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# SPAIN

## ALMOND PRODUCING ZONES



Reus



Alicante



Majorca



Malaga

## FOREWORD

Spain is usually the world's second or third largest producer and second largest exporter of almonds and therefore a major competitor with U.S. almond exports. (Traditionally, it has also exported large quantities to the United States.) In recent years, Spanish production and exports have been increasing and there are indications that further expansion may take place. Sales to the United States, however, have decreased.

This survey was undertaken in order to develop information on the production and marketing of Spanish almonds which will provide some insight on the Spanish almond industry and be of some assistance in evaluating its potential in competing with U.S. almonds abroad and, in some seasons, in the United States.

A handwritten signature in black ink that reads "J. W. Stewart." The signature is written in a cursive style with a period at the end.

J. W. Stewart, Director  
Fruit and Vegetable Division

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# The ALMOND Industry of SPAIN

3a  
By HARRY C. BRYAN

The historic pattern of trade in almonds between Spain and the United States is changing. Spain has long been a traditional supplier of almonds to the United States—in fact, the major one, for a number of years. However, quite recently the United States, because of rapidly increasing domestic production, has been able not only to meet more of its own needs but to enter the almond export market, sometimes competing with the Spanish product. It continues also to receive some Spanish almonds, especially certain varieties needed for specialized uses, though imports have been decreasing. Both countries continue to expand the production on which their export potential is based.

Spain, a long-established almond producer and exporter, is one of six countries accounting for nearly all the world's commercial production of sweet almonds. With three other of these, Italy, Portugal, and Morocco, it is located in the Mediterranean area, generally considered the center of world almond production. Aside from the United States, now one of the world's major producers, the remaining major commercial producer is Iran; minor ones are Turkey, Cyprus, Greece, Algeria, Afghanistan, and Tunisia. During the 10 years, 1955-64, commercial production in the six main countries averaged 102,000 short tons, shelled basis, of which Spain accounted for 26,800 tons, or 26 percent.

Following Italy, the United States and Spain vie for second place. U.S. production, which averaged 20,000 tons in the 1950-54 period, rose to 23,800 tons in the 1955-59 period and to 33,100 tons in the most recent 5 years, 1960-64. Italy's production is highly cyclical, and in some years of short Italian production Spain or the United States reigns as leading producer.

Almond exports by the six leading producers in the

10 years 1954-63 averaged 61,824 short tons, shelled basis; of this amount, Spanish exports, at 19,134 tons, came to 31 percent. While Italy has usually been far the leading world exporter, Spain leads in some years.

Since Spain's currency stabilization in 1959, that country's almond prices have been competitive in world markets, and in fact are one of the determinants of world prices. As producer prices and processing costs rise in Spain, Spanish export prices for almonds are apt to be maintained or even to rise.

Demand in the major importing countries continues to rise, serving as a stimulus to Spanish production and that of other exporters. For the 5-year period 1957-61, Spanish exports had risen to an average of almost 27,000 short tons, from about 17,000 tons for 1950-54.

Among individual markets, the countries of the European Common Market (EEC) have been very important to Spanish almond exporters, and here the granting of tariff preference to Italy, an EEC member, could affect Spanish trade. To date, these exports have not been adversely affected. However, once the Common Market attains its planned tariff structure (tentatively 1970), a 7-percent duty must be paid on Spanish almonds as they enter the EEC countries, while Italian almonds will be able to move free of duty. Thus, there could well be a shift in the destination of Spanish exports, with fewer going to the EEC and more to non-EEC countries, such as United Kingdom (now the main Spanish market), Scandinavia, Switzerland, and Canada, and other countries. As Spanish almonds are displaced by Italian almonds in the EEC, Italian almonds would, in turn, be displaced by the Spanish in non-EEC outlets. Other exporters might be affected also by such shifts of markets among major producers.

## SUMMARY

Almonds are important to Spanish agriculture and trade. In 1962, almond exports earned Spain about \$33 million in foreign exchange, or about 9 percent of total agricultural export earnings, or 4.5 percent of all export earnings. (About three-fourths of Spain's almonds enter world trade channels.)

Though Spain's Mediterranean coast is particularly favored for almond growing, almond trees are planted in all the country's 52 provinces. In the recent past, production has been showing an appreciable increase, most of it from new plantings just coming into bearing. Some further rise in production can be expected as additional plantings are being made and these are expected to exceed attrition. Almost all new production is of improved varieties, in greatest export demand. Harvests in the immediate future may average about 35,000 tons as against 30,000 tons the last 5 years.

<sup>1</sup> Mr. Bryan, formerly with the Fruit and Vegetable Division, is now Assistant U.S. Agricultural Attaché in Karachi, Pakistan.

For the most part, Spanish cultural practices have not changed greatly from those of 20 to 30 years ago; however, the more progressive farmers are beginning to adopt modern cultural practices. Where the terrain permits, some efforts are also being made toward mechanical or semi-mechanical harvesting.

Perhaps the most dramatic changes have taken place in marketing and processing of almonds. Exporters that used to hold considerable stocks during the year now prefer to buy from speculators or accumulators as need arises. In addition, the number of almond exporters is dwindling, and export trade is handled by a small number of large firms.

In processing, an increasing proportion of the crop is being handled by mechanical equipment. Innovations in packaging are taking place, with almonds now being packed in consumer-size packages. Increasing numbers are now being blanched, and more sold and shipped as selected sized varieties.

Much of the improvement in quality has come about through the exporters, who developed individual stand-

ards. However, the government also established in 1961, and amended in 1963, compulsory export standards and export inspection. Compulsory export pack-

aging standards were also put into effect.

Domestic consumption has shown some increase, particularly in the candy industry.

## PRODUCTION

For about 30 years, till the late 1950's, commercial sweet almond production<sup>2</sup> in Spain had changed little, averaging about 25,000 short tons<sup>3</sup> shelled basis. In 5 of the last 6 years, however, production has been considerably larger, in the past 5 years (1960-64) averaging about 30,000 tons. The 1964 harvest has been estimated at 33,000 tons, second largest on record.

Most of this increase in production arose from new almond plantings coming into bearing; part, however, was caused by favorable weather. Some additional increase in production is likely. The magnitude of this increase cannot be precisely estimated, but future crops of 30,000 to 40,000 tons may be expected. Unfavorable weather in any given year may, of course, result in a much smaller crop, such as in 1955.

## Producing Areas

Almonds are grown throughout most of Spain. However, because of mountains inland and Mediterranean weather along the coast, the commercial producing area is concentrated in the provinces bordering the Mediterranean Sea, in a narrow strip of land, stretching from the base of the Pyrenees Mountains in the northeast some 750 miles along the coast to the Portuguese border in the southwest. The Balearic Islands, off the east coast, are included in the area. On the east and south coasts, the commercial almond plantings run, in general, inland from the coastal plain some 25 to 50 miles up the valleys, which run into the sea. Almond plantings also extend up the slopes and hills adjoining the valleys, and are planted inland of the valleys, on higher ground. In the northeast, the producing area extends further inland following the Ebro River and adjacent river valleys. Here, almond plantings are found

mostly from the shoreline to an elevation of about 1,500 feet. At higher elevations, less frequent plantings are made in such a way as to take advantage of exposure, using terrain to block off cold winds.

Of the six islands of the Balearics, only two, Majorca and Iviza, are important almond producers. Mountains along the western and northern sides of these islands protect the trees from cold northern winds. Majorca is almost entirely one almond grove, as trees are grown from the seashore in the south up through a fairly level-to-rolling plateau that rises from 600 to 1,500 feet. Almonds, however, are not grown to a considerable extent in the mountainous areas.

Spain's almond producing area is usually considered divided into four "zones": Reus, Majorca, Alicante, and Malaga. These are not precisely demarcated but are based on traditional almond trade patterns and similarities in climate, varieties, and production problems. Areas producing almonds within a zone are not necessarily contiguous. Each zone is named after the city which is the major almond trade center.

The Reus zone in the northeast consists of the almond-producing districts of seven provinces: Castellon, Tarragona, Huesca, Lerida, Teruel, and Zaragoza, (all in the northeast), and Salamanca, (a province in western Spain). Commercial almond production in this zone is estimated at about 20 percent of the total.

Majorca is the next zone to the south and east, and comprises the islands of Majorca and Iviza. About 30 percent of Spain's commercial crop is reportedly harvested in this zone.

The Alicante zone, with four provinces—Alicante, Murcia, Valencia, and Albacete—also accounts for about 30 percent of the commercial harvest.

In the southwest, the provinces of Granada, Almeria, Malaga, and Huelva make up the Malaga zone. The commercial crop in this area amounts to approximately 20 percent of the total.

<sup>2</sup>The production statistics in this report are not the official figures published by the Spanish Government. The official figures (published in *Espana Anuario Estadístico*) cover total production, i.e. production in all provinces of Spain including those where almonds are not of commercial significance and also the production in commercially important areas which does not enter marketing channels. The figures for Spain reported here are estimates of commercial production by the Foreign Agricultural Service. They have been prepared on the basis of estimates by representatives of the almond industry in Spain and other countries, reports of the U.S. Agricultural Attachés and Foreign Service Officers in Spain, official statistics of the Spanish Government, other related information, and research by the Fruit and Vegetable Division, FAS. These estimates are in terms of shelled almonds.

Total almond production, according to official Spanish statistics, amounted to 145,800, 157,000, 171,000, 225,400, and 143,400 short tons, unshelled basis, in the years 1958 through 1962, respectively (taken from *Espana Anuario Estadístico* 1963; metric tons converted to short tons).

<sup>3</sup>Spain also produces bitter almonds; however, this study is concerned only with sweet almonds.

## Acreage, Tree Numbers

In 1962, Spain had over 510,000 acres of "specialized"<sup>4</sup> almond plantings with 29.9 million trees, according to official statistics. An additional reported 11.7 million almond trees in "scattered"<sup>5</sup> plantings, brought the total to 41.6 million almond trees. (In comparison, California reported 128,000 acres of almonds in 1963; tree numbers were probably not in excess of 9 million.) Although there are also Spanish statistics for earlier years on almond acreage and tree numbers, it is con-

<sup>4</sup>"Specialized" plantings refers to orchards solidly-planted to almonds. The almond trees are not permanently interplanted with other kinds of trees or vines.

<sup>5</sup>"Scattered" plantings, as the term implies, are isolated or dispersed almond trees. If planted in the form of orchards, the almonds are permanently interplanted with other kinds of trees or vines.



