

# **Asociación española de historia económica**

***Documentos de trabajo***

**DT-AEHE Nº 0701**

**Samuel Garrido**

**“The Anticalifornia”. Family farming, prices and quality product in the Spanish citrus industry (1840-1936)**

***Texto original recibido en enero de 2007***

***Texto revisado y aceptado por el Comité de Redacción en marzo de 2007***

**AEHE, MADRID, 2007**

# “The Anticalifornia”. Family farming, prices and quality product in the Spanish citrus industry (1840-1936)

Samuel Garrido

Departamento de Economía. Universitat Jaume I. 12071 Castellón.

E-mail: Samuel.Garrido@eco.uji.es

This paper stems from project A86DWW2. It would not have been possible without the support of Vicente Abad and the opportunity to research the holdings of the magnificent Museo de la Naranja in Burriana. An earlier version was presented at the XXIV Encontro da Associação Portuguesa de História Económica e Social, held in the Azores in November 2006. Notable improvements have been introduced thanks to the discussions the paper aroused there and, above all, as a result of the comments made by Salvador Calatayud and an anonymous reviewer from the DT-AHE.

**ABSTRACT:** In recent times a great deal of attention is being paid to the repercussions that the appearance of California as a new supplier of “Mediterranean products” had over the traditional producer countries located on the Mediterranean rim. The paper focuses on orange farming and starts with a comparison between the California and the Spanish citrus industries. While the former specialised in the production of high quality fruit, in the latter groves generated huge amounts of lower quality and cheaper oranges. The paper investigates why the Spanish growers – chiefly small and middle farmers – followed this line, and looks into the results of this kind of behaviour. It concludes that the methods used by Spanish farmers enabled them to resist the competition from California quite well, and that orange farming was a very profitable business in Spain during the period that is studied.

**KEY WORDS:** Oranges, Citrus Industry, California, Valencia, Family Farming

**RESUMEN:** Desde hace algún tiempo se está prestando una gran atención a las repercusiones que tuvo sobre los países situados a orillas del Mar Mediterráneo la emergencia de California como un nuevo gran productor y exportador de “productos mediterráneos”. El artículo dirige su atención hacia la citricultura y comienza haciendo una comparación entre la agricultura naranjera de California y la de España. Mientras que la primera se especializó en la producción de fruta de calidad muy elevada, en España los huertos valencianos generaban una enorme cantidad de naranja barata de baja calidad media. En el trabajo se investiga por qué los agricultores naranjeros españoles – que eran principalmente pequeños y medianos explotadores – adoptaron ese comportamiento, y se analiza los resultados que tal actuación produjo. Se concluye que los productores españoles pudieron resistir de manera bastante efectiva la competencia que les planteaba California, y que la producción de naranjas fue un negocio muy rentable en España durante el periodo considerado.

**PALABRAS CLAVE:** Naranjas, Cítricos, California, Valencia, Pequeña explotación

N50, N53, Q13, Q15

## “The Anticalifornia”. Family farming, prices and quality product in the Spanish citrus industry (1840-1936)

Samuel Garrido  
Universitat Jaume I

Spanish orange farming has traditionally been considered to be one of the most dynamic agricultures within the Mediterranean area. Although it has not been refuted, that image has, however, been somewhat eroded since comparisons started to be made with California.<sup>1</sup> In the late nineteenth century California became a great producer of citrus fruits, walnuts, almonds, raisins, prunes and many other crops that up till then had only been grown on a large scale on the Mediterranean rim. After capturing the U.S. domestic market, California growers began to export and increase their market share in Europe. Southern Europe, which depended so much on its agricultural exports in order to keep up with the industrialised nations, would have been the loser. According to Morilla, Olmstead and Rhode's counterfactual analysis, just the lost citrus revenues suffered by the Mediterranean exporters “would have been sufficient to support about 312 000 people at the average per capita income levels prevailing in Spain and Italy circa 1910”.<sup>2</sup> Despite reconsidering some of the assumptions of these authors, Pinilla and Ayuda reach a similar conclusion: in 1910 the Spanish GDP would have been 0.8 per cent higher than it was.<sup>3</sup>

Practically from its very beginnings, the Spanish citrus industry was characterised by its own protests about its situation, which may give the impression that it was permanently immersed in a state of crisis, but the amount of land devoted to oranges did not stop increasing. The fragment that follows, taken from a report written in 1908,

---

<sup>1</sup> Morilla, Olmstead and Rhode, “Horn of Plenty”; Olmstead and Rhode, “El desarrollo”; Olmstead and Rhode, “La competencia”.

<sup>2</sup> Morilla, Olmstead and Rhode, “Horn of Plenty”, p. 345.

<sup>3</sup> Pinilla and Ayuda, “‘Horn of Plenty’ revisited”, p. 33.

illustrates the reasoning of Spanish growers: “The appalling decline in wines has coincided with an enormous drop in exports; in contrast, the decline of the orange becomes more and more pronounced every year despite the fact that exports are rising steadily. In twelve years they have doubled”.<sup>4</sup> The writer points out that the average unit price of the Spanish export of orange followed a downward trend over those twelve years, but does not explain that per unit production costs had also dropped.<sup>5</sup> In actual fact, in the Valencian Region (the most important area of production in Spain) the orange was for many years the most profitable investment.<sup>6</sup>

The counterfactual analyses carried out to date have sought to estimate what would have happened in Mediterranean Europe without the existence of competition from the American growers of “Mediterranean products”. In the conclusions to this paper I am going to defend that this makes as much sense (or nonsense) as attempting to evaluate how much California failed to grow due to the presence of the Spanish citrus industry. As a first step towards dealing with this issue, the first section of the paper offers a comparison of the citrus industries in California and Valencia. The second section looks at the evolution of Spanish citrus farming before the 1936-39 Civil War. The third section investigates why many Valencian peasants became orange growers. Lastly, the fourth section considers why most of them produced large amounts of poor quality fruit and examines how they did it, with special attention being paid to the fertilising techniques used and the role played by cooperatives.

## CALIFORNIA AND SPAIN

The first Valencian grove exclusively dedicated to orange trees is supposed to have been planted in 1781 in Carcaixent (Valencia). At first few dared to follow step and, although more groves did begin to appear in the 1840s, the Spanish citrus industry did not

---

<sup>4</sup> Lassala, *Nuestra exportación*, p. 15.

<sup>5</sup> Expressed 1913 pesetas, over the period 1895-1900 Spain received an average of 199.6 pesetas for every metric ton of oranges it exported, 154.4 pesetas in 1900-04, and 138.1 pesetas in 1905-09; Lassala, *Nuestra exportación*, p. 15, Torres and Paris, *La naranja*, pp. 222 and 253. However, it cost 73 pesetas to produce a metric ton of oranges in Spain circa 1890, and 45 pesetas circa 1905; calculations based on Maylín, *Memoria*, pp. 51-52, and Maylín, *Manual práctico*, pp. 166-7.

<sup>6</sup> Palafox, “Expansión”, p. 328. Palafox: “Estructura”.

start to boom until the 1870s, barely two decades before its California counterpart.<sup>7</sup> From then to the end of the period we are considering here more than 70 (and often over 90) per cent of the harvest was exported.<sup>8</sup>

At least in the short term, California's appearance in the citrus industry had very little effect on the Valencian economy. Towards the middle of the nineteenth century Spain began to send small consignments of its oranges to the east coast of the U.S. This flow was stemmed after the near tripling of duties on citrus in the Dingley Tariff of 1897, but the U.S. had been a secondary market.<sup>9</sup> What did arouse a great deal of concern among Valencian growers was the possibility of the United States becoming an important exporter of citrus fruits, since they believed that this would result in their being pushed out of the European markets.<sup>10</sup> Indeed their fears were well founded, because California was constantly being portrayed as the place where the citrus culture had reached a higher degree of perfection.

As wheat was replaced by fruits and nuts, California underwent a change from large-scale extensive ranching to smaller-scale intensive farming.<sup>11</sup> By European standards, however, citrus crops were grown in California on a rather large scale. In Orange County, in the heart of the California Citrus Belt, citrus farms had an average size of 40 acres (16 hectares) in the 1930s.<sup>12</sup> A few large growers owned thousands of acres, hundreds of smaller citrus farmers owned "ten or twenty" acres each,<sup>13</sup> and it must be assumed that those who owned less than 10 acres were very few in number, because the expression a

---

<sup>7</sup> If we take the Spanish orange exports between 1900-1909 as base 100, the figures corresponding to the five previous decades are the following: 1850-59 = 3.3; 1860-69 = 6.7; 1870-79 = 17.9; 1880-89 = 24.3; 1890-99 = 46.5; Torres and Paris, *La naranja*, pp. 221-2.

<sup>8</sup> At the beginning of the 1870s 75 percent of the production was exported; Lassala, "Memoria", p. 14. According to Font de Mora, *El naranjo*, 1935, p. 17, the average was 90 percent throughout the first three decades of the twentieth century. Over the period 1927-36 this figure dropped to 72 percent; Instituto Valenciano de Economía, *Economía citrícola*, p. 48. From the 1960s onwards, the Spanish domestic market began to absorb a more significant portion of the output; current consumption stands at over 40 per cent.

<sup>9</sup> Spanish oranges shipped to countries other than Great Britain, France and Germany accounted for only 10.7 per cent of the total during the period 1850-69, 14.8 per cent (with only 2.4 per cent of the total going to the USA) between 1870-74, 4.9 per cent between 1875-96, and 3.9 per cent between 1897-1900. Torres and Paris, *La naranja*, p. 225; and Abela, *El naranjo*, pp. 170-1.

<sup>10</sup> In the 1870s they already foresaw the chances of a massive influx of U.S. oranges coming into Europe; Sanz-Bremón, "Contestación", p. 273. In the early twentieth century they predicted that this would occur following the opening of the Panama Canal; Lassala, *Nuestra exportación*, p. 47. And in the period immediately before the 1929 crash many thought that it was about to happen; Bellver, *La naranja*, p. 49.

