

Production And Marketing of Apples
in Lebanon

by

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A Thesis Submitted in Partial Fullfilment
for the requirements of the degree
Master of Arts in The Economics
Department of the American
University of Beirut

June, 1961

Acknowledgment

The writer wishes to acknowledge his deep indebtedness to Messers. Adel Kortas and A. Itani of the Ministry of Agriculture, and Messers. S. Ramadan and H. Hagga of the Fruit Board, for their cooperation and valuable suggestions.

Especially must the writer express his gratitude and indebtedness to Professor Gordon Ward for the valuable assistance and precision in enlightening the writer all through as well as for suggestions covering the entire preparation of the report. Without Professor ward this thesis would never have been written, and to him it is dedicated.

Salim Kabbani

PREFACE

The intention of this study is exposition of the various problems connected with apple production and marketing in Lebanon, particularly the costs of growing a crop of apples. The data collected relative to prices, costs and returns are first hand information obtained through a survey which for two seasons, covered the four productive regions of Lebanon and was conducted by the writer himself.

The sample of 100 orchards was taken in the following manner. One thousand orchards in the different regions of Lebanon which had applied to the Ministry of Agriculture for a copy of the book, the Fruitful Trees, were numbered from one to one thousand. Of this number, 600 (300 small and 300 larger ones) were in Mount Lebanon, 200 were (100 small and 100 larger ones) in North Lebanon, 100 (50 small and 50 larger ones) were in South Lebanon and 100 (50 small and 50 larger ones) were in the Bekaa. Then about 36 orchards in Mount Lebanon, 25 in North Lebanon, 20 in South Lebanon and 20 in the Bekaa were selected by chance out of the two size groups. If the owner of an orchard would not give me information about costs, a nearby one with apparently similar size and circumstances was selected to replace it. Thus, a sample containing a number of big and small orchards ranging from 3 to 300 dunums in Mount Lebanon, 3 to 40 dunums in North Lebanon, 4 to 200 dunums in South Lebanon and 10 to 600 dunums in the Bekaa, was obtained. Groups of generally typical apple orchards representative of the four main regions of Lebanon were sought to give as accurate information as possible.

Some of the orchard owners in the different regions that were visited found it inconvenient to supply the data about their costs during my visits and promised that they would send me the answers to the various questions in the questionnaire but did not do so. The result was that in the final analysis, those who gave information about the costs of establishing an apple orchard and for the first year 24 in Mount Lebanon, 20 in North Lebanon, 12 in South Lebanon and 14 in the Bekaa making a total of 70 orchards. The numbers of owners in the various regions who supplied data for the second, third and fourth years were 17, 12, 9 and 11 respectively.

In collecting data regarding costs and returns in the four different regions of the Lebanon, the writer encountered great difficulties because the farmers were at first suspicious and unresponsive, fearing that the aim beyond such a survey was the imposition of a tax. Some of them were enquiring about the use of giving such information. On the other hand, most of the merchants and exporters were not cooperative and gave information which frequently proved to be inaccurate. When informed by persons in whom they had confidence that the information would be used in a university thesis, most of those inter-viewed cooperated to give reasonably accurate information.

The reader's attention should be directed to the fact that the cost of land and terracing are valuations by the owners of the market prices at the time of the survey. Hence, all apple growers who have their land with the terraces from many years previous have for less investment than it is shown in the survey. Since most Lebanese expect land to increase in value in the future, they are more concerned with earning a normal profit on their capital used for paying annual production expenses.

It should also be mentioned that none of the orchardists interviewed kept accurate accounts of receipts and expenses for his apple production enterprise. Most of the figures were supplied from memory. It is natural that individuals who have heavy expenses and modest income should be impressed by the size of their costs and be liberal in their estimates to try to fully cover their expenses. Thus, it is probable that the costs here reported are more likely to be overstatements rather than understatements of the costs of producing apples in Lebanon.

In my opinion, the sample in the way it was taken was to a large extent accurate and representative of the orchard population since it covered the various regions and different sizes of orchards'. But its reliability cannot be taken to be 100 per cent since the number of orchards in Lebanon is about 10,000 and one man can collect cost data from only a relatively small number of producers in the course of the two summers that could be devoted to obtaining data for this thesis.

Abstract

The choice of this subject has been prompted by the improper attention given to one of the important agricultural crops of Lebanon, namely apples. This fact causes every one who cares for the Lebanese agricultural economy and the creation of national and international confidence in both the producer and the distributor, to think about the problem of apple growing and marketing.

A. The author sought information about the marketing and production problems of apple growers through interviews and questionnaires. He studied available reports and publications and collected additional information and data first hand.

B. 1. The annual apple crop now exceeds 60,000 tons per year whereas local consumption is in the magnitude of 15,000 to 20,000 tons. Thus, the apple industry of Lebanon faces the challenge of developing markets for the growing export surplus. The Fruit Board was established to work with the orchardist to meet this problem.

Lebanese apple producers face numerous problems in producing and marketing their fruit, both at home and abroad. The most important production problems are those of irrigation water, spraying, pruning, fertilization, and then picking the fruit at the proper stage of maturity so it will

keep well in cold storage for an extended period of time.

Poor mountain roads cause bruise damage to fruit as well as high cost of transport. Other costs of marketing are high in relation to prices received by producers. Poor operation of cell storages leads to deterioration of apples so that quantity and quality during the spring months is often unsatisfactory. Prices received by producers are low relative to the margins taken by wholesalers and retailers. Exporters are apparently reaping high profits of around 35 %.

2.-- The Fruit Board has brought about improvement in the marketing of Lebanese apples through providing mechanical grading machines in modern packing plants. It has also supervised exports to assure importers in foreign countries of a uniform pack of the quality ordered.

Data were collected from 70 owners of apple orchards of various sizes in Mount Lebanon, North Lebanon, South Lebanon and the Bekaa regarding the costs of establishing orchards and annual production expenses. Figures were assembled on the present values of land and current costs of building terraces and sub-soiling. Data was collected on the cost of constructing reservoirs and canals for irrigation water, necessary machinery, equipment and tools. Cost figures were assembled for nurse trees,

Planting, digging around trees , fertilization , tilling, irrigation, insect and disease control, pruning, care-taking and miscellaneous expenses.

3.-- Data were assembled for each of the four regions, to determine the capitalized costs per hectare of apple orchards through the fourth year. The annual increase in production costs from the fifth year until maturity at the eleventh year was calculated for each of the four regions. Returns from average yields of apples for the various ages of trees were then compared with annual production costs. This comparison revealed that in Mount Lebanon for illustration, a yield of 70 kilograms of apples is required to cover annual production expenses and an additional 30 kilograms will provide 5 percent interest on the capitalized costs of bringing the orchard up to profitable production. A further 30 kilograms will supply enough money to amortize these costs over 20 years of production of the orchard. At the costs and prices found in the survey, yields above 130 kilograms per tree are needed if any return is to be earned on the investment in land, terraces, and subsoiling.

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CHAPTER I

History of the Apple Industry in Lebanon.

In late years economic distress among the apple growers of Lebanon has been widespread, and many orchardists have found it difficult to meet operating expenses. The growers, in many instances, are questioning themselves whether it is worth while for them to put into their orchards the time and money which the best practices and methods seem to require or take what they can with the least possible expense. In order to get at an appropriate answer, an understanding of the underlying causes of the present economic distress and the future possibilities of the apple industry are essential.

Volume of Apple Production In Lebanon.

I. Area Cultivated.

It was estimated that the area planted with apple trees in Lebanon, up to the winter of 1950-51 amounted to 30,000 dunums or 2750 hectares, containing about one million and a quarter apple trees of various American and European varieties. The Golden and the Starking Delicious surpassed the number of trees of other kinds of apples due to the fact that their marketability is high and they are more suitable to the climatic conditions of Lebanon.¹

Several experts who were engaged by the Ministry of

¹Ma'aluf, Timothy, The Fruitful Trees, Beirut 1952, Dar-al-Manahel PP.1-2.

Agriculture had calculated the number of apple trees planted in the various Mohafazats of Lebanon. In 1953-54, for instance, Mr. Vincent Vonça Jreif, a French expert calculated, with the cooperation of the Department of Statistical Research, the number of apple trees. The figure reached was 2,448,224.¹ Since then the number continuously increased till it reached in 1956, 2,950,084 trees occupying an area of 73,750 dunums at the rate of 40 trees per dunum.

Another expert Dr. J.P. Ecimovic², prepared a report about the number of apple trees planted in the different regions of Lebanon, according to their altitudes, varieties and ages. In this thesis, his figures will be adopted because they are better substantiated.

II. Distribution of Apple trees according to size of Orchards

Table 3 shows the number of apple orchards in Lebanon. The distribution in the four mohafazats is divided into seven categories according to the order of their size. These categories are: 1- 50 trees, 51-100, 101-201, 300-301, 500-501, 1000, and above 1000. The number of apple trees found above an altitude of 900 meters is considerable, being about 70 %. The number of orchards found or planted at an altitude exceeding 900 meters is seen in table 4.

¹His figures together with those compiled by the government are shown in Table 2 on the next page.

²Agricultural Statistician of the FAO.

Table 1

Area of Land Planted with Fruitful and Non-Fruitful Apple Trees

Up to 1956

District	Area of Land (dunums)	Number of trees	Productive Area Dunums.	Percent Fruitful Trees	Fruitful Trees	Pro-duction (kg.)	Non-pro-duction dunums.	Per-centage cent	Non-Fru- tful trees.
Et-Lebanon	38200	1527904	14540	38	581754	15125621	23660	62	946150
North-Lebanon	19310	772317	7520	39	300907	7823597	11790	61	471410
Beka'a	13260	530542	2000	15	80242	2076892	11260	65	450300
South Lebanon	2980	119321	1000	34	40221	1043146	1980	66	79200
Total :	73750		25060		1003024	26078656	48690		1947060

Source: Report Presented by the Director of Agricultural Economics to the Director General of the Ministry of Agriculture, Beirut, 1942/1956.

Table 2

Number of Apple trees planted Since 1937 ¹

<u>Year</u>	<u>Number of trees planted</u>	<u>Total Number of Trees</u>
1937	20,000	300,000
1938	40,000	340,000
1939	50,000	390,000
1940	60,000	450,000
1941	65,000	515,000
1942	65,000	580,000
1943	80,000	660,000
1944	80,000	740,000
1945	80,000	820,000
1946	95,000	915,000
1947	95,000	1,100,000
1948	130,000	1,140,000
1949	145,000	1,285,000
1950	175,000	1,460,000
1951	200,000	1,660,000
1952	225,000	1,885,000
1953	255,000	2,140,000
1954	260,000	2,400,000
1955	300,000	2,700,000
1956	250,000	2,950,000
1957	240,000	3,190,000
1958	225,000	3,410,000
1959	195,000	3,610,000
1960	140,000	3,750,000

Table 2 (Cont'd)

<u>Year</u>	<u>Number of trees planted</u>	<u>Total Number o f trees</u>
1961	140,000	3,890,000
1962	110,000	4,000,000
1963	100,000	4,100,000
1964	75,000	4,175,000
1965	60,000	4,235,000

1 Report Prepared by Department of Statistical Research In
1956
Estimate.

Table 3

Number of Orchards According to SizeIn the Different Mohafazats ofLebanon 1953

Number of Apple trees in the Or- chard	North Lebanon	Mount Lebanon	South Lebanon	Bekaa	All of Lebanon
I-50	451(51) ¹	4432(63)	570(52)	430(80)	5883(62)
51-100	533(68)	2355(70)	242(37)	469(89)	3599(70)
101-200	678(76)	1851(77)	141(52)	407(89)	3077(78)
201-300	242(64)	634(84)	28(43)	145(85)	1049(78)
301-500	223(75)	503(86)	20(29)	143(94)	889(83)
501-1000	68(67)	256(82)	7(86)	67(79)	398(79)
1000	24(88)	110(86)	5(20)	58(83)	197(84)
All the sizes	2219(68)	1014(70)	1013(48)	1779(86)	15092(70)

¹ The numbers in the brackets represent the percentage of Orchards at altitudes above 900 meters.

Source: Ecimovic, J.P. Les Pommiers Au Liban En 1953, FAO, Beirut, July 27, 1957, P. II

Table 4

Number of Orchards Above 900 metersAccording to size in the differentMohafazats of Lebanon 1953.

Number of Apple trees in an or- chard.	North Lebanon	Mount Lebanon	South Lebanon	Bekaa	All of Lebanon
I-50	239	2,766	298	345	3,648
51-100	363	1,651	89	416	2,519
101-200	514	1,436	73	362	2,385
201-300	154	533	12	123	822
301-500	167	427	7	135	736
500-1000	45	209	6	53	313
1000	21	95	1	48	165
Totals	1,503	7,117	486	1,482	10,588

Source: Ecimovic, J.P. Les Pommiers Au Liban En 1953, FAO,
Beirut, July 27, 1957, P. 12

Table 5 exposes the fundamental relations concerning the distribution of orchards according to their size. In this table, percentage distribution of orchards according to their size or extent is shown for each region separately. If we look at this table, it is easily seen that more than 80% (83.2% exactly) of the orchards have between 1 and 200 apple trees, whereas more than 60% of the orchards in Lebanon have 100 apple trees or less. This table shows also, that the higher proportion of large orchards of over 300 trees is to be found in the Bekaa and in North Lebanon; while the larger percentages of small orchards are situated in South Lebanon and Mount Lebanon.

III. Distribution of Apple Trees According to Varieties

Table 6 represents the number of apple trees in each of the four mohafazats and in all of Lebanon. It shows also the principal varieties in four categories namely, Golden, Starking, Reinette and Sans Pareille; while the other unimportant varieties are grouped into a separate category. This table gives us the relative importance among the different varieties. It is obvious from it that the most numerous are Golden and Starking. It shows also that the Golden variety is found in small quantities in the North of Lebanon and the same is true concerning the Starking variety in the Bekaa.

IV. Distribution of Apple trees According to their Age.

Table 7 shows the distribution of apple trees according to their age for each Mohafazat and for Lebanon.

Table 5

Percentage of Orchards of Various Sizes in the Different
Mohafazats of Lebanon 1953.

<u>Number of Apple trees in an orchard</u>	<u>North Lebanon</u>	<u>Mount Lebanon</u>	<u>South Lebanon</u>	<u>Bekaa</u>	<u>All of Lebanon</u>
I-50	20,3	43,7	56,2	25,0	39,0
5I-100	24,0	23,2	23,9	27,3	23,8
10I-200	30,6	18,3	13,9	23,7	20,4
20I-300	10,9	6,2	2,8	8,4	7,0
30I-500	10,0	5,0	2,0	8,3	5,9
50I-1000	3,1	2,5	0,7	3,9	2,6
1000	1,1	1,1	0,5	3,4	1,3
Total	100	100	100	100	100

Source: Ecinovic, J.P. Les Pommiers Au Liban en 1953, FAO,
Beirut, July 27, 1957, P. 13.

Table 6

Distribution of Apple Trees According to Varieties
In the Different Mohafazats of Lebanon 1953.

Variety	North Lebanon	Mount Lebanon	South Lebanon	Bekaa	All of Lebanon
Golden	82,004	589,356	41,156	358,640	1,071,156
Starking	264,006	697,185	37,578	34,999	1,033,768
Reinette	32,695	96,669	---	2,882	1,322,46
Sans Pareil-					
le	20,760	68,027	7,628	8,235	104,650
Others	52,871	38,715	7,817	7,001	106,404
All varie-					
ties	452,336	1,489,952	94,179	411,757	2,448,224

Source: Ecinovic, J.P. Les Pommiers Au Liban En 1953, FAO,
Beirut, July 27, 1957, P. 15.

Table 7

Distribution of Apple trees According To Their
Age in the Different Mohafazats of Lebanon (1953)

Age in years	North Lebanon	Mount Lebanon	South Lebanon	Bekaa	All of Lebanon
I	18,663	256,258	11,995	99,016	385,932
2	51,329	212,765	26,925	100,529	391,548
3	42,490	390,873	22,157	82,094	537,614
4	55,863	178,503	7,195	32,164	273,725
5	62,589	92,647	5,193	40,838	201,267
6	30,357	148,094	8,255	42,989	229,695
7	28,585	40,896	5,817	1,332	76,630
8	27,062	42,559	1,190	885	71,696
9	51,256	2,518	4,421	434	58,629
10	55,825	36,697	836	3,404	96,762
11	1,820	9,808	--	58	11,685
12	13,530	5,992	--	16	19,538
13	3,316	25,307	--	--	28,623
14	--	517	--	--	517
15	1,024	27,398	--	1,183	29,605
16-19	8,010	14,783	195	--	22,988
20-25	617	4,337	--	618	5,572
25	--	--	--	6,197	6,197

All ages
452,336 1,489,952 94,179 411,757 2,448,224

Source: Ecimovic, J.P. Les Pommiers Au Liban En 1953, FAO
Beirut, July 27, 1957, P. 18

Such a distribution is very useful and interesting since it allows us to estimate the future production of apple trees for several years to come.

The distribution for all of Lebanon is presented graphically in figure I where the number of apple trees of a certain age is determined as a percentage for every Mohafazat and for Lebanon. The results of such a calculation are shown in table 8.

For obtaining a comparative idea of the actual relations among different Mohafazats, we constructed the graph shown in Figure 2 where the relative distribution in percent is given by lines of different colors for each Mohafazat and for Lebanon. Thus, table 9 shows the absolute number of apple trees of the different ages for the principal varieties in Lebanon. The relative distribution in percentage form for each variety is calculated and presented in table 10. The graph Figure 3, by its lines of different colors, shows the distribution according to the age of the different varieties.

V. Estimated Production of Lebanon 1953-1959.

Table 11 shows the number of apple trees estimated to have been producing during the years 1953-1959.¹ In effect, this table gives for 1953 the apple trees aged 7 years or more, and for each succeeding year, apple trees of a smaller age are included. These results are presented in the form of a graph for all of Lebanon in Figure 4.

¹ Ecimovic, J.P. Apple Trees In Lebanon (Les Pommiers Au Liban En 1953) FAO, July 1957, Beirut P. 30.

Table 8

Percentage Distribution of Apple Trees according
To Their Age in the Different Mohafazats of Lebanon 1953.

<u>Age in years</u>	<u>North Lebanon</u>	<u>Mount Lebanon</u>	<u>South Lebanon</u>	<u>Bekaa</u>	<u>All of Lebanon</u>
I	4,1	17,2	12,7	24,0	15,8
2	11,3	14,3	28,6	24,6	16,0
3	9,4	26,2	23,5	19,9	21,9
4	12,3	12,0	7,6	7,8	11,2
5	13,9	6,2	5,5	9,9	8,2
6	6,7	9,9	8,8	10,4	9,4
7	6,3	2,7	6,2	0,3	3,1
8	6,0	2,9	1,3	0,2	2,9
9	11,3	0,2	4,7	0,1	2,4
10	12,3	2,5	0,9	0,8	4,0
11	0,4	0,7	---	---	0,5
12	3,0	0,4	---	---	0,8
13	0,7	1,7	---	---	1,2
14	---	---	---	---	---
15	0,2	1,8	---	0,3	1,2
16-19	2,0	1,0	0,2	---	0,9
20-24	0,1	0,3	---	0,2	0,2
25	---	---	---	1,5	0,3
All ages	100	100	100	100	100

Source: Ecimovic, J.P. Les Pommiers Au Liban En 1953. FAO

Beirut , July 27, 1957, p. 19

Table 9

Distribution of Different Varieties of AppleTrees in Lebanon According to Their Age 1953

Age in years	Golden Delicious	Starking	Reinette	Sans Pareille	Others	All varieties
1	180,417	172,571	1,803	3,537	27,604	385,932
2	239,770	144,361	1,079	2,941	3,397	391,548
3	270,329	249,179	1,380	5,800	10,926	537,614
4	107,053	149,253	2,127	6,636	8,656	273,725
5	85,470	79,542	4,479	6,650	25,126	201,267
6	109,626	100,987	3,982	12,458	2,642	229,695
7	28,014	40,761	769	6,593	493	76,630
8	11,467	42,423	12,481	3,824	1,501	71,696
9	5,682	46,869	930	3,082	2,066	58,629
10	33,109	2,776	16,672	27,586	16,619	96,762
11	---	1,951	1,610	8,125	---	11,686
12	219	3,095	15,322	902	---	19,538
13	---	---	21,669	1,430	5,523	28,623
14	---	---	517	---	---	517
15	---	---	25,742	2,680	1,183	29,605
16-19	---	---	14,523	8,057	408	22,988
20-24	---	---	4,337	1,235	---	5,572
25	---	---	2,824	3,114	259	6,197
All						
Ages	1,071,156	1,033,768	132,246	104,650	106,404	2,448,224

Source: Ecimovic, J.P. Les Pommiers Au Liban En 1953 P. 20

Table IO

Percentage Distribution of Different Varieties of
Apple Trees In Lebanon According to Their Age 1953

<u>Age in years</u>	<u>Golden Delicious</u>	<u>Starking</u>	<u>Reinette</u>	<u>Sans Pareille</u>	<u>Others</u>	<u>All varieties</u>
I	16,8	16,7	1,4	3,4	25,9	15,8
2	22,4	14,0	0,8	2,8	3,2	15,9
3	25,2	24,1	1,0	5,5	10,3	22,0
4	10,0	14,4	1,6	6,3	8,1	11,2
5	8,0	7,7	3,4	6,4	23,6	8,2
6	10,2	9,8	3,0	11,9	2,5	9,4
7	2,6	3,9	0,6	6,3	0,5	3,1
8	1,1	4,1	9,4	3,7	1,4	2,9
9	0,5	4,5	0,7	2,9	2,0	2,4
10	3,0	0,3	12,6	26,4	15,6	4,0
11	---	0,2	1,2	7,8	---	0,5
12	0,2	0,3	11,6	0,9	---	0,8
13	---	---	16,5	1,2	5,2	1,2
14	---	---	0,4	---	---	0,0
15	---	---	19,6	2,6	1,1	1,2
16-19	---	---	11,0	7,7	0,4	0,9
20-24	---	---	3,3	1,2	---	0,2
25	---	---	2,1	3,0	0,2	0,3
All Ages	100	100	100	100	100	100

Source: Ecimovic, J.P. Les Pommiers Au Liban En 1953, P.21

Table II

Estimated Number of Apple Trees in the Different
Mohafazats of Lebanon

1953-1959

Year	North Lebanon	Mount Lebanon	South Lebanon	Bekaa	All of Lebanon
1953	191,045	210,812	12,459	1,427	428,443
1954	221,402	358,906	20,714	57,116	658,138
1955	283,991	451,553	25,907	97,954	859,405
1956	339,854	630,056	33,102	130,118	1,133,130
1957	382,344	1,020,929	55,259	212,212	1,670,744
1958	433,673	1,233,694	82,184	312,741	2,062,292
1959	452,336	1,489,952	94,179	411,707	2,448,224

Ecimovic, J.P. Les Pommiers Au Liban En 1953, FAO, July 1957, Beirut, P.30.

Fig. 2 Distribution of Apple trees in Lebanon in each Mohafazat according to age 1953.

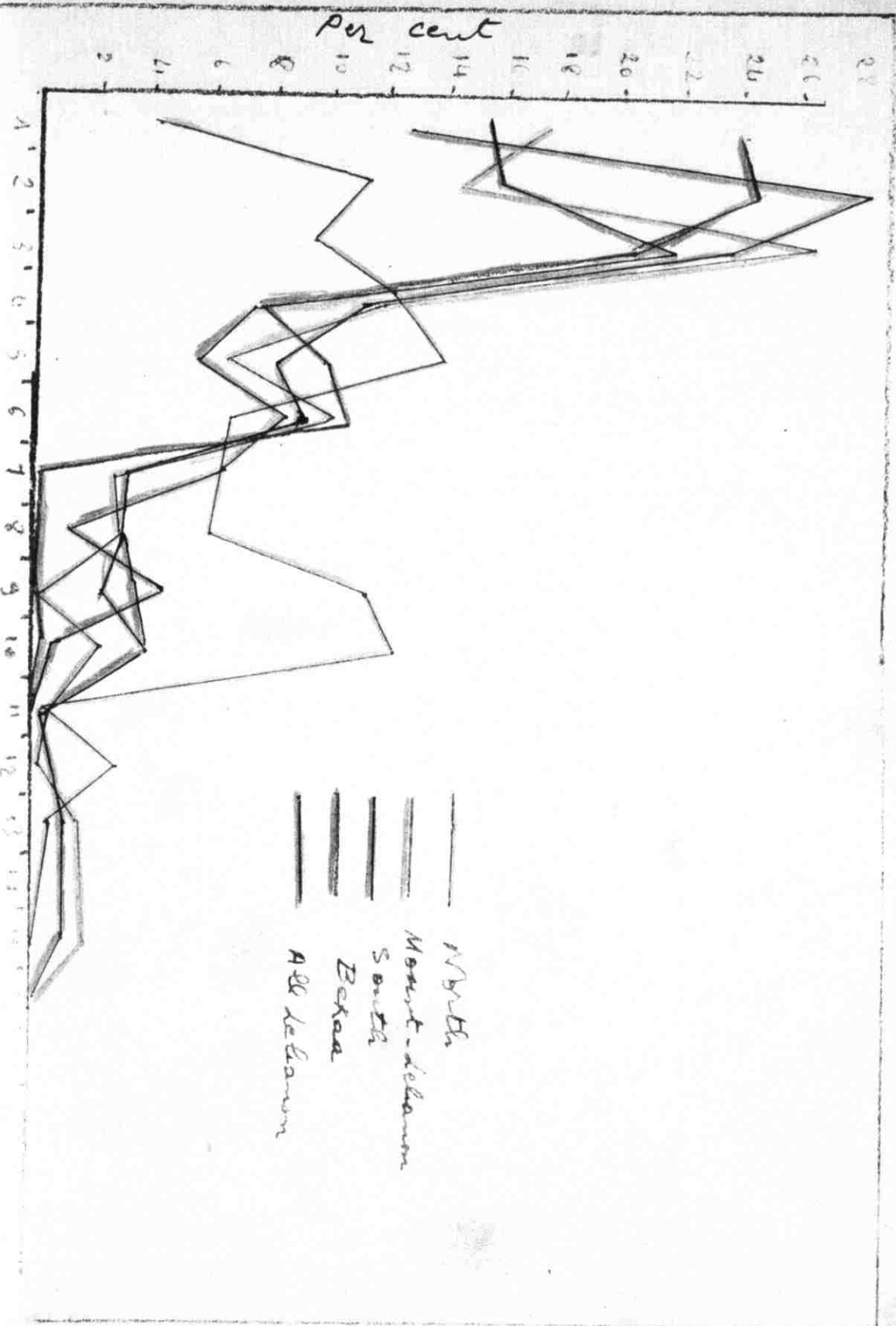


FIG. I Distribution of Apple Trees in Lebanon according to Age. 1953

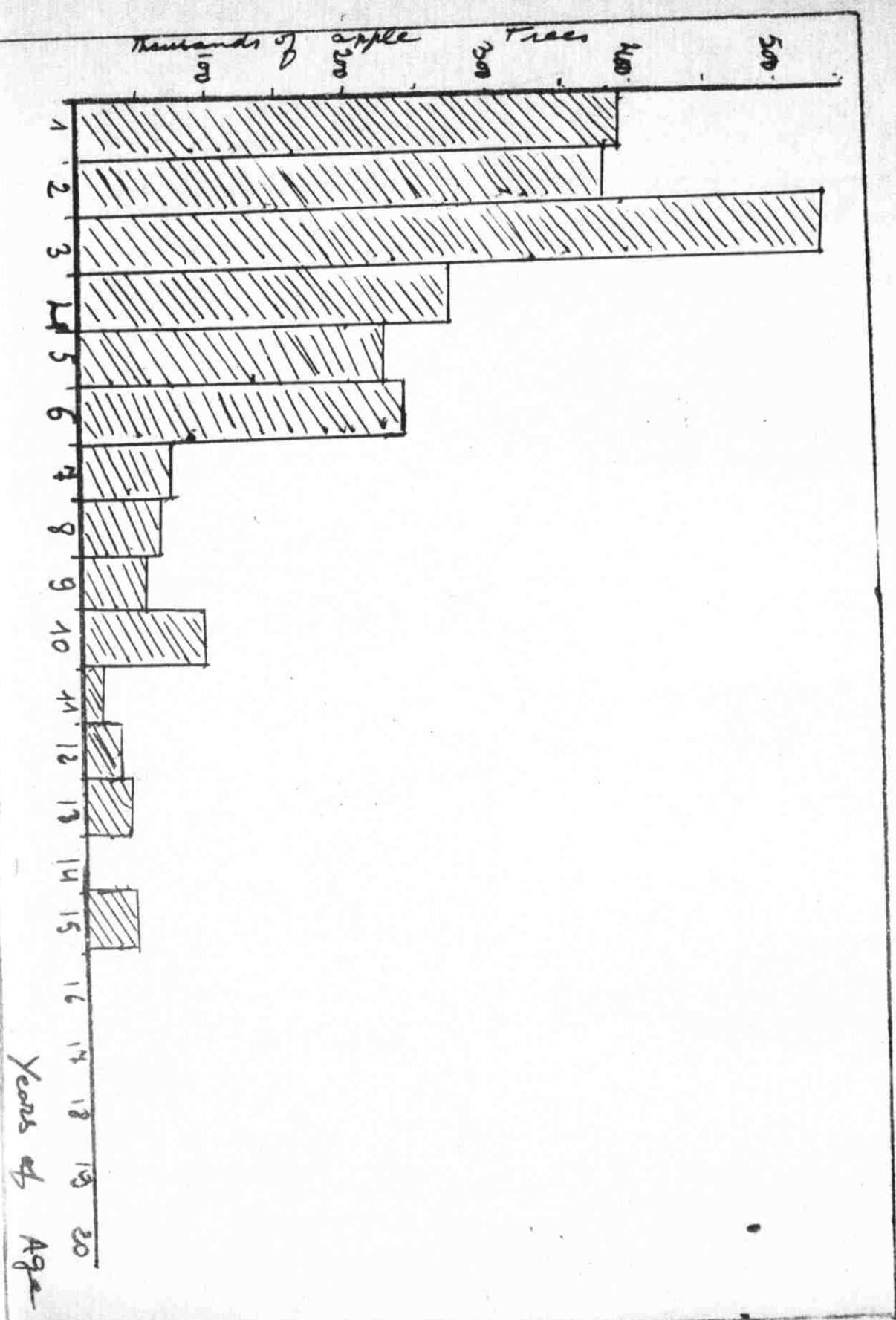
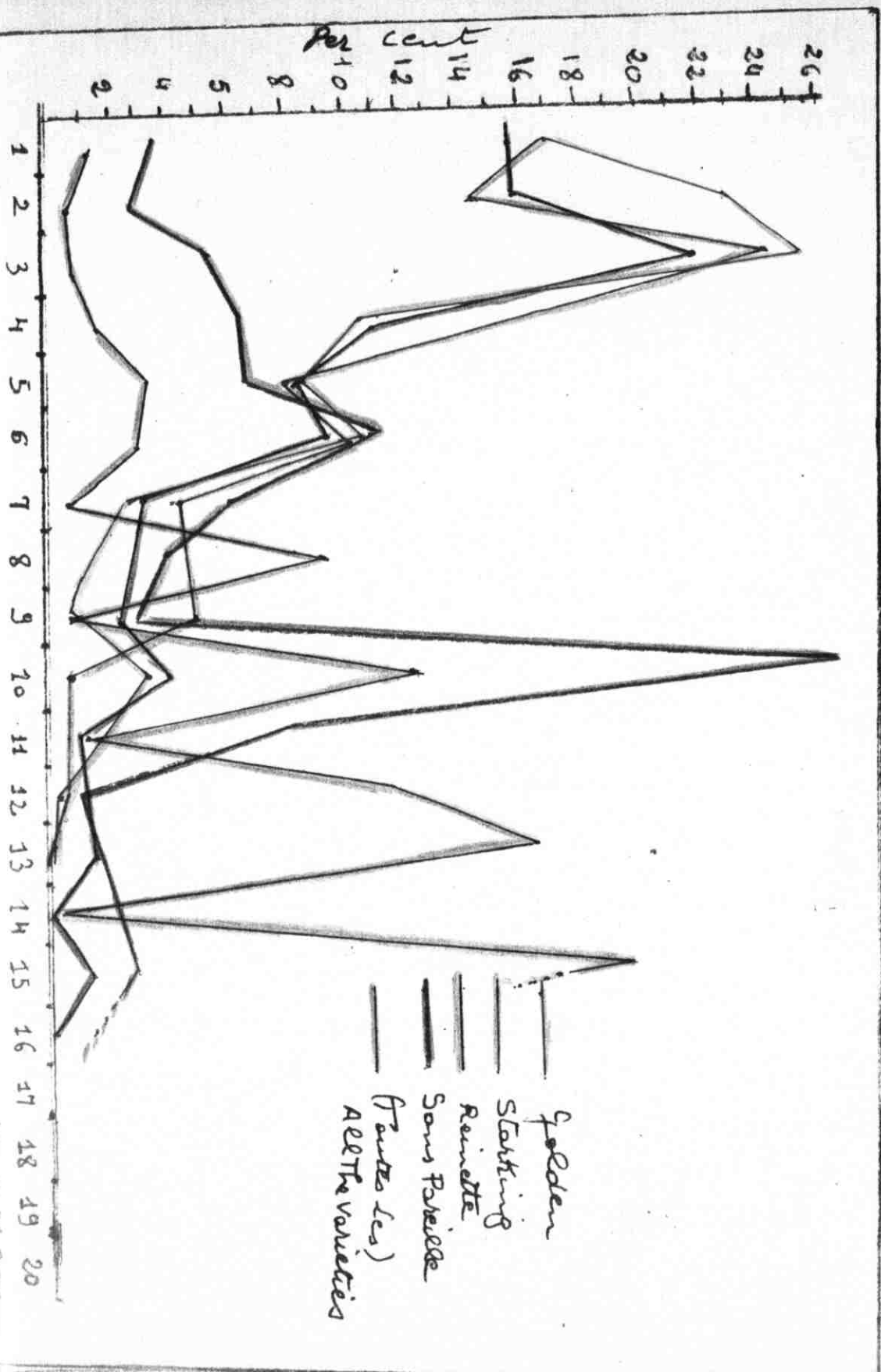


Fig. 3. Distribution of Apple trees in Lebanon
According to the age of different varieties
1953



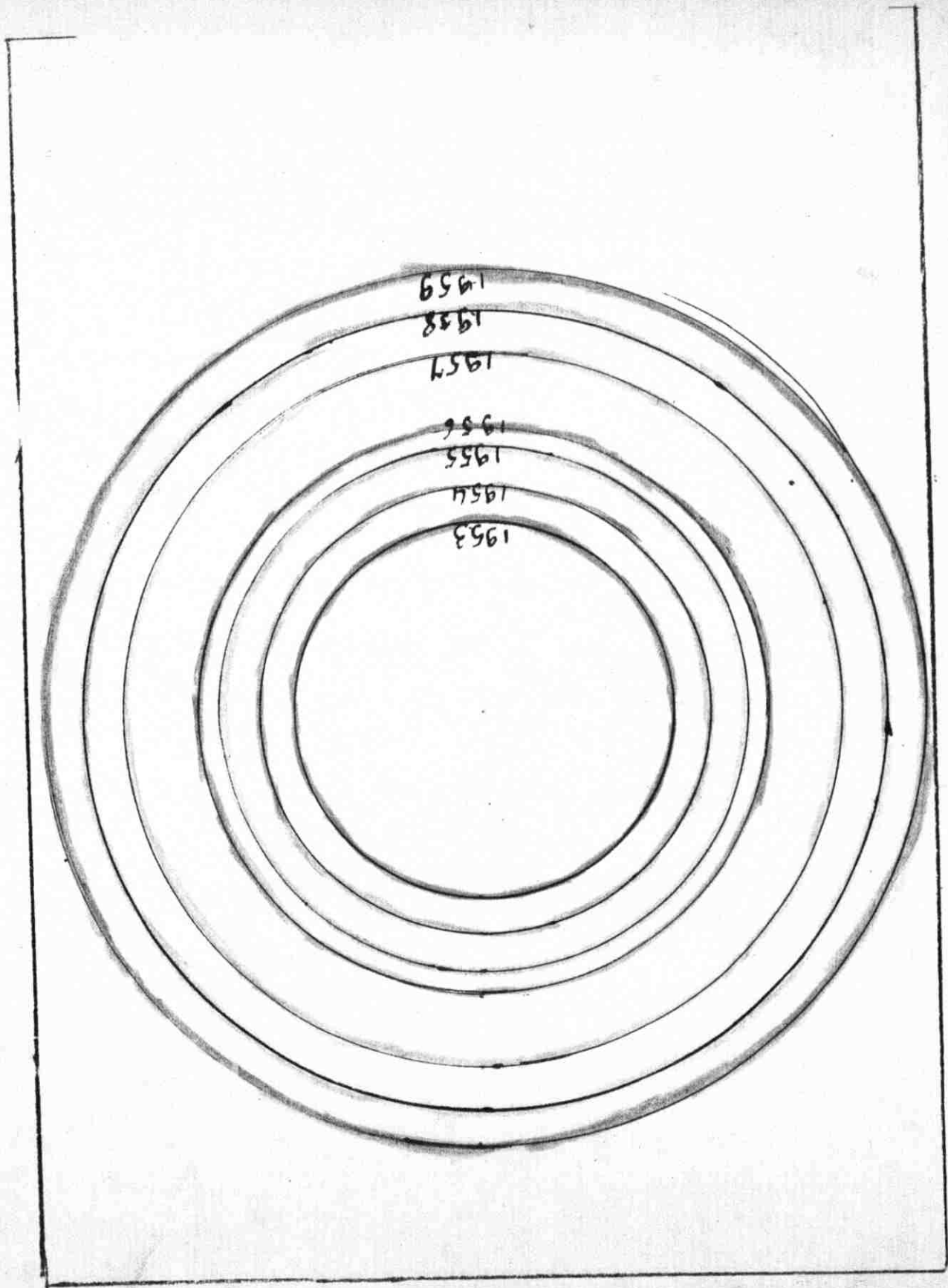


Fig. 4. Estimation of the Growth of the Number of Apple trees in production in Lebanon 1953-1959.

The numbers in Table II are converted into percentages in table 12 where indices of growth for the years 1953-1959 are given. The numbers for the year 1953 are considered as the base (100%) and the other numbers give the relative indices for each Mohafazat. Thus the number of apple trees, for the year 1957, estimated to produce, is doubled in North Lebanon (index: 200) in comparison to 1953; while that for Mount Lebanon is 4.84 times as great; for South Lebanon it is 4.44 times and for the Bekaa 15.02.

Also, we can remark that among the four Mohafazats, the highest index of growth for 1959 is in the Bekaa region; the lowest is in North Lebanon (2.37 times); while for all of Lebanon the index is 5.71 times (and 3.90 times that of 1957).

The graph in Figure 5 is constructed from table 12 to show the relative indices of growth for each Mohafazat and for Lebanon in lines of different colors. What interests us here, also, is the increase or decrease in the rate of growth, which is indicated by the slope of the line making the growth, and for making a comparison between the rates of growth for each year, for which we constructed the graph according to a semi-logarithmic scale, that is to say, the years 1953-1959 are indicated by equal intervals, while the vertical scale is proportional and the values it represents are logarithmic. As a consequence, for example, the growth rate of 100 to 200 in a year is represented by a line of equal

Table I2

Index of Growth of the Estimated Number
of Apple Trees in the Different Moha-
fazate of Lebanon

1953-1959 (Base: 1953=100)

Year	North Lebanon	Mount Lebanon	South Lebanon	Bekaa	All of Lebanon
1953	100	100	100	100	100
1954	116	170	166	404	154
1955	149	214	208	693	194
1956	178	299	266	921	264
1957	200	484	444	1502	390
1958	227	585	660	2214	481
1959	237	707	756	2914	571

Scimovic, J.P. Les Pommiers Au Liban En 1953, FAO, July 1957, Beirut, P. 31

Table I2

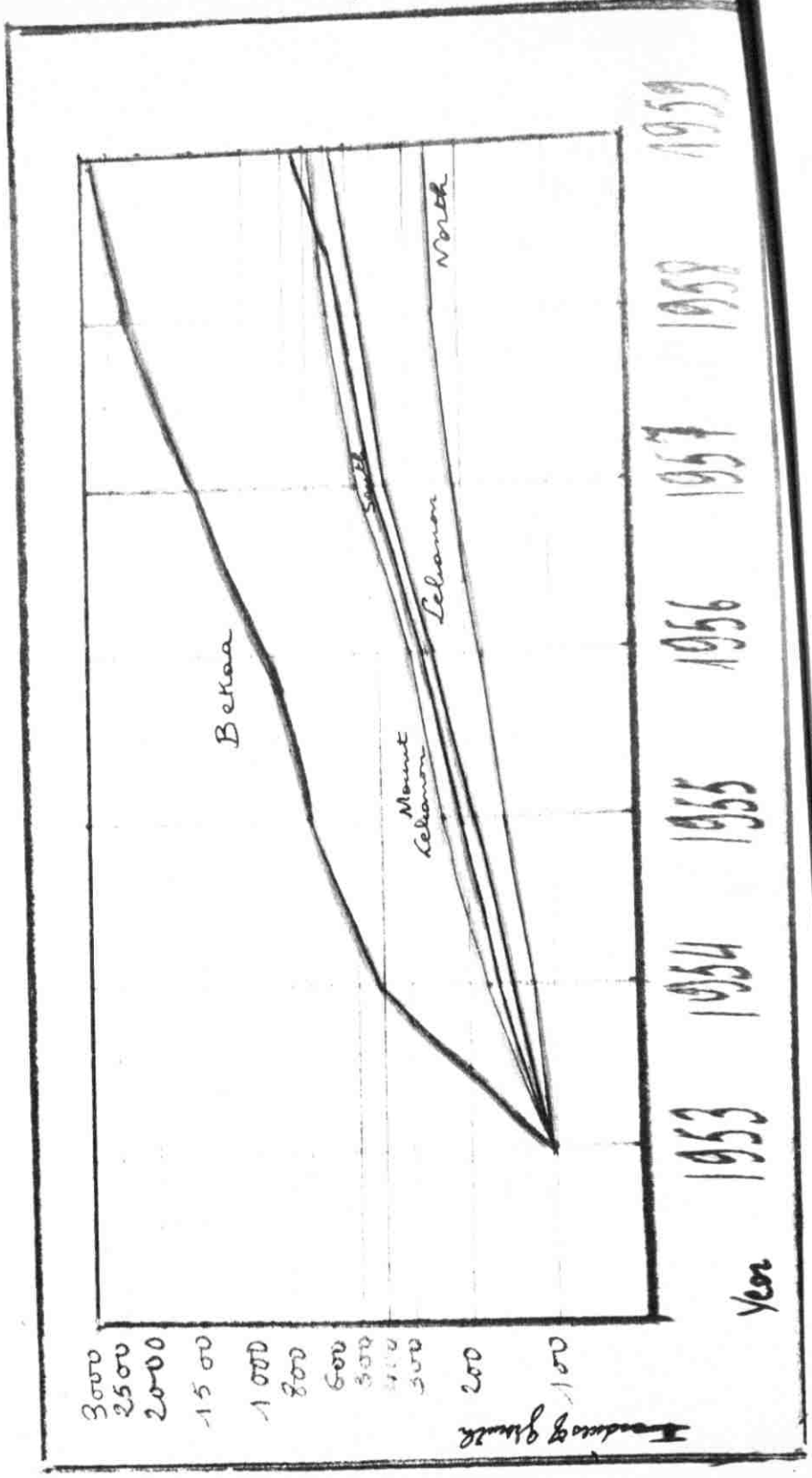
Index of growth of the Estimated Number
of Apple Trees in the Different Moha-
fazats of Lebanon

1953-1959 (Base: 1953=100)

Year	North Lebanon	Mount Lebanon	South Lebanon	Bekaa	All of Lebanon
1953	100	100	100	100	100
1954	116	170	166	404	154
1955	149	214	208	693	194
1956	178	299	266	921	264
1957	200	484	444	1502	390
1958	227	585	660	2214	481
1959	237	707	756	2914	571

Ecimovic, J.P. Les Pommiers Au Liban En 1953, FAO, July 1957, Beirut, P. 31

Fig. 5 The Estimated growth in number of apple trees in Production, 1953 - 1959 (Base : 1953 = 100)



inclination as the rate of growth of 200 to 400, or 300 to 600, etc...