TABLE 1.—COMMERCIAL ALMOND PRODUCTION<sup>1</sup>: IN SPECIFIED COUNTRIES, SELECTED AVERAGES 1935-64 AND ANNUAL 1950-60 (SHELLED BASIS)

Year	Iran	Italy	Morocco	Portugal	Spain	United States	Grand total
	1,000 <i>short tons</i>	1,000 <i>short tons</i>	1,000 <i>short tons</i>	1,000 <i>short tons</i>	1,000 <i>short tons</i>	1,000 <i>short tons</i>	1,000 <i>short tons</i>
Average:							
1935-39 -----	7.5	31.8	2.8	3.0	23.1	7.4	75.6
1950-54 -----	7.6	39.2	3.0	5.3	26.2	20.0	101.3
1955-59 -----	8.0	30.8	3.0	3.2	23.8	23.8	92.6
1960-64 -----	6.7	34.9	3.1	3.2	29.8	33.1	110.8
1955-64 -----	7.4	32.8	3.1	3.2	26.8	28.5	101.8
Annual:							
1950 -----	7.2	55.0	3.9	5.3	28.0	19.7	119.1
1951 -----	7.7	24.0	3.5	3.4	29.0	20.8	88.4
1952 -----	7.7	45.0	2.2	6.1	27.0	17.6	105.6
1953 -----	6.6	38.0	3.3	6.2	28.0	19.7	101.8
1954 -----	8.8	34.0	2.1	5.6	20.0	22.2	92.7
1955 -----	4.7	21.0	1.7	3.5	13.0	19.2	63.1
1956 -----	5.5	13.0	1.6	2.6	18.0	30.1	70.8
1957 -----	11.0	53.0	2.0	4.3	32.0	18.1	120.4
1958 -----	9.0	15.0	6.3	2.2	25.0	9.6	67.1
1959 -----	10.0	52.0	3.6	3.3	31.0	42.2	142.1
1960 -----	4.0	14.0	2.7	1.2	32.0	26.8	80.7
1961 -----	9.0	66.0	4.0	5.8	35.0	35.7	155.5
1962 -----	8.0	14.5	2.2	4.3	20.0	26.6	75.6
1963 -----	5.5	42.0	3.1	1.3	29.0	34.5	115.4
1964 <sup>2</sup> -----	7.2	38.0	3.3	3.6	33.0	42.0	127.1

<sup>1</sup> Estimated. <sup>2</sup> Preliminary.

Source: Foreign Agricultural Service, U.S. Department of Agriculture.

TABLE 2.—ALMOND EXPORTS: BY SPECIFIED COUNTRIES OF ORIGIN SELECTED AVERAGES 1935-63 AND ANNUAL 1950-63 (SHELLED BASIS)

Year beginning Aug. 1	Iran	Italy	Morocco	Portugal	Spain	United States	Grand total
	<i>Short tons</i>	<i>Short tons</i>	<i>Short tons</i>	<i>Short tons</i>	<i>Short tons</i>	<i>Short tons</i>	<i>Short tons</i>
Average:							
1935-39 -----	<sup>1</sup> 4,622	29,426	<sup>2</sup> 1,509	2,661	24,120	—	62,338
1950-54 -----	<sup>1</sup> 5,617	34,120	<sup>2</sup> 1,523	6,353	17,013	2,998	67,624
1955-59 -----	<sup>1</sup> 5,568	21,104	<sup>2</sup> 2,217	3,276	16,678	4,989	53,832
1954-63 -----	<sup>1</sup> 5,416	26,068	<sup>2</sup> 1,866	3,995	19,134	5,345	61,824
Annual:							
1950 -----	<sup>1</sup> 3,641	—	<sup>2</sup> 3,004	5,009	20,091	—	31,745
1951 -----	<sup>1</sup> 6,175	—	<sup>2</sup> 1,623	3,737	18,401	—	29,936
1952 -----	<sup>1</sup> 5,765	31,391	<sup>2</sup> 1,048	5,841	18,701	1,360	64,106
1953 -----	<sup>1</sup> 5,146	40,196	<sup>2</sup> 1,111	7,421	19,488	3,922	77,284
1954 -----	<sup>1</sup> 7,357	30,773	<sup>2</sup> 828	9,758	8,385	3,712	60,813
1955 -----	<sup>1</sup> 4,195	17,444	<sup>2</sup> 1,136	6,098	5,173	2,977	37,023
1956 -----	<sup>1</sup> 3,645	9,737	<sup>2</sup> 830	3,248	6,615	6,963	31,038
1957 -----	<sup>1</sup> 5,559	32,928	<sup>2</sup> 4,492	3,130	24,789	4,605	75,503
1958 -----	<sup>1</sup> 9,386	14,482	<sup>2</sup> 2,849	2,337	14,758	1,007	44,819
1959 -----	<sup>1</sup> 5,054	30,931	<sup>2</sup> 1,776	1,568	32,055	9,395	80,779
1960 -----	<sup>1</sup> 3,077	22,483	<sup>2</sup> 2,893	2,476	29,014	5,658	65,601
1961 -----	<sup>1</sup> 4,685	48,023	<sup>2</sup> 1,153	4,966	33,811	4,912	97,550
1962 -----	<sup>1</sup> 8,093	20,496	<sup>2</sup> 1,207	3,932	14,957	4,728	53,413
1963 <sup>3</sup> -----	<sup>1</sup> 3,111	33,380	<sup>2</sup> 1,500	2,436	21,781	9,497	71,705

<sup>1</sup> Year beginning March 20. <sup>2</sup> Calendar year of the following year shown. <sup>3</sup> Preliminary.

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

TABLE 3.—SPANISH ALMONDS: ACREAGE AND TREE NUMBERS IN SPECIALIZED AND MIXED PLANTINGS, AND TOTAL TREE NUMBERS, BY SELECTED ZONES AND PROVINCES, 1962

Zone and province	Specialized plantings		Scattered plantings	Total tree numbers <sup>1</sup>
	Acreage	Tree numbers <sup>1</sup>	Tree numbers <sup>1</sup>	
	<i>Acres</i>	<i>Thousands</i>	<i>Thousands</i>	<i>Thousands</i>
<i>Reus</i>				
Castellon -----	30,888	2,500	180	2,680
Tarragona -----	18,285	1,184	671	1,855
Huesca -----	10,378	840	2,226	3,066
Lerida -----	4,052	246	1,550	1,796
Salamanca -----	2,718	4	390	394
Teruel -----	1,803	58	120	178
Zaragoza -----	2,298	124	398	522
Total -----	70,422	4,956	5,535	10,491
<i>Majorca</i>				
Baleares -----	171,982	7,656	200	7,856
<i>Alicante</i>				
Alicante -----	78,405	4,950	1,335	6,285
Murcia -----	78,306	4,753	370	5,123
Valencia -----	8,673	649	75	724
Albacete -----	2,743	173	112	285
Total -----	168,127	10,525	1,892	12,417
<i>Malaga</i>				
Granada -----	43,243	2,625	370	2,995
Almeria -----	14,084	570	950	1,520
Huelva -----	12,009	729	924	1,653
Total -----	7,413	300	50	350
Total -----	76,749	4,224	2,294	6,518
Others -----	23,241	2,513	1,771	4,284
Grand total -----	510,521	29,874	11,692	41,566

<sup>1</sup> Both bearing and nonbearing trees.

Source: *Anuario Estadístico de la Producción Agrícola*, Spanish Ministry of Agriculture, 1963.

sidered inadvisable to make comparisons between years because of lack of comparability in the data. (The 1962 enumeration<sup>6</sup> is the most recent available and it may be more complete than earlier enumerations.)

Largest specialized plantings in terms of acreage are reported in the Majorca zone, with 34 percent of Spain's total; Alicante is close behind with 33 percent. (Alicante and Murcia provinces account for most of this zone's acreage.) Malaga zone is third with 15 percent (Granada is the main producing province); Reus zone is fourth, with Castellon the most important province and Tarragona next.

In tree numbers, the Alicante zone leads by a wide margin (though slightly behind Majorca in acreage) with 85 percent of its almond trees in specialized plantings. In this zone, Alicante province has the largest numbers of trees in orchards, as well as scattered trees. Reus zone—third in acreage—is second in tree numbers, but here a much lower percentage is in specialized plantings than in the leading zone (in 1962, only 47 percent). (While in this zone 93 percent of Castellon's and 64 percent of Tarragona's almond trees are in specialized plantings, most of the trees in Huesca, Lerida, and Zaragoza are scattered.)

Majorca ranks third in tree numbers with an exceptionally high proportion—over 97 percent—specialized. Malaga zone's trees are also predominantly specialized (65 percent). Here, the main province, Granada, is 88 percent specialized, but scattered trees predominate in Malaga and Almeria provinces.

## Climate

Spain's almonds are grown in a Mediterranean (or California) type of climate, well suited to almond culture. Individual areas vary somewhat, however. The northeast coastal and interior regions are generally cooler and more humid than the southeast. Nevertheless, because of the influence of the Mediterranean Sea, the climate throughout is generally free from extremely hot or cold weather.

The almond producing areas, as they are planted, range so widely over Spain that the entire crop is unlikely to be damaged by a single frost. Damage by frost to the production in each area is also limited, except in the case of a severe freeze, by variations in altitude and the fact that among the many varieties there are different flowering periods. The presence of a multitude of almond varieties is actually a hedge

<sup>6</sup> *Espana Anuario Estadístico*, 1963.

against complete crop failure, either in an area or else even on an individual farm, because of frost hazards.

Spanish almonds generally blossom during the 3-month period January through March, beginning in the south and gradually moving northward. Danger from frost exists in the south until early March, and in the north until the latter part of April.

In the southern areas, if frost damage should occur, it is not uncommon, in spite of this, for the trees to bear a limited crop from some later blooms, the so-called second blossom. High winds during flowering are sometimes also a hazard.

Annual rainfall in the almond producing areas averages 8 to 10 inches in the southeastern districts, and about 15 inches along the eastern coast; it ranges from 20 to 30 inches in the northeastern region and in the Balearic Island. Little rain falls in spring and summer months, although scattered showers—sometimes quite heavy—occur occasionally in summer. The rainy season—if it could be called that—is from late September through April. Growth and fruiting therefore take place during the dry season; this helps reduce disease.