<sup>11</sup> Rhode, "Learning", p. 773.

<sup>12</sup> Sackman, *Orange Empire*, p. 283.

<sup>13</sup> The information is provided by Phil Brigandi, in [www.cityoforange.org/localhistory/citrus/index.htm](http://www.cityoforange.org/localhistory/citrus/index.htm).

“ten-acre-grower” was used in California as a synonym for a small grower.<sup>14</sup> In Valencia orange farms had on average 2 acres (0.8 hectares) in 1920.<sup>15</sup>

Groves in California were not only bigger than those in Spain, but they were also far more capitalised and were run by a different kind of management. “Among all the horticultural industries of the United States,” wrote Harry Lawton, “the culture of citrus in California is unique. It was established for the most part by retired business or professional men from New England and the Central states, usually men of intelligence and education, often men who had lost their health in acquiring wealth and who moved here to begin a new life in the open air and sunshine”.<sup>16</sup> In California they found vast expenses of cheap land and, in a context of falling interest rates,<sup>17</sup> built up plantations using wage labour supplied by immigrants from China, Japan and Mexico. Most of them had no previous experience as farmers, but they were acquainted with business practices outside agriculture which they attempted to apply to the picking, packing, and marketing of fruit.

According to the *International Year Book of Agricultural Statistics*, over the five years from 1924 to 1928, 19.8 metric tons of oranges were produced per hectare in Spain, whereas the figure was 9.5 tons in the United States.<sup>18</sup> Partly because such high yields were obtained in Spain at the expense of quality, during the period 1922-1926 oranges exported from the U.S. cost an average of 4.15 dollars/box, whereas the price of Spanish oranges was 1.15.<sup>19</sup> The superior quality of California oranges was due to two main reasons. One was the fact that fruit was overwhelmingly marketed through cooperatives which incited their members to produce high quality fruit, while Spanish cooperatives seldom played this role. The second reason was the efficient activity of the agricultural services and the close contact (made possible by the mediation of the cooperatives) between scientists and farmers, which led to very effective measures to solve problems due to pests, freezing or

---

<sup>14</sup> Moses, “G. Harold Powell”, p. 141. By my reading, there is no other more complete information on the size of the California orange farms. We do know, however, that in 1910, in all the fruit-growing counties in the state, 16 per cent of the farms had less than 10 acres, 33 per cent had less than 20, and 26 per cent had over 100; Woeste, *Farmer's*, p. 248.

<sup>15</sup> Only 0.2 per cent of the orange growers owned 40 or more acres, 98.9 per cent owned less than 20 acres, 97 per cent less than 10, and 60 per cent had less than an acre (0.4 hectares). Garrido, *Cànem*, pp. 105 and 171.

<sup>16</sup> Klotz, Lawton, and Hall, *History*, p. 6.

<sup>17</sup> Rhode, “Learning”, p. 791.

<sup>18</sup> Quoted by Fontavella, *La Huerta*, p. 194.

<sup>19</sup> Morilla, Olmstead, and Rhode, “Horn of Plenty”, p. 324.

decay of the fruit during shipment.<sup>20</sup> Although Spanish citrus farming also benefited from the existence of public research centres, it did so on a far more modest level, and technical advances here were much more dependent on the individual efforts made by the farmers themselves, and thus on learning by doing.<sup>21</sup>

The chief citrus cooperative in California, the California Fruit Growers Exchange, was a giant that invested huge sums of money in promoting the orange, developed by-product industries and managed to create the habit of drinking bottled orange juice among the inhabitants of the U.S. – 20 per cent of the oranges it supplied in the mid-1930s was to be used for juice.<sup>22</sup> In Spain most of the few oranges the home market consumed were those deemed to be unfit for exportation, and juice was unknown on a commercial level. One obsessive concern of the California Fruit Growers Exchange was the standardisation of fruit grades and giving consumers a clear guarantee of what they were buying. As a result oranges were packed under a small number of brand names.<sup>23</sup> The success of the standardisation process was favoured by the fact that the California horticulturalists, following the advice of their cooperatives, focused on growing only two varieties of oranges: the winter-ripening Washington navel orange, and the summer-ripening Valencia orange. It is said that in Spain up to 30 different varieties (although some of them were actually just subvarieties and the presence of others was merely symbolic) were exported in the early twentieth century.<sup>24</sup> The advantage of this was that growers could choose the variety that best suited the soil and climate in each piece of land they owned and they could satisfy the particular tastes of each market,<sup>25</sup> but at the expense of making standardisation

---

<sup>20</sup> Sackman, *Orange Empire*, pp. 66-83.

<sup>21</sup> The first Spanish research centre devoted to the orange was set up in 1931 in Burjassot (Valencia), where there was already another more generic centre that introduced into Spain certain techniques that had been developed in California. It did not manage to import the Biological Pest Control or outdoor heater methods to prevent freezing, but, from 1907 onwards, it did disseminate the use of fumigation tents and hydrocyanic acid. In 1909 it introduced the Washington navel orange and, shortly afterwards, the Valencia orange, which, despite its name, was unknown in Valencia; Font de Mora, *El naranjo*, 1935, pp. 191-5, 206 and 57-59.

<sup>22</sup> Sackman, *Orange Empire*, pp. 84-116.

<sup>23</sup> The best oranges were classified as “Sunkist”, and represented from a half to two thirds of the total number; The Sunkist Growers, *Story*, p. 5.

<sup>24</sup> Webber and Batchelor, *Citrus Industry*, p. 95. The tendency to grow a great number of varieties and subvarieties had become more pronounced after the First World War, and started to experience a turnaround during the 1930s; see Font de Mora, *Comercio*, 224-6 and 309-11, and Instituto Valenciano de Economía, *Economía citrícola*, pp. 68-9.

<sup>25</sup> For example, the notable increase in the growing of “blood oranges” in Spain in the early twentieth century was due to the fact that they were the preferred varieties in Germany, which until then had imported them from Sicily.



impossible. Exporters used different brand names for the grades of each variety and, as there were many exporters, there were a multitude of brands. This made it very difficult to promote a particular brand and did nothing to help consumers distinguish between them on the basis of their quality.

After a talk on the differences between California and Spain in a meeting held in 1915, one prominent Valencian grower summed up his grief in a single sentence: “We are the Anticalifornia!”<sup>26</sup> Although the Spanish citrus industry introduced a great deal of small improvements (many of which were adapted from Californian techniques) and in the 1950s started to be significantly restructured, it remained very different from the California model.<sup>27</sup> In contrast, in the 1930s Jewish orange producers in Palestine had already managed to implement many of the methods used in California.<sup>28</sup> It could therefore be supposed that the Spanish case was one of frustrated imitation and failure.

Yet the truth is that events do not appear to have evolved in a way that was particularly detrimental to Spanish interests. As the twentieth century went on, Spain's share of the worldwide production of oranges dropped, but the evolution of Spanish orange output is perhaps more significant, because it became more difficult for Spain to maintain its share as countries where land was an abundant resource joined the orange industry. Spain (with 23.5 per cent of the total) was ranked alongside the United States as the world's number one producer during the period 1922-1926.<sup>29</sup> From then on, the accelerated growth in the U.S. coincided with the appearance of Brazil, Palestine and South Africa as new large-scale producers, and consequently Spain's contribution fell to 12 per cent of the worldwide total between 1934 and 1938. By the 1959-1960 campaign it had dropped further to only 6.9 per cent, but Spain was then the third most important producer (behind the U.S. and Brazil), continued to be the number one exporter, and its production had risen by 56 per cent with respect to the average over the period 1922-1926.<sup>30</sup>

Despite all the forecasts, the more expensive American oranges never invaded Europe.<sup>31</sup> Indeed, the cheaper Spanish orange never achieved a strong position in the North

---

<sup>26</sup> *Tribuna Libre* (Vila-real), November 22, 1915, p. 1.

<sup>27</sup> See Abad, *Historia* (II).

<sup>28</sup> Karlinsky, *California Dreaming*.

<sup>29</sup> Webber and Batchelor, *Citrus Industry*, p. 122.

<sup>30</sup> Liniger, *L'orange*, pp. 14-15.

<sup>31</sup> Over the period 1910-1940 the U.S. exported between 6 and 8 per cent of its orange output annually,

American market either.<sup>32</sup> But in view of the respective quality-price relationship, the latter seems more difficult to explain than the former. According to Morilla, Olmstead and Rhode, from 1910 the U.S. ad valorem rates on orange imports fell to 28 per cent or less, and the tariffs would therefore lose their effectiveness. Meanwhile, in the U.S. market, California oranges sold for \$1 to \$3 more than Spanish fruit.<sup>33</sup> This premium could reflect the difference in quality, but, although in appearance it was less attractive than the California orange, the Spanish fruit was not “bad” – in fact it was eaten by the French or German upper classes. Why did it go unnoticed among the American consumers with lower purchasing power? And among the juice industry, which consumed lower grades of citrus?

In actual fact, everything seems to indicate that the Spanish orange industry had little interest in undertaking the American adventure, as this would have involved a radical change in their methods of production, which were the reason why the Spanish orange was not a sturdy traveller and was not able to cross the Atlantic. As an exception, Spain did try to direct a greater part of its oranges towards the United States when the First World War ended and it took some time before Germany started importing them again. It was precisely in that moment when the California growers’ organisations rallied to obtain state and federal quality standardisation laws.<sup>34</sup> As a result, the Spanish orange was to encounter tremendous difficulties in the future to gain access to the U.S. market, and in 1926, at least, there was a ban on importing them. The American authorities alleged the move was made because of the presence of Mediterranean fly larvae in some shipments from Spain, but for the Spanish *Unión Nacional de la Exportación Agrícola* it was a “pretext that was put forward as a protectionist measure”.<sup>35</sup> Whatever the case may be, it seems that the American citrus growers also had reasons to be somewhat concerned about their Valencian colleagues. The rest of the paper deals with these Spaniards and their production methods.