Finally, the results of table 13 are represented by a graph in Figure 6 where the actual apple trees are represented for each year by a column of equal length for the years between 1953 and 1959. The various coloured parts of these columns indicate the corresponding proportional production in each Mohafazat.¹

VI. Past, Present and Future estimated Production.

Production is a function of the number of trees of bearing age. There are many causes for fluctuations in production, but the main variations over a period of years are the result of decreases or increases in the planting of trees.

Estimated of the production of apples in Lebanon show the following growth extending up to 1964/65 :

<u>Season</u>	<u>Tons</u>	<u>Season</u>	<u>Tons</u>
1951/52	9,000	1958/59	40,000
1952/53	11,000	1959/60	52,000
1953/54	14,000	1960/61	62,000
1954/55	17,000	1961/62	72,000
1955/56	21,000	1962/63	82,000
1956/57	29,000	1963/64	92,000
1957/58	38,000	1964/65	100,000

It is apparent from the above table that in a period of nine years, production of apples increased nearly seven times. As from 1965 on a certain stability in our production can be expected to take place for the following reasons :

¹ Ecimovic, J.P. op.cit. PP.2-10.
Tables & graphs are ibid. PP. II-48
Figures based on Ecimovic's data of number of trees of different ages.

Table 13

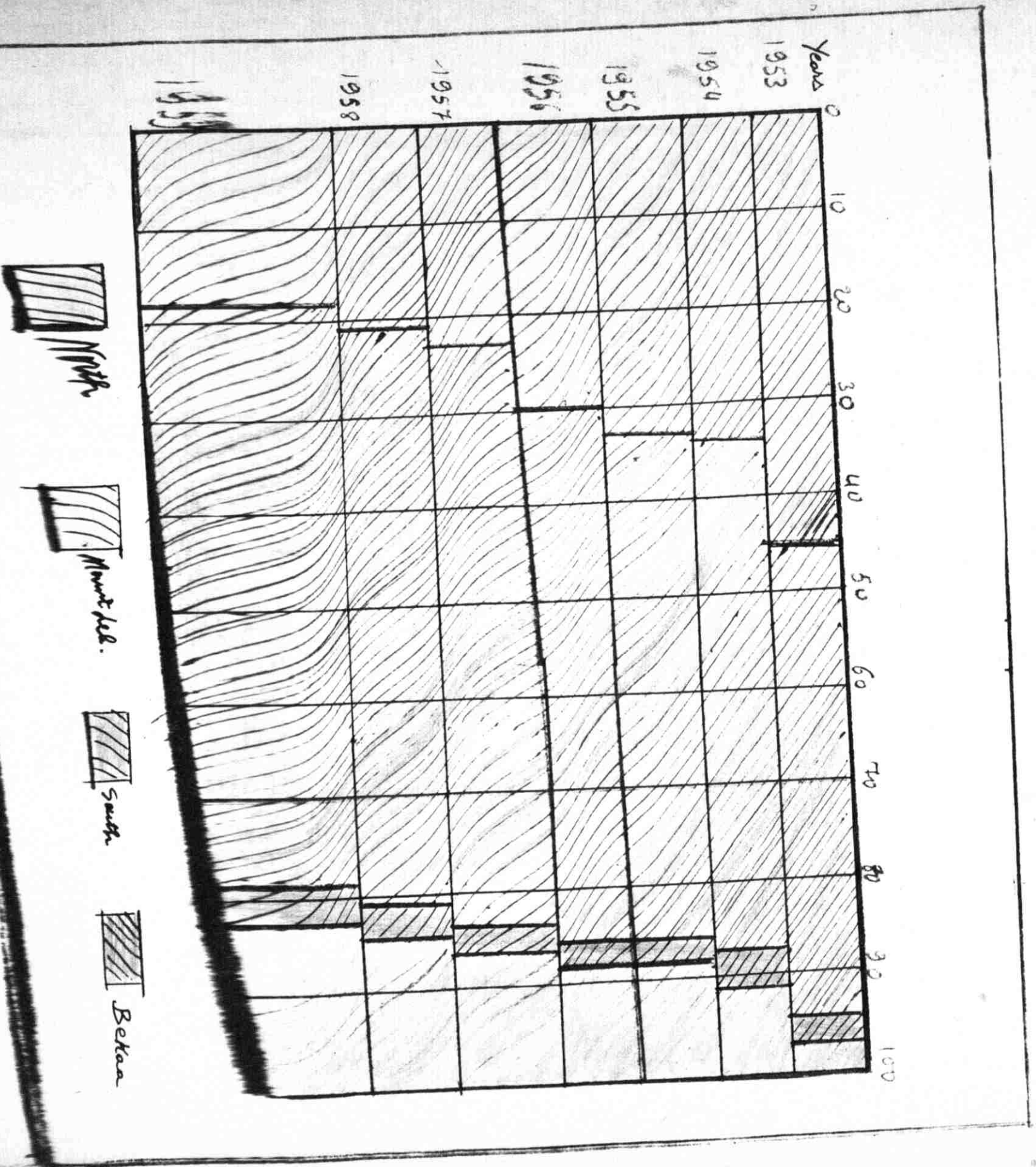
Percentage Distribution of Apple trees in the
Different Mohafazats of Lebanon

1953 - 1959

Year	North Lebanon	Mount Lebanon	South Lebanon	Bekaa	All of Lebanon
1953	45	49	3	3	100
1954	34	54	3	9	100
1955	33	53	3	11	100
1956	30	56	3	11	100
1957	23	61	3	13	100
1958	21	60	4	15	100
1959	18	61	4	17	100

Source: **Ecimovic, J.P. Les Pommiers Au Liban En 1953, FAO, Beirut, July 1957, P. 32**

FIG. 6. Geographical Distribution of the Estimated numbers of apple trees in Production in Lebanon. (The total number of apple trees equals to 100% each year) Per cent.



1) The increasing production of the more or less new plantations after 1959 will be offset by the decrease in the production of the trees in the lower altitude regions due to old age.

2) A majority of the apple trees will be that time have reached their maximum annual yield.

3) It is estimated by Maalouf that by 1965, the number of apple trees will reach a maximum of three and a half million trees covering an area of ten thousand hectares which is considered to be the maximum area that can be planted in the Lebanon.¹

The problem which needs a solution, and which is faced by those interested in the apple industry, is how to dispose of the growing apple surplus, specially when we learn that the maximum quantity that can be consumed locally is estimated at 15,000² tons, which amount was reached in the year 1953, or to be more reasonable in the season of 1953/54.

Consumption of apples in Lebanon has been increasing slowly since 1953/54 due to the increase in population in the country and other factors. With the mounting production and difficulties in exporting to Egypt since 1956, consumer prices have declined noticeably and this has encouraged greater consumption. Economists report rising per capita income in Lebanon during the past decade so that consumers have had more money to spend. No estimates have been made of local consumption of apples in recent years but it is logical to anticipate that it will continue to increase, albeit not as rapidly as production.

¹Maalouf, *op. cit.* p.3

² Department of Statistical Research, Ministry of Agriculture.

The excess output has to be sold abroad in order to relieve the pressure of surplus production toward lower prices to producers.

VII. Problems in Marketing the Export Surplus of Lebanese Apples.

Since our apparent consumption is somewhat more than 15,000 tons per year and our annual production exceeds 60,000 tons, we have a surplus to sell in the world market. It has to compete with world prices (i.e. prices of foreign countries' such as Italy) if we are interested in disposing of this export surplus part of our crop.

Actually, everything connected with costs, whether production costs, transportation costs, marketing costs, etc... is high and far from world prices. Only when the crop of other countries is bad and ours is good, we can sell on the world market at a profit. Even then much of the profit goes to the merchant or exporter and not to the farmer whose bargaining power is weak and because of the purchasing techniques discussed below.

" Cost of production has little if any effect on the price which may be obtained for perishable farm products at any particular time".¹

A. Market Strategy

There are sometimes forces at work which interfere with the normal working of the supply and demand factors and cause price deviations. Such forces are known as Market Strategy.

¹ Filley, H-C. Factors Affecting the Price of Farm Products, University of Nebraska, Bulletin 198, Nov. 1923, p.6.

Its causes might be economic or political. For instance, some merchants may go about the market saying that the so-called foreign country is making contracts and buying Lebanese apples. Prices will immediately rise till the falsity of the matter appears. By so doing he may sell part of his goods to others at a higher price.

Another kind of market strategy of the political type is what actually happened in 1957 regarding our exports to England. According to English regulations, Lead Arsenate should not be present on apples imported. The ratio permitted is one and two per million of arsenate, and lead respectively. Israel through its Intelligence Service reported to the English authorities that the Lebanese export of apples had more than the ratio allowed. By so doing, the Lebanese exporter whose goods were reserved for investigation lost tremendously. This is what was actually said at the time, whether it is true or not makes no difference here except to cite an example of such a kind of market strategy.

B. Divergences from Contract Specifications.

Too frequently in the past when a foreign dealer has purchased apples from Lebanon of a certain grade or packed according to certain requirements at a specified price, he has found to his entire astonishment that the contents of the cases bore no relation whatsoever to the specific product he contractually ordered. Our apples are often packed in such bad packages of so poor a quality that they rarely reach their

destination without being destroyed, for the packages are fragile and easily break, thus scattering the fruit which loses its good appearance. Good packing and the package are what sell the fruit as well as the fruit itself.

This is the reason why the Exportation Control Service became very severe in relation to the exports of apple consignments to European and Western Countries.

This Control Service imposed the following conditions in accordance with Decree No. 48 - Oct. 27, 1932 and Decree No. 1495, Dec. 30, 1933:-

No one can export fruits without having a certificate paper from the control office of the Fruits' exports; the exported fruits should be in good condition and satisfy the conditions of grading and perishability; the boxes of the fruits must be new, clean, of the same size and in accordance with the specifications of the Ministry of Agriculture. The boxes of apples should be 46.5 cms long, 29 cms wide and 27cms high.¹ Every fruit has to be wrapped with soft paper, marked produce of Lebanon, and the box has to be labelled in Western letters. Apples exported to Europe should be normally matured, clean and free from residues of substances like DDT, Lead arsenates or other spraying residues.

The internal surfaces of the boxes should be covered with corrugated cardboard and on one of its sides should be written in ink: The exporter's mark, the phrase 'Produce of

¹ Decree No. 16537, July 17, 1957.

Lebanon', the name of the variety, and the grade and number of apples contained in the case.¹

This is all fine, but actually what was the situation? The operation of export inspection used to take place at the time of exportation. This means that the exporter goes to the specialized office asking permission to ship his fruits which are waiting either in the depot or even on the Trucks. In such a situation, the controller who finds himself faced with thousand of cases all waiting his inspection and in most cases coupled with the cryings of the merchant, will be compelled to examine a small number which usually doesn't exceed one percent. Moreover, the exporter usually exposes for investigation those cases which are more carefully packed and conceal what doesn't conform with the export specifications.

Establishment of the Fruit Board to Expand Exports X

The various defects in our marketing system, such as the poor grading, packing, storing and improper means of transportation together with the high cost of production have all forced attention to finding a solution for the present situation.² It is necessary to solve these problems in order to export our surplus and thereby remove the pressure of excess supplies upon the prices offered producers of apples. To

¹Kortas, Adel "Technical & Economic Problems Relative to Apple Exportation," The Tree Vol. 10, No. 3 (July - Sept. 1959), pp. 46-47.

²United Farmers of Lebanon, the Problem of Fruit Exportation, Feb. 1, 1955.

supervise and control exportation in order to satisfy importers in various countries the Fruit Board was established by a legislative decree number 41, on 25 March 1959.

1. The Aim of the Fruit Board

The object of the Board is to regulate and supervise exports. To accomplish this end, it can take the following steps:-

- a- Imposition of technical conditions regarding grading, packing and standardizing.
- b- Building typical packing houses and controlling or supervising them.
- c- Supervision of packing houses built by others.
- d- Insuring sufficient places for fruit storing and supervise their working.
- e- Collecting agricultural and commercial statistics and information about the Lebanon and foreign markets and comment on it.
- f- Advertising for Lebanese fruits.
- g- Having agents of the Board in Foreign Countries.
- h- Working for getting new markets for Lebanese fruits.
- i- Defining conditions regarding the exportation of fruits and fixing the minimum prices as a result of agreement with the importing countries.
- j- Insuring means of Transportation .
- k- Restricting unlawful competition relative to fruit exportation.

- l- Obligatory supervision of all exported quantities and giving a certificate of conformity of the goods relative to the technical conditions of exportation.
- m- Making contracts in foreign markets on behalf of producers and exporters on condition that the latter give sufficient guarantee to execute their contracts.
- n- Guarantee to importers contracts made on behalf of others.
- o- Encouraging the establishment of Agricultural cooperatives.

These are in brief the aim of the Fruit Board. We shall turn now to its organization.

2. Organization.

The Fruit Board is composed of:

- a- Board of Directors.
 - b- Technical Committees
 - c- Executive Department.
- a. Board of Directors

The Board of Directors is composed of:

- 1) 10 Producers of citrus and apples, two of whom must be representatives of Agricultural Cooperatives and at least two agricultural engineers.
- 2) two producers of other kinds of fruits.
- 3) Four agricultural engineers of the Ministry of Agriculture.

4) Representative of the Ministry of Economy

b. Technical Committees

Technical committees for each kind of fruits are elected out of the members of the Board.

c. Executive Department

The Executive Department is composed of :

- 1) Director, 2) Administrative Department,
- 3) Technical Department and 4) Commercial Department.¹

VIII - Marketing Problems of Lebanese Apple Producers

A. Oligopoly of Apple Buyers.

We began from the end, let us return now to the beginning to see how the apple produce is bought from the farmers.

There are regional brokers in every district and have knowledge regarding the orchards situated in their area. Buyers, mostly wholesale merchants are in constant contact with them specially about one month before picking. They go themselves to the farms and look for the apples on the trees to see their present condition and the way they have been treated. Usually, most of the brokers in a region engage to represent one buyer, since before hand the large merchants have decided and divided the regions among themselves assigning a definite quota for each. Thus acting oligopolistically in the wholesale market and monopsonistically in the producing areas.

The farmer, especially the small one, is compelled to sell at any price either because he cannot afford to store

¹ Official Journal, No.14, April 1st, 1959.

his apples or has to pay loans obtained before to care for his orchard. Even the large farmer who can afford to store his apples may sell also at any price, but with a stronger bargaining power, fearing lest his produce be spoiled because of the unscientific methods followed in the cold storages. We can say with Gibb that "The present working of the agriculture produce market in Lebanon is such that the small farmer is at a serious disadvantage and can rarely obtain a fair price for his produce".¹

When the merchant fears of somebody coming into the field to compete with him, he, by a former agreement with the brokers, pays a relatively high price for the apples of an orchard and then goes away. By so doing, he would have shot two birds by one bullet. On the one hand, no other person will come to give a higher price because it is unprofitable or to offer a lower price fearing it will not be accepted. On the other hand, the farmers are unwilling to accept a lower price than the one formerly offered. Thus, the picking date comes and the monopsonist, with the help of the brokers, gets the apples at the price he dictated, since at such a time those who originally thought to get it have bought. Actually, I met this procedure while collecting cost data from the Jizzin area.

B. Improper Preparation for Market

In order for fruits to give satisfaction to consumers and thereby sell at reasonably high prices they must be picked

¹ Gibb, sir A. Economic Development of Lebanon, 1948, p.44.

at the proper stage of maturity, handled carefully to avoid bruising all the way to the consumer, graded and packed according to consumer grade preferences, stored under conditions to maintain their quality and then delivered to consumers in attractive condition. These points have been stressed by both horticulturists and marketing economists but they are largely neglected by Lebanese producers.

" First class fruit is a quantity of sufficient amount to be quoted in the market (as one box, basket or barrel) that is thoroughly well packed and of one variety and in which the individual specimens are very nearly uniform in size, shape, and degree of ripeness, are possessed of full length stems (in stembearing fruits), are free from bruises and injury and all insects and fungus blemishes, are fully characteristic of the variety, and are in that stage of maturity that the market demands at the time of their exposure or sale".¹

" Careless harvesting, handling, packing and storage practices may decrease considerably the sales value of fruit good in size and color and free from insect, disease and nutritional disorders. The general appearance or condition of apples in retail markets influences the demand for this fruit, and the presence of cuts, bruises and decay may lead purchasers to feel that they would get more "utility for their money" from competing fruits".²

¹ Bailey, L.H. The Principles of Fruit Growing, Mac & Co.Ltd. 1920.

² Southwick, F.W. and Melvin Hurd, Harvesting, Handling and Packing Apples, Cornell Extension Bulletin 750, Sept. 1948, p.3.

C. High Cost of Transportation.

Since the returns the farmer receives for his apples are the residual remaining after all marketing costs and expenses have been paid, transport costs are important for Lebanese producers.

Means of transportation in Lebanon are of two kinds, donkey and truck transport.

In many places where the orchards are far from the truck roads transportation follows two stages, donkey transport first and then truck transport. Here is a table showing the cost of transporting from different districts.

Name of District	Distance to Beirut or Tripoli km.	Donkey Cost P/Box	Truck Cost P/Box	Total cost L.P.
Mansourié	32	--	22	22
Tabarja (North)	90	45	25	70
Lehfid	70	20	25	45
Sofar	30	10	20	30
Mashgara	85	20	30	50
Ab-Elias	45	--	20	20

The donkey cost is an average figure, depending on the distance whether the orchard is far or near to the main roads.¹

In general, one can say that most of the roads leading to orchards in various districts are rough and narrow. This applies to the main roads, not to say anything about the donkey roads, thus giving rise to much bruising.

¹ Mulhim, Ibrahim, Report Presented to Prof. Farmer, Commerce 315, AUB Dept. of Business Administration, 1959.

Regarding foreign transportation, we don't have adequate means and therefore wait in the hope that a refrigerated ship may come and take our produce in its way back.

D. High Retail and Wholesale Margins.

Prices are usually determined by a set of forces which act and react causing prices of farm products to go up and down. Among such combined forces, the more important ones are volume of supply, cost of Production, monopoly, market strategy, the quantity of money in circulation, credit, transportation costs, and commercial costs. To this should be added the world supply and demand in the case of Lebanese apples as an increasing proportion of our production has to be sold in foreign markets in competition with apple raisers in other countries, particularly Italy.

In as much as the prices received by Lebanese apple growers are determined in part by the prices paid by local consumers, it is worth while tracing the price spreads between consumer and producer.

Retail prices in Beirut were as follows during recent years :

<u>Year</u>	<u>Prices in Piastres per kg.</u>	
	<u>Minimum</u>	<u>Maximum</u>
1957	75	175
1958	100	200
1959	80	150

Wholesale prices of apples in Beirut followed the following pattern :

<u>Year</u>	<u>Prices in piastres per kilogram</u>	
	<u>Minimum</u>	<u>Maximum</u>
1957	60	125
1958	80	140
1959	60	132

Producer prices per kilogram vary not only among districts but also in the same district.

In the last three years, they had the following tendency :

<u>Year</u>	<u>Mount Lebanon</u>	<u>North Lebanon</u>	<u>South Lebanon</u>	<u>Bekaa</u>
1957	(40-60) 50	(50-65) 57 1/2	(40-50) 45	(30-40) 35
1958	(35-45) 40	(40-55) 47 1/2	(30-40) 35	(25-35) 30
1959	(30-40) <u>35</u> 42	(40-55) <u>47 1/2</u> 51	(30-40) <u>35</u> 38	(25-35) <u>30</u> 32

The variations among districts depend upon the altitudes of the orchards and whether the orchard is famous or not (psychological factor).

Comparison of consumer with producer prices indicated that apple growers have been receiving less than 25 percent of what the consumer paid. The wholesaler paid the producer only about 30 percent of the price that he received from his customers. The low percentage returns to producers reflect their poor bargaining position arising from shortage of capital resources so that they can not hold their fruit for marketing several months after harvest.

CHAPTER II

Problems of the Lebanese Apple Industry

A. Production Problems

1. Physical Problems

Physical problems actually set limitations on the expansion of apple planting and the increase of production. Some of these problems are geographic suitability, limited cultivable lands on the mountains and scarcity of water for irrigation. There are particularly important in Lebanon.

a) Geographic suitability & cultivable lands.

It should be mentioned that the altitudes needed for the plantation of apples should be between 700 and 1500 meters and preferable altitudes are 1000 meters and above for producing the best fruit. But because of the geography of our country the land suitable for apple growing at such altitudes is scarce. It is either rocky or the soil is poor. In addition, even the suitable areas have to be terraced to provide sufficient depth of soil and this is very costly.

b) Scarcity of water.

Apple cultivation requires a large amount of water in order to produce good fruit. The quantity of water needed increases year after year concomitant with the increased size of the apple trees. This is a very important limiting factor on the production of apple trees and has destructive results, especially on the life of the trees. The flow of streams and springs is greatly reduced during late summer,

particularly following winters with sub-normal precipitation, so that storage reservoirs are necessary.

2. Technical Problems

a) Problems Relative to Irrigation

1) Poor system of irrigation

The amount of irrigation water applied to an orchard and its frequency depends upon the climatic conditions and the soil texture. In Lebanon we see that most of the orchards are under irrigation. But due to the ignorance of farmers, we notice in places where water is available often too much of it is used. When much water is used, the roots of the apple trees suffer from various diseases. The result is less fruit and waste of water.

2) Absence of dams

In spite of the fact that most orchardists have built reservoirs to store some water for irrigation, still there is much demand and the amount of water stored very limited.

Dr. Khalidy of the AUB Faculty of Agricultural Sciences suggests the use of dams in valleys where there are sites for holding much of the winter rainfall with a small dam. The water conserved instead of going to the sea and wasted, will either remain in the reservoir until needed or will sink into the rock and come out in springs.

b) Mechanization.

The use of machines is rare especially in the mountainous regions. Machines will reduce work, costs and time.

For instance, for tilling small tractors can be introduced in the mountainous places. Various labor saving machines are suitable for terraced orchards.

c) Problems in spraying.

Most of the farmers are ignorant and lack training regarding scientific fruit production they do not know what kinds of chemicals to use, in what quantities nor how many times and when to apply them. They spend large sums of money for plant protection but often the apples are not free from disease and insect damage. I met a farmer who was using Dimal against the Akorese insect and then used in another application American Parathion to combat another disease. This example will show to what extent farmers are ignorant.

d) Problems in Fertilizing

This is also attributed to the ignorance of the farmer who doesn't know which fertilizers are the best at the least possible cost. How much to use of animal manure, and what quantities of chemical fertilizers? What chemical fertilizers to use and what is the ratio between chemical fertilizer and animal manure? All these are problems which need solutions. Once solved, then we would have determined the most profitable use of fertilizer.

e) Problems Relative to Harvesting

It is known that while the apple is still on the tree, it gets its water and nutrients from the soil and food from the leaves. But as soon as it is picked it is

no longer in that position and has to live entirely on the materials stored in it. Therefore, "the eating quality and marketable life are dependent in part upon the condition and maturity of the fruit when harvested".¹ This situation gives rise to various problems.

1. Time of Picking.

According to horticultural scientists, "Picking at the proper stage of maturity is particularly important if the fruit is to be stored. Immature apples are likely to shrivel in storage and to be susceptible to storage disorders such as scald, bitter pit and brown core. On the other hand, apples too mature when picked are more likely to suffer from water core, soft scald, soggy and mealy breakdown; internal breakdown and Jonathan and Spy spot than when harvested sooner."²

There are several factors which determine the time of picking. Among which are the following :

- a. Changes in ground color of apples.
- b. Ease of separation from the tree.
- c. Firmness of fruit on tree.
- d. Soluble solids content.
- e. Starch content - Taste.
- f. Rate of respiration.
- g. Days from full blossom.
- h. Calendar date.
- i. Size of fruit.

1 Southwick and Hurd, op.cit. p.5

2 Ibid. P.6

j. Development of red colour.

k. Seed colour.¹

In most instances one index of maturity is not sufficient and the farmer has to take a combination of the above indices. Certain ones are more useful than others, and some are more effective in some varieties than with others.

2. Factors Involved in Fruit Bruising.

It is said that only 1.5% of bruising occur while apples are still on the tree. The remainder takes place because of improper picking, harvesting, transportation, handling, grading, packing and storing, etc...

The main factors involved in bruising are the following :

- a. variety.
- b. Individual picker.
- c. Speed of picking.
- d. Type of picking containers.
- e. Type of field containers.
- f. Emptying picking containers into boxes and field crates.
- g. The person handling and transferring the fruit from the orchard to packing house.
- h. Individual packers - finger nails.
- i. Washing and grading machines
- j. Picking gloves and packing with gloves.²

1. Smack, R.M. and Neubert, A.M., Apples and Apple Products, Vol. II Interscience Publishers, New York, 1950, pp.161-70
2. Professor Khalidi lectures, Tutorial Course, 1959.

B. Marketing Problems.

After we have discussed in a brief way the various physical and technical problems related to the production side of the apple industry, we turn now to what is more significant from our standpoint of economics. I shall discuss first the marketing problems and then shift to analysis of capitalized and production costs for apples in the various regions of Lebanon.

1. Poor Operating of Cold Storages.

Generally speaking, the individual apples storage life begins on the hour it is picked. It varies a lot depending on many factors such as the district where it grew, orchard, variety, conditions of growth, state of maturity at time of picking and also the temperature, humidity, and ventilation of the storage in which it is kept.¹ We pointed out previously that both immature and overmature apples will be susceptible to storage disorders. Here it is necessary to mention that the quality of many apples coming out of cold storages in Lebanon is inferior because the managers do not always enforce the maintenance of correct operation of the storage facilities. The three most important difficulties found are inadequate temperature control, insufficient humidity, and inadequate ventilation. The importance of these storage factors is shown in the following sections discussing the essentials for proper storage of apples.

1. Hukill, W.V., and Smith, Cold storage for Apples and Pears, Circular No.740I, 6. Washington, Feb. 1946 P.3.

a) Low uniform temperature about 30-32F°

varying with varieties and differing by 1 F°.

The freezing point of apples is 28.4 F°. Hence, care should be taken so that apples will not reach that point because if water in the apple cells freezes, it expands causing substances in the fruit to react and decomposition takes place resulting in the disrupting of the fruit and deterioration.

Magness and others conducted research regarding the storage life of apples at different temperatures and came to the following conclusions. "When apples are stored at 40 F°, the ripening is about double that at 32°, and at 60° the rate is about three times that at 40°. At 85° the softening and respiration rates have been found to be about double those at 60°. At 30° about 25% longer time is required for apples to ripen than at 32°.¹

b) High relative humidity.

Some prefer it to be 90-95%, others 80-85%; but the best for apples is at 88%.² This figure is a compromise between that which may cause excessive mold growth and that which may result in shrivelling. To maintain the relative humidity, water has to be added.

c) Proper ventilation.

As a result of their respiration process, apples give out ethylene and scald gases.³

1. Ibid. p.4.

2. Statement by Dr. Ramzi Khalidy in class lecture.

3. Smock, R.M. and Southwick, F.W. Air Purification in the Apple Storage, Bulletin 843, Ithaca, June 1948, p.1.

Circulation and renewal of air must be appropriate to carry these gases away from the fruit.

The respiration process is reduced by the use of oiled paper. Neither of these means are observed in the Lebanon.

2. High Marketing costs.

Marketing costs are so high that they tend to equal the prices received by producer's.

I shall present here estimated figures regarding the various costs of marketing from the time of temporary packing in the orchard till the apples are transported to the central market for sale for local consumption or to Beirut Port for export.

a) Cost of empty case

The price of empty case varies from 120 to 150 piasters depending on whether it is made of maritime pine or deal. This price is high because till now most such cases are imported from outside.

b) Cost of temporary packing in the orchard.

This cost varies from 10 to 15 piasters per box.

c) Cost of transporting a case 16 kgs. of weight from the orchard to the packing house and the cold storage.

Such cost varies from 20 to 30 piasters depending on the distance the truck has to travel.

d) Cost of nails and paper for wrapping apples and labelling the case.

This cost varies between 30 and 40 piasters per box.

e) Cost of storing in cold Storages for an average period of seven months.

The price of storing an apple case until the end of December, that is for a four month period, varies between 125 and 150 piasters; then 30 piasters per case per month is added as from the beginning of January. For an average period of seven months, the cost varies between 200 and 225 piasters. Actually, this price is very high specially in cold storages which hold more than its capacity and whose management is very poor as is the case in most of our cold storages.

f) Cost of actual cleaning, grading and packing, including labor.

This cost varies between 60 and 70 piasters per case for the European and Arab countries except Egypt. The latter country's expenses are exorbitant. They vary between 150 and 200 piasters over and above the cleaning expenses for the other countries. This is the reason why most farmers apply special sprayings to kill the red spider whose eggs when found on the apple fruit cost them so high an expense to clean.

g) Cost of transportation from cold storages to the Beirut Port plus fees of the Beirut Port Company.

This cost varies between 25 and 35 piasters.

The various costs discussed are summarized in the following tabulation.

Costs Per Box in Marketing Lebanese Apples.

(16 kilograms net)

1960 - 1961 Crop Season

	<u>Range of</u>
	<u>Cost in Piasters.</u>
1. Empty wooden box	20 to 150
2. Temporary packing in the orchard	10 - 15
3. Transport from orchard to packing house and cold storage	20 - 30
4. Nails, wrapping tissue papers, labels.	30 - 40
5. Cold Storage av. of 7 months	200 - 225
6. Cleaning Packing and grading, incl. labor	60 - 70
7. Transport from cold storage to produce market or Beirut Port, including Port fees.	<u>20 - 35</u>
Total costs	460 to 565 piasters.

In the case of sale for local consumption, the seller pays the commission seller 5 percent of the sales price as an additional marketing cost. In most cases of export sales, the exporter pays an agreed price for the apples de-

livered to Beirut Port. The above costs apply to exports to Europe and to Arab Countries other than Egypt. Extra costs for complying with Egyptian regulations governing control of the red spider raises the total expenses for export to that country from 615 to 760 piasters.

The above schedule shows us that the total marketing cost for a box of apple of 16 kilograms of weight exported to Europe or Arab Countries and Egypt is 510 and 690 piasters respectively - an average cost of 32 and 43 piasters per kilo. To this is added, 5% loss of weight and 10% normal profit, thus raising the average cost to 37 and 49 piasters per kilo.

In the light of producers' prices, whose averages is 41 piasters per kilo, paid by merchants and the latter's selling prices averaging to 96 piastres per kilo, the exporters' margin of profit is very high.

Av. Producers' Price piasters per kilo	Av. Marketing cost for Europe and Arab countries piasters per kilo	Av. Cost of Apples for Export per kilo piasters	Av. Selling Price per kilo piasters	Net Profit Piasters per kilo
41	37	78	96	18

23%

Producers' Price piasters per kilo	Average Marketing cost for Egypt piasters per kilo	Av. Cost of Apples for Export piaster per kilo	Av. Selling Price piaster per kilo	Total Profit piasters per kilo
41	49	90	96	6

16 2/3%

It is apparent from these schedules that the exporters' profits averages 18 and 6 piasters per kilo for Europe and Arab Countries and Egypt or 23 percent and 16 2/3 percent respectively over and above the 10% normal profit accounted for in the average marketing costs.

C. The Fruit Board - Achievements and Prospects.

In the first chapter we saw the birth of the Fruit Board and the hope that it would solve all the pending problems relative to fruit. Here we shall partray its work during the first two years of its life.

The Fruit Board had actually succeeded in achieving some important points which help to increase our exports of fruits. Among which are:

1. Building technical packing houses.
2. Introduction of definite standards regarding exportation of fruit.
3. Control of cold storage.
4. Supervision of exports.
5. Contacting foreign countries for importing our fruits under its supervision.¹

I. Technical Packing Houses.

The Fruit Board either initiated or adopted newly established technical packing houses for citrus and apples. The members of the board were interested in citrus more than

1. Interview with Mr. H. Hagga - Fruit Board Manager

apples. Whereas citrus packing houses exceed five in the various districts, apples packing planes, on the other hand, number two. In Beirut, it is centered in Kalongi cold storage near Sin el Fil.

All apples intended for export should be packed under the supervision of Fruit Board officials, whether in the official or private packing houses. 1

2. Standardization of apples for Export

Experience has shown that it pays to grade and pack apples that will reach their destination in good condition and looking attractive.

The Fruit Board in an effort to increase exports of our apples by giving importers more confidence regarding them, decreed in September 1959, the standards relative to the packing of apples, and the various grades and allowances governing the exportation of apples.²

a. All apples intended for export should be packed in boxes which conform with the decree No. I6597 of July 1957.³

b. Apples in every box should be of the same size, variety and colour; and the fruit should be wrapped with soft tissue paper written on it, "Produce of Lebanon".

1. Interview with Dr. Rasheed Idriss, Director of Technical Department of the Fruit Board.

2. Fruit Board, the Decree of September 16, 1959.

3. Loc. cit., p.10.

c. Cases should be totally full to avoid bruising and the net weight of each case should not be less than 17 kilograms.

e. Fruits should be packed according to the following schedule:

<u>Diameter of apple (mm)</u>	<u>No. of apples per box</u>
92	64
89	76
85	80
82	88
79	96 - 117
76	113 - 125
73	125 - 138
69	138 - 150
66	173 - 175
63	175 - 188
60	200 - 216
58	230 - 246
55	264
50	

The number written on the box must conform to the number of apples inside.

On the outside of the box should be written on one side the exporters' mark, variety, number of apples and grade. On the other side, the phrase "Produce of Lebanon" should be stamped.

f. The apples should possess the following characteristics to be allowed to be exported:

- 1) Each box should contain only one variety.
- 2) It should have matured in a natural way and be neither premature nor over mature.
- 3) It should be free from any scratches or bruises.
- 4) It should be clean, that is free of dirt, dust or spraying residues.
- 5) Absence of all insects and diseases.
- 6) Apples should be free of natural symptoms within the following ratio allowances.

1. Sun scald: It is prohibited when it is apparent and its area exceeds two square centimeters.

2. Hail spot.

Apples with this spot are divided into three kinds.

- a) Superficial hail spot: It is allowed if it doesn't exceed one sq. centimeter.
- b) Scratched Apples: It is permitted if it doesn't exceed one square millimeter.
- c) Deformed apples cannot be exported. Here hail has a vital effect on the internal part of the apple.

3. Spraying spot. It is allowed if its area is less than one square centimeter.

4. Bitter pit, Jonathan spot and apple scald. It is allowed within two square centimeters.

5. Freezing injury, Mealy Breakdown, Internal Browning, Soggy Breakdown and Water core should be absent.

g. Apples are divided into four different grades.

1. Extra fancy is the grade whose defects do not exceed 2% for any kind and 3% in all.
2. No. I is the grade whose defects does not exceed 5% for any kind and 7% in all.
3. No. 2 is the grade whose defects do not exceed 15% in all.
4. No. 3. is the grade whose defects are around 40 %.

h. Conditions relative to colour in the coloured varieties. These conditions are the following :

<u>Variety</u>	<u>Percentage of Red Colour in total Area of apple surface.</u>		
	<u>Extra-Fancy</u>	<u>No. I</u>	<u>No. 2</u>
Starking Double Red	90 %	80 %	70 %
Starking Red	75 %	50 %	40 %

i. Exportation to Foreign countries should be according to the following grade divisions:-

- a. Arab Countries, except Egypt, Apples exported to Arab countries, can be of any grade.
- b. Egypt and Eastern European Countries. Apples exported to these countries should be one of the first three grades, namely, Extra Fancy, No. I and No. 2.
- c. Other European Countries.

Exportation of apples to these countries should be of the first two grades, namely, Extra Fancy and N° I.

3. Control of Cold Storage.

Cold storage management needs technical experience and in no circumstance can it be left without control or supervision.

The Fruit Board had felt this and engaged an American expert to study the conditions of our cold warehouses. The expert prepared a detailed report which he offered to the Fruit Board for study.

In this report, the expert pointed to the poor management, over capacity, mishandling of fruit, technical handicaps relative to temperature, relative humidity and circulation of air in the cold storages.

The Fruit Board is intending, in the next season, to enforce the technical conditions reported by the expert over all cold storages.

In addition, it is going to take a hand in making it possible for the farmer to put his apples in storage instead of leaving it for the producer and owner of refrigerators to dispute about entering the fruit in the cold rooms, specially because the interval of time between picking and storing defines the life of the apple fruit. Apples must be put under refrigeration as soon after picking as possible.

The Fruit Board is not thinking of reducing the storage charges per box on the ground that it might deter private initiative from building new storages at a time when the existing ones are insufficient.¹

1. Interview with Mandouh Namli, expert and member of Fruit Board.

4. Supervision of Exports.

Every country producing fruit tries by all ways and means to find outside markets to which to export its fruit. In the markets of importing countries exports of different producing countries meet and that which is best, from the stand point of quality, variety, grade, way of packing and outside appearance is preferred and receives the highest price and gives good advertising to the country which grew it. For these reasons, most countries producing fruit have introduced compulsory supervision of exports. Such supervision has the following advantages :

- a) It guarantees the honorable exporters against others who try to cheat and deceive the foreign importers.
- b) It aids its exports against foreign competition by preserving confidence in the standards of the exporting country.
- c) It offers every foreign market the conditions it defines for importation. For instance, the British market stipulates that imported apples should be free of Lead arsenate residues. Hence, the Lebanese Fruit Board compelled every exporter exporting to the British market to prove that his apples are free of these residues before exporting. Also, the Egyptian market demands that apples imported should be free from the red spider. Regarding Scandinavian markets, they demand that the apples imported should contain a certain ratio of juice and acid.

In the first chapter I have presented the way supervision is conducted. In this present section, I am going to explain the procedure followed after the establishment of the Fruit Board and the way it is regulated.

Every merchant who intends to export apples has to send an application to the specified committee in the Fruit Board, at least five days before packing, stating the following points :

1. Name and address of exporter.
2. Name and address of importer and the country of final destination.
3. The quantity to be exported.
4. The packing center where the apples are to be packed for export.
5. The date of arrival and leaving of the ship and the name of the maritime agency responsible for it to ascertain whether it is refrigerated or not.

The Fruit Board, consequently, will send a comptroller to supervise the packing from beginning to end. At the same time, they give advice about the grading and packing and refuse shipment of apples which do not conform with the standards. After that, the box will be loaded on trucks, and if the goods are to remain several days before shipment, their owners will be given a temporary certificate valid for 24 hours only; then from the trucks on board of

ships under their supervision. They even have the right to conduct another control when the goods are transferred to the ship if they found this necessary. Their intention in doing this is to insure that only the inspected and approved boxes go aboard the ship.

5. Contacting foreign countries for importing our fruits under its supervision.

The Fruit Board has concluded several agreements with foreign countries, especially with those with whom we have bilateral agreements like the Eastern European countries and others.

The existence of the Fruit Board helped convince the various countries that the grading, packing and standardization of our fruits had become more accurate and dependable. The effectiveness of the Fruit Board is reflected in the increase of our exports during the last two years, as is shown in the following table N°14 p.40 a. From about 20 thousand tons in 1958 to 41.5 thousand tons in 1959, an increase of 100 per cent, and then to 30.75 thousand tons in 1960 (an increase of 50% on the 1958 figures). Comparison of export tonnage with the 1960 production of 53.000 tons, indicated that Lebanon exported 58 per cent. Although part of the increase in exportation in the year 1959 was due to the small Italian crop that year, yet to a large extent it was accounted for by the efforts of the Fruit Board because otherwise the grading of the Lebanese fruit would not have

been acceptable to the importers. The tonnage exported from the smaller 1960 crop confirms this.

