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A study of the production costs of two pomegranate varieties grown in poor quality soils

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SUMMARY – This study analyses the production costs in the cultivation of two pomegranate varieties typical of SE Spain (Valenciana and Mollar de Elche) in the Province of Alicante under very poor conditions. The results suggest that the pomegranate can be a viable crop in such conditions and that profitability can be substantially increased in more favourable conditions. The results also point to the greater productivity and profitability of Mollar de Elche variety.

Key words: Pomegranate, crop.

RESUME – "Etude des coûts de production de deux variétés de grenades cultivées dans des sols défavorables". Cette étude analyse les coûts de production de la culture de deux variétés de grenades typiques du SE de l'Espagne (Valenciana et Mollar de Elche) dans la province d'Alicante dans des conditions très défavorables. Les résultats suggèrent que la grenade peut être une culture viable dans ces conditions et que les bénéfices peuvent être augmentés de façon substantielle dans des conditions plus favorables. Les résultats laissent également espérer une meilleure productivité et de plus grands bénéfices pour la variété Mollar de Elche.

Mots-clés : Grenade, culture.

Introduction

The pomegranate is a characteristic fruit tree of the province of Alicante. It adapts to all kinds of soil and climate. It is tolerant to drought, salinity, iron chlorosis and active limestone. It is capable of vegetating in the worst growing conditions of SE Spain and it can often be seen near other fruit trees such as the fig and the date palm, which are also resistant to the factors mentioned. Traditionally, the pomegranate was grown in the salt pans of Elche, Albatera and Crevillente, towns where cultivation is concentrated in the province of Alicante (Melgarejo and Martínez, 1992; Melgarejo, 1993).

In 1996 the pomegranate was grown in 2666 ha in Spain, yielding 25,039 t. The surface area dedicated to the pomegranate in Valencia reached 2474 ha in the same year. The surface area of pomegranate cultivation in Alicante reached 2403 ha with a production of 22,000 t; meaning that Alicante grew 97.1% of the whole production of Valencia and 90.1% of the national total. In 1997, in the Province of Murcia, 256 ha were cultivated, yielding 1460 t, representing 9.6% of the national total. Therefore, practically 100% of the pomegranate growing area and yield is concentrated in the provinces of Alicante and Murcia (Consellería de Agricultura, Pesca y Alimentación, 1997).

As regards other fruits, besides citrus fruits, vines and olives, it can be said that the pomegranate holds a prominent position, having the highest yield in the province of Alicante, together with the loquat. In this province, pomegranate production is concentrated in a few towns: Elche, Albatera and Crevillente, in order of importance. This concentration of cultivation gives an idea of the social and economic importance of this production for these towns. Today the national pomegranate production exceeds 30,000 t (Melgarejo, 1998).

Spain is one of the main pomegranate producing countries of the world and the biggest producer and exporter in Europe, far ahead of the other producers of this continent, with the exception of (Eurasian) Turkey. In recent years, the area under pomegranate cultivation has reached an historic maximum in our country, following a long period of decline. This spectacular increase is due to the

profitability of the crop, especially considering that it is grown profitably in areas which would otherwise have difficulty in competing with other fruit crops cultivated in the Spanish Levant. From 1970 to 1980, cultivation declined but from 1980 onwards it began to recover as a consequence of higher prices and greater profitability. Figures 1 and 2 show the evolution of surface areas and prices.

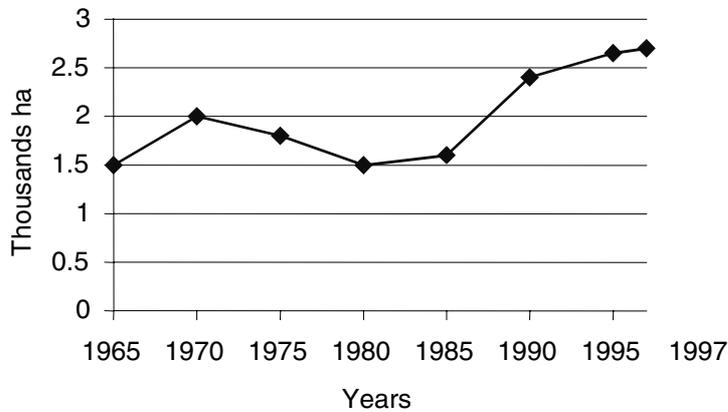


Fig. 1. Evolution of the pomegranate growing surface area.