---

chiefly to Canada; Olmstead and Rhode, “El desarrollo”, p. 443. In the early 1950s U.S. orange growers received an export subsidy of 1.25 dollars per box, which was reduced following the intervention of the GATT, and done away with in 1956; García-Guijarro, *Hespérides*, p. 89.

<sup>32</sup> Morilla, Olmstead and Rhode, “Horn of Plenty”, p. 322-3.

<sup>33</sup> Morilla, Olmstead and Rhode, “Horn of Plenty”, p. 324 n.

<sup>34</sup> Moses, “G. Harold Powell”, p. 48; Sackman, *Orange Empire*, p. 94. Bellver, *La naranja*, p. 89.

<sup>35</sup> *Conferencia Nacional*, p. 53.

## THE EXPANSION OF THE ORANGE INDUSTRY IN VALENCIA

Table 1 shows some significant data concerning the development of the citrus industry in Spain prior to 1936. No official figures are available regarding the amount of land given over to growing citrus crops in the nineteenth century, and those that do exist for the twentieth century are not particularly reliable. After completing the official data with different estimations conducted on the basis of other sources, column I shows that the number of hectares dedicated to orange trees in 1900 was 6.2 times the figure for 1872, and between 1900 and 1935 became almost 3.5 times larger again. Such figures appear to indicate strong growth but, as can be seen in column V, the fact that in both 1910 and 1931 orange groves only accounted for 0.3 per cent of the total amount of Spanish arable land puts this impression into a slightly different perspective. The orange was, nevertheless, one of the most intensively grown crops on irrigated land and its contribution to the Spanish agrarian product was therefore much greater – 2.6 per cent in 1910 and 9.6 per cent in 1931 (column VII). All the same, Column VII is where the disproportion between the small amount of land devoted to oranges and their importance in the Spanish economy is best represented. The fall in Spanish wine exports in the late nineteenth and early twentieth centuries coincided with the uninterrupted growth, until the 1930s, in the number of shipments of Mediterranean agrarian products (vegetables, fresh and dried fruits, olive oil or cork) that were sent abroad. The orange became the most important of those consignments, especially from the early 1920s onwards, and an essential source of foreign currencies for Spain.

Table 1: The Spanish orange industry (1872-1935)

	I	II	III	IV	V	VI	VII	VIII
1872	(3 546) <sup>1</sup>							440 934
1878	(8 225) <sup>2</sup>						2.0	856 502
1900	(22 125) <sup>3</sup>					2.2 <sup>7</sup>	4.9	2 602 257
1902	42 035	85.9	9.1	2.5			6.8	3 691 996

	(31 046) <sup>4</sup>							
1910	47 424	78.7	8.5	5.2	0.3	2.6 <sup>8</sup>	6.1	4 972 070
	(51 614) <sup>5</sup>	(80.4) <sup>5</sup>	(7.8) <sup>5</sup>	(4.8) <sup>5</sup>				
1922	46 714	78.9	11.3	6.1	0.2		7.6	4 010 491
1926	52 178	77.4	12.5	7.2			13.4	7 169 939
	(72 090) <sup>6</sup>	(84.7) <sup>6</sup>	(7.0) <sup>6</sup>	(5.6) <sup>6</sup>				
1927	57 193	79.9	10.7	6.6			9.8	6 204 875
1928	61 609	82.4	8.2	6.9			11.8	8 586 164
1929	66 410	82.6	7.6	6.4			11.3	7 927 571
1930	71 987	83.6	7.3	6.0			13.2	10 845 390
1931	72 476	83.8	7.2	6.0	0.3	9.6 <sup>9</sup>	18.1	8 552 460
1932	74 638	83.8	7.1	5.8			23.2	8 810 298
1933	77 146	84.1	7.2	5.9			24.8	9 779 665
1934	75 096	83.2	7.4	6.4			21.4	8 844 616
1935	76 793	83.5	7.3	6.2			17.7	7 003 432

*Caption:* I: Land area devoted to orange trees in Spain (in ha). II: Area devoted to orange trees in the Valencian Region (as % of Spanish total). III: Area devoted to orange trees in Andalusia (as % of Spanish total). IV: Area devoted to orange trees in the Murcia Region (as % of Spanish total). V: Spanish farmland taken up by orange trees (as %). VI: Contribution of the orange to the Spanish agrarian product (as %). VII: Share of the orange in Spanish exports (as %). VIII: Volume of Spanish orange exports (in metric quintals).

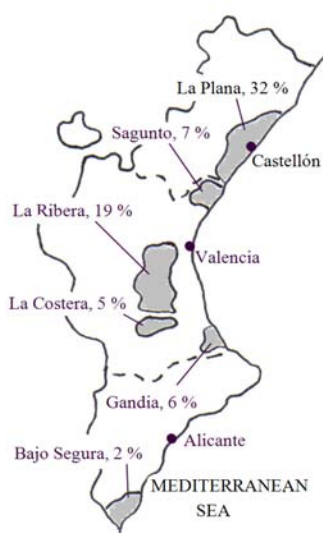
*Notes:* <sup>1</sup> Estimation based on Lassala, *Memoria*. <sup>2</sup> Estimation based on Martín, *Informe*, p. 32, and Abela, *El naranjo*, p. 161. <sup>3</sup> Estimation based on Maylín, *Memoria*, p. 21, and Sanz Bremón, *Memoria*, p. 38. <sup>5</sup> Estimation based on Dirección General de Agricultura, *El regadío*. <sup>5</sup> Estimation based on Lassala, *Nuestra exportación*, pp. 14 and 69. <sup>6</sup> According to *Conferencia Nacional*, p. 26. <sup>7</sup> 1897-1901. <sup>8</sup> 1909-13. <sup>9</sup> 1929-33.

*Sources:* I-IV: Grupo de Estudios de Historia Rural, *Estadísticas*; V: Carreras and Tafunell, *Estadísticas*, p. 304; VI: Simpson, "La producción", p. 69; VII and VIII: Torres and Paris, *La naranja*, pp. 221-2 and 253.

In Table 1 it can also be seen that before 1936 the Valencian Region always had about 80 per cent of the total amount of land devoted to orange farming in Spain (column II). Within the Valencian Region large-scale citrus farming was in turn restricted to a handful of districts located on the coastal plains. These can be seen in Figure 1, which shows their orange-producing area as a percentage of the total land area given over to orange farming in Spain for the year 1922. Owing to the importance that it will later take on in our reasoning, we should highlight here the case of the chief Spanish citrus-growing district, La Plana, which around 1926 produced about 8.9 per cent of the world's oranges and mandarins and exported more boxes than the joint number exported by the U.S. and

Italy, the world's second and third largest exporter countries.<sup>36</sup>

Figure 1: Main orange-growing districts in the Valencian Region.



The percentage shown refers to the contribution made by each district to the total land area devoted to orange growing in Spain in 1922.

Source: Piqueras, *La agricultura*, pp. 181-182.

Despite the apparent prosperity that seems to be reflected by the information in Table 1, in the early twentieth century it was often claimed that the greater part of the profits generated by the orange industry went to the foreign firms responsible for distributing the fruit in the destination markets, while the Valencian growers, after assuming heavy investments and a considerable degree of risk, obtained a profit rate of only 5 or 6 per cent.<sup>37</sup> Jordi Palafox argued very convincingly against this assertion and calculated that, in fact, full-bearing orchards gave profits of over 200 per cent in the late 1920s.<sup>38</sup> The figures shown in Table 2 are not so outstanding, but are still very high, which

<sup>36</sup> I consider that 38 per cent of the Spanish output indicated by Webber and Batchelor (*Citrus Industry*, p. 121) for the period 1922-1926 came from La Plana, the same as the 31 per cent of exports in the period 1927-1931. Between 1927 and 1931 La Plana exported about 8.2 million boxes of oranges annually compared to the 3.8 million boxes exported by the United States.

<sup>37</sup> For example, Bellver, *Esbozo*, pp. 170-197.

<sup>38</sup> Palafox, "Estructura", p. 350.

gives rise to a question: if the orange was such a profitable business in Spain, why did it take up prior to 1936 such a small percentage of the country's arable land?

Table 2: Profits earned by orange growers in Valencia

	Income <sup>1</sup> (pesetas/ha)	Costs <sup>1</sup> (pesetas/ha)	Net income <sup>1</sup> (pesetas/ha)	Profit rate	Yields (t/ha)
1856	520	265	255	96 %	6.4
1888 (a)	1 392	984	408	41 %	13.0
1888 (b)	1 638	1 254	384	31 %	13.6
1930 (a)	-	2 648	-	-	-
1930 (b)	5 000	2 157	2 843	132 %	25.5
1933	5 250	2 600	2 650	102 %	25.0
1935 <sup>2</sup>	-	2 648	-	-	42.0

Notes: <sup>1</sup> In current pesetas. <sup>2</sup> Whereas the data for the previous years are mean values, the figures for 1935 are those for a 5-hectare orange farm located in the district of Gandia.

Sources: 1856: Vila-real Town Records Office, *Padrón* from 1856; 1888 (a): Calatayud, "L'expansió citrícola", p. 103; 1888 (b): Gandia Town Records Office, *Cartilla evaluatoria de Beniopa* from 1888; 1930 (a): *Diario de Castellón*, July 27, 1930; 1930 (b): Bellver, *Esbozo*, p. 169; 1933: Font de Mora, *El naranjo*, 1935, pp. 240-2; 1935: Fontavella, *La Huerta*, p. 206.

