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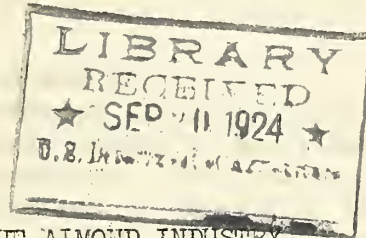
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UNITED STATES DEPARTMENT OF AGRICULTURE

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THE ALMOND INDUSTRY  
IN THE MEDITERRANEAN BASIN.

By

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London, England.

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## THE ALMOND INDUSTRY IN THE MEDITERRANEAN BASIN

### INTRODUCTION

In his trip through the almond producing areas of the Mediterranean Basin during July, August and September 1923, the author, who is American Agricultural Commissioner at London, sought to gather data that would supplement and amplify the investigation which he carried on in that field during 1922. The report of this earlier investigation was published by the Bureau of Agricultural Economics under date of November 1, 1922. 1/ Since the first report was devoted primarily to grading and production, the present report covers the cost of production.

#### Cost of Production.

Before the passage of the present American Tariff Law, little attention had been given to the cost of producing almonds in the Mediterranean Basin. Since that time such studies as have been made in the Mediterranean countries have been influenced more or less by a desire to create the impression that it costs more to produce almonds than it actually does cost. The reasons for this tendency are twofold. In the first place it is the general opinion in those countries that the placing of an American tariff on almonds is an attempt to offset the low cost of production in the Mediterranean countries. In the second place there has been a continual endeavor since the war, particularly

1/ The Almond Industry in Italy and Spain, F. S. #22.

in Italy and Spain, to find new commodities for taxation. The governments of both of these countries are, therefore, reassessing the values of the almond groves with a view to increasing the present taxes.

Frankly, no one knows what it costs to produce almonds, even in those districts where the science of almond growing is most advanced. Very few accurate studies of the cost of producing almonds have been made by qualified men. The groves themselves have no known replacement value. In most of the Mediterranean countries they have been handed down from father to son, and there are few sales. The few sales made are often based on sentimental values. Many years have passed since the land values in either Italy or Spain have been assessed, and no assessments of value under modern or post-war conditions have been made.

#### Wages.

The greatest increases in cost of production are in wages and handling charges. These increases are closely connected with the problem of unstable exchanges. The lira has dropped so much in value that in Italian money the laboring man's wages are at least four times what they were before the war, although in their value in United States currency, they have advanced little, if at all.

This survey includes pre-war estimates as given by men interested in the scientific cultivation of almonds, and some recent estimates by agricultural and commercial organizations both in Spain and Italy. The figures were verified and supplemented by the author as he travelled through the various producing sections.



### Standards of Living in the Mediterranean Basin.

In estimating costs of production in Spain and Italy and in the other almond producing areas of the Mediterranean basin, one must always bear in mind that the peasant population of these countries is backward and uneducated. There is but little scientific agriculture, and little fertilizer is used. The labor is often furnished by the proprietor and his family, whose living, in most cases is derived from a few acres of wheat and a little garden truck, a cow, a pig, and numerous chickens and goats.

The almonds usually comprise the cash crop on which the family depends for clothes, taxes and such small luxuries as it can afford. To the growers there appears no real question of a return on an investment. The standards of living are low, and drop lower when the almond season is bad. If the crop is poor or fails completely, the family merely sacrifices some of its necessities, or desired luxuries, and lives in the hope that the next year will be a better one. Moreover the fact that the crop fails one year means that the poverty-stricken farmer does not fertilize that year, for even if he realized that fertilizer was necessary, he could not purchase it. It is only in the best of years that his orchard is fertilized. In other years the trees must depend on the manual tilling of the soil and such manure as the small stable of the peasant farmer can provide. In addition to the deterrent of poverty, there is a general feeling among the almond growers that regardless of fertilizer and cultivation, every heavy crop will be followed by a poor one and then by a mediocre one.

## American Tariff Factor in Mediterranean Almond Industry

Very little new planting took place in the Mediterranean almond orchards during 1923, because of uncertainties arising from the establishment and operation of the American tariff. Farmers were replacing dead almond trees with olives. This apparently was quite a reversal in policy, for although no figures were available, it was the consensus of opinion that during the past ten years plantings had been steadily increasing. According to commercial estimates the total area in that period increased some 20 per cent. Since it takes about five years after planting before a tree begins bearing profitably in the Mediterranean basin, an increase in production may be expected during the next four years because of the new plantings made when almond prices were being maintained at a high level.

### Planting Methods.

In most of the Mediterranean basin, almond trees are planted from 19 to 32 feet apart. That trees may grow under most favorable conditions, plenty of space is allowed for their roots and plenty of light and ventilation for the free growth of their branches. In the low hilly regions away from the coastal plains of Italy and Spain, the trees are planted irregularly according to the conformation of the land. Where the plantation consists entirely of almond trees, in poor soil on a hillside or even on level land, the distance between the plants is generally 19 feet. When the orchard is located in the rich soil of the

plains the distance is usually about 27 feet. Sometimes it is 32 or even 39 feet. In the latter case, however, the farmers grow various other crops between the trees.

Trees are planted either in squares or diamonds. In the first case the land is divided into squares and the trees planted regularly, in the second, each tree is surrounded by six others equidistant on radii at angles of 60 degrees, so that any four plants come at the angles of a diamond. A one acre diamond allows the planting of 47 almond trees as compared with only 40 in the square acre formation. The rows generally run north and south in order to allow the trees a maximum of sunlight and heat.

#### Crops Cultivated Between Almond Trees.

In the level districts of Italy, Sicily and Spain, almonds are seldom cultivated by themselves. Although espezialized almond culture pays best in the long run, the farmers find it necessary to insure against a crop failure and to meet current requirements of daily farm life, by cultivating other crops between the almond trees. In the Bari section of Italy a three-year rotation of wheat, oats and garden truck or beans, is used. In Sicily a two-year rotation is used, wheat being followed by fallow. This plan is by no means to be advised for the soil is greatly impoverished thereby, and the trees are deprived of the requisite moisture, while the cereals thus cultivated are generally poor and the crop scanty. The poverty of the peasant farmers, however, makes it difficult for them to break away from this procedure.



The Department of Agriculture of Italy suggests that where other crops between the trees are necessary a better rotation is:

- 1st. Broad beans or peas fertilized with stable manure.
- 2nd. Pulse for fodder or green manure. 1/
- 3rd. Wheat or oats.

Vines are grown between the almond trees throughout many districts of the Mediterranean almond producing regions particularly in the Bari section of Italy and in Sicily. This combination of vines and trees is not successful in the long run as the roots of the vines and trees interfere with each other and the shade of the full grown trees eventually interfere with the vines. Olives and almonds however, are found together in all localities, without either damaging the other.

#### Harvesting the Almond Crop.

Almonds for home consumption, particularly those of the large soft sort, are gathered as soon as the fruit is fairly large and before the outer husk has hardened. They are served with the husks and are cut open at the table with an ordinary dessert knife. There is a considerable local use of almonds, in this form, both in Italy and Spain. Almonds for home consumption are not included in the estimates of production for various districts, but only production for export. Almonds for other than local use are gathered at the time of maturity by the color, the substance of the kernels and the bursting of the husks.

- 1/ The fodder must be cut green as there is serious danger of damage to the almond crop. Distinction is here made between broad beans and peas, or edible pulse, and that raised only for fodder or humus.

Hard shelled almonds are gathered both from the ground and by shaking the tree and catching the nuts on sheets placed beneath. Soft shelled almonds are usually hand-picked. When gathered, the almonds are taken home by the peasants and husked. This labor is usually performed by the family of the peasant farmer, but on the large estates it is done by women employees who can husk from 220 to 440 pounds per day. Following the husking the almonds are sun-cured. They are spread on cloths in the yards or on the roofs of the houses for two or three days. During the extreme heat of the day they are removed and during the night they are covered to protect them from damp. After sun-curing they are placed in piles in a store house and occasionally ventilated. The process of grading and sale after husking varies somewhat in the different countries, and will be treated later in the section devoted to the different almond growing districts.

#### By-products of the Almond Industry.

Almond shells are used for fuel, and the husks are burned and the ashes used as fertilizer. The husks are burned slowly, with new quantities added day and night to the pile, and the fire is not allowed to go out until all the husks have been consumed. It takes 13 pounds of husks to produce 1 pound of ash which yields 30 to 42 per cent potassium oxide. This ash is used on the orchard at the rate of four and one half pounds per tree. It is also used by soap makers.

### Loss of Weight in Drying.

Almonds picked in the husks lose from 12 to 15 per cent in weight by sun drying; those already husked lose from 3 to 5 per cent. After shelling, the almonds lose from 2 to 3 per cent by further drying. In unscrupulous circles, water is added by sprinkling some days before sale. The weight of the husks varies greatly from a minimum of 14 per cent in the Scicacolella variety to 37 per cent in the Magarella variety. In the soft shelled varieties such as the Mollese it reaches as high as 61 per cent of the weight of the almond.

### Average Weight of Hard Shelled Almonds.

Part	:	Small	:	Medium	:	Large
	:		:		:	
	:	grams	:	grams	:	grams
Almond:	:		:		:	
Fresh gathered with husk	:	8.95	:	10.40	:	13.30
After sun drying with husk	:	7.15	:	8.61	:	11.45
Dried husk .....	:	2.93	:	2.97	:	4.25
Almond in shell .....	:	4.22	:	5.64	:	7.20
Kernel .....	:	1.40	:	1.30	:	1.15
Shell .....	:	2.82	:	4.34	:	6.05

### Speculation in Almonds.

There is considerable speculation in almonds and other nuts in the various Mediterranean districts. Many people in Bari and Sicily and Spain, having a little money on hand for investment purposes, speculate in almonds, buying up either future contracts or present

supplies. Such speculation is particularly prevalent in Sicily where contracts are made about November and December for the crop of the following summer, specifying delivery in August or September. Generally the standard bales of 220 pounds each are dealt in; the parcels are usually small running from 25 to 50 bales. This is a pure gambling proposition as it is impossible to foretell anything about almond crops until sometime in June or July. These "shares" are also sold in foreign markets but not to such a great extent as in Sicily.

The endorsements of the contract exempt the successive purchasers from responsibility, leaving the original seller (the speculator) and the ultimate purchaser to settle matters between them. The new purchaser pays the seller the sum that the latter paid when he acquired the contract, plus or minus the difference arising from the rise or fall of the speculating market. Such speculation is encouraged by the fact that the original purchaser pays down only 10 or 15 per cent of the agreed price, the balance being paid on delivery. This enables the speculators on very small sums to deal in parcels of considerable value.

Frequently when the crop arrives instead of having a delivery of goods according to the contracts, the deal is liquidated, the seller taking any profit or loss brought about by changes in the market. In cases where delivery is actually made, it is made on orders at previously-settled prices. Payment is then tendered in bills of from 30 to 90 days, or a certain sum is paid on account, and the balance on delivery, or on delivery of export documents.



Almond Contracts.

The following are copies of generally used almond contracts:

The Undersigned Contracting Parties have agreed as follows:

Messrs.....sell and undertake to deliver to Messrs.....of..... who agree to purchase for re-sale or for shipment the quantity of.....(.....) Bales, each bale to weigh one hundred kilograms, of shelled, sweet almonds of Palma Girgenti & (or) Aderno Paterno quality, at the vendors' option, to the exclusion of any other almonds of non-Sicilian origin, grown in the year 1900..... of good quality, dried, and in good condition, saleable, receivable, and screened, and packed in good, new, jute almond bags, each bag not to weight empty more than 2.2 kgs.

The goods shall be delivered at Catania on the..... day of .....19.....at the vendors' option, the latter undertaking to give the purchasers five days notice thereof either by registered letter or by telegram. The said almonds shall be deposited and weighed in the warehouse notified by the vendors, in Catania, and thence, at their expense, loaded on steamer or sailing vessel in the port of Catania, as the purchasers shall choose. The export duty, Chamber of Commerce tax on freight, and customs dues, in case there are any, shall be defrayed by purchasers.

If at the appointed date the purchasers do not take delivery of the goods, the vendors undertake to give a warrant (tengo in mio potere) on stamped paper (value lire 1.22) over.....signature or with..... transfer and on.....responsibility and guaranty against any risks for thirty days from the day after the date when due, free of warehousing charges and short weight.

The price is fixed at Lire.....for every hundred kilogram bag of goods.

The purchase price shall be paid in Catania in the following manner: Lire..... on account at once and the balance of the price when the goods are delivered as above arranged.

Payments shall be made in the currency of the Kingdom and against private receipts of the vendors.

The clause as to the re-sale or shipment does not exonerate the purchasers from their responsibility towards the vendors.

in case of non-fulfilment of the contract, the party at fault undertakes to pay the other party as damages all the expenses, interests and fines which may result therefrom, in compliance with the commercial laws in force.

For the execution of the presents the parties, declaring their status of dealers, elect domicile in Catania made in duplicate to this effect for reciprocal security.

### CONTRACT FOR COB NUTS

In accordance with the terms of the following private agreement, to hold good as a public contract according to the rules of the commercial laws in force between the undersigned contracting parties it is agreed as follows:

Messrs.....sell and undertake to deliver to Messrs.....who agree to purchase for re-sale or shipment.....  
Sicilian cob-nuts of next season's crop of the year 1900  
.....from the coast of Tramontana or Castiglione, of good quality, dry, saleable and receivable, not exceeding 12% in rotten, black, or carious, and empty; the latter must, in no case, exceed six per cent, and bug-eaten not in excess of the reasonable proportion of the year's crop.

To be delivered at Messina at the quay, warehouse or railway station.....  
.....  
on the.....day of.....of the year 19.....at the choice of the said vendor. The price is by common consent agreed at Lire..... per 100 kgs. net weight without bags.

The whole in currency of the kingdom and against the private receipt of the said vendor. The Contracting Parties undertake reciprocally to indemnify one another for any damages, expenses, interests and fines, that may result from the non-fulfilment of this contract, according to the rules of commercial law in force.

For the execution of the present the parties declare their status of dealers and elect domicile in Messina, i.e.

.....  
.....

The data in this report were obtained almost entirely in foreign currency units, but have been converted to United States units for the convenience of the reader. This conversion is particularly essential in the use of figures applying to the last ten years during which the value of European currencies has fluctuated widely.

Below are given the important equivalents used in the conversions

Hectare	=	2.471 acres
Bale	=	quintal = 220 pounds
Tanega	=	1.58 bushels.
Liter	=	.908 dry quarts.
Meter	=	39.37 inches
Franc (at par)	=	19.30 cents
" Nov. 5, 1923	=	5.78 cents
" 1923	=	6.08 cents
Lire (at par)	=	19.30 cents
" 1914	=	19.50 cents
" 1915	=	16.86 cents
" 1916	=	15.46 cents
" 1917	=	13.73 cents
" 1918	=	11.64 cents
" 1919	=	12.56 cents
" 1920	=	4.97 cents
" 1921	=	4.29 cents
" 1922	=	4.76 cents
" 1923	=	4.60 cents
" Nov. 5, 1923	=	4.46 cents
Peseta (at par)	=	19.30 cents
" 1922	=	15.48 cents
" 1923	=	14.45 cents
Shilling (at par)	=	24.53 cents
" Nov. 5, 1923	=	22.315 cents

# ITALIAN ALMOND INDUSTRY.

Almonds are produced to some extent in all the departments of Italy. The most important areas, however, as shown by the tables, below, are the islands of Sicily and Sardinia and the Bari district, largely in the department of Apulia in southeastern Italy. <sup>1/</sup>

## Almond Production in Italy, 1916-1922

Depart- ment.	<sup>1/</sup>	1916	1917	1918	1919	1920	1921	1922	Average
		Bales:	Bales:	Bales:	Bales:	Bales:	Bales:	Bales:	Bales
Liguria ...		2,000:	3,000:	3,000:	3,000:	3,000:	2,300:	2,000:	2,614
Emilia ....		1,000:	1,000:	1,000:	1,000:	1,000:	1,000:	2,500:	1,214
Tuscany ...		1,000:	3,000:	1,500:	1,000:	1,000:	800:	1,000:	1,329
Marches ...		8,000:	8,000:	4,000:	4,000:	6,000:	4,700:	6,000:	5,814
Umbria ....		.....	.....	500:	500:	500:	400:	500:	480
Latium ....		1,000:	1,000:	1,000:	500:	500:	700:	1,000:	814
Abruzzi and		:	:	:	:	:	:	:	:
Molise ..		20,000:	19,000:	23,000:	5,000:	10,000:	7,200:	8,000:	13,171
Campania ..		29,000:	23,000:	26,000:	20,000:	24,000:	20,600:	18,000:	22,943
Apulia ....		416,000:	219,000:	180,000:	144,000:	216,000:	160,000:	653,000:	284,000
Basilicata.		3,000:	1,000:	5,000:	1,000:	1,000:	800:	8,000:	2,829
Calabria ..		8,000:	6,000:	7,000:	3,000:	5,000:	3,100:	4,000:	5,157
Sicily ....		603,000:	359,000:	638,000:	297,000:	1,075,000:	697,000:	1,106,000:	682,143
Sardinia ..		9,000:	35,000:	61,000:	74,000:	33,000:	40,000:	67,000:	45,571
Venetia Julia		.....	.....	.....	.....	.....	.....	1,000:	1,000
Total		1,101,000:	678,000:	951,000:	554,000:	1,376,000:	938,600:	1,878,000:	1,068,086

Commercial sources for 1916-1921 data; International Institute of Agriculture for 1922 data.

<sup>1/</sup> The departments or "compartimenti" of Italy are the main divisions of the country: the provinces such as Bari, are divisions within the departments.

Production figures are not available for the following departments: Piedmont, Lombardy, Venetia and Tridentine Venetia.

## Exports of almonds from Italy, 1910-1922.

Year	Quantity
	Bales
1910 .....	206,300
1911 .....	182,900
1912 .....	226,400
1913 .....	104,900
1914 .....	158,400
1915 .....	161,000
1916 .....	149,700
1917 .....	122,000
1918 .....	166,800
1919 .....	221,800
1920 .....	170,700
1921 .....	170,800
1922 .....	268,000



### The Bari District.

The Bari district is a low coastal plain along the Adriatic Sea from Foggia to Brindisi. The almonds grown here are of the rougher stock with a considerable mixture of bitters. This mixture of bitters is particularly noticeable in the northern part of the district. The production in the district in 1922 amounted to some 400,000 bales. The standard bale of 220 pounds is the ordinary market package in the district, though Bari almonds are sometimes quoted in English hundredweights.

### Climate.

Because this region is a long, low-lying coastal plain running back into the mountains, complete crop failures are not common. As a result of its peculiar geographical formation, the same climatic conditions do not simultaneously affect all parts of the plain, and the crop may be ruined in some sections while unharmed in others. A complete crop failure has been experienced only four times in the past thirty years, all four in consequence of heavy frosts which killed the entire crop in a single night. These heavy frosts come late in March or April. After April 1st, the crops are generally safe, though the worst frost ever encountered in the Bari district, thirty odd years ago, was on April 30th. Heavy cold fogs sometime occur as late as May 10th or 15th, causing almonds that are not strong to drop from the tree.

### Soil Strata.

The almond trees in the Bari district are generally small as the soil in which they are planted is shallow though rich in humus. It is from 18 inches to 3 feet in depth, and is underlaid with chalk. The small roots take water from the calcareous mass which retains the moisture a long time after the upper soil is dry, thus enabling the almond trees to live through periods, sometimes as long as 10 months, without rain. The trees are

planted 32 feet apart to give them as much ventilation as possible. This is very important in the Bari district because it has been found that the many humid days prevailing there each year are extremely detrimental to almond trees that are planted too close together.

#### Little Fertilizer Used.

Little fertilizer is used in the Bari region. The contracts for the rental of agricultural land, however, all call for definite fertilization. These contracts specify that a certain amount of sewage or city refuse be placed around the trees every two years. No attention is paid to this item of the contract, as the owner is always at Naples and does not bother the tenant so long as he gets his rent. The tenant has too many local worries to care much about the absentee landlord in Naples as long as he is able to pay the rental.

