchasing at wholesale markets. Ten of the respondents purchased eggplant exclusively at the Amman Wholesale Market, five at the Irbid market, one from the Karak market, two from the El Arda market and one from the Mafraq market, while two retailers purchased from multiple markets (Amman, Irbid, and Jerash).

Weekly sales of eggplant by the 21 retailers in the survey ranged from 36 kg. to 630 kg., with the average sales of all respondents being 205 kg. per week. Seven retailers handled less than 100 kg per week, seven handled between 100 and 200 kg. per week, two handled between 200 and 400 kg. weekly, while five handled between 400 and 630 kg. per week.

The following is a summary of the responses of the 21 retailers regarding various operating practices and attitudes regarding the marketing system for eggplant in Jordan:

1. Generally, respondents indicated the eggplant they purchase was in fair condition, occasionally in good condition, and often in poor condition. The major reasons for poor condition, in order of importance as mentioned by respondents, include:

- a. Topping (mentioned by 90 percent of respondents)
- b. Lack of grading at the farm level (mentioned by 75 percent of respondents). As a result retailers received damaged and bruised fruit, especially fruit with broken stems (mentioned by 50 percent of respondents) and fruit infected, discolored and immature (mentioned by 25 percent of respondents).
- c. High temperature during transit and while in wholesale market (especially when wholesalers have to hold more than one day due to slow sales) resulting in a high degree of wilting (mentioned by 67 percent of the respondents).
- d. Low price levels which encourage farmers to market anything they have, especially poor quality eggplant (mentioned by 50 percent of respondents).
- e. Low quality seed resulting in poor quality egg plant (mentioned by 20 percent of respondents).
- f. Piling fruit in transport resulting in bruising and breaking of the stem (mentioned by 20 percent of respondents).

Respondents suggested most frequently that solutions to many of the above problems could be solved by strict grading programs at both the farm level and at wholesale which would reject damaged, wilted, discolored, immature products and in turn would eventually eliminate the practice of topping. Also, education as to proper postharvest handling technology would greatly reduce damage to the product.

2. All retailers in the survey stated that they would be willing to pay for the additional cost involved in improving quality. They also said they felt their customers would also be willing to pay the added cost. Payment of the additional cost depended upon whether or not the government retail pricing program allowed consideration of these costs in the price structure.

3. Over 60 percent of the retailers in the survey leased vehicles to transport their produce from the wholesale market to their retail establishment. The remainder of the retailers owned their own vehicles.

4. Egg plant was transported an average of 20 km. from the wholesale market to the retail outlet (distances ranged from 1 km. to 120 km.). The cost of transport was estimated at an average of 6.6 fils/kg. for all retailers and ranged from 2 fils/kg. to 10.

5. Eighty-one percent of respondents stated that packaging methods and packaging in which they received eggplant was unsatisfactory. The major reasons for dissatisfaction with packaging in order of importance include:

- a. The practice of topping (mentioned by 71 percent of respondents);
- b. Inconsistency of weight of product in container (mentioned by 50 percent of respondents). This is a result of piling some containers too full and leaving others only partially full.
- c. The polystyrene containers are easily broken (mentioned by 30 percent of respondents).
- d. In general, the lack of grading the products before packaging results in poor quality in the container (mentioned by 30 percent of respondents).

6. Almost 60 percent of the respondents said they did not repackage eggplant before display to customers. Those who did repackage did so in order to sort out damaged and unmarketable fruit and to be able to display the fruit in a more attractive manner for the customer. In general their packaging process involved removing from container and arranging display of individual fruit on the shelf (no container).

7. Over 80 percent of the respondents manually regraded eggplant before display to customers. This regrading was done to remove damaged fruit and to classify into two grades to be sold at two different prices to meet consumer demand. The criteria upon which the regrading was done include:

- a. size according to method of consumption; i.e., cooked requires larger fruit and pickled requires small fruit.
- b. Color - preferred black and shiny and bright color.
- c. Freedom from blemishes, wilting, mechanical injury, pest and disease damage.
- d. Flavor - whether bitter taste or not.

8. None of the respondents were aware that the Ministry of Trade had quality specifications for eggplant. All respondents indicated that if the farmer applied the specifications at the farm level and the specifications

were applied at wholesale, then the use of specifications would assist in the marketing of eggplant.

9. Respondents indicated they purchased eggplant, on the average, about 4 times per week, with the range from once per week to daily. Over 70 percent of three respondents stored eggplant at the retail outlet for one to two days before displaying for sale to consumers. The storage areas used for storage were not temperature or humidity controlled, and most retailers stored the product in the container in which the fruit was received.

10. After placing the product on display, respondents indicated normal shelf life in the summer to be 1-3 days and in the winter 4-5 days unless exposed to dry air.

11. All respondents stated that they experienced product loss during their ownership of the product. Product loss ranged from 10-30 percent, with an average loss of all retailers placed at 16 percent. The major causes of product loss mentioned by all respondents include:

- a. Wilting due to high temperature and display in sun.
- b. Defects or infection generally not visible in product when received.
- c. Broken stems.
- d. Handling and tasting by consumers while on display.

12. All respondents indicated that their customers preferred specific quality specifications in eggplant. These specifications were uniform among respondents and include:

- a. Small size for pickling and large size for cooking.
- b. Varieties that were either seedless or near seedless; the classic variety was often mentioned as the preferred variety.
- c. Polished black color.
- d. No bitterness in taste.
- e. Seeds not yet mature.
- f. No blemishes.

13. All respondents indicated that their customers felt quality was the most important criteria for purchase of eggplant. This was true regardless of the level of customer income served by the retailers. Most of the retailers stated that the majority of their customers were in the middle income classification.

14. Respondents were about evenly split in regard to whether or not the government pricing procedure was suitable at the retail level. The most common complaints of respondents were:

a. At times the retail price is lower than the retailer's cost. This is primarily because setting the price for today based on yesterday's situation often does not correctly reflect today's situation in regard to supply and demand and quality of fruit on the market.

b. Fixed prices, as now determined, do not allow satisfactory reflection of quality of product.

15. All respondents indicated that if the government retail price program was terminated, they would attempt to purchase higher quality eggplant. Pricing of the product at retail would be based, according to respondents, upon the following factors:

a. Cost of product.

b. Price differential based on quality.

c. Priced competitively with neighboring retailers.

d. Profit margin to be included (respondents indicated a range in profit markup of 20-35 percent with the average margin of all retailer respondents of 27 percent).