Growth of the orange area was subject to two strong restrictions. First, orange trees are very sensitive to frosts, which means that they cannot be grown in most of Spain (and in most of the Valencian Region). Second, they need a large amount of water for irrigation in the hot dry summers of the Mediterranean climate and this was not always available (either because it was physically unfeasible or because it was not financially viable, given the level of technical development). In consequence, before the second half of the twentieth century large-scale orange farming only took place in the few areas of the Valencian Region that, in addition to being relatively free of frosts, were situated close to the banks of the few moderately plentiful rivers in the region. The spread of orange trees throughout these territories, however, was not automatic and occasionally took quite some time to occur.

Thus, in 1922, the irrigated area in the province of Valencia consisted of around 110 000 hectares, but oranges only accounted for 18 per cent of that land, while another 45 per cent was dedicated to growing cereals and legumes.<sup>39</sup> According to some scholars, this was the result of a third restraint.

Although the orange fuelled a strong agrarian bourgeoisie, the number of small farmers also rose dramatically in the Valencian Region from about 1870 onwards,<sup>40</sup> and it has sometimes been claimed that their presence tended to slow down the expansion of the orange culture, either due to their decapitalisation or because of their risk aversion.<sup>41</sup> One of the main purposes of the next two sections is precisely to discuss this idea.

#### FROM PEASANTS TO SMALL CITRUS GROWERS

Small farms played a decisive role in the citrus industry in all the Valencian orange districts in the late 1920s. But different paths had been followed to reach that situation: while in the north of the Region (province of Castellón) it was already quite apparent in the 1880s, in the central part of the Region (province of Valencia) the small farmers only entered the citrus industry to any significant extent in the twentieth century, and more especially after the First World War.<sup>42</sup>

In 1880, orange trees accounted for 39 per cent of the total irrigated land in the district of La Ribera, where 81 per cent of the plantations carried out after 1860 had been implemented, after sinking tube wells, on what had previously been unirrigated land.<sup>43</sup> A similar situation occurred in the other orange districts in the province of Valencia. As the wells and their machinery required heavy investments, they were only available to wealthy landowners, and this meant that, in 1860, 55 per cent of the orange trees being grown in La Ribera belonged to citrus farms with an area of more than 5 hectares (a considerable size

---

<sup>39</sup> Garrabou, *Un fals dilema*, p. 176. Cereals included 30 000 ha of rice, which was often grown on land that could not really be used for anything else.

<sup>40</sup> Calatayud, *Capitalismo agrario*.

<sup>41</sup> Palafox, "Expansión". Roncalés, "Propiedad".

<sup>42</sup> Around 1860, in the early days of the expansion of the orange industry, the average size of the orange farms was only 0.6 hectares in the province of Castellón, compared to 2.1 hectares in the province of Valencia; Garrido, *Cànem*, p. 121, and Calatayud, "La taronja".

<sup>43</sup> Roncalés, "Propiedad", pp. 189 and 196.

for irrigated land in Valencia).<sup>44</sup> Planting orange trees on the old river-irrigated land required less costly investments which even the small farmers could afford,<sup>45</sup> but in La Ribera few small farmers actually entered the citrus industry prior 1900. In part, because oranges gave only one crop a year that had to be sold, it could not be stored and it was ruined from time to time by frosts or strong winds. Consequently, “orange farming has no middle ground – it is either a great business or a complete failure”.<sup>46</sup> In contrast, cereals rotated with legumes, vegetables and industrial plants. These rotations supplied products that were used to satisfy the families’ basic needs and could also be marketed. And, since it was unlikely that all the crops being harvested over the rotation cycle would be ruined, the peasant household had far less chance of being hit by a total economic disaster than if they decided to grow oranges.

Moreover, replacing the rotations grown on the traditional irrigated land by orange trees entailed a high opportunity cost, because in the nineteenth century the former usually provided incomes that were similar to (and sometimes higher than) those deriving from the latter.<sup>47</sup> When the profits from oranges soared in the 1920s, the small farmers also specialised in growing them. In any case, the fact that until then orange trees were not a monoculture on irrigated land does not necessarily imply that the assignation of resources was inefficient. This is especially obvious in the district of Gandia. Because this district has a microclimate that allows crops to ripen a few weeks before those along the rest of the Valencian coast, during the second half of the nineteenth century its irrigated land was increasingly given over to growing tomatoes, sweet peppers and other vegetables that were exported to Great Britain. The small farmers in Gandia developed a number of highly sophisticated farming techniques and the demand for their vegetables continued to be high in the twentieth century. As the years went by, however, the district changed speciality – orange trees accounted for only 5 per cent of the irrigated land in 1887, 27 per cent in 1910, 40 per cent in 1921 and 80 per cent in 1936.<sup>48</sup>

---

<sup>44</sup> Calatayud, “La taronja”.

<sup>45</sup> Garrido, “Cànem”, pp. 122-124.

<sup>46</sup> Font de Mora, *El naranjo*, 1935, p. 130.

<sup>47</sup> According to tax-related sources, in Algemés (La Ribera) in 1888 orange crops provided a profit rate of 41 per cent, the figure for vegetables was 39 per cent, and 34 per cent for cereals; Calatayud, “L’expansió”, pp. 103-104. In the same year, in Beniopa (district of Gandia) oranges yielded profits of 31 per cent versus 37 per cent for cereals; Gandia Town Records Office, *Cartilla evaluatoria de Beniopa* from 1888.

<sup>48</sup> Calatayud and Garrido, “La compra”. Fontavella, *La Huerta*, p. 172.



Unlike what happened in the province of Valencia, in La Plana (province of Castellón), the most important orange district in Spain, the groundwater lies deep in the earth beneath hard bedrock and, before the improvements in tube-well technology introduced in the late nineteenth century, irrigation was absolutely out of the question for part of the territory. This is why orange farming spread first through the traditional river-irrigated areas, and it was only from 1900 onwards when the sinking of wells made it possible for citrus fruits to colonise what had hitherto been unirrigated land.

The first orange orchards were planted in La Plana around 1815, but their expansion was stemmed in the 1860s as a result of a pest – the “gum” – that killed off a large number of trees. Once the pest had disappeared, the plantations started growing again in the early 1870s, now at a tremendous rate. In 1847 oranges only accounted for 1.3 per cent of the irrigated area, 9.1 per cent in 1859 and 11.2 per cent in 1871, but from then on its expansion rocketed. In 1882 the figure had reached 63.6 per cent, 76.2 per cent in 1885, and 87.1 per cent in 1900.<sup>49</sup>

Paradoxically, in the nineteenth century agricultural technicians advised against turning oranges into a monoculture, since they thought that fruit prices would drop sharply as a result of over-production.<sup>50</sup> The speed with which the farmers in La Plana hastened to become part of the citrus industry, however, was partly conditioned by water availability. The expansion of the amount of the river-irrigated land from the late eighteenth century onwards resulted in a reduction in the water/land ratio, and many farmers started growing oranges because orange trees required less water than other intensive crops. Prior to 1870 most of the irrigated area was given over to a rotation of cereals and legumes that needed an average of 5625 m<sup>3</sup>/ha/year, while orange trees only consumed an average of 2800 m<sup>3</sup>/ha/year.<sup>51</sup> Moreover, cereals and legumes were ruined if they did not receive copious amounts of water during the frequent years of drought, but in La Plana (which has very clayey soils) orange trees could subsist on being irrigated a minimum of three times a year, 700 m<sup>3</sup>/ha each time.<sup>52</sup>

---

<sup>49</sup> Garrido, *Cànem*, p. 87.

<sup>50</sup> Garrido, *Cànem*, pp. 117-119.

<sup>51</sup> Ministerio de Fomento, *Medios*, I, pp. 423-415.

<sup>52</sup> According to Dirección General de Agricultura, *El regadío*, p. 147. If it ever became necessary to replace the orange, wrote the Chief Engineer of the province of Castellón in 1897, “we would find ourselves faced with a very difficult problem to solve, because although the conflicts that arise in the low water season are

As in all Valencian orange districts, initially the citrus industry in La Plana had been, above all, a matter concerning the middle and larger landowners. Table 3 shows how, in 1859, these farmers dedicated 11.5 per cent and 10.5 per cent of their land (respectively) to orange growing, as compared with only 4.7 per cent in the case of landowners with less than a hectare. But in 1885 it was the smaller landowners who lead the field, since at that time an average of 80 per cent of their land was used for growing oranges. An extensive set of reasons would seem to be necessary to explain why.

Table 3: Area of irrigated land used for orange growing in La Plana

Owners of:	Land owned by each group dedicated to orange farming (as %)		
	1847	1859	1885 (*)
< 1 hectare	0.4	4.7	80.0 (33.2)
1-5 hectares	1.7	11.5	79.3 (42.8)
> 5 hectares	2.1	10.1	66.1 (24.0)
Total	1.3	9.1	76.3 (100.0)

(\*) In brackets, the percentage of the total amount of irrigated land owned by each group.

Source: Vila-real Town Records Office, *Reparto de guardería rural* for the years 1847 and 1859, and *Amillaramiento* from 1885.

For centuries, peasants had bred silkworms in their homes. These fed on the leaves of the mulberry trees that were planted along the edges of the plots and acted as a source of cash income. When the worms were attacked by a pest in the 1850s, the mulberry trees were cut down and the small farmers had to look for another cash crop. The reason they chose the orange had to do with the fact that, when dedicated to cereals and legumes, much of the land belonging to humble farmers was of poorer quality than the rest of the irrigated

---

now under control (albeit with difficulty), if they were herbaceous plants it would be impossible to resolve the conflict and the land would unavoidably lose value"; Maylín, *Memoria*, p. 35.

land, but now it was found that these were precisely the areas where orange trees produced higher yields. Although these were the plots that suffered the greatest increases in price, the rest of the irrigated land also became more expensive.<sup>53</sup> In that region egalitarian inheritance was the norm. This system fragmented the peasant family's wealth from generation to generation and forced the children to seek new land, either by purchasing or renting them, in order to avoid landlessness. As the orange tree became more widespread, the landlords stopped using tenancy, and at the same time the rising prices made it more difficult to buy land. To be able to do so, it was now necessary to become involved in the market more than in the past, and this meant to cultivate oranges. But, presumably, what pushed the small farmers more than anything else to adopt the citrus culture was an issue related to irrigation.

