

Economic activities results and problems of the farm engaged in production of stick tomatoes in Erdemli (Mersin) Province

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Abstract. This study was carried out to investigate the socio-economic status of the stick-grown tomatoes located in Erdemli district of Mersin province and to examine the annual activity results and to reveal the problems. The data used in the research were obtained from questionnaires conducted with 44 selected farms by stratified random sampling method. The data obtained is for the 2016 production period. In the farmer surveyed, the operating area per farm was 7.01 da. In the enterprises, the average active capital per farm (69,916 \$), 89.62% of the land capital and 2,40% of the operating capital. The ratio of own capital in the passive capital is 85.22%. In the examined farm, the average net yield was 3,150 \$, the agricultural income was 5,483 \$, the financial profitability was 4.29% and the economic profitability was 4.39%. As a result of the pie tomato cost analysis, the cost of tomato was determined to be below the tomato sales price. In the study, the cost of 1 kg product was calculated as 0,23 \$. The surplus supply in the time of the intensive production of tomatoes in the region of the study causes the prices to decrease. For this reason, it is necessary to try to ensure price stability by ensuring balanced distribution of the accrual during the season.

1. Introduction

Turkey is a country which has great potential for vegetable species and production with its suitable ecology. Tomato has a significant place amongst vegetables; it has good nutrition facts, food industry and good product in both domestic and foreign trade. Tomato is one of the most important income sources for the farmers in the areas it has been being produced. Tomato production is common in especially Marmara, Mediterranean, Aegean and Black Sea region. Climate in Turkey is highly sufficient for tomato production. The industry to process the vegetable has widely been built since 1970s. For these reasons, Turkey has rapidly been lifted in the lists of tomato producer countries and placed amongst those who has vast production volume such as China, USA, and India.

Tomato is one of the most common of all the vegetables being produced, being consumed and been a subject to trade. Together with being produced in many countries in the world, thanks to its suitable climate conditions, Turkey is one of the most important countries in tomato production in the world. Tomato is being used freshly, in all kinds of meals, with other foods, as resistant tomato juice, as concentrated tomato juice, as pickle, as sauce, as smashed or as dried [1].

Tomato consists of 94,1% water. It is 23 calories when eaten. Tomato is cheap and source of lots of vitamins. Because it is both nutritious and delicious, in many of the countries it is commonly consumed. Since it can be grown out of season, it is being consumed all four seasons. In the tomato there are vitamins A, B1, B, B6, C, K, niacin, protein, fat, carbohydrate, potassium, calcium, iron and lycopene in high volumes. Vitamins A, B6, B1, C and lycopene in the tomato as antioxidant have



protective effects against various types of cancer and heart diseases. In the studies, it has been found out that the people who consume tomato at least twice a week are 34% less at risk of having prostate cancer than those who do not consume. Also it was seen that tomato strengthens the immune system, slows the aging of brain cells, and beautifies hairs and skin [2].

In tomato production and marketing, since there is not an association and producers cannot get organized, the efficiency in marketing cannot be sustained. Producers do not have power in negotiating with merchants and they cannot take part in pricing the product. In this issue, existing organizations and associations do not have the necessary authorization and they are not strong enough to strengthen producers' hand and to come up with solutions to producers' problems. Thus, existing legal legislations should be reconsidered and by doing so producers' competitive capacity should be increased and producers' associations should take more active part in pricing. Surplus supply during the intensive production months causes prices to critically decrease. For this reason, price consistency should be ensured by conserving the balance in distributing the harvest during the season [3].

Erdemli county geographically located in the middle of the Mersin province, besides its agricultural economy which depends on greenhousing is a rapidly growing tourism and summer resort city with modern structuring. It has a distinctive importance with its cultural and historical environment. The area of Erdemli is 2.078 km². 62% of this area is forest, 17% of this area is agricultural areas, 21% of this area is forages, stony and rocky areas. Total agricultural area in the count is 33080 da, vegetable production is being made in the 5845 da of this area. There are 2460 agricultural farms in Erdemli. 1315 of these farms produce vine tomatoes. Vine tomato production is widely being done in the areas whose altitude ranges between 300 and 1100 from sea level. These places are also called and characterized as "yayla". In 61,6% of the vegetable production area of Erdemli, tomato production is being done. The yield rate of vine tomato in the county is considerably high (9100 kg/da). It is a significant problem that the important income source of the region, vine tomato production, is being done by small and disorganized farms. Encouraging vegetable farming in bigger farms will enable the usage of advanced technologies. By doing this, the cost of production will reduce and safer production will be executed and related to all these factors marketing will be easier.

