Input usage and cost analysis in table tomato Production: Çanakkale Province Turkey Example

Reception of originals: 01/06/2023
Release for publication: 11/14/2023

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Abstract

Located in the Marmara Region of Turkey, Çanakkale province ranks 3rd in the country with a share of 4.82% in tomato production areas and 4.57% in production amount. Table tomato, which ranks first in terms of its return to the provincial economy, constitutes 13.50% of the plant production value of the province and 42.30% of the vegetable production value. In this study, it is aimed to make an economic analysis of table tomato production in open field in agricultural enterprises located in Central district of Çanakkale Province. The data used in the research were obtained from 99 table tomato producing enterprises which were determined according to the Stratified Sampling Method in 2020. It has been determined that the average cultivation area in the production of table tomatoes in the examined enterprises was 18.17 decares and the yield obtained from per unit area was 7109.18 kg/da. In the study, it has also been determined that in per unit area in table tomato production; 1016.67 seedlings, 48.92 kg/da of pure fertilizer, 0.62 lt pesticides, 38.28 lt diesel fuel, 207.82 hours of machine drawing and 41.85 hours of human labor are needed. The average production value of table tomatoes in the enterprises in the research area was calculated as 985.52 $/da, and the highest production value was obtained from the enterprises in the fourth group with 1054.98 $/da. In the study, the production cost of table tomatoes per unit area was 856.12 $/da, and the highest product cost was 906.26 $/da in the fourth group of enterprises. Considering the enterprises in general, it has been calculated that the gross profit in the production of table tomatoes per unit area was 199.65 $/da, and the net profit was 129.41 $/da. The highest net income was $148.72/da and it was provided by the fourth group of businesses. The study also revealed that as the size of the farm increases in table tomato production, the production value, gross profit and net profit value also increase depending on the yield obtained from the unit area.

Keywords: Table Tomato. Input Usage. Cost. Çanakkale, Turkey.

1. Introduction

Being one of the most produced vegetables in the world and in Turkey, tomato is a rich source of vitamins, minerals, lycopene, carotenoids, organic acids and natural

antioxidants. In addition to vitamins A, C, E and K in its structure, it also contains minerals such as potassium and iron (Wang and Seymour, 2017). Besides tomato has low level of calories and low rate of fat, as well as containing no cholesterol and plays an important role in a healthy diet and in the fight against many diseases such as cancer, osteoporosis, coronary heart disease (Palozza et al., 2012). In addition to its positive contributions to human health, tomato, which can be processed in various ways such as canned, tomato paste, puree, ketchup and pickles, is considered to be among the products with high economic value with its widespread consumption areas (Adenuga et al., 2013). The areas devoted to tomato production, which can be possible in almost every region of the world and is called the locomotive of the food industry, are increasing (Tahir et al., 2012; Al-Remi et al., 2018).

According to the data of the United Nations Food and Agriculture Organization (FAO), while tomato cultivation areas were 3837490 hectares (ha) in 2000, it reached a level of 5030545 hectares in 2019 with an increase of 31.09%. While the world tomato production amount was 109259803 tons for the same years, it reached to a level of 180766329 tons in 2019 with an increase rate of 65.45%. China (34.72%), India (10.51%) and Turkey (7.1%) meet more than half of the world's tomato production.

Turkey ranks 3rd in world tomato production (FAO, 2021). The country's tomato production, which was 13204435 tons in 2020, consisted of 65.56% table and 34.44% tomato paste varieties. Çanakkale province supplies 4.75% of Turkey's table tomato production and ranks 7th in terms of production amount (TÜİK, 2021). When the return of the products grown in the province to the provincial economy is examined, it is seen that table tomatoes are in the front lines. The income obtained from plant production in the province in 2020 is 6708289665 TL, and while 10.74% of this income is obtained from tomatoes, 7.28% of it comes from table tomatoes (TOB, 2020).

As we examine the table tomato production data in Çanakkale, it could be seen that 395609 tons of products were obtained in 53867 decares of land. Whereas the central district has a share of 23.48% from the table tomato cultivation areas in the province, its share from the production amount is 24.56% (TÜİK, 2021). Consisting nearly the one fourth of table tomato cultivation areas and production amount in the Province, tomato production business in the Central district is the most important source of income for the tomato cultivating producers.

In this study, the general structure of the enterprises producing table tomatoes in the central district of Çanakkale has been put forward and the use of inputs and product costs in the production of table tomatoes have been examined in terms of enterprise size. The obtained

findings have been analyzed by comparing with other research findings in the literature and have been commented upon.

2. Literature Review

In this section, some of the significant studies on input use and production cost in tomato production have been briefly mentioned. The comparative analyzes of the findings obtained from this and similar studies carried out with the research results are given in detail in the relevant section of this study.

Kumar et al. (2016), made a comparison of tomato cultivation in greenhouses and open air conditions in economic aspects. The overall findings of the study showed that tomato growing cost in greenhouses was Rs, 206.816,90/acre (Rs: Indian Rupee = 0.089 TL, 1 acre = 4,047 m^2) more than in the open air growing conditions. In contrast, it was found that net income gained in greenhouse conditions was Rs. 51097.54/acre more than the open air conditions.It was observed that producers achieved 53.70% higher tomato yield in greenhouse conditions compared to open field. In the case of production under greenhouse conditions; Gross return and net return were also calculated higher by 106.90% and 48.70%, respectively, according to open field conditions.