When the flow of the rivers decreased in times of drought and water had to be rationed, in the Valencian irrigation systems priority was usually given to irrigating staple food crops.<sup>54</sup> In the mid-nineteenth century, however, these practices started to be questioned. In La Plana conflicts broke out in the 1870s, when a string of heavy droughts threatened the investments being made in orange trees. In 1877 the Castellon Town Council tried to distribute the water in the same way it had always done in periods of shortage, but now the orange growers accused them of imposing an "agrarian socialism". The following year the Irrigation Board (*Sindicato de Riegos*) in Vila-real restricted water for the orange groves, but the provincial governor revoked the order, at the request of a group of wealthy landowners, and many small farmers lost their cereal and vegetable harvests.<sup>55</sup> The Board appealed before the authorities in Madrid, but they ruled in favour of the governor and from then on the restrictions regarding irrigation in times of drought were applied equally to all the land, regardless of the crops being grown on them. If, in general terms, the reduced water/land ratio acted as a stimulus to plant more orange trees, from 1877 onwards the small peasants were more aware of the benefits of doing so: in the future, those who ran a

---

<sup>53</sup> According to Llauredó, *Tratado*, p. 633, in 1878 the price of prime quality land was 9 000 *pesetas*/ha when dedicated to cereals and legumes, while a hectare of full bearing orange grove cost two to three times as much. As was reported some years later, 'The progressive increase in orange production and exportation brought with it a deluge of money. As a result, the number of transactions involving the buying and selling of land soared and this eventually reached a point where demand was so high that the price of irrigable land became astronomically high'; *La Plana*, August 18, 1906, p. 1.

<sup>54</sup> Calatayud, "El regadío", pp. 70-71.

<sup>55</sup> *Diario de Castellón*, August 25, 1878, p. 2.

greater risk of losing their harvests were the farmers who were still tied to higher water-consuming traditional crop rotation.

It would not appear to be an exaggeration to say, then, that peasant households' decision to shift to the best crop in order to maximise profits was to a certain extent a "forced decision". In the "forced commercialisation" model proposed by Amit Bhaduri for a backward agriculture the result is peasant impoverishment and the stoppage of technological improvement.<sup>56</sup> Here, in contrast, the peasants played a decisive role in the process of technological advance and adapted themselves to the requirements of the market in a way that suited their interests quite well. In this region small peasant ownership was already quite common, but orange farming made it even more widespread and, additionally, enabled a layer of middle-sized peasant holdings to become consolidated. This was even more the case after the sinking of the first motor tube-wells in the unirrigated land around the year 1900.

In 1927 there were at least 144 motor-driven wells operating in the district. Sometimes they irrigated the lands of a single great landowner, but far more frequently they belonged to societies of small and middle farmers. In 1909 there were 38 wells in Vila-real, 31 of which belonged to societies with 1585 members, who "are overwhelmingly small landholders, since 1189 of them own plots of land with an area of between 1 and 6 *hanegadas* [0.08 and 0.5 hectares]".<sup>57</sup> The presence of those collectively owned wells led many landless workers and small farmers to purchase plots in the cheap unirrigated land. They then ploughed them and planted orange trees using family labour. As explained by the engineer Font de Mora: "Once a society has sunk the well and found water, the worker has to start to drill and chip away the rock that makes up the ground; then, taking advantage of days when it was raining or he could find no work, he brought earth from gullies and rivers until a workable layer of soil had been created; the hardest part of the work is now finished – all he has to do is level off the land, build the irrigation channels [and] plant the orange trees".<sup>58</sup> In order to reduce salary expenses, the wealthy landowners often transformed their unirrigated land using the unpaid labour provided by peasant families, who in exchange became the owners of a portion of the grove when the orange trees started to yield fruit. "If

---

<sup>56</sup> Bhaduri, *Economic Structure*.

<sup>57</sup> Comunidad de Labradores de Villarreal, *Memoria*, pp. 1-2.

<sup>58</sup> Font de Mora, *El naranjo*, 1935, p. 22.

we were to calculate the worth of the work done by the labourers who owned dry-land orange groves that they had raised”, concludes Font de Mora, “the remuneration they received for their labours is less than the effort they put in, but it allowed them to achieve that economic independence so dearly loved by free men”.<sup>59</sup> In truth, relatively few actually attained “economic independence”, but the generalised desire to reach it had important repercussions on the cost structure of the Spanish citrus industry.

Table 4: Owners of “hectares of orange grove equivalent” in Vila-real (La Plana)

Owners of:	1859	1885	1900	1920	1936
< 1 hectare	2 481	2 538	3 340	4 075	5 393
1-5 hectares	382	654	647	899	970
> 5 hectares	43	71	77	117	143
Total	2 906	3 263	4 064	5 091	6 506

Sources: Garrido, *Cànem*, pp. 173-174. And Vila-real Town Records Office, *Reparto de guardería rural* for the year 1936.

At the beginning of the twentieth century an orange grove with a size of less than one hectare (2.5 acres) did not provide enough income to allow an average farmer household to live exclusively from working it. At the other extreme, the owners of more than 5 hectares (12.5 acres) of orange groves very often used only hired labour and saw themselves as “landowners” (*propietarios*) rather than farmers (*labradores*). The areas lying between these two extremes fulfilled (to widely differing extents) the double requirement of being large enough to cover the minimum economic needs of the household and also of being small enough to be tilled using basically family labour.<sup>60</sup> As most of the landowners owned parcels of both irrigated and unirrigated land at the same time, I have used the net returns generated by each crop to reduce the whole cultivated area to “hectares of orange grove equivalent”.<sup>61</sup> The results are shown in Table 4, where it can be seen that

<sup>59</sup> *Ibidem*.

<sup>60</sup> Calatayud, *Capitalismo*, p. 29. Garrido, *Treballar*, pp. 176-177.

<sup>61</sup> The method employed is explained in Garrido, *Cànem*, pp. 170-4.

the enlargement of the pie thanks to the orange allowed all the groups of landowners to increase simultaneously. In each of the years considered, however, about 80 per cent of the landowners did not have enough land to be able to subsist without some other source of income. In fact, 65.5 per cent of them owned less than half a hectare (1.25 acres) of “orange grove equivalent” in 1920. The 4100 hectares that were cultivated in Burriana in 1936 (almost entirely given over to oranges) were divided up among 5375 landowners, 68 per cent of whom had half a hectare or less, and 15 per cent owned plots that were equal to or less than a *hanegada* (0.083 hectares, or 0.21 acres).<sup>62</sup> Most orange groves, then, belonged to “labourers” (*obreros*), “because the main source of income for their owners comes from daily wages they earn working for others”.<sup>63</sup>

If the small farmers used huge amounts of unpaid family work in their groves, the presence of a large number of very small farmers had enormous repercussions on the labour market and the evolution of salaries. In 1907 the president of the *Federación Agraria de Levante* – a powerful federation that grouped together societies controlled by large landowners – drew up a report on the standard of living of wage-earners in the orange industry. A “typical” labourer family had an annual income of 1020 pesetas – 680 of which came from the father, while the rest were contributed by the mother, who worked in a packing house, and small amounts obtained by two children aged between 9 and 12 years old. But their expenses – 69 per cent of which was spent on food – amounted to 1281 pesetas. The labourers were able to support that deficit, the report concluded, because nearly all of them had a small piece of land.<sup>64</sup>

During the 1920s salary costs underwent an upward trend, which was to become even more pronounced following the proclamation of the Second Spanish Republic in 1931, but each social segment of orange growers was affected in different ways. In 1930 the Castellón Agricultural Cooperatives Federation (*Federación Castellonense de Sindicatos Agrícolas*) drew up another report in which the situation of the Spanish citrus industry was portrayed in exaggeratedly gloomy terms; it nevertheless acknowledged that the orange district did enjoy an apparent state of “wealth and wellbeing”. According to the report, this was largely due to the fact that 80 per cent of the orange-growing area belonged

---

<sup>62</sup> Garrido, *Treballar*, p. 229.

<sup>63</sup> *Diario de Castellón*, March 20, 1928, p. 1.

<sup>64</sup> Lassala, “Alimentación”.

to farmers who never, or very rarely, engaged hired labour and they themselves usually worked as wage-earners for other larger landowners. As a result, the higher the salaries were the greater the incomes they obtained.<sup>65</sup>

#### COOPERATION, FERTILISERS AND QUALITY PRODUCT

In contrast to what happened in California, in Spain relative prices favoured more attention being paid to land saving techniques than to labour saving techniques. This resulted in high yields per hectare. But as crops were often pushed beyond the limits of good farming practice, frequently they produced low quality oranges – the greater the yields, the lower the quality of oranges and their unit prices, but the higher the total profit. Although they were not the only ones to use it, the large numbers of small and middle farmers did help such a strategy to become widely generalised. For small growers, forcing production was a way of getting relatively small parcels of land to grant their owners “economic independence”.

In the average usual type of planting, in California a hectare contained from 212 to 250 trees.<sup>66</sup> In Spain, the corresponding figure was only 192 in the mid-nineteenth century, because, to reduce risks, orange trees were planted “with large separations between them, in order to use the remaining soil for other crops”.<sup>67</sup> But in the 1870s planting from 276 to 312 trees per hectare had already become commonplace, and in the early twentieth century the figure rose to around 324.<sup>68</sup> Because their branches almost touched each other, machinery could not move along the rows and the groves used up a large amount of human labour.

Initially, orange growing had worsened the traditional shortage of manure, because livestock lost grazing land. As of 1844, the bottleneck was overcome by importing guano, which was used in Valencia only a few years after it was introduced into Great Britain.<sup>69</sup> When it was replaced by chemical fertilisers in the late nineteenth century, fertilising grew

---

<sup>65</sup> *Diario de Castellón*, July 27, 1930, p. 1. Salaries accounted for 28.8 per cent of the 2648 pesetas it cost to cultivate a hectare of orange trees, while fertilisers consumed another 16 per cent and the rent was a further 42.8 per cent.