We are waiting now to see more work done by the Fruit Board in the near future.

Table 14 - Exports of Apples from Lebanon, in Kilograms 1952-1960

	1952	1953	1954	1955	1956	1957	1958	1959	1960
Egypt	3273460	2892077	5304743	4201847	4168826	1508318	82238	1563508	
Syria	587616	2105222	2085543	2232492	4412595	5416151	3799217	10841045	
Saudi Arabia	242442	792316	866882	1057387	1555247	2428672	2509879	3571785	
Jordan	160501	1130266	1034529	1724702	3936133	7194723	3760177	7355595	
Iraq	288091	747022	1654151	2354216	2451464	2079823	4011050	11025807	
Bahrain	2912	104252	35462	38349	6615	109940	93055	108973	
Katar	10784	1460	10900	30601	56153	84155	99222	240826	
Kuwait	38166	90172	194419	333698	509122	1435303	658821	1328510	
Libya	-	-	-	-	-	-	-	-	
Aden	-	34000	320	-	-	900	-	-	
Cyprus	100	-	10600	2080	-	-	12465	-	
Western Africa	-	990	-	-	9509	43093	103559	197400	
France	-	-	12600	-	1230	1212536	3387981	1241969	
Western Germany	-	-	-	-	-	703770	8655	-	
Russia	-	-	-	-	-	53725	-	1948254	
Malaya	-	-	-	-	-	-	-	17714	
Great Britain	-	-	-	-	-	1068998	1081241	449399	
Italy	-	-	-	-	-	30000	-	-	
Iran	-	-	-	-	-	-	-	260323	
Switzerland	-	-	-	-	-	279174	-	-	
Holland	-	-	-	-	-	34000	-	-	
Tunis	-	-	-	-	-	-	-	73229	
United States	-	-	-	-	-	63620	-	-	
Sudan	-	-	-	-	-	61009	-	40800	
Malta	-	-	-	-	-	10150	-	42419	
Algeria	-	-	-	-	-	29230	74290	111741	
Other countries	-	-	1250	2976	13314	7403	80466	129174	
Total for year	4604,072	7,897,777	11,271,399	11,987,488	17,120,208	23,816,545	197,82306	41,557,058	30,750,000

These figures are in net kilograms of apples after deduction

Source: Ministry of Agriculture, Statistical Research

the weight of the box.

Department, Export Division.

CHAPTER III

Variations of costs and Returns of Producing Apples in Different Regions of Lebanon.

During the early 1950's , apple growing in Lebanon was regarded as quite a profitable enterprise. This impression stimulated rapid expansion of the area planted with apple trees and led to apples becoming a major agricultural export. Various estimates have been made of the cost of growing an apple tree to bearing age and of the total investment in apple growing in the Lebanon. Two of these will be presented here for evaluation. The author undertook a survey of the costs of establishing apple orchards and of caring for them until producing commercial yields of fruit to provide the basis for determining the fixed costs involved in apple production in Lebanon. He also collected data from orchard owners regarding annual production expenses to secure the variable costs entailed in producing a crop of apples for market. By combining the fixed and variable costs, it has been possible to calculate costs of producing apples in the four main regions of Lebanon to compare with the market prices of the apples sold from these areas.

Volume of Investment In the Apple Industry

Before discussing this problem, the reader's attention should be brought to the fact that the cost of planting an apple tree varies with different districts, soil and topography of land. Timothy Ma'alouf considers it very difficult and even impossible to set up a figure indicat-

ing the cost per tree. According to him, this is so because in most districts of Lebanon, the costs vary even within the same district. Many factors should be taken into consideration, among which are the altitude, the topography, cost of land, the kind of soil, the kind of fertilizer used, the implements of cultivation, insecticides, system of irrigation and terracing.¹ In Mount Lebanon, for instance, the cost of planting an apple tree including the cost of land and ploughing is four or more times that in the Bekaa region, due primarily to the steep slopes with narrow terraces which necessitate the use of human labor without machines.

Mr. Barakat Nujaim estimated the total capital investment of producers in apple plantations at L.L. 300.000.000 or \$ 99,500,000.- His figure was calculated in the following manner:-

1 - The cost of a tree seven years old and above, including the price of land, cost of digging and terracing, compound interest on capital, and the cost of annual maintenance was estimated to total L.L. 170. In each acre, there are 160 trees. Therefore, the cost of an acre would be L.L. 27,000 or \$ 8500. Since the number of trees which are seven years of age and above are about one million apple trees, mostly in Mount Lebanon, the capital investment will then be L.L. 170 million.

2. The average cost of a tree four, five or six years old calculated on the same basis is estimated at L.L. 100 and

1. Interview with Timothy Ma'alouf, Agricultural Engineer.

therefore for one acre of 160 trees, the cost would be L.L. 16000. Since the number of apple trees which are of that age is about one million, then the capital investment will be L.L. 100 million.

3- The average cost of a tree less than four years of age is estimated at L.L. 60 and hence for one acre it is L.L. 9,6000. Since the number of apple trees which are of that age is about half a million trees, then the capital invested will be about 30 million Lebanese Pounds.¹ Thus the total investment will become L.L. 300 million.

In my opinion, estimates of such a kind are rarely reliable, not to say anything about their illogical basis for calculation. Is it reasonable to have a rise in costs of 70 percent between the fifth year and the seventh year of an apple tree? Moreover, there are several other factors which were not taken into consideration in calculating these figures. Such items as construction of reservoirs and irrigation canals, inventory of Machinery, and the like seemed to have been neglected.

In addition, one can say, since there is a lot of variation in costs and number of trees per hectare or dunum or acre, how can it be logical to assume that cost per tree is so and so and there are 160 trees per acre and consider it a constant figure for all of Lebanon?

¹ Nujaim, Baraket, (Agricultural Engineer), "Report on Apple Growing", Al'Amal Newspaper, Beirut, Jan. 8, 1956 & USOM, "Annual Report" Agriculture Division (Lebanon 1955) P.39

I am going now to calculate total investment according to the figures I have compiled. I don't pretend to appear more reliable but definitely more logical. Limitations both of time and money make it beyond the scope of any one individual to cover all the Universe. A small sample of the population (i.e. orchards) of each region has been taken.

Total investment according to my figures is calculated thus :

500,000 Trees of 4 years of age.

	No. Trees	Cost/tree	
Mount Lebanon	160,000 x	300 =	48.000.000 L.L.
South Lebanon	100,000 x	275 =	27.500.000 L.L.
North Lebanon	90,000 x	200 =	18.000.000 L.L.
Bekaa	<u>150,000 x</u>	<u>138 =</u>	<u>20.700.000 L.L.</u>
Total	500,000		114.200.000 L.L.

2 1/2 million trees 9-10 years of age.

	<u>No. Trees</u>		<u>Cost/tree</u>		
Mount Lebanon	1.5 million	X	345	=	517,500,000 L.L.
South Lebanon	100.000	X	316	=	31,600,000 L.L.
North Lebanon	450.000	X	230	=	103,500,000 L.L.
Bekaa	400.000	X	138	=	<u>55,200,000 L.L.</u>
Total					<u>707,800,000 L.L.</u>

Total capital Investment 822,000,000 L.L.

Thus, giving a total of eight hundred and twenty two million Lebanese Pounds. These estimates are based on capitalized costs ascertained by interviewing owners of apple orchards in the four regions of Lebanon. The calculation

of the costs of establishing an apple orchard and bringing it into production are explained in the following sections.

Variations of Costs in Four Production Regions.

of Lebanon

A. Capitalized costs.

Costs are capitalized till the end of the fourth year at which time the trees begin to bear.

In all the calculations that are made in the tables, I was after the average cost per hectar and per tree.

1. Cost of Land

The first four tables in the appendix show the cost of land in the four different regions of Lebanon. In each table, area of land, whether in dunums, feddens, square meters or Kadné is transferred into hectars. Number of trees is a weighted average figure. Cost of land per hectar differs from one region to the other, from 22,748 L.L. in Mount Lebanon to 7,824 L.L. in North Lebanon.

2. Original Planting Expenditures

Under this heading is included all the costs incurred at the time of preparing the orchard for planting, planting trees bought from a nursey, and starting them properly.

a. Building the Terraces and Levelling the Land

Tables 27-29 shows the variations in the cost of terracing between the three different regions, namely Mount Lebanon, North and South Lebanon. The average cost per hectar is figured out by multiplying the number of workers by

the price of a worker per day weighted by the number of hectares in each region.

This cost varies between 35,929 L.L. in Mount Lebanon, to 20,042 L.L. in North Lebanon and to 18,639 L.L. in South Lebanon.

Even the small farmers are compelled to establish such expensive terraced apple orchards irrespective of possible economic returns on the investment due to the fact that they have to work on their land and earn a subsistence wage.

b. Digging to An Average Depth of 75 cm.

This cost variation is presented in Tables 30-33 . The average cost per hectare weighted by area planted is derived as a result of multiplying the number of workers who carried this work by the wage per worker. This is shown in four regions of Lebanon.

It is around 8,167 L.L. in Mount Lebanon, 4,914 L.L. in North Lebanon, 649 L.L. in South Lebanon and 164 L.L. in Bekaa.

c. Construction of Reservoirs for Irrigation Water.

The average cost per hectare for this item is shown in Tables 34-36. The cost of construction of reservoirs in various orchards is taken as is given by the owner of the orchard. The total cost is weighted by the number of hectares in the various orchards under study.

The average cost per hectare varies between 4,006

L.L. in Mount Lebanon 3,295 L.L. in South Lebanon and 3,236 L.L. in North Lebanon.

d. Constructing Irrigation Canals with concrete.

Most farmers in different regions have found it to their interest to construct concrete canals in order to preserve as much as possible of the scarce water available.

Tables 37-40 present the cost of these channels. These tables include cost of labor obtained by multiplying the number of linear meters of canal and cost of labor per square meter, plus cost of sand, gravel and cement used by multiplying the total number of tins or cases by the price per tin or case. All these costs are added to get at the total cost from which the average cost per hectare is derived weighted by the areas planted in the various orchards. This cost is highest in Mount Lebanon, around I,520 L.L.; lowest in the Bekaa I,448 L.L. and in between in North and South Lebanon - 1463 and I,466 L.L. respectively.

e. Cost of Nursery Trees.

Tables 41-44 show the different costs of nursery trees in the various regions of the Lebanon. In each region, average cost per tree weighted by area planted is multiplied by number of trees per hectare in each region to get at the total cost from which the average cost per hectare is derived. It is apparent that the two factors which influence the average cost per hectare are the cost per tree (whether ordered from outside or bought locally) and the number of

trees per hectar. In Mount Lebanon where the number of trees per hectáres is around 400, the average cost per hectar is 1.075 L.L. while in Bekaa where the number of trees is around 300 the cost is 592 LL.

f. Cost of Planting Trees.

Here the average cost per hectar depends, in addition to the factors mentioned in the previous section, on the cost of labor. The latter differs from one place to another in the same and different regions.

The cost figures are presented in Tables 45-48, where the numbers of workers employed in planting the trees are multiplied by their price per day. Then the average cost per hectar is derived from the total cost. These costs are 121, 119, 104, and 60 L.L. for South Lebanon, Mount Lebanon, North Lebanon and Bekaa, respectively.

g. Digging Around the Trees 50 cms. in Radius.

Cost figures are presented in tables 49-52 where number of workers employed are multiplied by price per workers per day to get the total cost and hence the average cost per hectare. In addition to the cost of labor (price per worker in each region), the average cost per hectar depends on the number of Trees per hectare.

The cost figures are 112, 104, 90 and 471 L. per hectar for Mount Lebanon, South Lebanon, North Lebanon and Bekaa respectively.

h. Fertilizing the land with Manure.

Tables 53-56 show the average cost per hectare for

the different regions of Lebanon. This cost depends on the number of trees per hectare, cost of labor and manure. The cost of labor (number of workers employed multiplied by price per day) plus cost of manure (quantity number of tins multiplied by price per tin) give the total cost of fertilizing the land.

This cost is L.L. 511 for Mount Lebanon, L.L. 500 for North Lebanon L.L. 400 for South Lebanon and L.L. 384 for Bekaa.

3. Cost of Inventory of Machinery, Equipment and Tools.

Tables 57-60 show the cost of machinery in every region of Lebanon and variations between regions. The machinery included are tilling machines (tractors and cultivators), spraying equipment (engines and pumps), with hoses and water supply facilities (engines, pumps and pipes). The tables show that the most mechanized region is the Bekaa with an average cost per hectare of 958 L.L., then comes South Lebanon of 800 L.L., Mount Lebanon 656 L.L. and lastly North Lebanon of 260 L.L. To these figures may be added the cost of hand tools (not mentioned in the tables) like shovels, pick axes, axes, forks, scythes, pruning saws and shears whose sum doesn't exceed 10 L.L. per set or 100 L.L. per 10 sets.

4. Cost of care of Orchard until Bearing Age.

This section includes the costs incurred by the farmer each of the four years regarding tilling, irrigating, disease control, pruning, cost of fertilizing and

guarding, care-taking and miscellaneous expenses.

First hand data regarding the first four years until bearing age were collected from orchard owners in the form regions.

a. Tilling the soil.

Tilling costs are presented in tables 61-64. Tables 61-63 show tilling costs in Mount Lebanon, North and South Lebanon. They consist of an average of two tillings, one in the fall and one in the spring. The total cost is derived by multiplying the number of pairs of oxen employed by cost price per day and added to the cost of labor employed. This sum is multiplied by two to get the annual cost of tilling. This cost is fairly constant each year. It is 180 L.L. in Mount Lebanon 185 in South Lebanon and 175 in North Lebanon. Table 64 shows the annual cost of tilling in Bekaa. This table shows the number of tillings, 6 in number, the cost of operating a tractor (wage of driver plus cost of fuel, oil and grease and greasing) per hectare, depreciation of tractor and cultivator at the rate of 5 and 10% respectively, or cost of renting a tractor for those do not own one. The average cost per hectare is 76.80 L.L. for each of the first two years. After the second year, because of cash repairs of tractors, the average cost rises to 78 L.L.

b. Irrigating Expenditures.

Irrigating expenditures are presented in tables 65-68 which show the items of cost relative to

Mount Lebanon, North Lebanon and South Lebanon. They include (1) cost of water both fixed (depreciation of reservoirs at 2-3 1/3% depending on whether it is built of good masonry or reinforced concrete or ordinary stone work) plus depreciation of concrete lining of ditches (irrigating canals) and depreciation of water pump engines and pipes at 10 % each and variable defined costs or cost of operating water engines (number of days multiplied by cost of operating per day including worker's wage, fuel, oil and grease and greasing).

(2) Cost of Watering and ploughing.

This is cost of labor required to perform these operations. Table 65 shows that in addition to the above mentioned costs, in the Bekaa ploughing is conducted by tractors. Hence, the additional fixed and variable costs of tractor and cultivator are accounted for. Tractor and cultivator are depreciated at 5 and 10% respectively other than that accounted for in tilling, which cost is added to the cost of operating a tractor. Cost figures regarding irrigation expenses are the same without change due to the limited amount of water available.

These average cost per hectare figures are 1,705 L.L. in Mount Lebanon, 1,279 L.L. in North Lebanon and 1,048 L.L. in South Lebanon and 412 L.L. in Bekaa for each of the first two years.

After the second year, because of cash repairs to

water engines and tractors, the average cost per hectar rises to 171 L.L. in Mount Lebanon, 1051 L.L. in South Lebanon and 418 L.L. in Bekaa.

c. Disease Control Expenditures.

This item of cost is divided into two parts, cost of insecticides and cost of applying the spray chemicals.

1. Cost of Insecticides.

Such cost figures depend on several variable factors namely, number of trees per hectar, quantity of chemicals sprayed on the trees in one application and number of applications.

Tables 69-84 show the various cost figures for the first four years for each of the different regions of Lebanon. They include the average number of trees, number of applications and cost of various kinds of chemicals used as, Tar and mineral oil, lead arsenate, nicotine sulfate, colloidal sulfure and Perthion. Tables 69-72 show the average cost per hectar in Mount Lebanon to be 1,331 L.L. the first year, 1,676 L.L. the second year, 2,238 L.L. the third year and 3,251 L.L. the 4th year or an increase of 22,66 and 135 per cent based on the first year.

Tables 73-76 give the average cost per hectare of insecticides in North Lebanon in the following way: 1,233 L.L. for the first year, 1,676 L.L. for the second year, 2,255 L.L. for the third year, 3,301 for the 4th year or on increase of 35, of 3 and 87 percent. Tables 77-80 show the variations in the figures for South Lebanon. They tend

to be like this: 1,215 L.L. in the first year, 1,463 L.L. in the second year, 1,984 L.L. in the third year, 2,918 L.L. in the fourth year, or an increase of 20,63 and 136 per cent. Tables 81-89 show the difference in costs of insecticides per hectare in Bekaa. They tend to be in the following order: 1,101 L.L. in the first year, 1,340 L.L. in the second year, 1,952 L.L. in the third year and 2,492 in the fourth year, or an increase of 22,77 and 126 per cent.

2. Cost of operating spraying machines and of Labor of Spraying.

Tables 85-100 show the cost of figures per hectare relative to applying insecticides. Tables 85-96 relative to Mount, North and South Lebanon, include the cost of operating spraying machines, both fixed (depreciation on pumps and engines ranging from 5 to 10 percent) and variable cost (cost of operating spraying engine per day, including cost of fuel, oil and grease and greasing, multiplied by number of days), rental payment for those not owning equipment and labor expenses.

Tables 97-100 relative to Bekaa, include in addition to the foregoing items, cost of operating tractors both fixed (depreciation at 6% in addition to the previous 5+5 percent on tilling and irrigating) and variable cost (cost of operating a tractor per day times number of days).

Regarding cost per hectare in Mount Lebanon, it follows the following way: 388 L.L. in the first year, 480 L.L.

in the second year, 592 in the third year and 757 in the fourth year or an increase of 29,51, and 95 per cent. In North Lebanon, it goes in the following ascending order, 262 L.L. in the first year, 342 in the second, 385 in the third and 426 in the fourth year or an increase of 30,48 and 60 percent; in South Lebanon it follows another pattern, 290 L.L. in the first year, 305 L.L. in the second year, 342 L.L. in the third year and 410 in the fourth year, or an increase of 5, 17 and 41 per cent. While in the Bekaa, it is more proportional, 243 in the first year, 290 in the second year, 343 in the third year and 412 in the fourth year or an increase of 19,41 and 74 percent.

d. Prunning Expenses.

Tables IOI-116 show the average costs per hectare relative to prunning in the four regions and for each of the first four years. They include prunning labor expert costs, other labor prunning cost, and cost of gathering branches out of the orchard. These cost figures are a function of the number of trees per hectare, shape and size related to the age of the trees.

In Mount Lebanon, they follow the following pattern; 153 L.L. in the first year, 307 L.L. in the second year, 475 L.L. in third year and 823 in the fourth year, or an increase of 100, 210 and 440 percent. In North Lebanon, the pattern was like the following:- 123 L.L. in the first year, 242 L.L. in the second year 453 L.L. in the third year, 794 in the fourth year, or, an increase of 97, 268 and 545 percent.

In South Lebanon, the range seems like this :-
129 L.L. in the first year, 253 L.L. in the second year,
420 L.L. in the third year and 760 L.L. in the fourth
year, or, an increase of 95, 223 and 484 per cent. In the
Bekaa, the figures are 88 L.L., 149 L.L., 292 L.L. and
530 L.L. or an increase of 70, 232 and 616 per cent.

e. Cost of Fertilizing (chemical and animal manure)

Tables 117 - 128 present the total cost of fertili-
zer for the various regions of Lebanon for the second,
third and fourth years, since the cost for the first year
was accounted for in the original planting expenditures.

These tables include the chemical (super phos-
fate, sulfate of potash, Ammonium sulfa-nitrate, etc...),
the animal (oxen manure, goats, etc...) and the labor costs
for distributing it around the trees. These costs depend
to a large extent on the kind of fertilizer used, number
of trees per hectar, and age of tree.

The costs in Mount Lebanon, North Lebanon, South
Lebanon and Bekaa are as follows:-

In Mount Lebanon, 853 L.L. in the second year,
1,458 L.L. in the third year and 2,032 L.L. on the fourth
year. Taking the first year figure of 511 L.L. as base then
the increase is 66,185 and 298 per cent.

In North Lebanon, 715 L.L. in the second year,
1,022 L.L. in the third year and 1,694 L.L. in the fourth
year.

On the basis of first year figure of 500, the percentage increase is 43, 104 and 239 per cent.

In South Lebanon, 696 L.L. in the second year, 965 L.L. in the third year and 1,443 L.L. in the fourth year. On the basis of first year figure of 400 L.L. the increase is 49, 141 and 260 per cent. In Bekaa, 470 L.L. in the second year, 683 L.L. in the third year and 1,000 L.L. in the fourth year. On the basis of first year cost of 3844, the percentage increase is then 23,78 and 160 per cent.

f. Guarding or care-taking expenses

This item of cost is estimated at 600 L.L. for Mount Lebanon, North Lebanon, and South Lebanon and 750 L.L. for Bekaa.

g. Total capitalized costs

In order to get at the total capitalized costs per hectare in the different regions at the end of the fourth year, compound interest at 5 per cent should be added to the costs beginning from the second to the fourth year as it is shown in the various schedules headed: "Total capitalized costs per hectare." Tables 15-18.

For Mount Lebanon this is amounted to 119, 604,90 L.L. per hectare and cost per tree (400 trees per hectare) of 299 L.L.

For North Lebanon it is 74,974,15 L.L. per hectare and 199.90 L.L. cost per tree (375 trees per hectare).

For South Lebanon it is 90,637.80 L.L. and cost per tree of L.L. 274.70 (330 trees per hectar).

For the Bekaa, it is 42,245 L.L. per hectar and 137.60 L.L. per tree (307 trees per hectár).

It should be pointed out that about 55 percent of this investment in Mount Lebanon, for example, is in land, terracing, and sub-soiling. Thus it is permanent and does not have to be amortized. On the other hand, the investment in the irrigation system, tools and machinery, the trees and their care up to the time that income from apples covers the annual cost of production has to be recovered from profits during the profitable years of the trees so that funds can be accumulated to plant another set of trees and bring them up to profitable bearing age. If during periods of below average rainfall (as has been the case since 1957), yields are reduced to the extent that sales revenues do not cover these costs for reproducing the bearing trees, orchard owners hope to recoup them when yields improve to give larger profits over annual expenses.

Table 15 - Total capitalized

costs per hectar of apple Orchard in Mount Lebanon

	Total cost per hectar L.L.	Cost per hectar 1st year L.L.	Cost per hectar 2nd year L.L.	Cost per hectar 3rd year L.L.	Cost per hectar 4th year L.L.
I. Capitalized Costs	22,748.00				
A. Cost of Land					
B. Original Planting Expenditures					
1. Building the terrace and levelling the land	35989				
2. Digging to an average depth of 75 cms	8167				
3. Construction of Reservoir for Irrigation water	3236				
4. Construction of irrigation canals	1520.90				
5. Cost of Nursery Trees	845.40				
6. Cost of Planting Trees	119.60				
7. Digging around trees 70 cms. in radius	112.20				
8. Fertilized the land with Manure	511				
Total Investment in original planting Expenditures	50,441.10				
C. Cost of Inventory of Machinery	556.20				
D. Cost of care until Bearing Age.					
<u>First year</u>					
a. Filling the soil		179.60	179.60	179.60	179.60
b. Irrigation Expenses		1,705.10	1,705.10	1,710.70	1,710.70
c. Disease Control Expenditures		1,331.50	1,676.60	2,238.80	3,251.50
a) Cost of Insecticides		388.60	480.40	592.20	757.40
b) Cost of operating and Labor spraying Expenses		153.50	307.60	475.30	825.50
d. Pruning Expenses			852.90	1,457.50	2,032.
e. Cost of fertilizing (chemical and animal)		600	600	600	600
f. Guarding, care-taking and Miscellaneous Expenses	4,358.30				
g. Total cost of care in the 1st year					
h. Interest on capital Investment to end of first year at 5%	3,910.20				
Total cost for 1st year	22,113.80				
<u>Second year</u>					
a. Total cost of care of orchard for 2nd year			5,802.20		
b. Interest at 5% on the costs of the 2nd year			290.10		
c. Interest at 5% on the Total cost of first year			4,105.70		
Total cost for 2nd year.	10,198.00		10,198.00		
<u>Third year</u>					
a. Total cost of care of orchard for 3rd year				7,254.10	
b. Interest at 5% on the costs of the 3rd year				362.70	
c. Interest at 5% on the cost of 1st & 2nd years				4,615.60	
Total cost for 3rd year	12,232.40			12,232.40	
<u>Fourth year</u>					
a. Total cost of care of orchard for 4th year					9,356.70
b. Interest at 5% on the costs of the 4th year					476.80
c. Interest at 5% on the costs of 1st, 2nd & 3rd years					5,227.20
Total cost for 4th year	15,060.70				15,060.70
Total capitalized costs per hectar in Mount Lebanon cost per tree (400 trees per hectar) at the end of the 4th year	119,604.90				
	299.00				

Schedule No. 3

Total

capitalized costs per hectare of apple
Orchard in North Lebanon.

	Total Ls. Ls.	capitalized costs per hectare of apple Orchard in North Lebanon.			
		Total cost per hectare Ls. Ls.	Cost per hectare 1st year Ls. Ls.	Cost per hectare 2nd year Ls. Ls.	Cost per hec- tar 3rd year Ls. Ls.
I. Capitalized costs					
A. Cost of Land					
B. Original Planting Expenditures					
1. Building the (terraces) levelling the land	20042.50				
2. Digging to an average depth of 75 cms.	4924				
3. Construction of Reservoirs for Construction water	4006.50				
4. Constructing Irrigation Canals	1447.90				
5. Cost of Nursery Trees	1075.70				
6. Cost of Planting Trees	104.50				
7. Digging around the trees 50 cm. in radius	90.70				
8. Fertilizing the Land with manure	500.10				
Total investment in original planting Expenditures		32181.90			
C. Cost of Inventory of Machinery		260			
D. Cost of care until Bearing Age.					
1. First year					
a. Filling the soil			174.90	174.90	174.90
b. Disease Control Expenditures					
c. Irrigation Expenses					
a) Cost of Insecticides		1279.10	1279.10	1279.10	1279.10
b) Cost of operating & Labor spraying Expenses		1233.60	1676.90	2254.90	3301.60
d. Pruning Expenses		261.80	342.60	385.80	426.30
e. Cost of Fertilizing (chemical & animal)		122.80	242.30	453.20	793.70
f. Guarding, care-taking and Miscellaneous Expenses			715.60	1022.40	1694.30
g. Total cost of care in the 1st year	3672.20	3672.20	600	600	600
h. Interest on capital investment to end of fifth year at 5%			3672.20		
1. Total cost for the 1st year.		2196.90			
2. Second year					
a. Total cost of care of orchard in the 2nd year				5231.40	
b. Interest at 5% on the costs of the 2nd year				261.60	
c. Interest at 5% on the total costs of the 1st year				2306.75	
d. Total cost for the 2nd year.				7799.75	
3. Third year					
a. Total cost of care of orchard in the 3rd year					6170.30
b. Interest at 5% on the costs of the 3rd year					308.50
c. Interest at 5% on the costs of the 1st & 2nd years					2696.70
d. Total cost for 3rd year					9175.50
4. Fourth year					
a. Total cost of care of orchard in the fourth year					8269.90
b. Interest at 5% on the costs of the 4th year					413.50
c. Interest at 5% on the costs of the 1st, 2nd & 3rd years					3155.50
d. Total cost for the fourth year					11838.90
Total capitalized costs per hectare in North Lebanon		11838.90			
		74949.15			
Cost per tree (375 trees per hectare) at the end of the 4th year			199.90		

Table IV - Total capitalized

I. Capitalized costs	
A. Cost of Land	
B. Original Planting Expenditures	
1. Building the (terraces) and levelling of the land	18639.30
2. Digging to an average depth of 75 cms.	649
3. Construction of Reservoirs for Irrigation water	3295.10
4. Constructing Irrigation Canals	1466.50
5. Cost of Nursery trees	808.50
6. Cost of planting trees	121.20
7. Digging around trees 50 cms. in radius	103.90
8. Fertilizing the Land with Manure	399.80
Total Investment in original Planting Expenditures	<u>25383.30</u>
C. Cost of Inventory of Machinery	
D. Cost of care until Bearing Age.	
1. First year	
a. Tilling the soil	
b. Irrigation Expenses	
c. Disease Control Expenditures	
a) Cost of Insecticides	
b) Cost of operating & labors paying Expenses	
d. Pruning Expenses	
e. Cost of Fertilizing (chemical & animal)	
f. Guarding, care-taking and Miscell. Expenses	
g. Total cost of care in the 1st year	
h. Interest on capital Investment to end of fifth year at 5%	
1. Total cost for the 1st year	
2. Second year	
a. Total cost of care of orchard in the 2nd year	
b. Interest at 5% on the costs of the 2nd year	
c. Interest at 5% on the total cost of the 1st year	
d. Total cost for the 2nd year	
3. Third year	
a. Total cost of care of orchard in the 3rd year	
b. Interest at 5% on the costs of the 3rd year	
c. Interest at 5% on the total cost of the 1st and 2nd years	
Total cost for the 3rd year	
4. Fourth year	
a. Total cost of care of orchard in the 4th year	
b. Interest at 5% on the costs of the 4th year	
c. Interest at 5% on the total cost of the 1st, 2nd and 3rd year	
d. Total cost for 4th year	
Total capitalized cost per hectar in South Lebanon	
Cost per tree (330 trees per hectar) at the end of the 4th year.	

costs per hectar of apple orchard in the South Lebanon.

Total cost per hectar	Cost per hectar 1st year	Cost per hectar 2nd year	Cost per hectar 3rd year	Cost per hectar 4th year
L.L.	L.L.	L.L.	L.L.	L.L.
29187				
25383.30				
800				
	185.20	185.20	185.20	185.20
	1048.40	1048.40	1051.10	1051.10
	1214.50	1463.50	1384.10	2918.50
	290.20	304.80	342.70	409.50
	128.90	252.80	419.50	760.60
		696.20	964.90	1442.80
	600	600	600	600
3467.20	<u>3467.20</u>	<u>4550.90</u>	<u>5547.50</u>	<u>7367.70</u>
2941.90				
<u>61779.40</u>				
		4550.90		
		227.50		
		3089.		
7867.40		<u>7867.40</u>		
			5547.50	
			277.40	
			<u>3482.30</u>	
9307.20			<u>9307.20</u>	
				7367.70
				368.40
				<u>3947.70</u>
11683.80				<u>11683.80</u>
90637.80				
274.70				

Table 18
Schedule No.4 - Total Capitalized Costs

per Hectar of Apple Orchard in the Bekaa.

	Total cost per hectar L.L.	Cost per hectar 1st year L.L.	Cost per Hectar 2nd year L.L.	Cost per Hectar 3rd year L.L.	Cost per Hectar 4th year L.L.
I. Capitalized Costs.					
A. Cost of Land.	16088				
B. Original Planting Expenditures					
1. Digging to a depth of 50-75 cms	164.40				
2. Constructing Irrigation Canals	1462.90				
3. Cost of Nursery Trees	592.30				
4. Cost of Planting Trees	60.65				
5. Digging Around Trees 50 cms in radius	47.50				
6. Fertilizing the Land with manure	384.10				
	<u>2711.80</u>				
C. Cost of Inventory of Machinery	958.40				
D. Cost of care until Bearing Age.					
1. First year					
A. Filling the soil		76.80	76.80	78	78
b. Irrigating expenditures		411.90	411.90	418	418
c. Disease Control Expenditures					
a) Cost of Insecticides		1101.30	1339.50	1952.30	2491.60
b) Cost of operating & Labor spraying Expenses		242.90	289.80	343.60	411.60
d. Spraying Expenses		88.60	149.20	292.60	530.50
e. Cost of fertilizing (chemical & animal)			470.30	683.30	999.70
f. Guarding, care-taking & Miscell. expenses		750	750	750	750
g. Total cost of care in the 1st year	2671.50	<u>2671.50</u>			
h. Interest of 5% on capital Investment to the end of fifth year	1121.50				
i. Total cost for the 1st year	<u>3851.20</u>				
2. Second year					
a. Total cost of care of Orchard in the 2nd year			3487.50		
b. Interest at 5% on the costs of the 2nd year			174.40		
c. Interest at 5% on the total costs of the 1st year			1177.60		
d. Total cost for the 2nd year	4839.50		<u>4839.50</u>		
3. Third year					
a. Total cost of care of orchard in the 3rd year				4517.80	
b? Interest at 5% on the costs of the 3rd year				225.90	
c. Interest of 5% on the total costs of the 1st and 2nd years				1419.50	
d. Total cost efor the 3rd year	6163.20			<u>6163.20</u>	
4. Fourth year					
a. Total cost of care of orchard in the 4th year					5679.40
b. Interest at 5% on the costs of the 4th year					284.00
c. Interest at 5% on the total costs of the 1st, 2nd and 3rd years					1727.70
d. Total cost for the 4th year	7691.10				<u>7691.10</u>
Total capitalized cost per hectar in the Bekaa	42245				
Cost per tree (307 trees per hectar) at the end of the 4th year	137.60				

Table 19

Summary of Capitalized Costs of Apple
Orchards In The Four Regions of Lebanon.

Name of region	Total cost per hectar L.L.	No. of Trees per hectar Area as Wts.	Total Cost per tree L.L.	Cost per tree In Terms of Mount Lebanon 400 trees per hectar as in Mount Lebanon.
Mount Lebanon	119604.90	400	299	299
South Lebanon	90637.80	330	274.70	227
North Lebanon	74949.15	375	199.90	187
Bekaa	42245	307	137.60	106

B.- Annual Increases in Production Costs.

After the fourth year, experts in different regions of Lebanon have estimated the increase in costs from year to year according to the following pattern:

5- 6 years	an increase of	5%	over costs for fourth year.
7 - 8	" " " "	10%	" " " " "
9 -10	" " " "	15%	" " " " "
10 and over	" " " "	17 1/2 - 20%	" " " "

The percentage figures are based on the costs of the fourth year, that is 4th year costs are considered 100 per cent. The results of these calculations are presented in Tables 20 - 23 headed " Total Production Costs Per hectar". The costs for the 11 year are considered applicable to all the years during which apple trees are in full production.

Table 20 - Total Production

Costs per Hectar in Mount Lebanon

(No. of Trees per hectar is 400)

	Total cost per hectar <u>L.L.</u>	Cost per hec- tar 5-6 year <u>L.L.</u>	Cost per hectar 7-8 <u>L.L.</u>	Cost per hectar 9-10 year <u>L.L.</u>	Cost per hectar 11 add above years <u>L.L.</u>
A. Total capitalized costs per hectar in Mount Lebanon at the end of 4th year	II9,604.90				
Total cost of care of orchard for 5-6 years		I9649.06			
Interest at 10% on the costs of the 5-6 years		I964.90			
Total cost for 5 & 6th years	21,613.95				
Total cost of care of orchard for 7-8 years			22,546.10		
Interest at 10% on the costs of the 7-8 years			<u>2,254.60</u>		
Total cost for the 7th & 8th year	24,800.70		24,800.70		
Total cost of care of orchard for 9-10 years				24,327.40	
Interest at 10% on the costs <small>OS aldsT</small> of the 9-10 years				<u>2,432.75</u>	
Total cost for 9th-10 year	26,760.15			<u>26,760.15</u>	
Total cost of care of orchard for the 11th year					11,228.05
Interest at 10% on the costs of the 11th year					<u>1,122.80</u>
Total cost of the 11th year	<u>12,350.85</u>				<u>12,350.85</u>
Total cost of Production at the end of the 11th year	205,130.55				12,350.85

Table 21 - Total Production

	<u>Total cost per hectar L.L.</u>
Total capitalized cost per hectar in North Lebanon at the end of 4th year	74,949.15
Total cost of care of orchard for 5-6 years Interest at 10% on the costs of 5-6 years Total cost for 5-6 years	20,013.20
Total cost of care of orchard for 7-8 years Interest at 10% on the costs of 7-8 years Total cost for 7-8 years	21,832.65
Total cost of care of orchard for 9-10 years Interest at 10% on the costs of 9-10 years Total cost for 9-10 years	23,651.90
Total cost of care of orchard for 11th year Interest at 10% on the cost of 11th year Total cost of the 11th year	<u>10,916.30</u>
Total cost of Production at the end of the 11th year	151,363.20

costs per Hectar in North Lebanon.
(No. of trees per hectar is 375)

<u>Cost per hectar 5-6 year L.L.</u>	<u>Cost per hectar 7-8 year L.L.</u>	<u>Cost per hectar 9-10 year L.L.</u>	<u>Cost per hectar 11 and above year L.L.</u>
18193.80 1819.40			
	19,847.85 <u>1,984.80</u> 21,832.65		
		21,501.70 <u>2,150.80</u> 23,651.90	
			9,923.90 <u>992.40</u> <u>10,916.30</u>

Table 22 - Total Production

	Total cost per hectar L.L.
Total capitalized cost per hectar in Lebanon at the end of 4th year	90,637.80
Total cost of care of orchard for 5-6 year	
Interest at 10% on the costs of 5-6 years	
Total cost for 5-6 years	17,829.80
Total cost of care of orchard for 7-8 years	
Interest at 10% on the costs of 7-8 years	
Total cost for 7-8 years	19,450.75
Total cost of care of orchard for 9-10 years	
Interest at 10 % on the costs of 9-10 years	
Total cost for 9-10 years	21,071.60
Total cost of care of orchard for 11th year	
Interest at 10% on the cost of 11th year	
Total cost of the 11th year	9,725.30
Total cost of Production at the end of the 11th year	<u>158,715.20</u>

Costs in South Lebanon
(No. of trees per hectar is 330)

Cost per hectar 5-6 years L.L.	Cost per hectar 7-8 years L.L.	Cost per hectar 9-10 years	Cost per hectar 11 and above years L.L.
<u>16,208.90</u> 1,620.90			
	17,632.50 <u>1,763.25</u> 19,450.75		
		19,156.00 <u>1,915.60</u> 21,071.60	
			8,941.20 <u>894.10</u> 9,725.30

Table 23 - Total production costs

	Total cost per hectar <u>Ls. Ls.</u>
Total capitalized cost per hectar in Bekaa at the end of 4th year	42,245.00
Total cost of care of orchard for 5-6 years	
Interest at 10% on the costs of 5-6 years	
Total cost for 5-6 years	13,744.20
Total cost of care of orchard for 7-8 years	
Interest at 10% on the costs of 7-8 years	
Total cost for 7-8 years	14,993.60
Total cost of care of orchard for 9-10 years	
Interest at 10% on the costs of 9-10 years	
Total cost for 9-10 years	16,243.00
Total cost of care of orchard for 11th year	
Interest at 10% on the cost of 11th year	
Total cost of the 11th year	<u>7,496.80</u>
Total cost of Production at the end of the 11th year	94,722.60

per hectar in Bekaa
(No. of Trees per hectar is 307)

Cost per hectar for the 5-6 years <u>Ls. Ls.</u>	Cost per hectar 7-8 year <u>Ls. Ls.</u>	Cost per hectar 9-10 years <u>Ls.</u>	Cost per hectar 11 and above year <u>Ls. Ls.</u>
12,494.70			
<u>1,249.50</u>			
	13,630.55		
	<u>1,363.05</u>		
	<u>14,993.60</u>		
		14,766.40	
		<u>1,476.60</u>	
		<u>16,243.00</u>	
			6,815.30
			<u>681.50</u>
			<u>7,496.80</u>

per hecter in Bokna
(No. of Trees per hecter is 307)

Cost per hecter
for the 5-6 years
Ls. Ls.

Cost per hecter
7-8 year
Ls. Ls.

Cost per hecter
9-10 years
Ls.

Cost per hecter
11 and above year
Ls. Ls.

12,494.70
1,242.50

13,630.55
1,363.05
14,993.60

14,766.40
1,476.60
16,243.00

6,815.30
681.50
7,496.80

Statement of Revenue and Expenditures Per hectar in
Mount Lebanon, North Lebanon, South Lebanon, and Bekaa.

Year	Production per hectar kgs.	Price per kg. L.L.	Total Revenue L.L.	Total Costs ¹ (production & interest) L.L.	Total Loss L.L.
<u>Mount Lebanon</u>					
5-6 2 yrs.	4,800	.42	2,016	21,613.95	19,597.95
7-8 2 yrs.	16,000	.42	6,720	24,800.70	18,080.70
9-10 2 yrs.	24,000	.42	10,080	26,760.15	16,680.00
11 and over 1 yr.	18,000	.42	7,560	12,350.85 ²	4,790.85
<u>North Lebanon</u>					
5-6 2 yrs.	4,500	.51	2,295	20,013	17,718
7-8 2 yrs.	15,000	.51	7,650	21,832	14,182
9-10 2 yrs.	22,500	.51	11,475	23,651	12,176
11 and over 1 yr.	16,875	.51	8,606	10,916 ²	2,310
<u>South Lebanon</u>					
5-6 2 yrs.	3,960	.38	1,505	17,829.80	16,324.80
7-8 2 yrs.	13,200	.38	5,016	19,450.75	14,434.75
9-10 2 yrs.	21,800	.38	8,284	21,071.60	12,787.00
11 and over 1 yr.	14,850	.38	5,643	9,725.30 ²	4,082.30
<u>Bekaa</u>					
5-6 2 yrs.	3,684	.32	1,179	13,744	12,565.00
7-8 2 yrs.	12,280	.32	3,929	14,993	11,064.00
9-10 2 yrs.	18,420	.32	5,894	16,243	10,349.00
11 and over 1 yr.	13,815	.32	4,421	7,496 ²	3,075.00

1. Data from Tables 15, 16, 17, 18.

2. Annual production expenses only, without interest on capitalized costs, but including 10 percent normal profit on the annual production costs.