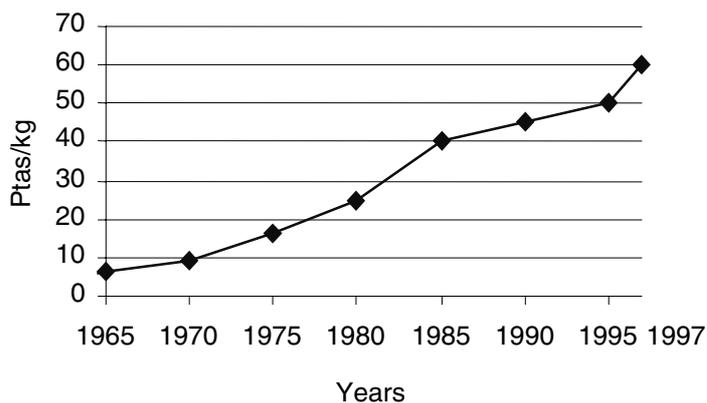


Fig. 2. Evolution of pomegranate prices.

It should be pointed out that the prices obtained are average prices, but the early fruit in particular reaches much higher prices and if the farmer is associated to an agricultural trade body, such as a processing firm or a cooperative, prices may also be different. Thus, we can estimate that the price obtained by the farmers last year was approximately 60 ptas/kg for associates, and 5-10 ptas/kg less if not.

The farms of the towns in the south of the province of Alicante are characterised by their small size; and it would be reasonable to say more than 80% of the surface area of these farms is divided into very small plots, between 0.1 and 4.99 ha. This is a normal situation in pomegranate growing, where the pomegranate plot owners do not always specialise in this crop and apart from this activity often have another non-agricultural job. The modernization of technology is often difficult because the farms are small, hence the necessary progress in the acquisition of knowledge about new varieties and new cropping techniques is slow (Melgarejo, 1993).

Material and methods

The plant material used for this study is made up of the variety populations Mollar de Elche and Valenciana.

The study has been carried out in an area called "Los Saladares" (the salt pans) in the town of San Isidro (Alicante), near the urban area of Albaterra (Alicante). The plot has a uniform soil of a very poor agricultural condition, as shown in the soil analysis in Table 1; this soil shows signs of structural degradation as a consequence of very high soil salinity. The texture is loam-clay-silt, with a low drainage capacity.

Table 1. Soil analysis

Measurement	Units	Concentration
Nitrogen	%	0.139
Phosphorus	mg/kg	31.60
Potassium	mg/100 g	36.10
Calcium	mg/10 g	338
Magnesium	mg/100 g	55
Sodium	mg/100 g	70.80
Organic matter	%	2.05
C/N		8.57
Carbonates	%	43.2
Active limestone	%	6.00
pH	u.pH	8.07
E.C.	mS/cm	2.150
Chlorides	mg/l	227.2
Sulphates	mg/l	800.16

The Valenciana is grown over 25,500 m² and the Mollar is cultivated over 4500 m². However the results obtained will be expressed in relation to one hectare. The plantation is 4x3.8 m for both varieties, which means a total of 657 trees/ha. The trees are obtained by vegetative propagation and are grafted onto a Borde rootstock. They are 8 years old and can be considered adult in ecological conditions; they are goblet-trained and appear to be in good health, although they need periodical supplies of iron chelates in order to avoid the negative effects of iron chlorosis. They have been flood-irrigated with water of an acceptable quality for the last three years, although they were irrigated with water from a highly saline well for the previous years.

The climate of the area, according to the Papadakis classification (MAPA, 1986), is Subtropical Mediterranean, with an average rainfall of approximately 300 mm per year and an average annual temperature of about 18°C, with an average temperature during the coldest month of 11°C and during the hottest of 26°C (August).

Results and discussion

The production costs for 1997 are indicated in Table 2, with the same cultivation practices for both varieties.