16. Respondents indicated that they implemented the following practices designed to maintain a quality product until the customer sale is made:

a. Keep fruit under awning during display to minimize effect of sun and heat.

b. During periods of a high temperature, transfer fruit from polystyrene containers to cardboard containers or to shelves to protect from heat damage.

c. Sort out damaged product and clean remaining product for display.

17. The major problems constraining efficient production and marketing of eggplant in Jordan expressed by respondents in order of importance, include:

- a. No grading system and the resulting inability to price the product on the basis of quality.
- b. Topping by farmer.
- c. Competition between the export and domestic market which tends to increase domestic price. In addition, desired export quality is many times not the same quality desired for the domestic market which causes confusion in pricing.
- d. Government retail price fixing program which does not allow pricing according to quality.
- e. Lack of consistent year-round supply of eggplant and the resulting impact on price of surpluses and deficits.
- f. Practice of reporting wholesale prices at a level lower than what retailer actually pays in order to reduce the amount of tax paid by buyer and seller. This lower price is considered in setting retail price so at times, actual cost of product to retailer is greater than price at which he is allowed to sell.
- g. Impact on supply when farmers do not conform to cropping patterns.

Cucumber:

Twenty-five retailers handling cucumbers were included in the survey. Seventeen of these retailers handled fruits and vegetables only, while eight also handled other products. Only one of the retailers in the study purchased cucumbers directly from farmers. Twelve retailers purchased cucumbers at the Amman Wholesale market, five at Irbid, one at Karak, five at both Amman and Irbid, one at Karak and Amman, and one at Al-Baqa. One retailer owned and operated more than one retail shop.

Average weekly sales of cucumbers by the 25 retailers ranged from 60-1500 kg. with an average for the group of 406 kg. per week. Only one retailer handled less than 100 kg. per week while 11 handled between 100-300 kg. per week, six handled between 300-500 kg. per week, six handled between 500 and 750 kg. per week, and one handled 1500 kg. per week.

The following is a summary of the responses of the twenty-five retailers regarding operating practices and attitudes about the marketing system for cucumbers in Jordan.

1. All respondents indicated that they tried to purchase all good quality cucumbers. They were not always successful because of topping practices by farmers and presence of fruit that was infected or damaged during harvest that was not evident at time of purchase. All respondents indicated that poor quality product could be eliminated if farmers would cease topping practices and grade the product at time of harvest. Improved harvesting techniques would help, as would harvesting at proper maturity. Also, developing varieties that would produce all uniformly small size cucumbers would eliminate the need to sort out the large size cucumbers which are not in demand. Again, all of the respondents indicated that these improvements would cost, but that they and their customers would be willing to pay a higher price to cover this cost if allowed by the government pricing system.

2. Thirty-six percent of the respondents owned their own transport vehicles while 64 percent leased transport vehicles. Three retailers were close enough to the wholesale market to use their own push carts. Transport distances ranged from .5 km. to 50 km. with the average distance travelled being 14 km. The cost of transport ranged from 1-11 fils/kg. with the average being 5.5 fils/kg.

3. About 90 percent of the respondents were not satisfied with the methods of packaging used to ship the product from the farm to his retail store. The most stated reason for this dissatisfaction was topping by farmers (mentioned by about 60 percent of respondents). Other reasons given were piling too much in a container and not filling boxes, and poor material used for boxes such that boxes are frequently broken. Only 25 percent of the respondents repackaged the cucumbers before display to the consumer. In all cases, the repackaging involved sorting out poor quality fruit and transferring cucumbers from the shipment container to display on shelves so that consumers could better select a product to meet their demand.

4. Over 90 percent of the respondents regraded the cucumbers before displaying to customers. The regrading involves primarily removing damaged or infected fruit and separating cucumbers into two grades to meet consumer desires. The large cucumbers are also removed because customers do not want them. Thus, the primary basis for

regrading was size selection, although color selection was also important.

5. Only one respondent was aware that the Ministry of Trade had quality specifications for cucumbers. When asked if they would prefer to apply specifications to the products they sell all respondents said they would because it would facilitate grading and sale of the product on the basis of quality. Respondents also recommended that in order to work properly, the specifications must be applied at the farm level and the government retail pricing program must consider pricing on the basis of quality.

6. Respondents indicated that they purchased cucumbers, on the average, 4 times per week with the range from twice per week to daily.

7. About one-half of the respondents stored cucumbers in their shop for 1-2 days before display to customers. None of the respondents had temperature or humidity controlled storage facilities. In all cases the cucumbers were stored in polystyrene containers, and respondents considered storage costs negligible.

8. Respondents indicated shelf life of cucumbers was 1-2 days in the summer and 3-4 days in the winter.

9. All respondents indicated they experienced product loss during their ownership of the cucumbers. These losses ranged from 10 to 25 percent with the overall average of all respondents of 16 percent. The major reasons given for the causes of these losses were:

- a. Heat and dry air conditions during display.
- b. Damage to product not seen at time of buying but which became evident during display.
- c. Customer sorting (handling) of the product.

10. All respondents indicated that their customers preferred specific quality characteristics in cucumbers. These characteristics include:

- a. Small size.
- b. Green color (they reject yellowing).
- c. No bitter taste.
- d. Full maturity such that product was not hard.
- e. Free from blemishes and injury.

11. Ninety percent of the respondents indicated that quality was the most desired factor by customers when purchasing cucumbers. The remainder of the respondents indicated that quality and price were equally important to their customers. About 16 percent of the respondents sold to only high income customers, while the majority of the remainder sold to medium income customers. Only two respondents indicated that they sold to low income customers along with medium income customers.

12. Respondents were asked what they thought of the government retail price fixing system. Respondents were about evenly divided between feeling the system was suitable and not suitable. Major criticisms of the system include:

- a. Limits quantities a retailer can purchase daily because of speculation over next days price.
- b. It does not allow adequate quality reflection in price.
- c. Because of method of fixing price based on previous day's situation, sometimes the purchase cost is higher than the allowed price for the day.
- d. It does not reflect cost of production.

Those who favored the system gave the following reasons:

- a. It eliminates bargaining between the retailer and consumer.
- b. Consumer is protected from unrealistic high prices.

13. When respondents were asking if the price fixing system was terminated, would they attempt to purchase higher quality products -- 100 percent of respondents said they would. They indicated they would establish the retail price for cucumbers based upon:

- a. Quality of the product.
- b. Retailer purchase cost.
- c. Consideration of consumer income level.
- d. Competitors' prices.
- e. Consideration of desired profit level, which ranged from 20-30 percent and an average of 25 percent.