Ali et al. (2017) conducted an economic analysis of tomato production in open field in their study in Punjab, Pakistan, and used the Cobb-Douglas type production function in the regression analysis. The sample volume was determined according to the stratified random sampling method and a survey with 70 tomato enterprises was conducted. Whereas production cost was determined as higher (Rs. 177288.36), it was followed by small sized enterprises (Rs. 171872.71) and large scale enterprises (Rs. 171750.74) respectively (Rs.: Indian Rupee = 0.089 TL). While the highest income was obtained from small sized enterprises (Rs. 484545.90/acre; 1 acre = 4.047 m^2), it was determined that the highest total production was in middle sized enterprises (14261.58 kg/acre). It has been calculated that the benefit-cost ratio was 2.83 for small scale enterprises, 2.59 for middle sized enterprises and 2.49 for large scale enterprises. According to the results obtained from the regression analysis; Education level, relations with the distributer, amount of seed used, experience of the producer, chemical applications and marketing cost have had a positive and significant effect on income.

Wahid et al. (2017) aimed at analyzing technical productivity of tomato growers in Malakand Region of Pakistan. A sample volume consisting of 120 tomato growers was determined using the multi-stage sampling method, and data were collected with a survey. In

the study, the Cobb-Douglas stochastic boundary generation model was used. The findings obtained from the research have showed that technical efficiency varies between 0.83 and 0.99 and the average technical efficiency level is 0.93. In the study, it was also determined that the experience of the producers in tomato production has had a significant impact on the technical efficiency. To increase the productivity of tomato producers, increasing the number of seedlings used was one of the the recommendations of the study. The public sector's providing training opportunities to producers to improve their skills is another proposition of the study to increase productivity.

Örük and Engindeniz (2019) examined their research on the economic analysis of greenhouse tomato cultivation in three groups in the context of the fall season, the spring season and the enterprises producing tomatoes as a single product. The average cost per hectare in the autumn tomato production in the examined enterprises; 7711.51 TL in plastic greenhouses, 8405.13 TL in glass greenhouses; In enterprises producing tomatoes in the spring season, the average cost per decare is 8460.82 TL in plastic greenhouses, 9749.18 TL in glass greenhouses; In enterprises producing tomatoes as a single product, the average cost per decare was calculated as 12380,76 TL in plastic greenhouses and 12666.39 TL in glass greenhouses, respectively. ion in glass and plastic greenhouses is 3924.45 TL/da and 4442.58 TL/da, respectively, net profit for enterprises cultivating in autumn season in glass and plastic greenhouses is 9152.14 TL/da, 3303.90 ,respectively and also in the enterprises producing in the spring period net profit in glass and plastic greenhouses is 1610.82 TL/da and -422.56 TL/da, respectively.

In their study, Yelmen et al. (2019) aimed to find out the energy equivalents of inputs and outputs in tomato cultivation. For this purpose, 126 producers were interviewed, of which 112 were growing in open fields and 14 in greenhouses. It has been found that the gross production value of tomato production in open field is 14680.35 $/ha, and in greenhouse it is 93148.34 $/ha. It was calculated that the total production cost per kilogram was $6316.16/ha in the open field and $30463.94/ha in the greenhouse, while the total production cost per kilogram was $0.12 in the open field and $0.21 in the greenhouse. It has been determined that the total production cost in greenhouse conditions is 79.27% higher than in open field conditions. While the gross income and net income of tomato production in open field were 10,755.12 $/ha and 8364.19 $/ha, respectively, it was calculated as 77170.92 $/ha and 62684.40 $/ha under greenhouse conditions. It was found that, while the gross income in the open field system was 7.20 times lower than the greenhouse conditions, the net income

was 7.50 times lower. While the benefit-cost ratio was 3.06 in greenhouse conditions, the same ratio was calculated as 2.32 in the open field.

In their study, Subedi et al. (2020) aimed to analyze the production economy and resource usage efficiency of tomato growing enterprises i the open field. With this respect, the socio-economic characteristics of the enterprises, the Cobb-Douglas production function and the resource use efficiency of tomato producers were examined. According to the analysis results, it has been found that the gross profit value per kattha is NRs 7255.10 and the net profit value is NRs 5464.1 (Kattha = 0.084 acre; 1 acre = 4.047 m^2, NRs.: Nepalese Rupee = 0.056 TL). Cobb-Douglas production function analysis has shown that there is a positive and significant relationship among gross profit and labor, seeds, farm manure, inorganic fertilizers and micronutrients and other related expenses. It has been calculated that the return to scale is 1.02, which indicates that there is an increase in return to scale, whereas it has been found out that the resource utilization efficiency values revealed hat the use of all resources in production is insufficient.

In their study, Kumbasaroğlu et al. (2021) aimed to examine producer-consumer prices and marketing margin of tomato and also to determine the factors affecting on tomato supply and demand by estimating models related with supply and demand functions. According to the results gathered, while the elasticity of supply is found to be 0.041, the elasticity of demand has been calculated as 0.285. The fact that the elasticity of supply is smaller than the elasticity of demand could be interpreted that consumers are more sensitive to changes in prices than producers. While it has been found out that in tomato supply, the variables of pepper producer real price, cucumber producer real price, time and agricultural worker real price variables are effective; tomato consumer real price, cucumber consumer real price, pepper consumer real price and national income variables are effective in tomato demand.

