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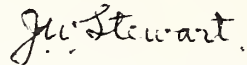
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The Almond Industry of Italy

FOREWORD

Italy is the world's largest producer and exporter of almonds, and therefore a main competitor of California's growing almond export business.

Although recently U.S. almond production and exports have risen very rapidly by contrast with any other major producer's, Italy's advantage in EEC markets--as a member country--may tend to limit U.S. opportunities there. Italian sales in the EEC may tend to divert U.S.--and other--supplies to alternative markets, particularly "other Europe." However, the EEC market for almonds continues to expand, possibly indicating increased opportunities for more than one supplier in future.



J. W. Stewart, Director
Fruit and Vegetable Division

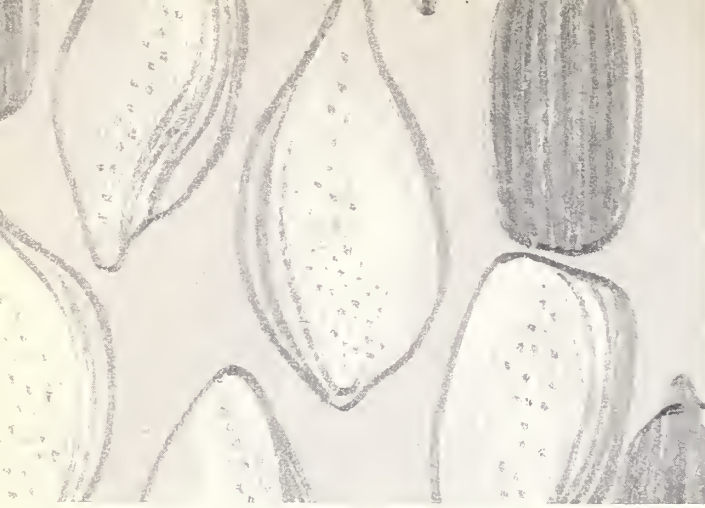
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HOW PRODUCTION FIGURES WERE DERIVED

FAS statistics on Italian almond production cover only commercial production i.e., that which enters marketing channels. In Italy, commercial production is concentrated in the region of Puglia and in Sicily; some minor quantities also originate in Sardinia. Estimates of commercial production are obtained from members of the Italian trade. Often information on the Italian commercial crop is also available from import firms in Germany, United Kingdom, Netherlands, and other countries which traditionally purchase substantial quantities of Italian almonds. These estimates of Italian commercial production are not the official Italian government figures on almond production. The official figures, released by the Istituto Centrale di Statistica annually, are for all of Italy--commercial and noncommercial areas--and are on an unshelled basis.

Data in this study are presented on a shelled basis, unless otherwise indicated. In the 5 years 1959-63, total production averaged 219,821 short tons, unshelled, according to the official figures. At an assumed shell-out of 20 percent, this production in terms of kernels would have averaged 43,960 tons, which is 16.6 percent above the FAS average for 1959-63 for commercial production of 37,700 tons. The official figures for Sicily and Puglia alone averaged 193,350 tons, unshelled, or 38,670 tons of kernels (at a 20 percent yield), differing from the estimate of commercial production by only 2.6 percent. However, comparison of multi-year averages conceals substantial differences in some individual years. This is probably caused by inadequate allowance for variations in shellout yields from one year to another when an invariable yield of 20 percent is assumed. Since some varieties have a higher shell-out than others, and since the production of individual varieties may vary from one year to the next, the average shell-out would be correspondingly affected. Sardinian almonds may also be included in the commercial tonnage.



The Almond Industry of Italy

By HARRY C. BRYAN*

In most recent years, Italy has led the world in commercial production of almonds, and in their export. The 1963 and 1964 Italian almond crops had a value of \$69.4 million and \$44.2 million, respectively. For the 5-year period, 1960-64, Italy's almond export earnings averaged \$34.7 million annually, and during a recent year they equalled nearly 10 percent of total value of agricultural exports.

However, in Italy almond production, is cyclical in nature, and is characterized by especially sharp year-to-year fluctuations. While Italy's commercial production in the 10-year period of 1955-64 averaged 32,400 tons, and overshadowed that of other producers, Italian crops in the same period were as large as 66,000 tons, in 1961, and as small as 13,000 tons, in 1956.

As a result, during the same 10-year period, Italy led other major producers--Spain, the United States, Portugal, Iran, and

Morocco--for only 5 years, Spain led world production another 4 years, the United States the remaining one. Exports reflect to some extent these fluctuations: during this 10-year period, Italian almond exports were the world's highest for 7 years, but Spain's led for 3 years.

Italian production shows no trend. Among major producers, the most marked change has been taking place by contrast in the United States, which in 1964 and 1965 produced about twice its own average for the 1950-54 period, and which in both 1963-64 and in 1964-65 shipped about 9,500 short tons contrasted with no exports in the 1935-39 period. (World production as defined by the Foreign Agricultural Service comprises commercial production in only the above six countries. Not included is the production, usually of minor commercial significance, of Algeria, Australia, Cyprus, France, Greece, Libya, Tunisia, Turkey, and other countries.)

PRODUCTION

Several aspects of Italian almond production are particularly worthy of note. These include concentration of plantings near the "heel" of southern Italy in the region of Puglia and in the two islands, Sicily and Sardinia; the small size of plantings and the high incidence of mixed plantings; and the use of traditional

cultural practices which tend to restrict yields. For export purposes, the production of a very large number of varieties tends to be a drawback, since it makes standardization difficult.

Cultural practices have had a profound influence on Italian almond production. Prominent

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Table 1.--ALMONDS: Estimated commercial production, shelled basis, in specified countries, selected averages 1935-64, annual 1950-65

Year	Iran	Italy	Morocco	Portugal	Spain	Foreign total	United States	Grand total
	1,000 short tons	1,000 short tons	1,000 short tons	1,000 short tons	1,000 short tons	1,000 short tons	1,000 short tons	1,000 short tons
Average:								
1935-39.....	7.5	31.8	2.8	3.0	23.1	68.2	7.4	75.6
1950-54.....	7.6	39.2	3.0	5.3	26.2	81.3	20.0	101.3
1955-59.....	8.0	29.8	3.0	3.2	24.2	68.2	23.8	92.0
1960-64.....	6.6	35.1	3.3	3.3	30.8	79.1	33.0	112.1
Annual:								
1950.....	7.2	55.0	3.9	5.3	28.0	99.4	19.7	119.1
1951.....	7.7	24.0	3.5	3.4	29.0	67.6	20.8	88.4
1952.....	7.7	45.0	2.2	6.1	27.0	88.0	17.6	105.6
1953.....	6.6	38.0	3.3	6.2	28.0	82.1	19.7	101.8
1954.....	8.8	34.0	2.1	5.6	20.0	70.5	22.2	92.7
1955.....	4.7	21.0	1.7	3.5	13.0	43.9	19.2	63.1
1956.....	5.5	13.0	1.6	2.6	18.0	40.7	30.1	70.8
1957.....	11.0	51.0	2.0	4.3	32.0	100.3	18.1	118.4
1958.....	9.0	15.0	6.3	2.2	26.0	58.5	9.6	68.1
1959.....	10.0	49.0	3.6	3.3	32.0	97.9	42.2	140.1
1960.....	4.0	14.0	2.7	1.2	33.0	54.9	26.8	81.7
1961.....	9.0	66.0	4.0	5.8	35.0	119.8	35.7	155.5
1962.....	8.0	14.5	2.2	4.3	20.0	49.0	26.6	75.6
1963.....	5.5	42.0	3.1	1.3	31.0	82.9	34.5	117.4
1964.....	6.6	39.0	4.4	4.0	35.0	89.0	41.3	130.3
1965 ¹	7.7	40.0	7.2	4.7	30.0	89.6	39.8	129.4

¹ Preliminary.

Source: Foreign Agricultural Service. Estimated on basis of reports of Agricultural Attaches and foreign sources - commercial and governmental.

are traditional beliefs that almond trees will yield some return from even a poor or dry piece of land where hardly any other crop would be worth raising. A companion attitude is that since almond trees yield something under unfavorable conditions, relatively little care is required. There is little use of fertilizer or pesticides; systematic pruning is not practiced; and few efforts have been made to improve output by irrigation, planting of better varieties, or use of other modern cultural practices. Thus, raising of almonds with a view to maximizing output and income is relatively uncommon, and the natural tendency of almonds toward alternate-bearing years is not mitigated by progressive cultural practices.

Italian almond production shows no long-range growth trends. For the most recent 10 years, 1955-64, the average has been little

different from prewar. Except for 1961, when the pack of 66,000 tons was largest on record, there has been little deviation from the level of earlier years.

CLIMATE AND RAINFALL

Climate is particularly favorable for almond-growing in parts of Puglia and the island of Sicily because of Mediterranean-type features. The island of Sardinia also possesses such a climate. In all these areas, winters are mild and short.

In Puglia's province of Bari, for instance, the average daily minimum temperature in the three coldest months of the year--December, January, and February--is 42°, 40°, and 41° F. respectively. Frost occurs, of

Table 2.--ALMONDS: Exports from specified countries, shelled basis, selected averages, 1935-64, and annual 1950-64

Year beginning August 1	Iran ¹	Italy	Morocco ²	Portugal	Spain	United States	Grand total
	Short tons	Short tons	Short tons	Short tons	Short tons	Short tons	Short tons
Average:							
1935-39.....	4,622	³ 29,426	1,509	2,661	24,120	--	62,338
1950-54.....	5,617	³ 33,794	1,523	6,353	17,013	2,998	67,298
1954-63.....	5,416	26,068	1,866	3,995	19,134	5,345	61,824
Annual:							
1952.....	5,765	31,391	1,048	5,841	18,701	1,360	64,106
1953.....	5,146	40,196	1,111	7,421	19,488	3,922	77,284
1954.....	7,357	30,773	828	9,758	8,385	3,712	60,813
1955.....	4,195	17,444	1,136	6,098	5,173	2,977	37,023
1956.....	3,645	9,737	830	3,248	6,615	6,963	31,038
1957.....	5,559	32,928	4,492	3,130	24,789	4,605	75,503
1958.....	9,386	14,482	2,849	2,337	14,758	1,007	44,819
1959.....	5,054	30,931	1,776	1,568	32,055	9,395	80,779
1960.....	3,077	22,483	2,893	2,476	29,014	5,658	65,601
1961.....	4,685	48,023	1,153	4,966	33,811	4,912	97,550
1962.....	8,093	20,496	1,207	3,932	14,957	4,728	53,413
1963.....	3,111	33,380	2,700	2,606	23,100	9,497	74,394
1964.....	2,491	28,305	⁴ 3,100	2,530	⁴ 27,400	9,457	73,283

¹ Year beginning March 20.

² Calendar year of the following year shown.

³ Year beginning January 1.

⁴ Estimated.

Source: Official trade statistics for each country, except Spain for 1960 on, export registrations by Sindicato Nacional de Frutos y Productos Horticolas.

course, during these months as well as in late fall and early spring, but severe freezing weather is uncommon. As evidence of the brevity of winter in southern Italy, the growing season is approximately 300 days. In Sicily, winters are even milder than in Puglia. In Siracusa, prominent almond-growing area of Sicily, December-February ranges from a low of 47°F. to a high of 58°F. There, summers are sunny, dry, and warm-to-very-warm. The average daily maximum for the two hottest months of the year is, in Bari, 81°F. for both July and August, and in Siracusa, it is 80°F. in July and 83°F. in August.

In these areas, the rainfall pattern, too, is favorable to almond culture. Precipitation is very light in June, July, and August and particularly heavy in November, December, and January. Dryness in summer inhibits development of almond diseases, and in addition provides ideal conditions for harvesting the nuts. Wetness in winter, conversely, provides much-needed moisture reserves and occurs at a

time when there is minimum interference with field work. The annual average totals of 22.5 inches at Bari and 24.8 inches at Siracusa are ample for growing, however, and as a result no irrigation is employed.

Averages, of course, do not reveal deviations from the "normal." Rain during blossoming, for instance, has in some years seriously reduced crops, as have severe late winter freezes and March frosts. Also, occasional dry hot winds (the "sirocco") from the Sahara desert have adversely affected crops in Sicily.