<sup>66</sup> Parker, *Manual*, p. 10.

<sup>67</sup> Beltrán, *La Plana*, p. 46.

<sup>68</sup> Respectivamente, Bou, *Estudio*, pp. 132-133, Bellver, *La naranja*, p. 169.

<sup>69</sup> Polo de Bernabé, *Memoria*.

and yields rocketed. According to official statistics, the average yields were 15 t/ha in 1881, 18 t/ha in 1902, and 19.5 t/ha in 1922.<sup>70</sup> Engineers and growers' associations, however, claimed in their reports much higher figures. In 1897, for example, they were reported to have reached 30 t/ha in full-bearing orchards.<sup>71</sup> Over the coming years it was often said that the groves had become “orange factories”,<sup>72</sup> and in an assembly held in 1907 it was claimed that yields were 5 times what they had been 25 years earlier.<sup>73</sup> According to Rosón, in the 1920s the average yield of plantations over ten years old was about 35 t/ha, but there were groves that produced 50 and even 60 metric tons.<sup>74</sup> In fact, we know that in 1935 a 5-hectare farm located in the district of Gandia yielded 42 t/ha of oranges that were fit for sale,<sup>75</sup> which means that the overall production (the sum of the oranges that were sold, the rejects and those spoilt by the wind) had to be over 50 t/ha.

A very reliable handbook stated in the 1930s that the “Comuna” orange required an average of 900 kg/ha of chemical fertilisers, while for the “Sanguina” it was advisable to use about 1800 kilograms.<sup>76</sup> In fact, during the 1920s the usual amounts had been around 1500 kg/ha for the former and between 3500 and 6000 kg/ha for the latter.<sup>77</sup> In order to raise production as far as possible, the way many growers employed fertilisers was, in addition, very unbalanced, with little phosphorous or potash and far too many nitrogenous fertilisers, especially ammonium sulphate. It is sometimes claimed that this took place after the First World War, but it already occurred before then, although to a lesser extent.<sup>78</sup> It can

---

<sup>70</sup> Simpson, *Spanish Agriculture*, pp. 140-141. Official statistics do not include the reject oranges, and they usually seem to mix bearing and non-bearing (less than 5-year-old) orchards.

<sup>71</sup> Maylín, *Memoria*, p. 52.

<sup>72</sup> “In order to increase his income, the grower has been using chemical fertilisers without measure, doubling the number of trees, to the point where he has turned the groves into orange factories”. Barrachina, *La crisis*, 1908, p. 6.

<sup>73</sup> *Asamblea Agrario-Naranjera*, p. 16.

<sup>74</sup> Rosón, *La riqueza*, p. 41. Nevertheless, not all that fruit reached the consumer because, on average, 15 per cent of the oranges produced were rejects and more than 20 per cent of the remaining harvest was blown off the trees by the wind and rotted on the ground. This happened above all with oranges belonging to varieties that ripened after Christmas, which reached a higher price the longer they were left on the tree but at the expense of greater reductions in the harvest; Sanz-Bremón, *Memoria*, pp. 2-4. Moreover, due to the commercial techniques employed, a substantial part of the “good” production was never actually consumed. According to Bellver, *Esbozo*, p. 165, during the 1929-30 season 11 per cent of this “good” harvest went to waste.

<sup>75</sup> Fontavella, *La Huerta*, p. 206.

<sup>76</sup> Font de Mora, *El naranjo*, 1935, p. 138.

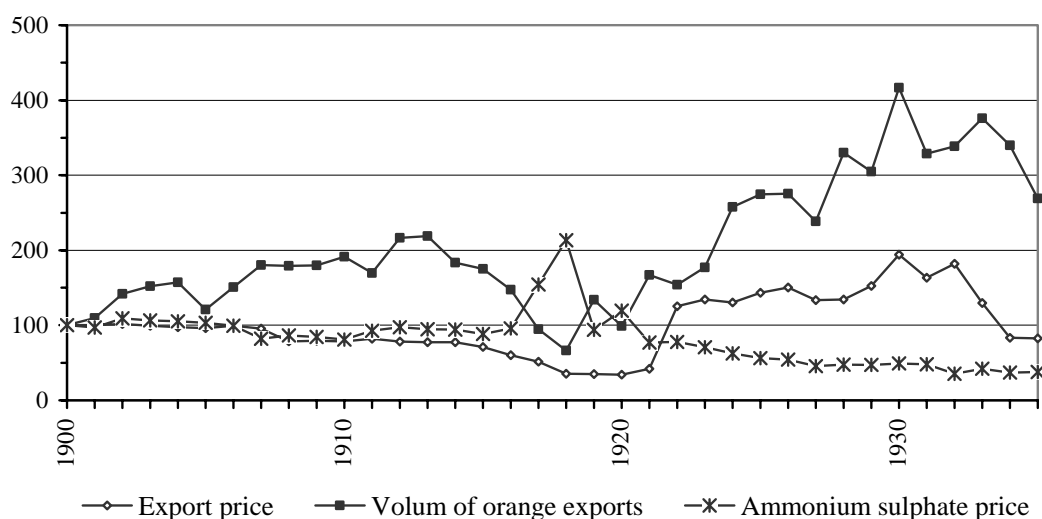
<sup>77</sup> Rosón, *La riqueza*, p. 44.

<sup>78</sup> Barrachina, *La crisis*, p. 7, states that, around 1905, some growers used more than 1200 kilograms of ammonium sulphate per hectare, which allowed them to produce up to 60 T/ha. In *Conferencia Nacional*,



be seen in Figure 2 that during the first two decades of the twentieth century the unit price of Spanish orange export decreased, but this did not prevent the amount exported from increasing – until the First World War broke out. Despite certain fluctuations, the price of ammonium sulphate tended to drop during that period and, if exports grew, it was because the increased yields resulting from greater fertilisation led to lower production cost per unit and higher total profit. Once the turbulence caused by the First World War had been overcome, in 1920-1921 the “golden decade” of the Spanish orange began. The increased volume of exports now coincided with a rise in the unit price of the fruit and a substantial drop in the price of ammonium sulphate, which was frequently used as the only fertiliser because it also became cheaper in relation to phosphor and potassium-based fertilisers.

Figure 2: Indices of orange export price, orange export, and ammonium sulphate price in Spain (1900 = 100).



Sources: Torres and Paris, *La naranja*, pp. 222 and 253. Pujol, “La difusión”, p. 181. Prices are given in 1913 constant pesetas.

The information shown in Table 5 confirms the idea that oranges were a magnificent business for their growers during the 1920s.<sup>79</sup> Despite the important rise in the

p. 157, it is claimed that such methods became generalised from about 1912 onwards, and that in the early 1920s a huge number of growers used 2400 kg/ha (“and even more”) of nitrogen-based fertilisers.

<sup>79</sup> The price that growers sold their oranges for was obviously lower than the export price but, in the absence of any notable changes in the commercialisation techniques during the period, one must suppose that they both evolved at the same pace. The export price is utilised in Table 5 because the price of oranges in the

costs of farming per hectare and the drop in the export price between 1930 and 1933, profits remained high during this latter year. The crisis of the 1930s would therefore have only hit the sector from 1934 onwards, and then just to a moderate extent (as pointed out by Torres and Paris in the 1940s<sup>80</sup>) if the data for 1935 can be generalised.

Table 5: The cost of growing and the export price of Spanish oranges (1905 = 100)

	<i>Cost of growing</i> ( <i>pesetas/ha</i> )	<i>Cost of growing</i> ( <i>pesetas/t</i> )	<i>Export price</i> <sup>1</sup> ( <i>pesetas/t</i> )
1893	137.1	162.2	155.6
1905	100.0	100.0	100.0
1922	94.2	93.3	103.3
1930	152.0	111.1	174.2
1933	192.2	137.7	135.1
1935 <sup>2</sup>	189.8	84.4	84.8

<sup>1</sup> Average values for the specified, next and previous years. <sup>2</sup> Whereas the data for the previous years are averages, the figures for 1935 are those from a 5-hectare orange farm in the district of Gandia.

*Sources:* The cost of growing in 1893: Maylín, “Memoria”, p. 52; 1905: Maylín, *Manual práctico*, p. 166; 1922: Font de Mora, *El naranjo*, 1922, p. 149; 1930: Bellver, *Esbozo*, p. 169; 1935: Font de Mora, *El naranjo*, 1935, p. 242. The export price: Torres and Paris, *La naranja*, pp. 222. Prices are given in 1913 constant pesetas.

Profuse and disproportionate fertilisation nevertheless had a number of drawbacks, since it produced sour oranges with a coarse peel, little aroma and a high tendency to go rotten during transport. The growers used two systems to sell their oranges to the packers and exporters. One consisted in paying an overall amount, the price being negotiated when the unripe fruit was still on the trees and nobody could be sure about the effective quality and volume of the harvest, while the other method involved paying so much per picked unit. With this latter system, the grower received a higher price per unit, but was not paid for reject oranges or for the good oranges that fell from the trees before picking.

---

groves indicated by some of the sources used do not seem to be very representative.

<sup>80</sup> Torres and Paris, *La naranja*, p. 11.

Throughout the 1920s the first method became the most common, as exporters wanted to ensure they would have enough fruit to satisfy their orders; this also led to widespread encouragement to produce as much as possible.

The average quality of the Spanish citrus fruits was poor, but not all Spanish citrus fruits were of poor quality. The mandarin (which accounted for 9.7 per cent of all land used for growing citrus fruits in Spain in 1936) was a variety with a relatively low yield, but a very high average quality. The “Comuna” orange (43 per cent of the citrus area in 1936) was situated at the other extreme. And within the so-called “Blood oranges” (34 per cent) a large number of different situations coexisted. While some were praised (perhaps with more than just a hint of chauvinism) as the best oranges in the world, on other occasions they gave middling or bad fruit.