Karadaş and Güler (2021), aimed at determining the the problems encountered in tomato production as well as socio economic characteristics of tomato producing enterprises in the province of Iğdır and they also aimed at offering a solution to these problems. In the aforementioned study, data were collected from 105 tomato producing enterprises which were selected by using the Simple Random Sampling Method. According to the results of the research, it has been found out that the average age of the producers is 52 years, and the tomato production experience is 18 years. It has been determined that 73.30% of the producers have had primary and secondary school education. The average land availability in the examined enterprises was estimated as 24.71 decares, and 33110 kg of tomatoes were

produced on an area of 6.07 decares, on average of the enterprises, and the selling price of 1 kg of tomatoes was estimated as $ 0.29. It has been determined that 70% of the producers market their products either in the field or on the roadsides. Whereas the high input prices, low product prices and marketing issues are among the most significant problems faced by manufacturers, suggestions for the establishment of multi-purpose agricultural cooperatives, the provision of sufficient input support and the organization of trainings on cultivation techniques have been offered in order to solve these problems. .

In their study, Bayramoğlu et al. (2021) aimed at determining the production cost, economic indicators and factors affecting the production cost of the major vegetables grown intensively in the province of Antalya. Within the scope of the study, a survey was conducted with 232 enterprises which were selected according to the Stratified Random Sampling Method. According to the results obtained, it has been calculated that the cost of 1 kg of tomatoes is 2.37 TL, the gross profit is 0.35 TL and the net profit is -0.26 TL. The estimation of the factors affecting the cost of the products has been conducted with linear regression analysis. Analysis results have shown that the cost of vegetable production is positively affected by fertilizer, seedling and pesticide costs, on the other hand it is negatively affected by material and seasonal labor costs .

In the study carried out in in Dhading region of Nepal, Khadka and Adhikari (2021) aimed to compare the economic aspects of tomato production in open field and greenhouse conditions. The study was conducted with the simple random sampling method and the sample volume was determined as 80 tomato enterprises. While half of the surveys were made with the producers producing in the open field, the other half were conducted with the producers producing under greenhouse conditions. It was estimated that the cost per unit of tomato production in open field was Rs 19955.75 while in greenhouse conditions the cost was 58791.01 (Rs.: Indian Rupee = 0.089 TL, 1 acre = 4.047 $m^{2)}$. It was determined that gross profit for the per unit area was Rs 42623.21 in open areas while it was Rs 134279.90 for greenhouse conditions. It is seen that the gross profit obtained from tomato cultivation in the open fields is less than that obtained in the greenhouse conditions. While labor and machinery costs are significant cost items in greenhouse conditions, seed cost, income animal and labor cost are substantial in open field. The study revealed that tomato production in greenhouse conditions is more profitable compared to open field.

3. Materials and Methods

3.1. Materials

The main material of the research consists of the data obtained from agricultural enterprises producing table tomatoes in the Central district of Çanakkale province in the period of November-December 2020. The secondary data of the research consists of along with the publications and electronic media data of other external sources related to the subject, especially from the United Nations Food and Agriculture Organization (FAO), and data throughout the country obtained from the Ministry of Agriculture and Forestry (TOB) and the Turkish Statistical Institute (TUIK). In the study, publications, theses and commission reports prepared by various national and international institutions and organizations related to table tomatoes were used.

3.2. Methods

3.2.1. Method Used in Sampling

In studies dealing with the socio-economic structure of agricultural enterprises, agricultural enterprises are divided into strata according to their size or income groups (Majumdar and Sengupta, 2021; Semerci and Everest, 2021). A heterogeneous structure is encountered due to the different sizes of the enterprises in the research area (Oğuz and Karakayacı, 2017). When the population is heterogeneous, stratification is an appropriate method for data collection. In this method, the heterogeneous population is divided into a series of homogeneous groups called strata or layer. Each one of the groups is homogeneous in itself, and then random units are sampled from each of these layers. With the stratification process, the power of the sample volume to predict the main mass, that is, the sensitivity, increases, and it is also possible to adequately represent different units in the population (Karagölge and Peker, 2002; Singh and Masuku, 2014).

Being one of the Stratified Sampling Methods, the statistical formula proposed by Neyman was used to determine the sample volume (Çiçek and Erkan, 1996; Yamane, 2010). Neyman Allocation is also known as Optimum Allocation. In this method, each stratum is proportional to the standard deviation of the variable distribution. In order to generate the lowest possible sapling variance larger samples are taken from the strata with the highest variability. The aim is to maximize the precision of the results with a fixed sampling size (Singh and Masuku, 2013).

$$n = \frac{[\Sigma(Nh * Sh)]^2}{N^2 * D^2 + [\Sigma(Nh * Sh)]^2} \qquad D^2 = \left(\frac{d}{t}\right)^2$$

n = Sample Volume

Nh= the number of enterprises in the sampling frame belonging to the hth layer

Sh= standard deviation of data in layer h*th*

Sh2= variance of data in layer h*th*

t= table value of t for a certain confidence interval

N= Total Number of Businesses per Sampling Frame

d= It represents a certain % deviation from the mean.

In distributing the sample volume to the layers, the following formula was used.

$$n = \frac{(N_h * S_h) * n}{\sum(N_h * S_h)}$$

In the determination of the sample volume, the study was carried out with 1% margin of error and 95% confidence limits. 99 table tomato enterprises were designated as to be surveyed as a result of the sampling study.