PRODUCTION BY AREA

In Puglia, of its five provinces, four--Bari, Brindisi, Foggia, and Taranto--produce appreciable quantities of almonds. Only a negligible tonnage is grown in Lecce, the province in the very tip of the "heel." Bari is by far the most important almond producing province--not only in Puglia but in all of Italy. Bari

Table 3.--ALMONDS: Italy, total production¹, in-shell², average 1959-63, annual 1961-65

Province and Region	Average	1961	1962	1963	1964 ³	1965 ³
	1959-63					
	1,000 short tons	1,000 short tons	1,000 short tons	1,000 short tons	1,000 short tons	1,000 short tons
Puglia:						
Bari.....	58.0	111.2	10.9	93.1	66.1	72.0
Brindisi.....	6.7	11.4	1.0	9.6	5.8	6.1
Foggia.....	10.1	14.2	5.0	17.5	12.0	15.0
Lecce.....	.8	.7	.7	1.0	.8	1.0
Taranto.....	12.0	15.1	6.7	16.2	14.4	13.3
Total Puglia.....	87.6	152.6	24.3	137.4	99.1	107.4
Percent of Grand Total..	39.9	42.1	22.3	57.9	35.1	43.0
Sicily:						
Agrigento.....	26.3	51.0	15.8	17.5	40.0	23.1
Caltanissetta.....	16.4	24.5	8.5	14.8	26.7	28.9
Catania.....	6.7	9.1	4.4	5.7	6.5	9.6
Enna.....	15.5	21.3	12.8	11.8	16.2	19.5
Messina.....	2.7	5.0	.9	2.9	1.4	2.4
Palermo.....	5.7	9.3	3.2	7.4	6.7	10.1
Ragusa.....	8.5	14.3	3.3	1.2	17.5	7.7
Siracusa.....	18.8	30.9	7.2	8.1	34.8	6.9
Trapani.....	5.1	6.2	2.6	2.3	4.1	6.8
Total Sicily.....	105.7	171.6	58.7	71.7	153.9	115.0
Percent of Grand Total..	48.1	47.4	53.8	30.2	54.6	46.1
Sardinia:						
Cagliari.....	11.5	18.5	12.4	7.3	9.2	8.6
Nuoro.....	2.6	4.1	2.2	4.1	4.1	2.1
Sassari.....	.5	.8	.3	.3	.5	.3
Total Sardinia....	14.6	23.4	14.9	11.7	13.8	11.0
Percent of Grand Total..	6.6	6.5	13.7	4.9	4.9	4.4
Total above.....	207.9	347.6	97.9	220.8	266.8	233.4
Percent of Grand Total..	94.6	96.0	89.8	93.0	94.6	93.5
Other Provinces.....	11.9	14.5	11.1	16.7	15.2	16.2
Percent of Grand Total..	5.4	4.0	10.2	7.0	5.4	6.5
Grand Total.....	219.8	362.1	109.0	237.5	282.0	249.6

¹ These are official statistics for total production, commercial and non-commercial. ² To convert to a shelled basis, a conversion factor of 20 percent is used. ³ Preliminary.

Source: Istituto Centrale di Statistical, Rome.

produces over 26 percent of Italy's almonds, while the Puglia region accounts for 40 percent of the national total, according to the official statistics.

Sicily accounts for 48 percent of Italy's almonds. All nine of Sicily's provinces raise appreciable tonnages. Agrigento, on the southwest coast, is the leading province with 12 percent of the nation's total output. Siracusa, on the southeast coast, is next with 8.6 percent, followed by Caltanissetta and Enna in central Sicily, with 7.5 and 7 percent respectively.

In Sardinia, Cagliari produces over 5 percent of Italy's almonds, and Nuoro over 1 percent.

Only about 5 percent of Italy's almonds are produced in all other, i.e., non-commercial, areas.

Although, on the average, Sicily accounts for 48 percent and Puglia 40 percent of Italy's production, these proportions are by no means constant. Weather causes considerable variation in the relative importance of a region's crop. In 1963, for example, Puglia's share was 58 percent and Sicily's only 30 percent. In 1960, however, Puglia produced only 19 percent of Italy's almonds compared with 64 percent for Sicily. Sardinia's share has also fluctuated greatly. In the 5-year period under consideration Sardinia accounted for as little as 3.7 percent in 1959 and for as much as 13.6 percent in 1962.

ACREAGE, TREE NUMBERS, YIELDS

Almond acreage in Italy is of two categories: "specialized" and "mixed." Specialized acreage refers to orchards solidly planted with almond trees. Mixed refers to almond trees interplanted with other types, such as olives, or with vines. Italian technicians have estimated that there are 150 almond trees per hectare in specialized plantings (60.73 trees per acre) and only 30 trees per hectare (12.15 trees per

acre) in mixed plantings, or five times as many trees per acre in a specialized planting as in a mixed planting. In the most intensive almond-growing communities of Sicily (such as Avola) about 100 trees per acre serves as a "rule-of-thumb" for specialized plantings.

Sicily leads in specialized acreage, Puglia in mixed; however, Bari has a substantial acreage of both. There is no consistent pattern within Sicily. In Agrigento, the heaviest producing province, solidly-planted acreage predominates, as it does also in Siracusa and Enna. In Caltanissetta, Catania, and Ragusa there is a much larger acreage in mixed than in solid stands.

In terms of production, less than half of Puglia's crop is from solidly planted orchards while about three-fourths of Sicily's output is from such plantings. In Sardinia, only a little more than a third of the crop is from specialized plantings. Of Italy's entire commercial production, roughly three-fifths of the crop is from trees in specialized plantings.

Almond acreage in the commercial area has trended slightly downward since 1958. The 1964 area of 403,500 acres in specialized plantings was 14,600 less than in 1958, a decline of 3.5 percent while the area in mixed plantings declined by 52,800 acres or 5 percent, in the same period.

Specialized acreage in the noncommercial areas¹ amounted to only 1 percent of the national total in 1964 and mixed acreage less than 9 percent of the total. However, data on the non-commercial areas are of questionable value because of the great difficulty in obtaining accurate statistics for a crop in areas where it is of little importance. Thus, the apparent drastic decline of mixed almond acreage in the noncommercial areas--from 923,400 acres in 1955 to 93,200 acres in 1964--is probably largely a statistical artifact. Production figures for the non-commercial areas would be similarly of dubious reliability.

¹ Areas other than Puglia, Sicily, and Sardinia.

Table 4.--ALMONDS: Italy, acreage in specialized and mixed plantings, selected years

Region and province	1955		1960		1964 ¹		1965 ¹	
	Special- ized	Mixed	Special- ized	Mixed	Special- ized	Mixed	Special- ized	Mixed
	1,000 <u>acres</u>	1,000 <u>acres</u>	1,000 <u>acres</u>	1,000 <u>acres</u>	1,000 <u>acres</u>	1,000 <u>acres</u>	1,000 <u>acres</u>	1,000 <u>acres</u>
Puglia								
Bari.....	132.2	412.2	129.2	409.4	126.5	406.6	126.2	406.1
Brindisi.....	5.9	125.0	6.2	97.9	5.3	96.3	5.3	96.3
Foggia.....	4.0	23.2	3.5	20.8	3.3	19.8	3.3	19.8
Lecce.....	.5	6.2	--	4.2	.1	3.2	.1	3.1
Taranto.....	16.8	30.1	16.3	28.9	15.8	28.0	15.1	27.7
Total.....	159.4	596.7	155.2	561.2	151.0	553.9	150.0	553.0
Sicily								
Agrigento.....	79.6	36.1	84.8	34.8	85.6	30.2	84.2	28.8
Caltanissetta..	30.6	78.3	32.1	80.1	32.0	80.0	32.1	80.1
Catania.....	20.8	187.3	15.6	186.3	13.4	158.6	12.4	158.6
Enna.....	4.7	20.5	40.0	8.4	40.1	8.6	40.1	8.6
Messina.....	3.0	36.1	4.2	1.5	4.1	4.3	4.1	4.4
Palermo.....	5.9	26.7	4.0	18.3	4.1	18.4	4.0	18.4
Ragusa.....	10.1	19.5	8.4	63.3	8.3	63.9	8.3	64.0
Siracusa.....	48.2	10.4	48.2	10.4	44.8	12.0	43.8	12.7
Trapani.....	5.4	17.3	5.4	17.3	5.5	17.3	5.5	17.3
Total.....	208.3	432.2	242.7	420.3	237.9	393.3	234.5	392.9
Sardinia								
Cagliari.....	12.6	34.8	15.3	33.6	12.3	34.1	11.3	32.5
Nuoro.....	2.2	39.3	2.5	13.1	2.2	11.7	2.2	11.4
Sassari.....	--	--	--	1.0	.1	.9	.1	1.0
Total.....	14.8	74.1	17.8	47.7	14.6	46.7	13.6	44.9
Total above.....	382.5	1,103.0	415.7	1,029.2	403.5	993.9	398.1	990.8
Other provinces..	4.0	923.4	4.2	100.1	4.2	93.2	3.9	83.3
Grand Total.....	386.5	2,026.4	419.9	1,129.3	407.7	1,087.1	402.0	1,074.1

¹ Preliminary.

Source: Istituto Centrale di Statistica, Rome.

Each of the commercial regions has been subject to the downward trend in acreage since 1958. In Sicily, though some important provinces, such as Agrigento, Caltanissetta, and Enna have more than held their own in the case of specialized plantings, the decrease in specialized acreage in other provinces and in mixed plantings in Sicily as a whole has been large enough to result in a slight net reduction in total acreage for Sicily. In Puglia, specialized acreage declined by 3.6 percent over the

6-year period while the mixed acreage dropped 6.1 percent.

In the all-important province of Bari, the acreage decline for each category was not as marked as for the other provinces in the Puglia region. In Sardinia, specialized acreage also declined slightly between 1958 and 1964; mixed acreage, however, suffered a somewhat sharper reduction--mainly in the province of Nuoro.

Table 5.--ALMONDS: Italy, estimated tree numbers¹, specialized and mixed, in commercial areas for selected years

	Puglia	Sicily	Sardinia	Total
	1,000 <u>trees</u>	1,000 <u>trees</u>	1,000 <u>trees</u>	1,000 <u>trees</u>
1955:				
Specialized.....	9,680	12,650	899	23,229
Mixed.....	7,247	5,250	900	13,397
Total.....	16,927	17,900	1,799	36,626
Percent of total.....	46	49	5	100
1960:				
Specialized.....	9,425	14,739	1,081	25,245
Mixed.....	6,816	5,105	580	12,501
Total.....	16,241	19,844	1,661	37,746
Percent of total.....	43	53	4	100
1964:				
Specialized.....	9,170	14,447	887	24,504
Mixed.....	6,728	4,777	567	12,072
Total.....	15,898	19,224	1,454	36,576
Percent of Total.....	43	53	4	100
1965 ² :				
Specialized.....	9,109	14,241	826	24,176
Mixed.....	6,717	4,772	545	12,034
Total.....	15,826	19,013	1,371	36,210
Percent of total.....	44	52	4	100

¹ Acreage from Istituto Centrale di Statistica multiplied by tree density as estimated by Italian technicians: 150 trees per hectare (60.729 trees per acre) for specialized plantings and 30 trees per hectare (12.146 trees per acre) for mixed plantings. ² Preliminary.

Italy is the world's leader in number of almond trees. There were an estimated 36.6 million almond trees in the commercial area of Italy in 1964 (based on the assumed densities in the specialized and mixed plantings compared with an estimated 30 million trees in Spain and 9 million trees in California. This represents a 4 percent decline in Italian tree numbers since 1958. Regionally, these estimates indicate a decrease of 785,000 trees, or 4.7 percent in Puglia, 623,000 trees or 3.1 percent in Sicily, and 120,000 trees or 7.6 percent in Sardinia. In 1964, Sicily's 19.2 million trees represented 52.5 percent of the almond trees in Italy's commercial areas

while the 15.9 million trees in Puglia accounted for 43.5; Sardinia's 1.5 million trees made up the balance of 4.0 percent.

Two-thirds of the trees--in Puglia, Sicily, and Sardinia combined--are in specialized plantings. Sicily has a substantially higher proportion (75 percent) of its trees in specialized plantings than Puglia (58 percent).

The Italian government does not publish per-acre or per-tree yields. Nor is it possible to derive meaningful yields by dividing acreage into production, since the latter includes the harvest from both specialized and mixed

acreage, and markedly different cultural conditions are thus involved. Nor do the statistics distinguish between bearing and non-bearing trees. If these differences are ignored and an attempt is made to obtain an overall average, then for the period 1955-64² the average yield would have approximated 1.76 pounds of kernels, or 8.8 pounds in-shell basis, per tree in the commercial districts. At the previously mentioned planting density of 60.7 trees per acre for solid orchard stands, the calculated yield would be 534 pounds per acre, in the shell. Though this is considerably less than the California yield (1959-63 average) of 1,364 pounds per acre it is quite similar to yields in certain parts of Spain.

VARIETIES

There are multitudes of almond varieties in Italy; supposedly some 1,200 have been identified. They are mostly sweet varieties, but some bitters also are produced. Hard and semi-hard shell varieties are mostly of little merit; but a few--both in Sicily and on the mainland--possess excellent qualities. However, the "excessive" number of varieties cultivated in any region of Italy is considered by the trade there to be "an important negative aspect" of Italian almond culture. The production of only a small tonnage for each of many varieties results in great heterogeneity of Italian almonds, and it is both difficult and costly to pack out a large quantity of homogeneous almonds conforming to well-defined standards.