For specified provinces in Spain, rainfall and representative temperatures are as follows:

	Annual avg. rainfall Inches	Avg. daily max. temperature (August) Degrees F.	Avg. daily min. temperature (January) Degrees F.
Zaragoza -----	12	74.7	42.1
Barcelona -----	23	75.6	48.9
Valencia -----	16	76.3	50.0
Murcia -----	11	79.3	50.4
Almeria -----	9	77.5	54.7
Seville -----	22	83.1	50.2
Badajoz -----	21	78.4	46.6

Below, left, almonds in bloom, Murcia area; orchard trees widely spaced, ground clean-cultivated. Right, mature almond orchard after pruning; trees distinctively open form.



## Varieties

Spain has a multitude of almond varieties; the Island of Majorca alone is said to have over 100. Because of this large number, many have been grouped into a few main types or classes. Out of two classes and seven varieties of commercial importance, seven are hard or semi-hard shell, and only two soft-shell. The main hard or semi-hard shell almonds are the Valencia and Majorca classes, and the varieties Esperanza, Jordana, Longuette, Marcona, and Planeta. Mollar and Fita are the better known soft-shell.

Perhaps the best known of the Spanish almond classes is the Valencia. This is a commercial category into which unspecified varieties, grown in any region except Majorca, are placed. Possibly 50 to 70 percent of Spain's total almond production falls into this grouping. The Valencia class thus consists of quite heterogeneous varieties, except that the nuts tend to have a rather low shell-out or yield of kernel from whole nuts, estimated between 18 percent and 24 percent.

The Majorca, better known as the Farmer Majorca class is composed of the many varieties grown on the Island of Majorca which are usually purchased on an orchard-run basis, hence the name Farmer Majorcas. Farmer Majorcas account for most of the almonds grown on the Balearic Islands and for about 15 to 25 percent of the total Spanish crop. One unique aspect of Farmer Majorcas is that all of the many varieties are sweet, making this class a favorite among the candy manufacturers. The kernel yield is estimated in the 20 to 26 percent range.

The Jordana is one of Spain's better known almonds. Some consider it a variety; others claim that it is a group of fairly similar varieties that produce a large, long, highly flavored almond with a smooth skin. The sugar-glazed almond confection, universally known, is



made from the Jordana. About 5 to 10 percent of Spain's almond production is comprised of the Jordana. Production is almost entirely concentrated in the Malaga area. Shelling yield is estimated from 20 to 23 percent.

The Longuette variety is best known in the United States for its use in candy bars. Candy bars require small flat almonds, designated because of this use as "bar types." The Longuette variety accounts for possibly 8 to 20 percent of Spain's production. This variety is grown in both the Reus and Alicante zones. The Longuette's shelling yield, estimated at 22 to 26 percent, is one of the highest of the hard-shell types.

The Marcona variety is perhaps best known for its extremely sweet flavor, and much utilized by the candy trades, particularly for "turrón" or nougat, which is basically made of almonds and honey. It is also suitable for salting and blanching. The kernel is round and thin. It is grown in the Reus and Alicante zones and accounts for approximately 3 to 7 percent of total production. Its kernel yield of 23 to 25 percent is one of the highest among the hard-shell varieties.

Spanish soft-shell almonds sold in-shell are largely limited to two varieties—the Mollar and Fita. Perhaps better known of the two is the Mollar or Tarragona Mollar, indicating that it is grown in the Reus-Tarragona area. In recent years, there has been some production of the Mollar variety in the Alicante zone. The kernel yield in this area is a little less than the 35-40 percent for the Mollar grown around Reus. The Fita variety is grown mainly on the Island of Iviza—one of the Balearic Islands. The kernel yield for the Fita is lower than for the Mollar with estimates of about 28 to 30 percent.

For Spain as a whole, the average shell-out is estimated at about 25 percent. In comparison with the 50 percent kernel yield, and even higher in some years, obtained from the chief California variety (Nonpareil), this is quite low; however, by far the most of Spain's almond varieties are hard or semi-hard shell varieties while most of California's production is from soft-shell varieties. Also, the average Spanish shell-out is comparable with that of other Mediterranean countries'

almonds, such as Italy's and Portugal's. As indicated, the hard or semi-hard shell varieties of Spain have a shell-out which is estimated to be in the 18 to 26 percent range, while the soft-shell varieties probably average 30 to 35 percent with some varieties even higher; but as these soft-shell varieties comprise only a small proportion of total production, the average shell-out for all the Spanish varieties is low.

Even in converting in-shell exports to a shelled basis, a relatively low shell-out would apply because these in-shell exports include about equal quantities of soft- and hard-shell varieties.

## Tree Spacing and Yields

Differing rainfall levels that characterize the various almond producing areas have resulted in considerable variation in tree spacing; variation exists also among plantings within an area. However, in all zones, orchard plantings are made on the diamond or square. In the case of scattered plantings, trees are located to take advantage of best available soil, topography, exposure, and moisture. In the Alicante and Malaga zones, for instance, many such plantings are made on terraced mountain sides. Also, in the extremely dry valleys in these zones, trees are grown on the borders of dryland crop fields, spaced 40 feet apart within the borders and the borders considerably farther apart.

It is apparent that there is a considerable range in number of trees planted to the acre. Approximations of average number of trees per acre in the various zones are: Majorca 50; Malaga 60; Alicante 65; and Reus 70.

Though data on yields are very limited, it is obvious that production per tree is small. Main causes are: lack of adequate moisture (resulting in relatively small open trees); the nature of the cultural practices used; and the advanced age of most trees.

Average yields per tree in the Alicante zone reportedly range from 4 to 20 pounds of in-shell almonds;

TABLE 4.—SPANISH ALMOND VARIETIES AND CLASSES: CHARACTERISTICS OF SHELL AND KERNEL, SHELLING YIELDS, PRODUCTION, AREAS AND USES

Variety or class	Characteristic of shell	Approximate shelling yield (percent)	Characteristic of kernel	Producing zone	Major Use
Valencias <sup>1</sup>	Hard and semi-hard	18-24	Varies	Reus, Alicante, Malaga	Confectionery, blanched, salting.
Esperanzas	Hard and semi-hard	20-25	Heart shaped, fine skin	Reus	Confectionery.
Longuettes	Hard and semi-hard	22-26	Long shaped, plump, fine skin, bar type	Reus, Alicante	Confectionery, blanched.
Jordanas	Hard and semi-hard	20-23	Large, long, smooth, flavorful	Malaga	Confectionery, blanched.
Marconas	Hard and semi-hard	23-25	Round shaped	Alicante, Reus	Confectionery, salting, blanched.
Planetas	Hard and semi-hard	22-23	Narrow uniform diameter	Alicante	Confectionery.
Majorcas <sup>1</sup>	Hard and semi-hard	20-26	Varies	Balearic Is. (Majorca)	Confectionery.
Fitas	Soft	28-30	Varies	Balearic Is. (Iviza)	Sale in-shell.
Mollar	Soft, thick	35-40	Plump, oval, medium and large size	Reus, Alicante	Sale in-shell.

<sup>1</sup> A class name applied to several varieties which have similar characteristics.

Source: Consensus of Spanish trade opinion.

those in the Malaga zone run from 4 to 15 pounds, and in the Reus zone from 2 to 16 pounds. In Majorca, yield averages range from 4 to 11 pounds.

These per-tree yields and the average number of trees per acre indicated suggest the following ranges of yield per acre by zone: Alicante, 260 to 13,000 pounds; Malaga, 240 to 900 pounds; Reus, 140 to 1,120 pounds; and Majorca, 200 to 550 pounds.

The midpoint of any of these ranges is far below the average (1959-63) yield in California of 1,364 pounds per acre.

The areas that have been described as the commercial almond zones are also Spain's fruit- and vegetable-producing areas. Instead of almonds, fruits and vegetables producing higher yields and more profits are grown on the superior land there, as well as on land with access to irrigation water. Coupled with the almond's hardiness and ability to produce crops even under driest and most adverse conditions, this situation has resulted in the almond being grown in the least desirable locations in terms of topography, soil, and water, as well as with a minimum of labor.

## Cultural Practices

Through the years, and even today, farmers have felt that almonds will give a return on unprofitable land where nothing else pays (except olives and carobs). This, of course, has had an important influence in relegating almond growing to poor land, and giving it little care.

**Cultivation, Intercropping and Irrigation.**—In specialized plantings and also in areas where there is not sufficient moisture for intercropping, the soil is clean-cultivated and smoothed. Two cultivations are reportedly common. Where there are intercrops, either fall- or spring-planted, the soil is plowed and leveled between plantings. Interplanting often embodies rotation of small grains and legumes. In Spain, only a relatively small acreage of almonds is believed to be intensively intercropped. Land suitable to such intensive cropping is gradually being taken out of almond production because of more profitable alternatives offered by annual crops. In scattered plantings, the ground around the base of the trees is broken up, usually by hand but sometimes by machinery.

Out of a total of 510,521 acres of almonds, only about 75,000 acres are reportedly irrigated; of these, 71,000 acres are in the province of Alicante. Where water is available and land suitable for irrigation, higher-value crops, such as citrus, deciduous fruits, or vegetables are grown. The irrigated almonds are those most commonly intercropped. Spanish almond rootstocks are reportedly not suited to irrigation, which has been held responsible for the death of some almond trees in Alicante. It is expected that most almond plantings in Alicante now on irrigated land will be removed eventually and the land utilized for higher income crops.

Every effort is made to conserve moisture resulting from rainfall. In some areas, basins are dug around the trees to collect rain; also the runoff is channeled into the groves.

**Rootstocks and Pruning.**—The bitter almond is now used almost exclusively as rootstock. In the past, peach and cherry-plum were also used. Many of the larger producers grow their own seedlings. Seedlings are also available from state-owned nurseries at a very low



Spanish almond orchard in early fall, with winter cover crop of small grain appearing.

price—about 5 cents each—or from commercial nurseries at about 15 cents each in lot quantities.

Seedlings are transplanted from the nurseries at 2 to 3 years of age. The following year, the desired variety is grafted to the rootstock.

In general, pruning is a haphazard operation carried on every third year. Removal of dead or diseased wood, suckers, and interfering branches is the usual practice. However, some of the older trees are pruned severely, and in some cases topworked. Trees generally have two or three main limbs and an open appearance. A height of 12 to 14 feet is common.

**Fertilization and Spraying.**—Until recently there was practically no use of fertilizer—either commercial or animal manure. The use of manure or a mixture of manure with ash (made by burning almond hulls) is becoming widespread. Each year about 8 to 10 pounds of manure, or the ash mixture, is worked into the soil around the tree base. Commercial fertilizers are sometimes used by the more progressive farmers; usually, however, this fertilizer can provide a more economic return when applied to other crops.