Considering the standard deviation and variation coefficients, the enterprises that make up the sample volume were divided into four groups as follows; enterprises with 2.00-5.00 decares, enterprises with 5.01-10.00 decares, enterprises with 10.01-15.00 decares and enterprises with 15.01 decares and above. The number of samples for each group was found with (n_h) equation.

$$nh = \frac{Nh}{N} * (\frac{n}{\sum NhSh})$$

In the calculation made using the equation; there were 13 enterprises in the first group, 23 enterprises in the second group, 16 enterprises in the third group and 47 enterprises in the fourth group.

3.2.2. The Method Used in Determining the Production Cost of Table Tomatoes

In the preparation of the cost chart for table tomatoes, the charts used by the Ministry of Agriculture and Forestry Çanakkale Provincial Directorate and the cost charts used in various researches on the subject were taken into account. In the study, the cost of table tomatoes was calculated according to the method below (Semerci, 1998; Aktürk, 2014; İnan, 2016).

Gross Production Value (GPP*): Main Product [Product Yield (kg/da)*Product Sales Price (USD/kg)

(*): Since only the economic analysis of table tomato production was taken into account, the production value of table tomato as the gross production value of the product was not regarded.

Changing Costs: It consists of the sum of Soil Cultivation + Seedling Cost + Planting Cost + Fertilizer and Fertilization + Spraying and agricultural spraying + Harvest + Transportation costs.

Fixed Costs: Land Rent (*) + Capital Interest (**) + Management Expense (***) consist the overall expenses.

(*): The rental value of the areas leased by the business owners in the production of table tomatoes or the rental values of their own lands according to the alternative cost principle are taken into account.

(**) Capital Interest: Changing Expenses * 4.5%

(The annual interest rate applied by Ziraat Bank to plant production in 2020 is 18%, and the share of the remaining 9% interest rate for the table tomato production period after deducting the subsidy part is taken into account).

(***) Management Expenses: Total Costs * 3%

Total Expenses: It is the sum of Changing Costs + Fixed Costs.

Gross profit: Gross Output Value- Changing Costs

Net profit: Gross Output Value- (Changing Costs + Fixed Costs)

In the study, the monetary values of the cost elements of table tomato production are given in USD. Considering the period in which the research data were collected, in the study, 7.43 TL=1 USD ($) parity was taken into account when converting the monetary data in TL used in the research area into USD (CBRT, 2020).

4. Research Findings

4.1. Household characteristics of surveyed enterprises

The number of people living in the households in the surveyed enterprises is 312, which corresponds to 3.15 persons per household. While 54.49% of the households are men, 45.51% are women. In a study aiming to determine the profit efficiency of enterprises producing tomatoes in greenhouses in Antalya province, it was found that the average household size was 3.90 people, and it was determined that 46.55% of the total population consisted of women and 53.45% of them were men (Özkan et al., 2011).

When the age groups are analyzed according to the average of the enterprises, it has been estimated that the rate of the population aged 0-6 is 3.53%, the rate of the population aged 7-14 is 9.62%, the rate of the population aged 15-49 is 43.27%, and the rate of the population aged 50 and over is %43.59. Among the groups the age range that seems most important is the population between the ages of 15-49, also known as the active population.

The high rate of active population will enable more efficient use of the workforce and an opportunity for economic development. Hence, there is a close relationship between the labor force, which is one of the production factors, and the population, which is the source of the business owner, and economic development (Şahin and Miran, 2008). In the study, it is seen that the active population ratio increases as the enterprise size groups increase and the average active population ratio has been estimated as 43.27%. Similarly, a study on greenhouse vegetable cultivation in Konya revealed that the active population ratio increased as the size of the holdings increased, and the average active population ratio has been estimated as 62.82% (Oğuz and Arısoy, 2002).

While classifying by age and gender groups, it is necessary to express the population in terms of male labor force units (MLFU) in order to eliminate the effect of age and gender differences on the population. Male labor unit is obtained as a result of calculating the working population in an agricultural enterprise with the help of conversion coefficients to male work unit. While calculating the male labor force unit, the population working in the agricultural enterprise is divided into three groups as 7-14, 15-49 and 50+, and male labor force units are obtained with the help of conversion coefficients (Erkuş et al., 1995). According to the calculations, although the population in the enterprises included in the study is 3.15 on average, the number of individuals with the potential to work is calculated as 2.21 on average. Although this calculation differs according to business size groups, it is the lowest with 1.84 people in the enterprises in the 1st group and the highest with 2.44 people in the enterprises in the 4th group. The ratio of the active population to the general population with working potential has been determined as 53.94%.

It has been determined that the average age of the surveyed business owners is 51.68 years, and the tomato production experience is 28.13 years. The group with the highest average age (56.31 years) and tomato production experience (32.15 years) has been the 1st group enterprises. It is thought that the higher average age of the producers in the 1st group is due to their relatively high experience in tomato production. While the average age of the producers was found to be 46.51 years in a study conducted in Muğla province, their experience in tomato production was estimated as 17.78 years (Değer et al., 2020).

More than half of the producers in the examined enterprises are primary and secondary school educated individuals (65.65%) and their average education period is 8.30 years. In a study conducted in the province of Izmir, it was determined that the average education period of the producers was 6.37 years (Engindeniz, 2010). This situation similarly demonstrates that the majority of producers have primary school education.