The varieties grown in Sicily and Puglia are different. Sweet Sicilian almonds, mainly hard-shelled, are classified³ as follows by the Italian trade:

1. "Choice Avola" (Avola scelta) is the trade designation mainly for kernels of the variety "Pizzuta d' Avola," which is grown chiefly in the provinces of Siracusa and

² For tree numbers, only the years 1955, 1958, 1960, 1962, 1963, and 1964 averaged.

³ Francaviglia, G. Tecnica Agricola, Anno X, No. 1-2, 1958, Catania, Sicily.

Ragusa. It is grown for export, commands a high price, and is highly desired by confectionery manufacturers.

2. "Common Avola" (Avola corrente) is the trade designation for kernels of the variety "Romano", also grown mainly in Siracusa and Ragusa. It is also for export but is priced as a common variety and often mixed with other common varieties and exported under the trade name "Palma-Girgenti."

3. "Fascionello" is the trade term for kernels of the variety "Fasciuneddu", grown, too, in Siracusa and Ragusa. (These two provinces are renowned for superior varieties.) When sorted and graded by the same criteria as Choice Avola it may be marketed as a Choice Avola. It thus commands a higher price than common types. It may, however, be graded less rigorously and shipped under the "Palma-Girgenti" category.

4. "Nostra contrada" (meaning "our region's almonds"), also known as Etna almonds, is grown in a limited area near Mount Etna and when mixed (in variable proportions) with other varieties is exported under the classification Palma-Girgenti.

5. "Cuore", or "Heart" consists of the kernels of the "Cuva" variety and occurs mainly in some communities in Catania. It is marketed largely for export.

6. "Similarianostra contrade" (meaning "similar to our regions' almonds") is a broad category consisting of various varieties cultivated in a large part of the province of Catania and in some communities of Enna and Messina. The kernels are less uniform than the Etna (Nostra contrade) type. They may be mixed in varying proportions with other types under the designation Palma-Girgenti and thus exported.

7. "Palma-Girgenti" is the name of a very broad grouping under which a portion of some of the types described and the many other Sicilian almond varieties--grown anywhere in Sicily--are traded. "Twins" of well-known

varieties are also included. Palma-Girgenti accounts for 60 to 65 percent of Sicily's kernel production.

A rough breakdown, according to Italian almond specialists of Sicily's kernel varieties (as a percent of value) is as follows:

Avola scelta, Avola corrente, and Fascionello	20%
Etna or nostre contrade and similar	18%
Cuore.....	2%
Palma-Girgenti.....	60%
	<u>100%</u>

The leading in-shell varieties grown in Sicily are the "Mollese di Niscemi", which has a soft shell and is exported largely to France and Germany, and the "Fellamasa," a semi-hard-shell variety which is exported to the United Kingdom. Other soft-shelled varieties are the Cavalera and the Regina.

In Puglia, the most valued varieties are the Santora, Fragiulia, and Tuono, all with a semi-hard shell, and the Rachele and Montrone, with a hard shell. Santora and Fragiulia are highly regarded in the export trade. Another variety, also hard-shelled, is grown in the province of Taranto; it is exported to India in the shell. By far the bulk of Puglia's production is designated under the trade name, "Prima Bari." This is simply a conglomeration of varieties grown in the Puglia area much as Palma-Girgenti is for Sicily. The "Ladonia" is the leading soft-shell variety in Puglia.

In Sardinia, there is no substantial production of any variety of merit. As a result, Sardinian production comprises a mixture of unspecified varieties which are sold to Sicilian firms and mixed with Sicilian almonds under the Palma-Girgenti designation.

SHELLING YIELDS

Italian almonds, being predominantly hard-shelled, have a relatively low yield of kernels upon shelling. The trade in Italy believes that the average shell-out is slightly in excess of

20 percent. This, of course, refers to shelling varieties; these account for the overwhelming share of Italy's production and trade. Soft-shell varieties have a much higher shelling yield, approaching 50 percent. Yields of the main Sicilian varieties have been estimated⁴ as follows:

	<u>Percent Shell-Out</u>
<u>Hard-shell varieties</u>	
Pizzuta (Choice Avola)	21
Romano (Common Avola)	20
Fasciunedde (Fascionello)	22 - 23
Cuore	20 - 26
<u>Semi-hard-shell varieties</u>	
Fellamasa	35 - 36
Bottara	35 - 36
<u>Soft-shell varieties</u>	
Mollese di Niscemi	45 - 55
Cavalere (Mollese)	45 - 48
Regina (Mollese)	47 - 50

CULTURAL PRACTICES

As in other Mediterranean countries, almond culture has been strongly--and adversely--influenced by the traditional belief that almond trees will yield a return from a piece of land, however poor or dry it may be, which would produce hardly any other crop.

In Sicily, for instance, almonds are grown on a wide range of soil types, including arid calcareous clay soils and rocky volcanic soils. Extreme fluctuations in yield, previously mentioned, reflect also a minimum of care, since it is believed that relatively little care is required. These fluctuations, in turn, fortify the growers' conviction that intensive care is pointless because a bumper crop is almost always followed by a very poor one, and vice versa. As a result, there has been very little use of fertilizers and pesticides and hardly any systematic pruning, planting of improved

⁴ Matarazzo, G. Tecnica Agricola, Anno X, No. 1-2, 1958. Catania, Sicily.

varieties, irrigation, or utilization of other modern cultural practices. Modern practices, including planting of improved varieties, would reduce the extreme fluctuations in yield.

Almonds are intercropped intensively, particularly in the so-called mixed plantings, where trees are widely spaced. Rotations of small grains, legumes (food and forage kinds) and fallow--where moisture conditions necessitate its use--are commonly employed. Vegetables may also be grown between the almond trees. Italian studies have indicated that almond yields are adversely affected when almonds are grown in association with cereals in drier areas, because of competition for available water. However, satisfactory results are possible if plants of shorter vegetative cycle are grown in the association.

In one type of mixed planting, found in Sicily as well as the mainland, almonds are grown in association with olives, a row of almond trees alternating with a row of olive trees. Carob trees also, are grown together with almonds. In the Bari area, intercropping with grapes--both table and wine varieties--is widely practiced. As indicated earlier, mixed acreage has been declining faster than specialized acreage.

The ground is generally cultivated two, three times in specialized plantings--at least once in the spring and again (shallowly) before harvest. The third cultivation is in the fall. The ground under the trees is smoothed before harvest, to assist in the picking up of the almonds. This smoothing also makes olive harvesting easier in a mixed almond-olive planting. Where moisture is insufficient, the soil is clean-cultivated. In certain districts of Sicily, such as Avola, Nota, Siracusa and Florida where almonds are grown mainly in pure, specialized stands, the trees receive especially good care and 4, or even 5 cultivations, are usual. In larger orchards, cultivation is performed by tractors; however, even in these, the ground near the trunk is hoed.

Pruning is not usually practiced intensively. In the above districts in Sicily and in the Bari district, it is commonly biennial, though each year suckers are removed. Elsewhere, it may

be triennial. Pruning for the most part involves removal of dead or diseased wood and crossing branches. Also when the trees are young, they are trained to two or three main branches, shaping the tree to an open form. Aged trees with declining production are often pruned severely to stimulate new growth. In some cases, they may be cut back to the trunk, or even the trunk cut to the ground, to promote a dense head of new growth. Pruning usually is carried out shortly after the harvest.

Use of commercial fertilizer was, until recently, quite uncommon. Its use is now spreading. Application of animal manure has been traditionally the only fertilization practiced; and even such applications have not been made annually. Ashes of almond husks are also spread around the trunks of the trees. A relatively small proportion of the growers apply phosphate or complete fertilizer to the trees. In the Bari area, manure, potash, and superphosphate are applied by some growers. Application in the autumn, prior to the heavy rains, is favored. Where almonds are grown in association with annual crops such as legumes or grains, the almonds do not receive tillage or fertilization directly but benefit from the cultural care given the annual crop. Leguminous green manure crops are also grown to improve the soil.

Use of pesticides is not common, though almonds in Italy, like other parts of the world, are at times damaged by insects and diseases. Hopelessly diseased trees are uprooted and as much as possible of the root system carefully removed. However, if only a portion of a tree is diseased, efforts are made to save it by removing the diseased stems and roots.

For rootstocks, the Italian almond grower depends almost exclusively upon bitter almond. Most producers grow their own seedlings, though some are available from other growers.

Italian almond plantings are not irrigated. On irrigated land higher value crops, such as table grapes, citrus, or vegetables are grown. Growers hold the belief that almond trees once grown nonirrigated, and subsequently subjected to irrigation, do not survive irrigation because of unadapted rootstocks. In the

Bari area, the Fund for the South has opened up and developed a considerable area of irrigable land. Some Italian horticultural technicians were hopeful that almonds would be included in the plans for the agricultural development of southern Italy; however, there have thus far been no indications to that effect.

One reason for the lack of modernization has been the prevalence of very small-sized farms in Puglia and Sicily. According to official statistics for 1961, 41 percent of the farms in Puglia and 44.8 percent of those in Sicily were less than 2 1/2 acres in size, 72.2 percent in Puglia and 73.5 percent in Sicily up to 7.4 acres each. For all of Italy, 63.3 percent of farms were up to 7.4 acres. Almond acreage per farm is also small and thus not susceptible to modern and efficient practices, though some farms have substantial acreages--farms with over 15 acres of almond trees are by no means rare.

Perhaps as good an indication as any of the limited potential of the land on which almonds are grown, in Italy, is the value of this land. According to the Italian Union of Chambers of Commerce, Industry, and Agriculture, the average estimated value of productive agricultural land in Puglia, in 1961, was \$102, and in Sicily, \$90 per acre. This contrasts with an estimated value of \$174 per acre for Campania, the region bordering Puglia to the west, and \$197 for Emilia-Romagna, a Po Valley region. For Italy as whole, the average value was \$110. It should also be noted that many of the almonds are grown on the poorest agricultural land in these two poorland regions.

In late 1963, a group of almond growers, technicians, and exporters met with a committee of the Chamber of Commerce in Bari to discuss problems of almond production. The discussion emphasized the need for: (1) Quality improvement; (2) increased productivity; (3) reduction of the number of varieties to a minimum, with each chosen variety to be as homogeneous as possible; (4) removal of trees producing bitter almonds to eliminate mixture of sweet with bitter kernels; and (5) an intensive disease and insect control program.

The relatively backward state of Italian almond culture is certain in time to yield to technological progress. Cultural practices are improving. A considerable amount of effort has been made and is continuing to be made by the Italian Ministry of Agriculture through its extension services to provide information on improved cultural practices and assist almond farmers with them. Also, the experiment stations in both Bari and Sicily are experimenting with new higher yielding varieties, improved rootstocks which are adapted to irrigation and better insect and disease control methods.

FARM LABOR

As is typical of almond production in the Mediterranean area, a minimum of labor is hired in Italy. The farm operator--either the owner-operator or share-cropper--and his family usually provide the labor required. Larger units may employ full-time workers and, during harvest season only, part-time labor as well.

Farm labor in southern Italy and Sicily has traditionally been abundant and cheap because of the chronic underemployment that characterized these areas. The availability of farm labor rarely presented a problem and the cost was minimal. The labor situation, however, has undergone a drastic change in recent years. The growth of industry in these less-developed areas of Italy and the out-migration of surplus labor to northern Italy and other countries of western Europe has resulted in a considerable increase in wage rates the past few seasons. Though these wages are still low by U.S. standards, they are beginning to be an important factor in the cost of producing almonds, where the use of labor has been typically inefficient.

An index of hourly wage rates in Italy based on 1953 wages as 100, shows an increase between 1950 and 1963 of 114 percent in agriculture compared with 108 percent in industry and building. The rate of increase in agricultural wages has been greatest at the latter end of the period. In the 5 years,

1959 to 1963, the hourly wage rate rose 48 percent, compared with 18 percent in the previous 5 years (1954-58). As a matter of fact, agricultural wages have been moving up faster than those in industry and building.

A comparison of these Italian hourly wage rates in terms of index figures follows:

Year	Agricultural wage index	Industrial and building wage index
	1953 = 100	1953 = 100
1950	87	85
1951	90	93
1952	95	97
1953	100	100
1954	104	104
1955	109	109
1956	114	115
1957	117	120
1958	123	126
1959	126	128
1960	127	134
1961	133	140
1962	153	155
1963	186	177

Source: Organization for Economic Cooperation and Development (OECD), March 1964.

Allocation of farm labor costs to the single operation of almond raising in Italy is not usually possible. However, a brief review of wages per day for temporary farm labor in almond-producing areas and of annual incomes for year-round, regular farm workers and managers makes possible some comparison of labor costs with those of competitive countries.

Data for 1963 are available on gross minimum contract daily wages for temporary workers, and for 1962-63 on gross minimum contract annual wages for regular farm workers, for Sicily and Puglia.

