Determination of cost and profitability of dried fig production: a case study for turkey

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Abstract

Dried fig production has a great importance in the western part of Turkey by means of foreign trade, farmer's income and employment. In this paper, information on the farmers who produces dried fig have been analyzed to determine production costs and profitability level. For this, many selected farmers were interviewed to find out return, items of costs and profitability level. This may also be informative to decision makers for subsidizing policies. The production costs and the net profit of dried fig was found 80.3 million TL/ decar and 36.9 million TL/decar, respectively.

Key words: dried fruit, fig, profitability, economic analysis, cost, Turkey.

Introduction

Fig is grown in tropics and subtropics and is produced in all Mediterranean basin and countries with similar climatic conditions like USA, South America, Australia and Southwest Asia. The annual average temperature in these areas ranges from 18-20 °C degree. And the minimum temperature is not less than -9 °C degree. Fresh fruit is dried under the sun up to 40 °C degree. Artificial drying methods are not in use.

Turkey has a share of 50 % of total world production of dried fig which is an important export product for western part of the country. It had been exported to many countries like Germany, France, Portugal and Spain. The value of exports was 77190 000 $ in 1998. The value of exported dried fig was 2.87 % in the value of total agricultural export in Turkey. Izmir, situated in western part of the country is the second largest area of producing fig in Turkey. It has 15.67 % of total fig production in Turkey and has 13.71 % of total fig plantations as well.

This paper argues how quantum of dried fig production is profitable in Turkey. This is important for the producers, exporters and policy makers that which products has a comparative advantages. Trade is worthwhile if a country can produce goods more efficiently than the others. And also, producers are targeted to get maximum profit. Economic factors effect producers in the decision making process as well as natural and political factors in the area and in the country. Relating with the many researches which were done on fig economics imply that decision making is mostly based on the marketing conditions of product and the supply conditions of inputs (Aksoy and Anac, 1994; Ilgin and Küden, 1997; Bülbül

et al., 1998; Altindisli and Ertem, 1998; Olgun and Akgüngör, 1998; Redonda, 2001).

Materials and methods

The case study consisted of surveyed data from fig producers in a selected area. This area was selected according to the production share in Izmir province. Three villages were selected from the province and data have been collected from 52 producers by random sampling method. The number of producers was determined by the following formula (Günes and Arikan, 1988):

$$n=\frac{S^2.Z^2.N}{e^2(N-1)+S^2.Z^2}=52$$

Where,

n = The number of sample fig orchards = 52

S = Standard deviation = 16.297

Z = 1.96

N = Total number of fig orchards = 312

e = error term = 4.054

The general cost items of dried fig production was classified as variable costs, fixed costs. The variable costs associated with crop production were all inputs that directly relate to the production and covered labour and machine costs, material costs (fertilizer, pesticide, wrapping, etc.) and transport costs. In this study, variable costs was calculated by using current input and labour wages.

Fixed costs are named as indirect costs, supplementary costs.

Table 1. Some statistical characteristics of total and sample fig orchards

Fig orchards	The number of sample fig producer	Fig orchards (decars)	Average fig orchards (decars)	Standard deviation	Min. fig orchards (decars)	Max. fig orchards (decars)	Constant of variability
Sample fig orchards	52	1 339	25.750	17.257	3	5	67.02
Total fig orchards	312	8 433	27.028	16.297	3	73	60.30

The cost of production that do not vary significantly with the volume of output. Fixed costs included interest of total variable costs, managerial costs, annual depreciation costs and land rent. Interest on total variable costs were calculated by charging a rate of 40 percent (The Agricultural Bank of Turkish Republic apply to short-term agricultural loans) on one-half of the total variable costs. Managerial costs were estimated to be 3 percent of the total variable costs. Annual depreciation cost was estimated using the straight-line method. Fig orchards are exempted from property tax and were not insured. In this study, total production costs were subtracted from total gross income to calculate net profit.

Results

Some features of fig production: The most convenient planting space in fig orchards was found 6x8 m (Kabasakal, 1990). It is preferred 6x6 m in the condition of ordinary soil quality and 8x8 m in the condition of extraordinary soil quality. This is also depending with the condition of climate and fertility of soil. In the present investigation, planting space was found between the interval of 6x6 m and 9x9 m. The most common and preferable planting space was 7x7 m in the researched orchards (Table 2).

Table 2. The distribution of orchards by plant spacing

Planting Space (mxm)	Fig orchards (decar)	%	Number of tree	%	Number of trees (per dacar)
6x6	341	25.47	9200	33.8	27
7x7	565	42.19	11230	41.26	19
8x8	382	28.53	6060	22.26	15
9x9	51	3.81	730	2.68	14

Establishment costs spreading to eight years are given in Table 3. This cover all the expenses which are relating with the period of the trees having productive capacity. These are generally related with the costs of labour and machines (maintenance, energy, etc).

Production cost: Production cost consists of both operating (variable) and fixed cost (Table 4). Productivity years of fig had been accepted 35-40 years. The portion of labour costs on dried figs are extremely high. Labour is used for harvesting, drying and grading.