Statement of Revenue and Expenditures Per hectar in
Mount Lebanon, North Lebanon, South Lebanon, and Bekaa.

Year	Production per hectar kgs.	Price per kg. L.L.	Total Revenue L.L.	Total Costs ¹ (production & interest) L.L.	Total Loss L.L.
<u>Mount Lebanon</u>					
5-6 2 yrs.	4,800	.42	2,016	21,613.95	19,597.95
7-8 2 yrs.	16,000	.42	6,720	24,800.70	18,080.70
9-10 2 yrs.	24,000	.42	10,080	26,760.15	16,680.00
11 and over 1 yr.	18,000	.42	7,560	12,350.85 ²	4,790.85
<u>North Lebanon</u>					
5-6 2 yrs.	4,500	.51	2,295	20,013	17,718
7-8 2 yrs.	15,000	.51	7,650	21,832	14,182
9-10 2 yrs.	22,500	.51	11,475	23,651	12,176
11 and over 1 yr.	16,875	.51	8,606	10,916 ²	2,310
<u>South Lebanon</u>					
5-6 2 yrs.	3,960	.38	1,505	17,829.80	16,324.80
7-8 2 yrs.	13,200	.38	5,016	19,450.75	14,434.75
9-10 2 yrs.	21,800	.38	8,284	21,071.60	12,787.00
11 and over 1 yr.	14,850	.38	5,643	9,725.30 ²	4,082.30
<u>Bekaa</u>					
5-6 2 yrs.	3,684	.32	1,179	13,744	12,565.00
7-8 2 yrs.	12,280	.32	3,929	14,993	11,064.00
9-10 2 yrs.	18,420	.32	5,894	16,243	10,349.00
11 and over 1 yr.	13,815	.32	4,421	7,496 ²	3,075.00

1. Date from Tables 15, 16, 17, 18.

2. Annual production expenses only, without interest on capitalized costs, but including 10 percent normal profit on the annual production costs.

costs which the owner must recover from the sale of apples total L.L. II,789,45. At the average price of 42 piasters for apples in Mount Lebanon, a yield of 28,070 kilograms per hectare is needed to cover these annual costs. With 400 trees per hectare, the yield per tree has to be 70 kilograms in order to break even. Since orchards with ample irrigation water are harvesting 100 kilograms per mature tree, it is apparent that such orchards are showing a profit above annual production costs.

Table 15 shows that the total capitalized costs per hectare of orchard in Mount Lebanon at the end of the fourth year amounted to L.L.II9.604.90. The statement of revenues and expenses on p. 68 indicates that accumulated deficit for the six years of the fifth through the tenth had amounted to L.L. 54,358.65. Thus, the total capitalized costs at the end of the 10 year aggregate L.L.I73,963.55 per hectare. We find further that the investment in the land, terraces and subsoiling amounted to L.L.66,849,00. When this sum is deducted from the capitalized cost at the end of the tenth year, there remains the sum of L.L. 107,119.55 representing the reproduction cost of the profitable producing orchard.

In order to obtain a sum equal to 5 percent interest on this amount, the orchardist must sell 12,761 kilograms of apples. This is equivalent to 32 kilograms per tree when there are 400 trees per hectare. Adding these 32 kilograms to the

70 kilograms per tree needed to cover the annual production costs, it becomes evident that a yield of over 100 kilograms, per tree will cover both annual expenses and interest on the capitalized cost of the bearing orchard 10 years old. This indicates that orchards in Mount Lebanon with adequate irrigation water for mature trees can cover all expenses necessary to continue producing apples. However there is no net profit to give any return on the investment in land, terraces, and sub-soiling.

If we assume that well irrigated and properly cared for trees will produce profitably for 20 years (i.e. from 10 years to 30 years of age) it is necessary to amortize the cost of reproducing the producing orchard at the rate of 5 percent per year. This will require 32 kilograms of apples per tree each year. Thus, in order to cover all costs and be able to replace the orchard with profits from the sale of the fruit, an apple grower in Mount Lebanon needs to get an average yield of 130-135 kilograms per mature tree per year at the costs and prices found in this study.

Similar calculations can be made for each of the other regions. The number of kilograms of apples per tree required to cover annual production costs, interest on the capitalized costs of bringing the orchard up to profitable production, and amortizing these costs, will vary according to the

circumstances in each season. Orchard owners who have an ample supply of irrigation water to provide their trees with the amount required for maximum production have the best chance to earn returns on their investment in the orchard. Those who do most of their own-work and are more productive than hired workers will earn better than average returns from their apple trees.

1. Cost of Labor in Relation to Total Production Costs.

The following table for the average cost of Production per hectare in Mount Lebanon for the fourth year segregates the various costs of care during the year into two categories: Labor cost and other costs. Labor cost, on the other hand, is divided into ordinary labor that can be performed by the farmer and his family and specialized labor which he needs to employ the technical work of pruning.

It is apparent from the table that the cost of the work that can be done by the owners of orchards is about one third or 33 per cent of the total cost. It is about 20% in tilling, 75% in irrigating, 82% in spraying, 65% in pruning, 3% in fertilizing and 83% of the miscellaneous work. The variation in the percentage that labor is of the cost of the different operations is related to the amount of materials, machinery use, and other non-labor items required.

In this analysis of labor costs the work done by the farmer himself has been separated from other ordinary labor that he hired and the cost of the specialist who does the technical work of pruning. About two thirds of the area of the orchards in Mount Lebanon included in the survey were owned by non-working orchardists who hired most of the work done. This work could be done by a working farmer and is added to the work actually done to get the total expense for ordinary labor. The cash expenditures by working farmers to grow a crop of apples are, therefore, about one-third less than for those who have to hire the orchard work done.

Average Cost of Labor in Relation to Average
Total Production Costs per Hectar in
Mount Lebanon for the Fourth Year.

	Average cost of ordinary labor by Farmers		Average cost of other Ordinary Labor		Specialized Labor cost		Other Total average cost		
	L.L.	p. %	L.L.	%	L.L.	%	L.L.	%	
Tilling	5.7	(3.2%)	30	(16.8%)			143.90	(80%)	I79.60
Irrigati- ng.	134	(7.5%)	1151.70	(68%)			425	(24.5%)	I710.70
Disease Control a) cost of insecticide							325I.50	(100%)	325I.50
b) Cost of ope- rating	56	(7.4%)	609	(80.4%)			92.40	(12.2%)	757.40
Pruning	56	(6.8%)	488.50	(59.2%)	28I	(34%)			825.50
Fertili- zing	6	(3 %)	5I	(2.5%)			1975	(97.2%)	2032
Misc.			500	(83 I/3%)			100	(16 2/3%)	600
All operations	257.70	(2 3/4%)	2830.20	(30 1/4%)	28I	(3%)	5987.80	(64%)	9356.70 (100%)

CHAPTER IV

CONCLUSION

The results reached at the culmination of this study were surprising in that they indicated the majority of apple growers are not covering their costs of production, not even their annual variable costs of operating their orchards.

One of the main reasons for this state of affairs is the fact that the average yield per tree at the peak of production between the 10th and 20th years is about 45 kilograms. This low yield is less than half what well irrigated apple trees produce and is mainly due to the scarcity of water available and which quantity has not expanded with the passage of time. Hence, as the trees increased in age and therefore in size there has not been a concomitant increase in the quantity of water, thus keeping annual crop yields very small. It should be pointed out that rainfall in Lebanon generally has been much below normal since 1957 so that yields per tree have been less than in earlier years when more irrigation water was available for apple trees.

Another reason for the loss is the high cost of production. The capitalized costs till bearing age include the current cost of land, terracing, construction of reservoirs and irrigation canals, inventory of machinery, etc... and it is very great. Even the costs of planting the trees and caring for them until bearing age amount to L.L. 25,000 to L.L.60,000

per hectare. These fixed costs are not taken into consideration by the farmers. The cost of the reservoirs, canals, machinery and tools have to be depreciated at specified rates so that their original costs will be re-couped over a number of years to provide the money for replacing them.

Regarding the cost of care of an orchard to bearing age and after, as tilling, irrigating, disease control, pruning, fertilizing, etc... are very high for several reasons pointed to in the second chapter under the headings, Problems relative to irrigation, spraying, fertilizing, etc... the farmers are ignorant of recommended practices and need and advice. They are like one who has a lence but does not know how to use it. For instance, five sprayings instead of fourteen might be sufficient if the farmer knew the best time to use a certain insecticide and what chemical is effective to combat a particular disease. Farmers cooperatives are of significance here. They help the farmer to get the chemicals needed at reduced prices and lower his cost of production and marketing.

One may say that since orchardists are losing, why then are they still continuing in this business ?

We know in economics that an entrepreneur may still remain in business even if he is not covering his fixed costs in the short run, but he cannot still be in business without covering his variable costs.

To answer this question, the owners of orchards should be divided into two categories: Those who rely for their living solely on their orchards, and those who have supplementary income that is who do not depend on apples for their living.

Many of those farmers who depend on apples for their living told me that they were losing and a number of them had actually begun to take out apple trees and plant instead either grapes or nuts. On the other hand, those who are still undertaking the apple business have supplementary income from elsewhere and carry on this business for prestige and similar reasons irrespective of economic returns (Psychological factor).

I shall conclude by saying that discussions with dealers, suppliers of fertilizers, chemicals and other supplies to apple growers tend to confirm my findings. Unless producers are guided to adopt practices to lower the cost of production and devise means to increase the quantity of water available, then an inevitable catastrophe will soon engulf the apple industry in Lebanon.

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INTERVIEWS

Mr. Adel Kortas	Agriculture Engineer and Member of Fruits Board
Mr. Timothy Mealouf	Agriculture Engineer
Mr. Fouad Najjar	Agriculture Engineer
Mr. Oscar Asali	Agriculture Engineer
Mr. Ahmed Itani	Agriculture Engineer
Mr. Nabil Saadé	Agriculture Economist
Mr. Mandouh Namli	Member of Fruit Board
Mr. Hussein Hagg	Member of Fruit Board
Mr. Suheil Ramadan	Fruit Board Advertising committee
Mr. Rasheed Idriss	Director of Technical Department in the Fruit Board.

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Appendix

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A P P E N D I X

DETAILED TABLES RELATED TO THE CAPITALIZED
COSTS IN THE FIRST FOUR YEARS

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A. Cost of Land in Mount Lebanon.

Orchard situation.	Number of orchards	Area of Apples planted hectars	No. of trees per hectar Weighted average
Mata	3	8.10	370
Q naba, Aley	2	20	472
Solel and sur- roundings	6	10.60	422
Kestran	3	12.40	390
Dahr-Baydar Gannin	2	1.20	326
Mughira Kertoba	3	1.20	276
Alouna-Uneitra	2	37.20	422
Total	24	100	

A. Cost of Land in Mount Lebanon

Table 23

410

Cost per tree (2274)

Total cost is the result of multiplying the area of orchards by price of apples (All measures of area are transferred into hectares)

Hectar " " " 10000 sq. meters.
Dunum is equal to 2500 sq. meters

Average No. of Trees per hectar
Average cost per hectar

A. Cost of Land in Mount Lebanon.

Orchard situation.	Number of orchards	Area of Apples planted hectar	No. of trees per hectar Weighted average
Matn	3	8.10	270
Q uada' Aley	5	20	452
Sofer and sur- roundings	6	10.60	428
Kesruan	3	15.40	390
Dahr-Baydar Sannin	2	7.20	326
Mughira Kortoba	3	1.20	876
Akoura-Uneitra	2	37.50	422
Total	24	100	

Average cost per hectar

Average No. of Trees per hectar

Dunum is equal to 919.30 sq. meters

Hectar " " " 10000 sq. meters.

(All measures of area are transferred into hectar)

Total cost is the result of Multiplying the area of orchards by price of sq. meter in each district.-

Table 23

Total cost L.L.	av. cost/hectar (Weights area planted) L.L.
193200	23852
508946	25447
839800	79283
307600	19974
101215	14058
24000	20000
300000	8000
2274761	

22748

Cost per tree (22748 : 410 = 55.48 L.L.)

A. Cost of Land in North Lebanon

Orchard situation.	Number of orchards	Area of Apples planted hectar	No. of trees per hectar <u>Weighted average</u>
Bhosprein-Sier-Akkar	3	13.50	278
Dennieh-Kouttin	4	7.40	605
Tannourin	2	3.20	476
Hasroun	3	2.70	515
Besharri	5	15.50	374
Ehden	3	6.7	373

Total 20 orchards 38.5
 Average cost per hectar
 Average No. of Trees per hectar 403

Cost per tree (7824 : 403 = 19.41 LL.)

Kadné equals 3000 sq. meters.

Dunum " 919.30 sq. meter

Feddan " 4200 sq. meters

Hectar " 10,000 sq. meters.
 (all area measures are transferred into hectors)

Total cost is reached by multiplying the area of orchards by the Price of square meter in each district.

Table 24

Total cost L.L.	^{average} cost/hectar (Weights area planted) L.L.
59500	4407
30755	4156
17010	5315
60535	22420
56425	11265
77000	11492
<u>302225</u>	<u>7824</u>

A. Cost of Land in South Lebanon.

Orderd situation	Number of orchards	Area of Apples planted hectars	No. of trees per hectar
Toubaia	1	4.20	400
Jessin	4	27.80	278
Moukbara	1	2.80	438
A. Cost of Land in South Lebanon			
		34.80	497
Total		39.80	

Table 25
Average cost per hectar

Average No. of Trees per hectar

338

Cost per tree (338) : 338 = 2.60 L.L.

Duration is equal to 219.30 sq. meters

Hectar is " 10000 sq. meters

(All area hectares are transferred into hectars)

Total cost is the result of multiplying the area of orchards by the price of

A. Cost of Land in South Lebanon.

Orchard situation	Number of orchards	Area of Apples planted hectar	No. of trees per hectar Weighted average
Joubelh	1	4.20	400
Jezzih	4	25.80	278
Moukhtara	1	2.80	436
Barouk-Nabh Safa	6	6.50	497
Total	12	39.30	
Average cost per hectar			<u>332</u>
Average No. of Trees per hectar			<u>332</u>

Cost per tree (29187 : 332 = 8.60 LL.)

Dunum is equal to 919.30 sq. meters

Hectar is " " 10000 sq. meters

(All area Measures are transferred into hectors)

Total cost is the result of multiplying the area of orchards by the Price of a square meter.

Table 25

Total cost L.L.	average cost/hectar (Weights area planted) L.L.
21200	4762
705722	27423
55160	20000
365000	56154
<u>1147082</u>	<u>23187</u>

A. Cost of Land in the Bekaa.

<u>Number of trees</u>	<u>Area of apices planted per hectare</u>	<u>Number of orchards</u>	<u>Orchard situation</u>
330	75.00	3	Idzai
270	40	3	Tahayai
415	1.90	3	Tahayai
304	18	3	Harbach
288	18.20	3	Sahie
	<u>154</u>	<u>15</u>	<u>Total</u>

A. Cost of Land in the Bekaa

~~-----~~
 Average cost per hectare
 Average No. of trees per hectare
 Cost per tree (1000 + 307 = 1307 L.L.)
 Diameter is equal to 21.30 cm.
 Hectare " " 10000 sq. meters

(All area measured and transferred into hectares)

Total cost is reached by multiplying the area of orchards by the price

A. Cost of Land in the Bekaa.

<u>Orchard situation</u>	<u>Number of orchards</u>	<u>Area of Apples planted hectar</u>	<u>No. of trees per hectar</u> <u>Weighted average</u>
Istabl	3	75.90	336
Tahnayel	3	46	270
Taalbaya	2	1.90	415
Baalbeck	3	12	307
Zahlé	3	18.20	269
Total	14	154	

Cost of Land in the Bekaa

Average cost per hectar

Average No. of trees per hectar

Cost per tree (16083 : 307 = 59.40 L.L.)

Dunum is equal to 919.30 sq. meters

Hectar " " 10000 sq. meters

(All area measures are transferred into hectars)

Total cost is reached by multiplying the area of orchards by the price

Table 26

Total cost L.L.	<i>average</i> cost/hectar (weights area planted) L.L.
937457	12351
699284	15202
30970	16300
12832	8736
705000	38736
<hr/> 2477543	<hr/> <hr/> 16088

of a square meter.

B. Original planting Expenditures: 1. Building the Terraces and

<u>Order</u>	<u>Number of</u>	<u>Area of Apricot</u>	<u>No. of Trees</u>
<u>planted</u>	<u>orchards</u>	<u>per hectare</u>	<u>per hectare</u>
Main	3	8.10	870
Quada Aley	2	80	478
Solar and surroundings	6	10.60	438
Kestran	3	12.40	390

B. Original Planting Expenditures

<u>Order</u>	<u>Number of</u>	<u>Area of Apricot</u>	<u>No. of Trees</u>
<u>planted</u>	<u>orchards</u>	<u>per hectare</u>	<u>per hectare</u>
1. Building the Terraces and leveling the Land in Mount Lebanon	3	1.80	878
	2	37.30	438

Total 100

Average cost per hectare 410
Average No. of Trees per hectare

410

Cost per tree (37329 : 410 = 91.05 L.L.)

Dump is equal to 219.30 sq. meters
Hector " " " 1000 sq. meters.

(All area measures are transferred into hectares)

Total cost is the result of multiplying the number of days of work by the

B. Original planting Expenditures: 1. Building the Terraces and

Orchard situation.	Number of orchards	Area of Apples planted hectar	No. of Trees per hectar
Matn	3	8.10	270
Quada Aley	5	20	452
Sofar and surroundings	6	10.60	428
Kesruwan	3	15.40	390
Dahr-Baydar Sannin	2	7.20	326
Mughira-Kortoba	3	1.20	876
Akoura-Uneitra	2	37.50	422
Total	24	100	
Average cost per hectar			<u>410</u>
Average No. of Trees/hectar			<u>410</u>

Cost per tree (35929 : 410 = 87.63 L.L.)

Dunum is equal to 919.30 sq. meters

Hectar " " " 10000 sq. meters.

(All area measures are transferred into hectares)

Total cost is the result of multiplying the number of days of work by the price per worker per day in each district.

Table 27

Levelling the Land in Mount Lebanon.

Total cost L.L.	av. cost/her hectar wt. by area.
267400	33022
623437	31172
346450	32624
525300	34110
255300	39625
45000	37500
1500000	40000
<u>3592887</u>	

35929

B. Original planting expenditures 1. Building the terraces and

Number of orchards	Area of apples planted hectars	No. of trees per hectar
-----------------------	-----------------------------------	----------------------------

3	13.70	272
4	7.40	602

B. Original Planting Expenditures

1. Building the Terraces and Leveling

Number of hectars	Average cost per hectar	Average number of trees per hectar	Total
13.70	272	272	374
7.40	602	373	373
	332		403

Cost per tree (2000 L.S. = 42.73 L.S.)

Hectar	10000 sq. meters	272
Fogdan	4200 sq. meters	602
Duma	2100 sq. meters	1204
Kabul	3000 sq. meters	1204

(All measures of area are translated into hectares).

Total cost is the result of multiplying the number of days of work by the

B. Original planting Expenditures: 1. Building the terraces and

Orchard situation.	Number of orchards	Area of Apples planted hectar	No. of Trees per hectar
Elmsprein-Sier-Akdar	3	13.50	278
Donnich-Kettin	4	7.40	605
Tannourin	2	3.20	476
Hasroun	3	11.70	515
Besharri	5	5	374
Ehden	3	6.7	373
Total	20	39.5	

Average cost per hectar

Average Number of Trees per hectar

403

Cost per tree (20042.50 : 403 = 49.73 L.L.)

Kadn4 is equal to 3000 sq. meters

Dunun " " 919.30 sq. meters

Feddan " " 4200 sq. meters

Hectar " " 10000 sq. meters.

(All measures of one are transferred into hectares).

Total cost is the result of multiplying the number of days of work by the price per worker per day.

Table 28

Levelling the Land in North Lebanon.

Total cost L.L.	av. cost/hectar wt. by area (Area as weights)
229600	9600
88925	22016.90
80225	85047
82500	30555.56
158288	31657.60
232800	34746.26
771638	20042.50

B. Original Planting Expenditures : 1. Building the Terraces and

Orchard situation.	Number of orchards.	Area of Apples planted Hectar	No. of Trees per hectar
Joubelh	1	4.20	400
Q uada Jizzin	4	25.80	278
Mouchtara	1	2.80	436
Barouk-Nabh Safa	6	6.50	497
Total	12	39.30	

average
 Total cost per hectar
average
 Total No. of trees / hectar

339

Dunum is equal to 919.30 sq. meters
 Hectar " " " 10000 sq. meters

Cost per tree (18639.31 : 339 = 55.10 L.L.)

(All area measures are transferred into Hectars)

Total cost is the result of multiplying No. of days of work by Price per worker per day in each district.

Table 29
 Levelling the Land in South Lebanon.

Total cost L.L.	av. cost/hectar wt. by area
63,625	15149
501,000	19418.60
56,100	20036
111,800	18153.80
<u>732,525</u>	
	<u>18,633.31</u>

B. Original Planting Expenditures: 2. Digging to an average depth

Orchard location	Number of orchards	Area of Apples planted -hectar	Number of trees per hectar (weighted average)
Mata	3	8.10	12700
Q. naba, Aley	2	20.00	422
Q. naba and surroundings	6	10.50	422
Kestriyal	3	12.40	390

B. Original Planting Expenditures

2. Digging to a depth of about 75 cms.

in Mount Lebanon

Amounts - Lira	Total
37.20	100

Total cost per hectar

Cost of trees per hectar

Cost per tree (816v : 410 = 19.92 L.L.)

10,000 sq. meters

10,000 sq. meters

(All the measures are converted into hectares).

Total cost is reached by multiplying the number of work days by the price

B. Original Planting Expenditures: 2. Digging to an average depth

Orchard situation.	Number of orchards	Area of Apples planted -hectar	Number of trees per hectar (weighted average)
Matn	3	8.10	2700
Q uada'Aley	5	20.00	452
Sofar and surroundings	6	10.60	428
Kesruwan	3	15.40	390
Dahr-Baydar-Samin	2	7.20	326
Mughira-Kortoba	3	11.20	876
Akoura-Uheitra	2	37.50	422
Total	24	100	

Total cost per hectar

No. of Trees per hectar

410

Cost per tree (8167 : 410 = 19.92 L.L.)

Dunum equals 919.30 per sq.meters

Hectar " 10,000 sq. meters.

(All are measures are converted into hectars).

Total cost is reached by multiplying the number of work days by the price per worker per day.

Table 30
of 75 cms. in Mount Lebanon.

Total cost L.L.	Average cost per hectar (Areas as weights) L.L.
54000	6667
156250	7813
79525	7502
117000	7597
62265	8648
10500	8750
337200	8992
816740	

8167

B. Original Planting Expenditures-- Digging to an average depth of 75 cm.

Orchard section	Number of Orchards	Area of Apples planted Hectar	Number of trees per hectar (Weighted average)
Bashayin-Sier Akkar	3	1350	278
Donnater-Kettin	4	740	607
Tannourin	2	320	476
Hazroun	4	270	212
Bashayri	2	2	374
		6.7	373
		<u>38.2</u>	

B. Original Planting Expenditures
 a. Digging to a depth of about 75 cm in North Lebanon

Average cost per hectar

Table 31

Average No. of trees per hectar

Cost per tree	(49% = 40% = 10% L.L.)
Hectar	10,000 sq. meters
Peddan	4200 sq. meters
Dunn	2120 sq. meters
Mains considered to equal 3000 sq. meters	

(All area measures are converted into hectares)

Total cost is reached by multiplying the number of work days by the price

403

B. Original Planting Expenditures:- Digging to an average depth of 75 cms.

Orchard si- tuation.	Number of Orchards	Area of Apples planted Hectar	Number of Trees per hectar (Weighted average)
Bhosfrein-Sier Akkar	3	1350	278
Donnieh-Kottin	4	7.40	605
Tannourin	2	3.20	476
Hasroun	4	2.70	515
Besharri	5	5	374
Ehden	3	6.7	373
Total	21	38.5	

Average cost per hectar

18.15

Average No. of Trees per hectar

403

Cost per tree (4914 : 403 = 12.19 L.L.)

Kadne considered to equal 3000 sq. meters

Dunum " " " 919.30 sq. meters

Feddan " " " 4200 sq. meters

Hectar " " " 10,000 sq. meters.

(All area measures are converted into hectar)

Total cost is reached by multiplying the number of work days by the Price per worker per

B. Original Planting Expenditures - Digging to an average depth of 75 cms

Number of trees planted per hectare (weighted average)	Area of Apices planted Hectare	Number of Orchards	Original Planting Expenditures
400	4.80	1	10000
278	27.80	4	40000
436	8.80	1	10000
421	6.70	1	10000
	<u>39.30</u>		<u>30000</u>

Average number of trees per hectare = 333
 Average cost per hectare = 30000
 Cost per tree (049 : 333 = R.90 L.L.)

(All area measures are converted into hectares)
 Hectare " 10,00 sq. meters
 + Denum equals 919.30 sq. meters
 Total cost is reached by multiplying the number of work days by the price

B. Original Planting Expenditures:- Digging to an average depth of 75 cms.

Orchard situation.	Number of Orchards	Area of Apples planted Hectar	Number of Trees per hectar (weighted average)
Joubelh	1 46	4.20	400
Quada Jizzin	4	25.80	278
Mouchtara	1	2.80	436
Barouk-Nabh			
Safa	6	6.50	491
Total		39.30	

Average cost per hectar

Average number of trees per hectar

339

Cost per tree (649 : 339 = 1.90 L.L.)

+ Dunum equals 919.30 sq. meters

Hectar " 10,00 sq. meters

(All Area measures are converted into hectors)

Total cost is reached by multiplying the number of work days by the price per worker per day.

Table 32

in South Lebanon.

Total cost ⁺ L.L.	Average cost per hectar (Area as weights) L.L.
1560	369
16374	635
1886	670
5695	876
<u>25515</u>	

649

B. Original Planting Expenditures 2. Digging to an average depth

Number of Trees per hectare (Weighted average)	Area of Apples planted per hectare	Number of Grafts	Original Planting Expenditures
338	72.00	3	12.00
270	48	3	12.00
412	1.00	3	12.00
307	12	3	12.00
282	12.00	3	12.00
			36.00

B. Original Planting Expenditures

2. Digging to a depth of about

75 cm. in the Bekan

307

Cost per tree (104.43 x 307 = 32,058.81)

(Note: is compared to equal 10.00 Dinar)

Table 33

(All the numbers are converted into hectares)

Total cost is reached by multiplying the number of work days by

B. Original Planting Expenditures: 2. Digging to an average depth

<u>Orchard si- tuation.</u>	<u>Number of Orchards</u>	<u>Area of Apples planted hectar</u>	<u>Number of Trees per hectar (Weighted average)</u>
Istabl	3	75.90	336
Tahnayal	3	46	270
Taalabaya	2	1.90	415
Baalbek	3	12	307
Zahlé	3	18.20	269
Total	14	154.00	

Average cost per hectar

Average No. of Trees (hectar) 307

Cost per tree (164.43 ÷ 307 = 53 Piasters)

(Hectar is considered to equal 10.33 Dunum)

(ALL area measures are converted into hectares)

Total cost is reached by multiplying the number of work days by

Table 33
of 50 cms. in the Bekaa.

Total cost L.L.	Average cost per hectar (Area as weights) L.L.
2367.50	163
7507.50	163
360	189.50
2055	169.60
3052.95	167.75
<hr/> 25322.95	

164.40

the price per worker per day or by the price of digging a dunum by tractor.

B. Original Planting Expenditures & Construction of Reservoirs for

Number of trees planted (Weighted average)	Area of Apple Planted Hectar	Number of orchards	Original situation
270	8.10	3	Mar
472	80	2	Grada Alley
488	10.00	6	Bozar and Surroundings
320	15.40	3	Karwan
386	7.80	2	Bar Bazar-Samin
876	1.80	3	Mghir-Korba
422	27.50	8	Alouza-Unetra
	<u>Mount Lebanon</u>		
	100	24	Total...

B. Original Planting Expenditures

2. Construction of Reservoirs for

Irrigation Water in

Mount Lebanon

Total cost is the sum total of the costs in the different districts.
 Cost per tree (386 : 410 = 7.90 L.L.)
 Average number of trees planted
 Average cost per hectar

410

B. Original Planting Expenditures: 2. Construction of Reservoirs for

<u>Orchard situation</u>	<u>Number of orchards</u>	<u>Area of Apples Planted Hectar</u>	<u>Number of Trees per hectar (Weighted average)</u>
Matn	3	8.10	270
Quada Aley	5	20	452
Sofar and Surroundings	6	10.60	428
Kesruwan	3	15.40	390
Dahr Baydar-Sannin	2	7.20	326
Mughira-Kortoba	3	1.20	876
Akoura-Uneitra	2	37.50	422
Total...	24	100	

Average cost per hectar

Average number of trees per hectar

410

Cost per tree

(3236 : 410 = 7.90 L.L.)

Total cost is the sum total of the costs in the different district.

Table 34

Irrigation Water in Mount Lebanon

Total Cost L.L.	Average cost/per hectar (Area as weights) L.L.
36000	444440
58000	281550
62500	589620
36500	237010
13000	180560
2600	216670
115000	306670
<hr/> 323600	

B. Original Planting Expenditures: 2. Construction of Reservoirs for I

Orchard situation	Number of orchards	Area of Apples planted Hectar	Number of Trees per Hectar (Weighted average)
Hastrow	3	13.70	278
Donnieh-Kattin	4	7.40	607
Tannourin	2	3.20	476
B. Original Planting Expenditures			
2. Construction of Reservoirs for Irrigation Water in North Lebanon			
Lebanon	3	6.70	374
Total	20	38.70	373

Table 35
Average No. of Trees per Hectar
Average cost per Hectar

Cost per tree (4000.70 : 403 = 9.90 L.L.)

Total cost is the sum total of the costs in the different districts.

403

B. Original Planting Expenditures: 2. Construction of Reservoirs for I

<u>Orchard situation</u>	<u>Number of orchards</u>	<u>Area of Apples planted Hectar</u>	<u>Number of Trees per hectar (Weighted average)</u>
Bhasrein-Sier-Akkar	3	13.50	278
Donnieh-Kattin	4	7.40	605
Tannourin	2	3.20	476
Hasroun	3	2.70	515
Besharri	5	6.70	374
Ehden	3	6.70	373
Total	20	38.50	

Average cost per hectar

Average No. of Trees per hectar

403

Cost per tree (4006.50 : 403 = 9.90 L.L.)

Total cost is the sum total of the costs in the different districts.

Table 35

Irrigation water in North Lebanon.

Total cost L.L.	Average cost/per hectar (Area as weights) L.L.
48000	3555.50
32000	4316.20
12000	3750
14500	5370.40
21750	4350
26000	3380.60
<hr/> 154250	<hr/> 4006.50

B. Original Planting Expenditures: 3. Construction of Reservoirs for

Number of Trees planted (weighted average)	Area of land planted hectares	Number of hectares	Original Expenditure
400	4.20	1	Lebanon
278	27.20	4	Guadalupe
436	2.20	1	Monterey
494	B. Original Planting Expenditures		

3. Construction of Reservoirs for

Irrigation Water

Average cost per hectare
in South Lebanon
Average number of trees per hectare

3.22

Cost per tree (3.22 x 10 = 32.2) = 3.22 x 10 = 32.2
Table 36

* Total cost is the sum of the total costs in the different districts.

B. Original Planting Expenditures: 2. Construction of Reservoirs for

<u>Orchard situation</u>	<u>Number of orchards</u>	<u>Area of Apples planted Hectar</u>	<u>Number of Trees per hectar (weighted average)</u>
Joubeih	1	4.20	400
Quada Jizsin	4	25.80	278
Mouchtara	1	2.30	436
Barouk-Nabk-Safa	6	6.50	497
Total		39.30	

Average cost per hectar 3295.10

Average number of trees per hectar 3.39

Cost per tree (3295.10 : 339 = 9.70 L.L.)

* Total cost is the sum of the total costs in the different districts.

Table 36

Irrigation Water in South Lebanon.

Total cost[†] L.L.	Average cost/per hectar (Area as weights) L.L.
15 000	3571.40
105 000	4700
95 000	3400
-	-
<hr/>	
1895 00	

3295.10

B. Original Planting Expenditures: & Constructing Irrigating Canals

Number of Trees per Acre + Number of Heater (Weighted Average)	Area of Acre planted Heater	Number of acres	Original Planting Expenditure
270	8.10	2	1820
425	20	2	8500
425	10.00	6	25500
300	12.40	3	37200
325	7.20	2	23400
275	1.20	2	5500
425	27.20	2	113200

B. Original planting expenditures Total

4. Constructing Irrigating canals

410

Average number of trees planted in

Cost per tree (1250.00 + 410 = 2.70 L.L.)

* Labor cost is derived by multiplying the number of canals' meters

Cost of materials is computed by multiplying the total cost of sand, gravel and cement

Total cost is the sum of labor cost and cost of materials.

B. Original Planting Expenditures: 4 Constructing Irrigation Canals

Orchard situation.	Number of orchards	Area of Apples planted Hectar	Number of Trees per + hectar (weighted average)
Matn	3	8.10	270
Quada-Aley	5	20	452
Sofar and Surroundings	6	10.60	428
Kesruwan	3	15.40	390
Dahr-Saydar-Sannin	2	7.20	326
Hughira-Kortoba	3	1.20	876
Akoura-Uneitra	2	37.50	422

Total ~~100~~ 100 g Landings .8

Average cost per hectar ~~100~~ 100 g Landings .8

Average number of trees per hectar 410

Cost per tree (1520.90 : 410 = 3.70 L.L.)

* Labor cost is derived by multiplying the number of Canals²meters

x Cost of materials is composed of the total cost of sand, gravel and cement.

o Total cost is the sum of labor cost and cost of materials.

Table 37

in Mount Lebanon.

Labor cost	Cost of Materials x L.L.	Total cost L.L.	Average cost per hectar L.L. (Area as weights)
2030	11005	13035	1609.10
5185	26620	31805	1590.30
3051	14034	17085	1611.80
3950	17263	21213	1377.40
2240	7700	9940	1380.60
342	1542	1884	1570
9420	47650	57070	1522.70
		<u>1520.90</u>	

1520.90

by the price of labor cost per square meter in the different districts.

Area of Apple
Planted in Acres

Number of
Orchards

13.50

1

7.40

4

3.20

2

27.2

4

B. Original Planting Expenditures

4. Constructing Irrigating Canals

in North Lebanon

23.50

18

Table 38

number of trees per hectare

cost per hectare

at per tree (147.50 : 403 = 3.60 L.L.)

cost is the sum of labor cost and cost of materials is composed of the total cost of cost is derived by multiplying the number

B. Original Planting Expenditures: 4. Constructing Irrigation

Orchard situation.	Number of orchards	Area of Apples Planted hectar	Number of Trees per hectar (weighted average)
Shasrein-Sier-Akkar	1	13.50	278
Donnleh-Kottin	4	7.40	605
Tannourin	2	3.20	476
Hasoun	4	2.70	515
Besharri	5	5	374
Ehden	3	6.70	373
Total	21	38.50	
Average cost per hectar			403
Average number of trees per hectar			
<p>Cost per tree (1447.90 : 403 = 3.60 L.L.)</p>			

- * Labor cost is derived by multiplying the number of Canal's meters x cost materials is composed of the total cost of sand, gravel
- * Total cost is the sum of labor cost and cost of materials.

Table 38

Canals in North Lebanon.

Labor cost *	Cost of Materials LL. x	Total cost °	Average cost per hectare (Area as weights LL.)
	LL.	L.L.	
3320	16658	19978	1479.90
1600	8747	10347	1398.20
860	3980	4840	1512.50
676	3515	4191	1552.20
1245	6382	7627	1525.40
1630	7533	9163	1367.60
		<u>55746</u>	
			<u>1447.90</u>

by the price of labor cost per square meter in the different districts, and cement.

B. Original Planting Expenditures: 4. Constructing Irrigation Canals

Order of Location	Number of Orders	Area of Apple Planted Acre	Number of Trees per Acre (Weighted Average)
Township	1	4.20	400
9 and 11th	4	27.80	278
Northside	1	1.20	436
Baron-Nash Sale	6	6.20	427
Total	12	39.40	

Average cost per acre

B. Original Planting Expenditures

4. Constructing Irrigation Canals

In South Lebanon

* Labor cost is derived by multiplying the number of man-hours
* Cost of materials is composed of the total cost of material
* Total cost is the sum of labor cost and cost of material

Table 39

Table 39

Canals in South Lebanon.

Labor cost *	Cost of Materials L.L. x	Total cost *	Average cost per hectare (Area as weights LL.)
	L.L.	L.L.	
945	4477	5422	1294
5885	32578	38463	1490.80
645	3600	4245	1516.10
1430	8075	9505	1462.30
		<u>57634</u>	
			<u>1466.50</u>

meters by the price of labor per square meter in the different districts. gravel and cement.

B. Original Planting Expenditures + Constructing Irrigation Canals

Order of Irrigation	Number of orders	Area of Apple planted hec- tars	Number of Trees per hec- tar (weighted average)
1st	3	75.00	336
2nd	3	46	273
3rd	3	100.1	417
4th	3	33	307
B. Original Planting Expenditures			382

4. Constructing Irrigation Canals in the

Be k a a Total

Average cost per hec-
tar

Average number of trees per hec-
tar

Table 40

Cost per tree (1940-41) = 4.80 L.P.

* Total cost is the sum of the labor cost and cost of materials.
* Cost of materials is composed of the total cost of hand,
* Labor cost is derived by multiplying the number of meters of

307

B. Original Planting Expenditures: 4. Constructing Irrigation Canals

Orchard situation.	Number of orchards.	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Istabl	3	75.90	336
Tahnayel	3	46	270
Taalbaya	2	1.90	415
Baalbeck	3	12	307
Zahlé	3	18.20	269
Total	14	154	307
Average cost per hectar			
Average number of Trees per hectar			<u>307</u>
Cost per tree (1468.90 : 307 = 4.80 L.L.)			

- * Labor cost is derived by multiplying the number of meters of
- x Cost of Materials is composed of the total cost of sand,
- * Total cost is the sum of the labor cost and cost of materials,

Table 40

in the Bekaa.

<u>Labor cost *</u>	<u>Cost of materials LL. x</u>	<u>Total cost °</u>	<u>Average cost per hectar</u>
		<u>L.L.</u>	<u>(Area as weights L.L.)</u>
14955	95675	110630	1457.60
9485	57395	66880	1453.90
441	2545	2986	1571.60
2660	14265	16925	1410.40
4540	23370	27910	1533.50
		<u>225291</u>	
			<u>1462.90</u>

Canals by price of labor per square meter in the different districts.
gravel and cement.

B. Original Planting Expenditures & Cost of Nursery Trees

Orchard Location	Number of Orchards	Area of Planted Hectars	Number of trees per hectare (weighted average)
Main	3	8.10	379
Quads Alley	2	20	422
Boyer and surroundings	6	10.60	488
Kestwan	3	15.40	390
Dair Baydar Sannin	2	7.20	326
Original Planting Expenditures			
		27.20	876
Cost of Nursery Trees in			
		100	422

Total Lebanon 100

Average cost per hectare

Average number of trees per hectare

Table 41

Cost per tree (876 : 422 = 2.08 L.L.)

410

+ Total cost is calculated by multiplying the total number of trees

B. Original Planting Expenditures: 5. Cost of Nursery Trees

Orchard situation.	Number of orchards	Area of Apples planted Hectar	Number of trees per hectar (weighted average)
Matn	3	8.10	270
Quada Aley	5	20	452
Sofar and surroundings	6	10.60	428
Kesruwan	3	15.40	390
Dahr Baydar Sannin	2	7.20	326
Mughira-Kortoba	3	11.20	376
Akoura-Uneitra	2	37.50	422
Total	24	100	

Average cost per-hectar

Average number of trees per hectar

410

Cost per-tree (345.40 : 410 = 2.06 L.L.)

+ Total cost is calculated by multiplying the total number of trees

Table 41

in Mount Lebanon.

Average cost per tree (weighted by area planted)	Total cost + L.L.	Average cost per hectare (Area as weights)
2.20	4811.40	594
1.43	12920	646
1.54	6985.40	659
1.73	10395	675
1.10	2584.80	359
1.88	1976.40	1647
2.85	45112.50	1203
	<u>84535.50</u>	

845.40

by the average price per tree.

B. Original Planting Expenditures: Cost of Nursery Trees

Number of trees per hectare (weighted average)	Area of Apples planted (hectares) (weighted average)	Number of orchards	Original Planting Expenditures
278	13.20	3	El-Harbi
605	7.40	4	Domieh-Kettin
476	3.20	2	Tannouin
215	2.70		B. Original Planting Expenditures
274	2		Cost of Nursery Trees in
273	6.70		North Lebanon
	<u>38.20</u>	<u>9</u>	<u>Total</u>

Average cost per hectare
 Table 42
 Average number of trees per hectare

404

Cost per tree (1977.70 : 404 = 4.89 L.L.)

+ Total cost is calculated by multiplying the total number of trees

B. Original planting Expenditures: 5. Cost of Nursery Trees

<u>Orchard si- tuation.</u>	<u>Number of orchards</u>	<u>Area of Apples planted Hectar (weighted average)</u>	<u>Number of trees per hectar (weighted average)</u>
Rhosfrein-Sier- Aldcar	3	13.50	278
Donnieh-Kottin	4	7.40	605
Tannourin	2	3.20	476
Harroun	3	2.70	515
Besharri	5	5	374
Ehden	3	6.70	373
Total	20	38.50	
Average cost per hectar			
Average number of Trees per hectar			<u>403</u>

Cost per tree (1075.70 : 403 = 2.64 L.L.)