#### Land Ownership.

Bari is a part of the Old Kingdom of Naples, and is largely owned by very wealthy men who live in Naples and have little interest in the country save to collect their rents. It is estimated that only 15 per cent of the land in Apulia is held by the small holders. The large holders, by reason of their great wealth, can without difficulty hold almonds over to the following year, especially when there is a small crop in sight. The small holders in this district live very much from hand-to-mouth, and must always have cash for immediate necessities. There is no system of stores giving credit for merchandise and collecting when the crop is gathered.

The small holders plant various crops between the almond trees and thus always have one product or another coming on the market. These crops as they come along are sold for cash and the cash used for the purchase of household or farm necessities. This system leads the small almond grower to dispose of his crop as soon as it is ready. The carry-over from the crop of 1922 therefore was chiefly in the hands of the large holders who held on to their crops principally because of poor markets after the new tariff law went into effect in the United States, and because of fluctuating exchanges.

#### Increased Almond Planting.

In the last few years there has been a definite increase in almond planting in the Bari section. While no official statistics are available, commercial estimates indicate that plantings have increased about 33 per cent during the past ten years. On most small holdings when a tree dies it is replaced, but whether it is replaced by an almond or by an olive tree depends on the relative prices of almonds and olives. Thus the first reason for the increase in almonds was the high price of almonds and the low price of olives. Little was known in Bari of the modern methods of making olive oil and only the poorest grade of oil was turned out. This made olive prices low. Furthermore, the wine industry has practically disappeared from the Bari district as a result of the damage to the vineyards wrought by the phylloxera and of the adverse tariff laws of importing countries. The almond market has benefited by the entry of the wine merchants into the almond business.

A further reason why farmers prefer to replant almonds is that they come into bearing more quickly than olives or other fruits. An almond tree will begin to earn an income in five years time, while it takes from twenty to twenty-five years for an olive tree to come into bearing.

#### Situation During 1923.

This district during 1923 had a very heavy carry-over of some 200,000 bales, most of which was held by the large proprietors. This is more than the average crop of the district, which merchants generally estimate at about 175,000 bales, excluding domestic consumption. The Bari crop of 1922 was the largest in 30 years, having amounted to 400,000 bales. 1/ About 90 per cent of the total was produced in the Province of Bari, and the remainder was distributed between Lettchia and Foggia. 2/ Conditions in Bari in 1923 were therefore very different from those existing a year before. In 1922 the 1921 crop was fairly well cleared up, and there was a prospect of a bumper crop. 3/ In 1923 a large part of the crop of 1922 still remained on hand, but the new crop was expected to be light although of good quality. In fact usually when the crop is large the nuts are rather small, but in years of low production, the nuts are ordinarily of much higher grade.

1/ Commercial estimate.

2/ Bari, Lettchia and Foggia are the provinces comprising the department of Apulia.

3/ With an average crop from an average tree, one should get from 10 to 45 pounds of shelled almonds according to the care taken of the tree.



### Market Situation.

Formerly the Bari market was largely governed by the American market. At present England, Holland and the Scandinavian countries are purchasing steadily in 10 or 20 bale lots, but the United States has been out of the market since the tariff was raised from 4 to 14 cents. It is not believed, however, that the tariff will keep American buyers permanently out of the market. It is estimated that just before the tariff went into effect American buyers took 50 or 60 thousand bales, and it is the general opinion that much of this stock is still on hand in New York. The Bari dealers state that until these almonds go into circulation there will be little hope of America coming into the market.

In the autumn of 1925 the large holders were keeping out of the market because of the prevailing stagnation. Small orders were picked up at random, but it was understood, that if large orders came from the United States in lots of from 100 to 1,000 bales, they must be filled by the large proprietors, and for that reason they were waiting and holding up the prices. The large proprietor, however, had still another reason for holding off; he was playing the exchange market with his almonds. Almonds are sold in the United States for dollars and in England for pounds sterling. The Lira was depreciating rapidly and so the longer the large proprietor held his crop the more lire he would get for it.

Competent judges looked for lower prices in spite of the fact that there was a light crop in 1925. America, they said, was well supplied and would not come in before the end of the year. By that time the small holders' crop would be on the market, and as the small holder

would have to sell for cash to meet current expenses, there would be plenty of almonds to fill all orders. With the diminished call for almonds from Europe the large estate holder could not afford to hold on longer as his almonds would be deteriorating and the stock on hand (larger in fact than a normal crop) was entirely too large to be carried indefinitely. Again, the exchange might become more stable, or might even rise, in which case it would be unprofitable to hold longer. All indications therefore pointed to lower almond prices. This was the view that existed at Bari. The carry-over of that section was of course, known elsewhere in Italy and in Spain. It was also known that a light crop was expected here and in other parts of the Italian mainland.

#### Local Marketing Methods.

The Bari producer sells his almonds unshelled either by volume or by weight according to local custom. If he sells by volume he sells by the tumilo, a measure of 50 quarts dry measure, while if he sells by weight, it is by the bale of 220 pounds. It is customary in this district when the almond season comes for certain brokers to go out and purchase almonds for cash as they are picked by farmers. These brokers take the almonds to their homes where their families and all their relatives begin shelling them. There are generally enough members in the broker's family to do all the work, but if extra women are required they are hired at about 18 cents per day. <sup>1/</sup> This wage was 19.3 cents <sup>2/</sup> before the War. The shelled almonds are bought up either by exporters or by speculators who come in between the shellers and the exporters. In no

<sup>1/</sup> Average rate of exchange for 1923; lira - 4.60 cents.

<sup>2/</sup> Exchange at par, lira - 19.30 cents.

cases do the exporters buy direct from the farmers, or do their own shelling.

Almost all the shelling is done by hand, as labor is cheap. Little or no electricity is available for machines, if they had them, although there are a few machines on the larger estates. Piece work in almond shelling has been introduced but without success. The women rushed the work and broke up so many of the nuts that in most cases the plan was been abandoned.

The almonds of the Bari district pass through 3 or 4 hands before reaching the consumers. There is first, the producer who usually sells to a speculator, who in turn sells to a dealer in the small market towns, centered throughout the district. This dealer is in constant communication with the large dealers of Bari, for whom he buys. The Bari dealer is generally an exporter, exporting to the large markets of France, England and the Scandinavian countries. In pre-war days, Russia, Germany and the Central Powers were important customers, but at the present time there is no inquiry from these countries. When the brokers purchase unshelled almonds, the expenses of shelling are generally double those of the producer who shells his own almonds. It is to the advantage of the broker therefore to purchase almonds that have already been shelled by the farmer rather than having them shelled at a greater cost later on. Almonds can always be purchased more cheaply from the farmer who cracks them than from the middle man who shellsthem himself.

### Grading

In order that a parcel of shelled almonds may be considered "fine" or "genuine", all irregular kernels are excluded, (these kernels are generally known as "twins"), and special care is taken that not many almonds are broken in the shelling process. The "fine" grade should be entirely free from "bitter" almonds. The parcel of almonds should consist of kernels with a fairly light skin, or with more or less deep golden yellow skins. A deep brown skin is a sign that the almond is one or more years old, or else the result of fermentation and heating which changes the taste of the almond. There should be no foreign matter of any sort in the parcel. In this district, poorly sorted almonds containing from 2 to 4 per cent of foreign matter, such as fragments of husk or shell and dirt are termed "vatica" and bring from 23 to 46 cents per bale <sup>1/</sup> less than "genuine" parcels.

The almonds of the Bari section are divided into 3 classes - "current", "fine" and "middling fine". This classification is for the home trade alone. If they are graded there are three grades - (1) "hand-picked", composed entirely of large kernels; (2) "First Bari" or "Prima", composed of sweet almonds of normal sizes, and including large almonds; (3) "current". There is generally a price difference of from \$ .92 to \$ 1.84 <sup>1/</sup> (per bale) between "hand-picked" and "Prima". A considerable effort has been made by the Bari Chamber of Commerce to institute grades and to arrange for the arbitration of all claims on parcels not coming up to standard. The efforts for improvement have not met with much success while the efforts for arbitration have been even a greater failure. Some <sup>1/</sup> Average rate of exchange for 1935; lira = 4.60 cents.



of the more reputable firms have expressed extreme dissatisfaction with the awards of the arbitration committees, and have refused to participate further in these arbitrations, maintaining that they were enabling dishonest dealers to palm off inferior packages on the foreign buyer, thus injuring their export trade.

#### Cost of Production.

During the season of 1922-23 there was no radical change either in the cost of land or the price of labor. In fact the tendency if any, was toward lower costs and lower land prices. The cost of producing almonds in the Bari district, however, gradually increased from the close of the war up to 1922. The laborers in the section received during 1923 about 21 cents a day <sup>1/</sup>, instead of 19.30 cents <sup>2/</sup> as in pre-war times. The women who are employed in breaking up and culling or grading almonds, receive about 18 cents <sup>1/</sup> a day. They work from 5 o'clock in the morning until 12 mid-day with frequent rests. No work is done in the afternoon or evenings. The breaking up and culling of almonds is often a family task done in the evenings by the farmer and his numerous family, of course under such conditions no real cost figures are available.

It is difficult to ascertain the value of land in the Bari district as the best land is not used for almonds and there are few sales. Orchards are handed down from father to son. Fairly good almond land could be obtained, however, for \$156 per acre <sup>2/</sup> before the war and for \$130 per acre <sup>1/</sup> during 1923.

- <sup>1/</sup> Average exchange for 1923; lira = 4.60 cents.  
<sup>2/</sup> Exchange at par; lira = 19.30 cents.

The following table gives the results of a study of the cost of producing almonds in Southern Italy as made by a leading almond concern in Bari, which is worthy of considerable confidence. The figures are based on a yield of 535 pounds of unshelled almonds per acre; this is the average yield for the last ten years. One hundred pounds of unshelled almonds make about 23 pounds of shelled nuts, 4.35 pounds of unshelled giving one pound shelled. Normally the almond crop is a biennial one, but serious damage is often caused by atmospheric conditions, (frost, mist, drought, etc.), so that the grower cannot expect a full yield more than every 3 or 4 years, and the crop is occasionally a failure. The average commercial value of an almond grove was about \$156.21<sup>1/</sup> per acre before the war; it is now about \$130<sup>2/</sup> per acre.

The average number of trees per acre is 60. The cost of planting an acre of almond trees was about \$14.06<sup>1/</sup> before the war; it is now about \$20.<sup>2/</sup> The average life of a tree is about 60 years. The expense of replacing dead trees is generally compensated by the sale of the timber. In Italian money the cost of almond growing has about quadrupled during the last ten years. This practically corresponds to the depreciation of the lira. The average cost cannot be established by summing up the costs of the last ten years and dividing by ten. As long as the lira remains at its present low level there is no substantial reduction to be expected in the cost, in lire, for labor, handling charge and other expenses. It therefore seems reasonable to take the figures of the last two or three years as giving a fair idea of the actual cost.

<sup>1/</sup> Exchange at par; lira = 19.30 cents.

<sup>2/</sup> Average rate of exchange for 1923; lira = 4.60 cents.

COST PER UNIT FOR LABOR AND FERTILIZER IN  
PRODUCING ALMONDS IN SOUTHERN ITALY.

Cost Item	Unit	Quantity: required	Rate per unit									
			1913	1914	1915	1916	1917	1918	1919	1920	1921	1922
			Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
Pruning	day	4.05	.328	.331	.270	.417	.549	.640	.941	.447	.600	.689
Tying faggots	day(women)	.81	.154	.156	.119	.170	.206	.210	.283	.125	.172	.190
Manure	ton	.60	1.177	.139	1.199	1.258	1.256	1.184	1.533	.707	.786	.888
Manure loading	day	.08	.387	.350	.325	.312	.550	.650	1.138	.450	.650	.725
day(boy)		.16	.138	.138	.119	.113	.206	.219	.256	.125	.306	.387
Manure carting	ton	.60	.451	.417	.325	.345	.419	.474	.663	.303	.524	.579
Manure spreading	day(women)	1.21	.136	.137	.118	.108	.207	.210	.252	.125	.138	.155
Plowing (animal and driver)	day	2.43	1.061	.877	.809	.973	1.098	1.105	1.380	.645	1.286	1.425
Hoeing	day	2.02	.348	.310	.287	.279	.482	.583	.881	.398	.601	.691
Gathering crop	day	1.21	.339	.251	.256	.289	.482	.613	.882	.407	.602	.686
day(women)		2.83	.116	.117	.101	.101	.206	.233	.314	.149	.258	.286
Transport to village	100 lbs.	5.35	.455	.407	.321	.357	.467	.053	.074	.032	.059	.065
Husking, drying, and warehousing	day	.40	.292	.218	.222	.250	.418	.530	.762	.352	.520	.578
ing	day(women)	2.43	.116	.117	.101	.100	.103	.116	.314	.148	.257	.285

Average annual exchange Value of lira \$0.193 \$0.195 \$0.169 \$0.155 \$0.137 \$0.116 \$0.126 \$0.05 \$0.043 \$0.048

See page 38 for Italian equivalents.

1/ "Day" indicates one day of man's work unless otherwise specified.

# COST PER ACRE OF PRODUCING ALMONDS IN SOUTHERN ITALY.

Cost Item	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922
	Dollars:	Dollars:	Dollars:	Dollars:	Dollars:	Dollars:	Dollars:	Dollars:	Dollars:	Dollars:
Pruning.....	1.328	1.342	1.092	1.639	2.223	2.590	3.811	1.809	2.430	2.789
Tying faggots.....	.125	.126	.095	.138	.167	.170	.229	.101	.139	.154
Manure.....	.703	.529	.716	.751	.750	.707	.915	.422	.459	.518
Manure loading.....	.053	.050	.045	.043	.077	.087	.132	.056	.101	.120
Manure carting.....	.269	.249	.194	.205	.250	.283	.396	.181	.313	.346
Manure spreading.....	.164	.166	.143	.131	.250	.254	.305	.151	.167	.188
Plowing (animal and driver) ..	2.578	2.131	1.965	2.365	2.667	2.685	3.354	1.568	3.126	3.463
Hoing.....	.703	.630	.580	.563	.973	1.178	1.779	.804	1.215	1.395
Gathering crop.....	.738	.635	.597	.635	1.166	1.401	1.956	.914	1.458	1.650
Transport to village.....	.244	.218	.172	.188	.250	.283	.396	.169	.313	.346
Husking, drying and warehousing	.398	.371	.335	.344	.417	.495	1.067	.503	.833	.923
Total direct cost.....	7.303	6.747	5.935	7.053	9.190	10.133	14.341	6.578	10.564	11.892
Rent or interest on capital ..	9.373	9.470	8.188	7.821	7.502	7.066	9.401	4.221	3.820	4.232
Land tax.....	1.877	1.971	1.825	1.710	1.895	1.669	1.967	.814	.838	1.715
Interest on working capital tools, insurance, and sundry expenses.....	1.460	1.349	1.167	1.411	1.838	2.024	2.862	1.336	2.113	2.379
Gross cost.....	20.013	19.527	17.135	17.995	20.425	20.894	28.571	13.049	17.385	20.218
Less timber and brushwood .....	.859	.858	.750	1.228	1.334	1.649	2.383	1.126	1.075	1.127
Total cost of pro- duction.....	19.154	18.669	16.385	16.869	19.091	19.245	26.183	11.923	16.309	19.025

For Exchange rates see page 24.

See page 69 for Italian equivalents.



# COST OF PRODUCING 100 POUNDS OF SHELLED ALMONDS IN SOUTHERN ITALY.

Cost Item	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922
	Dollars:	Dollars:	Dollars:	Dollars:	Dollars:	Dollars:	Dollars:	Dollars:	Dollars:	Dollars:
Cost of unshelled almonds ... (435 lbs.) <sup>1/</sup>	15.563:	15.171:	13.346:	13.709:	15.513:	16.960:	21.250:	9.691:	13.250:	15.459:
Cost of cracking, less value of shells .....	.2/	.2/	.2/	.2/	.405:	.600:	.805:	.390:	.552:	.609:
Cost of shelled almonds .....	15.563:	15.171:	13.346:	13.709:	15.918:	17.560:	22.055:	10.081:	13.802:	15.068:
Transport to exporting house.	.350:	.354:	.363:	.420:	.444:	.573:	.663:	.315:	.292:	.323:
Sorting, cleaning and preparing: for export .....	.344:	.345:	.299:	.353:	.395:	.436:	.570:	.277:	.266:	.299:
Cost of shelled almonds ready for export (not in- cluding grower's or export- er's profit) .....	16.257:	15.870:	14.028:	14.482:	16.811:	18.589:	23.308:	10.673:	14.360:	16.690:

For exchange rates see page 24.

See page 90 for Italian equivalents.

<sup>1/</sup> Based on yield of 534 pounds of unshelled almonds per acre and yield of 100 pounds of shelled almonds from 435 pounds unshelled.

<sup>2/</sup> No figures available; costs and returns assumed approximately equal.

# Cost of producing almond plants.

Professor Dr. G. Vincenzo, who is working in the Bari district and is an authority on the production of almonds, has estimated the following average cost of a seed-bed for almond trees of 120 square yards in area.

## Cost of an almond-seed bed.

Average exchange for 1921; lira = 4.29 cents.

Cost item.	Cost per 120 square yards. <u>1/</u>
	Dollars
Cost of preparing ground at opening of spring, hoeing to dept of 10 inches, and marking rows ..	.21
Cattle manure 220 pounds, ashes 110 pounds, mixing, carriage and spreading .....	.43
Selected almonds 1,600, for planting 10 inches apart in all directions, 14 quarts .....	.51
Selection of almonds, cracking shells, carriage and planting, 1 day .....	.21
After care, hoeing twice and other care until transplanting to nursery, 3 days .....	.64
Quota of general expenses, land tax and interest at 5% for 6 months on outlay .....	.06
Quota of annual interest at 5% on value of land, at about 340 dollars .....	.17
Total outlay at end of first year.	2.25

See page 91 for Italian equivalents.

1/ 100 square metres or 119.6 square yards.

From the almonds planted one may expect 90 per cent to grow. This gives 1,440 seedlings, at  $1\frac{1}{2}$  cents each.

When the nursery is planted from the seed-bed, one may count on the following outlay: -

First Year in Nursery.	
Average exchange for 1921; lira = 4.29 cents.	
Cost item	Cost per 600 square yards. $\frac{1}{2}$
	Dollars
1. Preparing 600 square yards of ground at opening of spring, hoeing to depth of 16 inches, 3 days .....	.64
2. Manure, 1,100 pounds at 5 cents per hundred, 550 pounds ashes at 20 cents per hundred; carriage, mixing and spreading .....	1.93
3. Digging up 1,440 seedlings, carriage, cleaning, and re-planting in nursery 24 inches apart, 4 days .....	.86
4. Care during year; hoeing 3 times, $2\frac{1}{2}$ days .....	.54
5. Stakes to support plants, 640 at 43 cents per hundred ..... <u>2/</u>	2.75
6. Carriage and preparing and placing of stakes, tying and material for tying, 3 days .....	.64
7. Quota of general expenses and land tax .....	.43
8. Interest at 5% for six months on above expenses .....	.19
9. Interest at 5% on value of land ....	.86
Total outlay for year .....	<u>8.84</u>
Previous year's outlay on seed-bed \$2.25 and interest at 5% .....	<u>2.36</u>
Cost of plants at end of first year in nursery .....	11.20

1/ 500 square meters or 593 square yards, (approximately one eighth acre).

2/ Stakes 10 feet long each of which makes 2 supports

Second Year in Nursery.