Total expenses per ha: 614,911 ptas/ha.

Net incomes obtained for both varieties are:

(i) Mollar variety

- Produce sold: 12,569 kg
- Price of sale before harvest: 47.6 ptas/kg
- Income: 574,353 ptas
- Income per hectare: 1,259,546 ptas/ha
- Annual profit: 644,635 ptas/ha

(ii) Valenciana variety

- Produce sold: 34,012 kg
- Price of sale before harvest: 105.22 ptas/kg

- Income: 3,435,592 ptas/ha
- Income per hectare: 1,145,197 ptas/ha
- Annual profit: 530,286 ptas/ha

Table 2. Production costs

Concept	Amount spent on 3 ha (ptas)	%
Trenching	28,037	1.52
Base fertilizing	211,508	11.46
Ploughing in of fertiliser	23,364	1.27
Top fertilization	115,000	6.23
Iron chelates (6% EDDHA)	93,457	5.07
Cultivator tillage	70,093	3.80
Herbicides	22,011	1.19
Thinning of fruit	130,841	7.09
Phytosanitary products	168,224	9.12
Machinery and wages for phytosanitary treatment	67,289	3.65
Water (6 irrigations/year)	303,600	16.46
Labour – various tasks	510,280	27.66
Labour – pruning	81,028	4.39
Rates	20,000	1.08
Total expenses	1,844,732	

Figures included, such as expenses or income, do not include VAT, and the harvest costs were incurred by the company purchasing the produce.

From the results shown, it can be deduced that the pomegranate can provide a profitable yield in the worst crop soils in the province of Alicante, where it would be practically impossible to produce many other fruit trees and still make a profit. Furthermore, in other areas with better quality soils, where iron chelate application (meaning an additional cost of 5%) is not necessary, with better quality and cheaper water (where savings of up to 15% are possible) and where, therefore, a better production is obtained, or where fertirrigation is practised as well as minimum tillage, the annual profits can rise by 50 or 55%.

Likewise, from the results it can also be deduced that the economic benefits of the pomegranate crop, under the conditions analysed, are higher in the case of the Mollar variety, as the Valenciana variety gives a higher yield than the Mollar, and therefore we can deduce that the Valenciana is not so profitable as at first would have appeared from its high prices, although one must not forget the need for varieties that can cover as wide a commercialization period as possible.

On the other hand, the Valenciana variety, as it is harvested earlier (August), presents the following advantages: (i) very little sun-damage; and (ii) less at risk from pest attack or losses from meteors.

The drawbacks of the Valenciana variety are: (i) low yield; (ii) average to poor internal quality of fruit; and (iii) smaller size.

The Mollar variety, of late harvest (end of September until mid-November), presents the following advantages: (i) higher yield; (ii) the internal quality of the fruit is excellent; (iii) larger in size, more highly appreciated by the consumer; and (iv) longer harvest period.

On the other hand, this variety presents great disadvantages, which undoubtedly will be one of the most important concerns, both for the producer and for the scientific community who will have to strive to find solutions: (i) important losses from sun damage; (ii) greater susceptibility to splitting; and (iii) greater risk of attack from pests and damage from meteors.

Conclusions

It can be concluded that the pomegranate varieties analysed in this study are profitable, even under the worst crop conditions. When the pomegranate crop is grown in more favourable conditions, its profitability can increase considerably and the Mollar de Elche variety is more profitable than the Valenciana, in spite of the fact that the latter fetches higher sales prices.

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References

- Consellería de Agricultura Pesca y Alimentación (1997). *Bulletí d'Informació Agraria* 127.
- MAPA (1986). *Atlas Agroclimático Nacional de España*. MAPA, Madrid.
- Melgarejo, P. (1993). *Selección y tipificación varietal de granado (Punica granatum L.)*. PhD Thesis, Universidad Politécnica de Valencia.
- Melgarejo, P. (1998). Entrevista sobre la comercialización de la granada. *Valencia Fruits*, 1870: 5-6.
- Melgarejo, P. and Martinez, R. (1992). *El granado*. Ed. Mundi-Prensa, Madrid.