* Total cost is calculated by multiplying the total number of trees

Table 42

in North Lebanon.

<u>Average cost per tree (weighted by area planted)</u>	<u>Total cost + L.L.</u>	<u>Average cost per hectar (Area as weights)</u>
2.25	8444.25	625.50
26.25	11752	1588.10
4.25	6573.60	2023
1.80	2502.90	927
2.15	4020.50	804.10
3.25	8122.10	1212.25
	<hr/>	
	41415.35	
		<u>1075.70</u>

by the average price per tree.

B. Original Planting Expenditures: 2. Cost of Nursery Trees

Number of trees per hectare (weighted average)	Area of apples planted Hectar	Number of orchards	Orchard si- tuation
400	42.4	1	Joubail
272	22.80	4	Quada Jisrin
436	2.80	1	Hochstern
497	6.20	6	Hochstern-Tabb Sala

B. Original Planting Expenditures

Total 12 32.20

5. Cost of Nursery Trees in

332

Average number of trees per hectare

South Lebanon

Cost per tree (L.L.) = 332 / 2.40 L.L.

Table 43 + Total cost is calculated by multiplying the total number of

B. Original Planting Expenditures: 5. Cost of Nursery Trees

<u>Orchard si- tuation.</u>	<u>Number of orchards</u>	<u>Area of Apples planted Hectar</u>	<u>Number of trees per hectar (weighted average)</u>
Jonbeih	1	4.20	400
Quada Jizzin	4	25.80	273
Mouhtara	1	2.80	436
Barouk-Wabh Safa	6	6.50	497
<u>Total</u>		<u>39.30</u>	

Average cost per hectar

Average number of trees per hectar

339

Cost per tree (308.50 : 339 = 2.40 L.L.)

+ Total cost is calculated by multiplying the total number of

Table 43

in South Lebanon

Average cost per tree (weighted by area planted)	Total cost + <u>L.L.</u>	Average cost per hectar (Area as weights)
2.00	3360	800
3.00	20743	804
1.50	1221	654
1.81	5250	900
	<u>32774</u>	
		<u>808.50</u>

trees by the average price per tree.

B. Original Planting Expenditures & Cost of Nursery Trees

Orchard Location	Number of orchards	Area of Apples planted (hectar)	Number of trees per hectar (weighted average)
Idahi	3	17.90	338
Tahavai	3	44	270
Talabava	3	1.90	415
Balibok	3	12	307
		18.81	289

B. Original Planting Expenditures

5. Cost of Nursery Trees

Average cost per hectar the Bekaa
 Average number of trees per hectar
 Cost per tree (L.L.) = 307 : 1.90 L.L. = 161.63

+ Total cost is calculated by multiplying the total number of

B. Original Planting Expenditures: 5. Cost of Nursery Trees

<u>Orchard situation.</u>	<u>Number of orchards</u>	<u>Area of Apples planted Hectar</u>	<u>Number of trees per hectar (weighted average)</u>
Istabl	3	75.90	336
Tahnayel	3	46	270
Taalabaya	2	1.90	415
Taalbeck	3	12	307
Zahid	3	12.20	269
Total	14	154	

Average cost per hectar

Average number of trees per hectar

307

Cost per tree (592.30 : 307 = 1.90 L.L.)

+ Total cost is calculated by multiplying the total number of

Table 44

in the Bekaa.

<u>Average cost per tree (weighted by area planted)</u>	<u>Total cost + L.L.</u>	<u>Average cost per hectare (Area as weights)</u>
1.75	44689	588
2.00	23828	518
2.00	1577	830
2.75	10128	844
2.50	11056.50	6.7.50
	<u>91218.50</u>	

592.32

trees by the average price per tree.

B. Original Planting Expenditures & Cost of Planting Trees

Order No.	Number of orchards	Area of Apples planted Hectar	Number of trees per hectar (weighted average)
1	1	8.10	970
2	2	80	472
3	6	10.00	472
4	3	17.40	390
5	3	7.30	306
6	3	1.80	870
7	2	27.70	422

C. Cost of Planting Trees in

Total 100
Mount Lebanon 84

Average cost per hectar

Average number of trees per hectar

Cost per tree (119.00 : 410 = 29.17 Pounds)
Table 45

* Total cost is reached by multiplying the number of

410

B. Original Planting Expenditures: 6. Cost of Planting Trees

Orchard situation.	Number of orchards	Area of Apples planted Hectar	Number of Trees per hectar (weighted average)
Matn	3	8.10	970
Quada Aley	5	20	452
Sofar and surroundings	6	10.60	423
Kesruwan	3	15.40	390
Bahr-Saydar-Sannin	2	7.20	326
Mughira-Kortoba	3	1.20	376
Akoura-Uneitra	2	37.50	422

Total 24 100

Average cost per hectar

Average number of trees per hectar

410

Cost per tree (119.60 : 410 = 29.17 Piasters)

* Total cost is reached by multiplying the number of

Table 45

in Mount Lebanon.

Total cost + L.L.	Average cost per hectare (weighted by Area planted)
647.50	80
2396.25	119.80
1302.50	122.80
1300	116.90
708	98.30
302	251.70
4800	128
<u>11956.25</u>	

119.60

workdays by the price per worker per day.

B. Original Planting Expenditures & Cost of Planting Trees

Orchard Location	Number of Orchards	Area of Apple Planted Hectar	Number of Trees per Hectar (Weighted Average)
Waziriyeh-Sier-Aidar	3	13.20	278
Dornieh-Korfia	4	7.40	607
Tannourin	3	3.20	470
B. Original Planting Expenditures			
Waziriyeh-Sier-Aidar	2	2	278
6. Cost of Planting Trees in			
North Lebanon			
Total	80	38.20	278

Average cost per hectar 64 elab
 Average number of trees per hectar
 Cost per tree (104.20 : 403 = 25.93 plants)

* Total cost is derived by multiplying the number of orchards

B. Original Planting Expenditures: 6. Cost of Planting Trees

<u>Orchard situation.</u>	<u>Number of orchards</u>	<u>Area of Apples planted Hectar</u>	<u>Number of Trees per hectar (weighted average)</u>
Bhasfrein-Sier-Akkar	3	13.50	278
Dennieh-Kottin	4	7.40	605
Tannourin	2	3.20	476
Hasroun	3	2.70	515
Besharri	5	5	374
Ehden	3	6.70	373
Total	20	38.50	

Average cost per hectar 104.50

Average number of trees per hectar 403

Cost per tree (104.50 : 403 = 25.93 piasters).

+ Total cost is derived by multiplying the number of workdays

Table 46

in North Lebanon.

<u>Total cost + L.L.</u>	<u>Average cost per hectare (weighted by Area Planted).</u>
925	68.50
1010	136.50
425	132.80
367.50	136.10
517	103.40
780	116.40
<hr/>	
4024.50	

104.50

by the price per worker per day.-

B. Original Planting Expenditures: 6. Cost of Planting Trees

Number of Trees per hectare (weighted average)	Area of Apples Planted Hectare	Number of orchards	Number of orchards
400	4.20	1	Joubail
278	25.28	4	Qada Jilain
431	8.80	1	Mouchata
497	6.20	6	Mouchata-Bah

B. Original Planting Expenditures

Total 39.30

6. Cost of Planting Trees in

South Lebanon

332

Average number of trees

Cost per tree (L.L.L. : 332 = 32.70 plants)

Table 47

* Total cost is reached by multiplying the total number of

B. Original Planting Expenditures: 6. Cost of Planting Trees

<u>Orchard situation.</u>	<u>Number of orchards</u>	<u>Area of Apples planted Hectar</u>	<u>Number of Trees per hectar (weighted average)</u>
Joubeih	1	4.20	400
Quada Jizzin	4	25.80	278
Mouchtara	1	2.80	431
Barouk-Nabh Safa	6	6.50	497
Total	12	39.30	

Average cost per hectar

Average number of Trees

339

Cost per tree (121.20 : 339 = 35.70 piasters)

* Total cost is reached by multiplying the total number of

Table 47

in South Lebanon.

Total cost + L.L.	Average cost per hectare (weighted by Area planted)
525	125
2910	112.80
302.50	108
1026	158
<hr/> 4763.50	

121.20

workdays by the price per worker per day.

101 -
B. Original Planting Expenditures: Cost of Planting Trees

Orchard as- tation	Number of orchards	Area of Apples planted Hectars	Number of Trees per hectar (weighted average)
Isabell	3	17.90	336
Tahmasyai	3	46	270
Taalpaya	3	1.90	472
Basilbeck	3	18	307
Sahlé	3	18.20	269
Total			
	14	114	

B. Original Planting Expenditures

6. Cost of Planting Trees in the

307

Average number of trees per hectar
 Average cost per hectar
 Cost per tree (60.67 : 307 = 19.80 Planters)

Table 48

+ Total cost is derived by multiplying the total number of

101 -

B. Original Planting Expenditures: 6. Cost of Planting Trees

Orchard situation.	Number of orchards	Area of Apples planted Hectar	Number of Trees per hectar (weighted average)
Istabl	3	75.90	336
Tahnayel	3	46	270
Taalbaya	2	1.90	415
Baalbeck	3	12	307
Zahlé	3	18.20	269
Total	14	154	

Average cost per hectar

Average number of Trees per hectar

307

Cost per Tree ($60.65 \div 307 = 19.80$ Piasters)

* Total cost is derived by multiplying the total number of

Table 48

in the Bekaa.

Total cost + L.L.	Average cost per hectar (weighted by Area planted)
5120	67.50
2460	53.50
160	84.20
700	58.30
900	49.40
<hr/> 9340	

60.65

workdays by the price per worker per day.

B. Original Planting Expenditures V. Digging around the Trees (Gons)

Number of Trees per hectar (weighted average)	Area of Apples Planted Hectar	Number of orchards	Orchard at - location
270	2.10	3	Mata
422	20	2	Ganda Aley
422	10.00	6	Sotz and surroundings
390	12.40	3	Kerwan
270	1.20	3	Mughra-Korvob
320	7.20	2	Dar Bahar
422			B. Original Planting Expenditures

7. Cost of digging around the Trees 50 cms.

Total 24 100

in radius

Average cost per hectar

Average number of trees per hectar

410

Cost per tree 64/2410 = 27.40 (pounds)

Total cost is calculated by multiplying the number of work days

B. Original Planting Expenditures: 7. Digging around the Trees 50cms.

Orchard situation.	Number of orchards	Area of Apples Planted Hectar	Number of Trees per hectar (weighted average)
Matn	3	8.10	270
Quada Aley	5	20	452
Sofar and surroundings	6	10.60	428
Kesruwan	3	15.40	390
Mughira-Kortoba	3	1.20	876
Dahr Baydar	2	7.20	326
Akoura-Uneitra	2	37.50	422
Total	24	100	
Average cost per hectar			
Average number of trees per hectar			410
Cost per tree (112.20 : 410 = 27.40 piasters)			

Total cost is calculated by multiplying the number of work days

Table 49

in Radius - In Mount Lebanon.

Total cost L.L. <hr/>	Average cost per hectar L.L. (Area planted as weights) <hr/>
1007	124.60
2133.75	106.70
1205.50	113.80
1662	107.90
130	150
834.50	116
4200	112
<hr/>	
11222.75	

112.20

by the price per worker per day.

B. Original Planting Expenditures V. Digging around the Trees

Orchard Location	Number of Orchards	Area of Apples Planted (hectars)	Number of Trees per hectare (weighted average)
Wantrien-Gier Akkar	3	13.20	278
Dennish-Kottin	4	7.40	602
Tannourin	2	3.20	476
Hatroun	3	2.70	212
Becharri	2	2	374
B. Original Planting Expenditures			
Eiden			

7. Cost of digging around the trees

Average cost per hectare 50 cms. in radius

Average number of trees per hectare

Cost per Tree (100.00 : 403 = 24.81 E.L. Plaster Japanese).

Table 50

Total cost is calculated by multiplying the number of work days

B. Original Planting Expenditures: 7. Digging around the Trees

Orchard situation.	Number of orchards	Area of Apples Planted hectar	Number of Trees per hectar (weighted average)
Bhasfrein-Sier Akkar	3	13.50	278
Donnieh-Kottin	4	7.40	605
Tannourin	2	3.20	476
Hasroun	3	2.70	515
Becharri	5	5	374
Ehden	3	6.70	373
Total..	20	38.50	

Average cost per hectar

Average number of trees per hectar

403

Cost per Tree (90.68 : 403 = 22.50 E.L. Piasters Lebanese).

Total cost is calculated by multiplying the number of work days

Table 50

50 cms. in radius in North Lebanon.

<u>Total cost</u> L.L.	<u>Average cost per hectar</u> L.L. (Area planted as weights)
1000	74.07
555	75
307.50	96.09
285	105.55
533.50	106.70
810	120.90
<hr/>	
3491	
	<u>90.68</u>

by the price per worker per day.

B. Original Planting Expenditures V. Digging around the Trees

Orchard location	Number of orchards	Area of Apples planted in each	Number of Trees per hectare (weighted average)
London	1	4.20	400
Quadrant	4	27.80	278
Monkton	1	2.80	436
Brown-Wash Falls	6	6.70	497

B. Original Planting Expenditures
Total \$39.30

7. Cost of digging around the

Trees 50 cent in radius

Average number of trees per hectare

Cost by table (103.90 x 332 = 30.70 plants)

332

Total cost is calculated by multiplying the total number of work

B. Original Planting Expenditures: 7. Digging around the Trees

Orchard situation.	Number of orchards.	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Joubeih	1	4.20	400
Quada Jizzin	4	25.80	278
Mouchtara	1	2.80	436
Barouk-Nabh Safa	6	6.50	497

Total 12 39.30

Cost of digging around the

Average cost per hectar

Average number of trees per hectar

339

Cost per tree (103.90 : 339 = 30.70 piasters).

Total cost is calculated by multiplying the total number of work

Table 51

50 cms. in radius in South Lebanon.

<u>Total cost</u> <u>L.L.</u>	<u>Average cost per hectar</u> <u>L.L.</u> <u>(Area planted as weights)</u>
385	77.40
2850	110.50
275	98.20
635	97.70
<hr/>	
4085	
	 <u>103.90</u>

days by the price per worker per day.

B. Original Planting Expenditures : 7. Digging around the trees 50 cm.

Orchard location	Number of orchards	Area of Apple planted (hectar)	Number of trees per hectare (weighted average)
Isabai	3	77.70	306
Tahunevei	3	46	270
Talapaiva	2	1.70	414
Balibek	3	31	307
Saibe	3	18.80	282

B. Original Planting Expenditures

7. Cost of digging around the trees

Average number of trees 50 cm diameter

Cost per tree (27.50 : 307 = 12.50 Japanese Yen)

Table 52

Total cost is calculated by multiplying the total work days by the

B. Original Planting Expenditures : 7. Digging around the Trees 50 cms.

Orchard situation.	Number of orchards	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Istabl	3	75.90	336
Tahnayel	3	46	270
Taalabaya	2	1.90	415
Baalbeck	3	12	307
Zahlé	3	13.20	269

Total **14** **154**
B. Original Planting Expenditures

Average cost per hectar 7.000 to 7000 .7

Average number of Trees 210 02 **307**

Cost per tree (57.50 : 307 = 15.50 Lebanese piasters).

22 21287

Total cost is calculated by multiplying the total work days by the

Table 51

in Radius in the Bekaa.

Total cost	Average cost per hectar
L.L.	L.L.
-----	-----
3380	44.50
2220	48.30
92	48.40
580	48.30
1040	57.20

7312	
	47.50

price per worker perday.

B. Original Planting Expenditures: B. Fertilizing the Land with

Order of Location	Number of orchards	Area of Apples planted hectars	Number of Trees per hectar (weighted average)
Mata	3	2.10	270
Qada Aley	2	20	420
Solar and Buroshin	6	10.60	480
Karwan	3	12.40	390
Dair-Baydar-Bannin	2	7.20	320
Mazra-Kayda	2	1.20	270
Akour-Beit	2	27.50	420
in Mount Lebanon			
-----		100	Total

B. Original Planting Expenditures
 C. Fertilizing the Land with Manure

Average cost per hectar
 Average number of trees per hectar
 Table 53

Cost per Tree (211 : 410 = 1.25 L.L.)

Total cost is the sum of labor cost and cost of manure.
 Cost of manure is the total cost of manure in the district i.e.
 Labor cost is calculated by multiplying the number of work days

B. Original Planting Expenditures: 8. Fertilizing the Land with

Orchard si- tuation.	Number of orchards	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Mata	3	8.10	270
Quada Aley	5	20	452
Sofar and surroundings	6	10.60	428
Kesruwan	3	15.40	390
Dahr-Baydar-Sannin	2	7.20	326
Mughira-Kortoba	3	1.20	376
Akoura-Uheitra	2	37.50	422
Total	24	100	

Average cost per hectar

Average number of trees per hectar

410

Cost per Tree (511 : 410 = 1.25 L.L.)

Labor cost is calculated by multiplying the number of work days

Cost of manure is the total cost of manure in the district i.e.

Total cost is the sum of Labor cost and cost of manure.

Table 53

Manure in Mount Lebanon.

Labor cost	Cost of Manure L. L.	Total cost L. L.	Average cost per hectar (Area Planted L. L.)
164.5	2296	2460.5	303.80
401.25	11158	11559.25	578
184.5	5588	5772.5	544.50
264	2196	2460	484.40
1395	2780	2924	386.40
24	1112	1136	946.70
588	19200	19788	527.70
		<u>51097.25</u>	

by the price per worker per day

total quantity times price per tin, case or meter.

B. Original planting Expenditures: S. Fertilizing the land with Manure

Orchard location	Number of orchards	Area of Apples planted hecтар	Number of Trees per hecтар (weighted average)
Brazein-Gier-Akary	3	13.50	278
Dannieh-Kettin	4	7.40	607
Tannouin	2	3.20	476
Hartoum	3	8.70	717
B. Original Planting Expenditures			
S. Fertilizing the Land with Manure			
in North Lebanon			
Total		38.50	278

403

Average number of trees per hecтар
 Table 54
 Average cost per hecтар

Cost per tree (200.10 : 403 = 1.24 L.L.)

Total cost is the sum of labor and cost of manure.
 Cost of Manure is the total cost of manure in the district
 Labor cost is the result of multiplying the total number of

B. Original planting Expenditures: 8. Fertilizing the Land with Manure

Orchard situation.	Number of orchards	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Bhasfrein-Sier-Akkar	3	13.50	278
Donnieh-Kottin	4	7.40	605
Tannourin	2	3.20	476
Hasroun	3	2.70	515
Becharri	5	5	374
Ehden	3	6.70	273
Total	20	38.50	

Average cost per hectar

Average number of trees per hectar

403

Cost per tree (500.10 : 403 = 1.24 L.L.)

Labor cost is the result of multiplying the total number of
 Cost of Manure is the total cost of manure in the district
 Total cost is the sum of labor and cost of manure.

Table 54

in North Lebanon.

Labor cost	Cost of Manure L.L.	Total cost L.L.	Average cost per hectar (Area Planted L.L.)
205	4420	4625	342.60
110	5232	5342	721.90
49.5	1772	1821.5	569.20
190	1702	1892	700.70
89.5	2256	2345.5	469.10
120	3108	3228	481.80
		<u>19254</u>	
			<u>500.10</u>

work days by the price per worker per day

i.e. total quantity times price per tin, case or meter.

B. Original planting Expenditures & Fertilizing the Land with

Number of Trees per hectare (weighted average)	Area of Apples planted hectare	Number of orchards	Orchard in- vestion.
400	4.20	1	Joubail
275	27.00	4	Grand Joubail
430	2.00	1	Monastery
497	0.70	0	Bark-Hair Bats

B. Original Planting Expenditures

C. Fertilizing the Land with Manure

Average cost per hectare in South Lebanon

Average number of trees per hectare

Cost per tree (299.00 : 332 = L.L.)

Table 55

Total cost is the sum of labor and cost of manure.
Cost of manure is the total cost of manure in the district i.e.
labor cost is calculated by multiplying the number of workdays

332

B. Original planting Expenditures; C. Fertilizing the Land with

Orchard situation.	Number of orchards	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Joubelh	1	4.20	400
Quadi Jezzin	4	25.80	278
Mouchtara	1	2.80	436
Barouk-Nabh Safa	6	6.50	497
Total	12	39.30	

Average cost per hectar

Average number of trees per hectar

339

Cost per tree (399.80 : 339 = 1.90 L.L.)

Table 22

Labor cost is calculated by multiplying the number of workdays
 Cost of Manure is the total cost of manure in the district i.e.
 Total cost is the sum of labor and cost of manure.

Table 55

Manure in South Lebanon.

Labor cost	Cost of Manure L.L.	Total Cost L.L.	Average cost per hectar (Area Planted L.L.)
65	1760	1825	434.50
468	8108	8570	331.80
44	1320	1364	487.10
	3832	3953.50	608.20
		<u>15712.50</u>	

399.80

by the price per worker per day.

total quantity multiplied by price per tin, case or meter.

B. Original Planting Expenditures & Fertilizing the Land with Manure

Order of Location	Number of orchards	Area of Acreage planted hectar	Number of Trees per hectar (weighted average)
Labadi	3	77.90	330
Tanjong	3	46	310
Tanjaya	3	1.90	415
Balibek	3	18	307
Selid	3	18.80	309

B. Original Planting Expenditures

B. Fertilizing the Land with Manure

in the Bekaa

Cost per tree (1944-1945) = 1.30 L.L.

307

Table 56

Cost of manure is the total cost in each district i.e. total
x labor cost is calculated by multiplying the total number of

B. Original planting Expenditures: 8. Fertilizing the Land with Manure

Orchard situation.	Number of orchards	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Istabl	3	75.90	336
Taanajel	3	46	270
Taalbaya	2	1.90	415
Baalbeck	3	12	307
Zahlé	3	18.20	269

Total 14 154

Average cost per hectar

Average number of Trees per hectar

307

Cost per tree (384.10 : 307 = 1.30 L.L.)

Table 26

x Labor cost is calculated by multiplying the total number of

o Cost of Manure is the total cost in each district i.e. Total

Table 56

in the Bekaa.

Labor cost ^x	Cost of Manure [•] L.,L.	Total cost L.,L.	Average cost per hectar (Area Planted L.,L.)
858	31684	32476	427.90
448	15200	15648	340.20
24	944	968	509.50
140	4468	4608	384
208	5254	5462	300.10
		<u>59162</u>	

384.10

work days by the price per worker per day

quantity times price per tin, case or meter

C. Cost of Inventory of Machinery in Mount Lebanon.

Number of Trees per hectare (Weighted Average)	Area of Apple planted Hectare	Number of orchards	Orchard si- tuation.
270	8.10	3	Mar
254	20	2	Quada Aisy
408	10.60	6	Sofar and surroundings
390	12.40	3	Karwan
326	7.20	3	Dahr-Baydar-Samin 3
276	1.20	3	Majma-Karada 3
324	10.20	3	Abnour-Gharib in Mount Lebanon

C. Cost of Inventory of Machinery

100

Table 57
Total..

Average cost per hectare

Average number of trees per hectare

Cost per tree (25.20 : 410 = 1.60 L.L.)

410

* Total cost includes cost of operating equipment (engines and pumps)

C. Cost of Inventory of Machinery in Mount Lebanon.

Orchard situation.	Number of orchards	Area of Apples planted Hectar	Number of Trees per hectar (Weighted Average)
Matn	3	8.10	270
Quada Aley	5	20	452
Sofar and surroundings	6	10.60	408
Kesrutwan	3	15.40	390
Dahr-Baydar-Sannin 2		7.20	326
Mughira-Kortoba	3	1.20	376
Akoura-Uneitra		37.50	422
Total..	24	100	

Average cost per hectar

Average number of Trees per hectar

410

Cost per tree ($656.20 \div 410 = 1.60$ L.L.)

* Total cost includes cost of spraying equipment (engines and pumps)

Table 57

Total cost *	Average cost per hectar
L.L.	L.L. (Area as weights)
4561	563.10
620	306
2840	268
18900	1227.30
7990	1110
1412	1176.60
23800	634.70
<u>65623</u>	
	<u>656.20</u>

Water pipes, pumps and cost of engines in each district.

C. Cost of Inventory of Machinery in North Lebanon.

Number of Tractor per hectare (weighted average)	Area of Apple planted hectare	Number of tractors	Tractor si- tuation.
278	13.50	3	Sharoun-Sior Albar
602	7.40	4	Domleh-Kayin
476	3.80	2	Tamounin
212	2.70	3	Haroun
374	2	2	Bechari
373	6.70	3	Haroun
	<u>38.50</u>	<u>15</u>	Total

C - Cost of Inventory of Machinery in North Lebanon

Average number of tractors per hectare
 Cost per Tractor (1950-1951 - (2.5 tractors)).

* Total cost is the sum of the spraying equipment costs.
 Table 58

C. Cost of Inventory of Machinery in North Lebanon.

Orchard si- tuation.	Number of orchards	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Bhasfrein-Sier Alkar	3	13.50	273
Donnieh-Kottin	4	7.40	605
Tannourin	2	3.20	476
Nasroun	3	2.70	515
Besharri	5	5	374
Ehden	3	6.70	373
Total	20	38.50	

Average cost per hectar

Average number of trees per hectar 403

Cost per Tree ($260 \div 403 = 64.5$ Piasters).

* Total cost is the sum of the spraying equipment costs.

Table 58

<u>Total cost *</u> <u>L.L.</u>	<u>Average cost</u> <u>per hectare L.L.</u> <u>(area as weights)</u>
3600	1185.20
1670	225.70
700	218.80
860	318.5
1580	316
1600	240
<hr/>	
10010	

260.00

C. Cost of Inventory of Machinery in South Lebanon.

Number of Tractors (Weighted Average)	Area of Apples planted Hectars	Number of tractors	Order of tractor
400	4.20	1	Tractor
278	25.80	4	Quad tractor
430	8.80	1	Mower
437	6.50	6	Barrow-Motor

Total
C. Cost of Inventory of Machinery

in South Lebanon

332

Average number of tractors per hectare

Cost per tractor = 332 / 2.40 L.L. = 138.33
Table 59

* Total cost is the sum of the spraying equipment (pumps and

C. Cost of Inventory of Machinery in South Lebanon.

Orchard situation.	Number of orchards	Area of Apples planted Hectar	Number of Trees per hectar (Weighted Average)
Joubelh	1	4.20	400
Quada Jizzin	4	25.80	278
Mouchtara	1	2.80	436
Barouk-Wabh Safa	6	6.50	437
Total	12	39.30	
Average cost per hectar			
Average number of Trees per hectar			339
Cost per Tree (300 : 339 = 2.40 L.L.)			

* Total cost is the sum of the spraying equipment (pumps and

Table 59

Total Cost * L.L.	Average cost per hecter L.L. (Area as weights)
3230	769
24452	951.60
1600	571.40
2176	334.80
31458	800

engines) and the cost of water pipes and engines in each district.

C. Cost of Inventory of Machinery in the States.

Orchard sta- tion.	Number of orchards	Area of Apples Planted Hectars	Number of Trees per hectar (weighted average)
Katani	3	77.90	330
Tainyaji	3	40	270
Tainyaji	2	1.90	415
Balbeek	3	13	307
C. Cost of Inventory of Machinery in the States			
Total...		134	202

Average cost per hectare

Average Number of Trees per hectare

Table 60
Cost per tree = 3.40 : 307 = 3.19 L.S.

* Total cost includes cost of spraying equipment (engines and pumps).

C. Cost of Inventory of Machinery in the Bekaa.

<u>Orchard situation.</u>	<u>Number of orchards</u>	<u>Area of Apples Planted Hectar</u>	<u>Number of Trees per hectar (weighted average)</u>
Istabl	3	75.90	336
Tahnayel	3	46	270
Taalbaya	2	1.90	415
Baalbeck	3	12	307
Zahlé	3	13.20	269
Total...	14	154	
Average cost per hectar			
Average number of Trees per hectar			<u>307</u>
Cost per tree			(958.40 : 307 = 3.10 L.L.)

* Total cost includes cost of spraying equipment (engines and pumps),

Table 60

Total cost Ls. Ls.	Average cost per hectar Ls. Ls.
39500	520.40
70300	1528.30
1000	526.30
5300	441.70
31500	1730.80
<hr/> 147600	
	<hr/> <u>958.40</u>

tractors and cultivators and cost of water pipes, engines and pumps.

D₁ - Cost of care until Bearing Age 1. Annual Tilling the Soil

Number of Trees per hectare (weighted average)	Number of oxen used	Area of Planted Hectare	Number of oxen used	Area of Planted Hectare	Number of Trees per hectare (weighted average)
400	3	2.10	3	2.10	400
400	3	10.90	3	10.90	400
400	4	7	4	7	400
400	3	7.30	3	7.30	400
400	3	1.80	3	1.80	400
400	3	24.90	3	24.90	400

D₂: Cost of care until Bearing Age 2

1. Tilling the soil in Mount Lebanon

Average Number of Trees per hectare

Cost per tree (400 = 45 pistons)

Total cost is the sum of animal and labor costs multiplied by two.
 Labor cost is calculated by multiplying the number of work days
 Animal cost is derived by multiplying the number of oxen used by

D₁ - Cost of care until Bearing Age: 1. Annual Tilling the Soil

Orchard situation.	Number of orchards	Area of Apples Planted Hectar	Number of Trees per hectar (weighted average)
Matn	3	8.10	270
Quada Aley	3	10.90	305
Sofar and surroundings	4	7	464
Dahr Baydar-Sannin	2	7.20	326
Mughira-Kortoba	3	1.20	876
Akoura-Uneitra	2	37.50	422

Total area 117.90

Average cost of tilling per annum per hectar 4.00

Average number of Trees per hectar 400

Cost per tree (179.60 : 400 = 45 piasters)

Animal cost is derived by multiplying the number of oxen used by
 Labor cost is calculated by multiplying the number of work days
 Total cost is the sum of animal and labor costs multiplied by two.

Table 61

in Mount Lebanon.

<u>Animal cost</u>	<u>Labor cost</u>	<u>Total cost</u>	<u>Average cost per hectare L.L. (Area as weights)</u>
576	151.5	1455	180
780	134.75	1929.50	177
504	11865	1245	177.90
528	133	1322	183.40
84	24	216	180
2700	672	6744	179.80
		<u>12911.50</u>	
			<u>179.60</u>

the price per pair per day

by the price per worker per day in each district

- 115 -
 D1 - Cost of Care until Bearing Age: Annual Tilling the Soil

Number of Trees per hectare (weighted average)	Area of Apples Planted Hectare	Number of orchards	Orchard si- tuation
278	13.70	3	Brasque-Sier
608	4.80	3	Alkat
476	3.20	3	Donnieh-Kottin
140	1.40	3	Tannovin
247	2.30	3	Haroun
		3	Bezzari
	<u>24.40</u>	<u>15</u>	Total

Average Annual Tilling the Soil until Bearing Age

Average Number of Trees per hectare
 1. Tilling the Soil in North
 Cost per hectare = 278 x 4.80 = 1334.40 (average)

 Total cost is the sum of animal and labor costs multiplied by two.
 Labor cost is calculated by multiplying the number of work days
 animal cost is derived from multiplying the number of oxen employed

- III -

D₁ - Cost of Care until Bearing Age: Annual Tilling the soil

<u>Orchard situation.</u>	<u>Number of orchards</u>	<u>Area of Apples Planted Hectar</u>	<u>Number of Trees per hectar (weighted average)</u>
Bhasgrein-Sier Akkar	3	13.50	278
Donnieh-Kottin	2	4.00	602
Tannourin	2	3.20	476
Hasroun	2	1.40	140
Besharri	3	8.30	247
Total	12	24.40	

Average cost of tilling per annum per hectar

Average number of Trees per hectar

375

Cost per tree: $(174.90 \div 375 = 46.60 \text{ piasters})$

Animal cost is derived from multiplying the number of oxen employed

Labor cost is calculated by multiplying the number of work days

Total cost is the sum of Animal and labor costs multiplied by two.

(1st tilling in the fall and 2nd tilling in the Spring)
 North Lebanon.

<u>Animal cost</u>	<u>Labor cost</u>	<u>Total cost</u>	<u>Average cost per hectare L.L.</u>
972	200	2344	173
288	60	696	174
228	56	568	177.5
96	21.5	235	167.90
48	44	424	184.30
		<u>4267</u>	

174.90

by the price per pair per day

by the price per worker per day

of cost of care until bearing age 1. annual tilling the soil

Number of trees per hectare (weighted average)	Area of tilled planted hec- tars	Number of orchards	Orchard at- tention
600	4.80	1	100%
870	82.50	3	100%
435	3.60	1	100%
200	2.00	4	100%
	<u>92.90</u>	<u>9</u>	Total

D. Cost of care until Bearing Age

336

1. Tilling the soil in South Lebanon

Cost per tree (100.00 + 100.00 = 200.00) (average)

Table 63

Total cost is the sum of animal and labor costs multiplied by two. Labor cost is calculated by multiplying the number of work days Animal cost is calculated by multiplying the total number of animals

D1. Cost of care until bearing age: 1. annual tilling the soil

Ochard si- tuation.	Number of orchards	Area of Apples Planted Hectar	Number of Trees per hectar (weighted average)
Joubelh	1	4.20	400
Quada Jissin	3	25.30	270
Moukhtara	1	2.80	436
Barouk-Nabh Safa	4	5.60	500
Total	9	37.90	

Average cost per hectar

Average number of Trees

330

Cost per Tree (125.20 ÷ 330 = 56.10 piasters).

Animal cost is reached by multiplying the total number of oxen used

Labor cost is calculated by multiplying the number of work days

Total cost is the sum of animal and labor costs multiplied by two.

Table 63

in South Lebanon.

<u>Animal cost</u>	<u>Labor cost</u>	<u>Total cost L.L.</u>	<u>Average cost per hecter L.L.</u>
3E	65	754	180
1324	456	4760	133.10
204	44	496	177.10
403	97	1010	130.40
		<hr/>	
		7020	

135.20

by the price per pair per day.

by the price per worker per day in each district.

DI - Cost of care until Bearing Age: Annual Tilling the soil

Orchard situation	Number of orchards	Area of Apples planted per hectare	Number of trees per hectare (weighted average)
Isabai	3	77.90	331
Tainayai	2	48.90	261
Tainayay	2	1.90	47
Balibock	2	?	333
Barid	2	16.90	268
Total	11	146.60	

Average number of trees per hectare

D. Cost of care until Bearing Age

Average cost of tilling per hectare for 6 times annually.....

307

1. Tilling the soil in the Bekaa

Cost per Tree (Vd. 60 : 307 = \$2.80 per tree)

Table 64

Total cost includes cost of renting a tractor or operating one

D1 - Cost of care until Bearing Age: 2. Annual Tilling the soil

<u>Orchard si- tuation.</u>	<u>Number of orchards</u>	<u>Area of Apples planted hectar</u>	<u>Number of Trees per hectar (weighted average)</u>
Istabl	3	75.90	331
Tahnayel	2	42.90	261
Taalabaya	2	1.90	415
Baalbeck	2	9	333
Zahlé	2	16.90	268
Total	11	146.60	

Average number of trees per hectar

Average cost of tilling per hectar for 6 times annually.....

307

Cost per Tree (76.80 : 307 = 25.20 Piasters)

Total cost includes cost of renting a tractor or operating one

Table 64

in the Bekaa.

Animal cost	Labor cost	Total cost L.L.	Average cost per hectare L.L.
-	-	5697.20	75.10
-	-	3207.90	74.80
-	-	155	81.60
-	-	734.40	81.60
-	-	1471.80	82.60
		<u>1266.30</u>	

76.80

(consisting of fuel, oil, wage of driver and grease and greasing) times number of tillings plus Depreciation of tractor and cultivator at 5 and 10% respectively.

D. Cost of care until Bearing Age & Irrigation Expenses (a) Annual

Orchard Location	Number of orchards	Area of Apples planted hectars	No. of Trees per hectar Weighted average
Mar	3	01.8	270
Qada Ala	3	10.90	375
Sala and surroundings	7	4.7	404
Dahr-Baydar-Sanna	2	7.20	320
Makhira-Karjeh	3	1.20	270
Akawa-Darjeh	2	1.20	422

D. Cost of care until Bearing Age

2. Irrigation Expenses in Mount

Total IV Lebanon 71.90

Average number of trees per hectar (a) Cost of water

Average cost of irrigation per hectar (b) Watering and Ploughing

Cost per tree (1700.10 : 400 = 4.25 L.L.)

Table 65
 Cost of water included in cost (Depreciation of canal at 10% +
 Cost of operating water engines: workers' wages + Harrow + Oil +
 Cost of irrigation is calculated by multiplying the number of
 Total cost in the sum of cost of water and irrigation.

D₂. Cost of care until Bearing Age: 2. Irrigation Expenses (a) Annual

Orchard situation.	Number of orchards	Area of Apples planted hectar	No. of Trees per hectar Weighted average
Mata	3	8.10	370
Quada Aley	3	10.90	395
Sefar and surroundings	7	7	464
Dahr-Baydar-Sannin 2		7.20	326
Mughira-Kortoba 3		1.20	376
Akoura-Uneitra 2		37.50	422
Total	17	71.90	

Average number of trees per hectar

Average cost of irrigating per hectar

400

Cost per tree $(1705.10 : 400 = 4.30 \text{ L.L.})$

Cost of water includes fixed cost (Depereciation of canals at 10%,

Cost of operating water Engine: worker's wage + Mazoute + Oil +

Cost of irrigations is calculated by multiplying the number of

Total cost is the sum of cost of water and irrigations.

Table 65

Cost of water b) Watering + Planing (5-14 Irrigations)
in Mount Lebanon.

<u>Cost of water</u>	<u>Cost of irrigations</u>	<u>Total cost LL.</u>	<u>Average cost per hectare L.L. (Area as weights).</u>
2173.5	9667.5	11841	1461.80
2563	13891.5	16454.5	1509.60
2368	9037.5	11405.5	1629.40
2494	7189.5	9683.5	1345
496.40	4680	5149.40	4291.20
10253	57810	68063	1815
		<u>122596.90</u>	

1705.10

of Reservoirs at 2-3 1/3%, and of engines at 10-20%) Plus variable cost
(Cost of running water, certain fee or Grease + greasing) (an average cost)

work days by the price per worker per day in each district.

Cost of care until Bearing Age : Irrigation Expenses (a) Annual

Order of Irrigation	Number of orchards	Area of Planted hec- tars	No. of trees per hectare Weighted average
Beirut	3	12.70	278
Haroun	2	1.40	640
Tannouin	2	3.20	446
Damieh-Kettin	2	2.00	608
Beirut-Ber-	3	12.70	278
Total	12	24.40	

D. Cost of care until Bearing Age

2. Irrigation Expenses in North Lebanon

Cost per tree (L.L.) = (L.L.)

b) Watering and Ploughing

Cost of irrigation is calculated by multiplying the number of work
 Total cost is the sum of cost of water and irrigation.
Table 66
 Cost of water includes fixed cost (Depreciation of Canal at 10% and of fee

D₂ Cost of care until Bearing Age + Irrigation Expenses (a) Annual

<u>Orchard si- tuation.</u>	<u>Number of orchards.</u>	<u>Area of Apples Planted hecтар</u>	<u>No. of trees per hecтар Weighted average</u>
Bhasfrein-Sier- Akkar	3	13.50	278
Donnieh-Kottin	2	40.00	602
Tanneurin	2	3.20	476
Hasroun	2	1.40	640
Besharri	3	2.30	247
Total	12	24.40	

Average number of trees per hecтар = 375

Average cost of irrigation per hecтар =

375

Cost per tree (1279.10 ÷ 375 = 3.40 L.L.)

Cost of water includes fixed cost (Depreciation of Canals at 10% and of res

Cost of irrigations is calculated by multiplying the number of work

Total cost is the sum of cost of water and irrigations.

Table 66

cost of water (b) watering & Planing (7-14 Irrigations) in North Lebanon.

<u>Cost of water</u>	<u>Cost of Irrigations</u>	<u>Total cost L.L.</u>	<u>Average cost per hectar L.L.</u>
3197.80	9160	12357.80	908
858.40	6750	7608.40	1902.10
750.70	5580	6330.70	1978.30
840.10	2350	3190.10	2278.60
627.30	11094.5	1721.80	748.60
		<u>31208.80</u>	

1279.10

ervoirs at 2-3 1/3%) plus variable cost (cost of using water) days by the price per worker per day in each district.

D. Cost of care until bearing Age & Irrigation Expenses: (a) Annual

Orchard si- tuation.	Number of orchards.	Area of Apples Planted hec- tars	No. of trees per hec- tare Weighted average
Joubath	1	4.20	400
Quada Tlasin	3	27.30	270
Mouchava	1	2.80	430
Baroun-Nakh Sals	4	7.60	700
Total	9	32.90	

330

D. Cost of care until bearing Age

Cost per tree (L.L.S. 1948-49 = 666.00 L.L.S.)
 Annual Irrigation Expenses in South Lebanon

- a) Cost of Water
 - b) Watering and Ploughing
- Cost of water includes fixed cost (Depreciation of canals at 10%)

Cost of irrigation is calculated by multiplying the number of

Table 67

Total cost is the sum of cost of water and irrigation.

D₂ Cost of care until bearing Age: 2. Irrigation Expenses: (a) Annual

<u>Orchard si- tuation.</u>	<u>Number of orchards.</u>	<u>Area of Apples Planted hectar</u>	<u>No. of trees per hectar Weighted average</u>
Joubelh	1	4.20	400
Quada Jizzin	3	25.30	270
Mouchtara	1	2.80	436
Barouk-Nabh Safa	4	5.60	500
	<u>9</u>	<u>32.90</u>	
Total	9	32.90	

Average number of Trees per hectar

Average cost of Irrigating per hectar **330**

Cost per tree (1048.40 ÷ 330 = 3.20 L.L.)

Cost of operating water Engine: Worker's wage 5 + 3.75 Manoute +

Cost of water includes fixed cost (Depreciation of canals at 10%

Cost of irrigations is calculated by multiplying the number of

Total cost is the sum of cost of water and irrigations.