There was a heavy demand for cheap oranges in Europe, and if Spain had not satisfied it other producer countries would surely have done so.<sup>81</sup> The problem with the Spanish citrus industry was that the specialisation of many growers in this type of fruit was accompanied by two dysfunctions. On the one hand, the complexity and inefficiency of the Spanish system of trade names played against the Spanish exporters specialised in shipping high quality oranges, who found it very difficult to build up a reputation for their brands. On the other hand, since there were no governmental regulations to defend consumers’ rights and in the short term foreign markets absorbed all the oranges that Spain sent, some exporters committed fraud. For example, they shipped reject produce under what were supposedly high quality brand names, or sent under-ripe or frost-damaged fruit. As each of the two dysfunctions reinforced the other, in the end the undermining of the consumer's confidence due to such fraudulent practices not only affected unscrupulous exporters but also the whole Spanish citrus industry. Over the period 1883 to 1936 frosts affected some

---

<sup>81</sup> As two renowned economists wrote in the late 1940s: “The decisive factor for the price of the [Spanish] orange is the price on the international market, and thus a restricting our offer would have only given rise to an increase in the production of competitor countries”, Torres and Paris, *La naranja*, p. 90. It is an argument that ties in with the theoretical considerations of Hoffman and Libecap, “Institutional Choice”, on the possibilities of success of the agricultural cartels. The California growers’ specialisation in high quality oranges was favoured by the fact that they were mostly consumed in the U.S. domestic market, where protectionist measures hampered the entrance of produce from other countries. Italian orange and lemon export to North America dropped after the rise in tariffs in 1897, but the Italian orange was also driven out of the German and French market by the cheaper Spanish orange. In part, South Africa and Palestine opted for high quality oranges because they could not compete price-wise with Spain.

parts of the Valencian orange area in at least 25 years.<sup>82</sup> Although the damaged fruit was often exported afterwards, usually only small lots were affected and the impact on business was not very significant. Two frosts that did affect the whole orange-growing region in December 1925 and January 1926 did give rise to a generalised commotion, but the business soon recovered from them. Yet it was not so easy to get over the disaster that occurred when shipments abroad were not cancelled after the widespread frosts of 1933, since this had a greater effect on the fall in the volume and value of exports during subsequent years than the tariffs applied by Great Britain to Spanish oranges as a consequence of the Imperial Preference system that was agreed in Ottawa in 1932.<sup>83</sup>

This kind of behaviour would have been unthinkable in California, owing to government legislation and the quality policy followed by the cooperatives. The first Spanish decrees with practical repercussions concerning the marketing of the orange were passed in 1935. And, as far as marketing the output was concerned, the orange cooperatives had very little say before the 1980s.<sup>84</sup> At the beginning of the twentieth century, the most powerful agrarian cooperatives in the whole of Spain were set up in the irrigated areas of the Valencian Region. Orange growers predominated among their members. They used cooperation to gain access to loans, to fight against pests or to purchase chemical fertilisers. Indeed, Spanish small citrus farmers were able to use huge amounts of fertilisers largely thanks to the low prices fixed by the cooperatives and the low-interest loans they offered members when they did not have cash to buy them.<sup>85</sup> Nevertheless, only a few Valencian cooperatives marketed and exported oranges, and usually they were weak societies. In 1905 the California Fruit Growers Exchange marketed 45 per cent of the citrus fruit shipments from California, and 72 per cent in 1920.<sup>86</sup> As of 1908 a *Federación Naranjera* was constituted in Spain, but during the 1911-1912 season (the one in which citrus export

---

<sup>82</sup> Abad, *Historia*, p. 68.

<sup>83</sup> Palafox, *Atraso*, pp. 168-9.

<sup>84</sup> Abad, *Cooperativas*.

<sup>85</sup> Experts at the cooperatives gave members instructions on how to use fertilisers properly, but they did not take much notice of them. The potent "San José" Cooperative in Almassora, for example, supplied compound fertiliser made up of ammonium sulphate (40 per cent), potassium chloride (13.3 per cent), iron sulphate (6.7 per cent), and superphosphates (40 per cent). Instead of acquiring this compound, the members bought the raw materials separately and what the cooperative really sold in the 1920s was the following: 84 per cent ammonium sulphate, 2 per cent potassium chloride, 2.3 per cent iron sulphate, and 11.7 per cent superphosphates; Garrido, *Treballar*, p. 261.

<sup>86</sup> Fogelberb and McKay, *Citrus industry*, p. 19.

cooperatives were most active before the 1970s) it only shipped 5 per cent of all Spanish orange export.<sup>87</sup>

According to the organisational model adopted by nearly all the exporting cooperatives, their members were obliged to market absolutely all their oranges through them and they, in turn, had to buy all their members' oranges, including rejects.<sup>88</sup> But, unlike when the future harvest was sold to an exporter for a fixed amount, the cooperative only paid for the fruit that was on the tree at harvest time. Since picking had to be carried out in different stages throughout the season, the longer the delay, the more likely the groves were to lose all or part of their harvest. For this reason, many growers did not want to renounce the freedom to sell their oranges whenever, however and to whomever they wanted, and did not become members of an export cooperative. They did, however, usually belong to a cooperative that bought and sold fertilisers or a society that offered a tube-well for collective use.

In a context in which it was easy to sell the harvest individually, and in which it was therefore difficult to impose effective sanctions on those who contravened the statutes, being a member of an export cooperative brought with it a high moral hazard. Members often sold the better part of their harvest to private dealers for a higher price, and at the same time they were very strict about demanding that the cooperatives accept their worst oranges and so the result was that the packing houses run by the cooperatives were filled with "fruit that was not only dubious, with a questionable health and resistance, but also produce that the least scrupulous merchant would reject as inadmissible on the day before he went bankrupt". According to the report that the previous quote was taken from, of the oranges sent in Liverpool in 1913 between five well-reputed Spanish exporters, 78 per cent were first quality grades, 20 per cent were second quality and 2 per cent were third class. Of the fruit that the *Federación Naranjera* sent to that destination, only 18 per cent were first class, 60 per cent were second class and the remaining 22 per cent were third or fourth grades, the latter being used exclusively by the cooperatives.<sup>89</sup> In view of all the foregoing, it is not so difficult to believe another piece of criticism aimed at them: because the orange cooperatives were shaky enterprises and offered their employees poor wages and scant

---

<sup>87</sup> "Cooperación en la agricultura española", pp. 16-19.

<sup>88</sup> Lassala, *Nuestra exportación*.

<sup>89</sup> *Los Mercados*, January 31, 1914, pp. 1-2.

chances of promotion, their managing directors were usually people with little professional worth whose way of running the business made any hope of improvement but an illusion. If the cooperatives played a crucial role in the California citrus industry's decision to aim towards a high quality product, not only did the Spanish orange cooperatives fail in this goal, but additionally their image was long associated with the worst fruit it was possible to purchase on the market.

## CONCLUSIONS

In contrast to California, increasing the area of land devoted to citrus was no simple matter in Spain with the technology available in the first half of the twentieth century. By 1920 it was said that in the Valencian Region they were ploughing unirrigated land in which sinking tube-wells and "creating" farmable soil was relatively cheap, but where frosts were a frequent occurrence that drove growers to bankruptcy. At the same time, extending citrus farming out in places with satisfactory climactic conditions often required such large investments that the operation became economically unfeasible. As we have seen, initially the need to save water led many farmers to plant orange trees, but soon after, when orange crops had taken up most of the traditional irrigated land, the shortage of irrigation water restrained further expansion of orange farming. If we also take into account that before the spread of cooperatives capital markets were fragmentary and the small farmers had no easy access to credit in Spain,<sup>90</sup> the Spanish citrus industry's capacity to meet the growing demand in the industrialised countries of Europe is particularly striking.

When California became an important producer of citrus fruits Spain had been in the same situation for barely twenty years, and the Valencian Region could have been unable to increase its supply to keep pace with the growth in demand in Europe. If this had been the case, it would have benefited California, which would have exported a greater percentage of its orange output. Or perhaps, for geographical reasons, Florida would have channelled its oranges towards Europe. This would have left the U.S. domestic market almost entirely in the hands of California, which would have assigned fewer oranges to the bottled juice and by-product industries, with the subsequent increase in average price of the

---

<sup>90</sup>Carmona and Simpson, *El laberinto*, pp. 261-300.

fruit. It is an exercise that does not appear to arouse much interest but, from a formal point of view, it makes as much sense to calculate how much more Spain would have grown without the existence of the California citrus industry as calculating how much more California would have grown if the Valencian orange industry had not been as dynamic as it was. Considering this issue makes no more sense beyond just that – to stress the fact that the Valencian orange industry was really very dynamic.

In particular, this dynamism was made possible by the effects of two phenomena. On the one hand, many Valencian growers were small and middle farmers who used huge amounts of unpaid family work, which allowed them to undertake operations that would have been financially disastrous with hired labour. On the other hand, the early days of the twentieth century witnessed the advent of a powerful cooperative movement in the orange-growing areas that allowed small growers access to cheaper credits, fertilisers or insecticides. The California Fruit Growers Exchange managed to act as a cartel and restrict the offer of oranges on the U.S. market so that prices rose.<sup>91</sup> Insisting that members of the cooperatives produce only high quality oranges was one of the main instruments used to achieve this, since with similar yields to those obtained in Spain the California orange harvest every year would have been two – and probably three – times higher than it was. The Valencian cooperatives also wanted to reduce the output and produce higher quality fruit, but they clashed with the preferences of their members (mainly small and middle farmers) and failed in the attempt.