Yield: Yield of dried fig vary between 165 kg/decar and 190 kg/decar (Kabasakal,1990). The average yield of dried fig is 186 kg per decar and 9 kg per tree. Fig tree is productive from 9th to 35th year (Fig. 1). Yield of dried fig increases by year up to 15th year. There is no increase in 15 to 30 years. After the 30th years, yield decreases rapidly.
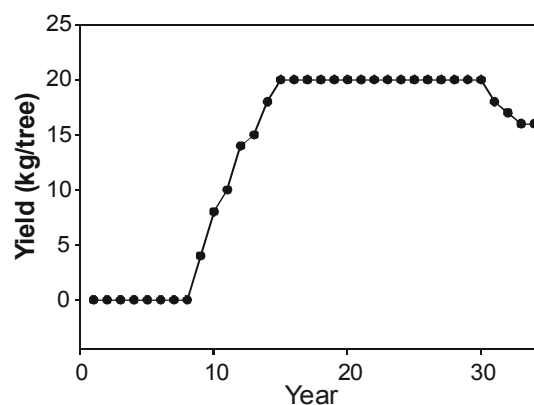

Fig. 1. Relationship between tree age and yield

Marketing and pricing: Dried fig is marketed by the Sales Cooperatives, whole sellers, commission agents, companies and retailers in Turkey. Sales Cooperatives has a 6-7% market share and 3-4% of total export in over all Turkish economy. In the selected area, most of producers are the member of sales cooperative (TARIS) and generally, most of the product is marketed by this cooperative. The price of dried fig varied between 400 000 TL/kg and 800 000 TL/kg. But, the producers had the price of 629 000 TL per kg of dried fig.

Gross income and net profit: Gross income of fig orchards is shown in Table 5. The gross income was found 117.2 million TL per decar and 5.8 million TL per tree.

Gross income and costs were as follows in Fig. 2 by years. Net profit was taken after 8 years of tree age. Maximum net profit had been realized between 15-30 years old trees.

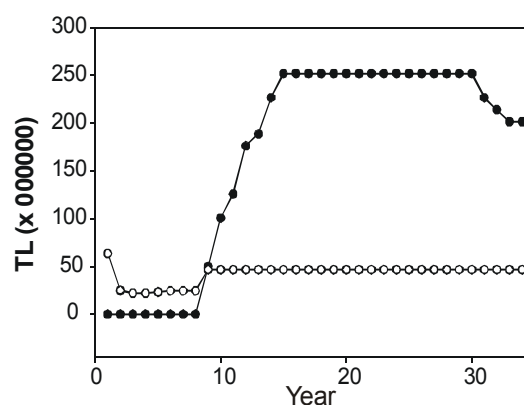Net profit is calculated by deduction from the total gross income

Fig. 2. Gross income and cost as a function of tree age

Table 3. Establishment costs of fig orchards (000 TL/decar)

Items		Years							
		1	2	3	4	5	6	7	8
Variable costs (1)	Labor and machine costs	317250	160600	152750	152750	162750	172750	172750	172750
	Material Costs (*)	192750	39400	24250	24250	24250	24250	24250	24250
	Total	510000	200000	177000	177000	187000	197000	197000	197000
Fixed costs (2)	Interest of total variable costs	102000	40000	35400	35400	37400	39400	39400	39400
	Managerial costs	15300	6000	5310	5310	5610	5910	5910	5910
	Land rent	300000	300000	300000	300000	300000	300000	300000	300000
	Total	417300	346000	340710	340710	343010	345310	345310	345310
Total costs (1+2)		92 7300	546000	517710	517710	530010	542310	542310	542310

(*) Sapling, fertilizer, pesticide, etc.

all such costs within the production period. This value is the income of fix assets. Net profit was found 36.9 million TL/decar and 1.8 million TL/tree in examined fig orchards (Table 6).

Discussion

In this paper, we presented explanatory information for the production economics of dried fig in Turkey along with the comparison of opportunities for the other producing countries. This is completely related with the comparative advantages between the countries.

The yield of a tree is 9 kg dried fig. This is 186 kg per decar. Farmers are getting 117,190,000 TL gross income per decar. This is the production value of the dried fig from a decar of orchard. Farmers are getting 36,900,000 TL net profit per decar of orchard. At the time of study, 1 US $ was equivalant to 626,519 TL and 1 decar is equal 1000 m^2 for making comparison.

According to this study, dried fig production may be more profitable. Collection of data on fig economics is useful to farmers for the knowledge about the production and market conditions of dried fig. Although cost and return estimates are believed to be typical and realistic, individual farmer should adjust values to represent their specific situation and circumstances.

Table 4. Production costs of fig orchards (000 TL/decar)

Items		9-35th Years
Variable Costs (1)	Labor and machine costs	282450
	Material costss	75650
	Transport costs	15400
	Total	373500
Fixed Costs (2)	Interest of total variable costs	74700
	Managerial costs	11200
	Annual depreciation costs (*)	43510
	Land rent	300000
	Total	429410
Total costs (1+2)		802910

(*) Sapling, fertilizer, pesticide, etc.

Table 5. Total gross income of fig orchards

The quantity of marketed dried fig (kg)	Total gross ıncome (000 TL)	Gross ıncome per decar (000 TL/decar)	Gross income per tree (000 TL/tree)
249 100	156918 000	117 190	5 765

Table 6. Nett profit from fig orchards

Total gross income (000 TL)[1]	Total production costs (000 TL) (2)	Total net profit (000 TL) (1-2)	Net profit per decar (000 TL)	Net profit per tree (000 TL)
1569180000	1075096490	494083510	368990	1815

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