Daily minimum wages for temporary workers are stated for men, for women, and for minors. Annual minimum wages (in cash, excluding payments in kind) are stated in terms of class of farm worker.

Temporary farm workers may be used in such operations as harvesting. In Sicily, the minimum daily wage for men ranged from \$1.95 in Agrigento to \$2.55 in Siracusa. The daily wages for women were generally a few cents less than for men. A minimum daily wage is also specified for minors, the bottom pay scale ranging between \$1.58 and \$2.45 in Sicily.

Wage rates are somewhat higher in Puglia. The 1963 minimum per day there was \$2.45-\$2.78 for men, \$2.07-\$2.62 for women and \$2.13-\$2.42 for minors. These figures represent minimum wage rates, according to official Italian statistics. A pragmatic indication that they truly represent minima is the information acquired while visiting the producing areas that part-time labor was difficult to obtain at \$4 per day.

Table 6.--FARM WAGES: Gross minimum contract daily wages¹ of temporary farm workers, in Sicily and Puglia, 1963

Region and province	Men ²	Women	Minors
	U.S.\$ equiv.	U.S.\$ equiv.	U.S.\$ equiv.
<u>Sicily</u>			
Messina.....	2.38	2.27	2.14
Palermo.....	2.03	1.93	1.72
Trapani.....	2.48	2.40	2.45
Enna.....	1.97	1.37	1.58
Catania.....	2.39	2.27	1.92
Agrigento.....	1.95	1.83	1.73
Caltanissetta.....	2.20	2.13	1.96
Siracusa.....	2.55	2.42	2.21
Ragusa.....	--	--	--
<u>Puglia</u>			
Bari.....	2.52	2.40	2.19
Taranto.....	2.45	2.07	2.13
Brindisi.....	2.76	2.62	2.40
Lecce.....	2.78	2.37	2.42
Foggia.....	2.61	2.55	2.27

¹ Converted from Italian lira to U.S. dollars at the official international rate of exchange, 625 lira per U.S. \$1.00. ² In the highest wage zones, wages of married men over 18 years of age.

Source: Annuario di Statistica Italiano 1964, Istituto Centrale di Statistica, Rome.

For regular workers attached to the farm, whose work may be divided in varying degrees in production of other crops, the official Italian statistics show an annual minimum contract wage raise in Sicily from \$356 to \$1,063, depending upon skill and locality. The range in Puglia, for which only lesser skills are specified, was \$676 to \$772. In Sicily, an appreciable portion of this gross minimum wage is represented by payments in kind. In

Agrigento, for example, nearly half of the annual total of a field worker was payment in kind, at \$172 compared with \$356 in cash. For higher skills such as for instance managerial work, the proportion of payment in kind was smaller, \$317 compared with \$1,063 in cash in Catania. In Puglia, payment in kind is of much smaller significance, though it does comprise part of the annual pay.

Table 7.--FARM WAGES: Gross minimum contract annual wages¹ of regular farm workers, Sicily and Puglia, 1962-63

Region and province	Specialty	Annual wage, 1962-63, regular farm workers	
		Total pay	Value of pay in kind ²
		U.S.\$ equiv.	U.S.\$ equiv.
<u>Sicily</u>			
Messina.....	Field worker	674	239
Trapani.....	Foreman	537	152
Enna.....	Ox driver	463	147
Catania.....	Manager	1,063	317
Agrigento.....	Field worker	356	172
Caltanissetta.....	Manager	710	44
Siracusa.....	Ox driver	915	192
Ragusa.....	Manager	756	171
<u>Puglia</u>			
Taranto.....	Ordinary farm hand	676	58
Lecce.....	Plowman	739	--
Foggia.....	Ordinary farm hand	772	132

¹ Converted from Italian lira to U.S. dollars at the official international rate of exchange, 625 lira per U.S. \$1.00. ² The value of payments in kind (not part of the agreements) is based on prices of commodities in each province.

Source: Annuario di Statistica Italiano 1964, Istituto Centrale di Statistica, Rome.

HARVESTING

Though some almonds are harvested as early as June, the harvesting period is usually July-October. It is usually earliest in Sicily. A late spring and/or cool summer may delay the harvesting peak until September. This causes considerable havoc with exporters and domestic suppliers in meeting their forward commitments for September and October deliveries when the carryover from the previous crop is not substantial.

The most common method of harvesting is for the almonds to be knocked off the trees with poles, either onto the ground or cloths laid on the ground. Intercropping, small orchards, and irregular terrain preclude widespread mechanization of harvest. However, the rapidly increasing labor costs are expected to provide an impetus to mechanical harvesting, particularly in larger orchards.

Harvest labor is generally provided by the farmer and his family. This is particularly

true for the small enterprises; the larger farms, of course, have to hire additional labor at harvest time.

Most growers have their own hulling machines. For those who do not, there are machines in the villages for custom use. After being hulled, the almonds are allowed to dry in the sun. After being dried, they are usually stored on the farm in the shell until sold, in the same form.

COST OF PRODUCTION

The range of costs in producing almonds in Sicily may be surmised from a sample of costs of 5 different farms, published in 1958,

shown for the reader's information. The study⁵ from which the table was derived was prepared by an acknowledged Italian authority and published in an authoritative journal; nevertheless it is of value to the reader chiefly because of the variation it shows rather than as a study of "representative" costs. In addition, a number of other factors--such as the fact that weather conditions and the point in the almond-producing cycle might bias the figures, and for individual farms such elements as nonrecurring costs are not identified--must warn the reader from drawing any general conclusions. With regard to whether or not almond prices to the producer

⁵ Matarazzo, G. Tecnica Agricola, Anno X, No. 1-2, 1958.

Table 8.--IN-SHELL ALMONDS: Estimated cost¹ of production in the Sicilian Provinces of Siracusa and Catania²

Item	Farm 1	Farm 2	Farm 3	Farm 4	Farm 5
	U.S.\$ equiv. per acre	U.S.\$ equiv. per acre	U.S.\$ equiv. per acre	U.S.\$ equiv. per acre	U.S.\$ equiv. per acre
Value of investment:					
Investment (land, trees, etc.).....	842	930	670	602	777
Inventory capital.....	55	10	2	23	6
Production costs:					
Cultural and harvest labor costs.....	41	3	2	16	24
Materials (fertilizers, etc.).....	7	8	1	2	3
Taxes and levies.....	17	15	11	12	12
Interest, maintenance, depreciation and management.....	58	52	35	37	44
Total annual cost of production (Items 3, 4, 5, 6).....	123	78	49	67	83
	Pounds per acre	Pounds per acre	Pounds per acre	Pounds per acre	Pounds per acre
Average annual production (in shell between 1951-1955).	857	926	298	407	415
	U.S. cents per pound	U.S. cents per pound	U.S. cents per pound	U.S. cents per pound	U.S. cents per pound
Cost of production (in shell).....	14.4	8.4	16.4	16.5	20.0

¹ Converted from Italian lira to U.S. dollars at the official international rate of exchange, 625 lira per US \$1.00. ² Table from an article by G. Matarazzo "Aspetti E Problemi Della Coltura Del Mandorlo Di Sicilia" Tecnica Agricola, Anno X - N. 1-2, Catania: La Nuovagrafica, January - April 1958.

actually met or exceeded almond producing costs, the reader must also recognize not only that the farm may have produced other income to which costs are not allocated with complete exactitude, but also that the farmer also had an "imputed" income in the form of farm-produced food and the cost of housing.

MARKETING

The grower sells his almonds to agents of the packer-exporters or to accumulator-speculators. When sold to the latter the almonds may change hands a number of times, depending upon market conditions, before they ultimately find their way to the packer-exporter.

There are probably about 20 large firms that export almonds, about a half dozen of which account for the bulk of the export business. In addition, there are possibly 50 small exporters that export almonds occasionally.

The almond packer-exporter in Italy, much the same as the Spanish packer-exporter, obtains almonds through two channels: (1) His agents, who are located throughout the producing areas; and (2) accumulator-speculators who may be located in the main trading centers, or in the case of smaller speculators, in the producing areas. Actually, his agents acquire almonds not only directly from growers but also from accumulator-speculators, particularly smaller ones operating in local producing areas, and from local almond crackers that have purchased directly from the producers. Almonds purchased from crackers have, of course, been shelled. Those purchased from accumulator-speculators may be already shelled or in the shell. The Italian trade traditionally engages in forward sales. This is a highly speculative activity since substantial commitments may be made well in advance of the harvest, the ultimate volume of which cannot be predicted with accuracy. Should the crop turn out larger or smaller than expected, and grower prices correspondingly lower or higher than antici-

It is immediately apparent that there is a considerable range in cost of production of 138 percent among only 5 farms. Not only do the per-acre yields vary greatly from farm to farm but so do the expenses. Nor are high yields necessarily associated with heavy expenditures in this limited sample.

pated, Italian exporters experience appreciable speculative gains or losses.

Unlike their Spanish counterparts, Italian packer-exporters generally carry large supplies of uncommitted almonds rather than relying on accumulator-speculators for supplies as orders are received. Those not able to market their stocks at the desired prices may carry them over into the next season.

As the need arises, the packer-exporter may shell the almonds that he had purchased in the shell in his plants in the producing areas, or as stated earlier, buy shelled almonds from a local sheller. At this state, only a rough grading and selection, i. e. sorting by size, are made. The shelled, roughly-sorted almonds are then brought to the packer-exporter's plant, where final grading and selecting are performed, and the almonds then packed for export or domestic shipment.

PRODUCER PRICES

Both the Central Institute of Statistics and the Bank of Sicily publish regular quotations on the prices received by Italian growers for almonds. Although prices published by the latter are not broken down by province or quality or origin, they are also included in this report because the Bank usually quotes prices for nearly every month of the year. Though the Institute does not cite prices for the late spring and early summer months (when sales are very light), it does segregate prices by province and type or quality.

Table 9.--ITALIAN ALMONDS: Prices¹ received by producers for almonds in the shell, in specified areas 1960-61 through 1964-65

Area and type	Monthly average				
	1960-61	1961-62	1962-63	1963-64	1964-65
	U.S. cents per lb.	U.S. cents per lb.	U.S. cents per lb.	U.S. cents per lb.	U.S. cents per lb.
Bari - 1st quality:					
September.....	11.4	9.6	15.6	15.5	15.2
October.....	11.3	9.4	16.1	16.5	15.2
November.....	11.2	10.2	16.8	15.4	14.8
December.....	11.2	9.7	16.7	15.0	14.6
January.....	11.2	10.5	16.3	14.6	14.9
February.....	10.8	10.6	15.7	14.9	14.8
March.....	10.1	12.0	14.9	14.7	14.7
April.....	9.7	14.0	14.1	14.7	14.6
Catania hard kernels:					
September.....	9.4	8.0	12.5	12.7	12.4
October.....	9.4	7.9	13.0	13.6	12.1
November.....	9.2	8.2	13.4	12.7	11.8
December.....	9.2	8.5	13.3	12.3	11.8
January.....	9.3	8.7	13.1	12.5	12.0
February.....	9.1	8.8	12.5	12.1	11.9
March.....	8.4	9.7	11.5	11.9	12.0
April.....	8.1	11.4	11.2	11.9	11.8
Siracusa - commons:					
September.....	8.7	7.3	14.0	16.0	11.2
October.....	8.9	7.3	14.5	13.8	11.1
November.....	9.7	7.7	13.8	14.5	10.9
December.....	8.6	7.8	16.7	14.5	10.5
January.....	9.2	8.9	15.6	14.2	10.4
February.....	9.0	8.7	14.5	13.8	10.2
March.....	8.1	10.9	11.4	12.0	11.1
April.....	8.1	12.0	12.5	12.5	11.2

¹ Converted from Italian lira to U.S. dollars at the official international rate of exchange, 625 lire per U.S. \$1.00.

Source: Prices drawn by local Chambers of Commerce and elaborated by Central Institute of Statistics. Prices not listed for the May-August period when only 3% of annual sales are made.

Prices received by producers have trended sharply upward. A comparison of prices of three areas in the 1963-64 marketing year (a year of heavy production) with those in 1960-61 (a year of light production) reveals an increase of 33-84 percent in the opening prices (September) and an increase of 38-54 percent in the late season prices (April). This increase was not attributable to any sudden price rise but rather to cumulative, i.e. year-to-year, price rises. Though there was some fall off in 1964-65 from the 1963-64 levels, prices paid to producers have never-

theless continued substantially above those of the 1959-60 through 1961-62 period. The fact that prices have risen even during periods of increased supplies is indicative of growing world demand.

Within the general upward trend there are, of course, within-season and between-season fluctuations. The tendency for grower prices to be lowest around harvest time is rather marked in the Bank of Sicily series but is not too evident in the Central Institute's series. Seasonal price movements, however,

may be accentuated or even reversed in the early spring months with the first indications of the size of the oncoming crop. In March and April 1961, for instance, prices reacted downward as it became apparent that the bloom for the 1961-62 crop had escaped frost damage and a large crop was likely. On the other hand, prices reacted sharply upward in March and April 1962, after the bloom, as it became obvious that the 1962-63 crop would be short.