Table 67

**cost of water (b) Watering & Plowing (5-14 Irrigations)
in South Lebanon.**

<u>Cost of water</u>	<u>Cost of irrigations</u>	<u>Total cost L.L.</u>	<u>Average cost per hectare L.L.</u>
1477.60	5650	7127.20	1697
6926	12360	19286	762.30
814.5	3052.5	3667	1309.60
1386.5	8767	9652.5	1723.80
		<u>39733.70</u>	

1048.40

75 oil + 50 grease & greasing = 10 L.L.

**of reservoirs at 2-3 1/3 % and of engine at 10%) Plus variable cost
(cost of using water and cost of operating water engine (Worker's
wage + mazout + oil + grease and greasing).**

work days by the price per worker per day in each district.

Cost of care until bearing age: 2. Irrigation Expenses

Orchard location	Number of orchards	Area of planted hec- tars	Number of trees per hec- tar (weighted average)
Isabai	3	75.90	330
Tamnyoi	2	42.90	261
Talibaya	2	1.90	47

D. Cost of care until bearing age

2. Irrigation Expenses in the Bekaa

Cost of Water (per hectare) 10.90

Total (b) Watering and Ploughing 146.80

Average number of trees per hectare

Average cost of irrigation per hectare for the 1st year

307

Cost per tree (411.90 ÷ 307 = 1.33 L.L.)

Cost of water consists of fixed (depreciation of engine

+ labor costs is reached by multiplying the number of

tractors costs consist of fixed (depreciation of tractors

0

Total cost is the sum of above mentioned costs.

D2 - Cost of care until Bearing Age: 2. Irrigating Expenses:

Orchard situation.	Number of orchards	Area of Apples planted hecta r	Number of Trees per hectar (weighted average)
Istabl	3	75.90	336
Tahnayel	2	42.90	261
Taalbaya	2	1.90	415
Baalbek	2	16.90	333
Zahlé	2	16.90	268
Total	11	146.60	
Average number of Trees per hectar			
Average cost of Irrigating per hectar for the 1st year			307

Cost per tree (411.90 : 307 = 1.30 L.L.)

x Cost of water consists of fixed (depreciation of engines

+ Labor costs is reached by multiplying the number of

o Tractor costs consist of fixed (depreciation of tractors

o

o Total cost is the sum of above mentioned costs.

Table 68

a) Annual cost of Water (b) Watering & Planning (6-9) Irrigations in the Bekaa.

Cost of [ⓧ] water	Labor costs [ⓧ]	Tractor costs ^⓪	Total cost ^⓪ L.L.	Average cost per hectare (area as weights LL)
14683	3240	12734.60	30657.6	403.90
11017	2124	7716.50	20857.5	486.20
798.60	144	387.60	1330.2	700
2671	432	1135.80	4238.8	471
3477	576	3247	7300.1	432
			<u>60384.20</u>	
				<u>411.90</u>

and pipes at 10%, and of canals at 10%) Plus variable cost (cost of operating engines : Number of days multiplied by cost per day consisting of the worker's wage + fuel + oil + grease and greasing) irrigating days by the price per worker per day.

and cultivator at 5 and 10 per cent respectively) and variable cost composed of number of irrigating days times number of hectares multiplied by cost of operating a Tractor per day which (includes driver's wage + fuel + oil + grease and greasing, or cost of renting a Tractor per day.

D. Cost of care until Bearing Age: 3. Disease Control Expenditures

Orchard si- tuation	Number of orchards	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
------------------------	-----------------------	-------------------------------------	---

Matn	3	8.10	270
Guada Alea	3	10.90	327

D. Cost of care until Bearing Age

3. Disease Control Expenditures

388	08.7	(a) Cost of insecticides in Mount
378	08.1	Lebanon
478	37.3	in the first year.
	71.90	

Table 69

Average number of trees per hectar

Average cost per hectar in Mount Lebanon in the first year

400

Cost per tree (1331.2 : 400 = 3.30 L.L.)

Total cost is the sum of all the different costs of

D. Cost of care until Bearing Age: 3. Disease Control Expenditures

Orchard si- tuation.	Number of orchards	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Matn	3	8.10	270
Quada Aley	3	10.90	395
Sofar and surroundings	4	7	464
Dahr-Baydar- Sannin	2	7.20	326
Mughira-Kortoba	3	1.20	876
Akoura-Unieitra	2	37.3	472
	<u>17</u>	<u>71.90</u>	
Average number of trees per hectar			
Average cost per hectar in Mount Lebanon in the first year			400
Cost per Tree (1331.5 : 400 = 3.30 L.L.)			<u>-----</u>

x Total cost is the sum of all the different costs of

Table 69

Cost of Insecticides in (7-12 Applications) Mount Lebanon
in the first year

Total cost x L.L.	Average cost per hectar L.L. (Area as weights).
7763	958.4
15951	1463.4
7922.5	1131.70
5692	780.80
4030	3358.30
54375	1450
<u>95733.5</u>	

1331.5

insecticides including (tar and mineral oil, lead arsenate, nicotine sulfate, colloidal sulfur, parathion, etc...)

D. Cost of care until Bearing Age 3. Disease Control Expenditures

Orchard in- tention	Number of orchards	Area of Apple Planted Hectar	Number of Trees per Hectar (weighted average)
Main	3	61.6	270
Qnada Aley	3	10.90	270

D. Cost of care until Bearing Age and 3. Disease Control Expenditures

Location	Cost of insecticides in Lebanon in the Second Year
Mount Lebanon	7.20
North Lebanon	1.20
Total	8.40

Average cost of insecticides per Hectar in Mount Lebanon in the second year
 Average number of Trees per Hectar
 Cost per tree (8.40 : 400 = 4.20 L.L.)

* Total cost is the sum of all the different costs of insecticides

400

D. Cost of care until Bearing Age: 3. Disease control Expenditures

Orchard situation.	Number of orchards	Area of Apples planted Hectar	Number of Trees per hectar (weighted average)
Matn	3	8.10	270
Quada Aley	3	10.90	395
Sofar and surroundings	4	7	464
Dahr-Baydar Sannin.	3	7.20	326
Mughira-Kortoba	3	1.20	871
Akoura-Uncitra	3	37.50	422
Total	17	71.90	

Average number of Trees per hectar

Average cost of Insecticides per Hectar in Mount Lebanon in the second year

400

Cost per tree (1676.60 : 400 = 4.20 L.L.)

* Total cost is the sum of all the different costs of insecticides

Table 70

**a) Cost of Insecticides (8-12 Applications) in Mount Lebanon
in the second year.**

Total costs x <u>L.L.</u>	Average cost per hectar <u>L.L.</u> (area as weights)
9338	1152.80
12240	1673.40
11342.5	1670.30
8352	1160
4922.75	4102.30
68350	1222.70
<u>120545.25</u>	<u>1676.60</u>

including (tar and mineral oil, lead arsenate, nicotine sulfate, colloidal sulfur, parathion, etc...)

D. Cost of care until Bearing Age: 3. Disease Control Expenditures

Number of trees for bearing (weighted average)	Area of Apples planted hectars	Number of orchards	Orchard si- tuation.
--	-----------------------------------	-----------------------	-------------------------

870	8.10	3	Mata
-----	------	---	------

322	10.90	3	Quada Aisy
-----	-------	---	------------

434			Bata and surroundings
-----	--	--	--------------------------

D. Cost of care until Bearing Age

3. Disease Control Expenditures

a) Cost of insecticides in Mount Lebanon

870	1.80		in the third year
-----	------	--	-------------------

434	37.20		
-----	-------	--	--

434	37.20		
870	1.80		
	<u>39.00</u>		

Total

Average number of trees per hec...

Average cost of insecticides per hec... in Mount Lebanon
400

Cost per tree (39.00 : 400 = 9.75 L.L.)

x Total cost is the sum of all the different costs of insecticides

D. Cost of care until Bearing Age: 3. Disease Control Expenditures

Orchard situation.	Number of orchards	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Matn	3	8.10	270
Quada Aley	3	10.90	395
Sofar and surroundings	4	7	464
Dahr Baydar Sannin	2	7.20	326
Mughira-Kortoba	3	1.20	376
Akoura-Uneitra	2	37.50	422
Total	17	71.90	

Averagenumber of Trees per hectar

Average cost of insecticides per hectar in Mount Lebanon
400

Cost per tree (2238.80 : 400 = 5.60 L.L.)

x Total cost is the sum of all the different costs of insecticides

Table 71

**a) Cost of Insecticides (8-12 Applications) in Mount Lebanon
in the third year.**

Total cost x L.L.	Average cost per hectar L.L. (area as weights)
12833	1584.30
21563	1978.30
14000	2000
10544	1464.40
6411.25	5342.5
95605	2549.5
<u>160956.25</u>	
	<u>2238.60</u>

in the third year

**including (tar and mineral oil, Lead arsenate, Nicotine sulfate,
colloidal sulfur, parathion, etc...)**

D. Cost of care until bearing age: 3. Disease Control Expenditures

Number of trees per hectare (weighted average)	Area of Apples planted hectare	Number of orchards	Orchard situa- tion.
270	8.10	3	Maré
327	10.90	3	Grada Alay
424	7	4	Bolay and Sourouhina
326	7.20	3	Dahr Baidar- Bannin
270	8.10	3	Maré
327	10.90	3	Grada Alay
424	7	4	Bolay and Sourouhina
326	7.20	3	Dahr Baidar- Bannin

D. Cost of care until bearing age

3. Disease Control Expenditures

(a) Cost of insecticides in Mount Lebanon

Average cost of insecticides per hectare in the fourth year

Average cost of insecticides per hectare in the 4th year

400

Cost per tree (327.5 : 8.10 L.L.)

Table 2

Total cost is the sum of all the different costs of

D. Cost of care until Bearing Age: 3. Disease Control Expenditures

Orchard situa- tion.	Number of orchards	Area of Apples planted hecтар	Number of Trees per hecтар (weighted average)
Matn	3	8.10	270
Quada Aley	3	10.90	395
Sofar and surroundings	4	7	464
Dahr Baydar- Sannin	2	7.20	326
Mughira-Kortoba	3	1.20	876
Akoura-Unaitra	8	37.50	422
Total	17	71.90	
Average number of trees per hecтар			
Average cost of insecticides per hecтар in the 4th year			400

Cost per tree $(3251.5 : 400 = 8.10 \text{ L.L.})$

x Total cost is the sum of all the different costs of

Table 78

a) Cost of insecticides (8-12 Applications) in
Mount Lebanon in the fourth year

Total cost x L.L.	Average cost/hectar L.L. (area as weights)
18596	2295.80
33720	3093.60
21290	3041.40
16484	2290
9717.5	8097.5
133975	3572.70
<u>233782.5</u>	<u>3251.5</u>

insecticides including (tar and mineral oil, Lead Arsenate, Nicotine sulfate, colloidal sulfur, parathion, etc...)

126

D. Cost of care until bearing age in Disease Control Expenditures

Orchard si- tuations	Number of orchards	Area of Apples planted per hectar	Number of trees per hectar (weighted average)
Bharatpur- Akbar	3	13.70	278
D. Cost of care until bearing age			
4. Disease Control Expenditures			
a) Cost of insecticides in			
North Lebanon in the			
first year			
Bharatpur	3	1.40	640
Bharatpur	3	3.30	247
Total	6	24.40	905

Average number of trees per hectar
Average
Cost per hectar in North Lebanon in the first year

375

Cost per tree (1233.60 : 375 = 3.30 L.L.)

x Total cost is the sum of all the different costs of insecticides

D. Cost of care until Bearing Age: 3. Disease Control Expenditures

Orchard si- tuation.	Number of orchards	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Bhasfrein-Sier- Akkar	3	13.50	278
Donnich-Kottin	2	4.00	602
Tamhourin	2	3.80	476
Hasroun	2	1.40	640
Besharri	3	2.30	247
Total	12	24.40	

Average number of Trees per hectar

Average

Cost per hectar in North Lebanon in the first year 375

Cost per tree ($1233.60 \div 375 = 3.30$ L.L.)

x Total cost is the sum of all the different costs of insecticides

Table 73
 a) Cost of Insecticides (3-12 Applications) in North Lebanon
 in the first year.

Total cost L.L.	x	Average cost per hectare (area as weights) L.L.
1128.75		824.40
7120		1780
6270		1959.40
3172.5		2268
2510		1091.30
<u>30201.25</u>		
		<u>1233.60</u>

including (Tar and mineral oil, Lead arsenate, Nicotine sulfate,
 Colloidal, sulfur, Parathion, etc...)

D. Cost of care until Bearing Age: 3. Disease Control Expenditures

Number of trees per hectare (weighted average)	Area of Apples planted hectare	Number of orchards	Orchard sit- uation
278	13.70	3	Bashraim-Bitar- Akbar
202	4.30	2	Donich-Kattin
476	D. Cost of care until Bearing Age		
640	3. Disease Control Expenditures		
242	a) Cost of insecticides in North Lebanon in the second year		
	2.30	2	Bashraim
	44.40	12	Total
272	Average number of trees per hectare		
	Average cost of insecticides per hectare in North Lebanon in the second year		

Cost per tree (1076.90 : 272 = 4.20 L.L.)

* Total cost is the sum of all the different costs of insecticides

D. Cost of care until Bearing Age: 3. Disease Control Expenditures

Orchard situation.	Number of orchards	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Bhasfrein-Sier-Akkar	3	13.50	278
Donnieh-Kottin	2	4.00	602
Tannourin	2	3.20	476
Hasroun	2	1.40	640
Besharri	3	2.30	247
Total	12	24.40	
Average number of Trees per hectar			
Average cost of insecticides per hectar in North Lebanon in the second year			375

Cost per tree (1676.90 : 375 = 4.50 L.L.)

* Total cost is the sum of all the different costs of insecticides

Table 74
 a) Cost of Insecticides (9-12 Applications) in North Lebanon
 in the second year.

Total cost x L.L.	Average cost per hectar L.L. (area as weights)
15960	1182.20
10475	2619.80
6962.5	2175.80
4228.75	3020
3287	1429.10
<u>40913.75</u>	<u>1676.80</u>

including (tar and mineral oil, lead arsenate, Nicotine sulfate,
 colloidal sulfur, parathion, etc...).

D. Cost of care until Bearing Age: Disease Control Expenditures

Number of trees per hectare (weighted average)	Area of applied planted hectare	Number of orchards	Orchard si- tuation
278	13.20	3	Bashrin-Glaz Arize
608	4.00	8	Donnan-Kovrin
476	3.30	8	Tannourin
640	1.40	8	Hastorn
247	2.30		
D. Cost of care until Bearing Age			
3. Disease Control Expenditures			
a) Cost of Insecticides in			
North Lebanon in the Third			
year			
Total			
24.40			

Average number of trees per hectare

Average cost of insecticides per hectare in the North Lebanon in the third year

278

Cost per tree (2224.90 : 278 = 8 l.l.)

Total cost is the sum of the different costs of insecticides including

D. Cost of care until Bearing Age: Disease Control Expenditures

Orchard situation.	Number of orchards.	Area of Appled planted hectar	Number of Trees per hectar (weighted average)
Bhasfrein-Sier Akkar	3	13.50	278
Donnieh-Kottin	2	4.00	602
Tannourin	2	3.20	476
Hasroun	2	1.40	640
Besharri	3	2.30	247
Total	12	24.40	

Average number of trees per hectar

Average cost of insecticides per hectar in the North Lebanon in the third year 375

Cost per tree (2254.90 : 375 = 6 L.L.)

x Total cost is the sum of the different costs of insecticides including

Table 75

3. Cost of Insecticides (10 Applications) in North Lebanon
in the third year.

Total cost	x	Average cost per hectare
<u>L.L.</u>		<u>L.L.</u>
22580		1672.60
13280		3320
9475		2960.90
5246.75		3747.70
4436.5		1926.30
<u>55018.25</u>		
		<u>2254.90</u>

(tar and mineral oil, Lead arsenate, Nicotine sulfate, colloidal sulfur, parathion, etc ...)

D. Cost of care until Bearing Age. 3. Disease Control Expenditures

Number of Trees per hectare	Area of Apples planted Hectar	Number of orchards	Orchard si- tuation
--------------------------------	----------------------------------	-----------------------	------------------------

278	13.70	3	Bharfein-Gier- Albar
202	4.00	2	Domnieh-Kettin
246	2.20	2	Tannounin

D. Cost of care until Bearing Age

3. Disease Control Expenditures

a) Cost of insecticides in the North
Lebanon

Total

Average number of trees per hectare

Average cost of insecticides per Hectar
in North Lebanon in the fourth year

Cost per tree (3301.60 : 377 = 8.80 L.L.)

x Total cost is the sum of the different costs of insecticides

D. Cost of care until Bearing Age. 3. Disease Control Expenditures

Orchard si- tuation.	Number of orchards	Area of Apples planted Hectar	Number of Trees per hectar
Bhasfrein-Sier- Akkar	3	13.50	278
Donnieh-Kottin	2	4.00	602
Tannourin	2	3.20	676
Hasroun	2	1.40	640
Besharri	3	2.30	247
Total	12	24.40	
Average number of Trees per hectar			
Average cost of insecticides per Hectar in North Lebanon in the fourth year			375
Cost per Tree (3301.60 : 375 = 8.80 L.L.)			

x Total cost is the sum of the different costs of insecticides

Table 76

a) Cost of insecticides (9-12 Applications) In North Lebanon
in the fourth year.

Total Cost x	Average cost per hectar
L.L.	L.L.
31660	2345.20
20600	5150
13950	4328.10
8507.5	6077
5850.5	2543.5
<hr/>	
80568	
	<hr/>
	3301.60

including (tar and mineral oil, Lead arsenate, Nicotine sulfate,
colloidal sulfur, Parathion, etc...)

D. Cost of care until Bearing Age: 3. Disease Control Expenditures

Number of trees per hectare (weighted average)	Area of Apples planted hectare	Number of orchards	Orchard si- tuation
400	4.20	1	Touba
270	27.30	3	Qunaya

D. Cost of care until Bearing Age

3. Disease Control Expenditures

300
 27.30
 Total
 300

Table 77
 Average cost per hectare in South Lebanon
 in the first year

Cost per tree (L.L.) : 300 = 4.05 L.L.

Total cost is the sum of the different costs of insecticides

D_{3a} - Cost of care until Bearing Age: 3. Disease Control Expenditures

Orchard situation.	Number of orchards	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Joubelh	1	4.20	400
Quada Jizzin	3	25.30	270
Mouchtara	1	2.80	436
Baronk-Nabli Safa	4	5.60	500
Total	9	37.90	
Average number of trees per hectar			
Average cost per hectar in South Lebanon in the first year			<u>300</u>

Cost per tree (L.L. : 300 = 4.05 L.L.)

x Total cost is the sum of the different costs of insecticides

Table 77

**a) Cost of Insecticides (7-12 Applications) in South Lebanon
in the first year.**

Total cost ^x	Average cost per hectare
<u>L.L.</u>	<u>L.L.</u>
4710	1121.40
26502.5	1127
5162.5	1243.5
9653.75	1724.10
<hr style="width: 100%; border: 0.5px solid black;"/>	
46028.75	 <u>1214.5</u>

including (Tar and mineral oil, Lead arsenate, Nicotine Sulfate,
Colloidal sulfur, parathion, etc...)

D. Cost of care until Bearing Age: 3.7. Diseases Control Expenditures

Number of trees per hectare (weighted average)	Area of Apples planted (hectares)	Number of orchards	Orchard situation
400	4.20	1	Joubert
270	27.30	3	Quatre Vaux
430	2.80	1	Montfort
200			

D. Cost of care until Bearing Age

3. Diseases Control of Expenditures

a) Cost of insecticides in South

Average number of trees per hectare in the second year

Average cost of insecticides per hectare in South Lebanon in the second year

Cost per tree (1400 L.L.) : 300 = 4.66 L.L.

Total cost is the sum of the different costs of insecticides

D. Cost of care until Bearing Age: 3. Disease Control Expenditures

Orchard situation.	Number of orchards	Area of Apples planted Hectar	Number of Trees per hectar (weighted average)
Joubeih	1	4.20	400
Quada Jizzin	3	25.30	270
Mouchtara	1	2.80	436
Barouk-Nabh Safa	4	5.60	500

Total 9 37.90

Average number of trees per hectar

Average cost of Insecticides per hectar in South Lebanon in the Second year 300

Cost per tree (1463.5 : 300 = 4.90 L.L.)

x Total cost is the sum of the different costs of insecticides

a) Cost of Insecticides (8-11 Applications)
in South Lebanon in the second year.

Total cost x L.L.	Average cost per hectare (area as weights) L.L.
6340	1509.5
29790	1173.5
6485	2316.10
12851	2294.80
<hr/> 55466	

1463.5

including (Tar and mineral oil, Lead arsenite, Nicotine sulfate,
Colloidal sulfur, Parathion, etc...)

D. Cost of care until bearing year 3. Disease Control Expenditures

Orchard location	Number of orchards	Area of Apples planted Hectar	Number of trees per hectar (weighted average)
Toubeh	1	4.20	400
Qanda Jirain	3	12.30	270
Mouhara	1	8.80	450
Bayrak-Nash Sala	4	2.60	200

D. Disease Control Expenditures

a) Cost of insecticides in South Lebanon in the third year.
 Average number of trees per hectar

Average cost of insecticides per hectar in South Lebanon in the third year

Cost per tree (1964.10 : 300 = 6.60 L.L.)

x Total cost is the sum of the different costs of insecticides

D. Cost of care until Bearing Age: 3. Disease Control Expenditures

Orchard situation	Number of orchards	Area of Apples planted Hectar	Number of Trees per hectar (weighted average)
Joubelh	1	4.20	400
Quada Jizzin	3	25.30	270
Mouchtara	1	2.80	436
Barouk-Nabh Safa	4	5.60	500
Total		37.90	
Average number of trees per hectar			
Average cost of insecticides per hectar in South Lebanon in the third year			<u>300</u>
Cost per tree (1984.10 : 300 = 6.60 L.L.)			

x Total cost is the sum of the different costs of insecticides

Table 79

a) Cost of Insecticides) in South Lebanon in the
Third Year.

Total cost x L.L.	Average cost per hectare (area as weights) L.L.
8837.5	2104
40492.5	1600.5
8725	3116.10
17142.5	3061.10
<u>75197.5</u>	

1984.10

including (Tar and mineral oil, Lead arsenate, Nicotine sulfate,
Colloidal sulfur, Parathion, etc...)

D. Cost of care with bearing age: Disease Control Expenditures

Number of trees per hectare (weighted average)	Area of Apple planted Hectares	Number of sprays	Organic si- cations
400	4.80	1	Topical
270	27.30	2	Organic liquid
430	2.80	1	Monoculture
200			

D. Disease Control Expenditures

a) Cost of insecticides in South Lebanon

Average number of trees per hectare in the fourth year

Average cost of insecticides per hectare in South Lebanon in the fourth year

300

Cost per tree (300 = 2.70 L.L.)

Total cost is the sum of the different costs of insecticides

D. Cost of care until Bearing Age: 3. Disease Control Expenditures

Orchard si- tuation.	Number of orchards	Area of Apples planted Hectar	Number of Trees per hectar (weighted average)
Joubelh	1	4.20	400
Quada Jizzin	3	25.30	270
Mouchtara	1	2.80	436
Barouk-Nabb Safa	4	5.60	500

Total 9 37.90

Average number of Trees per hectar

Average cost of insecticides per hectar
in South Lebanon in the fourth year

300

Cost per tree (2913.5 : 300 = 9.70 L.L.)

x Total cost is the sum of the different costs of insecticides

Table 80

(a) Cost of Insecticides (8-12 Applications)
in South Lebanon in the fourth year.

Total cost x	Average cost per hectar (area as weights) L.L.
12000	2859.50
60125	2392.30
13250	4732.20
25240	4507.20
<u>110615</u>	
	<u>2918.5</u>

including (tor and mineral oil, Lead arsenate, Nicotine sulfate,
Colloidal sulfur, Parathion, etc...)

D. Cost of care until Bearing Age & Disease Control Expenditures

Order of Location	Number of orchards	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
----------------------	-----------------------	----------------------------------	---

Estadi	3	75.90	336
Tahnyoi	8	48.90	351

D. Cost of care until Bearing Age

3. Disease Control Expenditures

333	a) Cost of insecticides in the	333
358	in the first Year	358
	<u>146.60</u>	
	Total	307

Average number of trees per hectar

Average cost per hectar in the Boka in the first year

307

Cost per tree (1101.30 : 307 = 3.60 L.L.)

x Total cost in the sum of the different costs of insecticides

D. Cost of care until Bearing Age: 3. Disease Control Expenditures

Orchard situation.	Number of orchards	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Establ	3	75.90	336
Tahnayel	2	42.90	261
Taalbaya	2	1.90	415
Baalbek	2	9	333
Zahlé	2	16.90	268
Total	11	146.60	

Average number of ^{16.81} Trees per hectar

Average cost per hectar in the Bekaa in the first year

307

Cost per Tree (1101.30 : 307 = 3.60 L.L.)

x Total cost in the sum of the different costs of insecticides

Table 8I

a) Cost of Insecticides in the (8-12 Applications) Bekaa
in the first year.

Total cost x L.L.	Average cost per hectar L.L. (area as weights).
89430	1178.30
44950	1047.80
2866.25	1510.50
9192.5	1021.30
15010	888.20
<u>161448.75</u>	
	<u>1101.30</u>

including (tar and mineral oil, Lead arsenate, nicotine sulfate,
colloidal sulfur, parathion, etc...)

D. Cost of care until Bearing Age: 3. Disease Control Expenditures

Orchard in- station.	Number of orchards	Area of Apples planted hec- tars	Number of Trees per hec- tar (weighted average)
Idahai	3	77.90	336
Tahayai	3	48.90	281
Tahayai	3	1.90	415
Bahak	3	9	333
			307

D. Cost of care until Bearing Age

3. Disease Control Expenditures

Average cost of insecticides in the

Year in the Second Year

Average cost of insecticides per hec-
tar in the Second Year

307

Table 33
Cost per tree (1939) : 307 = 4.40 L.L.

x Total cost is the sum of the different cost of insecticides

D. Cost of care until Bearing Age: 3. Disease Control Expenditures

Orchard situation.	Number of orchards	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Istabl	3	75.90	336
Tahnayel	2	42.90	261
Taalbaya	2	1.90	415
Baalbek	2	9	333
Zahlé	2	16.90	268
Total		146.60	

Average number of Trees per hectar

Average cost of insecticides per hectar in the Bekaa in the Second Year

307

Cost per-tree (1339.5 : 307 = 4.40 L.L.)

x Total cost is the sum of the different cost of insecticides

Table 82

(a) Cost of Insecticides (10-12 Applications) in the Bekaa in the second year.

Total cost x L.L.	Average cost per hectar L.L.
109385	1441.20
53225	1340.70
3457.5	1819.70
11973.75	1330.30
13275	1081.40
<u>196316.25</u>	
	<u>1389.5</u>

including (tar and mineral oil, Lead arsenate, nicotine sulfate, colloidal sulfur, parathion, etc...

D. Cost of care until Bearing Age 3. Disease control Expenditures

Number of trees per hectare (weighted average)	Area of Apples planted hectare	Number of orders	Order of rotation
--	-----------------------------------	---------------------	----------------------

336	77.90	3	Initial
-----	-------	---	---------

361	42.90	3	Intermediate
-----	-------	---	--------------

D. Cost of care until Bearing Age

3. Disease Control Expenditures

a) Cost of insecticides in the Bohas
in the third year

333	16.90	3	Initial
-----	-------	---	---------

146.60

Table 23 Total

Average number of trees per hectare

Average cost of insecticides in the Bohas
in the third year

307

Cost per tree (1978.30 : 307 = 6.44 L.L.)

x Total cost is the sum of the different costs of insecticides

D. Cost of care until Bearing Age: 3. Disease control Expenditures

Orchard situation.	Number of orchards	Area of Apples planted hecter	Number of Trees per hectar (weighted average)
Istabl	3	75.90	336
Tahmayel	2	42.90	261
Taalbaya	2	1.90	415
Baalbek	2	9	333
Zahlé	2	16.90	268
Total	11	146.60	

Average number of Trees per hectar

Average cost of insecticides in the Bekaa in the Third year

307

Cost per tree (1952.30 : 307 = 6.40 L.L.)

x Total cost is the sum of the different costs of insecticides

Table 33

**a) Cost of insecticides (9-12 Applications) in the Bekaa
in the third year.**

Total cost Σ <u>L.L.</u>	Average cost per hectare <u>L.L.</u> (area as weights)
163935	2160
75000	1748.30
5133.75	2730.90
14693.75	1632.70
<u>27380</u>	1620.10
286197.5	

1952.30

including (tar and mineral oil, Lead Arsenate, Nicotine sulfate,
colloidal sulfur, parathion, etc...)

Cost of care until Bearing Age: Disease Control Expenditures

Orchard station	Number of orchards	Area of Apples planted hectar	Number of trees per hectar (weighted average)
Idahi	3	78.90	336
Tainyoi	2	48.90	181
Taiyaya	2	1.90	41
Baidok	2	2	33

D. Cost of care until Bearing Age

3. Disease Control Expenditures

a) Cost of Insecticides in the Bekaa in

Average number of trees per hectar the fourth year

Average cost of insecticides per hectar in the fourth year

307

Cost per tree (2491.00 : 307 = 8.10 L.L.)

Total cost is the sum of the different costs of insecticides

D_{3a} - Cost of care until Bearing Age: Disease Control Expenditures

Orchard situation.	Number of orchards	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Istabl	3	75.90	336
Fahmayel	2	42.90	261
Taalbaya	2	1.90	415
Baalbek	2	9	333
Zahlé	2	16.90	268
Total	11	146.60	
Average number of Trees per hectar			
Average cost of insecticides per hectar in the Bekaa in the fourth year			307

Cost per Tree (2491.60 : 307 = 8.10 L.L.)

* Total cost is the sum of the different costs of insecticides

Table 84

a) Cost of Insecticides (11-12 Applications) in the Bekaa
in the Fourth year.

Total Cost ^x L.L.	Average cost per hectar L.L.
203150	2676.60
95575	2227.90
6286.25	3308.40
23895	2655
36360	2151.5
<u>365266.25</u>	
	<u>2491.60</u>

including (tar and mineral oil, Lead arsenate, nicotine sulfate, colloidal sulfur, parathion, etc....)

D. Cost of care until Bearing Age - 3. Disease control expenditures

Orchard No. - Station.	Number of orchards	Area of Apples planted in acres	Number of Trees per hectare (weighted average)
Marj	3	8.10	270
Quada Alley	3	10.80	322
Solar and Sawmills	4	7	404

D. Cost of care until Bearing Age

30 Disease Control Expenditures

382	30		Marj-Sawmills
378	(b) Cost of operating Spraying machines	1.30	Marj-Sawmills
384	(c) Labor spraying Expenses	37.70	Marj-Sawmills
	Total	39.00	

30 Mount Lebanon in the First Year

Average number of trees per hectare
Average cost of applying sprayers per hectare
in the Mount Lebanon in the first year

Cost per tree (39.00 : 400 = 97.5 E.L.) Planted.

x Cost of operating spraying machines in the sum of fixed
* Rental payment is calculated by multiplying the number
- Labor spraying expenses is reached by multiplying the
• Total cost is the sum of cost of operating spraying machines

D. Cost of care until Bearing Age - 3. Disease control Expenditures

Orchard si- tuation.	Number of orchards	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Matn	3	8.10	270
Quada Aley	3	10.20	395
Sofar and surroundings	4	7	464
Bahr-Baydar Sannin	2	7.20	326
Mughira-Kortoba	3	1.20	876
Akoura-Uneitra	2	37.50	422
Total	17	71.90	

Average number of Trees per hectar

Average cost of applying sprayings per hectar
in the Mount Lebanon in the first year 400

Cost per tree (388.60 : 400 = 97.5 B.L.) Piasters.

x Cost of operating spraying machines is the sum of fixed

* Rental payment is calculated by multiplying the number

- Labor spraying expenses is reached by multiplying the

o Total cost is the sum of cost of operating spraying machines

Table 85

(b) Cost of Operating Spraying Machines (c) Labor Spraying Expenses
(7-12 Applications) in Mount Lebanon in the First Year.

Cost of operating Spraying machines	Rental Pay- ment.	Labor spra- ying expenses	Total cost *	Average cost per hectar LL (area as weight)
316		2122	2428	300
688.60	200	3750	4638.60	425.5
375		1848.5	2223.50	317.60
195	70	1296	1561	217
325		1008	1333	1110.80
1924.20		13784	15708.20	418.90
			<u>27892.30</u>	
				<u>387.90</u>

(depreciation of engines and pumps at 10-50%) Plus variable cost which is the result of multiplying the number of work days by the cost of operating per day including (fuel, oil and grease and greasing)

of work hours by the price per hour.

number of work days (Number of workers times number of applications) by the price per worker per day.

and labor spraying expenses or rental payment.

D. Cost of care until Bearing Age 3. Disease Control Expenditures

Number of trees planted per hectare (weighted average)	Area of Apples planted per hectare	Number of orchards	Orchard situation
270	8.10	3	Main
322	10.90	3	Quada Alley
414	7	4	Solar and surroundings
322	7.80	2	Dahy Bahayr Samnia

D. Cost of care until Bearing Age

3. Disease Control Expenditures

b) Cost of operating Spraying Machines

c) Labor Spraying Expenses

400

Cost per tree (480.40 : 400 = 1.20 L.L.)

Table 86

x Cost of operating spraying machines is the sum of fixed

+ rental payment is calculated by multiplying the number of work hours by

- Labor spraying Expenses is reached by multiplying the

o Total cost is the sum of cost of operating spraying machines

D. Cost of care until Bearing Age: 3. Disease Control Expenditures

Orchard situation.	Number of orchards	Area of Apples planted per hectar	Number of Trees per hectar (weighted average)
Matn	3	8.10	270
Quada Aley	3	10.90	395
Sofar and surroundings	4	7	414
Dahr Baydar Sarmin	2	7.20	326
Mughira-Korobaa	3	1.20	376
Akoura-Uneitra	2	37.50	422
Total	17	71.90	
Average number of Trees per hectar			
Average cost per hectar in Mount Lebanon in the second year			400
Cost per tree (480.40 : 400 = 1.20 L.L.)			

x Cost of operating spraying Machines is the sum of fixed

+ rental payment is calculated by multiplying the number of work hours by th

- Labor spraying Expenses is reached by multiplying the

o Total cost is the sum of cost of operating spraying machines

Table 86

b) Cost of operating spraying machines c) Labor spraying Expenses
(8-12 Applications) in Mount Lebanon in the second year.

Cost of operating spraying machines	Rental Payment	Labor spraying expenses	Total cost L.L.	Average cost per hectar L.L. (area as weights)
354		2420	2774	342.50
699.80	320	4180	5199.80	447
432.50		2667	3099.50	444.60
225	100	1800	2125	295.20
381		1122	1503	1252.5
2197.20		17640	19837.20	589
			<u>34538.50</u>	
				<u>480.40</u>

(depreciation of engines and pumps at 10-50%) plus variable cost which is the result of multiplying the number of work days by the cost of operating per day including (full, oil and grease and greasing).

a. price per hour.

number of work days (number of workers times number of applications) by the price per worker per day.

and Labor spraying expenses or rental payment.

D. Cost of care until bearing age 3. Disease control expenditures

Order of plantation	Number of orchards	Area of Apples planted hec	Number of trees per hec (weighted average)
Mar	3	8.10	270
Grade Alley	3	10.90	270
Boyer and surroundings	4	7	404

D. Cost of care until bearing age

356

3. Disease Control Expenditures

870

b) Cost of operating Spraying Machines

432

c) Labor spraying expenses

71.90

Total 17

Total

Mount Lebanon
Average number trees per hec in the third year

Average cost per hec in Mount Lebanon in the third year

Table 87

400

Cost per tree (28.80 : 400 = 1.70 L.L.)

x Cost of operating spraying machines in the sum of lines

x Rental payment is calculated by multiplying the number

of labor spraying expenses is reached by multiplying the

Total cost is the sum of cost of operating spraying

D. Cost of care until Bearing Age: 3. Disease control Expenditures

Orchard situation.	Number of orchards	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Matn	3	8.10	270
Quada Aley	3	10.90	395
Sofar and surroundings	4	7	464
Dahr-Baydar	2	7.20	326
Sannin	3	1.20	376
Mughira-Kortoba	2	37.50	422
Akoura Uneitra	2		
Total	17	71.90	

Total
Average number of Trees per hectar

Average cost per hectar in Mount Lebanon
in the third year 400

Cost per tree (592.20 : 400 = 1.50 L.L.)

- x Cost of operating spraying machines is the sum of fixed
- x Rental payment is calculated by multiplying the number
- Labor spraying expenses is reached by multiplying the
- Total cost is the sum of cost of operating spraying

Table 37

b) Cost of Operating Spraying Machines c) Labor spraying Expenses
(3-12 Applications) in Mount Lebanon in the Third year.

Cost of operating spraying machine. ^x	Rental payment ⁺	Labor spraying expenses [←]	Total cost ^o L.L.	Average cost per hectare L.L.
372.60		2748.00	3120.60	365.30
816.40	400	5150	6366.40	584.10
433		3600	4033	576.10
195	140	2160	2495	346.5
325		1748	2173	1810.80
2669		21780	24389	650.40
			<u>48577</u>	
				<u>592.20</u>

(depreciation of engines and pumps at 10-50%) Plus variable cost which is the result of multiplying the number of work days by the cost of operating per day including (fuel, oil and grease and greasing).

of work hours by the price per hour.

number of work days (number of workers times number of applications) by the price per worker per day.

machines and labor spraying expenses or rental payment.

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D. Cost of care until Bearing Age 3. Disease Control Expenditures

Number of trees per hectare (weighted average)	Area of Apples planted (hectares)	Number of orchards	Grand total
270	81.8		221
322	10.90		353
464	7		527

D. Cost of care until Bearing Age

3. Disease Control Expenditures

b) Cost of operating Spraying Machines

c) Labor Spraying Expenses

Total 71.90

Average number of trees per hectare in Mount Lebanon in the fourth year
 Average cost per hectare in Mount Lebanon in the fourth year

Table 88

Cost per tree (757.40 : 400 = 1.90 L.L.)

* Cost of operating spraying machines in the sum of fixed

+ Rental Payment is calculated by multiplying the number

- Labor spraying expenses is reached by multiplying the

* Total cost is the sum of cost of operating spraying

D. Cost of care until Bearing Age: 3. Disease Control Expenditures

Orchard si- tuation.	Number of orchards	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Matn		8.10	270
Quada Aley		10.90	395
Sofar and surroundings		7	464
Dahr-Baydar-Sannin		7.20	326
Hughira-Khortoba		1.20	376
Akoura Unetra		33.50	422
Total		71.90	
Average number of trees per hectar in the fourth year			400

Cost per tree (757.40 : 400 = 1.90 L.L.)

x Cost of operating spraying machines is the sum of fixed

+ Rental Payment is calculated by multiplying the number

- Labor spraying expenses is reached by multiplying the

• Total cost is the sum of cost of operating spraying

Table 88

b) Cost of operating spraying machines c) Labor spraying Expenses
(9-12 Applications) in Mount Lebanon in the Fourth year

Cost of operating spraying machines	Rental Payment	Labor spraying expenses	Total cost L.L.	Average cost per hectare L.L.
446		3388	3834	473.30
975.20	600	5706.25	7281.45	668
510		4000.5	4510.5	644.40
225	200	2700	3125	434
381		1716	2097	1747.5
3309		30300	33609	896.30
			<u>54456.95</u>	
				<u>757.40</u>

(depreciation of engines and pumps at 10-50%) plus variable cost which is the result of multiplying, the number of work days by the cost of operating per day including (fuel, oil and grease and greasing).

of work hours by the price per hour.

number of work days (number of workers times number of applications)
by the price per worker per day.

machines and labor spraying expenses or rental payment.

B. Cost of Care until Age 3, Disease Control Expenditures

Orchard Station	Number of Orchards	Area of Apples planted (hectars)	Number of Trees per hectare (weighted average)
Hennin-Sier- Alkha	3	13.50	278
Donnleh-Ketta	2	4.00	602
Tannouin	2	3.20	472
Haroun	2	1.40	640
Banari	3	2.30	847
Total	12	24.40	

D. Cost of Care until Bearing Age

3. Disease Control Expenditures

- a) Labor spraying expenses
- b) Cost of operating spraying machines

* Total cost is the sum of cost of operating spraying machines + labor spraying expenses as recorded by multiplying the number of trees in the orchard by the sum of fixed cost of operating spraying machines is the sum of fixed

North Lebanon
in the First Year

Table 89

* Total cost is the sum of cost of operating spraying machines + labor spraying expenses as recorded by multiplying the number of trees in the orchard by the sum of fixed cost of operating spraying machines is the sum of fixed

D. Cost of Care until Age: 3. Disease Control Expenditures

<u>Orchard si- tuation.</u>	<u>Number of orchards.</u>	<u>Area of Apples planted hectar</u>	<u>Number of Trees per hectar (weighted average)</u>
Ehasfrein-Sier- Aldkar	3	13.50	278
Donniah-Kottin	2	4 .00	602
Tannourin	2	3.20	476
Hasroun	2	1.40	640
Besharri	3	2.30	247
Total	12	24.40	

Average number of Trees per hectar

Average cost per hectar in North
Lebanon in the first year

375

Cost per tree (261.80 ÷ 375 = 69.80 L.L.)

x Cost of operating spraying machines is the sum of fixed

+ Labor spraying expenses is reached by multiplying the number

o Total cost is the sum of cost of operating spraying machines

Table 89

(b) Cost of operating spraying machines and (c) Labor spraying Expenses
(8-12 applications) In North Lebanon in the First Year.