Although there are insects and diseases affecting Spanish almond production, use of commercial insecticides and fungicides is not general, especially in scattered plantings or small specialized plantings. However, owners of some large well-managed holdings have pest-control programs, usually involving the use of DDT and Bourdeaux Mixture.

**Farm Labor.**—Spanish almond production is accomplished with a minimum of hired labor. The farm operator and his family usually provide the labor required. Larger units may have additional full-time

workers but very little part-time labor is employed (if at all, it is for harvesting only).

Minimum wages for Spanish workers were established at \$1 per day in early 1963. Permanent farm workers are furnished housing and some farm-produced food; they also receive paid vacations and regular bonuses.

**Harvesting.**—Harvesting extends over approximately 3 months—August through October. In the earliest-blooming areas, Malaga and Alicante, harvest begins in early August and extends into October. In the later-blooming areas, Majorca and Reus, harvesting does not usually commence until early September.

Because of the nature of the almond plantings—the roughness of the terrain and the wide tree spacings—and the relative abundance of labor in most areas, the most common method of harvesting is for the almonds to be knocked off the trees with a pole. There are several variations of this practice; usually a crew of men go through the plantings knocking the almonds off the trees, followed by a crew of women and children who gather the almonds off the ground. If the trees are heavy-bearing, sometimes a ground cloth is used.

In some areas a semi-mechanical harvesting method is being used. Carts with cloth frames on 3 sides are

drawn under the trees; the almonds are then knocked into the cart.

Labor for harvesting is usually provided by the farm operator and his family. There is some exchange of labor, but very little is hired. Some of the larger operators, however, contract for harvesting; generally, however, they too, have enough of their own labor. Also, although contract-harvesting is faster, damage to trees is greater, as well.

Cost of harvesting varies considerably, depending on yields. Cost up to 0.6 cents per pound for harvesting almonds in the hull has been estimated by some of the larger growers. If labor is contracted, the cost may be slightly less, at 40 to 50 cents per 110-pound sack.

Most growers have their own hulling machines. For those who do not, nearly every village has machines for custom use. In either case, cost of hulling runs about 10 cents per 110-pound sack. The hulls are used quite extensively. Usually, they are burned and the ash used for making soap or put into mixture with manure for fertilizer.

After the almonds are hulled, they are allowed to dry for several days in the sun; during this time they are turned frequently. When dry, they are stored in the shell on the farm until sold.

## MARKETING

The Spanish almond packer-exporter has two means of obtaining almonds: (1) from his agents located throughout the producing areas or (2) from speculators located in the major trade centers (who have their own agents or buy from small speculators in the producing areas). Often agents also speculate for their own account.

Agents and speculators obtain their supplies of almonds in the same manner. The usual method is to purchase in-shell almonds from growers and shell the nuts at the semi-processor's own plants or send them directly to the packer-exporter for shelling. Alternatives include some custom shelling as well as purchase by local shellers direct from growers and resale to agents

or speculators. Also, agents may obtain almonds—both in-shell and shelled—from small speculators as the season progresses. These speculators are typically middlemen. However, growers, particularly larger ones, may speculate, often withholding their crops from the market until they feel the price is right.

Usually the packer-exporter obtains enough almonds to meet early commitments and, if he feels the price is favorable, perhaps additional supplies for future shipment. Generally, however, the packer-exporter does not keep large uncommitted stocks on hand, but buys as orders are received, calling upon his agents or going to speculators to obtain needed supplies. As the season progresses, prices of uncommitted stocks become quite

TABLE 5.—SPANISH ALMONDS: PRICES<sup>1</sup> RECEIVED BY PRODUCERS FOR ALMONDS IN THE SHELL, 1959-60 TO 1963-64 SEASONS

Month	Monthly average				
	1959-60	1960-61	1961-62	1962-63	1963-64
	U.S. ¢ per lb.	U.S. ¢ per lb.	U.S. ¢ per lb.	U.S. ¢ per lb.	U.S. ¢ per lb.
September -----	7.6	8.1	9.0	15.8	16.4
October -----	7.6	9.7	9.0	15.8	17.0
November -----	7.9	9.7	9.2	17.2	17.0
December -----	8.1	9.7	9.5	16.8	15.9
January -----	7.7	9.9	10.0	16.4	14.9
February -----	7.9	9.9	10.1	16.0	14.8
March -----	7.5	9.7	10.6	16.0	15.0
April -----	7.3	9.2	12.0	17.0	—
May -----	7.6	9.1	13.0	17.3	—
June -----	7.6	9.1	14.7	18.2	—
July -----	7.7	9.7	14.8	17.3	—
August -----	7.6	9.6	15.0	19.6	—

<sup>1</sup> Converted from Spanish currency at exchange rate of 60 pesetas per US\$1.00.

Source: Statistical Division, Spanish Ministry of Agriculture.

sensitive to changes in the world market. With either method of obtaining supplies, and whether they be in the shell or shelled, the packer-exporter performs the final grading and selecting processes.

Prices received by producers have risen markedly in the past 5 seasons, doubling between 1959-60 and 1963-64. From September 1959 to September 1961, they rose 18 percent or 1.4 cents per pound of unshelled almonds, despite the exceptionally large 1961 almond harvest in Spain and the other almond-producing countries. Between September 1961 and September 1962, the price again rose, this time 76 percent or 6.8 cents per pound, in response to short almond crops in 1962, in Spain and other countries. Though by September 1963 it was obvious that the 1963 Spanish harvest had been good and that world almond production was large, the Spanish opening price was even higher, even though only slightly, than a year earlier, and—at 16.4 cents—more than double the September 1959 price of 7.6 cents. By March 1964, when it had become apparent that there was a promise of large 1964 almond crops, (since the Spanish and other Mediterranean blooms had escaped frost damage) the price had declined somewhat; but at 15 cents it was still double the

March 1960 price of 7.5 cents.

Two factors—one market and one production—are responsible for this price increase: (1) expanding world demand for almonds stimulated by rising population and levels of living, and (2) rising costs of production in Spain. Also, some Spanish sources feel that the growers are more alert to these two factors than ever before. Improved education and news media have made them better aware of world market developments, on the one hand, while the trend toward commercialization and integration into a cash economy has made them more conscious of cost magnitudes.

The marketing practice, by accumulators and by some producers, of selling small quantities as the season progresses, enables them to raise prices as changes occur in the market. After February 1960, the price declined a little, since the bloom had escaped frost damage and a good new crop appeared in prospect. This happened again after February 1961. However, after February 1962 the price rose sharply as the fact became established that the 1962 crop would be small. Prices also reacted upward the latter part of the 1962-63 season as a tightening supply situation climaxed a season of short almond supplies.

## PROCESSING

There is a wide range in the size, amount, and type of equipment among Spanish almond processing plants, as well as the number of employees. Typical, however, is a downward trend in the total number of processing plants accompanied by an increase in size of operations and amount of mechanical equipment in remaining plants. Machinery is, for the most part, of Spanish manufacture, often designed or modified by the individual almond processing firm. Some Italian machinery is used, also.

Only a very small proportion of the crop is marketed unshelled. Shelling is done entirely by mechanical means. Small cracking plants in local producing areas process an estimated 30 to 40 percent of the crop; the remainder is shelled by packer-exporters in their relatively larger and more modern plants.

At many small plants the process consists merely of cracking the almonds and separating the kernels from the shells. The latter may be done either by hand or, in some plants, by shakers and screens. Often, all operations are performed by hand except for the cracking. In some cases, mechanical equipment moves the almonds through the different processes.

### Packer-Exporter

Plants of the large packer-exporters are, for the most part, highly mechanized in their handling of almonds from the time of their arrival, throughout processing, until shipment.

In 1960, a total of 160 firms were listed as almond and filbert exporters. It is likely, however, that no more than 30 firms are active in the export market year-in and year-out. Of this number, perhaps 10 would be located in Reus—the major center of the Spanish nut trade—and 5 or so in each of the other trade centers—Alicante, Malaga and Palma, the largest city on Majorca. Possibly 10 of these firms handle 90 to

95 percent of Spain's almond export trade.

Almonds in the shell normally arrive at the packer-exporter plants by truck, usually packed in 100 kilogram (220-pound) burlap sacks—sometimes, however, they arrive in bulk loads. Separation into varieties and classes is maintained during all stages. Storage is done in burlap bags for small quantities of a variety, or in bulk in underground concrete bins for large quantities. When the nuts are to be processed they are lifted mechanically, often for several floors, to the cracking area. There they are put through cracking machines, screened and separated from the shell; they may be sized at this time also. (Almonds purchased already shelled may be rescreened and then sized.) Kernels are then stored by variety and size.

The shelled and sized almonds are usually given a final grading and sorting, as needed to fill specific contracts. During this process, a crew of women grade and sort the nuts as they pass along on a continuous belt. Often several selections are made at the same time. During this step, several inspections by the management are made to insure that specified grades are being selected. Afterwards, the almonds are either blanched or immediately packed (either for export or domestic use). In the former operation, the almonds go through a blanching bath, for the prescribed time, are brought out mechanically on roller belts which remove skins and excess moisture, and are then placed on trays and put into small ovens to complete the process. Some Spanish packers believe that the ovens could be improved in controlling the timing and temperature uniformity. After removal and cooling the blanched almonds are packed.

For export, almonds are packed in wooden boxes containing up to 50 kilograms (110 pounds), in cardboard boxes holding up to 12.5 kilograms (27.5 pounds), or in 50-kilogram burlap sacks. Increasingly, almonds are packed in individual consumer-size packages, usually of cellophane, in weights of 100 and 250 grams; these are shipped in wooden or cardboard boxes.

# Packinghouse Labor

In the packinghouses observed, most workers were women, employed seasonally, mainly September through January, while a skeleton crew of men was employed year-round. Competition for labor, particularly in the Reus area where most packinghouses are located, is keen, especially for women workers engaged in grading and sorting. Special efforts to keep experienced women workers include, in some of the smaller establishments, employing some workers on a part-time

irregular basis as they are available. Washrooms and eating facilities are provided, and uniforms and caps furnished by employers to women working on grading and sorting lines.

Women also perform most of the work in packing, and do much of the stenciling and marking required on bags and boxes. Men operate shelling and other machinery, and do the heavy work in handling during the various plant operations.