A comparison of prices in Bari--for first quality almonds, in Catania--for hard-kernel varieties--and in Siracusa--for almonds of common quality, reveals, as would be expected, variations in price depending upon quality and the supply and demand of a particular type or grade. Unfortunately, data are not available that would permit price comparisons of high- and low-quality almonds within a province or of, say, high-quality almonds in a number of provinces. The price tabulation for the 3 provinces only serves to give some indication as to the range in the prices received by growers. It is, of course, obvious that first-quality almonds are considerably higher priced than lower grades. Also, it is apparent that prices, regardless of area and quality, have risen substantially since 1960-61.

It is interesting to note, in comparing Italian⁶ with Spanish producer prices, that Spanish prices have trended more sharply upward than the Italian. In the latter part of 1959-60 and early in the 1960-61 season, Italian almonds sold for about the same as Spanish almonds. In the latter months of the 1960-61 season, Spanish prices began to exceed Italian prices by about 1 cent per pound, more or less. In the 1961-62 season this margin widened; by the end of that season, Spanish growers were receiving 14.8 cents for their almonds as against 10.5 cents received by Italian growers. In 1962-63, this gap increased further; in April 1963, Spanish and Italian growers received 17.0 and 11.4 cents respectively. Early in the 1963-64 season, when the Spanish price soared to 19.6 cents, there was a gap of 6.9 cents between the Spanish and Italian price. A decline in the price paid Spanish growers in the course of the 1963-64 season narrowed this gap to around 2 cents per pound. It is possible to speculate over a variety of causes for the greater increase in prices paid to the Spanish farmer. However, the amount of premium enjoyed by Spanish almonds in the export market has not reflected this trend.

⁶ Bank of Sicily price series, which encompasses a number of varieties, as the Spanish series does.

Table 10.--ALMOND PRICES: Comparison of prices¹ received by producers in Italy and Spain for almonds in the shell, 1959-60 to 1963-64 seasons

Month	1960-61		1961-62		1962-63		1963-64	
	Italy	Spain	Italy	Spain	Italy	Spain	Italy	Spain
	U.S. cents per pound		U.S. cents per pound		U.S. cents per pound		U.S. cents per pound	
August.....	9.8	7.6	8.4	9.6	12.4	15.0	12.7	19.6
September.....	9.0	8.1	7.2	9.0	--	15.8	13.4	16.4
October.....	9.2	9.7	7.2	9.0	12.7	15.8	14.2	17.0
November.....	9.0	9.7	7.4	9.2	12.8	17.2	13.0	17.0
December.....	8.7	9.7	7.8	9.5	11.8	16.8	13.1	15.9
January.....	--	9.9	8.2	10.0	11.4	16.4	13.1	14.9
February.....	9.0	9.9	8.4	10.1	--	16.0	13.1	14.8
March.....	8.4	9.7	8.9	10.6	--	16.0	13.1	15.0
April.....	7.6	9.2	10.8	12.0	11.4	17.0	12.3	--
May.....	8.5	9.1	11.6	13.0	13.0	17.3	12.7	--
June.....	8.9	9.1	10.9	14.7	13.0	18.2	12.8	--
July.....	8.4	9.7	10.5	14.8	12.7	17.3	13.0	--

¹ Spanish prices: monthly averages, Spanish Ministry of Agriculture, converted at official exchange rate of 60 pesetas per U.S. \$1.00. Italian prices: 14 mid-points of ranges reported semi-monthly for Sicily in Prezzi Medi Informativi di Alcuni Prodotti Tipici Siciliani, Bank of Sicily. Converted at official rate of 625 lira per U.S. \$1.00.

PROCESSING

While little has changed in the techniques of producing almonds in Italy, there has been a radical change in the processing technology. In only a relatively few seasons, the Italian industry has converted to mechanized shelling and selection operations. It was estimated that in 1963 95 percent of the almonds in Puglia were shelled mechanically, as were 80 percent of the almonds in Sicily. This mechanization has continued, and in the near future the entire harvest is likely to be shelled and otherwise processed mechanically. Among the benefits of this mechanization is the reduction of the time required for processing. This enables a larger percentage of the harvest to be exported during the fall months, in time to reach the markets in the importing countries for the all-important Christmas business. Some of the larger packer-exporters have installed cold storage facilities. This enables them to carry almonds longer than heretofore possible.

Processing plants vary considerably in size, equipment, and number of employees. Much of the equipment is of new design; plants with older equipment are gradually making replacements or going out of business. Almost all of the machinery is of Italian design and manufacture, though there is some of Spanish origin.

It is estimated that there are about 25 large shellers which handle 2 to 10 tons per day and over 100 small shellers which handle one-half to 2 tons daily. The large plants perform the varied functions of cracking, separation of kernels from shell, and selecting. The small plants often perform only the cracking operation; some, though, also do some selecting. Blanching of almonds is much less important in Italy than in Spain.

As would be expected, the plants of the large-packer exporters are generally especially highly mechanized. This is particularly true of their plants in the major trade centers where they carry out the final grading, selecting, and packaging.

PACKAGING

Several of the large packer-exporters have automatic equipment which packs premium almonds in 100- and 200-gram cellophane bags. Polyethylene bags of 250 and 500 grams--packed in cardboard boxes containing a net weight of 50 kilograms (110 pounds)--are also used for retail packages of premium almonds. These were relatively recently introduced, but are of increasing significance. However, their use is much less important than that of bulk shipments.

Packaging for export is generally in 50 kilogram (less frequently 100 kilogram) burlap bags and in wooden boxes containing up to 50 kilograms or cardboard boxes holding 12.5 kilograms (27.5 pounds). The boxes are mainly used for higher priced types. Blanched almonds are packed in cardboard boxes with a net content of 12.5 kilograms.

LABOR AND WAGES

In the packinghouses visited most of the labor force was female--and a high percentage of these teenage girls--employed mainly only during the peak shelling season, while a small crew of men are employed year-round, operating and servicing the shelling and other equipment and performing the heavier work around the plant.

Competition for labor has become increasingly keen, particularly for women workers to do the grading and sorting. There is less of a necessity for women to seek part-time employment than in the past since the men in the family are now able to earn a steady livelihood, if not within the region, then in northern Italy or elsewhere in Europe. This accounts for the relatively high proportion of teenage girls employed.

In 1963, wages for women in almond packinghouses were said by industry sources to have ranged from \$1.13 to \$2.42 in Bari and \$1.93

to \$3.22 in Sicily per 8-hour day. The higher wages were paid those women engaged in the final grading and selecting, activities usually carried out in the packinghouses located in the larger centers of population. According to packer-exporters, the lower end of the wage scale was the same as the top wage two years earlier. Also, wages for men were reportedly double those for women.

Although official figures on wages, relative to almond processing are not available, such wage information is available for other food processing industries in southern Italy. In these industries the average daily wage for skilled workers ranged from \$3.14 to \$3.67, depending largely upon location. The lowest wage scale--for laborers--ranged from \$2.42 to \$2.90 per day.

Table 11.--PROCESSING PLANT¹ WAGES: Average daily wages² of workers in food industries in southern Italy, 1963

Province	Skilled worker	Semi-skilled worker	Unskilled worker	Laborer
	US\$ <u>equiv.</u>	US\$ <u>equiv.</u>	US\$ <u>equiv.</u>	US\$ <u>equiv.</u>
Palermo.....	3.57	3.20	3.02	2.82
Potenza.....	3.20	2.84	2.67	2.48
Napoli.....	3.67	3.28	3.10	2.90
Trapani.....	3.47	3.08	2.89	2.69
Salerno.....	3.14	2.78	2.61	2.42

¹ Macaroni and spaghetti factories and food canning plants; these compete with almond packinghouses for labor.

² Figures represent minimum contract wages which normally include the basic wage plus a "contingency allowance" paid in varying amounts depending upon the qualifications, age, and sex of workers. Converted from Italian lira to U.S. dollars at the official international rate of exchange, 625 lira per U.S. \$1.00.

Source: Annuario di Statistica Italiano 1964, Istituto Centrale di Statistica, Rome.

STOCKS

As is the case in other Mediterranean countries, there are no reliable statistics on stocks. An estimate of stocks carried over from one season to the next is little more than a consensus of educated guesses made by members of the trade. The level of Italian almond stocks at the end of a season is likely to be much different from that at the beginning of the same season. This is due to the sharp fluctuations in the size of Italian crops. Following a small crop the carryout is usually small. Following a large crop the carryout is likely to be large, particularly since the ex-

pectation is that a short crop is likely to follow. The knowledge that an abundant supply with low prices will probably be succeeded by a limited supply with high prices provides an incentive to many people to hold stocks: the farmers themselves, small and large accumulators and exporters. Since almonds are easily stored--in the unshelled state--these stocks have been as good as "money in the bank" and sometimes even better. In the case of farmers, it may simply be a matter of disinclination to sell out at what they consider unduly low prices in a season of heavy supplies.

Despite the fact that growers, accumulators, and speculators may hold stocks, the largest volume of stocks is probably held by the exporters. All hold these stocks in the shell. The almonds are not shelled until needed to fill a contract.

In the 5-year period, 1957-61, beginning stocks averaged 6,800 tons, shelled basis, and ending stocks, 9,000 tons. These averages conceal wide variations. For example, beginning stocks ranged from virtually nil in

1957-58 to 16,000 tons in 1960-61. Italian end-of-season stocks usually account for over half the stocks held in the almond-producing countries abroad.

Although Italian almond stocks at the end of the last 3 crop years--1962, 1963, and 1964--have been light, this does not appear to be as much the effect of any trend as simply the reflection of moderate or modest harvests in those years.

Table 12.--ALMONDS: Italy's supply and distribution, average 1957-61, and annual 1957-64 marketing seasons (shelled basis)

Item	Average 1957-61	Year beginning September 1							
		1957	1958	1959	1960	1961	1962	1963	1964 ¹
	1,000 Short tons	1,000 Short tons	1,000 Short tons	1,000 Short tons	1,000 Short tons	1,000 Short tons	1,000 Short tons	1,000 Short tons	1,000 Short tons
Beginning stocks.....	6.8	--	11.0	6.0	16.0	1.0	11.0	--	1.5
Production.....	39.0	51.0	15.0	49.0	14.0	66.0	14.5	42.0	39.0
Imports.....	--	--	.1	--	--	--	.3	.4	.2
Total supply.....	45.8	51.0	26.1	55.0	30.0	67.0	25.8	42.4	40.7
Exports.....	29.8	32.9	14.5	30.9	22.5	48.0	20.5	33.4	32.0
Domestic disappearance	7.0	7.1	5.6	8.1	6.5	8.0	5.3	7.5	4.7
Ending stocks.....	9.0	11.0	6.0	16.0	1.0	11.0	--	1.5	4.0
Total distribution..	45.8	51.0	26.1	55.0	30.0	67.0	25.8	42.4	40.7

¹ Preliminary.

Source: FAS estimates except for export and import data which are taken from official Italian trade statistics (ISTAT) and converted to shelled basis.

DOMESTIC CONSUMPTION

Like the estimates of stocks, figures on consumption of almonds in Italy are hardly more than guesses. Actually, the consumption figure is just a residual remaining after subtracting exports and estimated ending stocks from the supply. Little can, therefore, be said--with any degree of authoritativeness--other than that consumption appeared to average about 7,000 tons annually in the 1957-61 period and somewhat less since then. Here, too, this is less likely to be a downward trend

than simply a reflection of less-than-peak harvests in 1962, 1963 and 1964.

Italian almond traders believe that industrial use of almonds in Italy can be roughly broken down as follows:

Use	Percent
Confetti (sugar-coated almonds) . .	13
Ice cream	7
Bakery	80

Increasing living standards and population should result in expanding consumption of almonds in Italy, as they have in the two other leading almond-producing countries, the United States and Spain. The fact that the consumption figures in the supply and distribution balance show no upward trend between 1957 and 1964 is probably just another indication of the unreliability of statistics on almond supply and distribution in Italy.

EXPORT GRADES AND STANDARDS

Most Italian almonds are exported under the trade names "P. G." (Palma-Girgenti) and "Bari". As mentioned earlier, P. G.'s are a conglomeration of Sicilian varieties; almonds from Sardinia are also sold as P. G.'s. Similarly, almonds from Puglia are a mixture of varieties, exported almost exclusively as "Prima Bari Extra" and "Prima Bari."

Almonds are exported as either "unselected" or "selected." Unselected almonds are simply those that have not been as carefully culled, graded, or sized as selected almonds. Thus, compared with selected almonds, the admixture with other varieties or types may be greater; there may also be more bitters, doubles ("twins"), brokens, splits, and pieces as well as damaged kernels and other defects. Italian selected almonds may be designated as "clean", "hand-picked," "sieved", and "bar-type."