14. All respondents were asked to give the major problems they see as constraining efficient production and marketing of cucumbers in Jordan. The following is a listing of these problems in order of importance as determined by percent of respondents listing the problem:

- a. Increased competition from exporters for cucumbers, which has increased price and decreased supply available for domestic consumption (mentioned by 60 percent of respondents).
- b. Topping practices followed by farmers (mentioned by 60 percent of respondents).
- c. Lack of use of grading and standard system to reflect quality characteristics desired by consumers (mentioned by 33 percent of respondents).
- d. Inadequate agricultural extension programs to help purchasers adopt technology to reduce product losses.

Tomatoes:

Twenty-four retailers handling tomatoes were included in the survey. Twenty retailers handled fruits and vegetables only, while four also handled other products. Six of the retailers purchased some tomatoes directly from farmers in addition to purchases from wholesale markets. Fifteen retailers purchased their tomatoes at the Amman wholesale market, six at the Irbid market, one at Karak, and two at more than one wholesale market.

Average weekly sales of tomatoes by the 24 retailers ranged from 60-1800 kg. with the average for the group of 427 kg per week. Three retailers handled 100 kg. per week or less, nine handled between 100-300 kg. per week, seven handled between 300-600 kg. per week, and five handled over 600 kg. per week.

The following is a summary of the responses of the twenty-four retailers regarding operating practices and attitudes relating to the marketing system for tomatoes in Jordan:

1. In general, respondents found only fair tomatoes in the market: 50 percent of the respondents said the quality of tomatoes they purchased was fair, 37 percent said good, and 13 percent said the quality was poor. Reasons given for less than good condition of the fruit include, by order of importance:

Topping by the farmer.

- b. Poor harvesting methods and harvesting over or under mature tomatoes.
- c. No grading and classification at farm or wholesale level.
- d. Use of polystyrene containers.
- e. Wilting during transport.

Respondents stated that grading and classification if carried out at all levels would solve most quality problems. They also suggested use of wooden boxes instead of polystyrene. It was stated by respondents that solutions would cost, but they were willing to pay this cost, and they felt their customers would also be willing to pay the cost in order to secure higher quality tomatoes.

2. Eighty percent of the respondents leased vehicles to transport tomatoes from the wholesale market to their retail shop. The remainder owned their own vehicles. Transport distances ranged from .2 km. to 120 km., with the average distance travelled by all respondents being 15 km. The cost of transport ranged from 2.5 fils/kg. to 10 with the average being 6.1 fils/kg.

3. About 80 percent of the respondents said they were not satisfied with methods of packaging. The major problems with packaging were topping by the farmer, no grading before packing, and the unsatisfactory performance of polystyrene containers during hot weather. None of the respondents said they repackaged the tomatoes in their retail shop.

4. Eighty-seven percent of the respondents regraded tomatoes before displaying for consumers. Respondents stated that it was necessary to regrade tomatoes to remove damaged and infected fruit and to sort into two grades of quality for sale to customers. They felt it was very important to present different qualities from which the consumer could choose. The grading practice was primarily to sort by size, color and degree of maturity and to remove blemished and damaged fruit.

5. None of the respondents were aware that the Ministry of Trade had quality specifications for tomatoes. All respondents felt the use of these specifications would help correct some of the quality problems, and they would use the specifications if the government price fixing program allowed pricing on the basis of quality.

6. Respondents indicated they purchased tomatoes on the average of 5 times per week with the range from two to daily purchases. Fifty percent of the respondents purchased tomatoes daily.

7. Less than one-third of the respondents stored tomatoes at their shop before displaying, and the length of storage was one day. None of the respondents had temperature or humidity storage facilities. All of the respondents who stored tomatoes stored them in the same container in which they were purchased (polystyrene), and thus there was no cost of storage.

8. Respondents indicated that the shelf life of tomatoes ranged from 1-3 days, with the average being 2 days.

9. All respondents indicated they experienced product loss during their ownership. These losses ranged from 10-33 percent, with the average loss for all respondents being 20 percent. The major causes of this product loss include:

- a. Topping by the farmer (mentioned by 50 percent of respondents).
- b. High temperature, sun and dry air during display (mentioned by 42 percent of respondents).
- c. Handling of the fruit by customers during display (mentioned by 21 percent of respondents).
- d. Absence of grading through the system (mentioned by 17 percent of respondents).

10. All respondents except one stated that their customers preferred specific quality features in the tomatoes they purchased. These specifications preferred include:

- a. size: medium size (70 percent of respondents)
small size (10 percent of respondents)
large size (20 percent of respondents)
- b. Mature red color (85 percent of respondents)
Green color (15 percent of respondents)
- c. Maturity: Full maturity (85 percent of respondents). However, most respondents said that consumers at times demanded various degrees of maturity.
- d. Blemishes: Free from blemishes (100 percent of respondents)

11. Almost 80 percent of the respondents stated that quality was the most desired factor by customers when purchasing tomatoes. Another 13 percent of respondents said quality and price were equally important to the consumer. Only 7 percent of respondents said that price was the major factor determining consumer purchase.

12. About 75 percent of the respondents indicated that they felt the government retail price fixing system was unsuitable for the following reasons:

- a. The system does not allow pricing according to quality.
- b. The method of establishing today's price on yesterday's situation results in, at times, a purchase cost higher than allowed selling price.

13. 100 percent of the respondents said they would attempt the purchase of higher quality tomatoes if the government retail price fixing program was terminated. With the termination of the government programs, respondents would establish the retail price based on the following factors:

- a. Level of quality.
- b. Purchase cost.
- c. Added margin for profit. The suggested margin ranged from 10 percent to 35 percent, with the average margin from all respondents being 21 percent.

14. Respondents indicated that they implemented the following practices designed to maintain a quality product until the customer sale is made:

- a. Protect tomatoes from sun and heat at all times by covering with awning or paper.
- b. Sort out damaged tomatoes from display on regular basis.
- c. Clean fruit and display such that air is allowed to move through the tomatoes.

15. The major problems constraining efficient production and marketing of tomatoes in Jordan as expressed by respondents are:

- a. Absence of a grading or standardization program for produce and resulting topping by farmers.

- b. Government retail price fixing program which does not allow pricing by quality.
- c. Lack of consistent year-round supply of tomatoes and the resulting impact on price.
- d. Farmers not complying with cropping patterns.
- e. Use of polystyrene containers, particularly in the summer and resulting loss of product from heat.
- f. Competition between export and domestic market and the result that best quality goes for export.
- g. Weak agricultural extension program resulting lack of education aimed at assisting farmers to produce a better quality product.