For 1963, total cost for women workers was \$2.00 per woman per day, consisting of about \$1.50 cash wage and \$0.50 fringe benefits, packers estimated.

## STOCKS

Estimates of almond stocks in Spain are hardly better than "educated guesses." Many are held by individual growers, accumulators (speculators) both large and small, and exporters. Exporters, though, reportedly do not hold large stocks as in past, but buy mainly on order.

It is traditional for individual growers to hold stocks. As almonds are easily stored on the farm, growers consider these unsold almonds as good as "money in the bank." Growers tend to sell small amounts as they need money. Reportedly, they often do not sell the entire current harvest if it is large, but carry some over instead and sell after the next harvest is completed, because of the possibility of a smaller crop following a large one. Growers—by storing harvested nuts—may be able to hedge against price rises during the season or even between seasons; a few years ago, they were also able to hedge against exchange fluctua-

tions, although this is no longer a factor as Spain's currency has been stable since 1959. Conversely, growers may suffer a loss if prices fall.

Toward the end of the season, most of Spain's almond stocks are probably held by a few large speculators who collect supplies throughout the country and supply the exporters. Much more capital is now required because of the higher price levels. Also, packer-exporters with increasing tonnages handled and greater sophistication in processing and packing operations are relatively less interested in speculation. The Spanish almond industry generally has carried appreciable stocks into the new crop year. However, although beginning stocks averaged over 6,000 tons per year in the 1957-61 period, they have not exceeded 2,000 tons in each of the last 3 seasons. Spain's stocks have usually represented about one-third to over one-half of almond stocks in producing countries abroad.

## DOMESTIC CONSUMPTION

Reliable data on Spanish almond consumption is not available but it is believed to have averaged 4,700 tons in the 5-year period 1957-61 or 15 percent of production, according to best available data. However, consumption has been increasing, and is believed to have approximated 6,000 tons in 1962-63 and again in 1963-64. Increasing income and levels of living have stimulated demand. The candy manufacturing industry is believed to account for at least 50 percent of domestic consumption. Since domestic use is expected to continue to expand, it appears likely that at least 15 percent of the mounting production will continue to be consumed within Spain.

The candy industry uses most of its almonds in manufacturing "turrón"—a candy composed of about half almonds and half honey blended together—rang-

ing in size from small bars to 1 pound pieces and larger. A new product, turrón with a chocolate covering, reportedly has been received favorably by consumers. Considerable tonnage is also used in manufacturing marzipan, a candy made of almond paste. Sugar-coated almonds (peladillas) are also widely used. Production of these candies, and others using almonds as a base, is increasing for both domestic use and export, although exports of almond candies to Cuba—once a major customer—have fallen. Use of roasted almonds, either separately or in nut mixtures, has also been increasing in Spain.

Over 300 factories are reported manufacturing candy in Spain. Many—and the larger of these—are located in Jijona in Alicante Province; but almond candy is made in a number of other Spanish cities.

## FOREIGN TRADE

Spain is usually the world's second largest exporter of almonds—after Italy—but in some years Spain leads Italy in shipments. Foreign markets are obviously the main outlet, since only 15 to 20 percent of the crop is consumed domestically.

Almonds are an important foreign-exchange earner for Spain. In the 5-year period, 1958-62, the value of Spanish almond exports averaged US\$27.3 million annually. During this period, a high of US\$34.3 million

was earned in 1961-62, a low of US\$21.4 million in 1962-63.

Spanish exports of shelled and unshelled almonds in the 5-year period, 1958-62 averaged about 25,000 short tons, shelled basis. During this period, exports were as high as 33,800 and 32,000 tons during the 1961 and 1959 marketing years respectively, as low as 14,800 and 15,000 tons in 1958 and 1962 respectively. Since only a small proportion of the crop is



consumed within Spain, the export volume is expected to increase as production rises.

Spain's almonds are exported almost entirely in the form of kernels, which have averaged about 97 percent of the total in recent years. Exports of unshelled almonds have increased slightly in absolute terms but percentage-wise have remained about the same; they have ranged between 1,400 and 3,600 tons (unshelled basis) annually in recent years. Leading markets for unshelled almonds have been France, Egypt, Brazil, the United Kingdom, and West Germany.

In most seasons, over half of Spanish exports take place between September and January with October and November the months of heaviest shipment.

Of the kernel shipments, Valencias comprise about half of Spain's exports. Farmer Majorcas are next most important, accounting for about 20 percent, followed by Longuettes with about 15 percent. Jordanas and Planetas each account for about 5 percent, Marconas and Esperanzas the remainder. Exports of Valencias are mostly unselected, as are the Farmer Majorcas. However, shipments of the varieties are mostly selected. An increase in export of selected almonds is expected for all varieties. According to the Spanish trade, exports of kernels by classes and varieties in recent years have been as follows:

	<i>Selected Percent</i>	<i>Unselected Percent</i>	<i>Total Percent</i>
Valencias -----	10	40	50
Farmer Majorcas -----	2	18	20
Longuettes -----	9	6	15
Planetas -----	4	1	5
Jordanas -----	4	1	5
Marconas and others -----	2	3	5
Total -----	31	69	100

Europe has traditionally been the main market for Spain's almond exports, and in recent years, has been taking an even larger share than formerly. In the pre-war period, 83 percent of Spain's kernel exports went to European countries; in the 1955-59 period, 78 percent. By the 1962-63 and 1963-64 marketing seasons, this percentage had increased to 90 percent and 92 percent, respectively. Not only the proportions, but the absolute quantity, as well, that moved to these markets,

had increased. In the 5 years 1959-63, Europe took about 22,800 tons of kernels annually compared with 12,720 tons per year, on average, in the 1955-59 period.

Among individual countries, France or the United Kingdom is usually the largest single customer. West Germany is generally third most important, followed by Sweden and Switzerland. Other smaller but important European markets are Norway, Denmark, and the Netherlands. In North America, Canada has displaced the United States as the leading non-European market for Spanish almonds. Canadian purchases have increased moderately from the prewar level.

On the other hand, sales to the United States (where Spain has been the traditional supplier) have declined sharply from the prewar average of 2,230 tons annually, to only slightly over half, at 1,212 tons annually, for the 1955-59 average, and recently to as little as 187 tons and 206 tons respectively, in 1962-63 and 1963-64. This decline in sales to the United States came from the considerable expansion of almond production in California; the United States is now on a net export basis.

Interestingly, the coming into being of the European Economic Community (the Common Market) has not yet adversely affected exportation of Spanish almonds to countries of the Community though some tariff preference for Italian almonds has already gone into effect. On January 1, 1957, national rates of duty on almonds were 5 percent for Germany, 10 percent for Belgium, Netherlands, Luxembourg and Italy, and 0 for France. By January 1967, the Common External Tariff, i.e., the one to be levied by all six countries upon almonds from outside the Community, will become 7 percent ad valorem. By that date, too, tariffs among the six will have been abolished. Thus, Italian almonds will be able to enter Germany, France, Belgium, the Netherlands, and Luxembourg without duty; by contrast, almonds from third countries, such as Spain and the United States, will have to pay 7-percent duty (on the c & f price). At present, Italy's margin of advantage is smaller. For the 1963-64 season, the external tariff for Belgium, the Netherlands, and Luxembourg was 9.1 percent compared with an internal tariff (levied on Italian almonds) of 6.0 percent; for France respective duties were 2.1 percent and 0, and for Germany 2.1 percent and 0. (Italian duties of

TABLE 6.—ALMONDS: SPAIN'S SUPPLY AND DISTRIBUTION, AVERAGE 1957-61 AND ANNUAL 1957-63 MARKETING SEASONS (SHELLED BASIS)

Item	Average 1957-61	Year beginning August 1						
		1957	1958	1959	1960	1961	1962	1963
	1,000 <i>short tons</i>	1,000 <i>short tons</i>	1,000 <i>short tons</i>	1,000 <i>short tons</i>	1,000 <i>short tons</i>	1,000 <i>short tons</i>	1,000 <i>short tons</i>	1,000 <i>short tons</i>
Beginning stocks -----	6.1	2.0	4.5	11.0	7.0	6.0	2.0	1.0
Production -----	31.6	32.0	26.0	32.0	33.0	35.0	20.0	29.0
Total supply -----	37.7	34.0	30.5	43.0	40.0	41.0	22.0	30.0
Exports -----	26.9	24.8	14.8	32.1	29.0	33.6	15.0	22.9
Domestic disappearance -----	4.7	4.7	4.7	3.9	5.0	5.4	6.0	6.1
Ending stocks -----	6.1	4.5	11.0	7.0	6.0	2.0	1.0	1.0
Total distribution -----	37.7	34.0	30.5	43.0	40.0	41.0	22.0	30.0

Source: FAS estimates except for exports data.

7.5 and 5.4 percent are academic, since Italy is an exporter of almonds.)

Despite these tariff preferences enjoyed by Italy, 1963-64 Spanish exports to the Common Market accounted for 43.5 percent of Spain's almond exports compared with 41.8 percent in 1962-63, and 32.6 percent for the 1955-59 period. In absolute terms the 1963-64 Spanish export volume to the Common Market amounted to about 9,300 tons of kernels as against a 5-year average of 5,339 tons for 1955-59.

Undoubtedly, there will be some shift in trade once the full 7-percent preference has been in effect for some time. The margin of preference in effect for 1963-64 was obviously too small to have an impact upon the pattern of trade, particularly since there are long-established commercial channels in the almond import-export trade. However, there will be a tendency for Italian almonds to displace Spanish almonds within the Common Market once the Italian almonds enjoy the full 7 percent tariff advantage. Since Italian production is not expected to rise appreciably within the next few years, increased Italian sales to EEC countries will mean a decrease in Italian sales to non-EEC countries. The business that Spain loses to Italy within the Common Market would therefore probably be recouped by Spain in non-EEC countries.

## Spanish and U.S. Exports

In comparing Spanish and U.S. almond export trends, some interesting similarities and dissimilarities are discernible. For instance, between the 1955-59 and 1959-63 periods Spanish exports increased 56 percent, while U.S. exports also increased sharply, though not by quite so much, at 38 percent. The largest Spanish export increase, 10,050 tons or 79 percent, was in sales to other European countries. The largest U.S. export increase, on the other hand, was to a trio of non-European countries—Australia, Canada, and Japan—to which U.S. almond sales increased by 1,078 tons or 124 percent. Remarkably, Spanish exports to these three countries also expanded sharply, by 73 percent between the two periods cited. As for shipments to Latin America, both of these exporting countries suffered declines in sales but the U.S. fall-off was slight, at only 2 percent, while the Spanish sales dropped much more drastically, to only 34 percent of the previous level.