"Clean" P. G., for example are free of dust, shells, siftings, and dry and worm-infested kernels and may not have more than 5 percent broken kernels.

"Hand-picked" are free of dust, shells, siftings, and dry and worm-infested kernels; the tolerance for broken kernels is only 1 percent.

The "sieved"--besides meeting the requirements for hand-picked--have been selected on the basis of the size of the transverse diameter of the kernels, by passing them through sieves.

This diameter is expressed in terms of millimeters. The most commonly sold sizes are 36 to 37 and 37 to 38 for sieved, i. e. selected, almonds. These numbers indicate the diameter of the openings of the sieve, often abbreviated mm., through which the almond kernels will not pass.

"Bar-type" are small kernels that are suitable for use in chocolate candies. They must meet the minimum requirements of the hand-picked and are, in addition, graded into size-classes based upon the number of kernels weighing an ounce. Thus, bar-types are commonly classified as 27-30, 30-32, 32-35, 36-40, and 40-45 kernels per ounce.

"Choice Avola" are often subdivided into the singles and twins, with the twins sold under the designation "Double Avola." The singles are usually selected by size, and the diameters 36-37 and 37-37 bis (the latter meaning 37-37 plus) are most in demand, particularly for confectionery.

"Common Avola" is frequently not sorted, but when the price warrants, it too is divided into singles and doubles. The singles are then classified into 3 size groups: Giants, Small Giants, and Remainders.

"Heart" or "Cuore" are mainly sized into 2 selections--20 to 22 and 22 to 24 kernels per ounce.

"Prima Bari Extra" differs from "Prima Bari" in that it contains a minimum of 30 percent of kernels larger than sieve size 36 with at least one-half of the latter exceeding sieve size 37. Also, the "Extra" may not contain more than 20 percent, by weight of doubles.

MANDATORY EXPORT STANDARDS

The I.C.E. (Istituto di Commercio dell'Estero--National Institute of Foreign Trade) permits the exportation of shelled almonds only if they comply with the following quality requirements:

The almonds destined for export must be dry.

The following tolerances--to be calculated as the percentage of net weight may not be exceeded for almonds to be exported in sacks:

1 percent, in aggregate, of kernels that have turned musty, have been attacked by worms, are completely shrivelled or empty; of shells, dust, siftings, and other foreign substances;

5 percent of broken almonds;

3 percent admixture of bitter almonds in sweet almonds;

5 percent admixture of sweet almonds in bitter almonds;

For almonds to be exported in cases:

0.25 percent, in aggregate, of kernels that have turned musty, have been attacked by worms, are completely shrivelled or empty; of shells, dust, siftings, and other foreign substances;

1 percent of broken almonds;

3 percent admixture of bitter almonds in sweet almonds;

5 percent admixture of sweet almonds in bitter almonds.

A category designated as "broken almonds" may be exported provided that the following tolerances in terms of net weight per case or sack are not exceeded:

10 percent of broken kernels--as a percentage of the weight of whole kernels;

1 percent, in aggregate, of shells, dust, shrivelled kernels, siftings and other foreign material.

These standards are not as detailed as those for Spanish or U.S. almonds. It is possible, however, to make rough comparisons with some Spanish and U.S. grades.⁷

⁷For detailed Spanish and U.S. standards, see The Almond Industry of Spain, FAS-M-165, July 1965.

IMPLEMENTATION

The Ministerial Decree of July 31, 1938, under which the establishment of export standards was authorized, also provides the authority for implementing these standards.

Inspection (commonly known as "quality control" in Italy) is carried out by the I.C.E. which has at its disposal not only its own inspectors but also the personnel of the Railroad Police, Harbor Police, and Customs Houses.

A firm intending to export almonds has to notify the nearest control office of the name and location of the plant where the nuts have been processed. Not less than 48 hours before the loading or shipping of the goods, the exporter has to present a "control application" to the control office. In exceptional cases, the application may be submitted on shorter notice, but at the exporter's risk. An application is to be presented for each shipment with various relevant information.

Then, whichever agency is to carry out the inspection notifies the shipper or his duly-authorized forwarding agent when the inspection will be made. The goods are then presented at the Control (inspection) Office. The inspectors then remove a sampling of the packages for each type of package, i.e. sacks, boxes, or cartons, and determine for each package of the sample the following:

- 1) The weight of the packing when full and when empty, so as to determine the tare, and thus the net weight;
- 2) The percentage of the kernels that has become moldy, is worm-infested, completely dried out or empty, and of shells, dust, siftings, and other foreign substances;
- 3) The percentage of broken almonds;
- 4) The percentage of bitter almonds.

For the determination of No. 2, i.e. "waste", the contents of a package are poured into a

hopper. From this, a 10 kilogram (22.05 pound) sample is removed and passed through an appropriate cylindrical sieve. This process separates automatically the dust, siftings, and the small broken pieces from the rest of the product. From the latter, a quantity--1 kilogram (2.2 pounds)--is taken gradually, by hand, as it comes from the sieve. A determination is made from this 1-kilogram sample, by hand, of the large broken pieces of almonds, of the large broken pieces of shell, of the dried-out kernels, and of the kernels that have become moldy or worm-infested. All of these items making up waste are then added together, and the percentage of waste applicable to No. 2 is calculated.

An analogous method is used for No. 3, to determine the percentage of breakage.

For the determination of the percentage of bitter almonds (No. 4), a sample of 100 almonds is taken and each of the almonds is

individually rubbed against a different place on a sheet of sandpaper. Then, distilled water as well as a 10 percent alcohol solution of guaiac resin and a 1 percent aqueous solution of copper sulphate are sprinkled on the sandpaper. The traces left by the bitter almonds turn a blue color. The number of blue spots, therefore, indicate the percentage of bitter almonds in a package. The Italian authorities point out that to be absolutely correct the percentage would have to be determined by weight; but in practice, the numerical percentage is determined instead since it is believed to coincide closely enough with the percentage by weight.

If the product subjected to the inspection meets the minimum quality standards, the official in charge of the control will issue the "Inspection Certificate" made out to the exporter. This certificate has to be turned over to the port or railroad authorities, as the case may be, in order for the export shipment to be permitted.

EXPORT PRICES

Export prices during the last 3 marketing seasons (1962-63 through 1964-65) have been appreciably higher than in earlier seasons. This is clearly shown by the accompanying price tabulation. Actually, prices the last 3 seasons have been the highest since the summer of 1956 when unselected Baris and P.G.'s attained a peak of \$1.06 per pound in July-August and did not fall below 70 cents per pound until late February 1957. (World production in both 1956 and 1957 was exceptionally short).

These higher export prices in recent years are undoubtedly caused by expanded demand because, on the supply side, production of almonds in the world in general and in Italy specifically have not been below normal.

As for seasonal price trends, prices have a tendency, the latter part of the season: (a) To go up when it becomes apparent that the new crop will be short, or (b) to go down when it appears the crop will be large. The

direction of this movement is usually established in March or April, when first indications as to the possible size of the new crop are available. Thus, in March 1961 prices dropped sharply when it became apparent that the blossoms had safely survived the frost-danger period and a large 1961 crop was in the offing. Conversely, prices rose very sharply in April 1962 when it became obvious that the 1962 crop would be a short one because of frost and other weather damage to the bloom. In March 1963, prices declined sharply.

Such price movements, however, did not occur in the 1963-64 and 1964-65 seasons because there was no sharp fluctuation in size of crop--from the previous year's--in 1964 and 1965. The degree of month-to-month price stability displayed by Italian export prices during the last 2 crop seasons (and extending into 1965-66 season) is virtually unprecedented.

In a comparison of export prices of the two main types, unselected Baris and unselected P.G.'s, there appears to be little difference between them. At times one may be a fraction of a cent higher than the other--probably in response to relative supply--and at other times the reverse is true. A comparison of selected P.G.'s, size 37-38 mm., reveals that the selected almonds are usually about 1/2¢ or slightly more, per pound higher than the unselected P.G.'s.

There has been a remarkable similarity in the export price movements of Italian and Spanish almonds. In the 1960-61 season, unselected Baris and Valencias declined gradually during the season and closed at 87 and 88 percent, respectively, of opening levels. In 1961-62, both rose substantially after opening at depressed levels, Italian prices closed at 165 percent and Spanish prices at 154 percent of October 1961 levels. In 1962-63, they ended

at 97 and 96 percent, respectively, of the opening prices, after both experienced a price rise in the first part and then a price drop in the latter part of the season. In 1963-64, both rose early in the season, declined in mid-season, and then held on to part of a rise during the last quarter, closing at 103 and 105 percent, respectively, of opening prices. In 1964-65, both declined simultaneously and then rose; July 1965 quotations were 97 percent and 98 percent of the September 1964 quotations for Italy and Spain respectively.

These parallel price movements do not imply identical prices for unselected Baris and Valencias. Actually, unselected Baris (and P.G.s also) are usually 3 to 5 cents per pound cheaper than Valencias. At times this spread narrows appreciably, as it did a number of times in 1964-65, but it is rare for Valencias not to enjoy a premium over Baris and P.G.'s.

Table 13.--ITALY: Export prices¹ of specified types of almonds, 1960-61-1964-65 seasons

	Bari, Unselected					Palma-Girgenti (P. G.), Unselected					Palma-Girgenti (P. G.), 37/38 ²				
	1960-61	1961-62	1962-63	1963-64	1964-65	1960-61	1961-62	1962-63	1963-64	1964-65	1960-61	1961-62	1962-63	1963-64	1964-65
	Cents per pound	Cents per pound	Cents per pound	Cents per pound	Cents per pound	Cents per pound	Cents per pound	Cents per pound	Cents per pound	Cents per pound	Cents per pound	Cents per pound	Cents per pound	Cents per pound	Cents per pound
September..	48.4	38.7	65.2	64.4	64.7	47.4	40.1	63.9	64.7	64.9	48.0	40.7	64.3	65.4	64.6
October....	46.6	38.2	66.0	69.3	63.7	46.5	38.9	64.9	69.8	62.9	47.3	39.6	65.4	70.6	63.4
November...	46.5	39.4	69.4	66.6	61.9	46.1	41.8	69.9	66.9	61.3	46.5	40.2	70.3	67.5	61.7
December...	46.0	41.5	68.5	62.6	62.0	45.3	41.8	67.4	62.2	60.6	45.8	42.3	67.9	63.0	61.1
January....	46.2	45.0	69.0	64.9	63.1	45.9	45.0	68.7	64.8	61.8	46.4	45.4	69.2	67.5	62.2
February...	45.6	45.8	67.0	63.2	63.2	45.3	45.7	65.8	62.7	61.4	45.8	46.3	66.4	63.3	62.0
March.....	42.4	46.2	60.9	62.5	62.5	42.2	46.6	60.6	62.0	61.6	42.7	47.1	61.0	62.6	62.3
April.....	41.1	59.1	58.9	61.2	61.2	40.6	58.8	58.4	60.6	60.4	41.1	59.4	59.2	61.4	61.0
May.....	42.0	61.3	62.3	63.5	63.0	41.7	61.0	61.1	63.5	62.3	42.0	61.5	61.8	63.9	62.7
June.....	44.2	63.8	65.0	65.2	65.1	43.9	63.3	63.9	65.7	63.9	44.2	64.0	64.5	66.2	64.4
July.....	43.0	60.7	61.9	65.1	66.3	43.4	60.8	61.2	64.7	65.8	43.8	61.3	61.7	65.1	66.5
August.....	42.1	62.8	61.5	66.2	67.0	42.4	63.7	61.3	65.3	66.8	42.7	64.2	62.1	65.8	67.5

¹ Fob Italian ports; monthly averages of weekly quotations. ² Kernel size: 37-38 mm. diameter.

Source: Italian almond trade.

Table 14.--ALMOND PRICES: Italian and Spanish export quotations, gross/net, f.o.b. port, selected months, 1960-61 through 1964-65 seasons

First week of the month	Italy	Spain	First week of the month	Italy	Spain
	Unselected Baris	Unselected Valencias		Unselected Baris	Unselected Valencias
	U.S. cents per lb.	U.S. cents per lb.		U.S. cents per lb.	U.S. cents per lb.
1960-61:			1962-63--Continued		
September.....	48.4	51.6	March.....	64.0	69.9
November.....	47.0	49.2	May.....	61.1	67.0
January.....	46.3	49.7	July.....	63.2	68.6
March.....	42.6	46.8	1963-64:		
May.....	40.8	46.0	September.....	64.4	67.8
July.....	43.7	48.1	November.....	68.4	69.9
1961-62:			January.....	63.0	69.1
September.....	37.6	44.5	March.....	63.2	67.5
November.....	38.2	43.2	May.....	63.0	67.0
January.....	43.0	48.0	July.....	65.1	69.1
March.....	45.5	50.0	1964-65:		
May.....	61.0	65.1	September.....	67.3	71.4
July.....	60.3	64.1	November.....	63.0	63.5
1962-63:			January.....	62.6	65.1
September.....	63.0	67.8	March.....	63.7	64.6
November.....	68.0	74.6	May.....	62.6	67.5
January.....	69.3	75.4	July.....	65.4	70.2

Source: Italian and Spanish almond traders.