APPENDIX F

APPENDIX F

Agricultural Marketing Organization

Farm Production/Harvesting/Market Dispatch Questionnaire

1. Name of Farmer: _____
2. Crop: Name in English: _____ Arabic: _____
Scientific Name: _____
3. a. Farm Location: _____
b. Farm Size: _____ Dunums (___ has.)
c. Farm Tenure:
Owned: _____
Rented: _____
Partnership: _____
Other _____
4. Why do you grow this crop?
a. Profitability _____
b. Cropping rotation _____
c. No alternative crop _____
d. Other _____
5. a. Area of land in commodity _____ dunums
b. Monoculture _____ Yes/No
c. If No, with what other crop? _____
6. a. Cultivation Practices: (define, mechanized/animal, traction, etc.)

b. How do any of the above cultivation practices affect product quality? _____

c. How do any of the above cultivation practices affect production cost (labor, captial substitution ect.)? _____

7. What is the normal production season for this crop in the Jordan Valley? _____

Inputs:

8. a. Seedlings: Source of seedlings _____
b. What is the quality of seedlings? Good/Fair/Bad
c. Have you any comments on seedling production? _____

9. Seeds

- a. Source: Imported
Produced nationally
Farmer's own seed

b.	Name	Quantity
Cultivar 1	_____	_____
Cultivar 2	_____	_____
Cultivar 3	_____	_____

- c. Seed quality: High
Satisfactory
Low

- d. Seed germination: High (80-100%)
Medium (60-80%)
Low (less than 60%)

e. Are you able to buy varieties you want? _____

f. On what criteria do you choose variety?

1. High yield _____
2. Easy to grow _____
3. Resistant to disease _____
4. Better to transport _____
5. Sells best in the market _____

g. Have you any comment on these varieties? _____

h. Is the seed in any way (suitability of the variety, availability, etc.) a limiting factor as regards the postharvest situation of the commodity? _____

10. Fertilizer: _____ Quantity

- a. Type 1. _____
2. _____
3. _____

b. Source _____

c. What are the principal complaints concerning fertilizer? _____

d. Is fertilizer (availability or type) in any way a limiting factor as regards the post-harvest situation of the commodity? _____

11. Phytosanitary products.

a.	Type	Quantity
1.	_____	_____
2.	_____	_____

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3. _____
4. _____

b. Source _____

c. What are the principal complaints regarding sprays?

12. Harvesting methods:

a. What container do you harvest into? _____

- b. What determines when the harvest is undertaken?
1. Time of day _____
 2. Temperature _____
 3. State of maturity _____

- c. Does the present method of harvesting affect:
1. Quality of the product available for market
 2. Quantity of the product available for market
 3. Value of the product available for market

d. Are there other harvesting methods which you would consider better? Yes/No

- e. What prevents you from adopting these methods?
1. Cost _____
 2. Shortage of labor _____
 3. Other (specify) _____

f. What percentage loss is experienced during harvest?

g. What are the basic causes of these losses? _____

h. Is all of the crop harvested at one time? Yes/No

13. Grading

a. Is grading done at the farm following harvest? Yes/No
If Yes

- b.
1. Who does the grading? _____
 2. Why is grading done? _____
 3. How is grading done? _____
 4. When is grading done? _____
 5. What criteria are used in the grading?:

	Yes	No	Describe
Visual appearance	---	---	_____
Size of product	---	---	_____
Weight of product	---	---	_____
Texture of product	---	---	_____
Degree of maturity	---	---	_____

Color _____
Pest/disease damage _____

c. Is grading required by the market Yes/No

d. If Yes describe _____

e. What use is made of graded out (culled) product?

f. Have you done more grading since inspection at the
markets has begun? _____

14. Packaging

a. Is the product packaged for movement to market?
Yes/No If Yes

- b. 1. Who does the packaging? _____
2. Where does the packaging take place? _____
3. When does the packaging take place? _____
4. What type of packaging material is used?
Wood: _____
Polystyrene: _____
Carton: _____
Plastic: _____
5. Why is this type of packaging used? _____
6. Is the packaging material readily available? _____
7. Can the package be reused? _____
8. Who owns the package (container)? _____
9. What is the per unit cost of the package? _____

If No:

10. Why is packaging not done? _____

15. Precooling

a. Is the product precooled after harvest? Yes/No

If Yes

- b. 1. What method of precooling is used? _____
2. Describe the precooling process _____
3. Once precooled, is the product kept cool on its
way to the final market? Yes/No
If Yes how? _____

16. Storage

a. Is the product stored at the farm? Yes/No

If Yes:

- b. 1. Why is the product stored? _____
- 2. How long is product stored? _____
- 3. What is the per unit cost of storage? _____

17. Transport

- a. Who transports the product?
Farmer _____
Hired haulier _____
Buyer _____
- b. When is the product normally transported to market?
 - 1. Early morning _____
 - 2. Morning _____
 - 3. Afternoon _____
 - 4. Evening _____
 - 5. Night _____
- c. Does any loss to product (damaging/bruising) occur during transport? Yes/No

If Yes:

- d. 1. What percentage is lost? _____
- 2. What is the cause of the loss? _____

- e. What is the per unit cost of transport? _____

Market Choice

1. Do you have assurance, such as a contract or firm commitment by a wholesaler that he will be able to sell product? Yes/No

If Yes please describe the agreement.

2. What marketing channel does farmer use for this product?:
a. Commission agent in Amman wholesale market?
b. Commission agent in Local wholesale market?
c. Wholesaler
d. Retailer

e. Exporter
f. Processor

3. Why do you use this/these outlet/s?

4. Are you a member of a cooperative? Yes/No

If Yes

- Do you buy inputs from the cooperative Yes/No
Do you market produce through the cooperative? Yes/No

If No

Why do you not sell through cooperative (commission 1% lower)?

5. If you use more than one outlet on what information are decisions based?

6. Do you have access to institutionalized information about the market situation and prices? Yes/No

If Yes: please answer 7., 8. & 9.

If No: please answer 10. & 11.

7. What is the source of the information?
8. Describe how the information system works.
9. Is the information system adequate to satisfy your needs?