It thus appears that as Spain and the United States expand their almond exports each is doing relatively better in the markets closest to it. Fortunately, consumption in the importing countries—according to FAS data—has been increasing, and Spain and the United States have been able to simultaneously expand their export sales.

Competition has not been on a price basis; U.S. exports are usually priced a few cents per pound higher than the closest comparable grades of Mediterranean almonds. Foreign buyers have shown an increasing interest in California almonds—despite the higher prices—because of such factors as reliability of grading, cleanliness, freedom from bitter almonds, and generally high standards of quality. Spanish almonds at the same time are able to sell readily because of distinctive flavor, suitability for certain traditional uses, and the cooperativeness of Spanish exporters in tailoring their export packs to the specific needs of individual buyers.

## U.S. Imports

Though Spain's exports of almonds to the United States are much smaller than in earlier years, Spain has become virtually the sole supplier of foreign almonds for the U.S. market. This is true for all three types of imports: unshelled, shelled, and shelled blanched almonds. As previously indicated, U.S. imports of almonds have declined sharply as almond production in the United States has increased. In the 5-year period, 1955-59, U.S. shelled almond imports averaged 1,864 tons compared with 2,678 tons in 1935-39. In recent years they have declined drastically, amounting to 667 tons in 1959-60 and 77 tons in 1962-63. (U.S. import data for any given year may not coincide with Spanish export data because of time lag, transshipments, methods of weighing, and other factors). U.S. imports of unshelled almonds have been negligible for the past few years. In 1959-60, U.S. imports of blanched almonds, at 310 tons, were considerably above the 1935-39 and 1955-59 averages of 189 and 190 tons respectively. Since the 1959-60 season, however, blanched almond imports have been below the average, falling to 44 tons in 1962-63 and 66 tons in 1963-64.

The limited U.S. imports are for specialized uses. Jordanas, Longuettes, Marconas, and Valencias are the main Spanish almonds imported by the United States. The United States may also import heavily, particularly of bar types, in years of short domestic crops. In 1958-59, for instance, the United States imported 6,003 tons of shelled, 373 tons of unshelled, and

TABLE 7.—SPANISH ALMOND EXPORTS: SHELLED, UNSHELLED AND SHELLED BASIS, SELECTED AVERAGES 1930-59 AND ANNUAL 1950-62

Year	Year beginning August 1		
	Exports		
	Shelled	Unshelled	Shelled basis <sup>1</sup>
	<i>Short tons</i>	<i>Short tons</i>	<i>Short tons</i>
Averages: <sup>2</sup>			
1930-34 -----	19,573	5,262	21,287
1945-49 -----	12,927	2,211	13,597
1950-54 -----	16,666	1,147	17,013
1955-59 -----	15,520	940	15,804
Annual:			
1950 -----	19,677	1,365	20,091
1951 -----	18,033	1,213	18,401
1952 -----	18,363	1,115	18,701
1953 -----	19,005	1,593	19,488
1954 -----	8,250	447	<sup>3</sup> 8,385
1955 -----	5,173	—	<sup>3</sup> 5,173
1956 -----	6,432	604	<sup>3</sup> 6,615
1957 -----	24,462	1,080	24,789
1958 -----	14,344	1,367	14,758
1959 -----	31,534	1,720	32,055
1960 -----	28,109	2,985	29,014
1961 -----	32,722	3,595	33,811
1962 -----	14,511	1,473	14,957

<sup>1</sup> Unshelled converted at 3.1:1. <sup>2</sup> 1935-44 data not available. <sup>3</sup> Considerable exports probably not reported.

Source: Official Spanish trade statistics through 1959; subsequent years, unofficial data, from *Sindicato Nacional de Frutos y Productos Hortícolas*.

274 tons of blanched almonds because of a short 1958 crop. Of these 1958-59 imports, 5,151 shelled, 351 tons unshelled, and 265 tons of blanched came from Spain.

## Export Prices

Spanish export price quotations generally move parallel with those of other competing countries, such as Italy and Portugal. Unusually large or small supplies

in Spain or in a competing country cause some deviation from the general movement. Similarities exist in price trends between Spanish and Italian almonds. Unselected Valencias in the four seasons 1960-61 through 1963-64 from Spain have been bringing a premium of 3 to 5 cents per pound over unselected Paris from Italy. Spanish almonds also receive premiums over those from the other Mediterranean countries. It should be noted that in July 1959 a special Spanish export tax was put into effect as part of the

TABLE 8.—SPANISH ALMOND EXPORTS, SHELLED: AVERAGES 1935-39 AND 1955-59, ANNUAL 1959-60 TO 1963-64

Country of destination	Average		Year beginning September 1				
	1933-35 <sup>1</sup>	1955-59	1959	1960	1961	1962	1963 <sup>2</sup>
	<i>Short tons</i>	<i>Short tons</i>	<i>Short tons</i>	<i>Short tons</i>	<i>Short tons</i>	<i>Short tons</i>	<i>Short tons</i>
United States -----	2,230	1,212	853	796	586	187	206
Europe:							
Common Market:							
Belgium-Lux. -----	307	90	285	193	257	112	122
France -----	2,840	4,098	6,623	6,592	8,469	4,414	6,688
Germany, West -----	4,143	1,064	3,866	4,498	4,730	1,344	2,256
Italy -----	141	28	3	138	47	95	259
Netherlands -----	670	59	180	202	405	104	151
Total -----	8,101	5,339	10,957	11,623	13,908	6,069	9,476
Other Europe:							
Austria -----	14	103	157	184	143	81	122
Denmark -----	194	43	151	144	462	139	243
Finland -----	2	287	448	29	56	23	49
Ireland -----	20	4	18	49	164	47	81
Norway -----	213	314	820	811	937	729	852
Sweden -----	1,154	505	1,922	2,083	1,812	1,712	1,684
Switzerland -----	139	2,229	2,090	1,064	2,004	909	1,671
United Kingdom -----	8,488	3,166	9,556	7,081	9,126	3,126	5,564
Other -----	49	730	1,535	1,233	540	190	227
Total -----	10,273	7,381	16,697	12,678	15,244	6,956	10,493
Total Europe -----	18,374	12,720	27,654	24,301	29,152	13,025	19,969
Latin America							
Argentina -----	—	—	77	—	126	13	36
Brazil -----	35	85	282	19	55	7	26
Chile -----	2	1,087	—	—	—	—	—
Cuba -----	147	96	217	135	—	—	—
Mexico -----	146	128	228	145	108	74	31
Venezuela -----	3	32	87	110	136	73	76
Other -----	568	45	83	179	8	49	24
Total -----	901	1,473	974	588	523	216	193
Other countries:							
Algeria -----	80	42	172	133	53	98	12
Australia -----	78	13	31	52	218	64	142
Canada -----	467	538	951	733	1,129	625	691
Egypt -----	42	138	165	121	126	32	161
Morocco -----	27	17	—	—	—	—	—
Other -----	62	236	734	1,385	935	264	407
Total -----	756	984	2,053	2,424	2,461	1,083	1,413
Grand total -----	22,261	16,389	31,534	28,109	32,722	14,511	<sup>2</sup> 21,781

<sup>1</sup> No data available for 1936-39 because of the Spanish Civil War. <sup>2</sup> Includes small shipments of unshelled almonds; in 1962-63 shipments of unshelled almonds were 446 tons, shelled basis.

Source: Official Spanish trade statistics through 1959; subsequent years unofficial data, from *Sindicato Nacional de Frutos y Productos Hortícolas*.

economic stabilization program. The original tax was equivalent to 3.74 cents per pound for shelled almonds and 1.97 cents for unshelled. July 1961 this was reduced by 50 percent and was removed entirely in July 1962.

In 1960-61 both Valencias and Baris declined gradually during the season and closed at 88 percent and 87 percent respectively of opening levels. In 1962-63, they closed at 96 and 97 percent, respectively, of opening levels after both had experienced a price rise and then a decline in the course of the season. In 1961-62 both rose sharply during the season, particularly after February, as it became apparent that the 1962 crop would be short in Spain and extremely short in Italy. In 1963-64, both rose early in the season, declined in the middle, and then rose during the last quarter.

A strong influence on Spanish almond prices is the existence of speculative buying. The wide swings in production occurring in the Mediterranean area, and

the storable nature of the almond, make this an ideal commodity on which to speculate, in both producing and importing countries. Though storability of almonds helps to offset fluctuations in production, there are at times sharp price fluctuation between seasons as well as within some seasons, particularly in March or April when early (and very tentative) forecasts of the new crop's size start circulating.

A considerable number of forward sales are made for delivery in September and early October. These are usually made in February, March, and April, based upon early estimates of the coming crop. It is difficult to make a reliable forecast at this time; this difficulty is compounded by the ever-present threat of late frost damage to Spanish and to other countries' almond crops. Frost damage reports cause sharp price rises. If, afterwards, it is learned that the damage has been exaggerated, prices react downward. Export prices react also to crop estimates during September and October, as deliveries begin to be made and the actual

TABLE 9.—U.S. ALMOND EXPORTS, SHELLED<sup>1</sup>: AVERAGE 1955-59, ANNUAL 1959-1963

Country of destination	Year beginning August 1					
	Average					
	1955-59	1959	1960	1961	1962	1963
	<i>Short tons</i>	<i>Short tons</i>	<i>Short tons</i>	<i>Short tons</i>	<i>Short tons</i>	<i>Short tons</i>
Common Market:						
Belgium-Lux. -----	136	90	44	14	53	76
France -----	50	245	154	98	139	298
Germany, West -----	1,375	2,636	2,020	1,015	992	1,769
Netherlands -----	526	555	189	210	110	771
Total -----	2,087	3,526	2,407	1,337	1,294	2,914
Other Europe:						
Austria -----	10	42	4	—	—	3
Denmark -----	55	125	79	40	21	63
Finland -----	61	297	91	68	149	131
Ireland -----	79	224	66	11	1	62
Norway -----	133	203	160	122	155	276
Sweden -----	604	827	434	541	767	1,001
Switzerland -----	364	324	421	142	230	429
United Kingdom -----	236	1,147	99	561	2	1,074
Other -----	5	—	—	—	—	1
Total -----	1,547	3,189	1,354	1,485	1,325	3,040
Total Europe -----	3,634	6,715	3,761	2,822	2,619	5,954
Latin America:						
Cuba -----	20	5	—	—	—	—
Mexico -----	59	41	31	105	108	121
Peru -----	11	13	17	15	12	24
Venezuela -----	57	59	24	27	47	66
Other -----	12	9	12	18	13	13
Total -----	159	127	84	165	180	224
Australia -----	32	161	504	296	330	464
Canada -----	388	757	350	512	396	719
Japan -----	452	1,027	621	855	1,067	1,691
Other -----	87	115	43	71	71	132
Total -----	959	2,060	1,518	1,734	1,864	3,006
Grand total -----	4,752	8,902	5,363	4,721	4,663	9,184

<sup>1</sup> Not separately classified before January 1, 1943; included in "other nuts."  
Source: Bureau of the Census, U.S. Department of Commerce.

size of the harvest becomes ascertainable. But timing of the harvest can also be a factor: a late harvest can cause prices to increase sharply as exporters and speculators bid up the price to cover forward sales.

