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Economic prospects of pomegranate growing in the Spanish Mediterranean region

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Abstract. The objective of this paper is to analyze origin price trends, as well as to determine the profitability of Spanish pomegranate farms through the evaluation of investments. This analysis is performed in parallel with mandarin, since citrus is one of the main tree crops with which it competes and shares territory. Although farmers in the Spanish Mediterranean have preferred to choose citrus in recent decades, its drop in value is encouraging the choice of alternative tree crops, and there will be areas, like the one studied here, where the interest in species with more favorable prospects, such as the pomegranate, will increase. This is possible if demand grows, supported by the notion that it is a healthy or functional food.

I – Introduction

Pomegranate growing is chiefly centered in the southeastern Spanish Mediterranean region. Both surface area and production boomed nationally in the early eighties, leveling off in subsequent years (MARM, 2011). Alicante is the province with the strongest tradition in pomegranate cultivation and this is where most Spanish pomegranates have been grown for many years (CAPA, 2011). This tree crop is well established in the main pomegranate growing regions due to the fact it is well adapted to the agro-ecological conditions. The pomegranate is resistant to the hot dry climate and poor soils, tolerating calcareous soils with a degree of salinity (Melgarejo and Martínez-Valero, 1992). It is clearly an agronomic survivor in these areas, and has always coexisted with other intensively grown tree crops, such as citrus. Currently, international demand and a good market position in Spain (Mira, 2011) provide highly favorable expectations for this tree crop; however, this is dependent on its viability and profitability in the field.

Within this context, the objective of this paper is to analyze price trends, as well as to determine the profitability of pomegranate farms through the evaluation of investments. This analysis is performed in parallel with mandarin, since citrus is one of the main tree crops with which it competes and shares territory. Taken together this indicates the economic prospects one may expect of Spanish pomegranate growing.

II – Economic analysis of Spanish pomegranate growing

The analysis of pomegranate cultivation, and its comparison with mandarin, will be addressed taking into account the technical and economic aspects summarized in Table 1. On the one hand, an analysis has been made of the variation in prices received by farmers, and secondly, the profitability derived from the business after an investment project, such as tree crop planting and subsequent husbandry.

Table 1. Technical and economic aspects included in the viability analysis

	Pomegranate (Caliber C14)		Mandarin
Farm size (ha)	5		5
Planting distance (metros)	4x3.5		5.5x3.5
No. trees/ha	620		520
Study area	Southern Alicante		Northern Murcia
Data sources			
Varieties analyzed	Pomegranate "Mollar de Elche"	Pomegranate "Valenciana"	Mandarin "Clemennules"
Data source	Statistics (CAPA, 2011) and questionnaire answered by technicians and producers		
Prices obtained. Updated June 2011			
Prices	Post-harvest	Post-harvest	Pre-harvest
Study period	1986-2010 (24 yrs)	1980-2010 (21 yrs)	1989/90-2010/11 (21 harvests)
No. of observations	205	104	146
Investment data			
Investment (€/farm)	83,661		134,196
Production interval (kg/tree)	3.5 - 44 [†]		3 - 75.72

[†] Harvest "Mollar de Elche", the "Valenciana" variety is considered with half this average yield.

1. Price trends

The prices received by farmers, which represent the main component of agricultural income, decreased and likewise there was no improvement in the payment of quality selection, which may indicate a setback for Spanish Mediterranean fruit growing and citriculture (Caballero *et al.*, 2010).

Figure 1 shows the price trends of the two species analyzed, pomegranate and mandarin, including the trend curves, with significant quadratic fitting. The equations show that the price trend has been upward for pomegranates. The "Valenciana" variety has fetched an average price, over the series, of 0.824 €/kg with an increase of 6.5%. However, the situation of the "Mollar of Elche" variety has been much better, which although starting off from lower values, 0.52 €/kg, has risen by almost 49%, representing an annual increase of over 2%. The situation has been quite different for the "Clemennules" mandarin, which is the most representative variety of the Spanish citrus industry, with the whole series fetching an average price of around 0.37 €/kg, with a decrease of 19%, *i.e.*, a loss in value close to 1% per annum.

2. Profitability analysis for pomegranates and mandarins

The financial analysis involving the determination of income generated by the project activity minus the necessary out-payments, updated, determine the cash flows throughout the duration of the project (a total of 25 years for the two crops). The values introduced for both types of farms are listed below:

Investment: Involving the building of an irrigation reservoir, installing a drip irrigation distribution network in fields, machinery and tools, as well as all plantation costs.