Non-institutionalized information:

10. How does the farmer acquire information and from whom?

11. Is this source considered satisfactory? Yes/No
If no, why not:

APPENDIX G

APPENDIX G
FARM SURVEY ANALYSIS

Farm Production/Harvesting/Market Dispatch

Eggplant

Five farmers producing eggplant in the Jordan Valley were interviewed for this study. Four of the farmers rented their land (two of these farmers rented in partnership with another farmer) and one farmer owned his land. The rented farms were 40, 140, 150 and 180 dunums in size while the owned farm was 200 dunums. Two farms had 40 dunums planted to eggplant, two had 20 dunums planted, and one had 5 dunums planted to eggplant. One farm (the 40 dunum farm) produced only eggplant while the other farms also produced other crops including tomatoes (all farms also had tomatoes), squash, melons, peas and/or cucumbers. The major factor influencing these farmers to produce eggplant was anticipated profit and the need to diversify their crops to spread production and price risk.

Eggplant cultivation practices by these farmers, including harvesting, were all manually performed except for the initial plowing of the land to prepare for planting, which was done by tractor at an estimated cost of 1 JD per dunum. Aeration of the soil, weeding, and the application of fertilizer and chemicals were all performed manually. The normal production season for eggplant in the Jordan Valley is July-October.

Eggplant seedlings were produced from private sources and were generally considered to be fair to good in quality. Seedlings were considered to be expensive by farmers (about 8 JD per 1000 seedlings), and it was not uncommon to receive mixed varieties from the private producer. The seed from which the seedlings are produced was imported from Europe and considered to be of good quality and have high germination rates (80-100 percent). The variety used by all farmers in the study was "Classic." Seedlings were planted at the rate of about 1000 seedlings per dunum. The variety "Classic" was considered to be the variety that produced the desired quality eggplant by the market and even though more expensive than other varieties it was the variety required by buyers. The "Classic" variety was considered by farmers as high yielding and easy to grow, although it was felt that it was not as disease resistant as some other varieties. In addition, in some areas of the valley, for example Karana, the "Classic" variety was not considered as reliable (adaptable) since only a small plant was produced and yield was consequently low.

The farmers in this study utilized both commercial fertilizers and manure. Manure was preferred by all farmers because it was less expensive and felt to produce a higher quality, better appearance product. Manure was generally applied at the rate of 1-1/2 ton per 4 dunums. Commercial fertilizer used by these farmers included urea, ammoniac and some super phosphate. Urea was the major fertilizer used and was considered to be relatively expensive (about 45 JD per ton average cost, but has cost as much as 70 JD per ton). Urea is not produced in Jordan and has to be imported. Phytosanitary products used by these farmers include Anite, Linate and Sumbish. Although considered to be expensive because they are imported, farmers felt these chemicals were effective, especially for control of insects.

Harvesting of eggplant is determined by state of maturity and is usually performed between 6:00 and 10:00 in the morning, before the temperature gets too high. Eggplant is picked by hand by twisting the fruit loose from the plant. Often this method of harvesting damages the stem. Scissors could be used to cut the fruit from the plant, thereby reducing damage, but it takes much longer to complete the harvesting and thus increases the cost. Farmers claim that they experience 2-5 percent product loss due to the twisting method of harvesting. This loss (damaged product) is not a total loss in that it is fed to animals. Plastic boxes are used generally for field picking, and then the eggplant is transferred to polystyrene containers for shipment to market.

Grading of eggplant occurs at the time of picking, i.e., if large size fruit is wanted in the market only large eggplant is harvested. Thus, grading is done manually by the farmer at time of harvest.

In addition to size, grading considers appearance (no blemishes), maturity (fruit mature but seeds not), and color (polished black is desired). These are the characteristics desired by the market, and although grading is not officially required, products must meet these specifications if the fruit is to be accepted by the buyer. Farmers stated that since inspection was initiated at the wholesale market, they have attempted to do a better job of grading their eggplant. Product that has been graded out is fed to animals and thus has value as feed.

Following grading, eggplant is packaged in polystyrene containers by the farmer for shipment to the market. Buyers, both domestic and exporters, prefer shipment in polystyrene containers. Polystyrene containers are readily available to the farmer who purchases the containers (180 fils per new container and 100-120 fils per used container) which carry the fruit through the marketing process to the retailer. Eggplant is not precooled before shipment to the market nor is it stored for any length of time. That is, eggplant is picked, graded, packaged and immediately shipped to the wholesale market.

The farmer transports the fruit, in either leased vehicles or his own, to the wholesale market. The distance from the major production area in the Jordan Valley to the Amman wholesale market averages 35-45 km. The cost of transport was estimated by the farmers in this study to be about 100 fils per container. Transport to the market occurs in the morning immediately after harvest. The farmers in the study stated that they were unaware of any product loss during the transport function.

Cucumber

Five producers of cucumber in the Jordan Valley were interviewed for this study. Four farmers owned their land and one rented. Farm size ranged from 12 dunums to 1000 (12, 30, 45, 700 and 1000 dunums) and plantings of cucumbers on these farms were 2.5 dunums (under plastic), 20, 35, 100 and 300 dunums respectively. All farms produced other crops including, sweet peppers (4), green beans (2), hot peppers (3), tomatoes (3), squash (2), maize (1), egg plant (1) and melons (1). Profit was the reason why all these farmers included cucumbers in their crop mix.

Cultural practices followed for cucumbers were manually carried out except for initial plowing of the land, which was by tractor and plow. On the larger

plantings the application of chemicals which was done by motorized pump sprayer. Mechanized equipment was used because the task was accomplished more rapidly and it minimized the need to employ additional workers. The normal growing season ranged from October to April with the individual respondents aiming at November and December (1), December and January (1), February and March (1), March and April (1) and October and November (1).

Seeds planted by these farmers were imported, and the major varieties were Bacabillo and Sahara. Seed quality was considered good (satisfactory) and germination rates were considered by all farmers as high (80-100 percent). Seed was readily available to all farmers. They selected their varieties by the criteria: 1) high yield capability; 2) resistant to disease; and 3) the variety wanted by the market. The farmers felt that the varieties chosen met these criteria but were expensive.

A variety of fertilizers were used by the farmers, all of which were imported. The major fertilizer used was urea, but farmers also used Ammoniac, Crystalone, Plantbroad, Growmore and Iron. All farmers were satisfied with the results from the fertilizer they used.

Again, a variety of phytosanitary products were utilized by the farmers all of which were imported. Farmers were also satisfied by the results from the use of these chemicals.

