Impact of technical and commercial changes on fruit production in Spain

Negueroles J.

in

Lauret F. (ed.).
Les fruits et légumes dans les économies méditerranéennes : actes du colloque de Chania

Montpellier : CIHEAM
Options Méditerranéennes : Série A. Séminaires Méditerranéens; n. 19

1992
pages 113-118

Impact of technical and commercial changes on fruit production in Spain

Juan NEGUEROLES
ALM Group, Zaragoza (Spain)

Résumé. Changement et tendances dans la fruticulture espagnole. *La structure du secteur fruitier espagnol a changé sous l'effet de facteurs techniques et commerciaux. Les plus importants sont analysés ici. On indique également les tendances prévisibles à court, à moyen et à long termes.*

Abstract. The structure of the Spanish fruit sector has been modified by technical and commercial factors. The main factors are analyzed. Short-term changes, medium-term concerns, and long-term trends are also discussed.

Key words. Fruit – Production techniques – Markets – Marketing – Spain.

Introduction

In the past few years, the Spanish fruit industry has undergone various changes that have partially transformed the sector.

Fruit consumption in Spain has increased with the rise in the standard of living. This demand is not affected by the prevailing high prices and has rapidly yielded high profits on certain fruit crops.

Spanish businessmen—even those not involved in agriculture—have seized the opportunity to invest in this sector to diversify their profits. One of the benefits of this flow of money is that it has encouraged modernization of fruit farms.

Commercial fruit growers are constantly travelling to other countries with advanced agricultural technology to learn new techniques. Easy exchange of research data, technical information, and marketing figures has also contributed to changes in the Spanish fruit industry.

Adoption of modern technology has led to major technical, commercial, and social changes in the sector. The factors that have exerted the greatest influence on these changes concern the two main aspects of the fruit industry: technical and commercial.

I. – Technical factors

The technical factors are mainly related to on-farm fruit production but they also interact with other factors.

1. Farm size

Farm size in Spain remained relatively unchanged in the past. However, the current trend is toward larger fruit farms. This is mainly due to three reasons:

– The new agricultural groups activated the land market. These companies generally bought undeveloped land and large farms without substantial investments. The integration of Spain in the European Community (EC) intensified this trend.

- New irrigation schemes facilitated the establishment of fruit orchards over large tracts of previously uncultivated land.
- Farms need a certain acreage for efficient mechanization, as in the modern fruit farms. In the traditional fruit-growing areas, the farms are small and cannot be expanded because of high land values.

2. Yields

The modern fruit industry is based on high per hectare yields. One solution for obtaining higher yields is to increase plant density. The feasibility of planting more trees per hectare depends on several factors.

Suitable varieties and rootstocks with limited growth and rapid fruit production are needed for high-density orchards. But selection, based on breeding programs, is a slow process.

The other alternative is to use plant hormones. This has proved to be a good technique for controlling tree growth and enhancing yields in commercial orchards. Other traditional techniques such as pruning can be used. Summer pruning controls tree growth and can be combined with other techniques in high-density orchards.

3. Irrigation systems

The introduction and extension of drip irrigation has changed the fruit industry. Drip irrigation can be used for low flow rates with ponds to regulate water flow. It is very suitable for marginal areas with scarce water, high slopes, and soils with low permeability, or for poor quality and even moderately saline irrigation water. Drip irrigation has contributed significantly to the expansion of the fruit-growing area.

The amount of fertilizer can also be controlled through drip irrigation. In addition to the obvious economic advantage, this reduces percolation of fertilizers into the groundwater.

4. Mechanization

The rate of mechanization has often been determined by the speed with which equipment designers have adapted external technological changes to agriculture. However, there have also been cases where the appearance of new prototypes has accelerated fruit crop development.

Examples of innovative farm equipment include multilevel harvesters for intensive orchards, certain types of pruning machines, and sprayers for crop protection treatments in difficult conditions. Likewise, small planes and helicopters facilitate spraying of orchards on rugged terrain.

Development of mechanization is closely linked to the issue of labor supply.

5. Crop protection treatments

Crop protection treatment methods in fruit orchards have evolved noticeably in the past few years. Prototypes of equipment for specific treatments that use less chemicals and yet allow greater penetration are being investigated.

Chemical companies have to comply with prevailing laws on the use of chemicals, particularly safety requirements. Limitations on chemical pesticide use are forcing fruit growers to follow strict protocols for pesticide reentry intervals and application rates that conform to regulations on maximum authorized amounts of residues in fruit.