In any case, the Valencian growers who specialised in producing cheap fruits for European consumers with less purchasing power did not seem to have been mistaken, because before the 1930s this was a very profitable business for them. The period of hardships they underwent as of 1933 was followed by the 1936-39 Spanish Civil War and by an enormous scarcity of fertilisers in the 1940s, as a result of the international isolation of Spain during the early years of Franco's dictatorship. Nevertheless, oranges then became a magnificent business again. The changes in the standards of living and in the tastes of Europeans led to the disappearance of a strong demand for low quality fruit after the Second World War. The Spanish orange industry, however, was able to adapt itself by

---

<sup>91</sup> Hoffman and Libecap, "Institutional Choice".

changing the types and quality of the varieties it grew.<sup>92</sup>

For some scholars, the citrus industry succeeded in becoming very dynamic in Spain despite the large number of small farmers involved in it. What has been defended here is that, to a large extent, it was thanks to the abundance of these small farmers that it actually managed to become so dynamic.

## References

- ABAD, V. (1984): *Historia de la naranja (I), 1781-1939*, Valencia.
- ABAD, V. (1988): *Historia de la naranja (II), 1940-1962 (I)*, Valencia.
- ABAD, V. (1991): *Cooperativas citrícolas de exportación*, Valencia.
- ABELA, E. (1879): *El naranjo*, Madrid.
- ASAMBLEA AGRARIO-NARANJERA (1908): *Asamblea Agrario-Naranjera celebrada en la ciudad de Burriana*, 1908.
- BARRACHINA, F. (1908): *La crisis naranjera*, Castellón.
- BELLVER, J. (1928): *La naranja española en el mundo*, Madrid.
- BELLVER, J. (1933): *Esbozo de la futura economía valenciana*, Valencia.
- BELTRAN, E. (1919): *La Plana de Castellón*, Castellón.
- BHADURI, A. (1983): *The Economic Structure of Backward Agricultura*, London.
- BOU, F. (1879): *Estudio sobre el naranjo*, Castellón.
- CALATAYUD, S. (mimeo): *La taronja i el desenvolupament agrari valencià del segle XIX*.
- CALATAYUD, S. (1989): *Capitalismo agrario y propiedad campesina*, Valencia.
- CALATAYUD, S. (1989): “L’expansió citrícola valenciana. Producció i propietat de la terra a la Ribera del Xúquer (1850-1930)”, *Recerques*, 22, pp. 97-115.
- CALATAYUD, S. (1993): “El regadío ante la expansión agraria valenciana: cambios en el uso y control del agua (1800-1916)”. *Agricultura y Sociedad*, 67, pp. 47-92.
- CALATAYUD, S. and S. Garrido (forthcoming): “La compra silenciosa. Arrendamientos, estabilidad y mejoras en la agricultura valenciana de regadío (1850-1930)”, *Investigaciones de Historia Económica*, 8.
- CARMONA, J. and J. SIMPSON (2003): *El laberinto de la agricultura española*, Zaragoza.
- CARRERAS, A. and X. TAFUNELL, eds. (2005): *Estadísticas históricas de España*, I, Madrid.

---

<sup>92</sup> See Abad, *Historia (II)*.



- COMUNIDAD DE LABRADORES DE VILLARREAL (1914): *Memoria demostrativa de sus servicios*, Vila-real.
- CONFERENCIA NACIONAL NARANJERA (1926): *Conferencia Nacional Naranjera*, octubre 1926, Madrid.
- “Cooperación en la agricultura española”, *Boletín Mensual de Instituciones Económicas y Sociales*, Roma, March 1913, pp. 11-27.
- DIRECCIÓN GENERAL DE AGRICULTURA (1904): *El regadío en España*, Madrid.
- FOGELBERG, N. and A. W. MCKAY (1940): *The Citrus Industry and the California Fruit Growers Exchange System*, Washington, D. C.
- FONT DE MORA, R. (1922): *El naranjo. Su cultivo y explotación*, 1<sup>st</sup> edition, Madrid.
- FONT DE MORA, R. (1935): *El naranjo. Su cultivo y explotación*, 2<sup>nd</sup> edition, Madrid.
- FONTAVELLA, V. (1952): *La Huerta de Gandía*, Zaragoza.
- GARCÍA-GUIJARRO, L. (1957): *Hespérides, o la riqueza citrícola española*, Madrid.
- GARRIDO, S. (1996): *Treballar en comú. El cooperativisme agrari a Espanya*, Valencia.
- GARRIDO, S. (2004): *Cànem gentil. L'evolució de les estructures agràries a la Plana de Castelló*, Castellón.
- GRUPO DE ESTUDIOS DE HISTORIA RURAL (1991): *Estadísticas históricas de la producción agraria española, 1859-1935*, Madrid.
- HOFFMAN, E. and G. LIBECAP (1991): “Institutional Choice and the Development of U.S. Agricultural Policies in the 1920s”. *The Journal of Economic History*, 51, 2, pp. 397-411.
- INSTITUTO VALENCIANO DE ECONOMIA (1951): *Economía citrícola*, Valencia.
- KARLINSKY, N. (2005): *California Dreaming. Ideology, Society and Technology in the Citrus Industry of Palestine, 1890-1939*, New York.
- KLOTZ, E., H. W. LAWTON, and J. H. HALL (1969): *A History of Citrus in the Riverside Area*, Riverside.
- LASSALA, M. (1907): “Alimentación y presupuesto del obrero del campo”. In *Tercer Congreso Agrícola de la Federación Agraria de las Provincias de Levante*, Jumilla, pp. 100-126.
- LASSALA, M. (1908). *Nuestra exportación de naranja*, Valencia.
- LASSALA, V. (1873): *Memoria sobre la producción y el comercio de la naranja en España*, Valencia.
- LINIGER, M. (1962): *L'orange d'Espagne sur les marchés européens*, Geneva.
- LLAURADÓ, A. (1878): *Tratado de aguas y riegos*, Madrid.
- MARTÍN, E. (1878): *Informe sobre el estado actual de la agricultura en la provincia de Castellón*, Castellón.

- MAYLÍN, A. (1904): *Memoria sobre el arbolado cultivado y espontáneo en la provincia de Castellón*, Madrid.
- MAYLÍN, A. (1905): *Manual práctico para el cultivo del naranjo*, Valencia.
- MINISTERIO DE FOMENTO (1918): *Medios que se utilizan para suministrar riego a las tierras*, Madrid.
- MORILLA, J., A. L. OLMSTEAD, and P. W. RHODE (1999): "'Horn of Plenty': The Globalization of Mediterranean Horticulture and the Economic Development of Southern Europe, 1880-1930". *The Journal of Economic History*, 59, 2, pp. 317-352.
- MOSES, H. V. (1995): "G. Harold Powell and the Corporate Consolidation of the Modern Citrus Enterprise, 1904-1922". *Business History Review*, 69, 2, pp. 119-155.
- OLMSTEAD, A. L. and P. W. RHODE (1995): "La competencia internacional en productos mediterráneos y el auge de la industria frutícola californiana, 1880-1930". In J. Morilla (ed.), *California y el Mediterráneo*, Madrid, pp 173-205.
- OLMSTEAD, A. L. and P. W. RHODE (1997): "El desarrollo de la industria frutícola de California y la globalización del mercado de productos hortofrutícolas mediterráneos, 1880-1930". In J. Morilla, J. Gómez and P. Cressier (eds.), *Impactos exteriores sobre el mundo rural mediterráneo*, Madrid, pp. 433-452.
- PALAFOX, J. (1983): "Estructura de la exportación y distribución de beneficios. La naranja en el País Valenciano (1920-1930)", *Revista de Historia Económica*, 1, 2, pp. 339-351.
- PALAFOX, J. (1991): *Atraso económico y democracia. La Segunda República y la economía española*, Barcelona.
- PALAFOX, J. (1996): "Expansión de las exportaciones, crecimiento, diversificación industrial e industrialización". In *De la sociedad tradicional a la economía moderna*, Alicante, pp. 321-343.
- PARKER, W. (1951): *A Manual for Citrus Growers*, Los Angeles.
- PINILLA, V. and M. I. AYUDA (2006): "'Horn of Plenty' Revisited: the Globalization of Mediterranean Horticulture and the Economic Development of Spain", Documentos de Trabajo de la Asociación Española de Historia Económica, DT-AEHE N° 0606.
- PIQUERAS, J. (1985): *La agricultura valenciana de exportación y su formación histórica*, Madrid.
- POLO DE BERNABÉ, F. (1846): *Memoria sobre el guano*, Valencia.
- RHODE, P. W. (1995): "Learning, Capital Accumulation, and the Transformation of California Agriculture". *The Journal of Economic History*, 55, 4, pp. 773-800.
- RONCALÉS, V. (1998) "Propiedad y riesgo en los inicios de la expansión citrícola valenciana". *Historia Agraria*, 16, pp. 183-208.

- ROSÓN, L. (1948): *La riqueza citrícola española*, Madrid.
- SACKMAN, D. C. (2005): *Orange Empire. California and the Fruits of Eden*. Berkeley.
- SANZ-BREMÓN, M. (1979) [1881]: “Contestación al interrogatorio”, *Estudis d’Història Agrària*, 2, pp. 245-288.
- SANZ-BREMÓN, M. (1900): *Memoria sobre la riqueza agrícola de la provincia de Valencia*, Madrid.
- SIMPSON, J. (1994): “La producción y la productividad agraria españolas, 1890-1936”, *Revista de Historia Económica*, XII, 1, pp. 43-84.
- SIMPSON, J. (1995): *Spanish agriculture: the long Siesta, 1765-1965*, Cambridge.
- SUNKIST GROWERS, THE (1936): *The Story of California Oranges and Lemons*, Los Angeles.
- TORRES, M. and H. PARIS (1949): *La naranja en la economía española*, Madrid.
- WEBBER, H. and L. BATCHELOR (1943): *Citrus Industry*, Berkeley.
- WOESTE, V. S. (1998): *The Farmers Benevolent Trust*, Chapel Hill.