Cost item.	Cost per 600 square yards. 1/ Dollars
1. 3 days work on land; one at opening of spring; one during spring; one in summer .....	.64
2. Removing low lateral shoots from plants and arranging supports, 3 days .....	.64
3. General expenses as previous year.	.43
4. Interest at 5% for 6 months above expenses .....	.04
5. Interest on land value as previous year .....	.86
Total outlay for year .....	2.61
Outlay for previous year plus interest at 5% .....	11.77
Cost of plants at end of second year in nursery .....	14.38

Third Year in Nursery.

Cost item.	Cost per 600 square yards. Dollars.
1. Outlay as previous year .....	2.62
2. Outlay of previous years and interest at 5% .....	15.09
Cost of plants at end of third year in nursery .....	17.71

1/ 500 square meters or 598 square yards, (approximately one eighth acre).



Allowing for a loss of 5 per cent of the plants placed in the nursery the number of plants remaining at the end of the third year would be about 1,368; so that each plant in the nursery would cost about  $\frac{1}{2.14}$  cents. Figuring the cost of digging up in the nursery and preparing for transplanting to their final place in the orchard as \$1.07 - i.e., 5 days at 21 cents per day, would add a small fraction of a cent per tree.

Since trees of this age are sold by nursery men (taking them as they come, good and poor) at from 6 to 11 cents each the advantage to the almond grower of growing his own trees, especially in cases of large almond orchards, is obvious; also there is a profit to be derived from selling any surplus trees.

The following table gives the cost of planting the orchard after the trees are taken from the nursery:

Cost of Establishing an acre of Almond Orchard.

Average exchange for 1921; lira = 4.29 cents.

Cost item	Cost per acre
	Dollars.
1. Preparation of the ground for trees to be planted 23 feet apart, 80 holes	8.69
2. Trees, 80 at 3 years old ungrafted, taken from nursery	1.81
3. Carriage, preparing and planting of trees, 5 days work	.43
4. Fertilizing. $\frac{2}{1}$	5.64
5. Props, 80	1.74
6. General expense and land tax	2.08
7. Interest at 5% for 6 months on above expenses	.51
8. Interest at 5% on land value	6.95
Total cost for year	27.85
Net return on vegetables grown between almond rows	1.45
Net cost for year	26.40

See page 94 for Italian equivalents.

$\frac{1}{1}$  Average exchange for 1921; lira - 4.29 cents.

$\frac{2}{2}$  For each plant 44 pounds of slightly decomposed manure mixed with 22 pounds of ashes; at 5 cents per 100 pounds for manure and 20 cents per 100 pounds for ashes; plus carriage \$1.07: Conversions of necessity only approximate.

Budget of an Almond Orchard.

The following table is a budget of an acre of almond orchard, showing the different periods in the life of the orchard, (81 trees in orchard). It is customary in the Mediterranean region to divide the life or productive period of an almond orchard into several periods. Conversions to United States Currency at par, Lira = 19.30 cents.

Expenses. 1/

Item	Periods and Years				
	II.	III.	IV.	V.	VI.
	10th-15th	16th-25th	26th-55th	56th-65th	66th-70th
	Dollars	Dollars	Dollars	Dollars	Dollars
1. Hoeing the land:					
once to depth					
of 10 to 12					
inches and					
once to depth					
of 4 to 6 inch	2/				
7¼ days		7.03	7.03	7.03	2/
2. Manure, 55 lbs.					
and ashes 22					
lbs. per tree.					
Spreading in-					
cluded .....	2/	15.62	15.62	15.62	2/
3. Pruning, 7 2/10					
days .....	7.03	9.37	9.37	9.37	9.37
4. Harvesting, and					
shelling almonds					
and sundry ex-					
penses until sale					
17 cents per					
bushel. 3/...	3.91	5.86	9.37	5.86	3.91
5. Land tax and					
general ex-					
penses. 4/..	6.25	7.03	7.03	7.03	6.25
6. Administrative					
expenses, 5%					
on value of al-					
monds in shell:	4.69	7.03	9.37	7.03	4.69
7. Annual quota of:					
planting ex-					
penses. 5/..	2.03	2.03	2.03	2.03	2.03
8. Interest on					
original value:					
of land about					
\$624.80 .....	31.24	31.24	31.24	31.24	31.24
9. Interest at					
5% on annual					
expenditure					
on No. 1 above					
for 6 months ..	.55	1.30	1.51	1.30	.60
Total expenses	55.70	86.51	92.57	86.51	58.09

Returns.

Item	Periods and Years					
	II. 11th-15th	III. 16th-25th	IV. 26th-55th	V. 56th-65th	VI. 66th-70th	
	Dollars	Dollars	Dollars	Dollars	Dollars	
1. Wood from 6/ pruning 162 fagots ....	7.81	8.98	8.98	8.98	8.98	
2. Husks, 23 pounds per bushel of almonds at 26 1/3 cents: per pound .	1.41	2.11	2.81	2.11	1.41	
3. Almonds in shell 23 bu. at \$4.08 per bu. 7/	93.73	140.59	187.45	140.59	93.73	
Total returns:	102.95	151.68	199.24	151.68	104.12	
Profit per year	47.25	65.17	106.67	65.17	46.03	

See page 95 for Italian equivalents.

- 1/ The first period from the first through the ninth year has been omitted as receipts practically balanced expenditures and the trees benefited by the fertilizing.
- 2/ Receipts balanced expenditures. See note a
- 3/ Almonds in the shell bring on an average of \$4.08 per bushel.
- 4/ General expenses increase with increased production.
- 5/ Not included under general expense.
- 6/ After the second period the wood from pruning increases about 15 per cent.
- 7/ Average yields for second, third, fourth, fifth and sixth periods taken as 734, 1102, 1470, 1102 and 734 pounds respectively.

### Average net Returns for 70 Years.

It will be seen from the foregoing figures that the average net returns for each of the 70 years amounts to \$72 and for the 60 years of active production, i. e. from the 10th to the 70th year amounts to an average of \$84 per annum.

Where vegetables are cultivated in the almond orchard during the third and fifth periods, also, thus covering the cost of work on the land and of fertilization as shown in respect of the second and sixth periods, the annual income is increased by the saving of those charges, and, even allowing for a smaller output of almonds, the net income is always higher.

Where almond trees and vines are grown together, dividing between them the cost of work done in proportion to the ground occupied by each, the expense of almond growing is noticeably diminished; so that even with lesser crops than those mentioned, these trees always make a good annual income.

The table below gives cost and returns for an almond orchard by Dr. G. Vincenzo a recognized authority on almond production.

#### Annual operating cost and returns of an Almond tree.

Exchange at par: lira - 19.3 cents

Item	Period of development.					
	1st	2nd	3rd	4th	5th	6th
	:Dollars:Dollars:Dollars:Dollars:Dollars:Dollars					
Cost of hoeing, pruning	:	:	:	:	:	:
and grafting .....	: .10:	:	:	:	:	:
Cost of gathering and	:	:	:	:	:	:
shelling almonds ....	: .10 :	: .40 :	: .50 :	: .40 :	: .10 :	:
Returns from vegetables	: .80:	: .80 :	: .80 :	: .80 :	: .80 :	: .80
Returns from almonds ..	: .91 :	: 3.50 :	: 4.57 :	: 3.57 :	: .91 :	:
Net returns .....	: .70:	: 1.61 :	: 3.90 :	: 4.87 :	: 3.90 :	: 1.61



In 1920 Dr. L. Vivarelli and Dr. M. Marchio made the following estimate of the cost of starting an almond orchard in the Bari district.

Cost of Establishing an Acre of Almond Orchard.

"Almond orchards cultivated on the Bari system require very little work for setting them up; hence the expenses are not heavy both on account of the preparation of the ground and of the distance allowed between the trees. One does not plow up the whole ground, but holes are dug in rows 25 to 50 feet apart, according to the fertility of the soil, so that the vegetables planted with the trees may grow properly. The distance between the holes is the same as the distance between the rows."

"Great economy is insured by forming a small seed-bed and nursery in one's own orchard. In a seed-bed of 119.6 square yards one can grow from 1200 to 1300 seedlings at a cost of little more than .002 of a cent. Upon transplanting these into the nursery, at three years old, (allowing for a loss of 10%), and taking into account the cost of transplanting, each plant will cost about .012 cents. Since such plants cost around .020 cents apiece the advantage of growing one's own is obvious, especially in the case of large orchards." 1/

"Taking this for granted, I give the expenses incurred in establishing one acre of almond orchard on fairly level ground of average lightness. 2/

The periods into which the life of an almond grove is divided by Dr. Vivarelli and Dr. Marchio are as follows:

- 1st period. 5 years from the final planting of the trees until the grafts are established.
- 2nd period. From the sixth through the fifteenth year increasing yield (average 3 pounds of shelled almonds per acre.)
- 3rd period. From the sixteenth through the twenty-fifth year increasing yield (average 125 pounds of shelled almonds per acre.)
- 4th period. From the twenty-sixth through the fiftieth year increasing yield (average 156 pounds of shelled almonds per year.)
- 5th period. From the fiftieth through the sixtieth year, decreasing yields (average 125 pounds of shelled almonds per acre.)
- 6th period. From the sixty-first through the seventieth year, very low yields, (average 31 pounds of shelled almonds per acre.)

1/ Average exchange for 1920, lira - 4.97 cents.

2/ The figures given are for 1920. Anyone wishing to estimate the cost of planting at a later date must bring the cost of the various items which fluctuate considerably up to date.



Cost of establishing an almond orchard.

Conversions at average exchange for 1920: lira - 4.97 cents.

Cost item	Cost per acre Dollars.
1. Preparing the ground for trees, 28 holes ....	3.52
2. 28 trees <u>1/</u> .....	1.13
3. Carriage and planting of trees, two days ....	.25
4. Fertilizer and carriage .....	2.11
5. Supports for trees .....	.35
6. General expenses and land tax .....	1.61
7. Interest at 5% for 6 months on anticipated outlay .....	.20
8. Interest at 5% on land value .....	2.01
Total outlay, first year .....	11.18
Loss returns for vegetables grown between almond trees .....	.80
Net outlay for first year .....	10.38

See page 96 for Italian equivalents.

- 1/ Trees not set with entire regularity, but the usual distance between them about  $7\frac{1}{2}$  feet. Both 43 feet and 28 trees per acre are made up of averages and estimates. As they disagreed somewhat the latter is here used.

Sicilian Almond Industry.

The second important almond district of Italy is the Island of Sicily. Almond trees are scattered almost all over the Island, although they are principally found about Catania and Messina on the East Coastal plain and about the cities of Palma and Girgenti in the South. The crop of Sicily normally runs from 125,000 to 150,000 bales. Of this quantity from 20,000 to 25,000 bales normally consist of "Avolas" which are the finest grade. The "Etnas" average around 60,000 bales, the balance consisting of "Palma-Girgentis". The crop in 1923 was not large being estimated at about two-thirds of normal. Before harvest, about 12,000 to 15,000 bales were expected to be "Avolas".

Cost of Production.

The situation in Sicily, as in the Bari district, has experienced but slight change since 1922, though there is a tendency for wages to decrease, and for affairs to settle more closely to the pre-war level. It is generally estimated that everything in Sicily is about four times as expensive as it was before the war, and that pre-war costs multiplied by four will give the present-day costs in Italian currency.

In considering farm labor and the labor required for shelling and handling almonds, different conditions are found in the various sections. In the region about Messina farm wages are about twice as high as they are in the neighborhood of Palma and Girgenti. The reason is that since the destruction of the city of Messina in 1908 there has been a large demand for unskilled labor to clear away and rebuild. In the time of maximum reconstruction wages went as high as \$4.83 <sup>1/</sup> per day, and the building is not yet completed. At the present time highly skilled farm 1/ Exchange at par; lire - 19.5 cents.

labor is bringing from 69 to 92 cents a day, while rough farm labor is bringing from 32 to 46 cents. Women obtain from 23 to 32 cents, and children from 14 to 18 cents. 1/

In other parts of the country, wages are not so high. Farm laborers in and about Catania are receiving from 37 to 46 cents for the poorer class of labor, and 55 to 78 cents for the better class. Women are receiving 18 to 28 cents a day. Out in the country in the Palma-Girgenti region there is plenty of farm labor to be had of all sorts from 23 to 46 cents a day, women receiving from 14 to 23 cents, and children 14 cents. 1/

#### Land Ownership.

The land in Sicily is held in several ways. Along the eastern coastal plain from Syracuse north almost to Palermo, the land is held in small holdings, the farmers in Syracuse district owning from 500 to 1000 trees, and those in the Catania and other Northern districts having from 300 to 600 each. The trees are planted about 12 feet apart in the Northern section, and from 19 to 29 feet<sup>apart</sup> in the Southern section. These farmers are usually owners of the land which they cultivate. In the interior there are the larger estates, many of which are principally devoted to grain. The typical small farmer in the interior is a tenant farmer, though many have their own small holdings.

#### Methods of Marketing.

Almonds are sold in various ways in Sicily. There is an enormous amount of speculation. This starts in October and November before the crop is harvested, and the opening of the next harvest season finds many of

1/ Exchange at par; lira = 19.30 cents.

the speculators still with contracts on which they must deliver. This forces the speculator to go to the farmer and purchase on whatever terms he can arrange. The speculators in turn must sell their stocks to the exporters in order to get the cash required to pay for the new almonds which they must have for delivery.

As in other places, the almonds are usually bought unshelled. In Catania and Messina there is some machinery for cracking and for rough grading. The almonds are first sized through a sieve, and then graded by hand on tables and bands. The defective nuts are rigorously excluded in the "Avolas" grade. After grading, the nuts are stocked in 220 pound bales and sold through the ports of Catania, Messina and Palermo. In general the Sicilian groves are well kept. The farmers have been decidedly prosperous since the war, and are now financing themselves entirely, while in pre-war times almost all of them were borrowing money.

#### Maintaining Prices.

Notwithstanding the heavy carry-over of some 80,000 bales from the 1922 crop and the common knowledge of the heavy carry-over in Italy, the Sicilian producers have attempted to keep up prices. During the summer months of 1923 they were buying contracts calling for delivery of almonds from the new crop at higher prices than those prevailing the previous year. Producers and speculators have not yet determined the effect that the American tariff will have on Sicilian almonds. The very heavy purchase of them by American importers just before the tariff was imposed leads local dealers to believe that America will come into the market as soon as these

supplies have been utilized. Unlike the Bari dealers the Sicilians looked for a high market in rough almonds for the season of 1923-24.

### Pre-war cost of Production.

The following is an estimate of pre-war costs for producing almonds in the Syracuse district made by Professor de Mattei, who is in charge of the Italian Ministry of Agriculture in that district. An estimate of the cost of producing almonds in Sicily at the present time is also given. This estimate was prepared by the Cattedra Ambulante 1/ of Catania.

### THE CULTIVATION OF ALMONDS IN THE COMMUNE OF SYRACUSE.

by Dr. V. di Mattei

#### Cost of cultivating one acre of Almond Orchard.

"To complete the study of the cultivation of almonds in this district, I give the cost of cultivating one acre of almonds under the owner's direct management and without the use of fertilizer. The figures are based on local prices."

#### Work on the Land.

Exchange at par; lira = 19.50 cents.

Item	Cost per acre. Dollars.
1. Plowing during December, 1.21 days .....	1.17
2. Plowing during January, 1.21 days .....	1.17
3. Plowing during February, 1.21 days .....	1.17
4. Plowing during April, 1.21 days .....	1.17
Total .....	4.68

See page 97 for Italian equivalents.

1/ The Catania office of the Ministry of Agriculture.



### Fertilization

Almond trees are not usually fertilized.

### Harvesting

"It is estimated that each 100 pounds of almonds costs 23 cents for knocking them off the trees, collecting and shelling."

"Taking the average production of our almond orchards in different parts of the district, and with due regard also, to good and poor harvests, I conclude that 1 acre of almond orchard produces about 1,023 pounds of almonds. This costs (shelling included) \$2.34" 1/.

### Pruning

"If the orchard is well pruned every year, one man can prune from 20 to 25 trees per day. Where the trees are planted with an interval of 19 feet between them (which is considered the most suitable distance) there would be 112 trees planted in squares and 123 trees planted in quincunx. The cost of pruning 123 trees, given that the man prunes 25 trees per day, would take 4.85 days at a cost of \$1.87" 1/.

### Cost and receipts of an almond orchard in Sicily.

Item	Expenses <u>1/</u>	: Cost per acre
		: Dollars
Work on land .....	:	4.69
Harvesting and shelling .....	:	2.34
Pruning .....	:	1.87
Total .....	:	8.90
Interest on this outlay at 5% .....	:	.45
Total .....	:	9.35

### Receipts

	:	
11.52 quintals of almonds .....	:	37.49
48 kg. of ashes of almond husks ....	:	.30
Twigs from pruning .....	:	.62
Total returns .....	:	38.41
Expenses .....	:	9.35
Profit .....	:	29.06

"The profit on one acre of almond orchard is thus seen to amount to \$29.06 per annum, charged with the land tax."

See page 92 for Italian equivalents.

1/ Exchange at par; lira = 19.30 cents.

# Budget of an Almond Orchard.

Almond growing by Dr. V. di Mattei.

Below is a budget of one acre of almond orchard situated in the district of Syracuse, held under direct supervision of the owner.

The life of an almond orchard is divided into three periods as follows:

1. Period of growth: From planting to the 16th year.
2. Stationary period: From 16th to 41st year.
3. Period of decline: From 41st year onward.

## Budget of an acre of almond orchard in Sicily.

Exchange at par; lira = 19.30 cents

Item of cost or returns	Years					
	1st	2nd	3rd	4th	5th	6th
	year	year	year	year	year	year
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
ST:						
Brought forward .....		24.72	34.47	43.30	55.42	68.15
Preparing ground .....	.23					
Digging 83 holes for trees, <u>1</u> / .....	4.00					
Fertilizer, manure <u>2</u> / ..	3.84			2.22	2.22	2.22
Spreading fertilizer ...	.39					
Trees, 2 years old, 83 ..	6.41					
Props to support trees <u>3</u> /	1.12					
Planting .....	.94					
Plowing, 1.21 days .....	3.51	3.51	3.51	3.51	3.51	3.51
Pruning .....				.62	.62	.62
Grafting .....		1.41				
Loss of trees <u>4</u> / .....	3.91	3.90	3.91	3.91	3.91	3.91
General expenses and land tax .....	2.97	2.97	2.97	2.97	2.97	2.97
Interest <u>5</u> / .....	.68	1.24	1.72	2.17	2.77	3.41
Cost for year .....	28.00	13.03	12.11	15.40	16.00	16.64
Total cost .....	28.00	37.75	46.58	58.70	71.43	84.79
TURN:						
Vegetables .....	3.28	3.28	3.28	3.28	3.28	3.28
Almonds .....						2.42
Wood from pruning .....						
Total returns .....	3.28	3.28	3.28	3.28	3.28	5.70
Excess of cost over returns .....	24.72	34.37	43.30	55.42	68.15	79.09
Cost of almond production <u>6</u> / .....	24.72	8.75	8.83	12.12	12.73	10.94
Cost per pound <u>7</u> / ....						.22



Budget of an acre of almond orchard in Sicily. Cont'd.

Items of cost or returns	Years		
	13th	14th	15th
	year	year	year
	Dollars	Dollars	Dollars
<b>COST:</b>			
Brought forward .....	48.63	36.38	18.32
Fertilizer, manure .....	2.22	2.22	2.22
Plowing .....	3.51	3.51	3.51
Pruning .....	.62	.62	.62
Loss of trees .....	3.91	3.91	3.91
General expenses and land tax ...	2.97	2.97	2.97
Interest .....	2.43	1.82	.92
Cost for year .....	15.66	15.05	14.15
Total cost .....	64.20	51.43	32.47
<b>RETURNS:</b>			
Vegetables .....			
Almonds .....	26.36	31.63	45.69
Wood from pruning .....	1.56	1.48	1.41
Total returns .....	27.92	33.11	47.10
Excess of cost over returns ..	36.38	18.32	14.63
Cost of almond production ....	14.10	13.57	12.74
Cost per pound .....	.02	.009	.005

See page 69 for Italian equivalents.