All farmers harvested cucumbers into plastic buckets. Harvesting time was determined by degree of maturity; once considered mature the cucumbers were harvested early in the morning to complete harvesting before the heat of the day arrived. Farmers felt this gave them better quality and better price in the marketplace. Product loss during harvest was considered minimal, around 2 percent. This loss was caused primarily by poor handling methods used by the workers during the multiple pickings of the fruit.

Cucumbers were field graded at picking, i.e., a separate grading after picking was not followed. At picking cucumbers were graded as to size wanted in the market (usually the market wants only small size), free of blemishes due to mechanical damage, insects, etc., and degree of coloring (cucumbers with yellowing were not shipped to market). The culled out cucumbers were generally fed to animals but occasionally were sent to the market to be sold as low grades. Since inspection was initiated at the wholesale market, farmers stated that they have done more grading of cucumbers before sending to the market.

The harvested cucumbers were removed from the plastic picking buckets and placed in polystyrene boxes for transport to market. This activity was performed on the farm by the farmer in the morning immediately after picking. Polystyrene boxes were used for transport because they were readily available, lightweight, were fairly effective in minimizing damage in transit and were preferred by the buyers in the market. The normal cost of the polystyrene boxes was 180 fils for a new box. Farmers purchased generally new boxes.

None of the farmers in the survey precooled cucumbers after the harvest and none of them stored the product before sending to market. Transport of the cucumbers to the wholesale market was done usually in the morning after picking, but occasionally was done at night so as to arrive at the market when it opened. Four of the farmers transported fruit in their own trucks

while one leased a truck for transport. Farmers were unaware of any damage occurring to the cucumbers during transit and estimated the cost of transport to be approximately 5 fils per kg.

Tomatoes

A sample of five farmers producing tomatoes was interviewed. Their farm size averaged 55 dunum (5.5 has.), the largest being 140 dunum and the smallest 30 dunum. Of the five farms, four were owned and one rented. As to why they grew the crop, four saw no alternative and one claimed that its profitability prompted him to do so. The area they devoted to the crop ranged from 8 dunum to 12 dunum, and averaged 10 dunum. All grew other crops - cucumber (3), eggplant (3), squash (2), capsicum (2), potatoes (2) and green beans (1).

Cultivation was manual for all tasks except plowing, where all hired a tractor and plow. They all saw tractor plowing as worthwhile in terms of timeliness and reduced labor cost. The production season for which they aimed varied, three replied November, one December and June and the fifth, May. They all used nursery produced seedlings, but two also produced some seedlings themselves. One farmer reported that he used 1/2 kg. of seed, which leads one to suspect that he grows seedlings for sale himself. One reported a problem of mixed varieties being supplied by the nurseries (a complaint verified by personal observation when farmers were asked about mixed varieties of fruit in boxes offered for sale). Varieties most often used were "Processing," of which no one seemed to know the name (therefore, it is difficult to know if this is one variety or more than one), Bakhoor 85 and Special. One respondent did not know what variety he grew, as his extension worker recommended the variety. All claimed seed was imported, of good quality and of high germination -- although one claimed that seed was expensive. They all saw the qualities of high yield, ease of cultivation, resistance to disease and market acceptability as the features needed in selecting varieties. Four of them seemed to be very aware of the need to select a variety suitable for their area.

All felt that the use of fertilizers was essential to improve yield and quality, but all appeared to use a preponderance of nitrogen fertilizer, the most frequently used being urea and 'ammoniac.' Additionally, one used 'Syngral' and one a compound fertilizer as well as superphosphate. The question as to source was variously interpreted as 'imported' or 'the cooperative.' A wide range of spray chemicals was used -- Tramilox, Zineb, Avogan, Kemaltine, Robigan, Dimethoate and powdered sulphur are listed. One grower did not know what he used as his son is an agricultural engineer and provides the spray which the farmer then applies. The sole complaint about spray chemicals was that they were expensive.

One farmer only harvested his crop directly into the polystyrene box, the rest using plastic buckets. The time of harvesting was seen as being determined by the time of day to avoid the heat by four farmers, with the state of maturity being considered an important factor by three. They saw the harvesting method as having an effect on quantity, quality, and price, but while two were aware of other harvesting methods, they considered them uneconomical for Jordan. They estimated their losses up to this point at 5 - 10%, the mode being 5%. Causes were various. Employee harvesting techniques and bad handling were the most easily avoidable reasons mentioned, but others considered climatic conditions of widely varying temperatures and fungi and pests important. One

farmer particularly mentioned irrigation problems in the variety 'Special,' which seems susceptible to changes in the water regime. In all cases the harvesting was spread over several pickings.

As to whether grading was done on the farm, only one said not, but the reply does not agree with his subsequent replies. One farmer appears to pack as harvesting proceeds, since he picks directly into market boxes. In two cases the employees do the grading and in two the farmer does so. In four cases the price is mentioned as the reason for grading, although one grades at the request of the exporter. All grade manually and in the field, with no particular criterion predominant. All five agree that grading is required and sort according to outlet. One farmer specifically sorts for export, with the lower quality destined for the local market. The others exclude produce affected by insects and disease, which, in times of low prices, is totally rejected but which is sent to market when prices are high. All agree that they have done more grading since market inspection was introduced.

Grading and packing are done simultaneously in the field, in all five cases. All five farmers use polystyrene boxes because they say that is what the market demands, and in two cases because they are cheaper. They all use secondhand packages sometimes, and the price reported for boxes was 160-170 fils new and 130 fils secondhand.

The question about why packaging was not done appears to have been misinterpreted as regards tomatoes. Although it was intended really to determine whether anyone dispatched in bulk for subsequent repacking, people seem to have seen the question as one to determine whether a special market pack for tomatoes was used.

No precooling took place, nor were tomatoes stored. In all cases the farmer undertook the transport and in four cases in a hired vehicle, although one of the four used his own vehicle also. In one case it was not determined whether it was his own vehicle or not. All took produce to market early in the morning or late in the afternoon. Losses were claimed to be 3 - 4% by all five respondents. Causes mentioned were dehydration during transport, bad handling, over-filling of boxes causing crushing, fragility of polystyrene boxes, and long waiting time in the market. Four claimed that the cost of transport was 100 fils per box, and one claimed transport cost 75 fils.