Quotations for the past four complete seasons, which include both large and small crops, reflect some of these conditions. During this period an upward trend in Spanish almond prices can be noted. Although differences are not consistent, there seems also to be an increasing gap between prices for unselected and selected, and another between unblanched and blanched almonds. These changes are probably responses to increasing costs of processing.

Some factors responsible for the higher price paid for Spanish than for other Mediterranean almonds are: (1) higher degree of selection and cleanliness (less almond dust), (2) better flavor, (3) greater freedom from bitters, (4) better packaging. Also Spanish almonds have usually been available for export several weeks earlier than Italian.

## Almond Export Standards

Spain in 1961 established compulsory export standards for shelled almonds and for unshelled. A resolution of the office of the Director General of

Foreign Trade—published in the *Official Bulletin* of March 23, 1961—established these standards which were amended in 1963. The Inspection Service of the Ministry of Commerce (SOIVRE) is responsible for the enforcement of export standards.

Spain's almond export standards seem to be patterned after U.S. standards, except for one major difference. Spanish standards for shelled almonds generally specify only two grades—either selected or unselected—for each variety or class. However, for Valencianas and Majorcas there are three grades and for Esperanzas and Planetas only one. This contrasts with the U.S. standards, which provide seven grades for all varieties.

Spanish standards take into consideration special characteristics of their varieties in processing, handling, and use in determining tolerances allowed to meet their grade requirements. Considerable similarity with U.S. standards exists in the description of types of defects; however, in some groupings and separations of defects, the Spanish standards differ from the U.S.

With some exceptions, the Spanish standards for the selected varieties would come closest to meeting U.S. standards for grade No. 1. The Spanish standards for unselected varieties, also with some exceptions, would come closest to meeting U.S. standards for Select Sheller Run.

TABLE 10.—U.S. ALMOND IMPORTS BY COUNTRY; AVERAGES 1935-39 and 1955-59, ANNUAL 1959-63

Country of origin and type	Average		Year beginning August 1				
	1935-39 <sup>1</sup>	1955-59	1959	1960	1961	1962	1963
<b>UNSHELLED</b>							
Europe:	<i>Short tons</i>	<i>Short tons</i>	<i>Short tons</i>	<i>Short tons</i>	<i>Short tons</i>	<i>Short tons</i>	<i>Short tons</i>
Spain -----	276	87	81	131	54	22	—
Other -----	42	—	—	—	1	—	—
Total -----	318	87	81	131	55	22	—
Other countries -----	13	4	—	—	—	—	—
Grand total -----	331	91	81	131	55	22	—
<b>SHELLED</b>							
Europe:	<i>Short tons</i>	<i>Short tons</i>	<i>Short tons</i>	<i>Short tons</i>	<i>Short tons</i>	<i>Short tons</i>	<i>Short tons</i>
Italy -----	1,420	173	—	6	33	—	—
Portugal -----	11	9	—	—	—	—	—
Spain -----	1,154	1,554	570	285	142	76	62
Other -----	65	4	—	—	—	—	16
Total -----	2,650	1,740	570	291	175	76	78
Other countries							
Morocco -----	11	69	55	—	—	—	—
Turkey -----	—	29	22	5	—	—	5
Other -----	17	26	20	—	—	1	36
Total -----	28	124	97	5	—	1	41
Grand total -----	2,678	1,864	667	296	175	77	119
<b>BLANCHED SHELLED</b>							
Europe:	<i>Short tons</i>	<i>Short tons</i>	<i>Short tons</i>	<i>Short tons</i>	<i>Short tons</i>	<i>Short tons</i>	<i>Short tons</i>
Italy -----	24	31	4	1	—	—	—
Spain -----	162	153	306	132	178	31	42
Other -----	3	6	—	6	3	13	24
Total -----	189	190	310	139	181	44	66

<sup>1</sup> Year beginning September 1, except blanched, which is calendar year average.

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

Main differences between Spanish and U.S. standards for shelled almonds include:

1. The Spanish permit an admixture of 5 to 20 percent of "other sweet varieties," depending upon variety (or class) and grade (selected or unselected). The U.S. allows only 5 percent mixture of "other varieties" (including bitters) regardless of variety or grade.

TABLE 11.—ALMOND PRICES: SPANISH AND ITALIAN EXPORT QUOTATIONS, GROSS/NET, F.O.B. PORT, 1960-61 THROUGH 1963-64 SEASONS

First week of the month	Spain	Italy
	Unselected Valencias	Unselected Baris
	<i>U.S. cents per lb.</i>	<i>U.S. cents per lb.</i>
1960-61:		
September -----	51.6	48.4
October -----	50.5	46.2
November -----	49.2	47.0
December -----	48.3	45.3
January -----	49.7	46.3
February -----	50.5	45.9
March -----	46.8	42.6
April -----	46.8	42.3
May -----	46.0	40.8
June -----	48.1	43.6
July -----	48.1	43.7
August -----	45.6	42.2
1961-62:		
September -----	44.5	37.6
October -----	42.9	37.8
November -----	43.2	38.2
December -----	44.5	41.5
January -----	48.0	43.0
February -----	50.0	47.0
March -----	50.0	45.5
April -----	61.9	57.6
May -----	65.1	61.0
June -----	71.4	65.0
July -----	64.1	60.3
August -----	66.2	62.2
1962-63:		
September -----	67.8	63.0
October -----	71.4	65.1
November -----	74.6	68.0
December -----	71.4	68.7
January -----	75.4	69.3
February -----	70.6	67.3
March -----	69.9	64.0
April -----	64.2	59.7
May -----	67.0	61.1
June -----	68.6	64.2
July -----	68.6	63.2
August -----	65.4	61.1
1963-64:		
September -----	67.8	64.4
October -----	73.0	69.9
November -----	69.9	68.4
December -----	65.5	63.0
January -----	69.1	63.0
February -----	68.3	63.3
March -----	67.5	63.2
April -----	66.2	60.6
May -----	67.0	63.0
June -----	69.1	65.5
July -----	69.1	65.1
August -----	70.9	66.2

Source: Spanish and Italian almond traders.

2. The Spanish have various tolerances for admixture of bitter almonds (depending upon the variety or class of sweet almond) up to a 6 percent maximum. (Tolerance of bitter almonds is usually lower in selected than in unselected.) By contrast, the U.S. standards permit only 1 percent bitter almonds, regardless of variety or grade.

3. For all varieties of Spanish selected almonds, except Esperanza, tolerance for doubles is equal to the 3 percent tolerance for U.S. fancy, or less.

For the most common Spanish almonds, unselected Valencias and Farmer Majorcas, there are high double tolerances of 20 and 40 percent, respectively, and for unselected in specified varieties, 7 to 15 percent.

4. Spanish tolerance for "broken" and "splits," in both selected and unselected, is low—2 and 3 percent respectively—except for a special category of Majorcas. There is a greater range in U.S. standards.

5. Selected Spanish almonds have an 8-percent tolerance for damage by chip and scratch (mainly from machine damage); U.S. Grade No. 1, 10 percent. For unselected Spanish almonds the 20 percent tolerance is the same as for U.S. Select and Standard Sheller Run.

6. U.S. standards have separate tolerances for foreign material and for particles and dust, allowing 0.2 percent for foreign material and 0.1 percent for particles and dust in the top five grades, 0.3 and 0.1 respectively for Whole and Broken, and 0.3 and 1.0 respectively for No. 1 Pieces. Spanish standards have grouped these tolerances, allowing a combined total of 0.25 percent for particles, dust, and other foreign matter for both selected and unselected.

## Classification

Shelled almonds in Spain may be classified in terms of size, or by count of kernels per unit of weight. Spanish classification by size is based on the width of the kernel. Sizes are determined by passing kernels through sieves, with openings equal to the minimum axis (width) measurement.

Intermediate sizes are authorized on special request for certain markets.

Classification	Shape of kernel	
	Long-shaped	Round-shaped
Large-----	Axis equal or over 14 millimeters (0.546")	Axis equal or over 14 millimeters (0.546").
Medium----	Axis between 11 and 14 millimeters (0.429" and 0.546")	Axis between 11 and 14 millimeters (0.429" and 0.546").
Small-----	Axis under 11 millimeters (0.429")	Axis under 12 millimeters (0.468").

A tolerance by weight of 5 percent is allowed for deviations from the designated size.

Shelled almonds are classified by weight on the basis of the number of kernels to an English ounce (28.3495 grams to the ounce) as follows:

Count	Number of kernels per ounce
16 -----	16 or less
16/18-----	16 - 18 inclusive
18/20-----	18 - 20 inclusive
20/22-----	20 - 22 inclusive

22/24	22-24 inclusive
23/25	23-25 inclusive
24/26	24-26 inclusive
26/28	26-28 inclusive
27/30	27-30 inclusive
30/34	30-34 inclusive
36/40	36-40 inclusive
40/50	40-50 inclusive
50	50

Intermediate counts are allowed on special request for certain markets.

No tolerance is allowed for deviation from the designated count.

## Packing For Export

Spanish almonds, either shelled or unshelled, may be exported in bags, boxes, or tin cans.

Bags may be of jute, esparto grass, or a combination of these two fibers, or of any other fiber resistant to damage from handling and transportation. The bags may be one or two folds and may be with or without

paper lining. If lined, the paper must be new, dry, clean, and lacking unpleasant odor. Maximum capacity is 50 kilograms (110 pounds).