Table tomato yield was determined as 7109.18 kg/da in the examined enterprises. The highest yield per unit area was obtained in the 4th group, and the lowest in the 1st group (Table 1).

Table 1: Table tomato production information in enterprises

Layers	Cultivation Area (da)	Production Amount (kg)	Yield (kg/da)
1	53.00	318.750	6 014.15
2	213.50	1 420.000	6 651.05
3	226.00	1 480.000	6 548.67
4	1 305.00	9 560.000	7 325.67
Total	1 797.50	12 778.750	7 109.18

According to the 2019 data of Çanakkale Provincial Directorate of Agriculture and Forestry, it has been determined that the tomato yield is 7294.00 kg/da, and the tomato yield is 7753.00 kg/da as for the 2020 data (TOB, 2019; TOB, 2020). It is seen that the examined enterprises are generally below this yield value, and the yield values of the enterprises in the 4th group are above the provincial average. In a study conducted in the Biga district of Çanakkale province, it was determined that the tomato yield per unit area was 6356.00 kg/da (Aktürk et al., 2006).

4.2. Plant production activities of enterprises

It is seen that in the examined enterprises, mainly wheat, seed corn, paddy, oil sunflower and tomato are produced. It has been determined that the enterprises make vegetative production in a total area of 24162.55 decares. In the vegetative production design, wheat ranks first with a share of 22.43%, seed corn ranks second with a share of 21.81%, rice third with a share of 20.46%, and oil sunflower ranks fourth with a share of 10.13%. table tomato ranks fifth with a share of 7.44% (Table 2).

Table 2: Plant production pattern of the examined enterprises

	1. Layer		2. Layer		3. Layer		4. Layer		Grand Total	
Products	Production Area (da)	Share (%)	Production Area (da)	Share (%)	Production Area (da)	Share (%)	Production Area (da)	Share (%)	Production Area (da)	Share (%)

Wheat	550.00	34.23	558.00	15.86	946.00	28.22	3 365.00	21.45	5 419.00	22.43
Corn (Seed)	365.00	22.71	942.00	26.78	609.00	18.17	3 354.00	21.38	5 270.00	21.81
Paddy	77.00	4.79	730.00	20.75	165.00	4.92	3 972.00	25.32	4 944.00	20.46
Sunflower (Oil)	297.00	18.48	369.00	10.49	1 000.00	29.83	782.00	4.99	2 448.00	10.13
Tomato	**53.00**	**3.30**	**213.50**	**6.07**	**226.00**	**6.74**	**1 305.00**	**8.32**	**1 797.50**	**7.44**
Pepper (Capia)	27.00	1.68	113.00	3.21	44.00	1.31	1 011.00	6.45	1 195.00	4.95
Barley	160.00	9.96	185.00	5.26	40.00	1.19	669.00	4.27	1 054.00	4.36
Corn (Silage)	0.00	0.00	242.00	6.88	90.00	2.68	177.00	1.13	509.00	2.11
Olive (Oil)	0.00	0.00	0.00	0.00	24.00	0.72	365 00	2.33	389.00	1.61
Melon	24.00	1.49	91.00	2.59	20.00	0.60	245 00	1.56	380.00	1.57
Clover	10.00	0.62	29.00	0.82	80.00	2.39	108.00	0.69	227.00	0.94
Corn (Grain)	0.00	0.00	15.00	0.43	70.00	2.09	140.00	0.89	225.00	0.93
Watermelon	10.00	0.62	18.00	0.51	5.00	0.15	49 00	0.31	82.00	0.34
Feed Peas	11.00	0.68	0.00	0.00	32.00	0.95	32.00	0.20	75.00	0.31
Nectarine	0.00	0.00	0.00	0.00	0.00	0.00	45.00	0.29	45.00	0.19
Peach	0.00	0.00	0.00	0.00	0.00	0.00	40.00	0.26	40.00	0.17
Bean	5.00	0.31	0.00	0.00	0.00	0.00	13 00	0.08	18.00	0.07
Chickpeas	17.00	1.06	0.00	0.00	0.00	0.00	0.00	0.00	17.00	0.07
Cauliflower	0.00	0.00	8.00	0.23	0.00	0.00	4.00	0.03	12.00	0.05
Leek	0.00	0.00	3.00	0.09	0.00	0.00	3.00	0.02	6,00	0.02
Cabbage	0.00	0.00	0.50	0.01	0.00	0.00	3.00	0.02	3.50	0.01
Broad beans	1.00	0.06	0.00	0.00	1.00	0.03	0.00	0.00	2.00	0.01
Aubergine	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.01	2.00	0.01
Celery	0.00	0.00	0.50	0.01	0.00	0.00	1.00	0.01	1.50	0.01
Lettuce	0.00	0.00	0.25	0.01	0.00	0.00	0.50	0.00	0.75	0.00
Parsley	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.30	0.00
Total	1 607.00	100.00	3 517.75	100.00	3 352.00	100.00	15 685.80	100.00	24 162.55	100.00

The average plant production area per enterprise in the examined enterprises is 54.90 decares, and 33.10% of this area is reserved for table tomato production. It has been found out that table tomato cultivation area owned by the enterprises varies between 2 decares and 52 decares, and the average tomato production area per enterprise is calculated as 18.17 decares. In a study carried out in Çanakkale city center, Bayramiç, Biga and Ezine districts, it has been determined that the average land width is 28.50 da, tomato production area is between a minimum of 2 da and a maximum of 100 da (Aktürk, 2014).