The subject of this study is to investigate the socio-economic status of vine tomato producers in Erdemli, Mersin. Besides this it has been done to examine the annual activity results and to discover problems. This study aims to put light to the existing condition by analyzing the agricultural who produce vine tomato. By doing so it will be possible to make suggestions to improve vine tomato production. It will be possible to determine on what scale a more beneficial production can be made between agriculture. Also it is possible to determine existing problems and developing possible solutions for these problems, and to detect the physical and financial quantities of the entries used in production. Determining the cost of unit area and per kg, discovering producers' socio-economic and cultural status, determining producers' expectations have been set as the goal of the study

2. Material and Method

A large part of the material consists of the data obtained from agriculture through questionnaires. A number of neighborhood, in which there are intensive amounts of vine tomato producers, who can represent the region as means of vine tomato production and economic conditions has been intentionally chosen. Tomato producer all considered as a whole and the land size of these calculated with the formula given below according to stratified random sampling [4].

$$n = \frac{\sum (Nh \cdot Sh)^2}{N^2 \cdot D^2 + \sum (Nh \cdot Sh^2)} \quad D^2 = d^2 / z^2$$

In the formula; N: Company number in population, Nh: Company number in h stratum, Sh²: Variance of h startum, n: Number of sample, d: Allowed tolerance from population average. Z: z value in standart normal distribution according to error rate.

After sampling 44 company has been found sufficient. 35 of these small, 9 of these are large scaled, these investigated in two groups as small and large scaled. The questionnaires applied to the coincidentally. The population at present in the are examined as means of age, gender and education status; family labor presence converted into male labor unit (EIB). To determine the presence of revenue and working animal in farms converted into the common cattle unit (BBHB) and to be able to compare this with the business expense group's reputations. The area presence of the farms and status of partition, population and labor status, education status, amount of capital and components are determined. Labor of farms at presence converted into (EIB). While calculating the total male labor in the area of study, annual work time was considered 251 days and daily work time was considered 10 hours. Farms' annual activity results were calculated and they are compared according to expense groups. Gross output (GSUD), gross proceeds (GSH), business expense, gross income, avail, agricultural income were calculated as a result of annual activity. GSUD was reached by multiplying obtained herbal and animal product quantity with the product prices given to the farmer. Non-operating agricultural income and housing rent were added to the GSUD and GSH was reached. Non-operating agricultural income consisted of using man and machine power of the company on the agricultural businesses outside of the company and direct income support payments by national registry of farmers. Life cycle cost was made up of constant cost and variable expenses. Gross income was calculated by subtracting variable expenses from GSUD. Avail was reached by subtracting business expenses from GSH. Constant cost was subtracted from gross income and added to non-operating agricultural income to find agricultural income.

3. Result and Discussion

Population presence per company is 1,90 and women population (52,54%) is more than men population(47,76%). 65,11% of the population consist of people aging between 15-49. Women population in the group whose ages ranging between 15-49 is also more than that of men. 15-49 age group's population density is important for labor potential of the farms. It was determined in the farms that 95,8% of the population older than 6 years of age are literate and 4,2% are not. It was found out that 23,72% of the literate population are primary school, 17,23% of them are middle school, 25,66% of them are high school, 6,16% of them are college and university graduates. On the farms investigated, it was detected that there are average 3,12 EIB labor per company. 52,25% of this amount are men, 47,75% of this amount are women. There are differences in labor presence between the farms of different size groups. Labor presence of small scaled farms was found to be greater (3,23 EIB) than that of large scaled farms. Labor presence per company is 116 EIB, and 5,02% of this number is the family's own labor presence and 94,98% is foreign labor presence. Women labor ratio is more than men labor ratio in total labor presence. This situation is because there is a significant need for women labor in harvesting and other labor requiring processes in field farming, in hoe plants' labor and especially in vine tomato production which is being done intensively in the region. Total labor potential in farms calculated as 1128 EIG. 89,28% of this amount is family labor which can be used in business, 10,72% of this is the family labor that is being used outside of the business. This ratio might show large differences from business groups to business groups. It was detected that family labor which is used in business was calculated as 248,55 EIG and idle labor was calculated as 642,16 EIG. According to this approximately 61,3% of the labor is idle.