Boxes may be made of wood, cardboard, or any other material strong enough to stand handling and transportation. All materials used in box manufacture or lining must be free from any odor which could be absorbed by almonds. If colored paper is used, it must not discolor the contents. The wood must be dry, clean, and free from large knots. Maximum capacity for wooden boxes is 50 kilograms (110 pounds), and for cardboard boxes (cartons) 12.5 kilograms (31 pounds).

Cans must be made of new, clean, and odorless tin plate. They must have openings and lids and must be lithographed. The maximum capacity is 25 kilograms (55 pounds).

As for other containers, the Inspection Service of the Ministry of Commerce (SOIVRE) may authorize their use.

**Marking of Containers.**—Aside from brand names, the Spanish Government requires that containers be marked with the following information: (1) type of nut, (2) exporter's registry number, (3) net weight (for boxes), (4) type or name (for classified almonds), (5) the inscription, "Produced in or imported from

TABLE 12.—ALMOND PRICES: SPANISH EXPORT QUOTATIONS<sup>1</sup> F.O.B. REUS, FOR SELECTED VARIETIES, 1960-61 THROUGH 1963-64 SEASONS

First week of the month	Shelled								Unshelled
	Unselected Valencias		Selected Valencias <sup>2</sup>		Selected Longuettes <sup>3</sup>		Selected Marconas <sup>4</sup>		Mollars
	Unblanched	Blanched	Unblanched	Blanched	Unblanched	Blanched	Unblanched	Blanched	
	<i>U.S. cents per lb.</i>	<i>U.S. cents per lb.</i>	<i>U.S. cents per lb.</i>	<i>U.S. cents per lb.</i>	<i>U.S. cents per lb.</i>	<i>U.S. cents per lb.</i>	<i>U.S. cents per lb.</i>	<i>U.S. cents per lb.</i>	<i>U.S. cents per lb.</i>
1960-61:									
Sept.	51.6	—	53.8	—	53.4	—	53.4	—	19.7
Nov.	49.2	—	51.4	—	51.4	—	51.5	—	19.8
Jan.	49.7	—	52.6	—	51.8	—	52.8	—	20.3
Mar.	46.8	—	48.8	—	49.1	—	53.1	—	19.5
May	46.0	—	48.2	—	49.9	—	53.8	—	18.7
July	48.1	53.1	49.8	54.7	52.3	57.6	58.2	64.1	—
1961-62:									
Sept.	44.5	49.3	47.3	51.9	49.4	54.5	50.2	55.5	18.0
Nov.	43.2	48.0	49.7	54.7	51.8	57.2	49.4	54.5	17.6
Jan.	48.0	53.2	51.3	56.4	53.9	53.9	51.8	57.2	18.1
Mar.	50.0	55.8	53.6	59.4	56.6	62.9	54.2	60.3	18.6
May	65.1	72.3	66.5	73.4	66.9	74.2	66.9	74.2	23.9
July	64.1	67.4	71.4	74.6	75.4	83.7	71.1	78.9	24.2
1962-63:									
Sept.	67.8	75.6	71.1	79.4	79.6	88.8	72.5	81.0	30.3
Nov.	74.6	83.1	76.7	85.5	86.9	96.6	78.8	87.9	29.9
Jan.	75.4	83.9	77.1	86.0	85.3	94.8	78.0	87.1	29.6
Mar.	69.9	77.8	72.7	81.2	82.8	92.2	77.7	86.6	29.7
May	67.0	74.8	68.3	76.3	86.4	96.2	78.4	87.4	28.7
July	68.6	76.5	71.4	79.8	87.5	97.4	78.4	87.4	27.4
1963-64:									
Sept.	67.8	75.8	68.7	76.8	77.2	86.2	77.2	86.2	26.4
Nov.	69.9	77.9	75.2	83.4	78.9	88.0	75.7	84.5	26.0
Jan.	69.1	77.0	72.7	81.1	81.2	90.5	73.3	81.8	25.5
Mar.	67.5	75.3	70.3	78.1	79.7	88.8	73.4	81.9	25.2
May	67.0	74.8	70.3	78.6	77.3	86.2	76.9	85.7	25.2
July	69.1	77.0	72.7	81.1	73.3	81.9	75.0	83.6	25.2

<sup>1</sup> Gross/net packed in 50 kilo bags. <sup>2</sup> 19/21 sizes quoted until January 1963, 18/20 sizes afterwards. <sup>3</sup> 18/20 sizes. <sup>4</sup> 20/22 sizes.

Source: Spanish almond traders.

Spain." This may be in Spanish or in any other language in a visible place.

## Export Inspection

Enforcement of Spain's compulsory almond export standards is the responsibility of SOIVRE. An inspection certificate stating variety, grade, and classification is issued for each shipment, meeting export standards.

The inspection procedure used by the SOIVRE in examining the almond shipment is similar to that used in other countries. Inspection can be performed in all major Spanish export centers. The almonds are usually inspected in the dock warehouses, before being loaded on board ship.

The exporter first notifies the SOIVRE inspector that an almond shipment is ready for inspection.

The inspector takes random samples from about 5 percent of each lot in the shipment. These individual samples weigh from 4 to 8 ounces each. Samples are identified and then taken to the SOIVRE laboratory. At the laboratory, the samples of each lot are mixed together; from this mixture, a sample of about 25 kernels or in-shell almonds is then inspected according to procedures determined by the Inspection Service.

If the sample meets the export standard for the stated variety, grade, and classification, an inspection certificate stating this fact is issued. However, if the sample fails to meet the standards, another random sample is drawn, this time from 10 percent of the lot. This sample is inspected in turn, according to the same procedure. If the second sample also fails to meet export standards, the entire lot is returned to the exporter for regrading and packing.

All almonds designated for export must be accompanied by the SOIVRE inspection certificate.

TABLE 13.—SPANISH STANDARDS FOR SHELLED ALMONDS<sup>1</sup>: TOLERANCE ALLOWED TO MEET GRADE

Type of defect	Valencias			Esperanzas <sup>2</sup>	Longuettes		Jordanas	
	Unselected	Selected		Selected	Unselected	Selected	Unselected	Selected
	Percent	above 13mm	below 13mm	Percent	Percent	Percent	Percent	Percent
Admixture with other sweet varieties -----	20.00	5.00	5.00	5.00	10.00	5.00	10.00	5.00
Bitters -----	4.00	3.00	6.00	2.00	4.00	1.00	4.00	1.00
Doubles -----	20.00	3.00	3.00	5.00	7.00	2.00	15.00	2.00
Broken and splits -----	3.00	2.00	2.00	2.00	3.00	2.00	3.00	2.00
Damaged by chip and scratch -----	20.00	8.00	8.00	8.00	20.00	8.00	20.00	8.00
Particles, dust and all other foreign matter <sup>2</sup> -----	.25	.25	.25	.25	.25	.25	.25	.25
Damaged kernels -----	2.00	1.00	1.00	1.00	2.00	1.00	2.00	1.00
Serious damage -----	.50	.25	.25	.25	.50	.25	.50	.25

  

	Marconas		Planetas <sup>2</sup>	Majorcas		
	Unselected	Selected	Selected	Farmer		Selected
	Percent	Percent	Percent	w/broken	w/o broken	Percent
Admixture with other sweet varieties -----	10.00	5.00	5.00	10.00	10.00	5.00
Bitters -----	4.00	1.00	1.00	4.00	4.00	1.00
Doubles -----	7.00	2.00	2.00	40.00	40.00	3.00
Broken and splits -----	3.00	2.00	2.00	12.00	2.00	2.00
Damaged by chip and scratch -----	20.00	8.00	8.00	20.00	20.00	8.00
Particles, dust and all other foreign matter <sup>2</sup> -----	.25	.25	.25	.25	.25	.25
Damaged kernels -----	2.00	1.00	1.00	2.00	2.00	1.00
Serious damage -----	.50	.25	.25	.50	.50	.25

<sup>1</sup> Adapted for comparison purposes from a resolution of the office of the Director General of Foreign Trade, published in the *Official Bulletin*, March 23, 1961.

<sup>2</sup> Below 5 millimeters. Note: Requirement for whole kernels, 100% for all grades.



TABLE 14.—U.S. STANDARDS FOR SHELLED ALMONDS:  
TOLERANCE<sup>1</sup> ALLOWED TO MEET GRADE

Type of defect	U.S. Fancy <sup>2</sup>	Extra No. 1	No. 1	Select Sheller Run	Standard Sheller Run	Whole and Broken	No. 1 pieces
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Requirement for whole kernels -----	100	100	100	100	100	30	0
Admixture with other varieties <sup>2</sup> -----	5.0	5.0	5.0	5.0	5.0	5.0	( <sup>3</sup> )
Doubles -----	3.0	5.0	15.0	15.0	25.0	35.0	( <sup>3</sup> )
Splits or broken -----	<sup>4</sup> 1.0	<sup>4</sup> 1.0	<sup>4</sup> 1.0	5.0	15.0	( <sup>3</sup> )	( <sup>3</sup> )
Pieces passing through 20/64-inch hole <sup>5</sup> -----	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>4</sup> )	<sup>6</sup> 2.0	5.0	( <sup>3</sup> )	( <sup>3</sup> )
Injury by chip or scratch -----	5.0	( <sup>3</sup> )	( <sup>3</sup> )	( <sup>3</sup> )	( <sup>3</sup> )	( <sup>3</sup> )	( <sup>3</sup> )
Damage by chip or scratch -----	( <sup>4</sup> )	5.0	10.0	20.0	20.0	( <sup>3</sup> )	( <sup>3</sup> )
Particles and dust -----	.1	.1	.1	.1	.1	.1	1.0
Foreign material -----	.2	.2	.2	.2	.2	.3	.3
Other defects -----	2.0	4.0	5.0	3.0	3.0	5.0	5.0
Seriously damaged <sup>4</sup> -----	1.0	1.5	1.5	2.0	2.0	3.0	3.0

<sup>1</sup> Tolerances by weight. Adapted for comparison purposes from U.S. Standards for Grades of Shelled Almonds, U.S. Dept. Agr., August 1960. Additional requirements specified in the official published U.S. Standards. <sup>2</sup> Not more than 1 percent bitter almonds in all grades. <sup>3</sup> No maximum specified. <sup>4</sup> Subtracted from percent allowed for "Other defects." <sup>5</sup> 20/64 inch equals 0.79 centimeter. <sup>6</sup> Included in percent allowed for splits or broken.

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