The Production Value (PV) that the enterprises obtained by vegetative production activities is found to be $ 14,434,111.57. A significant portion (78.82%) of the total PV is formed by the enterprises in the 4th group. Whereas the enterprises in the 2nd group with a share of 8.68% from the total PV are in the second place, the enterprises in the 3rd group with a share of 7,99% rank as the third and the enterprises in the 1st group with a share of 4.51%. enterprises are in the fourth place (Table 3).

Considering the PV of the enterprises in terms of product groups; rice product ranks first with a share of 30.29% from the total PV, alfalfa is in the second place with a share of 15.44%, corn (seed) is in the third place with a share of 14.41%, tomato (table) is in the fourth place with a share of 12.60% and pepper (capia) is in the fifth place with a share of 10.85%. The total PV obtained from the production of table tomatoes is $1819347.24, of which 76.01% belongs to group 4, 11.42% belongs to group 3, and 10.17% comes from group 2 enterprises and 2.40% comes from the first group enterprises (Table 3).

Considering the shares of table tomato production in total PV in respect of enterprise groups; the total PV of the enterprises in the 3rd group is $1152722.61 and 18.02% of this value is provided from the production of table tomatoes, and the highest share belongs to the 3rd group enterprises. The total PV of the enterprises in the 1st group is 651660.16 $ and 6.69% of this value comes from table tomato production (Table 3). Despite the fact that the enterprises in the 4th group have higher PVs from vegetative production activities and table tomato production than other business groups, the share of table tomato production from the PV especially in the 2nd and 3rd group higher due to the relative importance of table tomato production. In fact, this situation is inversely proportional to enterprise size groups and production pattern.

Table 3: Vegetative production values

	1. Layer		2. Layer		3. Layer		4. Layer		Grand total	
Products	PV ($)	Share (%)	PV ($)	Share (%)	PV ($)	Share (%)	PV ($)	Share (%)	PV ($)	Share (%)
Paddy	269 327.05	41.33	350 258.41	27.96	68 317.63	5.93	3 683 909.83	32.38	4 371 812.92	30.29
Clover	2 187.08	0.34	42 193.81	3.37	16 958.28	1.47	2 166 823.69	19.05	2 228 162.85	15.44
Corn (Seed)	126 951.55	19.48	292 187.08	23.33	288 798.79	25.05	1 372 637.95	12.06	2 080 575.37	14.41
Tomato	**43 566.62**	**6.69**	**185 080.75**	**14.78**	**207 752.36**	**18.02**	**1 382 947.51**	**12.16**	**1 819 347.24**	**12.60**
Pepper (Capia)	26 547.78	4.07	117 765.81	9.40	41 991.92	3.64	1 380 484.52	12.13	1 566 790.04	10.85
Wheat	40 545.09	6.22	58 096.90	4.64	77 907.67	6.76	548 707.94	4.82	725 257.60	5.02
Sunflower	62 540.38	9.60	68 248.99	5.45	195 733.51	16.98	188 549.80	1.66	515 072.68	3,57
Melon	13 109.02	2.01	66 016.15	5.27	16 150.74	1.40	220 271.20	1.94	315 547.11	2.19
Olive (Oil)		-	-	-	129 205.92	11.21	140 915.21	1.24	270 121.13	1.87
Corn (Silage)		-	40 053.84	3.20	75 572.01	6.56	27 496.64	0.24	143 122.48	0.99
Barley	12 979.14	1.99	17037.01	1.36	3 230.15	0.28	57 643.34	0.51	90 889.64	0.63
Bean	252.36	0.04	-	-		-	69 986.54	0.62	70 238.90	0.49
Watermelon	6 729.48	1.03	8 344.55	0.67	5 047.11	0.44	47 981.16	0.42	68 102.29	0.47
Corn (Grain)		-	3 028.26	0.24	21 197.85	1.84	26 352.62	0.23	50 578.73	0.35
Chickpeas	45 760.43	7.02	-	-	-	-	-	-	45 760.43	0.32

Peach		-	-	-	-	-	29 071.33	0.26	29 071.33	0.20
Cauliflower		-	2 153.43	0.17	-	-	8 613.73	0.08	10 767.16	0.07
Nectarine		-	-	-	-	-	9 084.79	0.08	9 084.79	0.06
Feed Peas	1 002.69	0.15	-	-	4 374.16	0.38	3 364.74	0.03	8 741.59	0.06
Leek		-	1 816.96	0.15	-	-	6 056.53	0.05	7 873.49	0.05
Cabbage		-	43.74	-	-	-	3 230.15	0.03	3 273.89	0.02
Aubergine		-	-	-	-	-	2 422.61	0.02	2 422.61	0.02
Broad beans	161.51	0.02	-	-	484.52	0.04	-	-	646.03	-
Lettuce		-	84.12	0.01	-	-	504.71	-	588.83	-
Parsley		-	-	-	-	-	161.51	-	161.51	-
Celery		-	100.94	0.01	-	-	-	-	100.94	-
Total	651660.16	100.00	1252510.77	100.00	1152722.61	100.00	11377218.03	100.00	14434111.57	100.00

4.3. Production value of the enterprises for table tomato production (PV)

The PV information regarding table tomato production in the examined enterprises is given in Table 4. PV for table tomato production was calculated as $985.52 throughout the enterprise. While the PVs of the enterprises in the first three groups are below all the enterprises, it is understood that the highest table tomato PV obtained from the unit area is in the 4th group and the lowest value is in the 1st group.