Potatoes

Farm size varied widely in the case of the five potato farmers interviewed, the largest was farming 4000 dunums (400 has.) and the smallest 30 dunums (3 has.), with farms of 200, 40 and 45 dunums making up the sample. The man farming 4000 dunums was also an Amman commission agent, which clearly colors his view of the production process. Four of the farmers owned their farms, with the smallest farm rented, but two of the farmers rented land in addition to what they owned. The areas devoted to potatoes ranged from 500 dunums to 9 dunums, four farmers saying it was to diversify their cropping and the fifth saying it was a habitual crop. One expressed the view that the imposition of cropping patterns had influenced his choice. In addition to the potato crop the farmers grew cucumber (2), watermelon (1), tomato (4), summer squash (10), sweet pepper (4), onion (1), eggplant (2) and stringbeans (1).

All were mechanized to some degree, two having a lift truck and spraying

machine in addition to the tractor plow commonly used. One also used some animal traction for cultivation. One farmer said there was no effect from mechanical cultivation on product quality, but two saw benefits in soil aeration and thus better crops, while two claimed mechanical damage. Two saw mechanical cultivation as increasing production costs, two as reducing them, but one saw financial benefits for the large farmer but increased costs for the small man.

The normal production season is in January for two respondents and in March/April for three, but one man grew an early crop and a later one in addition. All bought seed from commercial shops, with four reporting good quality and one fair. The comments about seed were that the price was high in four cases and no comment in the fifth. One farmer reckoned that he suffered from late blight attributable to the seed. All used imported seed. Varieties chosen were Sponta (3), Volcano (2), Agex (2), Formosa (2), with one mention each of Herka, Kloster and Xlora. One farmer volunteered the information that he grew Volcano for export and Agex for the domestic market. It is also interesting to note that the commission agent/farmer grew Sponta on all 500 dunums. All said seed quality was high and four said they could buy the variety they wanted; the one who said he could not grew three different varieties. All chose the varieties on the basis of high yield and market saleability. Three had no comments on the varieties per se, but two commented on disease problems and one added that Sponta out yielded Herka. They felt that a factor in judging the suitability of a variety, in addition to its adaptability to the local conditions, was its keeping quality.

Fertilizers were universally used, with triple superphosphate, Ammoniac, urea, Compound NPK (no composition given), Kestron, Senjran, Mecaphos and Senyur mentioned as mineral fertilizers. One man reported using animal manure as well. All bought their fertilizers from commercial companies, with one buying also from the Farmer's Union (JVFA). One person had no comment, but of the other four three said prices were high and one said there was insufficient animal manure available. Asked whether fertilizer availability was in any way a limiting factor as regards the postharvest situation of the crop, all replied that the potato needed a high fertility regime to yield well and not to rob the soil. The question was originally included to determine whether there was a problem in obtaining supplies of fertilizer in Jordan, but since this seems to have occurred to no respondent or interviewer it would seem that there is no problem.

Spray chemicals were used by all of the respondents in wide variety. Deces, Torge, Zenib, Kozan, Rodomil, Dythin, Avogan, Dimethate and Intercool are all mentioned. All five farmers bought from commercial organizations, but two bought from cooperatives and one from JVFA. The main comments regarding spray chemicals were in regard to high and rising prices and the availability when needed according to one, and two farmers claimed the existence of too many types.

Harvesting is done using polystyrene boxes in four cases, two use plastic buckets, and one, small wooden boxes. It almost seems that they use whatever comes to hand. The time of day headed the list of determinants for harvesting followed by temperature for four, and maturity in the case of two. The method of harvesting was considered to have an effect on the quantity and quality of the crop and its value. Three harvested by tractor and two manually, although the man who grew both early and maincrops used a tractor or animal traction

for the latter and manual lifting for the early crop. Three felt there were better harvesting methods. It is interesting to see that the small man thinks other methods would be more costly because field size is small, whereas the large farmer thinks it would be better to lift by hand, but it is too costly. Losses were put at 1% by the largest farmer ranging up to 10%. One farmer claimed 10% loss during the growing period and 4% loss by harvesting -- his harvesting method was not mentioned. All five replied that harvesting was not all done at one time, with three saying they graded on the farm, and two not. In all three cases where grading was done on the farm it was done by the employees. They all graded manually at field level, the criteria cited being the size of the tubers and those that were damaged. Of the outgraded produce, two fed it to animals and two marketed the poor quality separately -- which is slightly inconsistent since three only had claimed that they graded. Four of the five agreed that they had done more grading since market inspection began.

Again the question as to whether they packed for movement to the market brought a confused response, four saying no, and one yes, but the question on the type of pack revealed that all five sent in polystyrene boxes, three using sacks in addition, and one using wooden boxes. Reasons for using these types of packaging were that they were available and what the market wanted. In all cases the farmer bought the packaging, and all bought secondhand packages on occasions. Costs were quoted as 175-180 fils for new polystyrene boxes, 90-150 fils for used; sacks were 40-50 fils; and wooden boxes 140-170 fils.

One farmer claimed that he precooled his crop by spreading the potatoes under a field shelter from morning harvesting until evening, and then packed for market. No one stored at the farm.

In all cases the produce was taken to market by the farmer, in one case the farmer sometimes hired a hauler, and in another the buyer sometimes collected from the farm. The produce was dispatched either early in the morning, in the evening, or at night. None of the respondents claimed any loss during transport. The estimated cost was 80-100 fils per package to Amman and 50 fils per pack to El Arda.

Farm Extension/Credit/Marketing Survey

Eggplant

The same producers were interviewed for this survey as were interviewed for the Farm Production/Harvesting/Market survey.

All farmers stated that they had access to technical assistance for growing cucumbers from the government extension service. This assistance was only for production/cultural practices. They did not have assistance available to help them improve their harvesting and postharvest handling of their crops. They did however generally know what the quality requirements were because the buyer, primarily export buyers, told them what they were. These requirements were relative to size, color, degree of blemishes accepted, etc. Buyers also informed the farmers generally when to harvest in relation to degree of maturity wanted by the market.

Two of the farmers used institutionalized credit to finance their production activities for their last crop. They received this credit from the Agricultural Credit Corporation and generally felt it was adequate to meet their needs in relation to carrying out recommended production practices. Three of the farmers did not use institutionalized credit because they felt the government required too much paperwork and because they had to pledge their land as collateral for the loan. These farmers utilized informal credit from a commission agent at the wholesale market (the other farmers also used informal credit from commission agents in the market to supplement government loans). One farmer also obtained credit from a friend. In all cases where farmers obtained credit from a commission agent, they were unsatisfied with the arrangement because they had to obligate their production to the commission agent so the loan could be deducted from the proceeds of the sale. This practice limited the possible market channels which could be used by the farmer to market through their commission agent in the wholesale market. However, this practice also, in a sense, assured that the farmer had a market for his eggplant. All of the farmers also stated that they felt they could not get the best price for their product under this arrangement because the committed product was sold for whatever price existed at the time of sale, i.e., they felt the commission agent did not try to get the best price but rather enough to ensure the proceeds covered the loan.