Cost of opera- ^x ting spraying machines.	Labor spraying + Expenses	Total cost * L.L.	Average cost per hectar L.L. (area as weights).
610.40	1880	2490.40	134.50
170	1240	1410	352.5
175	1020	1195	373.40
300	502	702	501.40
150	434.5	584.5	251.
		<u>6381.90</u>	
			<u>261.80</u>

(depreciation of engines and pumps at 10-50%) plus variable cost which is the result of multiplying the number of work days by the cost of operating per day including (fuel, oil, and grease and greasing).

of work days (number of workers times number of applications) by the price per worker per day.

and labor spraying expenses.

D. Cost of care until bearing age, Disease Control Expenditures

Number of trees per hectare (weighted average)	Area of Apples planted per hectare	Number of orchards	Orchard situation
278	13.20	3	Alkhar
202	4.00	2	Domfeh-Kottin
476	3.20	2	Tannouin
242	1.40	2	Hazoum
242	2.30	2	Bachari
	24.40	12	Total...

Average number of trees per hectare

Average cost of care until bearing age per hectare in North Lebanon in 1950

D. Cost of care until bearing age

3. Disease Control Expenditures

b) Cost of operating spraying machines

c) Labor spraying Expenses

Cost of operating spraying machines is the sum of fixed

North Lebanon
+ Labor expenses as recorded by multiplying the

Table 90
Total cost of operating spraying machines and labor

D. Cost of care until Bearing Age: ³ Disease Control Expenditures

Orchard si- tuation.	Number of orchards.	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Bhasfrein-Sier- Akkar	3	13.50	278
Donniah-Kottin	2	4.00	602
Tannourin	2	3.20	476
Hasroun	2	1.40	640
Besharri	3	8.30	247
Total...	12	24.40	

Average number of trees per hectar

Average cost of operating & applying spraying
per hectar in North Lebanon in the
second year

375

Cost per tree $(342.60 \div 375 = 91.40 \text{ Piasters})$.

x Cost of operating spraying machines is the sum of fixed

+ Labor spraying Expenses is reached by multiplying the

o Total cost is the sum of cost of operating spraying machines and Labor

Table 90

b) Cost of operating Spraying machines c) Labor spraying expenses
(9-12 Applications) in North Lebanon in the Second Year.

Cost of opera- ^x ting spraying machines.	Labor spraying + Expenses	Total cost ° L.L.	Average cost per hectar L.L. (area as weights)
634.20	2550	3234.20	238.80
215	1750	1965	491.20
200	1345	1445	451.90
230	790	1020	728.60
190	506	696	302.60
		<u>8360.20</u>	
			<u>342.60</u>

(depreciation of engines and pumps at 10-50%) plus variable cost which
is the result of multiplying the number of work~~er~~ days by the cost of
operating per day including (fuel, oil, and grease and greasing).

number of work days (number of workers times number of applications)
by the price per worker per day.

and labor spraying expenses.

D. Cost of care until Bearing Age: Disease control Expenditures

Number of trees per hectare (weighted average)	Area of apples planted hectare	Number of sprays	Order of treatment
178	13.50	3	Benlate-3-12
300	4.00	2	Donatol-Kosin
476	3.80	2	Tanoxin
640	1.40	2	Harom
847	2.30	3	Benlate

D. Cost of care until Bearing Age

3. Disease Control Expenditures

b) Cost of operating spraying machines

c) Labor spraying expenses

Cost per tree (37.50 : 375 = 1.04 L.A.)

North Lebanon

Cost of operating spraying machines is the sum of fixed
in the third year

Table 91

+ Labor spraying expenses is reached by multiplying the number

• Total cost is the sum of cost of operating machines and labor

D. Cost of care until Bearing Age: Disease control Expenditures

Orchard situation.	Number of orchards	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Bhasfrein-Sier Akkar	3	13.50	178
Donnieh-Kettin	2	4.00	602
Tannourin	2	3.20	476
Hasroun	2	1.40	640
Besharri	3	2.30	247
Total	12	24.40	

Average number of Trees per hectar

Average cost of applying sprays per hectar in North Lebanon in the third year

375

Cost per tree ($385.60 : 375 = 1.04 \text{ L.L.}$)

x Cost of operating spraying machines is the sum of fixed

+ Labor spraying Expenses is reached by multiplying the number

• Total cost is the sum of cost of operating machines and labor

Table 9I

b) Cost of operating spraying machines c) Labor spraying Expenses
(10 Applications) in North Lebanon in the third year.

Cost of opera- ^x ting spraying machines.	Labor spraying ⁺ Expenses	Total cost ° L.L.	Average cost per hectar L.L.
644	3200	3844	284.80
170	2000	2170	542.5
175	1415	1590	497
200	940	1110	793
150	550	700	304.30
		<u>9414</u>	
			<u>385.80</u>

(depreciation of engines and pumps at 10-50%) plus variable cost which is the result of multiplying the number of work days by the cost of operating per day including (fuel, oil and grease and greasing).

of work days (number of workerstimes number of applications) by the price per worker per day.

spraying expenses,

D. Cost of care until bearing age: Disease Control Expenditures.

Orchard location	Number of orchards	Area of Apples planted per hectare	Number of Trees per hectare (weighted average)
Bashayin-Ghar Akkar	3	13.50	270
Donniah-Koffin	2	4.00	80
Tannouyin	2	3.20	476
Hastoun	2	1.40	640
Bashayin	2	2.70	547
Total	12	24.40	

Average Number of Trees per hectare

Average cost of applying materials per hectare in North Lebanon in the fourth year

375

D. Cost of care until bearing age
Cost per tree (480.20 x 375 = 1.14 L.m.)

3. Disease Control Expenditures

a) Cost of operating Spraying Machines

b) Labor spraying Expenses

+ Labor spraying Expenses is reached by multiplying the number

of operating spraying machines in North Lebanon

Table 92

D. Cost of care until Bearing Age: Disease Control Expenditures.

Orchard situation.	Number of orchards.	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Bhasfrein-Sier Akkar	3	13.50	278
Donnieh-Kottin	2	4.00	602
Tannourin	2	3.20	476
Hasroun	2	1.40	640
Besharri	3	2.70	247
Total	12	24.40	

Average number of Trees per hectar

Average cost of Applying materials per hectar in North Lebanon in the Fourth year

375

Cost per tree (426.30 : 375 = 1.14 L.L.)

Cost of operating spraying machines is the sum of fixed

+ Labor spraying Expenses is reached by multiplying the number

• Total cost is the sum of cost of operating spraying machines

Table 92

b) Cost of operating spraying machines c) Labor spraying Expenses
(9-12 Applications) in North Lebanon in the fourth year.

Cost of opera- ^x ting spraying machines	Labor spraying ⁺ Expenses	Total cost ^o L.L.	Average cost per hectar L.L. (area as weights).
732.80	3375	4107.80	304.30
215	2200	2415	603.30
200	1639	1839	574.60
230	960	1190	850
190	660	850	370
		<u>10401.80</u>	
			<u>426.30</u>

(depreciation of engines and pumps at 10-50%) plus variable cost which is the result of multiplying the number of work days by the cost of operating per day including (fuel, oil and grease and greasing).

if work days (number of workers times number of applications) by the price per worker per day.

and labor spraying expenses.

D. Cost of care until bearing age: 3. Disease Control Expenditures

Orchard si- -tion, West of Jordan	Number of trees planted	Area of Aplica per hectare	Number of trees per hectare (weighted average)
Joubeth	1	4.50	400
Quada 11x11	3	27.30	270
Mechenters	1	2.80	430
Brown-Wash Sals	4	2.80	200
Total	9	17.90	

Average cost per tree until bearing age: D. Cost of care until bearing age

3. Disease Control Expenditures

a) Cost of operating Spraying Machines

c) Labor spraying expenses

Cost of operating spraying machines is the sum of fixed

+ Rental payments in the first year of multiplying the number

- Labor spraying expenses reached by multiplying the

Table 93

Total cost is the sum of cost of operating spraying

D. Cost of care until bearing Age: 3. Disease Control Expenditures

Orchard situation.	Number of orchards	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Joubeih	1	4.20	400
Quada Jizzin	3	25.30	270
Mouchtara	1	2.80	436
Barouk-Wabih Safa	4	5.60	500
Total.	9	17.90	

Average cost per hectar in South Lebanon the first year

Average number of Trees per hectar 300

Cost per tree (290.20 / 300 = 99 Piastres).

x Cost of operating spraying machines is the sum of fixed

+ Rental payment is the result of multiplying the number

- Labor spraying expenses is reached by multiplying the

o Total cost is the sum of cost of operating spraying

Table 93

b) Cost of operating spraying machines c) Labor spraying Expenses
(7-12 Applications) in South Lebanon in the First Year.

Cost of opera- ting spraying machines.	Rental Payment	Labor spra- ying Expenses	Total cost ° L.L.	Average cost per hecter L.L. (area as weights)
30		700	730	185.10
2658.10		4992	7650.10	302.40
183		990	1173	418.90
225	182	990	1397	231.60
			<u>11000.10</u>	
				<u>290.20</u>

(depreciation of engines and pumps at 10-50%) plus variable cost which is the result of multiplying the number of work days by the cost of operating per day including (fuel, oil and grease and greasing).

of work hours by the price per hour.

number of work days (number of workers times number of applications) by the price per worker per day.

machines and labor spraying expenses or rental payment.

D. Cost of care until bearing age 3. Disease Control Expenditures

Number of Trees per hectare (weighted average)	Area of Apples planted hectare	Number of orchards	Orchard si- tuation
400	4.20	1	Tonkin
270	27.30	3	of Vinh Thuan
436	2.20	1	Monkhan
700	7.60	4	Binh-Hiep 2/1 & 2/2
	<u>37.90</u>	<u>9</u>	Total

Average number of trees per hectare

Average cost per hectare in South Lebanon
in the Second Year

300

D. Cost of care until bearing age

3. Disease Control Expenditures

Cost of operating spraying machines in the sum of fixed

b) Cost of operating spraying machines

a) Labor spraying expenses

+ Rental payments in the amount of multiplying the number

- Labor spraying expenses as recorded by multiplying the number of

South Lebanon

* Total cost in the sum of cost of operating machines and labor

in the Second Year

Table 94



D. Cost of care until Bearing Age: 3. Disease Control Expenditures

Orchard situation.	Number of orchards	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Joubelh	1	4.30	400
Q unda Jizzin	3	25.30	270
Moughtara	1	2.80	436
Barouk-Nabh Safa	4	5.60	500
Total	9	37.90	

Average number of Trees per hectar

Average cost per hectar in South Lebanon in the Second Year

300

Cost per Tree ($304.30 \div 300 = 1 \text{ L.L.}$)

x Cost of operating spraying machines is the sum of fixed

+ Rental payment is the result of multiplying the number

- Labor spraying expenses is reached by multiplying the number of

o Total cost is the sum of cost of operating machines and labor

Table 24

Table 94

b) Cost of operating spraying Machines e) Labor spraying Expenses
(3-11 Applications) in South Lebanon in the Second Year.

Cost of opera- ting spraying machines	Rental + Payment	Labor spra- ying expenses	Total cost ° L.L.	Average cost per hectar L.L. (area as weights)
85		320	1005	239.30
2709.70		4872	7581.70	299.70
133		1028.50	216.50	434.50
243	239.5	1265	1747.50	322
			<u>11550.70</u>	
				<u>304.80</u>

(depreciation of engines and pumps at 10-50%) plus variable cost which is the result of multiplying the number of work days by the cost of operating per day including (fuel, oil and grease and greasing)

of work hours by the price per hour.

work days (number of workers times number of applications) by the price per worker per day, spraying expenses or rental payment.

D. Cost of care until Bearing Age:
 3. Disease Control Expenditures: b) Cost of operating spraying

Number of trees per hectare (weighted average)	Area of Apples planted hectare	Number of orchards	Orchard si- tuation
400	4.20	1	Lebanon
270	25.30	3	Quadr. Lebanon
430	2.80	1	Monastery
200	7.60	4	Narrow-Height Sals..
	<u>37.90</u>	<u>9</u>	Total...

Average number of trees per hectare

Average cost of applying spraying per hectare
 in South Lebanon in the third year

300

D. Cost of care until Bearing Age
 Cost per tree (342.70 : 300 = 1.14 L.L.)
 3. Disease Control Expenditures

b) Cost of operating spraying machines

c) Labor spraying Expenses.

* Rental ~~per hour~~ of multiplying the number

labor spraying in South Lebanon
 in the third year

* Total cost is the sum of cost of operating machines

Table 95

D. Cost of care until Bearing Age:

3. Disease Control Expenditures: b) Cost of operating spraying

Orchard situation.	Number of orchards	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Joubaih	1	4.20	400
Quada Jizzin	3	25.30	270
Mouchtara	1	2.80	436
Barouk-Nabh Safa..	4	5.60	500
Total...	9	37.90	

Average number of trees per hectar

Average cost of Applying sprayings per hectar in South Lebanon in the third year

300

Cost per tree (342.70 : 300 = 1.10 L.L.)

* Cost of operating spraying machines is the sum of fixed

+ Rental Payment is the result of multiplying the number

- Labor spraying expenses is reached by multiplying

* Total cost is the sum of cost of operating machines

Table 95

Machines c) Labor spraying Expenses (8-11 Applications) in South Lebanon in the third Year.

Cost of operating spraying machines	x Rental Payment	+ Labors spraying Expenses	Total cost ° L.L.	Average cost per hectar L.L.
80		1000	1080	257.20
2924.75		5400	8324.75	329
228		1144	1372	490
275	397	1540	2212	395
			<u>12988.75</u>	
				<u>342.70</u>

(depreciation of engines and pumps at 10-50%) plus variable cost which is the result of multiplying the number of work days by the cost of operating per day including (fuel, oil and grease and greasing).

of work hours by the price per hour.

the number of work days (number of workers times number of applications) by the price per worker per day.

and labor spraying expenses or rental payment.

D. Cost of care until Bearing Age 3. Disease Control Expenditures

Average number of trees per hectare (weighted average)	Area of Apples planted hectare	Number of orchards	Orchard size in hectares
400	4.20	1	1000
270	27.30	3	8190
431	2.80	1	1208
200	7.60	4	3040
	<u>37.90</u>	<u>9</u>	<u>12378</u>

D. Cost of care until Bearing Age

3. Disease Control Expenditures

b) Cost of operating Spraying Machines

c) Labor Spraying Expenses

Cost of operating spraying machines in the sum of fixed South Lebanon in the Fourth Year

+ Rental payment is the result of multiplying the number of labor spraying expenses is reached by multiplying the

Table 96

Total cost is the sum of cost of operating machines

D. Cost of care until Bearing Age 3. Disease Control Expenditures

<u>Orchard si- tuation.</u>	<u>Number of orchards.</u>	<u>Area of Apples planted hectar</u>	<u>Average number of Trees per hectar (weighted average)</u>
Joubelh	1	4.20	400
Quada Jissin	3	25.30	270
Mouchtara	1	2.80	431
Barouk-Nabh Safa	4	5.60	500
Total	9	37.90	

Average number of trees per hectar

Average cost of applying insecticides per hectar
in South Lebanon in the fourth year 300

Cost per tree (409.5 : 300 = 1.30 L.L.)

- x Cost of operating spraying machines is the sum of fixed
- + Rental Payment is the result of multiplying the number
- Labor spraying expenses is reached by multiplying the
- Total cost is the sum of cost of operating machines

Table 96

b) Cost of operating spraying machines e) Labor spraying Expenses
(8-12 Applications in the fourth year in South Lebanon.)

Cost of opera- ting spraying machines	x Labor spraying Expenses	* Total cost L.L.	o Average cost per hectar L.L. (area as weights).
85	1200	1285	305.90
3123	6564	9687	382.30
243	1518	1761	628.90
313	1980	2799	498.20
		<u>15528</u>	
			<u>409.5</u>

(depreciation of engines and pumps at 10-50%) plus variable cost which is the result of multiplying the number of work days by the cost of operating per day including (fuel, oil and grease and greasing)

of work hours by the price per hour.

number of work days (number of workers times number of applications) by the price per worker per day.

and labor spraying expenses or rental payment.

D. Cost of care until Bearing Age. 3. Disease Control Expenditures

Orchard station	Number of orchards	Area of Apples planted hectare	Number of trees per hectare (weighted average)
Isabai	3	75.90	336
Tamayi	2	42.90	261
Talibya	2	1.90	47
Balibar	2		333
Table			268

D. Cost of care until Bearing Age

3. Disease Control Expenditures

b) Cost of operating Machines

c) Labor Spraying Expenses

Average cost of spraying chemicals per hectare in the first year

Cost per tree (268.00 / 307 = 79.10 Ptas/Tree).

Table 77

x Cost of operating spraying Machines is the sum of fixed

+ Cost of operating Tractors is the sum of fixed (depreciation of Tractors

- Labor spraying expenses is reached by multiplying the

* Total cost is the sum of cost of operating spraying engines

D. Cost of care until Bearing Age. 3. Disease Control Expenditures

Orchard situation.	Number of orchards.	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Istabl	3	75.90	336
Tahmayel	2	42.90	261
Taalbaya	2	1.90	415
Baalbek	2	9	333
Zahlé	2	16.90	268
Total	11	148.60	

Average number of Trees per hectar

Average cost of applying spraying chemicals per hectar in the Bekaa in the first year 307

Cost per tree (242.90 : 307 = 79.10 Piasters).

x Cost of operating spraying Machines is the sum of fixed

+ Cost of operating Tractors is the sum of fixed (depreciation of Tractors ;

- Labor spraying expenses is reached by multiplying the

• Total cost is the sum of cost of operating spraying engines

Table 97

b) Cost of operating Machines c) Labor Spraying Expenses (8-12 Applications) in the Bekaa in the first year.

cost operatings ^x spray-machines.	Cost operating + Tractors.	Labor spra- ying expenses	Total Cost ° L.L.	Average cost per hectar (area L.L. as weights).
1966.10	3286.90	13960	19213	253.10
1762.80	1907.50	6720	10390.30	242.20
225		380	605	318.40
491		1200	1691	187.90
689	547	2400	3636	215.20
			<u>35535.30</u>	
				<u>242.90</u>

(depreciation of engines at 10%) plus variable cost which is the result of multiplying the number of work days by the cost of operating per day including (fuel, oil and grease and greasing).

at 6%) plus variable cost which is the result of multiplying the number of work days by the cost of operating per day including (fuel, oil and grease and greasing).

number of work days (number of workers times number of applications) by the price per worker per day.

and tractors and labor spraying expenses.

D. Cost of care until Bearing Age: 3. Disease Control Expenditures

Order of plantation.	Number of orchards	Area of Apples planted per orchard	Number of trees per hectare (weighted average)
1st	3	7.90	330
2nd	3	8.90	331
3rd	3	1.90	415
4th	3	9	333
5th	3	10.90	335

D. Cost of care until Bearing Age

3. Disease Control Expenditures

b) Cost of operating Machines

c) Labor spraying expenses.

Cost per tree (239.00 : 307 = 77.50 Plaster).

Bokas in the Second Year

Cost of operating spraying machines is the sum of fixed

Table 98

+ Cost of operating tractors is the sum of fixed (depreciation)

- Labor spraying expenses is reached by multiplying the number

* Total cost is the sum of cost of operating spraying engines

D. Cost of care until Bearing Age: 3. Disease Control Expenditures

Orchard situation.	Number of orchards	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Istabl	3	75.90	336
Tahnayel	2	42.90	261
Taalbaya	2	1.90	415
Baalbek	2	9	333
Zahlé	2	16.90	268
Total	11	146.60	

Average number of trees per hectar
 Average cost of applying spraying materials per hectar in the Bekaa in the Second year 307
 Cost per tree (289.80 : 307 = 95.30 Piasters).

- x Cost of operating spraying machines is the sum of fixed
- + Cost of operating Tractors is the sum of fixed (depreciation
- Labor spraying expenses is reached by multiplying the number
- Total cost is the sum of cost of operating spraying engines

Table 98

b) Cost of operating machines + c) Labor spraying Expenses (10-12 Applications) in the Bekaa in the Second Year.

Cost operating ^x spray-machines	Cost operating +	Labor spra- ying expenses	Total cost ^o L.L.	Average cost per Hectar L.L. (area as weights)
2224.80	3939.80	13704	24868.60	387.70
1780.40	1868.70	6800	10449.10	243.60
229.50		488	717.50	377.60
529.50		1680	8209.50	245.5
712.80	578.80	2940	4231.60	250.40
			<u>42476.30</u>	
				<u>289.80</u>

(depreciation of engines at 10%) plus variable cost which is the result of multiplying the number of work days by the cost of operating per day including (fuel, oil and grease and greasing)

of tractors at 6%) plus variable cost which is the result of multiplying the number of work days by the cost of operating per day including (fuel, oil and grease and greasing).

of work days (number of workers times number of applications) by the price per worker per day,

and tractors and labor spraying expenses.

D.3pc. Cost of care until Bearing Age Disease Control Expenditures

Orchard ai-
tution
Number of
orchards
Area of Apple
planted hec
Number of trees
per hec
(weighted average)

Orchard ai-tution	Number of orchards	Area of Apple planted hec	Number of trees per hec (weighted average)
Istadi	3	77.77	333
Tahmeh	3	42.99	181
Talshys	3	1.90	412
Balshk	3	9	333
Balsh	3		333

D. Cost of care until Bearing Age

3. Disease Control Expenditures

b) Cost of operating spraying Machines

c) Labor spraying Expenses

307

Cost per Tree (342.00 / 307 = 1.10 L.A.)

Cost of operating spraying machines in the sum of fixed
Basis in the
Third Year

Cost of operating spraying machines in the sum of fixed (depreciation)
Table 99

Total cost is the sum of cost of operating spraying machines
- labor spraying expenses is reached by multiplying the number of work days

D.3bc. Cost of care until Bearing Age: Disease Control Expenditures

Orchard si- tuation.	Number of orchards.	Area of Apples planted hecter	Number of trees per hectar (weighted average)
-------------------------	------------------------	----------------------------------	---

Istabl	3	75.90	336
Tahnayel	2	48.90	261
Taalbaya	2	1.90	415
Baalbek	2	9	333
Zahlé	2	16.90	268
Total	11	146.60	

Average number of Trees per hectar

Average cost per hectar in the 3rd year 307

Cost per Tree $(343.60 \div 307 = 1.10 \text{ L.L.})$

* Cost of operating spraying machines is the sum of fixed

+ Cost of operating tractors is the sum of fixed (depreciation

- Labor spraying expenses is reached by multiplying the number of work days

o Total cost is the sum of cost of operating spraying engines

Table 99

b) Cost of operating Machines (91-12 Applications) c) Labor spraying Expenses in the Bekaa in the Third year.

Cost operating spraying machines.	Cost operating + tractors	Labor spraying Expenses	Total cost ^o L.L. (area as weights)	Average cost per hectar L.L.
2565.50	4511	20736	27812.5	366.5
2066.80	2162.40	8956	13185.20	307.10
239.25		660	899.25	473.30
583.25		2424	3007.25	333
792	674.20	4000	5466.20	323.50
				<u>343.60</u>

(depreciation of engines at 10%) plus variable cost which is the result of multiplying the number of work days by the cost of operating per day including (fuel, oil and grease and greasing)

of tractors at 6%) plus variable cost (which is the result of multiplying the number of work days by the cost of operating per day including (fuel, oil, repairs and grease and greasing).

(number of workers times number of applications) by the price per worker per day. and tractors and labor spraying expenses.

D. Cost of care until Bearing Age & Disease Control Expenditures -

Order of Location	Number of tractors	Area of planted tractors	Number of tractors (weighted average)
1st	3	75.90	336
2nd	2	42.90	281
3rd	2	1.90	47
D. Cost of care until Bearing Age			
3. Disease Control Expenditures			
b) Cost of operating Machines			
c) Labor spraying Expenses			

307

Cost per tree (307 / 1.30 L.S.)
Bakka in the
Fourth Year

Table 100

x Cost of operating spraying machines in the sum of fixed

+ Cost of operating tractors in the sum of fixed (Investment)

+ Labor spraying expenses is reached by multiplying the number

• Total cost is the sum of cost of operating spraying engines

D. Cost of care until Bearing Age: 3. Disease Control Expenditures -

Orchard si- tuation.	Number of orchards.	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Istabl	3	75.90	336
Tahnayel	2	42.90	261
Taalbaya	2	1.90	415
Baalbeck	2	9	333
Zahlé	2	16.90	268
Total...	11	146.60	

Average number of trees per hectar

Average cost per hectar in the Bekaa
in the fourth year

307

Cost per tree ($411.60 \div 307 = 1.30$ L.L.)

- x Cost of operating spraying machines is the sum of fixed
- + Cost of operating tractors is the sum of fixed (depreciation
- + Labor spraying expenses is reached by multiplying the number
- o Total cost is the sum of cost of operating spraying engines

Table 100

b) Cost of operating machines e) Labor spraying Expenses (11-12 Applications) in the Bekaa in the Fourth Year.

Cost operatings spray-machines	Cost operating + Tractors	Labor spra- ying expenses	Total cost? L.L.	Average cost per H. (area as weights)
1970.75	5471.50	25768	34210.25	450.80
2403.20	2563.10	10640	15606.30	363.80
249.20		800	1049.15	552.20
638.25		2800	3438.25	382.30
761.80	780.20	4500	6042.	357.5
			<u>60346.95</u>	
				<u>411.60</u>

(depreciation of engines at 10%) plus variable cost which is the result of multiplying the number of work days by the cost of operating per day including (fuel, oil and grease and greasing)

of tractors at 6%) plus variable cost which is the result of multiplying the number of work days by the cost of operating per day including (fuel, oil repairs and grease and greasing).

of work days (number of workers times number of application) by the price per worker per day.

and tractors and labor spraying expenses.

D. Cost of Care until Bearing Age: 4. Pruning Expenses (a) Labor

Orchard location	Number of orchards	Area of Apples planted per hectare	Number of trees per hectare (weighted average)
Mount Lebanon	3	8.10	270
Qadsh Alek	3	10.90	327
Solar and surroundings	4	7	484
Dahr Baydar - Samir	3	7.80	386
Mughira-Korjaba	3	1.80	876
Akoura - Mount Lebanon	3	1.80	482

D. Cost of care until Bearing Age

4. Pruning Expenses in Mount Lebanon in the first year

Table IOI IV Total

Average number of trees per hectare

Average cost of Pruning in first year per hectare in Mount Lebanon

400

Cost per tree (123.5 : 400 = 38.40 Pasters)

- * Total cost is the sum of pruning and cost of gathering
- * Cost of gathering branches out is reached by multiplying the
- * Pruning cost is the result of multiplying the number of work-

D. Cost of Care until Bearing Age: 4. Pruning Expenses (a) Labor

Orchard si- tuation.	Number of orchards.	Area of Apples planted hecctar	Number of Trees per hecctar (weighted average).
Matn	3	8.10	270
Quada Aley	3	10.90	395
Sofar and surroundings	4	7	464
Dahr Baydar - Sannin	2	7.20	326
Mughira-Kortoba	3	1.20	876
Akoura- Uneltra	3	37.50	422
Total	17	71.90	
Average number of Trees per hecctar			
Average cost of Pruning in first year per hecctar in Mount Lebanon			400

Cost per tree (153.5 : 400 = 38.40 Piasters)

- x Pruning cost is the result of multiplying the number of work-
- + Cost of gathering branches out is reached by multiplying the
- Total cost is the sum of pruning and cost of gathering

Table IOI

Pruning cost (b) cost of gathering the branches out of orchard
in Mount Lebanon in the first year.

Pruning cost ^x	Cost of gathering + branches out	Total cost ° L.L.	Average cost per hectar (area as weights.)
723.50	138.50	862	106.40
1395	253.25	1648.25	151.20
995	180	1175	115.20
762	139	901	128.70
362	66	428	356.70
5090	930	6020	160.70
		11034.25	
			153.5

days by the price per day per expert and worker respectively.

number of work days by the price per worker per day.

branches out of orchard.

D. Cost of care until Bearing Age: 4. Pruning Expenses (a) labor

Orchard al- tation.	Number of Orchards.	Area of Apples planted hectar	Number of Trees per hec- tar (weighted average)
Main	3	8.10	270
Quads Aley	3	10.90	392
Solar and surroundings	4	7	464
Dahr-Baydar Sanna	2	7.20	326
Mughira-Korjoh	3	1.20	376
Akoura-Ushra	2	2.70	422

D. Cost of care until Bearing Age

4. Pruning Expenses in Mount Lebanon

in the Second Year

Average number of trees per hec-
tar

Average pruning cost per tree in Mount
Lebanon in the second year

400

Cost per tree (307.60 : 400 = 77 Pasters).

* Pruning cost is the result of multiplying the number of work
+ Cost of gathering branches out is reached by multiplying
• Total cost is the sum of pruning and cost of gathering

D. Cost of care until Bearing Age: 4. Pruning Expenses (a) Labor

Orchard situation.	Number of orchards.	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Matn	3	8.10	270
Quada Aley	3	10.90	395
Sofar and surroundings	4	7	464
Dahr-Baydar Sannin	2	7.20	326
Mughira-Kortoba	3	1.20	876
Akoura-Uneitra	2	37.50	422
Total.	17	71.90	

Average number of Trees per hectar

Average pruning cost per hectar in Mount Lebanon in the second year

400

Cost per tree (307.60 : 400 = 77 Piasters).

- x Pruning cost is the result of multiplying the number of work
- + Cost of gathering branches out is reached by multiplying
- Total cost is the sum of pruning and cost of gathering

Table 102

Pruning cost (b) Cost of gathering Branches out of Orchard in
Mount Lebanon in the Second Year.

Pruning cost ^x	Cost of gathering + branches out	Total cost ^o L.L.	Average cost per hectar L.L.
1450	267	1717	212
2762.50	512	3274.5	300
2590	360	2950	421.40
1467.50	284	1751.5	243
730	132	862	718.30
9700	1860	11560	308.20
		<u>22115</u>	
			<u>307.60</u>

days by the price per day per expert and worker respectively.
the number of work days by the price per worker per day.
branches out of orchard.

D. Cost of care until Bearing Age: 4. Pruning Expenses (a) Labor

Number of Trees (weighted average)	Area of Apples planted (hectars)	Number of operators	Ground at- tention
278	8.10	3	Main
322	10.90	3	Yards Alley
414	7	4	Boys and surroundings
388	7.80	3	Boys-Boys Boys
278	1.80	3	Highway-Kitchens
388	27.50	3	Almond-Orchards

D. Cost of care until Bearing Age

4. Pruning Expenses in Mount Lebanon

in the Third Year

Average cost of pruning per hectare in Mount Lebanon in the third year

400

Cost per tree (400 / 1.80 = 222.22 L.L.)

Table 103

* Pruning cost is the result of multiplying the number of
+ Cost of gathering branches cut is reached by multiplying
• Total cost is the sum of pruning and cost of gathering

D. Cost of care until Bearing Age: 4. Pruning Expenses (a) Labor

Orchard situation.	Number of orchards.	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Mata	3	8.10	270
Wanda Aley	3	10.90	395
Sofar and surroundings	4	7	414
Dahr-Baydar Sannin	2	7.20	326
Mughira-Kortoba	3	1.20	375
Akoura-Uneitra	2	37.50	422
Total	17	71.90	

Average number of trees per hectar

Average cost of Pruning per hectar in Mount Lebanon in the third year

400

Cost per tree ($475.30 \div 400 = 1.20$ L.L.)

- * Pruning cost is the result of multiplying the number of
- + Cost of gathering branches out is reached by multiplying
- Total cost is the sum of pruning and cost of gathering

Table 103

Expenses (b) Cost of gathering the branches out of orchard in Mount Lebanon in the Third year.

Pruning cost *	Cost of gathering + branches out	Total cost • L.L.	Average cost per hectar L.L.
2879	472.50	3351.50	413.80
4967.50	1412.5	6380	585.30
3505	630	4135	590.70
2712	489	3201	444.60
1362	252	1614	1345
12240	3060	15300	408
		<u>33921.5</u>	
			<u>475.30</u>

work days by the price per day per expert and worker respectively
the number of work days by the price per worker per day,
branches out of orchard.

Cost of care until bearing age: 4. Pruning Expenses (a) Labor

Number of Trees (weighted average) per bearing	Area of Apples planted bearing	Number of orchards.	Orchard in- tention.
270	61.8	3	Main
325	10.90	3	Quads Alley
404	7	4	Belt and surroundings
325	5	3	Belt-Belt Garden
670	1.20	3	Highway-Roads
422	17.50	3	Home-Home

D. Cost of care until bearing age

4. Pruning Expenses in bearing orchards

Average cost of care in the fourth year for the fourth year

Cost per tree (a) 275 = 400 = 2.00 L.A.

Table 104

x Pruning cost is the result of multiplying the number of

+ Cost of gathering branches out of orchard is reached

• Total cost is the sum of pruning and cost of gathering

Cost of care Until Bearing Age: 4. Pruning Expenses (a) Labor

Orchard situation.	Number of orchards.	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Matn	3	8.10	270
Quada Aley	3	10.90	395
Sofar and surroundings	4	7	464
Dahr-Baydar Sannin	2	27.70	326
Mughira-Kortoba	3	1.20	876
Akoura-Uneitra	2	37.50	422
Total	17	71.20	

Average number of Trees per hectar .4

Average cost per Pruning per hectar in Mount Lebanon for the fourth year 400

Cost per Tree ($\$ 325.5 : 400 = 2.06 \text{ L.L.}$)

401 eldat

x Pruning cost is the result of multiplying the number of

+ Cost of gathering branches out of orchard is reached

o Total cost is the sum of pruning and cost of gathering

Table 104

Expenses (b) Cost of gathering Branches out of orchard in Mount Lebanon in the fourth year.

Pruning cost ^x	Cost of gathering + branches out	Total cost ^o L.L.	Average cost per hectar L.L.
4345	945	5290	714.30
3307	1547.50	10354.5	950
6025	1059.50	7084.5	1012.10
4595	358	5453	757.40
2350	372	2722	2263.30
22100	5350	27950	745.30
		<u>59354</u>	

835.5

work days by the price per day per expert and worker respectively by multiplying the number of work days by the price per worker per day. out of orchard.

D. Cost of care until Bearing Age: 4. Pruning Expenses (a) Labor

Number of Trees per hectare (weighted average)	Area of Apples planted Hectare	Number of orchards	Orchard at- tention
278	13.70	3	Bharatpur-Sher Akbar
608	4.00	2	Danapur-Kottal
478	3.20	2	Tanwarin
648	1.40	2	Harwar
847	2.30	3	Bharatpur

D. Cost of care until Bearing Age Total

4. Pruning Expenses in North Lebanon

Average number of trees per hectare
in the first year
Average cost per hectare in North Lebanon
in the first year

372

Cost per tree (L.L.D. = 38.70 piasters).

* Total cost is the sum of pruning and cost of gathering
+ Cost of gathering branches out of orchard is reached by
x Pruning cost is the result of multiplying the number of work

D. Cost of care until Bearing Age: 4. Pruning Expenses (a) Labor

Orchard situation.	Number of orchards.	Area of Apples planted Hectar	Number of Trees per hectar (weighted average)
Bhasfrein-Sier Akkar	3	13.50	278
Donnieh-Kottin	2	4.00	602
Tannourin	2	3.20	476
Hasroun	2	1.40	640
Besharri	3	2.30	247
Total	12	24.40	375

Average number of Trees per hectar in the first year in North Lebanon
 Average cost per hectar in North Lebanon in the first-year

375

Cost per tree (128,60 : 375 = 32.70 piasters).

- x Pruning cost is the result of multiplying the number of work
- + Cost of gathering branches out of orchard is reached by
- Total cost is the sum of pruning and cost of gathering

Pruning cost + (b) Cost of gathering branches and of orchard in North Lebanon in the first year.

Pruning cost x	Cost of gathering + branches out	Total cost * L.L.	Average cost per hectar L.L.
1060	185	1245	122.20
675	120	695	173.75
420.50	100	520.5	162.5
273.50	48.50	322	230
181	33	214	93
		<u>2996.5</u>	
			<u>122.80</u>

days by the price per day per expert and worker respectively.

multiplying the number of work days by the price per worker per day.

branches out of orchard.

D. Cost of care until Bearing Age + Pruning Expenses (a) Labor

Number of Trees per Acre (weighted average)	Area of Apples planted Acre	Number of orchards	Orchard si- tuation
278	13.70	3	Becharri-Old Alkay
408	4.00	2	Becharri-Kattin
470	3.20	2	Tannourin
640	1.40	2	Haroun
847	2.20	3	Becharri

Total Age bearing until care cost

4. Pruning Expenses in North Lebanon

Average cost of pruning in the
second year in North Lebanon

375

Cost per tree = 375 / 1000 = 0.375 (L.L.)

* Total cost is the sum of pruning and cost of gathering
+ Cost of gathering branches out of orchard is reached
x Pruning cost is the result of multiplying the number

D. Cost of care Until Bearing Age: 4. Pruning Expenses (a) Labor

<u>Orchard si- tuation.</u>	<u>Number of orchards</u>	<u>Area of Apples planted Hectar</u>	<u>Number of Trees per hectar (weighted average)</u>
Bhasfrein-Sier Akkar	3	13.50	278
Donnich-Kottin	2	4.00	602
Tannourin	2	3.20	476
Hasroun	2	1.40	640
Besharri	3	2.30	247
Total	15	24.40	

Average number of Trees per hectar

Average cost of Pruning per hectar in the
Second Year in North Lebanon 375

Cost per Tree (242.30 : 375 = 64.60 Piasters).

- x Pruning cost is the result of multiplying the number
- + Cost of gathering branches out of orchard is reached
- Total cost is the sum of pruning and cost of gathering

Pruning Cost (b) Cost of gathering Branches out of orchard in
North Lebanon in the Second Year.

Pruning cost x	Branches out +	Total cost * L.L.	Average cost per hectare (area as weights)
2035	350	2385	176.70
1260	930	1790	372.5
825	194	1019	313.40
525	97	622	444.40
341	605	401.5	174.30
		<u>591.75</u>	
			<u>242.30</u>

of work days by the price per day per expert and worker respectively.
by multiplying the number of work days by the price per worker per day.
branches out of orchard.

D. Cost of care until Bearing Age: 4. Pruning Expenses (a) labor

Orchard si- tuation	Number of orchards	Area of Apples planted Hectar	Number of Trees per hectar (weighted average)
Basseln-Sier Alber	3	13.70	278
Donnen-Kottin	3	4.00	603
Tannowin	3	3.30	471
Harzen	3	1.40	640
Basseln	3	2.30	247

D. Cost of care until Bearing Age

4. Pruning Expenses in North Lebanon

Average cost of pruning per hectar in North Lebanon in the third year

375

Cost per tree (473.20 : 375 = 1.26 L.L.)

Table 107

* Pruning cost is the result of multiplying the number of work
 + Cost of gathering branches out of orchard as reached by
 • Total Cost is the sum of pruning and cost of gathering branches

D. Cost of care until Bearing Age: 4. Pruning Expenses (a) Labor

Orchard situation.	Number of orchards	Area of Apples planted Hectar	Number of Trees per hectar (weighted average)
Bhasfrein-Sier Akkar	3	13.50	278
Donnieh-Kottin	2	4.00	602
Tannourin	2	3.20	471
Hasroun	2	1.40	640
Besharri	3	2.30	247

Total 13 24.40

Average number of Trees per hectar

Average cost of Pruning per hectar in North Lebanon in the Third year

375

Cost per tree (453.20 : 375 = 1.20 L.L.)

VOI aidsT

- x Pruning cost is the result of multiplying the number of work
- + Cost of gathering branches out of orchard is reached by
- o Total Cost is the sum of pruning and cost of gathering branches

Table 107

Pruning cost (b) cost of gathering Branches out of orchard
in North Lebanon in the Third year.

Pruning cost x	Branches out +	Total cost ° L.L.	Average cost per hectar (area asw weights).
3835	650	4485	338.30
2205	425	2630	657.5
1570	438	2008	627.5
960	172	1132	808.90
632	121	803	349.10
		<u>11058</u>	
			<u>453.20</u>

days by the price per day per expert and worker respectively.
multiplying the number of work days by the price per worker per day.
out of orchard.

DI. Cost of care until bearing age: 4. Pruning Expenses (a) Labor

Number of trees per hectare (weighted average)	Area of applied pruned hectares	Number of workers	Grade of worker
278	12.50	3	Skilled-Semi-Skilled
308	4.00	2	Skilled-Semi-Skilled
476	3.00	2	Skilled-Semi-Skilled
640	1.40	2	Skilled-Semi-Skilled
247	2.30	3	Skilled-Semi-Skilled

D. Cost of care until bearing age Total

4. Pruning Expenses in North Lebanon

Average cost of pruning per hectare in North Lebanon in the fourth year

375

Table 103 Cost per tree (375 ÷ 2.10 L.L.)

* Pruning cost is the result of multiplying the number of work days + Cost of gathering branches cut or removed is reached by multiplying Total cost is the sum of pruning and cost of gathering branches

D1. Cost of care until Bearing Age: 4. Pruning Expenses (a) Labor

<u>Orchard si- tuation.</u>	<u>Number of orchards</u>	<u>Area of Apples planted Hectar</u>	<u>Number of Trees per hectar (weighted average)</u>
Bhasfrein-Sier Akkar	3	13.50	273
Dennieh-Kottin	2	4.00	602
Tannourin	2	3.20	476
Hasroun	2	1.40	640
Besharri	3	2.30	247
Total	12	24.40	
Average cost of Pruning per hectar			
Average cost of Pruning per hectar in North Lebanon in the fourth year			375

Cost per Tree $(793.70 \div 375 = 2.10 \text{ L.L.})$

- x Pruning cost is the result of multiplying the number of work days
- + Cost of Gathering branches out of orchard is reached by multiplying
- Total cost is the sum of pruning and cost of gathering branches

Table 108
Pruning Cost (b) Cost of gathering Branches out of Orchard
In North Lebanon in the Fourth Year.