- 1/ Each hole 40 inches square and 40 inches deep.
- 2/ Three hundred and thirty pounds of manure the first year, none the second and third years, thereafter one half the trees fertilized each year.
- 3/ Chestnut wood stakes to which the trees are tied.
- 4/ Rough estimate.
- 5/ First year, 5 per cent for six months on year's outlay, for later years 5 per cent on outlay of previous years.

Foot notes continued:

- 6/ Cost for year less returns from vegetables and wood.  
Method of figuring cost favored by the Cost of Production Division, Bureau of Agricultural Economics considers the orchard established by the end of the sixth year, the cumulated cost up to that time being the basis for all later interest charges. The difference in this case is theoretical, not changing cost per pound expressed in even cents.
- 7/ Based on yield of 625 pounds per acre for sixth year, 312 pounds for seventh year, 312 pounds for eighth year, 383 pounds for ninth, 513 pounds for tenth, 714 pounds for eleventh, 625 pounds for twelfth, 669 pounds for thirteenth, 803 for fourteenth, and 1,160 for fifteenth.
- 8/ Excess of returns over cost.

Let us now inquire into the profit on the second or stationary period; from the 16th to the 40th year.

Budget of one acre of almond orchard, sixteenth to fortieth year.

Exchange at par; lira = 19.30 cents.

Item	Per acre
	Dollars
<b>COST:</b>	
Pruning, 7 3/10 days .....	2.89
Fertilizing one third of orchard per year ....	5.47
Plowing, 1.21 days .....	3.51
Gathering, husking and drying almonds .....	4.53
General expense and land tax .....	2.97
Interest at 5% for six months on advanced capital .....	.56
Total cost .....	19.93
<b>RETURNS:</b>	
Almonds in shell, 950 pounds .....	36.65
Wood from pruning .....	2.34
Ashes from husks .....	.78
Total returns .....	39.77
Profit .....	19.84

See page 101 for Italian equivalents.



Post-war cost of Production.

The following table is an estimate of post-war cost made by the Catania office of the Italian Ministry of Agriculture. It is based on 63 trees to the acre. A hole 40 inches square and 40 inches deep is dug for each tree and 66 pounds of manure put into the hole which is then refilled. Almond seeds are then planted in their permanent positions.

Management and overseeing expense as shown before the eleventh year is 5 per cent of the items which precede it; in later years it is 5 per cent of gross produce. Unforeseen expense is given as 5 per cent of the items preceeding it. For computation of interest on advances, expenses are considered as advanced on an average of ten months for the first year as the greatest expense comes in the spring; after the first year interest is allowed for six months.

The daily wage rates applied, converted at the average rate at New York for July 1923, are 43.3 cents with the following exceptions, digging holes, 51.9 cents; grafting and pruning (second year's pruning excepted) 69.2 cents; and harvesting 34.6 cents for men and 21.6 for women.

In completion of this study of post-war costs, the cost of demolishing an orchard is given as \$43.52 from which is deducted \$5.54, the cost of pruning and hoeing which need not be done the last year. The labor required for this is 25.4 days per acre.

Annual income from an Almond Orchard.

Eighth, ninth and tenth years

Conversions at average rate for 1920, lira; 4.97 cents.

Item	:	Income
	:	per
	:	acre
	:	Dollars
Almonds, 9/10 quart, per tree, 57 quarts ...	:	4.78
Fagots from pruning; one fagot from 20 trees	:	.21
Total annual income .....	:	4.99

Eleventh to sixteenth years.

	:	
Almonds 36 quarts per tree, 1,288 quarts ...	:	19.12
Fagots from pruning, one fagot from 16 trees	:	.26
Total annual income .....	:	19.38

See page 104 for Italian equivalents.

# Post-war cost of almond production in Sicily.

Average exchange for 1923; lira - 4.60 cents.  
Cost Per Acre.

Cost Item.	Periods.									
	1st year	2nd year	3rd year	4th year	5th year	6th-7th year	8th-10th year	11th-15th year	16th-20th year	21st- 40th yr
Digging holes for trees	17.41									
Fertilizing	4.35				1.09	1.09	1.09	1.09	1.27	1.45
Carriage and spreading of fertilizer	.74				.37	.37	.37	.37	.45	.56
Filling holes	1.30									
Seed almonds	.09									
Planting and marking	.19									
Props to support plants		.11								
Grafting				1.23	.10					
Hoeing, first time	1/	.26	2/	.37	.26	2.60	2.60	2.60	2.60	2.60
Pruning, gathering										
tying and carrying										
of fascots				.19						
Gathering, shelling					.30	.30	.89	1.36	2.34	3.31
and spreading										
almonds to dry										
Hoeing, second time		.26	.26	.37	.28	2.23	2.23	1.19	1.71	2.57
General expenses	.22	.22	.22	.22	.22	.22	.22	.22	.28	.28
Taxes	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30
Manurement and overseeing	1.30	.11	.12	.17	.20	.41	.47	1.03	2.30	4.59
Unforeseen expenses	1.36	.12	.12	.13	.21	.47	.49	.57	.72	.95
Interest on advanced expenses	1.45	.06	.06	.11	.15	.27	.31	.35	.48	.59
Total annual cost	29.97	2.30	2.66	5.23	4.48	9.22	10.57	12.34	15.69	20.43
										17.41

1/ Given as "summer hoeing."

2/ Includes setting props and tying up trees.

3/ Includes adjusting props.

Includes unttying grafts.

# Post-war cost of almond production in Sicily.

Labor requirements per acre.

Item	Periods											
	1st year Days	2nd year Days	3rd year Days	4th year Days	5th year Days	6th-7th year Days	8th-10th years Days	11-15th years Days	16-20th years Days	21-40th years Days	41-50th years Days	
Digging holes for trees	31.27				.51	.51	.51	.51	1.01	1.21	1.21	
Fertilizing	1.65											
Filling holes	2.83											
Planting almonds and marking	.40											
Grafting		1/	.81	2/	1.62	5.67	5.67	5.67	5.67	5.67	5.67	
Hoeing, first time				.51	.61	.40	1.21	1.62	2.43	3.24	3.24	
Pruning				.40	.40	4.86	4.86	4.86	4.86	4.86	4.86	
Hoeing, second time	4/	.61	.61	.61	.61							
Gathering, shelling and spreading almonds to dry:												
Women							1.62	3.24	4.55	7.23	5.66	
Men							.61	1.21	1.62	2.43	2.02	
Gathering, tying and carrying fagots								.40	1.21	2.02	2.02	

See page 102 for Italian equivalents.

- 1/ Includes setting props and tying trees.
- 2/ Includes adjusting props.
- 3/ Includes gathering, tying and carrying of fagots.
- 4/ Given as "summer hoeing".
- 5/ Includes untying of grafts.

## SPANISH ALMOND INDUSTRY.

### The Balearic Islands

The Balearic Islands are situated in the Mediterranean off the East Coast of Spain, opposite Valencia. Along the North Coast of these Islands extends a high mountain range, on the south slope of which almonds are raised in large quantities. They are also raised in the mountain valleys and along the Southern Coast of the Islands. The almonds are of rough grinding type, and are especially notable because of the absence of bitter almonds. The general range of Balearic production runs from 20,000 to 50,000 standard bales.

#### Varieties of Balearic Almonds.

Soft shelled almonds are raised in the islands of Majorca and Iviza as well as on the mainland about Tarragona and Reus. The crop is less hardy than other almonds and crop failures are frequent. The shells are bleached and the nuts are sold ungraded, usually through Valencia or Barcelona in bales of 110 pounds each, one half of the standard bale.

The Majorcan production of this class, known as the Mollarettas, amounts to from 8,000 to 10,000 bales of 220 pounds annually. The Isle of Iviza produces from 12,000 to 15,000 bales, while the Tarragona production will run from 40,000 to 50,000. The Tarragonas are exported to the United States, Great Britain and the continent of Europe. Their present price is about \$7.95 per bale of 110 pounds.<sup>1/</sup> The larger part of the Mollarettas and Ivizas go to France and at a price from  $7\frac{1}{2}$  to 12 per cent below the Tarragonas.

In Majorca the largest island of the Balearic group, almonds

<sup>1/</sup> Average exchange for 1923; peseta = 14.45 cents.



constitute the cash crop, and many varieties are grown. Dr. Pedro Estellrich a well known authority on almonds, divides them into the following four classes:

1. Soft-shelled - these shells can be broken with the fingers.

The smooth-shelled are called "Princessa", "Infanta", "Mollar Blanda", "Capseta", "Mollar de Canal", etc. The rough-shelled are called "Pico de Cueva", "Mollar Fina", etc.

2. Semi soft-shelled - these can be broken by a greater effort with the fingers.

The smooth-shelled are called "Real Caragola", "Fita Mollar", "Mollar Trincheta", etc. The rough-shelled "Mollar Blanca", "Mollar Pintada", etc.

3. Semi-hard - a hammer is needed to break these shells, which on being struck, break in halves.

The smooth-shelled are called "Verderetó", "Fanereta", "Poteta", "Dueta", "Blanqueta", and "Rutilona". The rough-shelled are called "Pinyol de Pressech", "Pintada", "Boscona", "Saborosa", "D'en Camet", etc.

4. Hard-shelled - these have hard, brittle shells, and require hard blows with the hammer to break the shells which fly into splinters -

The smooth-shelled are called "D'en Pou", "D'en Horrach", "De Lengana", "D'en Pons", "De la Canal y Firella". The rough-shelled are called "Mare de Deu", "Rimada Larga", "Pelada", "Larguera", "Pintada", etc.

#### Marketing of the Balearic Crop.

The crop of Majorca for 1923 was very large. The production was estimated by commercial houses at 50,000 bales, which constitutes a record as the production for good years is placed at only 40,000 bales.

The Chamber of Commerce at Palma, the chief port of Majorca, states that for the season of 1920-1921 there were exported from that port 85,400 pounds of almonds in the shell and 9,473,000 pounds of shelled almonds.

The Balearic peasants are considerably more prosperous than those of Italy or of the Spanish Mainland, and the habit of holding over almonds from year to year is common. As a matter of fact farmers in this region have been known to hold over their crops as long as three years. The nuts are put away when cured and are shelled during the year as the necessity for cash arises. The farmers of these islands are thus enabled to hold their almonds for a better price than that accepted by the less provident growers on the mainland. For that reason the almond crop of Majorca and of the entire Balearic group of Islands comes into the market at all times of the year and not, as in other localities, immediately after harvesting. This makes the local market a very steady one, not easily influenced by sudden drops in price.

The market in the Balearic Islands is controlled from Palma in Majorca and from Valencia and Reus. The dealers from these towns purchase from the brokers in the various villages of the Islands, who in turn purchase from small speculators, or from the farmers direct. The brokers are allowed a brokerage of 59 cents per bale. <sup>1/</sup> The almonds are forwarded for shipment either from Valencia or Barcelona as no ocean-going ships touch at the Islands themselves. The larger part of the crop goes to England and America to be used by confectioners.

The Majorca farmer has a very good idea of market prices. He knows what his neighbor gets for his almonds, and will not sell below that price. He is more or less informed as to the ruling prices in Sicily and Bari, and ultimately the Majorcan market is controlled by the prices obtained for grinding almonds in Italy and Sicily. Often the Majorcans refuse to meet a drop in the Cantania or Bari markets and remain out of the market until prices recover to their satisfaction. The Majorcan prices in Spanish

<sup>1/</sup> Exchange at par; peseta = 19.30 cents.

currency have shown but slightly the effect of the American tariff because drops in the exchange value of the lira since the tariff came into effect have more or less offset the decrease in price due to the tariff.

#### Increase in Agricultural Wages.

In the Balearic Islands as elsewhere, there has been a gradual increase in wages. The population is almost entirely engaged in agriculture. Wages on the farm are 58 to 72 cents a day <sup>1/</sup> for ordinary labor, compared with 39 to 58 cents <sup>2/</sup> before the war. They have advanced to about \$1.00 <sup>1/</sup> for higher classes of labor. The labor engaged in cracking and rough-sorting of almonds is paid at a rate of 72 cents a day for men, and 43 cents <sup>1/</sup> for women.

#### Cost and Land Value.

It was not possible to obtain specific statistics on production costs for the Balearic drop, but while practically no scientific work has been done in those islands, the costs in general are not higher there than in Italy.

Good almond land varies in value from \$234 to \$351 <sup>1/</sup> per acre for orchards in full production. The trees on such land are planted from 16 to 24 feet apart and yield on the average about 18 quarts of unshelled nuts per tree. Almond culture apparently is a relatively profitable use of the land and the area devoted to the industry is slowly increasing. Though no increase in planting is expected for 1923 as there is considerable uncertainty regarding the effect of the American Tariff, it is believed that Russia and Germany will soon be taking a substantial part of the production offsetting possible losses in the American market.

<sup>1/</sup> Average exchange for 1923; peseta = 14.45 cents/  
<sup>2/</sup> Exchange at par; peseta = 19.30 cents.

Coming to the Spanish Mainland we find almond production scattered all along the eastern coastal plain from Barcelona to Gibraltar. The main producing centers are those about Reus and Tarragona, Valencia, Alicante and Malaga.

#### Tarragona and Reus.

The production for export of the Tarragona district in good years is in the neighborhood of 30,000 bales. It was estimated that there would be a large crop in 1923, and that the carry-over from the 1922 crop was about 15 per cent. The Tarragona crop is handled principally through Valencia and Reus, where the important almond exporting houses are located.

The almonds in this country are of the rougher type, somewhat similar to the Majorcan almonds, though in addition there are finer grades known as "Esperanzas" and "Marconas". The latter are similar to the French almonds, and there is a considerable trade between the Tarragona and Reus, and the Marseilles and Aix markets.

#### Agricultural Wages.

The Tarragona district suffers somewhat from the fact that it is close to Barcelona, the chief manufacturing center of Spain where there usually is a good demand for labor. This, of course, raises farm wages and we find that farm hands in the vicinity receive \$1.01 and even \$1.45 per day. <sup>1/</sup> Female labor, which is employed on shelling and grading, is paid about 51 cents a day. <sup>1/</sup> In Spanish currency the wages are about double those before the war, but in United States currency the pre-war wage would have been from .68 to .96 and .74 for female labor. <sup>2/</sup>

<sup>1/</sup> Average exchange for 1923; peseta = 14.45 cents.

<sup>2/</sup> Exchange at par; peseta = 19.30 cents.



### Land Utilization.

There are two types of land in the district: The low coastal plains and the sheltered hillsides and valleys lying back some twenty miles from the ocean. The lowland plains, which are excellently irrigated, are now devoted to oranges, lemons and rice, and the planting of almonds is on the decrease there as the land is too valuable. There is some increase in planting back in the hills, where the trees are sheltered from the cold winds and frosts of the coastal plains. Fertilizer is little used in the almond groves but is used extensively in the citrus groves. In regular planting the number of trees per acre averages from 53 to 61; where the planting is irregular as on the mountain sides and where the land is terraced the number is considerably less. The yield of a tree in full bearing of course varies, but a general average may be accepted as ranging from 13 to 15 pounds per tree, or from 4 to 6 pounds less than the Balearic production.

Complete crop failure is never experienced in this district though sometimes a crop decreases to 20 or 30 percent of normal. These partial failures occur on the average every six years.

### Local Marketing Methods.

The almond producers in this country sell their almonds through the small town merchants or dealers, who in turn sell to the local headquarters of the exporters of Reus and Valencia. Valencia is really the principal market, quotations being forwarded from Valencia to the small country markets. The producers here are not very provident, and the crop comes on the market almost as soon as it is ready.



The shelling of the nuts is done on the farms. Although some machinery is used both in Tarragona and Reus, it is used chiefly for the rougher quality of nuts. It is generally considered that the present machinery breaks too many nuts to render its use advisable on the finer grades.

The carry-over from the 1922 crop is estimated at from 7,000 to 10,000 bales. This carry-over is in some cases in the hands of speculators, but there is a considerable amount in the hands of dealers throughout the district. There is here, and in fact throughout all of Spain, some tendency to do away with the middleman between the grower and exporter, and this is particularly true in the southern markets.

#### Alicante.

The next important Spanish almond district is about Alicante which lies to the south of the Tarragona and Reus region. The majority of the almonds are produced along or near the coast and are of very high quality.

Production for export normally is about 20,000 bales. 1/ The 1922 crop was in the neighborhood of 23,000 to 25,000 bales and that of 1923 promised to be as large. Situated so far south where it does not have heavy frosts, the district seldom has a complete crop failure. Fertilizers are used only on the better plantations, and there not extensively.

#### Wages and Land Value.

As the orchards are further removed from the centers of population the almond costs in this district are considerably lower than about Tarragona and Reus. Skilled farm labor is paid 72 cents to 87 cents a day, 2/ without perquisites such as room and food. Ordinary labor is paid

1/ Prices in this district are usually quoted in boxes of 28 pounds each.

2/ Average exchange for 1923; peseta = 14.45 cents.

from 43 cents to 58 cents a day. Where food is provided (consisting principally of bread, olive oil and occasionally a little meat and fruit) a rate of 29 cents a day is paid. Women employed as shellers and graders receive from 29 to 43 cents according to their skill. Children are paid 14 cents a day. <sup>1/</sup>

Farm land in the neighborhood is valued from \$58 to \$75 <sup>1/</sup> per acre according to its situation, fertility and accessibility to Alicante or Mercia. The holdings are usually small, 2.5 to 5 acres being the usual farm of a small grower.

The trees are variously planted. A few in the mountains are terraced wherever sufficient soil is available. On the level land if the soil is dry and can take care of only the almonds, they are planted about 23 feet apart, but if there is sufficient water to raise grain or vegetables between the trees, they are planted 35 to 45 feet apart and other crops are cultivated between them. Average production for a good tree runs from 6 to 11 pounds.

#### Local Marketing Methods.

In this country the producer sells his almonds to dealers in the central market who make about 10 per cent on the sales, and in turn sell to the exporters. The exporters buy only graded almonds, although they themselves re-grade them into their own grades for export. There is about 15 per cent carry-over in the district, largely in the hands of the speculators, who have been unable to unload on the exporters.

<sup>1/</sup> Average exchange for 1923; peseta = 14.45 cents.

Malaga.

Malaga, the most southerly district in Spain, is probably the finest almond producing section in the world. The Two types of Malga almonds, the "Jordans" and "Malaga Valencias", are the most highly priced almonds on the market. The annual production of the district amounts to about 14,000 bales for "Jordans" and 25,000 bales for "Valencias". The year 1923 was an excellent one and prospects pointed to a bumper crop both in "Jordans" and "Valencias". The average yield per tree will run from 10 to 15 pounds.

Agricultural Wages.

The price of labor in the Malaga region ranges from 58 to 87 cents per day for the better class of farm hands who have some skill; the ordinary workmen receive from 29 to 58 cents; and the unskilled, about 29 cents a day. Women working as crackers or rough-graders, receive 36 and 43 cents a day, while skilled graders receive from 43 to 58 cents. Children, supposed to be over 14 years of age, receive anything from 14 cents a day up. Land values are from \$58 to \$117 per acre, and crop failures very seldom occur. 1/ There is a tendency yearly to increase the planting of almonds throughout the district.

Local Marketing Methods.

The method of selling the produce of the Malaga section differs from that of any other section. A very large percentage of the almonds are cracked at home by the farmers and sold direct to the exporters. 2/ The exporters take the nuts rough graded by measure, then they have them regraded by expert graders, grading them by sight into the following grades: 14 to 16, 16 to 17, 19 to 20, 21 to 22, 26 to 28 almonds to the ounce.

1/ Average exchange for 1923; peseta = 14.45 cents.

2/ The usual unit of quotation is the box of 28 pounds.

All defective almonds are rigidly excluded from the better grades. The grading of these exports is almost perfect.