Farmers were asked about their participation in cooperatives. Two belonged to a cooperative and three did not. Those farmers that did not belong to a cooperative were unaware of any in their area. One of the farmers belonging to a cooperative purchased inputs from the cooperative and the other did not. The reason given for not purchasing inputs from the cooperative was that he owed the cooperative and it wanted payment before he could purchase additional inputs so he did not approach the cooperative. Neither of the cooperative farmers marketed products through the cooperative because they were unaware that the cooperative was involved with marketing.

None of the farmers in the survey had access to institutionalized market information. In fact, they were unaware of the existence of any. Their source of information regarding market conditions and prices was obtained during their frequent visits to the wholesale market or from neighbors who had been to the market. In general, the farmers felt that this information was adequate for their needs.

Cucumbers

All of the respondents stated that they had access to technical assistance for growing cucumbers from their input supply merchants. None of the farmers had access to technical assistance in regard to harvesting or postharvest technology that could help them improve harvesting or marketing activities.

None of the farmers in the survey used institutionalized credit. And only two of the five farmers utilized any source of credit. These two farmers obtained credit from a commission agent -- the other three farmers said they did not need credit to operate their farm. One of the farmers using credit from the commission agent was satisfied with the arrangement, while the other was not because he was obliged to sell his product through the commission agent, which limited alternative market possibilities.

None of the farmers in the survey entered contractual agreements to assure a market for his product. However, the farmers who obtained credit from a commission agent felt they were assured of a market because they were obligated to market through the commission agent in order to pay back their loans.

All of the farmers sold their cucumbers through a commission agent in the Amman market and one also sold in his local wholesale market. The reasons given for choosing this marketing channel were:

- a Crop could be sold as soon as harvested at the wholesale market and they could be guaranteed payment.
- b The commission agent assisted the farmer in selling his products and paid the farmer immediately after sale.

The choice of commission agent (for those not obligated) was made on the basis of which one the farmer thought could get the highest price for his product.

None of the farmers in this survey belonged to a cooperative and thus did not purchase inputs from or market his product through cooperatives.

The farmers in this survey did not have access to institutionalized market information. They were unaware that any was available. They all obtained market information directly from the wholesale market through frequent visits to the market. They felt they received accurate price information as far as actual sale prices were concerned, but they felt this was unsatisfactory in terms of receiving information regarding a quality/price relationship. This was because there is no grading system and thus no way of reporting prices by grade.

Tomatoes

All five farmers claimed that they had access to extension services and to government services, and one mentioned additionally an input supplier. Four claimed that they had access to postharvest technology and harvesting methods from the same sources.

One farmer used no credit whatever, but the other four did so. All used the Agricultural Credit Corporation, with one using a commercial bank. The four

using credit used it for the tomato crop and three of them claimed that the credit available was insufficient. Three used informal credit sources also, these being private individuals, wholesalers and supply companies. The one who used institutional credit claimed that this was not sufficient but did not have informal credit, as he said he had no one from whom he could borrow. Another who borrows from the Agricultural Credit Corporation, his Cooperative, and JVFA, said that the informal sources were unsatisfactory since he could not always pay back because of low prices and went to prison for debt.

Only one farmer regarded himself as having a firm contract with a merchant, but his reply revealed that it was more that he was obligated to the merchant from whom he had taken credit.

All five farmers marketed through a commission agent in Amman, but with one exception, all sent to other outlets. They sent to the local market (El Arda), sold to exporters, or sent to the processing factory. The one who sent exclusively to Amman claimed that he did so because it was a habit; a second claimed that he improved his chance of finding a market by sending to several outlets; the third used the processing factory as one of his outlets because the marketing costs were lower; the fourth preferred the exporter as an outlet, then the processing factory, then Amman market, and finally the local market; and the fifth preferred to sell to the exporter, since marketing costs are lower.

Three respondents were cooperative members and all bought inputs from their respective cooperatives. However, they did not market produce through them, claiming that their cooperative did not have a stand in the market. The question on what information the farmers made their decision as to which marketing channel to use was uniformly misunderstood by the four who use more than one. They all claimed no access to institutionalized information and so relied on news from the wholesale market prices being relayed back to them or their being there themselves, which one claimed was daily. Three regarded this method as unsatisfactory, one because the market (Amman) is a long way from the Jordan Valley, and the other two because they claimed that the merchants are not interested in realizing a high price but only in achieving a high throughput.

Potatoes

One farmer claimed not to have access to technical assistance. Of the other four, three had assistance from the government service, three from input suppliers, and one employed an agronomist on his farm. As for advice on harvesting and postharvest methods, only the farmer with his own agronomist claimed to have access to advice.

None of the farmers used institutionalized credit. One had done so in the past when he borrowed from a commercial bank to assist with his production costs. As for informal credit one said he had no access, another (the commission agent) did not, since he extended credit to others, and the other three had access to credit from individuals (friends or neighbors), or

commission agents or middle men. Two said that the arrangement with the commission agent was that they would dispatch produce to the agent until the debts were liquidated. A third said he had used this method in the past. The two who had borrowed from the commission agent felt that the arrangement was satisfactory, and the third who no longer borrowed money felt that the commission agent's interest rate of 8-10% per annum, which had to be paid in a limited time, was too onerous.

The marketing channels used varied. Obviously the commission agent/farmer sold through his own outlet in Amman market. The other four all sent some produce to Amman market, but two also sold at El Arda market (one predominantly so because of the short distance and lower transport cost, but also because he had obtained credit from a commission agent there in the past). One farmer sold some of his potatoes to a wholesaler who collected them at the farm.

Two farmers were members of cooperatives. Both bought some inputs from their respective cooperative, but one made a point of saying that he paid cash for his purchases. Neither marketed through the cooperative, both claiming that their cooperative had no stand in the wholesale market.

The choice of marketing outlet based on information sources was again misunderstood, as with the tomato enquiry, and farmers repeated the answers to the question on how they chose a particular marketing channel. As to sources of institutionalized information they offered replies which included the wholesale market, AIPCO, and the Farmers' Union (JVFU), with one saying he had no source of such information. This last did say he obtained information from Amman wholesale market which he considered satisfactory. Another felt that the information he received from the wholesale market was not satisfactory because it was only short-term. The commission agent/farmer was obviously happy with his source of information!