FOREIGN TRADE

Italy is normally the world's largest exporter of almonds, though in some years Spain leads. Exports are far the main market outlet for Italian almonds. Eighty percent of Italy's almonds were exported--an annual average of over 26,000 tons, shelled basis, in the 10-year period 1954-63. In terms of value, also, almond exports were an important item in the Italian trade picture. In the 4 calendar years, 1961-64, the value of Italian almond exports ranged from \$35.6 to \$44.2 million, volume as high as 48,000 tons in 1961-62.

The 26,000-ton export average conceals very substantial annual variations in the export volume. Thus, exports have been as low as 9,737 tons in the 1956-57 marketing season and as high as 48,023 tons in the 1961-62 season.

The most recent 5-year average, 30,537 tons of the 1960-61 through 1964-65 marketing seasons, is exceptionally high compared with earlier averages. It does not reflect so much an upward trend in exports as the weight of the unprecedentedly heavy exports in 1961-62, when the crop was record-large. As a matter of fact, the average export volume in the last three complete seasons, 1962-63 through 1964-65, of 27,394 tons, is only slightly larger than the 10-year average of 26,068 tons.

Italian exports are predominantly made in the form of kernels. Exports of almonds in the shell, i.e. unshelled, account for only 1 to 3 percent of the export volume (after conversion to an equivalent basis). In terms of shelled equivalent, exports of almonds in the shell average about 400 tons annually. European

Table 15.--ITALIAN ALMOND EXPORTS: Shelled, unshelled, and shelled equivalent, selected averages 1935-64, annual 1952-64

Year	Year beginning August 1		
	Shelled	Exports unshelled	Shelled equivalent ¹
	Short tons	Short tons	Short tons
Averages:			
1935-39 ² ..	28,850	2,592	29,426
1955-59...	20,720	1,730	21,104
1960-64...	30,200	1,517	30,537
1954-63...	25,661	1,830	26,068
Annual:			
1952.....	30,443	4,266	31,391
1953.....	39,233	4,334	40,196
1954.....	30,058	3,216	30,773
1955.....	17,000	1,996	17,444
1956.....	9,457	1,258	9,737
1957.....	32,445	2,175	32,928
1958.....	14,276	929	14,482
1959.....	30,422	2,290	30,931
1960.....	22,241	1,090	22,483
1961.....	47,542	2,164	48,023
1962.....	20,092	1,819	20,496
1963.....	33,078	1,359	33,380
1964.....	28,048	1,155	28,305

¹ Unshelled converted at 4.5:1. ² Average of calendar years.

Source: Statistica Mensile del Commercio Con L'estero (monthly).

countries, and in particular the United Kingdom, take the lions' share of the almonds exported in the shell.

European markets account for an even larger share of Italy's kernel exports. In the 1955-59 period, for example, 19,097 of 20,268 tons, or 94 percent, went to European destinations. In 1962, the last year for which detailed export data are available, 98 percent of Italy's kernel exports were sold in Europe.

Germany is traditionally Italy's best almond kernel customer. This has been true not only before World War II but in recent years as well. Remarkably, in 1961 and again in 1964 Italy sold more almonds to West Germany alone than to all of Germany, on the average, before the war. Shipments to West Germany ranged between 7,600 and 18,200 tons per year in the 1960-64 period. France is in second place,

albeit far behind Germany, as an almond market for Italy. Sales to France ranged between 2,600 and 3,700 tons in the same period. Netherlands is not far behind France. Sweden and then Switzerland follow. Exports to each of the last two countries range roughly between 1,500 and 3,500 tons annually. Lesser, but still important, customers are the United Kingdom, Norway, Czechoslovakia, East Germany, Austria, Denmark, and Finland.

Of the Soviet Bloc, only Czechoslovakia and East Germany are consistently large, and ever expanding, markets. The Soviet Union made an exceptionally large purchase in 1960 and much smaller, though significant, purchases in subsequent years. Poland, Rumania, and Hungary buy Italian almonds regularly though in small quantities.

Among overseas outlets, Australia and Canada have been buying small and declining tonnages from Italy. The United States has now also become a very small--even insignificant--market for Italian almonds. This represents a striking change in the status of the United States as a buyer of Italian almonds. Before World War II, the United States was one of Italy's top six customers, buying about 1,600 tons of kernels annually. By contrast, the United States in the last 3 marketing seasons, 1962-63 through 1964-65, imported a grand total of 11 tons from Italy. This sharp decrease in U.S. purchases was caused neither by displacement of Italian by other Mediterranean almonds nor by any decline in U.S. consumption. Rather, it was caused by the very appreciable expansion of almond production in the United States, specifically in California. Traditionally, the United States had been on a net import basis and an important buyer of Italian and Spanish almonds. The situation is now reversed; the United States is on a net export basis, having become an important exporter of almonds, as well as a larger consumer than ever before.

There is, of course, considerable interest in the possible effects upon the pattern of trade of the preferential tariffs of the European Common Market. The Common Market, also known as the European Economic Community

(EEC), provides for the gradual elimination of customs duties among its six members: Belgium, France, Germany, Italy, Luxembourg, and Netherlands. These duties, that the Six still impose upon each other's products, are known as "internal duties." More or less simultaneously with the dismantling of internal duties, the Six are gradually unifying the tariffs that they impose on outside, i.e. "third" countries. Such tariffs are known as "external" duties. Unification of the external duties, once completed, will result in a "common external tariff." Thus, by January 1970, if not sooner, the EEC will have a common external tariff on almonds of 7 percent ad valorem, meaning that almonds from, say, Spain or the United States will be subject to a duty equivalent to 7 percent of their c.i.f. value, at a port or border, of any of the Six. On the other hand, internal duties will have been eliminated by 1970, so almonds from Italy will be able to move into the other five countries without paying any tariff duty whatsoever. Thus, Italian almonds will have a built-in 7 percent price advantage in EEC markets by January 1, 1970. This, of course, assumes that the EEC continues to adhere to its schedule of adjusting internal and external duties.

The national tariff duties on almonds immediately prior to any EEC adjustments were as follows: Belgium, 10 percent; France, 10; Germany, 5 percent; Italy, 10 percent; Luxembourg, 10 percent; and Netherlands, 10 percent. Adjustments of the internal rates began January 1959, while adjustment of the external rates began January 1961. Italian almonds have, therefore, been enjoying a gradually increasing tariff preference--toward the ultimate preference of 7 percent--since these adjustments began. The question naturally arises: To what extent are Italian almonds already displacing those from third countries within EEC markets?

It is too early to answer this question at the time of this writing. First, the margins of tariff preference already in being have not been large enough to have had much impact upon the pattern of trade, particularly since there are long-established commercial chan-

nels and consumer preferences in the almond import-export trade. Secondly, there is some lag in the publication of detailed almond export statistics in Italy, Spain, Iran, and Morocco; the latest trade pattern is, therefore, not ascertainable.

Based only on 1961 and 1962 export figures for Italy (the latest available in detail) it appears that there has already been some shift in Italian almond exports towards the EEC market. In the 1955-59 period, 55 percent of Italy's shelled almond exports were sold to the other five EEC countries. In 1961 and 1962, an average of 65 percent of Italy's almonds went to the EEC. The percentage going to other European destinations, however, decreased from 39 to 35 percent and the percentage moving to non-European destinations dropped from 6 percent to less than 1 percent. Comparisons of percentage rather than of tonnage are made because Italy had greater export availabilities in the 1961 and 1962 period than in the 1955-59 period, and export volumes were generally higher than in the earlier period.

Remarkably, Spanish almond exports to the Common Market countries have not suffered though Italy's exports to Common Market countries have expanded. EEC consumption of almonds has risen appreciably so that both major almond exporters were able to effect simultaneous substantial increases in sales. With higher standards of living in Europe, almonds are regarded less as a luxury and are entering more into everyday usage. Spanish exports to other European countries, as well as to EEC countries, have scored sharp gains because of increases in Spanish production and export availabilities.⁸

U.S. EXPORTS AND IMPORTS

With Italian exports having registered only a slight increase in recent years and with Italian export prices having risen perceptibly, California almonds have generally not had to face any intensified competition from Italy.

⁸ cf The Almond Industry of Spain, USDA, FAS-M-165, July 1965.

Table 16.--ITALIAN ALMOND EXPORTS: Average 1935-39 and 1955-59, annual 1960 through 1964

Country of destination	Average		Calendar Year				
	1935-39	1955-59	1960	1961	1962	1963 ¹	1964 ¹
	Short tons	Short tons	Short tons	Short tons	Short tons	Short tons	Short tons
Shelled							
United States.....	1,583	191	10	28	10	--	--
Europe:							
Common Market:							
Belgium-Luxembourg.....	460	453	654	973	745	735	--
France.....	1,920	2,454	2,915	3,654	2,650	3,220	3,154
Germany, West..... ²	13,040	6,635	7,553	18,230	12,861	11,232	14,884
Netherlands.....	2,184	1,677	2,471	3,479	2,880	2,245	2,646
Total.....	17,604	11,219	13,593	26,336	19,136	17,432	(³)
Other Europe:							
Austria.....	307	364	464	895	542	--	--
Czechoslovakia.....	1,100	244	294	1,086	958	984	1,332
Denmark.....	454	239	418	790	478	--	--
Finland.....	106	217	233	447	363	--	--
Germany, East..... ⁽⁴⁾		597	43	1,104	983	985	1,070
Hungary.....	198	148	--	67	22	--	--
Ireland.....	19	3	62	3	--	--	--
Malta.....	18	27	69	71	42	--	--
Norway.....	788	550	387	1,072	728	--	--
Poland.....	181	2	60	99	6	--	--
Rumania.....	21	2	28	34	55	--	--
Sweden.....	1,798	2,278	1,429	3,614	2,489	1,813	1,913
Switzerland.....	1,431	2,061	2,144	3,365	2,005	1,701	2,011
United Kingdom.....	1,863	924	595	1,516	515	--	--
Yugoslavia.....	47	175	--	102	--	--	--
Other.....	18	47	10	3	22	--	--
Total.....	8,349	7,878	6,236	14,268	9,208	--	(³)
Total Europe.....	25,953	19,097	19,829	40,604	28,344	--	(³)
Other countries:							
Australia.....	117	148	97	69	51	--	--
Canada.....	130	67	9	20	21	--	--
U.S.S.R.....	10	130	2,499	193	380	--	--
Other.....	1,057	635	354	496	201	2,711	4,929
Total.....	1,314	980	2,959	778	653	--	(³)
Grand total.....	28,850	20,268	22,798	41,410	29,007	25,626	31,939
Unshelled							
United States.....	18	15	10	17	--	--	--
Europe:							
Common Market:							
Belgium-Luxembourg.....	9	6	14	28	18	--	--
France.....	333	117	39	85	374	124	--
Germany, West..... ²	89	94	181	256	373	388	427
Netherlands.....	7	2	33	15	44	--	--
Total.....	438	219	267	384	809	--	(³)
Other Europe:							
Austria.....	--	--	23	6	18	--	--
Denmark.....	6	26	8	8	17	--	--
Finland.....	3	4	--	14	2	--	--
Malta.....	6	6	18	9	9	--	--
Norway.....	30	41	18	29	25	--	--
Sweden.....	41	88	144	252	142	--	--
Switzerland.....	8	31	81	263	113	--	--
United Kingdom.....	222	549	768	669	433	--	--
Other.....	4	51	--	--	--	--	--
Total.....	320	796	1,060	1,250	759	--	(³)
Total Europe.....	758	1,015	1,327	1,634	1,568	--	(³)
Other countries:							
Canada.....	126	110	60	70	103	--	--
Argentina.....	190	2	41	17	15	--	--
Brazil.....	38	35	--	119	82	--	--
India..... ⁵	1,204	443	71	--	--	--	--
New Zealand.....	--	6	6	--	19	--	--
Uruguay.....	25	1	31	40	60	--	--
Other.....	234	241	153	216	134	776	839
Total.....	1,816	847	362	462	413	--	(³)
Grand total.....	2,592	1,877	1,699	2,113	1,981	1,288	1,266

¹ Complete country breakdown not yet published by Italian government. ² All Germany. ³ Not available. ⁴ Included under West Germany. ⁵ Includes Pakistan.

Source: Statistica Annuale del Commercio Con L'estero through 1962. Statistica Mensile del Commercio Con L'estero (monthly) for 1963 and 1964.