Special Report on Almond Industry in Malaga

A complete report on the conditions under which almonds are grown in the Malaga district of Spain was prepared upon request by various farm interests of the Malaga district, principally the Farmers' Syndicates of Almogía, Alora, Casarabonela, Coin and Pizarra. These organizations endeavor to collect with impartiality the most accurate information possible. The accounts of production and expenses contained in the old valuation certificates made out by the authorities of the various villages concerned, and the reports on standard values by the Technical Boards of the Government Service of Agricultural Valuation, were consulted and studied as were the facts published by the Spanish Ministry of Agriculture in their "Propaganda Sheets" which are issued gratis on demand. Official documents, books and magazines on agriculture, etc., were consulted in order that the report would be as nearly as possible a true account of present conditions; of the changes that have taken place as a result of a more careful selection of soil for cultivation of the trees; of the increase of wages; and the material reduction of working hours and of various other causes. The following is an abridged translation of this report.

The Almond Tree

Of the various Agricultural regions or zones into which Europe can be divided according to temperature, the almond tree belongs to the warmest, or at any rate to the sugar cane region, which comprises the land situated from 0 to 394 feet above sea level. Normally, the



almond tree grows to a height of from 15 to 24 feet. In the "Diccionario Enciclopedia Hispano Americano," Vol. 1, Page 1048 of the 1887 Edition, we are told that "the almond tree develops in the poorest of soils, in fact, soils which are too poor for any other kind of cultivation, and that the tree resists the droughts which are so frequent in this Peninsula." It is a fact that almond trees were formerly planted in poor soils, but modern farmers look for the best soils, having realized that, when planted in inferior soil, the almond tree does not attain as much as a third of its normal development, with consequently smaller production.

#### Land Utilization.

The almond farmers for some years past have utilized the land which was formerly reserved for the cultivation of grain, thereby enjoying the temporary exemption from taxes which was granted by Article 8 (Sec. 7.) of the Law of Taxes on Real Estate, of September 30th 1885. According to this law "all land which was formerly intended for the cultivation of grain, if planted with almond trees, will bear the same tax as for grain, for a period of 30 years".

The aim of the almond farmer should be to make a proper selection of land suited to particular varieties, and to adopt a reasonable process of cultivation and transplanting suited to the kind of land he has. Reports are now being issued by the Technical Board of the Department of Agriculture in this district, which deal with the classification of lands within the municipal boundaries of the towns, the area under cultivation et., etc. For example the report for the district of Alora, dated, Malaga, July 22nd 1920, shows the area of soils of good quality used for the cultivation of almond trees to be 2540 acres; whereas that of the poorer soils, only appear to be 367 acres, and the proportion is the same, or relatively the same, in the other municipal districts. In former years almond trees were planted in inferior land, but as fagots were sold at a very high price during the European War, scarcely any almond trees remained on the 367 acres of poorer land, the greater part having been cut for sale.

#### Irregular Rainfall in Malaga.

It is recorded by the Board of Agriculture of Malaga in the Government records of the year 1878 that "one of the drawbacks in this province, is the lack of water. Because of the irregularity and insufficiency of rain fall the unirrigated land is very unproductive, and even the yields of the irrigated lands are scanty and relatively poor". The lands of inferior quality do not resist the droughts which are so frequent in our Peninsula, as stated in a memorandum issued by the Board of Agriculture of Malaga, in 1878, one of the greatest difficulties of the agriculturist is the lack of rain for which reason the land only in exceptional years produces enough to cover the cost of production. In the Eastern and Southern Zones months pass without rain.

A memorandum read in the Academy of Science in Malaga on the 22nd of February 1922 by the Engineer Mr. Jimenez Lombardo concerning the



hydrology of this province dealt with the irregularity of rainfall in this zone. In the year 1822, the almond plantations in this province suffered severely as a result of a drought, and again in 1905. Not only were some two thirds of the plantations completely dried up, but the surviving trees were so poorly nourished, that in many places the nuts were only about a fourth of their normal size.

#### Old Methods of Planting.

The almond tree requires great care during growth. Under the old method, the seed of the hardiest variety, which is the bitter almond was planted in a hole from 2 to 3 inches deep, the planting thus costing very little, not only because of the ease of the operation but also because of cheap wages, which were generally from 24 to 29 cents per day;<sup>1/</sup> but as the roots of the new plant were so near the surface, it was found that a large part dried up from the summer heat.

#### New Methods of Planting.

At the present time planting is done in two ways: first, directly in the ground, making holes some 10 inches deep and 10 inches wide, in the bottoms of which the almond seed is planted. As soon as the shoot appears and commences to grow, earth is gradually filled in around the shoot until the plant protrudes above the surface of the ground and the hole is then completely filled in. As the root of the plant grows at a depth of from 10 to 12 inches it is afforded protection from the summer heat. The second method of planting is by preparing a piece of irrigated land, well fertilized, and as soon as the shoots appear and become somewhat developed, they are planted in a "nursery". A year or two afterwards they are dug up, with a thick layer of soil covering their roots, and are planted in the places where they are to remain. Needless to say, by the old method, any laborer with a small hoe could, in 1 1/5 working days, at a cost of 35 cents, plant an acre of land. <sup>1/</sup>

Nowadays, using the first of the above methods, in addition to the cost of the seed, one has the expense of opening 100 holes, one for each 11.9 square yards, for which four days' wages are needed at 58 cents per day, and another 8 days wages at 43 cents for the man in charge of the operation of gradually filling in the holes until the surface is levelled up. If the second method is adopted, it is necessary thoroughly to prepare the piece of ground required, which takes two days wages at 58 cents per day, and also ten loads of fertilizer at \$3.61. Besides this, one has to reckon 10 days, at 36 cents per day, for the irrigation and weeding, which has to be done at least three times, thus adding another \$3.61 to the cost. <sup>2/</sup>

Afterwards it is necessary to prepare in the same way the patch that is to be used as a nursery. This requires a larger area than the former, because the small plants must be placed at a distance of 20 to 27 inches from each other necessitating three times the amount of fertilizer and labor required in the first operation. When the plants are ready to be transferred to the orchard 40 holes per acre are dug. Each hole is

<sup>1/</sup> Exchange at par: peseta = 19.30 cents

<sup>2/</sup> Average exchange for 1923; peseta = 14.45 cents.

dug twice the depth of those in which the seed only was originally planted. This operation requires 4 days at a cost of 58 cents per day. Afterwards the plants are taken out with the roots covered with earth, bound up with brushwood, and firmly tied with a string, which requires 2 days at the same rate. Finally the plants are carried from the nursery to their destination on horseback, which takes on an average of 1.21 days at 72 cents per day,<sup>1/</sup> and two more days for replanting them, at 58 cents per day.

#### Grafting the Almond Trees.

When the trees are eight or ten years old they must be grafted with various kinds of sweet almonds of both the long (Jordan) and the round (Valencia) shape. The beginning of this process consists of cutting off the top part of the tree, a laborer for this work being paid 72 cents a day. <sup>1/</sup> The grafting is done in the ordinary way, and costs about 58 cents per acre. There is another expense which must not be overlooked, namely, the replacing of the many trees which die because of the grafting, and also those killed by pests which attack the trees.

#### Agricultural Wages.

The increase in wages of women as well as men has now reached unheard of limits, especially since 1902, when the farm labor question in Spain became acute as a result of the organization of the laborers and the increasing strength of the syndicates. The women who husk the almonds formerly earned from 8 to 10 cents per day, while now they earn 14 cents a day. The husking is paid for at a rate of 14 cents per "fanega". <sup>3/</sup>

According to the old records of costs, as kept by the village Alora, the hoeing of the earth at the foot of the trees, cost 29 cents per day; pruning the trees, 39 cents, while the cost of gathering the nuts varied from 19 to 24 cents per day. The cost of carrying them on the backs of horses to the village was 39 cents <sup>2/</sup> per horse, per day, working from 8 to 9 hours. The laborers were always supplied with wood, water, olive oil and provisions.

Nowadays the work of digging costs 51 cents, pruning 72 cents, gathering 29 to 43 cents, wood, olive oil, and other provisions 3 cents, and the use of a horse 87 cents per day. <sup>1/</sup> Laborers work about 6 hours as in many districts the farmers have come to an agreement with the laborers to divide up the working days as follows: Leave the village at sunrise, have one hour for breakfast; a luncheon interval which during the months of June to September will last three hours, to enable them to have a siesta, 30 minutes to be taken five times a day to smoke, the day's work to stop at an hour which will enable them to reach their village by sunset. Transportation to the exporters at the seaports used to be done on horseback, costing on an average of 39 cents per "fanega" <sup>3/</sup> Now it is done by train, motor trucks, or cart, and costs 14 cents.

<sup>1/</sup> Average exchange for 1923: peseta = 14.45 cents

<sup>2/</sup> Exchange at par: peseta = 19.30 cents

<sup>3/</sup> "Fanega" equals 1.58 American bushels.

# Taxation of Land.

When the revision of the land taxes took place in 1848, county property began to be taxed at the rate of 12 per cent on its calculated value, afterwards this was increased to 21 per cent, which latter percentage some villages, not subject to the new advances, are still paying. Those villages which have declared the value of their lands pay 16.24 per cent, plus 1.59 per cent for Municipal tax and a tax of 0.5 cent for shelled almonds for the loading and unloading of same when leaving the village, and another on entering the seaport.

Taking all these calculations into account, the cost of an acre of land, averaged, some years ago, according to reliable calculations \$156 for first class, \$117 for second and \$78 per acre for third class land. 1/ At the present time the majority of plantations are made on good quality soil. These prices (in Spanish currency) have now trebled. The United States currency equivalents are for first class land \$351 per acre, second class, \$234 per acre, and third class \$175, although the profits work out only about 3 per cent, more or less, of these values. 2/

The following table gives the production, costs, returns, and profits per acre of almond orchard in Southern Spain on the three classes of land mentioned above.

Physical Production of an Acre of Almond Orchard  
In Southern Spain.

Product.	Unit.	Quantity		
		1st class	2nd class	3rd class
		land.	land.	land.
Almonds, Malaga ..	Bu.	3.24	2.83	2.43
Almonds, Valencias	"	1.21	.31	.40
Fire wood .....	Lbs.	178.	154.	89.
Shells for fuel ...	"	196.	160.	125.

See page 105 for Spanish equivalents

1/ Exchange at par; peseta = 19.30 cents.

2/ Average exchange for 1923; peseta = 14.45 cents.



Costs and returns for an acre of Almond Orchard in Southern Spain

Average rate of exchange for 1923, peseta = 15.48 cents

Item.	: First : class : land.	: Second : class : land.	: Third : class : land.
	: Dollars	: Dollars	: Dollars
COST:	:	:	:
Pruning and cleaning trees. <u>1</u> / .....	1.25	.94	.63
Labor of draft animals .....	4.70	4.70	4.70
Digging about trees, 2.47 days labor .....	1.32	1.32	1.32
Fertilizer for weaker trees .....	1.88	1.57	1.25
Flowing, 1.21 days labor .....	.66	.66	.66
Gathering nuts .....	2.76	2.26	1.75
Transportation to store house .....	.69	.56	.44
Storing .....	.17	.14	.11
Yearly replanting .....	.63	.63	.63
Watchman .....	.94	.94	.94
Shelling .....	.69	.56	.44
Land tax .....	1.57	.94	.63
Assessments, other .....	.12	.10	.06
Tax on loading and unloading in village .....	.14	.11	.09
Transportation to exporting house at seaport ..	.69	.56	.44
Tax on unloading at seaport .....	.14	.11	.09
Total cost .....	18.35	16.10	14.18
RETURNS:	:	:	:
Almonds, Jordan or long .....	25.06	21.93	18.80
Almonds, Valencias or round .....	3.76	2.51	1.25
Fire wood .....	.50	.38	.25
Shells, for fuel .....	.14	.11	.09
Total returns .....	29.46	24.93	20.39
Profit .....	11.11	8.83	6.21

See page 105 for Spanish equivalents.

1/ One and sixty-five hundredths days work on first class  
land 1.21 days on second class, and .81 days on third class.

# Summary

Item.	Dollars per Acre.		
	1st class land.	2nd class land.	3rd class land.
	Dollars	Dollars	Dollars
Products and sales	29.46	24.93	20.39
Expenses	18.35	16.10	14.18
Profits	11.01	8.83	6.21

In spite of the above mentioned facts, the Technical Department of the Board of Agriculture has had to grant to the owners of the farms situated in dry regions a reduction in tax on account of the insecurity of their crops, whereas in respect of almond plantations situated within the boundaries of Alhaurin de la Torre and in the Agricultural Zone, or rather at a height of 395 feet above sea level, they have fixed the tax at about \$11.71 per acre for lands belonging to the first class, \$8.77 for the second, and \$5.76 for the third class. 1/

## Variations in the Crop.

Experience shows that almond trees give one abnormally abundant crop every 20 or 25 years, in which case the value of the almond drops to half its average price owing to its depreciation in size and quality. An average crop is yielded four or five times during that period, the production during the remaining years being low and sometimes nil. This information is verified in both the "Diccionario Enciclopedico" and in the reports published by the Ministry of Agriculture.

The almond tree is easily affected by frosts which greatly reduce the size of the crop and the development of the almond. The almond tree in Southern Spain blossoms in the month of January, during the period of the frosts, the crops thus being frequently in danger. Its damaging effect on the almond trees can be seen in different zones practically every year. In some cases the frost causes the destruction of a whole crop.

We do not agree with the statement that the use of artificial clouds, by burning heaps of fuel at a distance of 66 feet apart, composed of straw or any other fuel that will give off a heavy and abundant smoke, is a sure means of protecting the trees from frost. We will not waste time on the serious discussion of this theory which we consider to be a mere fancy, for if it were put into practice it would not only be useless but altogether too expensive. This method might be workable during winter nights, in a closed-in garden where there are only 3 or 4 almond trees, but not in large plantations, for even were we to admit of its having the desired effect, the fuel would cost more than the value of the almonds which one would try to save, in other words "the collar would be worth more than the dog."

1/ Average rate of exchange for 1925; peseta = 15.48 cents.



This special report is a translation from the original as prepared by Don Antonio Bootello, President of the Agricultural Syndicate (or Farmers' Union) of Alora. The document is signed and sealed by the Syndicates of Alora, Sasarabonela, Coin, Pizarra and Almogia. The signatures are confirmed and certified by the President and Secretary of the Federation of the Agricultural Syndicates of Malaga under date of May 30, 1923.

#### TUNISIAN ALMOND INDUSTRY

##### Sfax Almond Market.

The almond districts of Tunis are largely situated in and about the city of Sfax, on the East Coast. Up until the last few years the acreage of almonds in the country probably remained about stationary, but the gradual development of Tunis under French protection has caused a very definite increase. In many places the almonds grow wild. Of the cultivated plantations the older ones are owned by the Moors who planted them very irregularly wherever they found soil suitable for the trees. Much of the new acreage has been planted by Italian and Spanish immigrants recently settling in the country.

Some almonds are produced at the more distant interior points of which practically no information is available. These almonds arrive from the back country on camels. The supply is very irregular. In years when the locust infests the groves there is absolutely no production. Following numerous experiences the growers have adopted the "semi-soft" shelled type of almond, of which many kinds are of fairly equal quality. The blossoms of this particular type are more resistant to cold and wind, than the others are, and the fruit is not so easily attacked by mould.

As Tunis, especially in the almond districts, has hardly been touched by civilization, no accurate figures are available. The acreage is entirely unknown in many districts, particularly where almonds are produced from wild trees. No attempt has been made at scientific cultivation. The ground in many cases is merely scratched up with a wooden plow. One cannot get much of an idea of the cost of production as no definite figures are kept, and as little money as possible is expended for labor and cultivation, either on the large plantations owned by wealthy Moors, or on the newer plantations, usually small, owned by whites. Two facts are noticeable: First, the Moors generally consider that a good year is always followed by one or two bad years, and second that, the almond crop is in the hands of the gods who send a good or a poor crop as they may desire.

Below is the best available estimate of almond production in Tunis.

Almond production in Tunis, 1912-1921.

Year	Trees	Almonds produced.
	Number	Bales
Average 1912-16 .....	.....	10,380
" 1917-21 .....	.....	26,920
" 1912-21 .....	.....	18,650
1912 .....	.....	10,200
1913 .....	.....	9,800
1914 .....	.....	2,700
1915 .....	.....	11,200
1916 .....	200,000	18,000
1917 .....	200,000	26,000
1918 .....	210,000	22,000
1919 .....	214,000	27,600
1920 .....	216,000	24,000
1921 .....	216,500	35,000

Almond imports and exports of Tunis, 1912-1921.

Year	Imports	Exports
	Bales	Bales
Average 1912-16	1,215	4,278
" 1917-21	1,893	5,723
" 1912-21	1,554	4,995
1912 .....	1,558	5,000
1913 .....	1,625	4,881
1914 .....	1,056	1,357
1915 .....	926	5,632
1916 .....	911	4,419
1917 .....	1,500	515
1918 .....	1,459	8,886
1919 .....	3,377	3,032
1920 .....	1,731	7,826
1921 .....	1,396	8,304

Bales of 220 lbs. each.

In some years the imports are as heavy as the exports. The reason is that there is a great amount of speculation in almonds in Tunis. If, when the crop comes on the market, the price is low enough to guarantee the few dealers a profit in exporting the almonds, they are exported in as large quantities as the markets will absorb. Considerable quantities of these exports go to Palermo and to Marseilles. It is believed that the almonds are eventually mixed with the local French production and sold by the Marseilles and the Aix merchants as French almonds. Domestic consumption in Tunis is very heavy. Almonds are the foundation of many of the popular desserts used by the natives but when the French market is good all stocks in sight, regardless of domestic needs, are sold to Marseilles. When local supplies are exhausted the flow of trade turns and local merchants buy both in Sardinia and Sicily.

### Large Surplus on Hand.

The "Depeche Tunisian" estimated on September 1, 1923 there would be a surplus in Sfax of 1,320,000 pounds. There was said to be a heavy carry-over of the crop from 1922. The 1923 crop was supposed to be considerably in excess of the annual demand in Tunis, and an attempt was made to get prices in line to enable export to France. In the fall of 1923 the "soft-shelled" almonds were quoted around \$15.20 per bale. The hard-shelled at \$3.21 and "shelled" at \$41.04 per bale, f.o.b. Sfax. 1/ These almonds have no other commercial name than "Sfax" and apparently there is only one quality of Sfax almond on the market.

### MOROCCAN ALMOND INDUSTRY.

The Moroccan almond situation is interesting. Considerable quantities of almonds are produced in the valley districts around Sous and Haha. Although these valleys are well protected from frost and wind almond orchards are only irregularly planted. The natives plant trees more or less at random. The almonds grown are of two kinds taking their names from the two districts, Haha and Sous. Those from Haha are grown in the neighborhood of the Great Atlas and Morocco City. They are dark brown in color and unusually large. Those from the Sous country are small and much lighter in color. In both districts the harvest comes in August and September and the picking and shelling is done entirely by natives. A large number of almond trees in Morocco grow wild without attention or care. They are found principally in the neighborhood of the Great Atlas. The ownership of many of them is vested with certain nomadic tribes of Arabs who wander up and down the long valleys. 1/ Average exchange for 1923, franc = 6.08 cents.



Almonds form an important article of food among the civilized Arabs, who use them as a foundation for all of their desserts. Some of the wandering tribes in the Atlas Mountains live on them very largely during certain periods of the year. In fact, even for the inhabitants of Sous and Haha, almonds, honey and dates are the main articles of diet.

#### Marketing Practices.

Almonds are continually brought to the almond markets of Morocco at Mosagan, Casablanca, Mogador and Morocco City, by Arabs in caravans from more or less unknown points. The Arabs, who are ignorant and cannot count, bring in the almonds on the backs of camels. The nuts are already shelled, but no attempt is made to grade them. They are badly mixed with bitters which are difficult to eliminate, and the price is regulated largely by the percentage of bitters present. Jewish brokers meet the Arabs at the gates of the city and carry on their trading for them. The broker takes charge of the caravans and offers the almonds in the market place. The almonds are piled on the ground and the piles are sold to dealers, mostly for home consumption.