In the study, land area per company was determined as 7,01. 72,07% of this value is property areas, 27,97% of it is rented areas. In the study, no partnership in businesses was encountered. In the large scaled farms average area of the company is 8,43 and 56,58% of this is property areas and 43,41 of this is rented areas. In the small scaled farms average area of the company is 5,63 and 87,56% of this is property areas and 12,44% of this is rented areas. In the large scaled farms, property area's share in overall company area is significant and it is less than that of small scaled farms.

Total land capital per company was detected as 32.664\$, 50,66% of this value is property areas and 49,34% of it is rented areas. In the small scaled farms, capital for property areas are greater than that of large scaled farms. The capital for buildings per company is 19.388\$, 96,16% of this is housing,

3,84% of this are storehouses. Average capital for herbs was determined as 15.587\$. 24,36% of the herb capital is for orchard areas and 75,64% of it is for fields. In the small scaled farms this value is 14.757\$ while it is 16.418 in large scaled farms. There were no hunting and/or fishing capitals encountered in the investigated farms. Total land capital per company was determined as 62.655\$, 47,15% of this value is land capital, 4,94% of it is land improvement capital, 27,99% of it is building capital and 10,37% of it is herb capital.

Table 1. The distribution of the active capital in investigated .

Capital Groups		Farm Groups (\$)					
		1. Layer (1-3 da)		2. Layer (4-5)		average	
		\$	%	\$	%	\$	%
Land investment	Soil land	26,888	45.08	43,391	53.77	32,664	46.72
	Land reclamation capital	2,799	4.69	4,043	5.01	3,421	4.89
	Building investment	16,015	26.85	19,598	24.29	19,388	27.73
	Plant resources	7,325	12.28	7,037	8.72	7,181	10.27
	Total	53,029	88.90	74,070	91.78	62,655	89.62
Fixed Capital	Tooling machine capital	5,249	8.80	5,916	7.33	5,583	7.99
	Total	4,635	7.77	5,262	6.52	5,583	7.99
Revolving Operating Capital	Money capital	1,984	3.33	1,369	1.70	1,677	2.40
	Total	1,984	3.33	1,369	1.70	1,677	2.40
Total business capital		6,619	11.1	6,632	8.22	7,260	10.38
Total active capital		59,648	100	80,702	100	69,916	100

Approximate tool-machine capital per company was determined as 5.583\$. 62,33% of this value are tractors, trailers (8,68%), plough (1,53%), pulverizator (2,82%), cultivator (0,91%), other tool-machine capital (0,91%), rototiller (3,63), motopomp (0,98%). Money capital per company is 1.677\$, in small scaled farms this is determined as 1.984\$, in large scaled farms this is determined as 1.369\$. In the farms investigated there has been no spare material capital encountered. Business capital per company was determined as 6.625\$. 25,20% of this value is circulating capital, 74,78% of it is fixed capital. Fixed capital is 5.583\$ and since there is no animal capital, all of this value is tool-machine capital. Circulating capital is 1.677\$, all of this value is money capital.

Total active capital is 69.916\$. 2,40% of this value is business capital, 89,62% of it is land capital. Land capital in large scaled farms (91,78%) are greater than that of small scaled farms(88,90%). Foreign capital per company was determined as 12.170\$. 15,13% of this value are debts 84,87% of this is the value of rented areas. The amount of foreign capital shows differences according to company sizes. In the large scaled farms the amount of foreign capital is greater than that of other business groups. Foreign capital is 18.817\$ per company. The main reason of the debts the farms have to the banks is because in the recent years the presence of tool-machine that farms have increased.