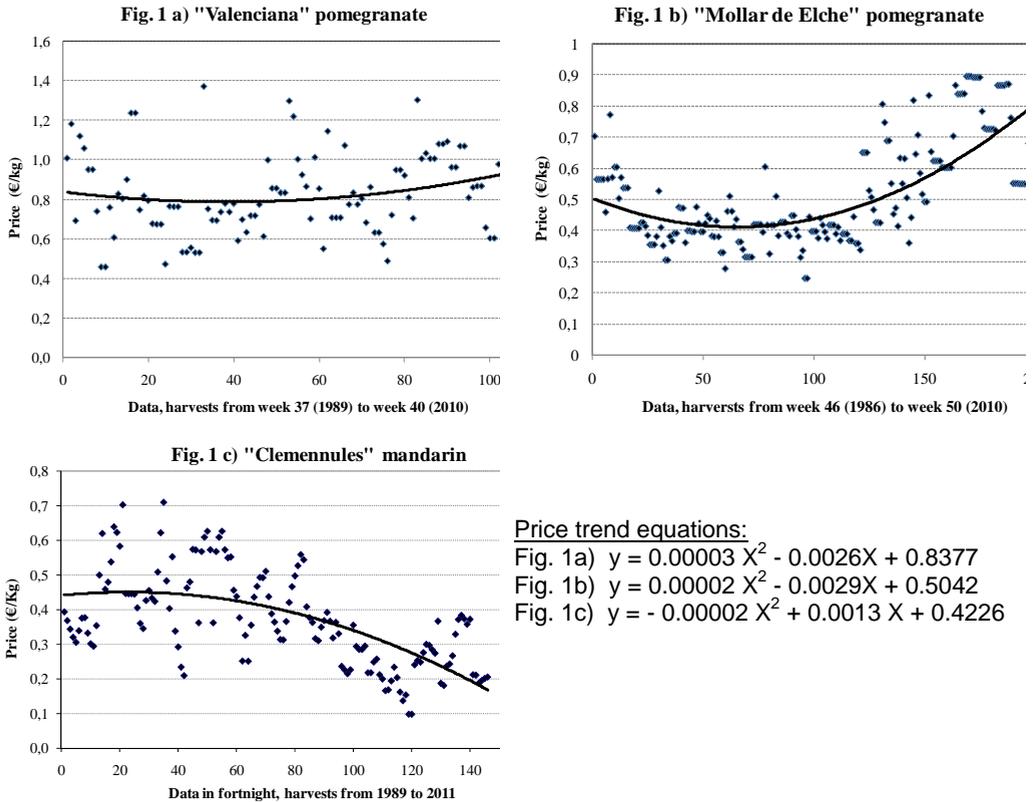


Fig. 1. Price trends for mandarin and pomegranate in the Spanish Mediterranean region.

Regular expenses: These are the operating and maintenance costs of the tree crop (water, fertilizers, plant protection products, etc.). These values increase with the age of the trees and are related to the onset of production.

Regular income: Proceeds from the sale of harvests at market prices.

Non-recurring/extraordinary expenses: These involve the renewal of fixed assets whose useful life requires their replacement before the investment project has terminated.

Extra income: obtained from the sale of modernized fixed assets.

The *Net Present Value (NPV)*, which indicates the absolute profit that the project would give the farmer (Romero, 1992). The *Internal Rate of Return (IRR)* and *Benefit to Investment Ratio (BIR)* are also estimated, measuring the return provided by the activity itself and the relative gain provided by each euro spent, respectively. Once the cash flows have been estimated and updated with a discount rate of 4%, investment analysis results are shown in Table 2.

The pomegranate shows good returns for the two main varieties at current average prices, and although these would diminish were prices to go down they would continue to maintain a return similar to the mandarin, a tree crop that has always competed in terms of territory and resources.

Table 2. Reference prices and results of the investment analysis for pomegranate and mandarin in Spain

		Price (€/kg)	NPV (€)	IRR (%)	BIR
Pomegranate	Average Price "Valenciana"	0.824	91,407	8.29	1.09
	Average price "Mollar"	0.52	172,561	11.79	2.06
	Adverse price Mollar [†]	0.45	70,881	7.77	0.85
Mandarin	Average price "Clemennules"	0.37	250,852	13.42	1.87
	Normal price ^{††}	0.28	55,594	6.83	0.41

[†]Adverse price for pomegranates, estimated at a decline of 13%.

^{††}Normal price for mandarin at present, according to the experts consulted.

Source: Own data.

III – Conclusion

If the price trends are maintained, the viability and continuity of the two species seem to differ greatly. Although farmers in the Spanish Mediterranean have preferred to choose citrus in recent decades, its drop in value is encouraging the choice of alternative tree crops, and there will be areas, like the one studied here, where the interest in species with more favorable prospects, such as the pomegranate, will increase. Without doubt, steady and guaranteed prices that are equal to or better than the current ones would seem to be decisive for pomegranate growing. This is possible if demand grows, supported by the notion that it is a healthy or functional food. In the production areas, an effort should be made to achieve a greater presence and availability of this fruit on the markets (home and abroad) something that is feasible, as a business structure has been established and is ready to extend the campaign, along with plant improvement and innovation programs, the use of cold storage and suitable means of transport.

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