A small group of Europeans in Mogador, Morocco City, and Mosagan dealing almost exclusively with the Jewish brokers, collect these almonds from the markets and export them. About 70 per cent of the exports go to England; about 25 per cent to France and 5 per cent to America, Holland and other countries. In Moroccan almonds sold abroad the proportion of bitters runs from 2 to 5 per cent. The returns to the Arab are very small. Almost the entire profit goes to the broker who, as he is somewhat familiar with the export prices of almonds, demands from the exporter as much



as he can, and at the same time takes every advantage of the Moor, who usually can neither measure the volume of his product nor count the money he receives for it. Tolerating the virtual robbing of the Moors of the small agricultural crops they raise is one of the worst features of Moroccan Government. The country Moor is as much in need of protection as the American Indian.

#### Production and Export Statistics.

There are no available statistics in which any confidence can be placed, but it is safe to say that the total export of almonds from Morocco runs from 4,500,000 to 9,000,000 pounds annually. A leading exporter estimates a good harvest for the country at from 20,000 to 30,000 bales.

The collector of the port of Mogador, the chief export point for Morocco almonds, gave the entry of almonds into the city of Mogador from August 1, 1922 to July 31, 1923 as 2,131,000 pounds; exports as 3,274,000 pounds. The difference between the entry and exports represented the stock carried over in the city of Mogador from the preceeding year. Most of this stock, however, was brought in during the month of July 1922, and has been completely liquidated.

The following export statistics were obtained from the American agent at Tangiers, Morocco.

Exports of Almonds from Morocco, 1916-1922.

Country of destination:	1916		1917		1918		1919	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	Bales	Dollars	Bales	Dollars	Bales	Dollars	Bales	Dollars
France .....	1,480	63,096	300	17,326	19,610	1,179,771	7,710	452,302
England ...	4,670	202,567	2,820	132,148	4,570	273,805	14,990	750,394
Spain .....	30	141	10	734	.....	.....	4	90
Italy .....	90	4,360	...	.....	.....	.....	...	.....
U. S. A.....	410	18,279	740	366,747	.....	.....	1,540	70,447
Belgium ...	...	.....	...	.....	.....	.....	170	11,662

Country of destination.	1920		1921		1922	
	Quantity	Value	Quantity	Value	Quantity	Value
	Bales	Dollars	Bales	Dollars	Bales	Dollars
France .....	4,370	190,895	10,450	391,041	5,900	182,832
England .....	16,750	818,698	20,590	792,667	13,020	508,692
Germany .....	90	3,547	840	31,969	470	12,917
Spain .....	40	2,207	...	.....	.....	.....
Belgium .....	480	29,093	160	6,362	290	11,374
U. S. A. ....	170	7,582	690	24,968	540	21,834
Holland .....	50	228	...	.....	660	27,168
Italy .....	...	...	...	.....	10	355

## THE PORTUGUESE ALMOND INDUSTRY.

### Almond Districts and Varieties

Almonds are grown on the west coast of Portugal, in a few districts around Lisbon and along the Douro River, and are usually exported by way of Oporto, at the mouth of the Douro. The more important almond district, however, is along the eastern part of the southern coast about the town of Faro. In the latter district the terrain is similar to that along the south eastern coast of Spain. The climate is dry and hot and there are very few frosts. As in Bari, the almonds grown in the northern part of the district include a considerable quantity of bitters.

Two varieties of almonds are grown in Portugal, the "Coco" and the "Durazia". Generally about one third of the production is of the "Coco" variety and two thirds "Durazia". The orchards are poorly cultivated. Little or no attention is given to most of the trees. In fact most of the almonds grow wild.

As large numbers of almond trees are mixed in the orchards with fruit trees, no acreage figures are available. Export figures range from 12,000 to 20,000 bales. The smallest export in the last forty years was 5,000 bales, which is the nearest the section has come to a complete crop failure during that period. During the last five years exports have ranged from 12,000 to 15,000 bales annually. During 1919, which was an unusually good year, they amounted to 20,000 bales.

### Marketing Methods.

The crops are picked and shelled by the peasants. No machinery of any kind is used in the process. Buyers from Faro travel throughout the

district and purchase the nuts. Usually the peasants have little or no knowledge of the world market value, and are at the mercy of the buyers. These buyers in turn sell to the dealers at Faro, usually making a rather large profit.

The Portuguese almond exports go to France and England most of the time because the best transportation facilities abroad are in that direction.

The 1923 crop was estimated at about 18,000 bales, and the carry-over from 1922 was not heavy, running from 3,000 to 5,000 bales. Owing to the backward conditions of the country very little information is available except that which can be obtained from the Consular Offices, or through the merchants at Faro. Their ideas are rather hazy as the almond trade in Portugal is not organized on the same efficient plan as that in the cities of Malaga and Alicante, which are within easy reach of Faro by steamer.

#### FRENCH ALMOND INDUSTRY.

##### Marseilles and Aix.

The annual production of almonds in France ranges from 25,000 to 30,000 bales, practically all of which are produced in the extreme southeastern part of the country. Marseilles, on the southern coast, is one of the most important almond markets in the world and that of Aix, some twenty miles inland and the center of handling for the almond district is one of the oldest in existence.

This almond district lies in the ancient province of Provence comprising the present departments of Bouches du Rhone, Var, Basse Alpes, the eastern portion of Vaucluse and a small part of Alpes Maritimes. The almond area of the district ranges from 1,500 to 2,000 acres. It is all in small but very highly cultivated plantations from 3 to 12 acres in size. Acreage of almonds in



Provence is shrinking every year because of the continual increase in the price of labor and because of the extreme variations in yield which make the crop very uncertain. No irrigation is used as the trees are very sensitive to water and are killed by too much moisture.

#### Varieties of Almonds.

The French almonds are of three types.

1. Tender and sweet - "Princesse," "Ai," "Languedo," "A la Dame", or "Ronde". These almonds are sold in the shell.
2. Semi-tender - "Margher", "Moliere" or "Rase". These are the best eating almonds. They are uniform in quality and do not deteriorate or degenerate in type. These are also sold in the shell. The "Aberane" or "Coque Batard" is a semi-soft almond and likewise sold in the shell.
3. Hard almonds - "Flots" constitute the highest class of shelled almonds, and the "Beranne" the highest class of almonds for sugar coating. "Tourne Fort" and "Dure Comme" are hard-shelled almonds but are sold in the shell. Many of them are shipped to India where labor is cheaper than in France. There they are shelled and graded or sold in the shell.

Gustave Hueze in the "Journal d'Agriculture Pratique" divides the almonds grown in the South of France into two classes, soft-shelled and hard-shelled.

Soft-Shelled - "Princesse" or "Fine" or "De la Reine" The tree flowers very early. It blossoms at different times, and therefore has irregular production. The lower branches die off, which makes it very necessary to prune them well. The shell is somewhat hard, but can be broken by the fingers. The shell is fairly thick, flattish, yellowish, and flexible, and very easily broken by the fingers. The skin of the kernel is of a golden yellow; the kernel is very white. It is in great demand, and very dear. It is used in the finest confectionery. 1/

- 1/ A free translation apparently would read: The tree flowers very early. Its period of bloom is extended, causing irregular development of the fruit. It is necessary to prune the trees well to prevent the lower branches from dying. The shell of the nut is fairly thick and flat, yellowish, flexible and somewhat hard, but can be broken with the fingers. The skin of the kernel is golden yellow: The kernel is very white. The variety is in great demand and very dear. It is used in the finest confectionery.



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"Dame" or "Medium Fine" or "Abelan" or "Aberana". This almond resembles the "Princesse": the inside of the shell is somewhat hard but can be broken with the fingers. It is flat and narrow at one end. Its flavor is less pronounced than the "Princesse". It ripens early but its flowers are liable to fall. The "Sultana" almond is a variety of the "Dame"; it is soft and of very delicate flavor.

Hard-Shellled.

"Commun" or "Franca" (ordinary or plain). The fruit is long. It is sold shelled. The trees are strong. There are two varieties, one with large almonds and one small.

"Moliers" or "Raza" (smooth). The fruit is large, regular, very oily with a fine smooth skin; the shell is very hard. The tree is strong but not very prolific, especially as it grows older. These almonds are in demand by confectioners.

"Flots" or "Trochets". The fruit is usually grown in groups. They are medium size and perfect shape. Its commercial value is always much higher than that of other hard varieties. It blossoms late, but is very prolific. It ripens in September.

"Matheroune". Fairly hard, medium sized, sharp pointed and well shaped.

"Laly". A large swollen, hard-shelled almond.

"Redonda" (round). Small fruit but swollen in the middle. The shell is flexible, and medium hard. It has the defect of blossoming early.

"Grande y Verde" (large and green). Blossoms late, for which reason it is grown where late frosts occur. The almonds, which ripen in September, are of second quality.

"Pequena Verdes" (small green). This tree is rough and grows a lot of leaves. It blossoms late, producing abundant flowers only every second year. The shell is hard.

The almonds grown in Provence, the soft shell variety excepted, are usually shipped abroad for eating purposes. The grinding almonds sold in the Marseilles and Aix markets are usually imported. These markets, while dealing in the local almonds which they buy direct from the farmers,

grade and export; They also speculate considerably in the crops of other districts and other countries.

The usual planting in this district is about 50 trees to the acre. The general expenses for planting and for tending an almond orchard as worked out by a French Agriculturist, are as follows:

Cost of planting almonds.	
Average rate of exchange for 1923; franc = 6.08 cents.	
Cost item.	: Cost per : tree.
	: Dollars
Price of trees grafted ....	: .24
Labor in planting:	:
Excavating for tree .....	: .12
Disinfecting excavations. 1/	: .08
Planting tree .....	: .02
Total .....	: .46

Cost of tending and producing almond orchard.

Cost item.	: Cost per : acre.
	: Dollars
Fertilizing and working ...	: 7.69
Harvesting, caring for trees, destruction of parasites, cleaning and pruning .....	: 4.61
Total .....	: 12.30

See page 106 for French equivalents.

- 1/ Either humus is burned in the hole for disinfection or chemical fertilizer is required.

### Agricultural Wages.

Farm labor at the present time is receiving from 70 to 90 cents a day without board or lodging. A plowman with two horses and a plow receives \$3.00 a day. Pruners get from \$1.20 to \$1.50 a day without board or lodging. The women, who harvest the crops, are piece workers and receive .05 a tree, and are able to make from 40 to 50 cents a day. The men who shake the almonds from the trees receive 90 cents a day. <sup>1/</sup>

### Marketing Methods.

The almonds grown in the district are bought up by the speculators who have been working for many years at Aix. Owing to the continual shrinking of the crop, however, and poor business methods, together with the gradual increase in the Marseilles market, and the improved methods of commerce in Italy and Spain, this trade has been gradually decreasing, and every year shows a reduction in exports from Aix. The dealers of Aix go through the country purchasing directly from the farms, and as they have not time to test the contents of each bag by sorting out the bitter or shriveled nuts, any farmer can sell his entire crop by gross weight for the variety he claims to produce. Dealers therefore very often pay as much for a sack containing 20 per cent or more of bitter or shriveled nuts as they do for one containing only sweet sound nuts. The dealers later endeavor to remove nuts that are not of the proper variety in order not to lower the reputation abroad of the finer export grades.

<sup>1/</sup> Average exchange for 1923, franc = 6.08 cents.

### Methods of Grading.

Labor for cracking almonds in the homes is so cheap that a great deal of cracking is still done by hand. The hard shelled almonds, while sometimes broken by the farmers themselves, are usually brought in and shelled by the dealers who run them through rollers and then sort and grade them. There are also contractors who own machinery and do nothing but break and grade. Three or four French machines are used in which the nut is run under or between rollers for breaking, the almonds later being sorted in the shell by hand. Other machines, break, separate and clean the nuts. The last grading, however, is always done by hand, and the various sizes are separated by running the almonds through sieves. Hand cracking is most popular in that it does slight damage to the nuts. It is generally considered in the French markets that 3 pounds of unshelled almonds will produce one pound shelled.

The French system of grading was, until the present century, largely a matter of guesswork. The largest nuts of any year's crop were known as "largest", and others called "large", "medium", and "small". This system had the advantage of classifying each year's crop in nearly a fixed percentage, thus incurring a fairly uniform measure of value to both the producer and the dealer. The disadvantage was that customers at distant points often did not realize that the "largest" of any one year might be no larger than the "medium" of the preceding year. The new system classifies the nuts in millimeters according to the short diameter of the shell. The nuts are graded for size by running them through sieves.

which are manufactured by the Fondina firm at Marseilles. It is not known whether these sieves are patented. Arbitrary numbers are assigned to the sizes of the various nuts instead of giving their diameter in millimeters.

The following table gives these numbers, and the diameters of the circular holes through which the different sized nuts fall in the grading process.

French Almond Grading Sieves.

Number of sieve. 1/	:	Diameter of mesh.	:	Number of sieve 1/	:	Diameter of mesh.
	:	Inches.	:		:	Inches
32	:	.394	:	38	:	.670
32 bis	:	.414	:	38 bis	:	.709
33	:	.433	:	39	:	.729
33 bis	:	.453	:	39 bis	:	.749
34	:	.473	:	40	:	.788
35	:	.512	:	40 bis	:	.827
35 bis	:	.532	:	40 ter	:	.867
36	:	.552	:	41	:	.906
37	:	.591	:	41 bis	:	.946
37 bis	:	.630	:	42	:	.985
37 ter	:	.650	:		:	

See page 106 for equivalents.

1/ "Bis" = double; "ter" = triple.



# Almond Prices.

The following tables give quotations on almonds in the various almond markets of the world on November 5, 1923, the conversions to American currency having been made according to the exchange rates prevailing at that date.

Almond quotations in Bari, November 5, 1923.

Exchange rate Nov. 5, 1923; lira = 4.46 cents		
Grade	::	Price per bale. 1/
	::	Dollars
La Bari .....	::	34.57
Andria .....	::	35.01
Selected Santoro, 18 to 20 per oz:		57.98
Best Bitters .....	::	21.44
See page 107 for Italian equivalents.		

1/ Bags of 220 pounds gross, f.o.b. Bari, for cash payment upon delivery of documents.

Almond quotations in Catania, November 5, 1923.

Exchange rate Nov. 5, 1923; shilling = 22.315 cents.  
Firm A

Grade	:	Price per
	:	cwt. 1/
	:	Dollars
Palma-Girgenti .....	:	17.85
Etna .....	:	18.97
Current Avola .....	:	18.97
Selected Avola .....	:	13.24

Firm B

Grade	:	Price per
	:	bale. 2/
	:	Dollars
Almonds in shell "Cavalliere" in bays of 110 pounds, (\$25.42 at warehouse - profit \$.89 transport \$.13 ) .....	:	26.45
Palma-Girgenti in bags of 220 pounds, (\$33.99 at warehouse - profit \$1.34 - transport \$.13) ...	:	35.46
Bitters in bags of 220 pounds (\$19.13 at warehouse: profit \$.89 - transport \$.13 ) .....	:	20.20
Avola Giants in bags of 220 pounds, (\$13.48 at warehouse - profit \$3.34 - transport \$.13 ) ...	:	46.96

Almond quotations in Catania, November 5, 1923. Cont'd.

Firm B Cont'd.

Grade	Price per bale. 2/ Dollars
Avolas very selected in cases of 110 pounds net, (\$71.36 at warehouse - profit \$2.90- cases \$1.34 transport \$.22 ): 3/	
37 bis 4/ .....	75.82
37/37 .....	75.82
Avolas very selected in cases of 110 pounds net, (\$62.44 at ware house - profit \$2.45 cases \$1.34 transport \$.22 ): 3/	
36/37 .....	66.45
34/36 .....	66.45
Etnas in bags of 220 pounds: 5/	
Extra large )	
Large ) .....	40.59
Medium )	
Small )	

See page 107 for English equivalents

- 1/ Cwt. of 112 pounds, f. o. b. Sicily.
- 2/ Bale of 220 pounds, f.o.b. Catania.
- 3/ Three fifths of the "very selected Avolas" sold are 37 bis and 37/37: two fifths are 36/37 and 34/36
- 4/ "37 bis" = 37 double.
- 5/ Fifteen per cent of Etna almonds sold are "extra large" 20 per cent "large", 25 per cent "medium", and 40 per cent small.

Almond quotations in Palma, Majorca, November 5, 1923.

Exchange rate Nov. 5, 1923; shilling - 22.315 cents

Grade	Price per cwt. 1/ Dollars
Selected crops .....	18.30
Second grade .....	16.96

See page 103 for English equivalents.

Price includes cost and freight to New York.

- 1/ Cwt. of 112 pounds.

Almond quotations in Reus, November 5, 1923

Rate of exchange Nov. 5, 1923; shilling = 22.315 cents

Grade	Price per bale.
	Dollars
Longuettes courantes .....	42.40 - 43.51
Esperance premieres .....	37.94 - 39.05
Esperance courantes .....	35.70 - 36.82
Communes .....	34.59 - 35.70
Almonds in shell, mollars courantes. 1/ .....	17.42 - 17.86

See page 108 for English equivalents  
1/ Quoted as \$6.71 - \$8.93 per 110 pounds.

Almond quotations in Valencia, November 5, 1923.

Rate of exchange Nov. 5, 1923; shilling = 22.315 cents

Grade	Price per cwt. 1/
	Dollars
Majorcas:	
"Selected" quality .....	17.63
"Farmers" quality .....	16.07
Planetes .....	24.55
Marconas .....	23.43
Almonds in shell, Itizas 2/ .....	6.47

See page 109 for English equivalents  
In bags of 2 cwt. (224 pounds) gross, f.o.b. Valencia.

1/ Cwt. of 112 pounds.  
2/ Per bag of 110 pounds gross.

Almond quotations in Alicante on November 5, 1923.

Rate of exchange Nov. 5, 1923; shilling = 22.315 cents

Grade	Price per box.
	Dollars.
"Fancy", in boxes of 28 pounds net. ....	7.27
"Finest" " " " " " " " " .....	6.25
"Medium" " " " " " " " " .....	6.25
"Venus" " " " " " " " " .....	6.25
"Bulldog" in " " " " " " " " .....	5.49
"Cat brand" in boxes of 28 pounds net. ....	5.49
	Price per cwt. 1/
"Twin" in bags of 2 cwt. gross .....	18.97
"Broken" in bags of 2 cwt. gross .....	14.73

See page 109 for English equivalents.  
Price includes cost and freight to New York.

1/ Cwt. of 112 pounds.

Almond quotations in Malaga on November 5, 1923

Rate of exchange Nov. 5, 1923; shilling = 22.315 cents

Grade	Price per cwt. 1/ Dollars
Jordans:	:
"Small", in boxes of 25 lbs. net	: 26.43
"Medium" " " " 28 " "	: 35.60
"Large" " " " " " "	: 49.00 - 72.00
"Twin", in bags of 112 lbs. net	: 20.00
"Pieces", in bags of 112 lbs. net	: 16.00
Valencia:	:
"Small", in boxes of 28 lbs.	: 20.00
"Medium" " " " " " "	: 32.00
"Large" " " " " " "	: 50.00 - 72.00
"Twin", in bags of 112 lbs. net	: 18.00
"Pieces" in bags of 112 lbs. net	: 15.00

Prices include cost and freight to New York.

1/ Cwt. of 112 pounds. Quotations converted from  
boxes to cwt.

Almond quotations in Magador on November 5, 1923

Rate of exchange Nov. 5, 1923; franc = 5.78 cents

Grade	Prices per bale. Dollars
Sweet Almonds:	:
First quality Haha, not over 2 per cent bitters.	: 27.17
Second quality Sous, not over 5 per cent bitters	: 25.14
Bitter almonds	: 15.03

See Page 109 for French equivalents

Prices f.o.b. Magador: freight on almonds from Magador  
to New York by way of London is \$24.33 per ton (this  
being a British rate is assumed that it applies  
to a long ton).