Table 4: Table tomato production value information

Layers	Cultivation Area (da)	Production Amount (kg)	Yield (kg/da)	Tomato PV ($)	PV ($/da)
1	53.00	318 750.00	6 014.15	45 903.43	866.10
2	213.50	1 420 000.00	6 651.05	191 117.09	895.16
3	226.00	1 480 000.00	6 548.67	199 192.46	881.38
4	1 305.00	9 560 000.00	7 325.67	1 376 742.93	1 054.98
Total	1 797.50	12 778 750.00	7 109.18	1 771 482.23	985.52

In their study conducted in Iğdır Province, Karadaş and Güler (2021) found the average tomato yield as 5454.76 kg/da and the average production value as 1608.38 $.

4.4. Input usage and cost in table tomato production

Considering the average of enterprises in table tomato production, 7.27 h/da of labor force and 2.00 h/da of pull force were used in soil preparation and planting stages per unit area. Planting labor constitutes 51.17% of soil preparation and planting activities and 1016.67 seedlings are used per decare. The laying of drip irrigation pipes constitutes 21.32% of the soil preparation activities (Table 5).

For maintenance operations, 78.74 h/da of labor force and 39.85 h/da of pulling force are used. Of the labor force spent in maintenance operations, hoeing constitutes 37.24% and pass filling constitutes 9.74%. While irrigation constitutes 22.20% of the labor force spent on maintenance operations, this rate corresponds to 43.86% of the pulling force. While fertilization process constitutes 22.72% of the labor force used in maintenance works, it accounts for 44.89% of the pulling force. The labor force hours used for harvesting is 121.80 hours, of which 53.00% consists of picking and 47.00% consists of transport and loading activities (Table 5).

In the production of table tomatoes, per unit area; 21.20 kg/da of base manure (pure), 48.92 kg/da of chemical fertilizer (pure), 4489.29 kg/da of farm manure and 1.21 lt/da of leaf manure are used. Use of pesticides; it was calculated that 0.37 lt/da herbicide, 0.14 lt/ha fungicide and 0.11 lt/ha insecticide are used. It was determined that the fee paid to the irrigation cooperative was $6.26/da (Table 5).

Table 5: Input usage values per unit area of all enterprises (99 enterprises)

Production Operations	Number of Operations	Effort and Pull Force (min/da) Labor	Pull force	Material (kg-gr-cc-lt-piece/da)	Type	Explanation
(A) Soil Preparation and Planting						
Ploughing	3-4	75.12	75.12	9.72	Diesel (lt/da)	Plow
Base Fertilizer	1	8.92	8.92	1.04	Diesel (lt/da)	
Harrowing	2	23.18	23.18	1.28	Diesel (lt/da)	Harrowing
Furrowing	1	13.02	13.02	0.45	Diesel (lt/da)	Chisel
Drip Irrigation Laying (by hand)	1	93.00	-	-		
Planting Work (by hand)	1	223.20	-	-		
Total		**436.44**	**120.24**	**-**	Labor and Pull force (min/da)	
(B) Maintenance Works						
First water + Fertilization	1	14.50	14.50	0.34	Diesel (lt/da)	
Channel Stuffing (manual)	1	460.20	-	-		

Hoeing (by hand)	3-4	1 759.20	-	-		
Intermediate Release	2-3	40.83	40.83	1.23	Diesel (lt/da)	
Fertilization	22	1 073.40	1 073.40	8.14	Diesel (lt/da)	Dripping
Foliar Fertilization	3-4	22.04	22.04	1.32	Diesel (lt/da)	Pulverizator
Farm Fertilizer	1	87.00	87.00	2.74	Diesel (lt/da)	
Irrigation	23	1 048.80	1 048.80	7.82	Diesel (lt/da)	Dripping
Spraying (Herbicide)	1-2	15.30	15.30	0.60	Diesel (lt/da)	Pulverizator
Spraying (Fungicide)	4-5	36.80	36.80	1.50	Diesel (lt/da)	
Spraying (Insecticide)	6-7	52.15	52.15	2.10	Diesel (lt/da)	
Drip Collection (manual)	1	114.60	-	-		
Total		**4 724.82**	**2 390.82**	-	Diesel (lt/da)	
(C) Harvest						
Harvest (by hand)	5-6	3 873.60	-	-	Labor force (hr/da)	
Loading + Transport	5-6	3 434.40	-	-	Labor force (hr/da)	
Total		**7 308.00**	-	-	Labor force (hr/da)	
(C) Various Inputs						
Seedling (manually)		-	-	1 016.67	Seedling (piece/da)	(planting by hand)
Chemical Fertilizers and Agrochemicals						
Base Fertilizer (pure)	1	-	-	21.20	kg/da	
Fertilization (pure)	22	-	-	48.92	kg/da	
Foliar Fertilizer	3-4	-	-	1.21	lt/da	
Farm Fertilizer	1	-	-	4 489.29	kg/da	
Agricultural Pest Control Spraying (pesticide) (Insecticide)	6-7	-	-	0.11	lt/da	
Agricultural Pest Control Spraying (pesticide) (Fungicide)	4-5	-	-	0.14	lt/da	
Agricultural Pest Control Spraying (pesticide) (Herbicide)	1-2	-	-	0.37	lt/da	
Water Fee (Cooperative)	1	-	-	6.26	$/da	

In their study Wahid et al. determined that a maximum of 1433.51 seedlings and a minimum of 1112.21 seedlings were used per a thousand m^2. It was calculated that the average labor force used for tomato production was 207.60 hours per a thousand m^2. It was found that the machine pulling force used was 10.28 hours per a thousand m^2. A significant

portion of the labor force comes from the harvesting processes. Bayramoğlu et al. (2010) calculated that 34.98 % of the total labor force in total tomato production consists of the harvesting activities. In this study, however, the labor force used for tomato production has been calculated as 207.82 hours per a thousand m^2, which is in line with previous research findings.