In the investigated farms, passive capital per company was determined as 82.346\$. 85,22% of this is owner's equity and 14,78% of this is foreign capital. The status of passive capital may vary between business groups. In small scaled businesses, passive capital per company was determined as 65.172\$. 91,52% of this value is owner's equity and 8,48% of this is foreign capital. In the small scaled farms, the reason for the owner's equity ratio to be more in the passive capital is because small scaled farms are operating less rent areas compared to large scaled farms. In the large scaled farms, total passive per company was determined as 99.520\$. 81,09% of this is owner's equity and 18,91% of this is foreign capital.

Table 2. Distribution of passive capital in investigated .

	1-3 da		4-5 da			
	\$	%	\$	%	\$	%
Foreign capital	5.524	8,48	18.817	18,91	43.815	14,78
Own capital	59.648	91,52	80.702	81,09	252.633	85,22
Total passive capital	65.172	100	99.520	100	296.448	100

In the investigated , profitability factor per company was determined approximately as 19,21%. This ratio shows differences according to business groups. In small scaled farms this ratio was determined as 27,28% while it was 11,93% in the large scaled farms. In the investigated farms, return on equity was detected as 4,29%. In the large scaled farms this was 1,87% and in the small scaled farms it was 6,72%. In the investigated farms, average economic profitability was detected as 4,39%. This varies according to the business groups. In the large scaled farms economic profitability was calculated as 2,07%, while it was 6,51% in small scaled farms. As a result of calculating return on equity and economic profitability, it was seen that in the large scaled farms the value is lower than that of small scaled farms. This is because; in the large scaled farms, although the owner's equity is in large amounts the net profit levels are way too low. In the investigated farms, capital turnover ratio was 19,50% and capital turnover time was calculated as 5,24 years. This varies between business groups. In the small scaled farms, capital turnover ratio was 22,6% while the capital turnover time was calculated as 4,42 years. In the large scaled farms; however, capital turnover ratio 16,4% while capital turnover time was detected as 6,06 years. In the investigated farms, financial leverage ratio was detected as 2,30%. This value in the small scaled farms was detected as 2,63% and in the large scaled farms it was 1,98%.

In the investigated farms, GSH per company was detected as 16.400\$. 95,05% of this value was GSUD, 4,95% of this was non-operating agriculture income. As well as this, the rate of GSH to the active capital was calculated and noted as 4,37% per company. In small scaled farms, GSH per company was determined as 15.550\$. Adding to this, the ratio of GSH to the active capital was detected as 26,07%. In the large scaled farms, GSH per company was 17.249\$. Concurrently, the ratio of the GSH to the active capital was determined as 21,37%.

In the investigated farms, variable cost was calculated as 8.623\$ per company. Variable costs amount increase as the size of a company increases. In the small scaled farms, total variable cost was calculated as 6.945\$. In the large scaled farms, variable cost per company was calculated as 10.301\$. In the investigated farms, fixed cost per company was calculated 4.625\$. 35,35% of this value was depreciation expenses, 2,71% of it was building maintenance expenses and 58,90% of it was family labor fee. Fixed costs shows differences as the company sizes grow. In the small scaled farms, fixed cost per company was calculated as 4.362\$. 52,17% of this value is depreciation expense, 36,02% of this is family labor fee and 11,81% of it is building maintenance expenses. In the large scaled farms, fixed cost per company was calculated as 4.889\$. 34,01% of this value is depreciation expenses, 5,46% of it is building maintenance expenses and 60,53% of it is family labor fee. In the investigated farms, avail per company was calculated 3.150\$. Avail shows differences as company sizes increase. While in the large scaled farms it was 2.058\$, in the small scaled farms it was 4.242\$. Avail per decare of the business area in the small scaled farms was 859\$, in the large scaled farms it was 378\$ and company average was calculated as 618\$. The ratio of avail to the active capital was calculated and in the small scaled farms it was 26,07%, and in the large scaled farms it was 21,37% and company average was 23,72%. In the investigated farms, gross income per company was calculated 6.964\$. While it was 7.812\$ in the small scaled farms, it was 6.116\$ in the large scaled farms. In the investigated farms, agriculture income per company was calculated 5.482\$. This value varies according to the business groups. In the small scaled farms, agricultural income was 6.495\$, in the large scaled farms it was 4.470\$. Also vine tomato production per company was determined 8.756,19 kgs, in the small scaled farms it was 9.038,69 kgs, and in the large scaled farms it was 8.473,68 kgs.