Almond quotations in Marseilles, on November 5, 1923.

Rate of exchange, Nov. 5, 1923: franc - 5.78 cents

Grade.	Price per bale.
	Dollars.
Shelled Almonds:	
Andria (c.i.f.) .....	34.39
Prima Bari (c.i.f.) .....	33.52
Majorca (Proprietaire c.i.f.) 1/ .....	32.08
Majorca (Inca c.i.f.) 1/ .....	34.68
Casablanca (c.i.f.) .....	28.90
Casablanca (spot) .....	29.77
Palma-Girgenti (c.i.f.) .....	35.26 - 35.55
Magador (c.i.f.) .....	29.19
Provence .....	37.57
Sfax .....	36.70
Almonds in the Shell:	
Aberannes .....	10.12
Hard shell .....	6.94 - 7.22
Iveza .....	14.45
Mollarettes (c.i.f.) .....	15.03
Molieres .....	Not quoted
Molleses soft shell .....	" "
Molleses Ordinary .....	13.01
Princess Papershell (plains) .....	26.59
" " (hills) .....	25.72
Provence Matheronnes .....	Not quoted
Ais .....	17.34
Provence a la Dame .....	14.74 - 15.03
Sfax (c.i.f.) .....	14.45
Tarragonas (nominal) .....	16.76

See page 110 for French equivalents

- 1/ The quotation of Majorcan almonds in Marseilles as "proprietaire" and "Inca" apparently distinguishes between stock coming directly from the grower or land owner (the proprietaire) and those coming from the market in the Majorcan city of Inca. This is indicated in the tables of Valencia prices where Majorcan almonds are quoted as "Selected" quality and "Farmers" quality.



Range of Almond prices anticipated in November, 1923  
for Marseilles during the season of 1923-1924.

Rate of exchange Nov. 5, 1923; franc = 5.78 cents

Grade	Price per bale.
	Dollars
Soft Shelled:	
Princesse (according to quality and origin) .....	26.01 - 28.90
Ai .....	15.90 - 17.34
Languedoc .....	15.03 - 15.61
A la Dame .....	13.01 - 14.45
Semi-Soft Shelled:	
Matheronne .....	12.14 - 13.01
Moliere .....	18.67 - 19.83
Aberanne (according to quality) ....	10.12 - 11.56
Hard-Shelled:	
Flot .....	7.51 - 8.09
Beraude .....	7.23 - 7.51
Tournefort .....	6.94 - 7.22
Dures Communes 1/ .....	5.78 - 6.65

See page 111 for French equivalents

1/ Ordinary hard.

Almond quotations in London, on November 5, 1923.

Rate of exchange Nov. 5, 1923: shilling = 22.315 cents

Grade.	Price per cwt. 1/
	Dollars
Shelled Almonds:	
Valencia (according to grade) .....	24.55 - 30.13 ex. wharf
Jordan (according to grade) .....	27.89 - 55.79 " "
Alicante (according to grade) .....	24.55 - 30.13 " "
Etna .....	21.20 c. & f.
Majorca:	
Current quality .....	14.95 c. & f.
" " .....	17.29 ex. wharf
Selected .....	17.63 c. & f.
" .....	20.08 ex. wharf
Palma-Girgenti .....	18.41 c. & f.
" " .....	20.64 ex. wharf
Bari:	
Prima .....	16.74 c. & f.
Current selected .....	19.41 c. & f.
Large Hand picked .....	22.54 c. & f.
Canary:	
Teneriffe .....	18.41 ex. wharf
Round - Pas Palmas .....	19.53 ex. wharf
Almonds in the shell:	
Carthagena 2/ .....	8.70 c. & f.
Tarragona 2/ .....	9.15 c. & f.
Iviza 2/ .....	7.59 c. & f.
French Hard Shell .....	4.46

See page 112 for English equivalents

It will be noticed that the "ex. wharf" quotation for any class is somewhat above the "cost and freight" quotation for the same class: "ex. wharf" indicates that all wharf charges have been paid, "cost and freight" includes only cost and freight to the wharf.

1/ Cwt. of 112 pounds

2/ Per bag of 110 pounds.

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A P P E N D I X

Cost per unit for labor and fertilizer in producing almonds in Southern Italy.

Cost Item.	Unit	Quantity required	Rate per unit.									
			1913	1914	1915	1916	1917	1918	1919	1920	1921	1922
			Lire	Lire	Lire	Lire	Lire	Lire	Lire	Lire	Lire	Lire
Pruning.....	day	10	1.70	1.70	1.60	2.70	4.00	5.50	7.50	9.00	14.00	14.50
Tying faggots.....	day (women)	2	.80	.80	.70	1.10	1.50	1.80	2.25	2.50	4.00	4.00
Manure.....	quintal	15	.60	.70	.70	.80	.90	1.00	1.20	1.40	1.80	1.80
Manure loading.....	day	1/5	2.00	1.80	1.90	2.00	4.00	5.50	7.80	9.00	15.00	15.00
Manure carting.....	day (boys)	2/5	.70	.70	.70	.70	1.50	1.80	2.00	2.50	7.00	8.00
Manure spreading.....	quintal	15	.23	.21	.19	.22	.30	.40	.50	.80	1.20	1.20
Plowing (animal and and owner).....	day (women)	3	.70	.70	.70	.70	1.50	1.80	2.00	2.50	3.20	3.25
Hoeing.....	day	6	5.50	4.50	4.80	6.30	8.00	9.50	11.00	13.00	30.00	30.00
Gathering crop.....	day	5	1.80	1.60	1.70	1.80	3.50	5.00	7.00	8.00	14.00	14.50
	day	3	1.50	1.10	1.30	1.60	3.00	4.50	6.00	7.00	12.00	12.50
	day (women)	7	.60	.60	.60	.65	1.50	2.00	2.50	3.00	6.00	6.00
Carting to village. Husking, drying and warehousing	quintal	6	.52	.46	.42	.50	.75	1.00	1.20	1.40	3.00	3.00
	day (women)	6	.60	.60	.60	.65	.75	1.00	2.50	7.00	12.00	12.00
	day	1	1.50	1.10	1.30	1.60	3.00	4.50	6.00	7.00	12.00	12.00

See page 24 for American equivalents.

1 "Day" indicates one day of man's work unless otherwise specified.

Cost per hectare of producing almonds in Southern Italy.

Cost Item.	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922
	Lire	Lire.	Lire.	Lire	Lire.	Lire	Lire	Lire	Lire.	Lire
Pruning.....	17.00:	17.00:	16.00:	27.00:	40.00:	55.00:	75.00:	90.00:	140.00:	145.00
Tying up fascots	1.60:	1.60:	1.40:	2.20:	3.00:	3.60:	4.50:	5.00:	8.00:	8.00
Manure .....	9.20:	10.50:	10.50:	12.00:	13.50:	15.00:	18.00:	21.00:	27.00:	27.00
Manure loading	.68:	.64:	.66:	.68:	1.40:	1.82:	2.60:	2.80:	5.30:	6.20
Manure carting..	3.45:	3.15:	2.85:	3.30:	4.50:	6.00:	7.80:	9.00:	18.00:	18.00
Manure spreading	2.10:	2.10:	2.10:	2.10:	4.50:	5.40:	6.00:	7.50:	9.60:	9.75
Plowing .....	33.00:	27.00:	28.80:	37.80:	48.00:	57.00:	66.00:	78.00:	180.00:	180.00
Hoing .....	9.00:	8.00:	8.50:	9.00:	17.50:	25.00:	35.00:	40.00:	70.00:	72.50
Gathering crop..	9.45:	8.05:	8.75:	10.15:	21.00:	29.75:	38.50:	45.50:	84.00:	85.75
Carting to village .....	3.12:	2.76:	2.52:	3.00:	4.50:	6.00:	7.80:	8.40:	18.00:	18.00
Husking, drying and warehousing	5.10:	4.70:	4.90:	5.50:	7.50:	10.50:	21.00:	25.00:	45.00:	48.00
Total direct cost .....	93.50:	85.50:	86.98:	112.73:	165.40:	215.10:	282.20:	332.20:	668.40:	618.20
Interest on capital invested	120.00:	120.00:	120.00:	125.00:	135.00:	150.00:	135.00:	210.00:	220.00:	220.00
Land tax .....	24.03:	24.97:	26.75:	27.33:	34.10:	35.42:	38.70:	40.51:	51.12:	89.15
Interest on working capital, tools, insurance & sundry expense	18.70:	17.10:	17.40:	22.55:	33.08:	43.02:	56.32:	66.45:	121.70:	123.65
Gross cost..	256.23:	247.57:	251.13:	287.61:	367.53:	443.54:	568.23:	649.16:	1,000.22:	1,051.00
Less timber and brushwood ..	11.00:	11.00:	11.00:	18.00:	24.00:	35.00:	47.00:	56.00:	52.00:	62.00
Total cost of production .	245.23:	236.57:	240.13:	269.61:	343.53:	408.54:	515.23:	593.16:	939.22:	989.00

See page 25 for United States equivalents.



## Cost of producing one quintal of shelled almonds in Southern Italy.

Cost Item	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922
Cost of unshelled almonds	177.73	171.52	174.52	195.49	249.06	296.19	373.19	430.04	630.91	717.01
4.35 quintals. 1/ .....	177.73	171.52	174.52	195.49	249.06	296.19	373.19	430.04	630.91	717.01
Cost of cracking less	2/	2/	2/	2/	6.52	10.44	14.14	17.40	25.27	25.27
value of shells .....	2/	2/	2/	2/	6.52	10.44	14.14	17.40	25.27	25.27
Total cost of shelled almonds.....	177.73	171.52	174.52	195.49	255.60	306.63	387.24	447.44	709.18	745.28
Transport to exporting house .....	4.00	4.00	5.00	6.00	7.00	10.00	12.00	14.00	15.00	15.00
Sorting, cleaning and preparing for export ..	3.95	3.90	3.91	5.03	6.34	7.60	10.01	12.31	13.66	13.65
Cost of shelled almonds ready for export (not including grower's or exporter's profit) ....	185.71	179.42	183.43	206.52	269.94	324.23	409.24	473.75	737.84	774.13

See page 26 for United States equivalents.

- 1/ Based on a yield of 6 quintals of unshelled almonds per hectare, and yield of 1 quintal of shelled almonds from 4.35 quintals unshelled.
- 2/ No figures available; costs and returns assumed approximately equal.

Cost of Almond seed-bed.

Dr. G. Vincenzo

Cost item.	: Cost per : 100 square : meters.
	: Lire.
Cost of preparing ground at opening of spring, hoeing to depth of 25 centimeters and marking rows, 1 day .....	: : : : : 5.00
Cattle manure, 1 quintal, ashes 1/2 quintal, mixing, carriage and spreading .....	: : : : : 10.00
Selected almonds, 1600, for planting 25 centimeters apart in all directions, 15 liters at 80 lire per hecto liter .....	: : : : : 12.00
Selection of almonds, cracking shells, carriage and planting, 1 day .....	: : : : : 5.00
After care, hoeing twice and other care until transplanting to nursery, 3 days .....	: : : : : 15.00
Quota of general expenses, land tax and interest at 5% for 6 months on outlay .....	: : : : : 1.35
Quota of annual interest at 5% on value on land, at 8000 lire .....	: : : : : 4.00
Total outlay at end of first year ...	: : : : : 52.35

Cost of almond plants,

First year in Nursery

Cost item.	:	Cost per 500 square meters.
	:	Lire
1. Preparing 500 square meters of ground at opening of spring, hoeing to depth of 40 centimeters, 3 days .....	:	15.00
2. Manure, 5 quintals at 25 lire per quintal, /ashes at 10 lire per quintal: carriage, mixing and spreading .....	:	45.00
3. Digging up 1,440 seedlings, carriage, cleaning, and replanting in nursery, 60 centimeters apart, 4 days .....	:	20.00
4. Care during year: hoeing 3 times, 2 1/2 days ...	:	12.50
5. Stakes to support plants, 640 at 10 lire per hundred. 1/ .....	:	64.00
6. Carriage and preparing and placing of stakes tying and material for tying, 3 days .....	:	15.00
7. Quota of general expenses and land tax.....	:	10.00
8. Interest at 5% for six months on above expenses .	:	4.50
9. Interest at 5% on value of land .....	:	20.00
Total outlay for year .....	:	205.00
Previous year's outlay on seed-bed, 52.35 lire and interest at 5% .....	:	54.96
Cost of plants at end of first year in nursery ..	:	260.96

1/ Stakes 3 meters long each of which makes 2 supports.

Cost of almond plants, second year in nursery

Cost item	: Cost per : 500 square : meters.
	: Lire
1. 3 days work on land; one at opening of spring one during spring; one in summer .....	: 15.00
2. Removing low lateral shoots from plants and arranging supports, 3 days .....	: 15.00
3. General expenses as previous year .....	: 10.00
4. Interest at 5% for 6 months above expenses .....	: 1.00
5. Interest on land value as previous year .....	: 20.00
Total outlay for year .....	: 61.00
Outlay for previous years, 260.96	
lire, plus 5% .....	: 274.01
Cost of plants at end of second year in nursery .....	: 335.01

Third year in nursery.

1. Outlay as previous year .....	: 61.00
2. Outlay of previous years and interest at 5% .....	: 351.76
Cost of plants at end of third year in nursery .....	: 412.76

Cost of establishing a hectare of Almond Orchard

Cost item.	: Cost : per : hectare : Lire
1. Preparation of the ground for trees to be planted 7 meters apart, 200 holes at 25 lire each .....	: 500.00
2. Trees, 200 - 3 years old, ungrafted, taken from nursery, at .52 lira each .....	: 104.00
3. Carriage, preparing and planting of trees, 5 days work at 5 lire per day .....	: 25.00
4. Fertilizing 1/ .....	: 325.00
5. Props, 200 at .5 lira each .....	: 100.00
6. General expense and land tax .....	: 120.00
7. Interest at 5% for 6 months on above expenses .....	: 29.35
8. Interest at 5% on land value .....	: 400.00
Total cost for year .....	: 1,603.35
Net returns on vegetables grown between almond rows .....	: 83.35
Net cost for year .....	: 1,520.00

- 1/ For each plant 20 kilograms of slightly decomposed manure mixed with 10 kilograms of ashes; at 2.5 lire per quintal for manure and 10 lire per quintal for ashes, plus carriage, 25 lire.



## Budget of an Almond Orchard in Southern Italy

Expenses. 1/

Item	Periods and Years.					
	II.	III.	IV.	V.	VI.	
	10th-15th	16th-25th	26th-55th	56th-65th	66th-70th	
	Lire	Lire	Lire	Lire	Lire	
1. Hoeing the land once to depth of 25 to 30 centimeters and once to depth of 10 to 15 centimeters, 18 days	<u>2/</u>	90.00	90.00	90.00	<u>2/</u>	
2. Manure, 25 kilograms and ashes 10 kilograms per tree. Spreading included	<u>2/</u>	200.00	200.00	200.00	<u>2/</u>	
3. Pruning, 18 days	90.00	90.00	90.00	90.00	90.00	
4. Harvesting, and shelling almonds and sundry expenses until sale 2.5 lire per hectoliter. <u>3/</u>	50.00	75.00	120.00	75.00	50.00	
5. Land tax and general expenses. <u>4/</u>	80.00	90.00	90.00	90.00	80.00	
6. Administrative expenses, 5% on value of almonds in shell	60.00	90.00	120.00	90.00	60.00	
7. Annual quota of planting expenses. <u>5/</u>	26.00	26.00	26.00	26.00	26.00	
8. Interest on original value of land about 8000 lire ..	400.00	400.00	400.00	400.00	400.00	
9. Interest at 5% on annual expenditure on No. 1 above, for 6 months .....	7.00	16.60	19.40	16.60	7.75	
Total expenses	713.00	1,107.60	1,185.40	1,107.60	743.75	

1/ The first period from the first through the ninth year has been omitted as receipts practically balanced expenditures and the trees benefitted by the fertilizing.

2/ Receipts balanced expenditures. See note 1/

3/ Almonds in the shell bring on an average of 60 lire per hectoliter.

4/ General expenses increase with increased production.

5/ Not included under general expenses.

Budget of an Almond Orchard in Southern Italy. Cont'd.

Item.	Returns				
	Periods and Years.				
	II. 10th-15th	III. 16th-25th	IV. 26th-35th	V. 36th-45th	VI. 46th-55th
	Lire	Lire	Lire	Lire	Lire
1. Wood from pruning, fagots. 1/	100.00	115.00	115.00	115.00	115.00
2. Husks, .3 quintal per hectoliter of almonds at 3 lire per quintal	18.00	27.00	36.00	27.00	18.00
3. Almonds in shell 60 lire per hecto- liter. 2/	1,200.00	1,300.00	2,400.00	1,800.00	1,200.00
Total returns	1,318.00	1,442.00	2,551.00	1,942.00	1,333.00
Profit per year	605.00	834.40	1,365.60	834.40	529.25

- 1/ 400 fagots for the second period, after the second period the wood from pruning increases about 15 per cent
- 2/ Average yields for second, third, fourth, fifth and sixth periods taken as 20, 30, 40, 30, and 20 hectoliters respectively:

Cost of establishing an Almond Orchard in Southern Italy.

Dr. M. Vivarelli and Dr. M. Marchio

Cost of item.	Cost
	per hectare.
	Lire
1. Preparing the ground for trees, 70 holes, 13 meters apart	175.00
2. 70 trees	56.00
3. Carriage and planting of trees, 5 days	23.00
4. Fertilizer and carriage, 25 lire per plant	105.00
5. Supports for trees	17.50
6. General expenses and land tax. (value of land 2000 lire)	80.00
7. Interest at 5% for 6 months on anticipated outlay	9.00
8. Interest at 5% on land value	100.00
Total outlay, first year	566.40
Less returns for vegetables grown between almond trees	40.00
Net outlay for first year	526.40

Cost of cultivating one acre of Almond Orchard in Sicily.

Dr. V. di Mattei

Item.	: Cost : per : hectare. : Lire
1. Plowing during December,	:
3 days ..... 15	:
2. Plowing during January,	:
3 days ..... 15	:
3. Plowing during February,	:
3 days ..... 15	:
4. Plowing during April,	:
3 days ..... 15	:
Total ..... 60	:

Expenses and receipts of an almond orchard in Sicily.