6. Labor

Wages for farm workers in Spain have risen and are now proportional to those in other European countries. This increase has raised production costs tremendously, especially on traditional farms which are characterized by low productivity. The impact has been relatively low on modern farms because greater mechanization and higher productivity have allowed them to reduce the work force and production costs per kilogram of fruit.

As the standard of living rises, the labor force is attracted toward sectors such as industry and services which offer good wages. Social reasons and a search for a higher quality of life have also led young people to move from the countryside to cities. The efficiency level for operations that need greater manual skill (pruning, thinning of fruit) has therefore declined.

Large orchards are thus confronted with a labor supply problem. Workers have to be moved from areas with an abundant labor force to those where there is a shortage. But the problem is not completely solved because the new workers do not have the required skills and need training. Employers also have to provide boarding and lodging for these workers.

7. Entry in the European Community

Spain's integration in the EC has a direct influence on the choice of new sites for fruit orchards. Agribusinesses need to be located in areas that offer a comparative advantage (at any time during the year) for products that are in demand in other European markets.

Spain has been traditionally producing fruit for export. However, except for the citrus orchards in Valencia, the orchards were small and did not meet the conditions for large-scale export. They were able to survive because even small quantities of fruit fetched good prices in other countries.

Spain's integration in the EC has changed the geographic distribution of fruit production sites *(Table 1)*. The center for early fruit production has shifted to Levante and Andalusia with favorable climatic conditions for earliness, especially for deciduous fruit trees (peach, nectarine, and plum), table grape, and citrus. For fruit species that require lower temperatures (apple, pear, and cherry), the most suitable areas are in the Ebro river valley and Catalonia. New plantations established in these areas choose the most promising early varieties and use modern technology.

The establishment of new fruit plantations in areas with traditional unirrigated crops (olive, almond) has created a year-round demand for labor and attracted related commercial activities.

Table 1. Location and ripening dates for major export-oriented fruit crops

Fruit	Location	Ripening dates
Peach	Andalucía, Murcia	May–July
Nectarine	Andalucía	May–June
Apricot	Valencia, Murcia	May–June
Plum	Andalucía,Valencia	May–July
Table grape	Andalucía, Murcia	July–August
Cherry	Ebro valley, Catalonia	May–June
Pear	Catalonia, Ebro valley, Extremadura	June–July
Apple	Catalonia, Ebro valley, Extremadura	July–August
Clausellina	Andalucía, Valencia	September–October
Mari sol	Andalucía, Valencia	September–October
Navelina	Andalucía, Valencia	October–November
Grapefruit	Andalucía, Valencia	October–November

8. Variety selection

Variety selection is, however, the most important factor. Suitable varietes should possess earliness, productivity, and commercial qualities. Selections made on modern orchards are promoting a dynamic process of varietal change, which is logical in a competitive market. New promising varieties identified by fruit growers are evaluated agronomically in the area so that they can be rapidly introduced on a commercial scale.

Although fruit produced out of season has, in general, a good market price, much effort has to be devoted to variety selection and crop planning.

II. – Commercial factors

Factors that influence the commercial structure of the fruit industry are also linked to other factors.

1. Fruit quality

International regulations for fruit quality are being introduced rapidly in Spain because of its export activities.

Consumers and growers do not have the same concept of fruit quality, which creates a technical and marketing problem.

Certain norms for fruit characteristics have been established to ensure minimum quality: sugar/acidity ratio for citrus and table grape, fruit size for peaches, etc. However, it is often difficult to produce fruit that satisfy such commercial requirements. In high-temperature areas, sugar content of fruit is always high but acidity is usually low. Good fruit color requires a moderate difference in day and night temperatures. Therefore, marketing regulations for fruit can influence the location of commercial orchards.

Fruit quality has to be maintained until the fruit reaches the consumer. The harvested fruit is treated to slow down physiological maturation (peach, nectarine) or dessication (table grape, cherry). It is then calibrated to sort out individuals that do not have the minimum size.

The packing procedure depends on the category and quality of the fruit and market destination. Large fruit orchards and cooperatives have constructed well-equiped packing units in strategic locations. The packed fruit is stored in refrigerated chambers to maintain its quality until it is transported. Fruit growers use refrigerated trucks so that the fruit arrives in good condition.