In the investigated farms, gross vine tomato production value per company was calculated 3.048\$. All of this value consists of main product. Because vine tomato harvest period starts with the 3rd week of June and goes until mid-August, there are no side product incomes. In the small scaled farms, vine tomato production value per company is 3.055\$, and in the large scaled farms it is 3.040\$. In the investigated farms, vine tomato production cost per company is 2.001\$, in small scaled farms it is 2.248\$, and in large scaled farms it is 1.860\$. Company average unit tomato cost is 0,23\$, in small scaled farms it is 0,25\$, in the large scaled farms it is 0,22\$. Vine tomato price in 2016 production period was 0,35\$. According to agreed price of it, net profit average for farms per decare is 1.046\$. In the small scaled farms vine tomato price was 0,34TL and producers made 807\$ profit out of it. Large scaled farms made 1107\$ profit and their apparent price for vine tomato was 0.36\$. According to this information, small scaled farms made the best efficiency out of vine tomato per decare. One of the elements which decides the vine tomato production value; price is variable because price follows a variable course.

Existing problems of vine tomato production were detected. Main problem of it is high values of input price in research area, no alternative market exist so producers can't sell their products in the desired price and some problems occurring in the marketing. In the production phase of vine tomato, when compared to other vegetables it requires more input and labor, thus it has a high production cost. Not only that, but also quality is an important factor on vine tomato. The reason why it can't be in the desired quality is because tomato is a very sensitive plant against diseases and pests. Product quality may be effected dearly when the disease and pest amounts are high.

Vine tomato producers in the region, get their seedlings by ordering from the seedling producers as it requires expertise. Seedling supplying is one of the most important problems of producers as it is expensive. In the research area, it was detected that most of the vine tomato planting farms do not do organized alternation. For the farms that do alternation it was found out that they are doing alternation with green pepper and string beans. When the data of two years which is obtained from summer vegetables evaluated together, in tomato species on efficiency values pre-plant has significant effect and especially after plants of cabbage, broccoli and cauliflower had good efficiency values. Considering efficiency values obtain, for both years, cabbage parcel has found more effective. In tomato production, especially effect on efficiency, findings of both years was interpreted in such a way that alternation has a positive effects [5].

In the last half of the century, in agriculture activities there have been important changes. In the new applications, inorganic fertilizer usage has increased, in the battle against pests and diseases chemicals started to be used widely, monoculture production systems have gained significance and earth processing has been much more than ever. Chemical drugs and fertilizers pollute earth, underground and ground waters. Waste products corrupts earth, plants and eatables in a way that they could be harmful for living. Because of these reasons, ecologic agriculture is more important than the conventional agriculture systems which is widely used in many countries.

In the investigated farms, in the earth preparation process various agriculture tool and machine has been being used other than substitution tool and machines. In vine tomato production, it was detected that hard labor is being done more than machine usage. In earth preparation, it was found that in different times, with various processing tools in various depths the earth had to be processed. The aim is to prepare a better seed bed, struggle with the foreign weeds, reconfiguring the earth's physical structure to make it keep and transmit more water [6].

In the investigated farms, all of the farms has been using drip irrigation. Main reasons as to why producers have been using drip irrigation are reducing the labor, fertilization convenience and insufficient water resources. In the investigated farms, the biggest problem that they face is the insufficient water resources and being unable to water their plants in time related to this. Drip irrigation is a method in which sterilized water is being given to the roots of a plant by inserting the system underground or it is being given to the surface of earth through emitters by dripping [7]. This method has been widely used and each day users of this method increase in number, because it makes a good water economy and it enables the user to keep the earth humidity in the desired levels and it

even enables the user to give the nutrients to the plant with water. Agricultural pest control has been being done frequently in the investigated farms, and no hormones are being used. Producers indicated that they often encounter diseases and pests. Mostly they encounter total absolute and green worm pest. Most of the vine tomato producers generally take technical assistance from pesticide dealers. Because total absolute pest's population was at high levels in 2016 production period and agricultural pest control was not strong enough against this; most of the producers indicated that they could not get the efficiency they desired to have.