Expenses	
Item	: Cost per : hectare
	: Lire
Work on land .....	: 60.00
Harvesting and shelling .....	: 30.00
Pruning .....	: 24.00
Total .....	: 114.00
Interest on this outlay at 5% .....	: 5.70
Total .....	: 119.70

Receipts	
	:
6 "measures" of almonds at 80 lire per	:
"measure" .....	: 480.00
48 kilograms of ashes of almonds	: 5.84
Twigs from pruning .....	: 8.00
Total returns .....	: 491.84
Expenses .....	: 119.70
Profit .....	: 372.14

# Budget of a hectare of Almond Orchard in Sicily

Dr. V. di Mattei

Item of cost or returns.	Years					
	1st	2nd	3rd	4th	5th	6th
	year	year	year	year	year	year
	Lire	Lire	Lire	Lire	Lire	Lire
<b>COST:</b>						
Brought forward .....		316.54	441.36	554.42	709.58	872.49
Preparing ground .....	3.00					
Digging 205 holes for trees 1/ .....	51.25					
Fertilizer, manure 2/ .....	49.20			28.44	28.44	28.44
Spreading fertilizer .....	5.00					
Trees, 2 years old, 205 .....	82.00					
Props to support trees 3/ .....	14.35					
Planting .....	12.00					
Plowing, 3 days .....	45.00	45.00	45.00	45.00	45.00	45.00
Pruning .....				8.00	8.00	8.00
Grafting .....		18.00				
Loss of trees 4/ .....	50.00	50.00	50.00	50.00	50.00	50.00
General expenses and land tax .....	38.00	38.00	38.00	38.00	38.00	38.00
Interest 5/ .....	8.74	15.82	22.06	27.72	35.47	43.63
Cost for year .....	358.54	166.82	155.06	197.16	204.91	213.06
Total cost .....	358.54	483.36	596.42	751.58	914.49	1,085.55
<b>RETURNS:</b>						
Vegetables .....	42.00	42.00	42.00	42.00	42.00	42.00
Almonds .....						31.00
Wood from pruning .....						
Total returns .....	42.00	42.00	42.00	42.00	42.00	73.00
Excess of cost over returns .....						
Cost of almond production .....	316.54	441.36	554.42	709.58	872.49	1,012.55
Cost per kilogram 7/ ..						
	7th	8th	9th	10th	11th	12th
	year	year	year	year	year	year
<b>COST:</b>						
Brought forward .....	1,012.55	1,028.11	1,011.95	988.48	895.80	746.03
Fertilizer, manure .....	28.44	28.44	28.44	28.44	28.44	28.44
Plowing .....	45.00	45.00	45.00	45.00	45.00	45.00
Pruning .....	8.00	8.00	8.00	8.00	8.00	8.00
Loss of trees .....	50.00	50.00	50.00	50.00	50.00	50.00
General expense and land tax .....	38.00	38.00	38.00	38.00	38.00	38.00
Interest .....	50.62	51.40	50.59	49.42	44.70	37.30
Cost for year .....	220.06	220.34	220.03	218.86	214.23	206.74
Total cost .....	1,232.61	1,248.95	1,223.98	1,207.34	1,110.03	952.77
<b>RETURNS:</b>						
Vegetables .....	42.00	42.00	42.00	42.00		
Almonds .....	157.50	189.00	193.50	259.54	350.00	315.03
Wood from pruning .....	5.00	6.00	8.00	10.00	14.00	15.00
Returns for year .....	204.50	237.00	243.50	311.54	364.00	330.03
Excess of cost over returns .....	1,028.11	1,011.95	988.48	895.80	746.03	622.74
Cost of almond production .....	173.06	172.84	170.03	166.86	200.23	191.74
Cost per kilogram .....	.05	.05	.04	.29	.25	.27



Budget of a hectare of Almond Orchard in Sicily.  
Cont'd.

Item of cost and returns.	Years		
	13th	14th	15th
	year	year	year.
	Lire	Lire	Lire
COST:			
Brought forward .....	622.74:	465.81:	234.54
Fertilizer, manure .....	28.44:	28.44:	28.44
Plowing .....	45.00:	45.00:	45.00
Pruning .....	8.00:	8.00:	8.00
Loss of trees .....	50.00:	50.00:	50.00
General expense and land tax .....	38.00:	38.00:	38.00
Interest .....	31.13:	23.29:	11.72
Cost for year .....	200.57:	192.75:	181.16
Total cost .....	823.31:	658.54:	415.70
RETURNS:			
Vegetables .....			
Almond .....	337.50:	405.00:	585.00
Wood from pruning .....	20.00:	19.00:	18.00
Total returns .....	357.50:	424.00:	603.00
Excess of cost over returns .....	465.81:	234.54:	187.30
Cost of almond production .....	180.57:	173.73:	163.16
Cost per kilogram .....	.24:	.19:	.13

- 1/ Each hole 1 meter square and 1 meter deep.
- 2/ 1 1/2 quintals of manure the first year, none the second and third years, thereafter one half the trees fertilized each year.
- 3/ Chestnut wood stakes to which the trees are tied.
- 4/ Rough estimate
- 5/ First year, 5 per cent for six months on year's outlay, for later years 5 per cent on outlay of previous years.
- 6/ Cost for year less returns from vegetables and wood.  
Method of figuring cost favored by the Cost of Production Division, Bureau of Agricultural Economics considers the orchard established by the end of the sixth year, the cumulated cost up to that time being the basis for all later interest charges. The difference in this case is theoretical, not changing cost per pound expressed in cents.
- 7/ Based on yield of .7 kilograms per hectare for sixth year, 350 for seventh, 350 for eight, 430 for ninth, 580 for tenth, 800 for eleventh, 700 for twelfth, 750 for thirteenth, 900 for fourteenth and 1300 for fifteenth.
- 8/ Excess of returns over cost.

Budget of one hectare of Almond Orchard in Sicily,  
sixteenth to forty-first year.

Item	: : Per hectare :
	: Lire
COST:	:
Pruning, 18 days .....	: 37.00
Fertilizing one third of orchard	:
per year .....	: 70.00
Plowing, 3 days .....	: 45.00
Gathering, husking and drying almonds	: 58.00
General expense and land tax .....	: 38.00
Interest at 5% for six months	:
on advanced capital .....	: 7.20
Total cost .....	: 255.20
	:
RETURNS:	:
Almonds in shell, 10.45 quintals	: 469.25
Wood from pruning .....	: 30.00
Ashes from husks .....	: 10.00
Total returns .....	: 509.25
Profit .....	: 254.05

## Post-war cost of almond production in Sicily.

Cost per Hectare.

Cost Item	1st year		2nd year		3rd year		4th year		5th year		6-7th years		8th-10th years		11-15th years		16-20th years		21-40th years		41-50th years	
	Lire	year	Lire	year	Lire	year	Lire	year	Lire	year	Lire	year	Lire	year	Lire	year	Lire	year	Lire	year	Lire	year
Digging holes for trees	936.06																					
Fertilizing	234.00																					
Carriage and spreading of fertilizer	20.00																					
Filling holes	70.00																					
Seed almonds	5.10																					
Planting and marking	10.00																					
Props to support plants			5.00																			
Grafting																						
Hoeing, first time	1/ 15.00	2/ 20.00	3/ 20.00		5.50		15.00		15.00		140.00		140.00		140.00		140.00		140.00		140.00	
Pruning, gathering, tying and carrying of fagots					10.00																	
Gathering, shelling and spreading almonds to dry																						
Hoeing, second time																						
General expenses	12.00		15.00		15.00		20.00		15.00		120.00		120.00		120.00		120.00		120.00		120.00	
Taxes	70.00		70.00		70.00		70.00		70.00		70.00		70.00		70.00		70.00		70.00		70.00	
Management and overseeing	69.60		5.15		5.35		9.15		10.60		21.62		25.02		55.35		123.80		246.82		124.47	
Unforeseen expenses	73.03		6.15		6.66		9.60		11.13		22.70		26.27		30.69		39.00		50.69		43.16	
Int. on advanced expenses	75.40		4.05		4.20		5.05		7.01		14.43		16.55		19.33		24.57		31.92		27.19	
Total annual cost	1,610.14		139.66		744.21		207.60		240.74		495.45		552.34		663.37		343.62		1,096.44		933.62	

1/ Given as "summer hoeing."

2/ Includes setting props and tying up trees.

3/ Includes adjusting props.

4/ Includes untying grafts.

Post-war cost of almond production in Sicily.

Labor requirements per Hectare.

Item	Periods													
	1st	2nd	3rd	4th	5th	6th-7th	8th-10th	11-15th	16-20th	21-40th	41-50th	years	days	years
	year	year	year	year	year	years	years	years	years	years	years	years	days	days
Digging holes for trees..	78													
Fertilizing .....	4													
Filling holes .....	7					2		2	2.5	3				
Planting almonds and marking .....	1													
Grafting .....				4	.35									
Hoeling, first time .....		1/	2	1.5	1.5	14	14	14	14	14	14			
Pruning .....			2/	1	1	1	3/	4	6	6	6			
Hoeling, second time ....		1.5	1.5	5/2	1.5	12	12	12	12	12	12			
Gathering, shelling and spreading almonds to dry .....	4/1.5													
Women .....														
Men .....														
Gathering, tying and carrying fagots.....														

- 1/ Includes setting props and tying up trees.
- 2/ Includes adjusting props.
- 3/ Includes gathering, tying and carrying of fagots.
- 4/ Given as "summer hoeing".
- 5/ Includes untying grafts.

Annual income from an Almond Orchard in Sicily.

	:	Income
Eighth, ninth and tenth years.	:	per
	:	hectare.
	:	Lire
Almonds, 1 liter per tree, 156 trees at	:	
175 lire per hectoliter .....	:	273.00
Fagots from pruning, one fagot from 20	:	
trees, 8 fagots .....	:	12.00
Total annual income .....	:	285.00
	:	

Eleventh to sixteenth years.

	:	
Almonds 4 liters per tree, 624 liters ....	:	1,092.00
Fagots from pruning, 1 fagot from 16 trees	:	
10 fagots .....	:	15.00
Total annual income .....	:	1,107.00
	:	



Physical production of a hectare of almond orchard in Southern Spain. 1/

Product		Quantity		
		1st class land	2nd class land	3rd class land
Almonds, Malaga	Bu.	8	7	6
Almonds, Valencias	"	3	2	1
Fire wood	Quintals	2	1.5	1
Shells for fuel	"	2.2	1.8	1.4

Costs and returns for a hectare of almond orchard in Southern Spain. 1/

Item	First class land.	Second class land.	Third class land.
	Pesetas	Pesetas	Pesetas
<b>COST:</b>			
Pruning and cleaning trees. <u>2/</u> .....	20.00	15.00	10.00
Labor of draft animals. <u>3/</u> .....	75.00	75.00	75.00
Digging about trees, 6 days labor .....	21.00	21.00	21.00
Fertilizer for weaker trees .....	30.00	25.00	30.00
Plowing, 3 days labor .....	10.50	10.50	10.50
Gathering nuts .....	44.00	36.00	28.00
Transportation to store house .....	11.00	9.00	7.00
Storing .....	2.75	2.25	1.75
Yearly replanting .....	10.00	10.00	10.00
Watchman .....	15.00	15.00	15.00
Shelling, 1 peseta per bushel .....	11.00	9.00	7.00
Land tax .....	25.00	15.00	10.00
Assessments, other .....	1.86	1.54	.89
Tax on loading and unloading in village ..	2.20	1.80	1.40
Transportation to exporting house at seaport	11.00	9.00	7.00
Tax on unloading at seaport .....	2.20	1.80	1.40
Total cost .....	292.51	256.89	225.94
<b>RETURNS:</b>			
Almonds, Jordan or long .....	200.00	350.00	300.00
Almonds, Valencias or round .....	60.00	40.00	20.00
Fire wood .....	8.00	6.00	4.00
Shells, for fuel .....	2.20	1.80	1.40
Total returns .....	470.20	397.80	325.40
Profit .....	177.69	140.91	99.46

1/ Conversion of the fanego to American bushels apparently was made previous to the first draft obtained.

2/ Original reads "4 laborers working on the pruning and cleaning of trees on first class land; 3 on 2nd class and 2 on 3rd at 5 pesetas per head".

3/ Original reads "5 mules working at the rate of 3 on first class, 2 on second and 2 on third".

Cost of planting almonds in France.

Cost item.	: Cost per : tree.
	: Francs
Price of trees grafted .....	4.00
Labor in planting: .....	:
Excavating for tree .....	2.00
Disinfecting excavations <u>1/</u> .....	1.35
Planting tree .....	.35
Total .....	7.70

Cost of tending and producing almond orchard.

Fertilizing and working .....	: 312.50
Harvesting, caring for trees, destruc- tion of parasites, cleaning and pruning .....	: 187.50
Total .....	: 500.00

1/ Either humus is burned in the hole for disinfection or chemical fertilizer is required.

French Almond Grading Sieves.

Number of sieve	: Diameter : of mesh : Millimeters	Number of sieve	: Diameter : of mesh : Millimeters
32	: 10	38	: 17
32 bis <u>1/</u>	: 10.5	38 bis <u>1/</u>	: 18
33	: 11	39	: 18.5
33 bis <u>1/</u>	: 11.5	39 bis <u>1/</u>	: 19
34	: 12	40	: 20
35	: 13	40 bis <u>1/</u>	: 21
35 bis <u>1/</u>	: 13.5	40 ter <u>2/</u>	: 22
36	: 14	41	: 23
37	: 15	41 bis <u>1/</u>	: 24
37 bis <u>1/</u>	: 16	42	: 25
37 ter <u>2/</u>	: 16.5	:	:
	:	:	:

1/ Double  
2/ Triple

Almond quotations in Bari, November 5, 1923.

Grade	: Price per bale. 1/
	: Lire
La Bari .....	: 775
Andria .....	: 785
Selected Santoro, 18 to 20 per oz.....	: 1300
Best Bitters .....	: 480

1/ Bags of 220 pounds gross, f.o.b. Bari, for cash payment upon delivery of documents.

Almond quotations in Catania, November 5, 1923.

Firm A	
Grade	: Price per : cwt. 1/ : Shillings
Palma-Girgenti .....	: 80
Etnas .....	: 85
Current Avola .....	: 85
Selected Avola .....	: 140

Firm B	
Grade	: Price per : bale. 2/ : Lire
Almonds in shell "Cañalliere" in bags of 50 kilograms, 570 lire at warehouse - profit	:
20 lire - transport 3 lire .....	: 593
Palma-Girgenti in bags of 1 quintal, 762 lire at warehouse - profit 30 lire - transport 3 lire .....	: 795
Bitters in bags of 1 quintal 430 lire at warehouse, profit 20 lire - transport 3 lire.	: 453
Avola Giants in bags of 1 quintal, 975 lire at warehouse - profit 75 lire - transport 3 lire .....	: 1053
Avolas very selected in cases of 50 kilograms net, 1600 lire at warehouse - profit 65 lire cases 30 lire - transport 5 lire: 3/	: 1700
37 bis 4/ .....	: 1700
37/37 .....	:
Avolas very selected in cases of 50 kilograms net, 1400 lire at warehouse - profit 55 lire cases 30 lire - transport 5 lire: 3/	:
36/37 .....	: 1490
34/36 .....	: 1490

Almond quotations in Catania, November 5, 1923. Cont'd.

Firm B Cont'd.	
Grade	: Price per bale. 2/ Mre
Etnas in bags of 220 pounds: 5/	:
Extra large	:
Large	:
Medium	: 910
Small	:

- 1/ Cwt. of 112 pounds, f.o.b. Sicily.
- 2/ Bale of 220 pounds, f.o.b. Catania.
- 3/ Three fifths of the "very selected Avolas" sold are 37 bis and 37/37: two fifths are 36/37 and 34/36
- 4/ "37 bis" - 37 double.
- 5/ Fifteen per cent of Etna almonds sold are "extra large" 20 per cent "large", 25 per cent "medium", and 40 per cent small.

Almond quotations in Palma, Majorca, November 5, 1923.

Grade	: Price per cwt. 1/ Shillings
Selected crops	: 82
Second grade	: 76

Price includes cost and freight to New York.

- 1/ Cwt. of 112 pounds.

Almond quotations in Reus, November 5, 1923.

Grade	: Price per bale. Shillings
Longuettes courantes	: 180-195
Esperance premieres	: 170-175
Esperance courantes	: 160-165
Communes	: 155-160
Almonds in shell, mollars courantes. 1/	: 72-80

Cost and freight to London without insurance, payment on delivery of documents,  $1\frac{1}{2}$  per cent discount and 1 per cent commission.

- 1/ Quoted as 39-40 shillings per 50 kilograms.



Almond quotations in Valencia, November 5, 1923.

Grade	: Price per : cwt. 1/ : Shillings
Majorcas:	:
"Selected" quality .....	: 79
"Farmers" quality .....	: 72
Planetes .....	: 110
Marconas .....	: 105
Almonds in shell, Ibizas <u>2/</u> .....	: 29
	:

In bags of 2 cwt. (224) pounds ) gross, f.o.b. Valencia.  
1/ Cwt. of 112 pounds.  
2/ Perbag of 110 pounds gross.

Almond quotations in Alicante on November 5, 1923.

Grade	: Price per : box. : Shillings:Pence
"Fancy"; in boxes of 28 pounds net .....	: 32 : 6
"Finest" " " " " " " .....	: 28 :
"Medium" " " " " " " .....	: 28 :
"Venus" " " " " " " .....	: 28 :
"Bulldog" " " " " " " .....	: 24 : 6
"Cat brand" " " " " " " .....	: 24 : 6
	: Price per cwt.
" <del>Trih</del> " in bags of 2cwt. gross .....	: 85
"Broken" in bags of 2cwt. gross .....	: 66

Price includes cost and freight to New York.  
1/ Cwt. of 112 pounds.

Almond quotations in Magador on November 5, 1923.

Grade	: Price per : bale. : Francs
Sweet Almonds:	:
First quality Haha, not over 2 per cent bitters .....	: 470
Second quality Sous, not over 5 per cent bitters .....	: 435
Bitter almonds .....	: 260
	:

Prices f.o.b. Magador; freight on almonds from Magador  
to New York by way of London is 100 shillings per ton  
(this being a British rate it is assumed that it ap-  
plies to a long ton)



Almond quotations in Marseilles, on November 5, 1923.

Grade	Price per bale
	Francs
Shelled Almonds:	
Andria (c.i.f.)	595
Prima Bari (c.i.f.)	580
Majorca (Proprietaire c.i.f.) 1/	555
Majorca (Inca c.i.f.) 2/	600
Casablanca (c.i.f.)	500
Casablanca (spot)	515
Palma-Girgenti (c.i.f.)	600-615
Magador (c.i.f.)	505
Provence	650
Sfax	635
Almonds in the Shell:	
Aberannes	175
Hard shell	120-125
Iveza	250
Mollarettes (c.i.f.)	260
Molieres	Not quoted
Molleses soft shell	" "
Molleses Ordinary	225
Princess Papershell (plains)	460
" " (hills)	445
Provence Matheronnes	Not quoted
Ais	300
Provence a la Dame	225-260
Afax (c.i.f.)	250
Tarragonas (nominal)	290

1/ The quotation of Majorcan almonds in Marseilles as "proprietaire" and "Inca" apparently distinguishes between stock coming directly from the grower or land owner (the proprietaire) and those coming from the market in the Majorcan city of Inca. This is indicated in the tables of Valencia prices where Majorcan almonds are quoted as "Selected" quality and "Farmers" quality.

Range of Almond prices anticipated in November, 1923  
for ~~M~~arseilles during the season of 1923-1924.

Grade	: : Prive per bale.
	: : Francs
Soft Shelled:	:
Princesse (according to quality and origin) .....	: 450-500
Ai .....	: 275-300
Languedoc .....	: 260-270
A la Pene .....	: 225-250
Semi-Soft Shelled:	:
Matheronne .....	: 210-225
Moliere .....	: 150-170
Aberanne (according to quality) .....	: 175-200
Hard Shelled:	:
Flot .....	: 130-140
Beraude .....	: 125-130
Tournefort .....	: 120-125
Dures Communes <u>1/</u> .....	: 100-115

1/ Ordinary hard.

Almond quotations in London, on November 5, 1923.

Grade	Price per cwt. <u>1/</u>
	Shillings
Shelled Almonds:	
Valencia (according to grade)..	110-135 ex. wharf
Jordan (according to grade)...	125-25 " "
Alicante (according to grade)..	110-135 " "
Etna .....	95 c. & f.
Majorca:	
Current quality .....	67 c. & f.
" " .....	77/6 ex. wharf
Selected .....	79 c. & f.
" .....	90 ex. wharf
Palma-Girgenti: .....	82/6 c. & f.
" " .....	92/6 ex. wharf
Bari:	
Prima .....	75 c. & f.
Current selected .....	87 c. & f.
Large Hand picked .....	101 c. & f.
Canary:	
Teneriffe .....	92/6 ex. wharf
Round - Pas Palmas .....	87/6 " "
Almonds in the shell:	
Carthagena <u>2/</u> .....	39 c. & f.
Tarragona <u>2/</u> .....	41 c. & f.
Iviza <u>2/</u> .....	54 c. & f.
French Hard Shell .....	20 c. & f.

1/ Cwt. of 112 pounds.  
2/ Per bag of 110 pounds.

It will be noticed that the "ex. wharf" quotation for any class is somewhat above the "cost and freight" quotation for the same class: "ex. wharf" indicates that all wharf charges have been paid, "cost and freight" includes only cost and freight to the wharf.