2. Concentration of supply

Fruit crops should be concentrated near large packing centers to facilitate handling. But careful planning is required to phase out the fruit harvest so that accumulation of fruit in the packing centers can be avoided. It is for this reason that varieties with similar ripening periods should not be planted together, nor should a single variety be planted over a large area. On the other hand, a large number of different varieties can slow down the packing process because of frequent adjustment of calibrating machines.

3. Evolution of markets

The Spanish fruit sector is traditionally based on a limited group of varieties that are known to consumers. For pear, apple, apricot, and European plum, few new varieties have been developed

recently. However, in the case of peach, nectarine, cherry, and Japanese plum, new varieties are driving the Spanish hard-flesh varieties out of the market and relegating them to the canning industry. Fruit growers are therefore forced to regraft old orchards or clear and replant them with the new varieties.

White-flesh nectarines are being gradually introduced in a market that is already favorable to nectarines. The growing demand for cherries, especially early varieties, has promoted their cultivation in the new areas where fruit can mature early. The Ebro valley is a good example of this situation because it has adequately low temperatures for this species and it is conducive to early maturation.

Japanese plum orchards have multiplied in the past few years due to increasing demand. However, they have to be located in warm, frost-free areas as the trees flower early and are susceptible to spring frost.

Fruit growers may also anticipate demand, as in the case of seedless grape. Vineyards were planted even before a real demand existed in most European countries. The introduction of seedless grape is the result of private endeavor through which varieties that were successfully produced in other countries were adapted to Spanish conditions. The Granny Smith apple is another well-known example of such adaptation strategies.

Changing the Spanish consumer's tastes is difficult but it is possible when:

- a fruit appears on the international market and gains rapid acceptance: for example, kiwifruit;
- a subtropical fruit is produced mainly for export and later introduced on the national market: for example, avocado grown in Malaga and Granada;
- new orchards are planted in collaboration with foreign commercial groups who market the fruit outside Spain: for example seedless grape;
- varieties from the Southern Hemisphere that are initially introduced during the off-season are later sold all year round because of consumer demand and thus compete with European produce.

Entry in the EC is expected to have a positive influence through the elimination of tariffs on Spanish exports.

III. – Evolution of fruit production

1. Short-term changes

Spain's entry in the EC has a notable impact on agriculture. Although the main effects will only emerge after several years, certain short-term changes can already be perceived:

- concentration of fruit production in areas for early or very late crops;
- large investments by foreign companies in agroindustry;
- few changes in the pome varieties (apple and pear), but fruit species that bear in the first years (peach, nectarine, plum) start to have some impact on the market;
- change in the consumption pattern owing to supply of fruit from the Southern Hemisphere, as in the United States several years ago;
- intensive cropping in all new orchards regardless of geographic location to reduce labor requirements and enable mechanization of operations.

2. Medium-term concerns

The commercial cycle of a variety does not exceed 15 years owing to rapidly changing consumer tastes. The risk of overplanting a popular variety is high and can lead to accumulation of perishable fruit at certain times of the year.

Identification of new species or varieties should be a vital function of the modern fruit sector. The objective is to select varieties that ripen in the off-season, store well in refrigerated chambers, are resistant to handling, etc. The new varieties are tested in orchards for a reliable evaluation. Varieties with satisfactory results are disseminated rapidly before they lose their novelty.

The new varieties should be planted in overlapping cycles of 3–5 years so that any error in the preliminary evaluation will only have a minimum effect on total production. A new variety retains its novelty for 5–10 years, after which period it is adopted in other orchards and its supply increases. Some fruit such as Japanese plum have spread rapidly in certain areas of the country.

Labor supply problems and production costs are likely to lead to extensive mechanization.

3. Long-term trends

One of the consequences of concentration will be the disappearance of small orchards that have not formed cooperatives. They will become obsolete because they will not be able to replant new varieties. Orchards in marginal areas will not be able to compete profitably with those in prime locations.

The fruit sector in general will stabilize economically when it reaches a discreet profit level so that businessmen outside the agricultural sector will lose interest in making future investments.

Marketing regulations and high standards of fruit quality will be enforced to satisfy more quality-conscious markets.

Large packing facilities and refrigerated transport will be commonly used.

The arrival of fruit from the Southern Hemisphere at competitive prices compared with those of refrigerated fruit could cause a reduction in low-profit orchards (pear and apple). With the creation of the single market greater competition from other fruit-producing countries with larger acreage or better-quality fruit could adversely affect acreage of certain varieties in Spain.