Pruning cost *	Branches out +	Total cost °	Average cost
		L.L.	per hectare
			(area as weights)
6620	1150	7770	575.50
3900	750	4650	1162.50
2720	435	3555	1110.90
1755	328	2083	1457.90
1112	198	1310	570
		<u>19368</u>	
			<u>793.70</u>

by the price per day per expert and worker respectively.
the number of work days by the price per worker per day.
out of orchard.

D. Cost of care until bearing age 4. Pruning Expenses (a) Labor Pruning Exp

Orchard Location	Number of orchards	Ages of Apples Planted per hectare	Number of trees per hectare (weighted average)
Joubail	1	4.30	400
Quana Jilain	3	27.30	270
Monkara	1	2.80	430
Bark-Habb	4	2.60	200
Sala			
Total	9	27.90	

D. Cost of care until bearing age

Average Number of Trees per hectare
 4. Pruning Expenses in South Lebanon
 Average cost per hectare in South Lebanon
 in the first year

300

Cost per Tree (Total 300 = 43 Pruning)

* Total cost is the sum of pruning and cost of gathering
 + Cost of gathering branches cut of orchard is reached by
 x Pruning cost is the result of multiplying the number of work

D. Cost of care until Bearing Age: 4. Pruning Expenses (a) Labor Pruning Ex

Orchard si- tuation.	Number of orchards.	- 201 - Appa of Apples Planted hectar	Number of Trees per hectar (weighted average)
Joubelh	1	4.20	400
Quasa Jissin	3	25.30	270
Mouchtara	1	2.80	436
Barouk-Nabh Safa	4	5.60	500
Total	9	37.90	

Average number of Trees per hectar
Average cost per hectar in South Lebanon
in the first year

300

Cost per Tree $(37.90 : 300 = 43 \text{ Piasters})$.

- x Pruning cost is the result of multiplying the number of work
- + Cost of gathering branches out of orchard is reached by
- Total cost is the sum of pruning and cost of gathering

Table 109

Costs + (b) Cost of gathering the branches out of Orchard
in South Lebanon in the first year.

Pruning cost	Cost of gathering branches out	Total cost ° L.L.	Average cost per hectare L.L. (area as weights).
495	85	580	138
2474	390	2864	113.20
362	66	428	152.80
857	158.50	1015.5	187.20
		<u>4837.5</u>	

128.90

days by the price per day per expert and worker respectively.

multiplying the number of work days by the price per worker per day.

branches out of orchard.

D. Cost of care until Bearing Age: + Pruning Expenses (a) labor

Number of Trees per hectare (weighted average)	Area of Apples planted Hectare	Number of hectares	Orchard sit- uation
400	4.20	1	Joubail
270	27.30	3	Quada Lishin
430	2.80	1	Machhara
200	7.60	4	Brouh-Nahr Sals +
	<u>37.90</u>	<u>9</u>	Total

D. Cost of care until Bearing Age

4. Pruning Expenses in South Lebanon

Average cost of pruning per hectare in South Lebanon
in the second year

Cost per tree (270 x 300 = 81.30 Plasters) *

* Pruning cost is the result of multiplying the number of work
+ Cost of gathering branches out of orchard is reached by
• Total cost is the sum of pruning and cost of gathering

D. Cost of care until Bearing Age: 4. Pruning Expenses (a) Labor

Orchard situation.	Number of orchards.	Area of Apples planted Hectar	Number of Trees per hectar (weighted average)
Joubelh	1	4.20	400
Quada Jizzin	3	25.30	270
Mouchtara	1	2.80	436
Barouk-Nabh Safa	4	5.60	500
Total	9	37.90	

Average number of Trees per hectar
Average cost of Pruning per hectar in South Lebanon in the second year 300

Cost per tree $(252.80 \div 300 \text{ h} = 84.30 \text{ Piasters})$.

- x Pruning cost is the result of multiplying the number of work
- + Cost of gathering branches out of orchard is reached by
- o Total cost is the sum of pruning and cost of gathering

Table 110

Expenses + (b) Cost of gathering the Branches out of Orchard in South Lebanon in the second year.

Pruning cost ^x	Cost of gathering Branches out	Total cost ^o L.L.	Average cost per hectare ^{L.L.} (area as weights).
975	175	1150	274
4040	768	4808	190
680	110	790	232.20
1635	299	2934	524
		<u>9682</u>	
			<u>252.80</u>

days by the price per day per expert and worker respectively.

multiplying the number of work days by the price per worker per day.

branches out of orchard.

C. Cost of care until Bearing Age + Pruning Expenses (a) Labor

Orchard at- tention	Number of orchards	Area of Apples planted hec- tars	Number of trees per hec- tar (weighted average)
Lebanon	1	4.30	400
Qada Iksin	3	27.30	270
Monchana	1	2.00	400
Harok-Nakh Sara	4	7.00	300

D. Cost of care until Bearing Age

4. Pruning Expenses in South Lebanon

Average number of trees per hec-
tar in the third year
Average cost of pruning per hec-
tar in South Lebanon in the third year

300

Table III

Cost per tree (419.5 + 300 = 1.40 L.L.)

* Pruning cost is the result of multiplying the number of work
+ Cost of gathering branches out of orchard is reached by
* Total cost is the sum of pruning and cost of gathering

D. Cost of care until Bearing Age: 4. Pruning Expenses (a) Labor

Orchard situation.	Number of orchards.	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Joubeih	1	4.30	400
Quada Jiszin	3	25.30	270
Mouchtara	1	2.80	436
Barouk-Nabh Safa	4	5.60	500

Total 37.90

Average number of trees per hectar
Average cost of Pruning per hectar in South Lebanon in the Third year

300

Table III

Cost per Tree (419.5 : 300 = 1.40 L.L.)

- x Pruning cost is the result of multiplying the number of work
- + Cost of gathering branches out of orchard is reached by
- Total cost is the sum of pruning and cost of gathering

Table III

Expenses (b) Cost of gathering the Branches out of orchard in South Lebanon in the third year.

Pruning cost ^x	Cost of gathering Branches out	Total cost ^o L.L.	Average cost per hectare ^{L.L.} (Area as weights)
1930	325	2255	537
7320	1350	8670	342.70
1275	220	1495	534
2915	365	3480	621.40
		<u>15900</u>	
			<u>419.50</u>

days by the price per day per expert and worker respectively.
 multiplying the number of work days by the price per worker per day.
 branches out of orchard.

D. Cost of care until bearing age & Pruning Expenses (a) Labor

Orchard Station	Number of orchards	Area of Apples planted Hectar	Number of Trees per Hectar (weighted average)
Jordania	1	4.20	400
Qada Jisrin	3	27.30	270
Monshara	1	2.80	430
Barkuh-Habib Bata	4	7.60	500
Total...	9	37.90	

Average number of trees per hectar

D. Cost of care until bearing age

Average cost of pruning per Hectar in

4. Pruning Expenses in South

300

Yearly cost in thousands : 300 = 2.5 L.L.

* Pruning cost is the result of multiplying the number of work
 + Cost of gathering branches out of orchard is reached by
 • Total cost is the sum of pruning and cost of gathering

Table 112

D. Cost of care until Bearing Age: 4. Pruning Expenses (a) Labor

Orchard si- tuation.	Number of orchards.	Area of Apples planted Hectar	Number of Trees per hectar (weighted average)
Joubelh	1	4.20	400
Quada Jizzin	3	25.30	270
Mouchtara	1	2.80	436
Barouk-Nabh Safa	4	5.60	500
Total...	9	37.90	

Average number of Trees per hectar
هذا المتوسط لعدد الاشجار في الهكتار

Average cost of Pruning per Hectar in
متوسط التكلفة لعمليات التقليم في الهكتار في السنة الرابعة في جنوب لبنان

300

Cost per tree (760.60 : 300 = 2.5 L.L.)

- x Pruning cost is the result of multiplying the number of work
- + Cost of gathering branches out of orchard is reached by
- o Total cost is the sum of pruning and cost of gathering

Table IIE

Pruning Expenses (b) Cost of gathering Branches out of orchard in South Lebanon in the fourth year.

Pruning cost ^x	Cost of gathering Branches out	Total cost ^o L.L.	Average cost per hectare L.L. (area as weights).
3250	600	3850	917
13320	2700	16020	632.40
2285	407	2692	916.40
5210	956	6166	1101
		<u>23728</u>	
			<u>760.60</u>

days by the price per day per expert and worker respectively,
 multiplying the number of work days by the price per worker per day,
 branches out of orchard.

D. Cost of care until Bearing Age: 4. Pruning Expenses (a) Labor

Orchard at- tention	Number of orchards	Area of Apples planted per hectar	Number of Trees per hectar (weighted average)
Istadi	3	75.90	336
Tamaye	2	48.90	261
Talibya	2	1.90	474
Balibok	2	9	336
Sabit	2	16.90	261
Total	11	146.60	

Average cost per hectar in the Bekaa in the first year

307

Average number of trees per hectar
D. Cost of care until Bearing Age
 Cost per tree (88.60 + 307 = 129.30 L.L.Balibok)
4. Pruning Expenses in the Bekaa in the

x Pruning cost in the Bekaa in the first year of work
 + Cost of gathering expenses out of orchard is received by multi-
 * Total cost is Table 113 pruning and cost of gathering

D. Cost of care until Bearing Age: 4. Pruning Expenses (a) Labor

Orchard si- tuation.	Number of orchards.	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Istabl	3	75.90	336
Tahnayel	2	42.90	261
Taalbaya	2	1.90	415
Baalbeck	2	9	333
Zahlé	2	16.90	268
Total	11	146.60	

Average cost per hectar in the Bekaa in the first year

Average number of trees per hectar

307

Cost per tree (88.60 : 307 = 28.90 L. Biasters)

- x Pruning cost is the result of multiplying the number of work
- + Cost of gathering branches out of orchard is reached by multi-
- Total cost is the sum of pruning and cost of gathering

Table II3

Pruning Expenses and (b) Cost of gathering the branches out of orchard in the Bekaa in the first year.

Pruning cost *	Cost of gathering Branches out +	Total cost °	Average cost per hectare L.L.
		L.L.	
6378	1020	7398	97.50
2780	448	3228	75.20
133	32	220	115.80
732	120	852	94.70
1116	176	1292	76.5
		<u>12990</u>	
			<u>88.60</u>

days by the price per day per expert and worker respectively.
 plying the number of work days by the price per worker per day.
 branches out of orchard.

D, Cost of care until Bearing Age + Pruning Expenses, (a) Labor

Orchard Location	Number of orchards	Area of Apples planted (acres)	Number of trees per hectare (weighted average)
Isabel	2	72.90	336
Tahquamenon	2	42.90	181
Tahquamenon	2	1.90	43
Isabel	2	9	353
Isabel	2	26.90	268
Total	11	146.60	

Average number of trees per hectare

Average cost of pruning per hectare in the second year in the second year

306

D. Cost of care until Bearing Age

4. Pruning Expenses in the Second Year

* Pruning cost is the result of multiplying the number of work days + Cost of gathering branches out of Orchard is needed by * Total cost is the sum of pruning and cost of gathering

Table 114

D. Cost of care until Bearing Age: 4. Pruning Expenses. (a) Labor

Orchard situation.	Number of orchards.	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Istabl	3	75.90	336
Tahnayel	2	42.90	261
Taalbaya	2	1.90	415
Baalbeck	2	9	333
Zahlé	2	16.90	268
Total...	11	146.60	

Average number of trees per hectar

Average cost of Pruning per hectar in the Bekaa in the Second year

307

Cost per tree ($149.20 \div 307 = 48.60$ Piasters).

- x Pruning cost is the result of multiplying the number of work days
- + Cost of gathering Branches out of Orchard is reached by
- Total cost is the sum of pruning and cost of gathering

Table 11a

Table 11A

Pruning Expenses and (b) Cost of gathering branches out of orchard in the Bekaa in the Second year.

Pruning cost ^x	Cost of gathering Branches out ⁺	Total cost ^o L.L.	Average cost per hectare L.L. (area as weights)
11650	1800	13450	177.20
5220	800	6020	140.30
360	64	424	223.20
1420	240	1660	134.40
2000	320	2320	137.30
		<u>23874</u>	
			<u>149.20</u>

by the price per day per expert and worker respectively.

multiplying the number of work days by the price per worker per day.

branches out of orchard.

D. Cost of care until bearing age: 4. Pruning Expenses

Number of trees per hectare (weighted average)	Area of 4 trees planted per hectare	Number of orchards	Orchard in- tention
330	7.90	3	Isabai
361	48.90	8	Tamuyai
417	1.90	8	Talibaya
333	2	8	Baibak
368	18.90	8	Sabi
	<u>146.80</u>	<u>11</u>	Total

D. Cost of care until bearing age

4. Pruning Expenses in the

307

the Third Year
Cost per tree (87.00 x 307 = 26,709 E.L. Plassons)

Total cost is the sum of pruning and cost of gathering branches out
+ Cost of gathering branches out of orchard is reached by multiplying
x Pruning cost is the result of multiplying the number of work days

Table 115

D. Cost of care until Bearing Age: 4. Pruning Expenses

Orchard situation.	Number of orchards	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Istabl	3	75.90	336
Fahnayel	2	42.90	261
Taalbaya	2	1.90	415
Baalbek	2	9	333
Zahlé	2	16.90	268
Total	11	146.60	

Average number of trees per hectar

Average cost of Pruning per hectar in the Bekaa
in the third year

307

Cost per tree ($892.60 \div 307 = 95.30$ B.L. Piasters)

- x Pruning cost is the result of multiplying the number of work days
- + Cost of gathering branches out of orchard is reached by multiplying
- o Total cost is the sum of pruning and cost of gathering branches out

Table 168

(a) Labor Pruning Expenses (b) cost of gathering Branches out of orchard in the Bekaa in the Third year.

Pruning cost ^x	Cost of gathering ⁺ branches out	Total cost ^o L.L.	Average cost per hectare L.L. (area as weights).
209.50	3300	24250	319.5
9250	1460	10710	249.60
720	120	840	444.40
2560	380	2940	380
3600	560	4160	248.10
		<u>42900</u>	
			<u>292.60</u>

by the price per day per expert and worker respectively.
the number of work days by the price per worker per day.
of orchard.

D. Cost of care until Bearing Age: 4. Pruning Expenses - Labor

Number of trees per hectare (weighted average)	Area of Apples planted Hectare	Number of orchards	Orchard location
333	75.90	3	Isabai
333	42.90	3	Tainyaji
412	1.90	3	Tainyaji
333	2	3	Balibek
333	16.90	3	Schib
	<u>140.60</u>		Total

Average number of trees per hectare

Average cost of care until bearing age in the fourth year

4. Pruning Expenses in the Bekaa

Cost per tree in the fourth year = 1.40 L.L.

Total cost is the sum of pruning and cost of gathering + Cost of gathering branches out of orchard is reached by x Cost of pruning is the result of multiplying the number

Table 116

307

D. Cost of care until Bearing Age: 4. Pruning Expenses - Labor

Orchard situation.	Number of orchards.	Area of Apples planted Hectar	Number of Trees per hectar (weighted average)
Istabl	3	75.90	336
Tahnayel	2	42.90	261
Tealbaya	2	1.90	415
Baalbek	2	9	333
Zahlé	2	16.90	268
Total		146.60	

Average number of trees per hectar

Average cost of Pruning per hectar in the Bekaa in the fourth year

307

Cost per tree (530.5 ÷ 307 = 1.40 L.L.)

- x Cost of pruning is the result of multiplying the number
- + Cost of gathering branches out of orchard is reached by
- Total cost is the sum of pruning and cost of gathering

Table 116

Pruning Expenses (b) Cost of gathering Branches out of orchard in the Bekaa in the fourth year.

Pruning cost *	Cost of gathering Branches out	Total cost ° L.L.	Average cost per hectare L.L. (area as weights)
37850	5690	43810	577.20
16750	2760	19510	454.80
1320	240	1560	221
4670	320	5490	610
6320	1030	7400	438
		<u>77770</u>	
			<u>530.5</u>

of work days by the price per day per expert and worker respectively.
 multiplying the number of work days by the price per worker per day.
 branches out of orchard.

D. Cost of care until Bearing Age: (a) Cost of Fertilizer

Number of trees per hectare (weighted average)	Area of land planted (hectares)	Number of workers	Order of plantation
278	01.8	3	Main
322	10.90	3	Quads Alex
404	7	4	Solar and surroundings
D. Cost of care until Bearing Age			
282	5% Chemical and animal Fertilizer		
278	a) Cost of Fertilizer		
404	b) Labor cost		
	02.75		
	<u>02.10</u>	IV	Total

Average cost of fertilizer per hectare in Mount Lebanon in the second year

Average number of trees per hectare in Mount Lebanon in the second year

Cost per tree (282 : 400 = 0.705 L.L.)

Chemical and animal expenses are the sum of chemical (chemical

+ Labor cost is the result of multiplying the number of work days

* Total cost is the sum of fertilizer and labor cost.

D. Cost of care until Bearing Age: 5. a) Cost of Fertilizer

Orehard si- tuation.	Number of orchards	Area of Apples planted hecтар	Number of Trees per hecтар (weighted average)
Matn	3	8.10	270
Quada Aley	3	10.90	395
Sefar and surroundings	4	7	464
Dahr Baydar- Sannin	2	7.20	326
Mughira-Kortoba	3	1.20	576
Akoura Uheitra	2	37.50	422
Total	17	71.90	

Average cost of fertilizer per hecтар in Mount Lebanon in the second year

Average number of trees per hecтар 400

Cost per tree (52.90 : 400 = 2.10 L.L.)

x Chemical and animal Expenses are the sum of chemical (chemical

+ Labor cost is the result of multiplying the number of work days

• Total cost is the sum of fertlizer and labor cost.

Table II V

(b) Labor cost in Mount Lebanon in the Second Year.

Chemical and animal Ex- penses.	Labor cost +	Total cost °	Average cost per hectar L.L. (area as weights)
4080	220	4300	530.90
9285	312	9597	880.50
5890	158	6048	864
4700	194	4894	680
1930	30	1960	1633.30
57700	792	58492	1560
		<u>35891</u>	
			<u>852.90</u>

fertilizer: super phosphate, potash sulfate, ammonium sulf. nitrate,
etc..at 11-16 piasters per kilogram and cost of animal
manure (goats, oxen, etc... 23-25 piasters per kilogram).

by the price per worker per day.

D. Cost of care until bearing: 5. Cost chemical and animal fertilizer

Order of Custodian	Number of orchards	Area of planted hectar	Number of trees per hectar (weighted average)
Marin	3	8210	3300
Quada Alay	3	10.90	332
Bolan and surroundings	4	7	464
Dair Baydar- Sanna	2	8.80	381
Majlis-Korob	3	1.80	378
Akour-Orfira	2	38.50	484
Total	IV	71.90	

D. Cost of care until bearing Age

5. Chemical and animal fertilizer

a) Cost of fertilizer

b) Labor cost

Average number of trees per hectar
Average cost of fertilizer per hectar in Mount
Lebanon in the third year

Cost per tree: 400 = 3.60 L.L. (Table II)

400

x Chemical and animal expenses are the sum of chemical (chemical

+ labor cost is the result of multiplying the number of work days

• Total cost is the sum of fertilizer and labor cost.

D. Cost of care until Bearing: 5. Cost chemical and animal fertilizer

Orchard situation.	Number of orchards.	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Matn	3	8.10	279
Quada Aley	3	10.90	395
Sofar and surroundings	4	7	464
Dahr Baydar-Sannin	2	7.20	321
Mughira-Kortoba	3	1.20	871
Akoura-Oneitra	2	37.50	422
Total.....	17	71.90	

Average number of Trees per hectar

Average cost of fertilizer per hectar in Mount Lebanon in the third year

400

Cost per tree (1457.5 : 400 = 3.60 L.L.)

x Chemical and animal expenses are the sum of chemical (chemical

+ Labor cost is the result of multiplying the number of work days

• Total cost is the sum of fertilizer and labor cost.

Table IIS

a) Cost of fertilizer b) Labor cost in Mount Lebanon in the third year.

Chemical and animal Ex- penses.	Labor cost +	Total cost ° L.L.	Average cost per hectar L.L. (area as weights).
5645	307	5952	734.20
12356	170	12526	1555.60
8477	225	9702	1386
5929	230	6159	855.40
2700	48	2748	2290
66385	1320	67705	1306.70
		<u>104792</u>	

1457.5

fertilizer: superphosphate, potash sulfate, ammonium sulfo-nitrate, etc...
at 11-26 piasters per kilogram) and cost of animal manure (goats, oxen,
etc... at 8-25 piasters per kilogram.)

by the price per worker per day.

Cost of care until Bearing Age: 5. Cost of chemical and animal fertilizer

Number of trees per hectare (weighted average)	Area of applied planted hectare	Number of orchards	Orchard location
270	01.8	3	Kain
305	10.90	3	Guada Atoy
444	8	4	Solar and surroundings
300	7.80	2	Dain-Baydar Sanna
370	1.80	3	Maghira-Kortob
488			Alowra-Bhetra

D. Cost of care until Bearing Age

5. Chemical and animal fertilizer

Total
Average number of fertilizer per hectare in fourth year
Average cost of fertilizer per hectare in fourth year
a) Cost of Fertilizer
b) Labor cost
Cost per tree (8000 : 400 = 20 L.S.)

400
Average number of fertilizer per hectare in fourth year

x Chemical and animal fertilizer per hectare in the fourth year
= the sum of chemical (chemical)

Table II9
+ Labor cost is the result of multiplying the number of work
* Total cost is the sum of fertilizer and labor cost.

Cost of care until Bearing Age: 5. Cost of chemical and Animal fertilizer

Orchard situation.	Number of orchards.	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Matn	3	8.10	270
Quada Aley	3	10.90	305
Sofar and surroundings	4	2	464
Dahr-Baydar Sannin	2	7.20	326
Mughira-Kortoba	3	1.20	676
Akoura-Uneitra	2	37.50	422
Total	17	71.90	

Average number of trees per hectar

Average cost of fertilizer per hectar in Mount Lebanon in the fourth year

400

Av

Cost per tree (2032 : 400 = 5.10 L.L.)

x Chemical and animal Expenses are the sum of chemical (chemical

+ Labor cost is the result of multiplying the number of work

* Total cost is the sum of fertilizer and labor cost.

Table II9

b) Labor cost in Mount Lebanon in the fourth year.

Chemical and ^x animal Expen- ses.	Labor cost +	Total cost ° L.L.	Average cost per hectare L.L. (area as weights)
3495	505	9000	1111.10
17210	407.50	17717.5	1625.40
13508	293	13801	1971.60
7795	3285	8123.5	1128.20
4230	84	4314	3595
90750	2400	93150	2484
		<u>146106</u>	

2032

fertilizers: super phosphate, potash sulfate, ammonium sulfo-nitrate, etc...
at 16-26 piasters per kilogram) and cost of manure (goats, oxen, etc...
at 8-25 piasters per kilogram).

days by the price per worker per day.

D. Cost of care until bearing age: 2. (a) Cost of chemical and

Orchard location	Number of orchards	Area of Applis planted hecetar	Number of trees per hecetar (weighted average)
Harbin-Sier	3	13.20	278
Alkat	2	4.00	608
Donner-Kettin	2	3.80	476
Tannowin	2	1.40	640
Harbin	2	2.30	847
D. Cost of care until Bearing Age			
5. Chemical and Animal Fertiliser			
Total			
a) Cost of Fertiliser			
Average number of trees per hecetar			
b) Labor cost			
Average cost of fertilizer per hecetar in North Lebanon in the second year			
Cost per tree (1000) (1000) (1000) (1000) (1000) (1000)			
(North Lebanon in the Second Year)			

372

Table 120
Chemical and animal expenses are the sum of chemical

+ Labor cost is the result of multiplying the number of work days
• Total cost is the sum of fertilizer and labor cost.

D. Cost of care until Bearing Age: 5. (a) Cost of chemical and

Orchard si- tuation.	Number of orchards	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Bhasfrein-Sier Akkar	3	13.50	278
Donnieh-Kottin	2	4.00	602
Tannourin	2	3.20	476
Hasroun	2	1.40	640
Besharri	3	2.30	247
Total	12	24.40	
Average number of trees per hectar			
Average cost of fertilizer per hectar in North Lebanon in the second year			<u>375</u>
Cost per tree (715.60 : 375 = 1.90 L.L.)			

x Chemical and animal expenses are the sum of chemical (chemical

+ Labor cost is the result of multiplying the number of work days

• Total cost is the sum of fertilizer and labor cost.

Table 120.

 animal fertilizer b) Labor cost in North Lebanon in the Second Year.

Chemical and animal Ex- penses.	Labor cost +	Total cost * L.L.	Average cost per hectar L.L. (area as weights)
6704	320	7024	520.30
4550	95	4645	1161.20
2725	84	2809	877.60
1344	34	1378	1341.40
1033	71.50	1104.5	480
		<u>17460.5</u>	
			<u>715.60</u>

fertilizer: super phosphate, potash sulfate, ammonium sulfo-nitrate,
 etc... at 11-26 piasters per kilogram) and cost of manure (goats,
 oxen, etc... at 8-25 piasters per kilogram).

by the price per worker per day.

D. Cost of care until bearing age: 5. Cost of chemical and animal

Number of trees planted per hectare (weighted average)	Area of apples planted hectare	Number of orchards	Orchard name
278	13.20	3	Bharain-Sier Akker
202	4.00	2	Dondah-Kottin
476	2.80	2	Tannourin
240	1.40	2	Hassan
247	2.20	2	Bashari
	24.40	12	Total

5. Chemical and Animal Fertilizer

a) Cost of fertilizer

b) Labor cost

D. Cost of care until bearing age

Average number of trees per hectare

Average cost of labor in North Lebanon in the third year

375

Cost per tree (L.L.) : 375 = 2.70 L.L.

x Chemical and animal expenses are the sum of chemical (chemical

+ Labor cost is the result of multiplying the number of work days

o Total cost is the sum of fertilizer and labor cost.

D. Cost of care until Bearing Age: 5. Cost of chemical and animal

Orchard situation.	Number of orchards	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Bhasfrein-Sier Akkar	3	13.50	278
Donnieh-Kottin	2	4.00	602
Tannourin	2	3.20	476
Hasroun	2	1.40	640
Besharri	3	2.30	247
Total	12	24.40	

Average number of Trees per hectar

Average cost of fertilizer per hectar in North Lebanon in the third year

375

Cost per tree $(1022.40 : 375 = 2.70 \text{ L.L.})$

- x Chemical and animal expenses are the sum of chemical (chemical
- + Labor cost is the result of multiplying the number of work days
- o Total cost is the sum of fertilizer and labor cost.

Table ISI

fertilizer b) Labor cost in North Lebanon in the Third Year.

<u>Chemical and animal Ex- penses</u>	<u>Labor cost +</u>	<u>Total cost ° L.L.</u>	<u>Average cost per hectar L.L. (area as weights).</u>
91.20	440	9560	706.70
7560	130	7690	1922.5
3680	123	3788	1183.80
2410	45.50	2455.5	1753.60
1359	93.50	1452.5	631.30
		<u>24946</u>	
			<u>1022.40</u>

fertilizer: super phosphate, potash sulfate, ammonium sulfo-nitrate, etc...
at 11-26 piasters per kilogram, and cost of manure (goats, oxen, etc...
at 8-25 piasters per kilogram).

by the price per worker per day.

D. Cost of care until Bearing Age. 7. (a) Cost of chemical and

Number of trees planted per hectare (weighted average)	Area of Apples planted per hectare	Number of orchards.	Grains at tation.
--	---------------------------------------	------------------------	----------------------

278	13.70	3	Braunstein-Glow Albany
608	4.00	8	Donner-Kottin
446	3.80	8	Tannowin
640			Harzow
247			Beckhart

D. Cost of care until Bearing Age

5. Chemical and Animal Fertilizer

a) Cost of fertilizer Total

b) Labor cost

Average number of trees per hectare

Average cost of fertilizer per hectare in fourth year

278

Cost of fertilizer in the fourth year = 4.50 L.L.

x Chemical and animal manures are the sum of chemical (chemical fertilizer)

Table 122

+ Labor cost is the result of multiplying the number of work days

* Total cost is the sum of fertilizer and labor cost.

D. Cost of care until Bearing Age. 5. a) Cost of chemical and

Orchard situation.	Number of orchards.	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Bhasfrein-Sier Akkar	3	13.50	273
Donnich-Kottin	2	4.00	602
Tannouria	2	3.20	476
Hasroun	2	1.40	640
Besharri	3	2.30	247
Total		24.40	

Average number of trees per hectar

Average cost of fertilizer per hectar in North Lebanon in the fourth year

375

Cost per tree (1694.30 ÷ 375 = 4.50 L.L.)

x Chemical and animal Expenses are the sum of chemical (chemical fertilizer

Table III

- + Labor cost is the result of multiplying the number of work days
- Total cost is the sum of fertilizer and labor cost.

Table 122

animal fertiliser b) Labor cost in North Lebanon in the fourth year.

Chemical and animal Ex- penses.	Labor cost +	Total cost °	Average cost per hectar L.L. (area as weights)
17850	750	18600	1377.80
10700	200	10900	2725
5440	151	5591	1747.20
3525	63.50	4193.5	3987.90
1920	137.50	2059.5	895.70
		<u>41344</u>	
			<u>1694.30</u>

super phosphate, potash sulfate, ammonium sulfo-nitrate, etc... at 11-26 piasters per kilogram) and cost of manure (goats, oxen, etc... at 8-25 piasters per kilogram).

by the price per worker per day.

D. Cost of care until Bearing Age 5 (a) Cost of chemical and animal

Number of trees per hectare (weighted average)	Area of Apples planted hectare	Number of orchards	Orchard si- tuation
400	4.80	1	Lebanon
870	87.30	3	Qada Ixra
430	8.80	1	Konkara
200	2.60	4	Brouk-Nakh Bata
D. Cost of care until Bearing Age			
	103.50	9	Total

5. Chemical and Animal Fertilizer

a) Cost of Fertilizer
b) Labor cost

300

Cost per tree (696.80 : 300 = 2.32 L.L.)

x Chemical and animal expenses are the sum of chemical

South Lebanon in the second year

+ Labor cost is the sum of fertilizer and labor cost.
Total cost is the sum of fertilizer and labor cost.

D. Cost of care until Bearing Age: 5. a) Cost of chemical and animal

Orchard situation.	Number of orchards.	Area of Apples planted hectar	Number of trees per hectar (weighted average)
Joubelh	1	4.20	400
Quada Jizzin	3	25.30	270
Mouchtara	1	2.80	436
Barouk-Wabh Safa	4	5.60	500
Total	9	37.90	

Average number of trees per hectar

Average cost of Fertilizer per hectar in South Lebanon in the second year

300

Cost per tree (696.20 : 300 = 2.30 L.L.)

- x Chemical and animal expenses are the sum of chemical (chemical
- + Labor cost is the result of multiplying the number of work days
- Total cost is the sum of fertilizer and labor cost.

Table 123
 fertilizer (b) Labor cost in South Lebanon in the Second Year.

Chemical and x animal ex- penses.	Labor cost +	Total cost ° L.L.	Average cost per hectar L.L. (area as weights)
2750	100	2850	630
14744	546	15290	590.40
1600	55	1655	591
6400	191	<u>6591</u>	1177
		26386	
			696.20

fertilizer: super phosphate, potash sulfate, ammonium sulfo-nitrate, etc...
 at 11-26 piasters per kilogram) and cost of manure - (goats, oxen, etc...
 at 8-25 piasters per kilogram).

by the price per worker per day.

D. Cost of care until bearing age: 2. (a) Cost of chemical and

Number of trees per hectare (weighted average)	Area of trees planted hectare	Number of orchards	Orchard site location
400	4.80	1	Tombelir
870	27.30	3	Quada Likain
435	8.90	1	Monehara
200	2.60	4	Berok-Nahh Bais

U. Cost of care until bearing age

5. Chemical and Animal Fertilizer

a) Cost of Fertilizer

b) Labor cost

300

Cost per tree (204.90 : 300 = 3.20 L.L.)

Chemical and animal fertilizer are the sum of chemical (chemical
and animal fertilizer) in the
Third Year

Table 124

Total cost is the sum of fertilizer and labor cost.
+ Labor cost is the result of multiplying the number of work days by the

D. Cost of care until Bearing Age: 5. (a) Cost of chemical and

Orchard si- tuation.	Number of orchards	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Joubelh	1	4.20	400
Quada Jizain	3	25.30	270
Mouchtara	1	2.80	436
Barouk-Nabh Safa	4	5.60	500
Total			37.90
Average number of trees per hectar			
Average cost of fertilizer per hectar in South Lebanon in the third year			<u>300</u>

Cost per tree (964.90 : 300 = 3.20 L.L.)

* Chemical and animal expenses are the sum of chemical (chemical

+ Labor cost is the result of multiplying the number of work days by the

• Total cost is the sum of fertilizer and labor cost.

Table 134

animal fertilizer (b) Labor cost in South Lebanon
in the third year.

Chemical and animal expenses.	Labor cost *	Total cost * L.L.	Average cost per hectare L.L. (area as weights)
4300	150	4450	1059.50
20200	786	20986	810.30
1990	61	9051	732.5
8805	277	9082	1621.80
		<u>36569</u>	
			<u>964.90</u>

fertilizer: super phosphate, potash sulfate, ammonium sulfo-nitrate, etc...
at 11-26 piasters per kilogram) and cost of manure (goats, oxen, etc...
at 8-25 piasters per kilogram).

price per worker per day.

D. Cost of care until bearing age (a) Cost of chemical and animal

Number of trees planted per hectare (average)	Area of Apples planted hectare	Number of orchards	Orchard no. , location
400	4.20	1	Loubah
270	22.20	3	Quada Lixia
430	2.80	1	Hawshara
200	2.20	4	Karok-Nabar Bala 4

D. Cost of care until bearing age Total

5. Chemical and Animal Fertilizer

Average number of trees per hectare

a) Cost of fertilizer

Average cost of fertilizer per hectare in South

b) Labor cost

300

Cost per tree (142.80 : 300 = 46 L.L.)

South Lebanon in the

Chemical and animal expenses and the sum of chemical (chemical
fourth year

* Total cost is the sum of fertilizer and labor cost.
+ Labor cost is the result of multiplying the number of work days

D. Cost of care until Bearing Age: 5. (a) Cost of chemical and animal

Orchard si- tuation.	Number of orchards	Area of Apples planted hecтар	Number of Trees per hecтар (weighted average)
Joubaih	1	4.30	400
Quada Jizzin	3	25.30	270
Mouchtara	1	2.80	436
Barouk-Wabah Safa	4	5.60	500

Total area planted 37.900 .a

Average number of trees per hecтар

Average cost of fertilizer per hecтар in South Lebanon in the fourth year

300

Cost per tree (1442.80 : 300 = 4.80 L.L.)

x Chemical and animal expenses are the sum of chemical (chemical

- + Labor cost is the result of multiplying the number of work days
- Total cost is the sum of fertilizer and labor cost.

Table 125

Fertiliser (b) Labor cost in South Lebanon in the Fourth Year.

Chemical and animal ex- penses.	Labor cost +	Total cost L.L.	Average cost per hectare L.L. (area as weights).
5900	200	6100	1452.40
30000	1062	31062	1328
5390	88	5478	1942.60
11660	385	12045	2150.5
		<u>54635</u>	
			<u>1442.80</u>

fertiliser: super phosphate, potash sulfate, ammonium sulfate, nitrate, etc...
at 11-26 piasters per kilogram) and cost of manure (goats, oxen, etc...
at 8-25 piasters per kilogram).

by the price per worker per day.

D. Cost of care until bearing age: 2. (a) Cost of chemical and animal

Number of trees per hectare (weighted average)	Area of apples planted hectare	Number of orchards.	Orchard si- tuation.
116	42.90	2	Isabai
121	42.90	2	Tahavai
413	100.10	2	Tahavai
123	9	2	Isabai
222	16.90	2	Isabai
	<u>146.60</u>		

D. Cost of care until bearing age
5. Chemical and animal Fertilizer
a) Cost of fertilizer
b) Labor cost

Average cost of fertilizer per hectare in the Isabai in the second year

107

Average number of trees per hectare

Cost per tree (in the second year) = 1.00 (L.S.)

Table 126

x Chemical and animal expenses are the sum of chemical (chemical)

+ Labor cost is the result of multiplying the number of work days

• Total cost is the sum of fertilizer and labor cost.

D. Cost of care until Bearing Age: 5. (a) Cost of chemical and animal

Orchard si- tuation.	Number of orchards.	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Istabl	3	75.90	336
Tahnayel	2	42.90	261
Taalbaya	2	1.90	415
Baalbek	2	9	333
Zahlé	2	16.90	268
Total...	11	146.60	

Average cost of fertilizer per hectar in the Bekaa in the second year

Average number of trees per hectar

307

Cost per tree = $(470.33 \div 307) = 1.60 \text{ L.L.}$

8VI a1d8T

x Chemical and animal expenses are the sum of chemical (chemical

* Labor cost is the result of multiplying the number of work days

o Total cost is the sum of fertilizer and labor cost.

Table 126

fertilizer (b) Labor cost in the Bekaa in the second Year.

Chemical and x animal ex- penses.	Labor cost +	Total cost ° L.L.	Average cost per hectar L.L. (area as weights)
35476.25	228	36204.25	477
21150	564	21714	506.20
1270	32	1302	635.20
5575	132	5707	634.10
7265	260	7525	445.30
		<u>72452.25</u>	
			<u>470.30</u>

fertilizer: super phosphate, potash sulfate, ammonium sulfo-nitrate, etc...
at 11-26 piasters per kilogram) and cost of manure (goats, oxen, etc....
at 8-25 piasters per kilogram).

by the price per worker per day.

D. Cost of care until bearing age: (a) Cost of chemical and animal

Number of trees per hectare (weighted average)	Area of apples planted hectare	Number of ex- plants	Orchard al- location
333	75.90	3	Isabai
181	48.90	3	Taharvei
417	1.90	3	Taharvei
333	9	3	Bahar
333	18.90	3	Sahar

D. Cost of care until bearing age

5. Chemical and animal Fertilizer
Average cost of fertilizer per hectare in the orchard in the third year

307

a) Cost of Fertilizer

Average number of trees per hectare

b) Labor cost

Cost per tree (333.30 x 307 = 102,100 L.I.)

Taken in the third Year
x Chemical and animal expenses are the sum of chemical (chemical

Table 127

* Total cost is the sum of fertilizer and labor cost.
+ Labor cost is the result of multiplying the number of work days

D. Cost of care until Bearing Age: 5 (a) Cost of chemical and animal

Orchard situation.	Number of orchards.	Area of Apples planted hectare	Number of Trees per hectare (weighted average)
Istabl	3	75.90	336
Tahnayel	2	42.90	261
Taalbaya	2	1.90	415
Baalbek	2	9	333
Zahlé	2	16.90	268

Total 146.60

Average cost of fertilizer per hectare in the Bekaa in the third year

Average number of Trees per hectare 307

Cost per tree (633.30 : 307 = 2.06 L.L.)

x Chemical and animal expenses are the sum of chemical (chemical

+ Labor cost is the result of multiplying the number of work days

• Total cost is the sum of fertilizer and labor cost.

Table 127

fertilizer b) Labor cost in the Bekaa in the third year.

Chemical and x animal ex- penses.	Labor cost +	Total cost ° L, L _v	Average cost per hectare L, L _v (area as weights)
48010	1128	49138	647.40
28830	800	29630	690.70
1787.50	48	1835.5	965.80
8198	804	8402	933.70
10768.50	392	11160.5	660.40
		<u>100166</u>	

683.30

fertilizer: super phosphate, potash sulfate, ammonium sulfo-nitrate, etc...
at 11-26 piasters per kilogram) and cost of manure (goats, oxen, etc...
at 8-25 piasters per kilogram).

by the price per worker per day.

D. Cost of care until bearing age: (a) Cost of chemical and animal

Orchard section	Number of trees	Area of applied chemical (hectares)	Number of trees per hectare (weighted average)
Isabai	3	77.90	136
Tahrayai	2	42.20	261
Tahrayai	2	1.90	415
Isabai	2	9	133
Isabai	2	26.20	268

D. Cost of care until bearing age

5. Chemical and animal fertilizer
 a) cost of Fertilizer
 b) Labor cost.
 Cost per tree (999.70 + 307 = 1306.70 L.S.)

Chemical and animal fertilizer in the fourth year

Table 138

Total cost is the sum of fertilizer and labor cost.
 Labor cost is the result of multiplying the number of work days

D. Cost of care until Bearing Age: 5 (a) Cost of chemical and animal

Orchard situation,	Number of orchards,	Area of Apples planted hectar	Number of Trees per hectar (weighted average)
Istabl	3	75.90	336
Tahnayel	2	42.90	261
Taalbaya	2	1.90	45
Baalbek	2	9	333
Zahlé	2	16.90	268
Total	11	146.50	

Average cost of fertilizer per hectar in the Bekaa in the fourth year

Average number of Trees per hectar

307

Cost per tree (999.70 ÷ 307 = 3.30 L.L.)

x Chemical and animal expenses are the sum of chemical (chemical

SRI aidaI

+ Labor cost is the result of multiplying the number of work days

• Total cost is the sum of fertilizer and labor cost.

Table 133

Fertilizer b) Labor cost in the Bekaa in the fourth year.

Chemical and x animal ex- penses.	Labor cost +	Total cost • L.L.	Average cost per hectare L.L. (area as weights).
69250	1720	70970	935
42525	1200	43725	1019.5
2640	72	2712	1427.40
12025	280	12305	1367.20
16250	600	16850	997
		<u>146562</u>	
			<u>999.70</u>

fertilizers: super phosphate, potash sulfate, ammonium, sulfo-déhydrate, etc..
at 11-26 piasters per kilogram) and cost of manure (goats, oxen, etc...
at 3-25 piasters per kilogram).

by the price per worker per day.