As a matter of fact, California kernel exports have been expanding dramatically, increasing from the 1955-59 average of 4,752 tons per year to roundly 9,500 tons annually in 1963-64 and 1964-65. However, U.S. exports to the EEC countries have actually declined while Italy and Spain were increasing their sales to the Common Market countries. In the 1955-59 period, 44 percent of the California almonds exported went to the EEC. In the 1961-64 period, this percentage dropped to 27.

In terms of absolute volume, however, the decrease in California almond sales to the EEC was slight. On the other hand, California sales to European countries outside of the EEC have increased somewhat, both percentage-wise and volumewise, between the 1955-59 and 1961-64 periods. Even more striking has been the increase in U.S. exports to non-European destinations while Italian and Spanish sales to these destinations have fallen sharply.

In the 1955-59 period, the United States sold 1,118 tons, or 23 percent of its kernel exports, to non-European markets contrasted with 2,636 tons, or 38 percent of its exports, in the 1961-64 period. Japan, Australia, and Canada have become the outstanding non-European markets for the United States. Sweden, the United Kingdom, and Norway have been the leading U.S. markets in Europe outside of the Common Market.

Within the Common Market, Germany has been by far the main buyer of U.S. almonds but is not showing any growth in its purchases of U.S. almonds contrasted with its considerable expansion of purchases of almonds from Italy. Netherlands' purchases of U.S. almonds

have dropped while their purchases of Italian almonds have risen. French imports of Italian, Spanish, and U.S. almonds have all gone up; Belgian imports are up for Italian almonds and down for U.S. almonds.

As earlier pointed out, U.S. imports of almonds have declined sharply. Formerly, kernel imports were of considerable significance in the U.S. supply picture; now they are virtually insignificant. Increasing California production on the one hand and rising foreign prices on the other have been responsible for the diminution of imports into the United States. There has been no change in the U.S. tariff duty which remains at 16 1/2 cents per pound for shelled almonds, 5 1/2 cents per pound for almonds in the shell, and 18 1/2 cents per pound for blanced almonds.

Before World War II, Italy was the main supplier of U.S. imports of shelled almonds. After the War, too, as late as 1950-51 the United States imported as much as 4,799 tons of kernels from Italy. However, a decline set in immediately thereafter, and the 1953-54 season was the last time Italy shipped in as much as 1,000 tons. From 1959-60 on, U.S. imports from Italy have not amounted to as much as 35 tons a year.

In the years of heavy imports from Italy, U.S. purchases were predominantly of bar types, i.e. small almonds particularly suited for chocolate bars. The decline in U.S. imports has been by no means confined to Italian almonds. In the 1964-65 season, U.S. imports of shelled almonds--from all sources--totaled only 140 tons compared with 3,097 tons per year in the 1950-54 period.

Table 17.--U.S. ALMOND EXPORTS: Average 1955-59¹, annual 1960-61 through 1964-65

Country of destination	Average 1955-59	Year beginning August 1				
		1960	1961	1962	1963	1964
Unshelled¹	Short tons	Short tons	Short tons	Short tons	Short tons	Short tons
Europe:						
Finland.....	3	14	3	4	4	6
Norway.....	16	4	9	4	7	16
Other.....	29	2	1	--	1	30
Total.....	48	20	13	8	12	52
Latin America:						
Mexico.....	5	103	219	11	201	267
Venezuela.....	3	15	9	13	10	13
Other.....	6	11	14	7	11	13
Total.....	14	129	242	31	222	293
Other countries:						
Canada.....	379	403	106	74	329	120
Philippines.....	8	14	7	1	7	21
Other.....	26	23	14	16	56	30
Total.....	413	440	127	91	392	171
Grand total.....	475	589	382	130	626	516
Shelled¹						
Common Market:						
Belgium-Lux.....	136	44	14	53	76	70
France.....	50	154	98	139	298	272
Germany, West.....	1,375	2,020	1,015	992	1,769	1,331
Netherlands.....	526	189	210	110	771	279
Total.....	2,087	2,407	1,337	1,294	2,914	1,952
Other Europe:						
Austria.....	10	4	--	--	3	--
Denmark.....	55	79	40	21	63	102
Finland.....	61	91	68	149	131	194
Ireland.....	79	66	11	1	62	134
Norway.....	133	160	122	155	276	436
Sweden.....	604	434	541	767	1,001	1,519
Switzerland.....	364	421	142	230	429	206
United Kingdom.....	236	99	561	2	1,074	1,257
Other.....	5	--	--	--	1	28
Total.....	1,547	1,354	1,485	1,325	3,040	3,876
Total Europe.....	3,634	3,761	2,822	2,619	5,954	5,828
Latin America:						
Cuba.....	20	5	--	--	--	--
Mexico.....	59	31	105	108	121	82
Peru.....	11	17	15	12	24	22
Venezuela.....	57	24	27	47	66	89
Other.....	12	12	18	13	13	18
Total.....	159	84	165	180	224	211
Australia.....	32	504	296	330	464	680
Canada.....	388	350	512	396	719	483
Japan.....	452	621	855	1,067	1,691	1,787
Other.....	87	43	71	71	132	210
Total.....	959	1,518	1,734	1,864	3,006	3,160
Grand total.....	4,752	5,363	4,721	4,663	9,184	9,199

¹ Prewar average not shown because shelled and unshelled categories not separately classified before January 1, 1943.

Source: Bureau of the Census, U.S. Department of Commerce.

Table 18.--U.S. ALMOND IMPORTS: By country, averages 1935-39 and 1955-59, annual 1960-61 to 1964-65

Country of origin and type	Average 1935-39 ¹	Average 1955-59	Year beginning August 1				
			1960	1961	1962	1963	1964
UNSHELLED							
	<u>Short tons</u>	<u>Short tons</u>	<u>Short tons</u>	<u>Short tons</u>	<u>Short tons</u>	<u>Short tons</u>	<u>Short tons</u>
Europe:							
Spain.....	276	87	131	54	22	--	--
Other.....	42	--	--	1	--	--	1
Total.....	318	87	131	55	22	--	1
Other countries.....	13	4	--	--	--	--	--
Grand total.....	331	91	131	55	22	--	1
SHELLED							
Europe:							
Italy.....	1,420	173	6	33	--	--	11
Portugal.....	11	9	--	--	--	--	--
Spain.....	1,154	1,554	285	142	76	62	48
Other.....	65	4	--	--	--	16	5
Total.....	2,650	1,740	291	175	76	78	64
Other countries:							
Morocco.....	11	69	--	--	--	--	--
Turkey.....	--	29	5	--	--	5	14
Other.....	17	26	--	--	1	36	62
Total.....	28	124	5	--	1	41	76
Grand total.....	2,678	1,864	296	175	77	119	140
BLANCHED SHELLED							
Europe:							
Italy.....	24	31	1	--	--	--	--
Spain.....	162	153	132	178	31	42	53
Other.....	3	6	6	3	13	24	20
Total.....	189	190	139	181	44	66	73

¹ Year beginning September 1, except blanched, which is calendar year average.

Source: Bureau of the Census, U.S. Department of Commerce.

OUTLOOK

In attempting to appraise future Italian production and exports, it seems unreasonable to assume that Italian almond producers will continue to be relatively indifferent to strong world demand. While California and Spanish producers have reacted to indications of strengthening demand by increasing plantings of almonds, there has not been any expansion of almond acreage in Italy.

There may have been some slight increase in Italian production because of improved yields per tree. Despite the relatively backward state of Italian almond culture, there has been some improvement in technology and this improvement should take place at a faster rate in the future. There is no question but that Italian agriculture is modernizing and this change should spill over into the almond industry. Also, there have been reports that Italian growers have been more active in recent years in replacing old, unproductive trees with young stock. The Ministry of Agriculture, in addition to extension service and experiment station activities with almonds, has also financed a survey by the Central Organization of Italian Almond Production (C.O.M.I.) with the aim of suggesting improvements. The Europe-wide trend of consolidation of uneconomically small farm units into larger enterprises able to afford more efficient practices may well extend into southern Italy, too. It, therefore, appears likely for a variety of reasons that almond production, even on an unchanged acreage base, will show some increase.

There are some signs that Italian farmers have reacted to higher almond prices. For example, prices charged by nurseries for young almond trees are reported to have risen sharply in the Bari area. The acreage decline has leveled off in recent years, and it would not be at all surprising to see some expansion of Italian almond acreage. Any expansion of Italian almond acreage, however, would be

limited to modest proportions because alternative uses of the land are being particularly favored by EEC policies. Although all tree fruits and nuts are included in the EEC Common Agricultural Policy, citrus, which competes with almonds for land in Southern Italy, has already been accorded a degree of protection by an EEC reference price system, the purpose of which is to assure favorable returns to common Market producers (in this case, Italian) of citrus. For the 1965-66 citrus marketing season, for example, the EEC sharply increased the "reference prices" (or "minimum entry price") of oranges and lemons. These reference prices provide a means by which imports--in this case, of citrus fruits--from third countries can be subjected to a compensatory tax should the "entry price" of the imported commodity fall below the reference price. Though there is considerable disagreement within the EEC whether reference prices and compensatory taxes should continue to be the means of aiding Italian citrus producers, there is little doubt that one means or another will be utilized. An EEC reference price system is also in effect for table grapes--an important crop in Puglia. No EEC programs have thus far been undertaken, or even contemplated, which would similarly benefit almond producers.

A modest increase in acreage coupled with a moderate improvement in yields could result in some expansion of production within the next few years. An increase of 15 percent, or 5,000 tons, is conceivable; however, the increase in Italian export availabilities would not be that large because consumption within Italy should increase, too. Therefore, other almond-exporting nations such as Spain and the United States which meet Italian competition would probably encounter only limited growth in export availabilities of Italian almonds. Furthermore, this growth is likely to be largely offset by increases in world demand.

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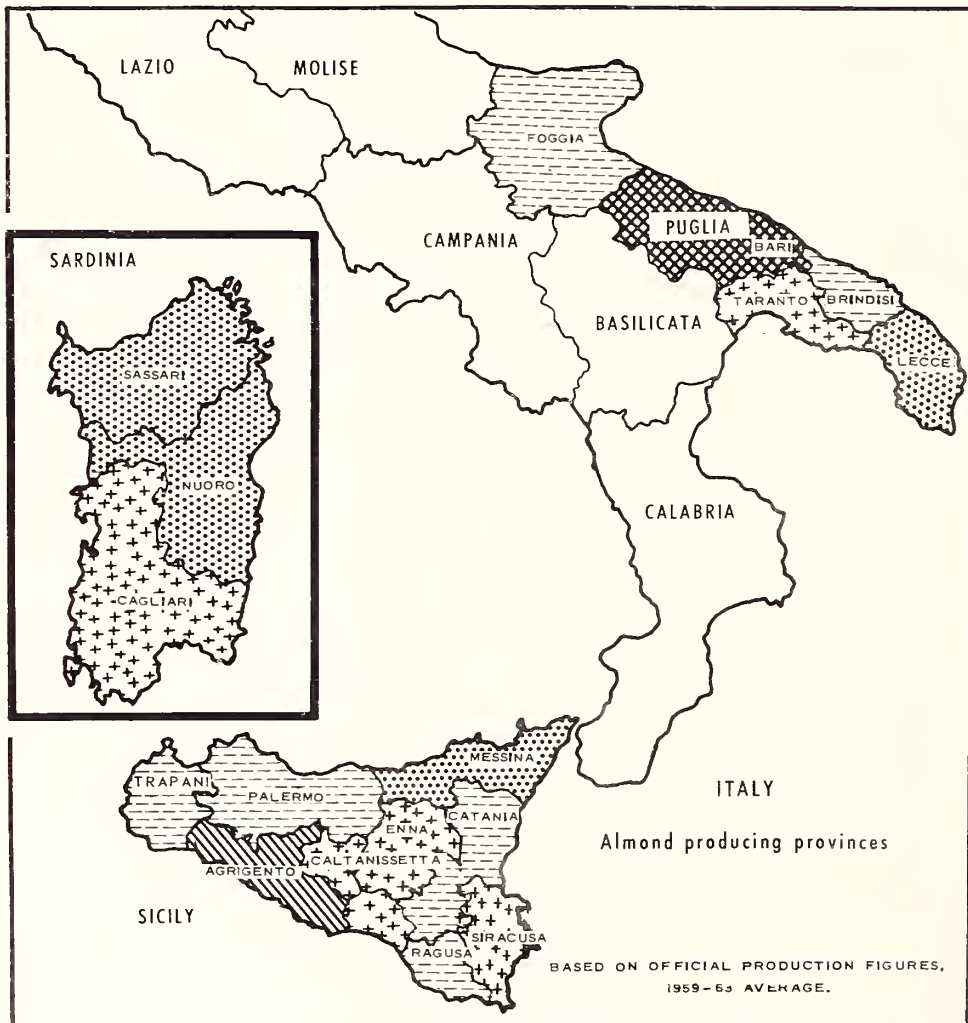
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Percentage of National Production