In inorganic and organic conditions, it was reported that in the study that researchers did to investigate the effects of efficiency and fruit quality in tomato producing on brix applications' effect, just like the findings obtained, was insignificant as means of statistics [8].

Vine tomato is one of the agricultural products that needs frequent fertilization. This process must be done very carefully, it has to be in time and efficient. In the investigated farms, it was detected that generally they are doing the fertilization after each harvest. Vine tomato is one of the plants which requires foreign labor. Especially reasons such as increase in the area it was produced and not having enough family labor levels makes the foreign labor usage in large scaled farms needed. Generally, producers fulfill their foreign labor need from the farmer families around the region. Vine tomato producing areas are enlarged in the recent years with the increase of irrigation areas and cultivation areas. And thus labor requirement increased and because the labor presence in the region is not enough, it was supplied by neighborhoods near. Foreign labor was supplied from outside the county and thus this increased the fee paid to the foreign labor.

Vine tomato harvest frequency ranged between 25-30 in 2016 production period. When climate conditions are normal, a harvest was being done per 2-3 days. In the investigated farms, most of the farms are not happy with the vine tomato prices and it was detected that merchants determined the price of the vine tomato. Because producers have no alternative they got to sell their products to the merchants. Vine tomato producers in the region are in large numbers, although there are many producers in the region there are no association, and this is one of the other important problems. Producers in the mutual agreement that they need an association especially for the vine tomato producers. This situation shows that producers are having hard times in getting organized and that they are in need of a leader. In the research region, socio-economic conditions of environment, having a irrigation association, the tendency to have an association in farmers are the signs that promising associations might be founded. After required preparations for the desired association and its goals are set for sure, it will enable the region to develop further. If an association founded and headed towards activities such as production and marketing and if it finds information and foreign resources when farmers are in need, it would be beneficial for the farmers. It was detected that producers want an association to be formed to solve their problems with marketing and especially in the pricing. They at least want a base price for the products. Investigated farms has indicated that if a base price is to be set they would even consider their cultivation areas. Main reason for this increase would be the efficiency of vine tomato in the area is at desired levels and profit margin is high. Sariaydın dam, which is being planned to be built on Silifke County's Lamas creek, which supplies irrigation for the research area, there will be a rise in the irrigated areas and there will be more production done in the area. In the investigated farms it was found that producers need information on growing vine tomato.

4. Conclusion

The findings after the research are; farmers are not very careful on choosing the seedling and producing vine tomato. However, choosing the appropriate tomato seedling is one of the most important elements which decides the amount and quality of the production. And related to this, high quality, more efficient and disease-resistant seed usage will increase efficiency and quality in the region. Before planting the seedling of vine tomato, the physical and chemical characteristics of the earth should be determined and proper fertilization must be done. When producing tomato, farms are facing lots of pests and diseases, and there is an apparent inexperience they have to fight against these challenges. Wrong applications in agricultural pest control, insensible and over usage of drugs are one

of the most important problems; and this situation in domestic and foreign trade causes the products to be sent back and thus affecting the foreign trade badly. For human health and safe food, unnecessary use and over usage of the drugs must be prevented. It was detected that farms were not getting earth analysis done, are not being sensible and conscious about the amount and type of fertilizer. Producers are doing the applications of such with their experiences. To make the earth analysis common and to make the producers more conscious about the situation, concerned corporation must do the necessary education activities and try to spread awareness. By doing so, over usage of the fertilizer will be prevented and the producers will be made sure to use the fertilizer in a conscious manner and one of the most important input cost will be reduced. If most important input materials; drug and fertilizer choice are to be done by the help of an expert it would also reduce the input cost dearly in the region. After the harvest, grading, packaging and offering to market will sustain the profit and continuity. As a result, production must be done according to the techniques and be more conscious to have more efficient and profitable vine tomato in the region. Surplus supply in the intensive tomato production periods causes prices to decrease. For this reason, price consistency should be ensured by conserving the balance in distributing the harvest during the season. In the investigation region, the small farms which are not large enough for mechanization, should use these machines partnered up, this will help their economy. By partnering up in buying machines, small farms could have the costly machines and use them on a more comfortable way since their time to use these machines are limited in the season. Thus, their cost for machine per production unit will be reduced since it will be working one a larger area [9].

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