In their study Yelmen et al. (2019) they determined 31.86 kg/da of pure manure and 1120.72 kg/da farm manure were used for tomato production in open fields. The use of pesticides per unit area was calculated as 0.19 lt/da for herbicide, 0.16 lt/da for pesticide and 0.19 lt/da for fungicide. The level of use of pesticides shows similarity to the research area, and it is seen that the level of herbicide use is 2 times higher.

The costs per unit area in the examined enterprises are given in Table 6. The average total amount paid for soil preparation and maintenance operations is $36.68 per unit area, and the costs per unit area in the 1st and 2nd group enterprises are below the average. The expenditures made by the enterprises in the 2nd group during the soil preparation and planting stage were minimum and were estimated as $ 35.15 per unit area. The expenditures made in the 3rd group enterprises are quite close to the enterprise average. On the other hand, the expenditures of the 4th group enterprises for soil preparation and planting operations are above the enterprise average and it are estimated as $38.40 per unit area. It is seen that 46.03% of the average costs in the soil preparation and planting phase are due to the tillage process and the enterprises in the 4th group pay 0.92 times more for the plowing process. The amount of expenses incurred for planting labor is $6.03 on average and 16.44% of the expenses incurred during soil preparation and planting are due to planting labor. The seedling cost per unit area is $ 75.83 on average. With a seedling cost of 72.94 $ per unit area, the lowest cost belongs to the 2nd group enterprises, and the highest cost with a seedling cost of 77.44 $ belongs to the 4th group enterprises (Table 6).

The amount of expenses for maintenance operations is $198.33 on average. While the costs per unit area of the enterprises in the 2nd group are the lowest with 186.82 $, the expenses of the enterprises in the 4th group are the highest with 203.26 $ per unit area. An important part of the expenditures made for maintenance activities is due to hoeing, fertilization, irrigation and pesticide (insecticide) activities. It is found out that of the expenses made for maintenance works, 22.65% belongs to hoeing, 22.40% to irrigation, 21.26% to fertilization and 7.11% to pesticide (insecticide) (Table 6).

Costs for harvesting activities have been determined as an average of $200.45 per unit area in the enterprise in general. The expenditures of the enterprises in the 1st group for the

harvest were the lowest and it was estimated as 179.54 $ per unit area. The land widths of the enterprises in this group are relatively small and the rate of employing foreign labor is low as well. For this reason, it could be said that the costs incurred during the harvesting phase are low when compared to other enterprise groups. The highest cost per unit area for harvesting belongs to the 4th group enterprises with a sum of $209.31. It is seen that the expenditures of the enterprises in the 4th group for the harvest are 0.96 times higher than the average of the enterprises. The land widths of the enterprises in this group are the highest, and their yield per unit area is relatively higher than the other groups. As a result of the fact that more foreign labor is required, it could be said that the cost of harvesting is the highest (Table 6).

Table 6: Table tomato production cost ($/da) in the surveyed enterprises

Production Operations	Number of Operations	Cost per Unit Area ($/da) Layers				
		1	2	3	4	Average
(A) Soil Preparation and Planting						
Ploughing	3-4	16.05	16.11	16.86	18.28	16.88
Base Fertilizer	1	2.36	1.93	2.10	2.25	2.17
Harrowing	2	5.54	5.31	5.39	5.70	5.54
Furrowing	1	2.70	3.09	2.90	3.09	3.01
Drip Irrigation Laying (by hand)	1	2.75	2.89	3,57	3.04	3.06
Planting Work (by hand)	1	6.56	5.82	5.92	6.03	6.03
Total		**35.96**	**35.15**	**36.73**	**38.40**	**36.68**
(B) Maintenance Works						
First water + Fertilization	1	2.75	3.01	3.17	3.03	3.01
Channel Stuffing (manual)	1	10.58	11.29	11.57	11.75	11.46
Hoeing (by hand)	3-4	38.56	45.46	45.97	46.07	44.93
Intermediate Ploughing	2-3	8.91	8.65	9.94	10.01	9.53
Fertilization	22	42.31	38.20	42.19	44.03	42.16
Foliar Fertilization	3-4	6.76	6.71	7.12	7.09	6.96
Farm Fertilizer	1	5.05	4.26	3.66	4.19	4.16
Irrigation	23	44.24	39.80	46.77	45.07	44.42
Spraying (Herbicide)	1-2	4.29	3.80	3.97	4.13	4.05
Spraying (Fungicide)	4-5	10.87	9.04	10.25	10.19	10.03
Spraying (Insecticide)	6-7	15.22	12.66	14.35	14.41	14.10
Drip Collection (manual)	1	3.57	3.94	3.54	3.28	3.51
Total		**193.10**	**186.82**	**202.50**	**203.26**	**198.33**
(C) Harvest						
Harvest (by hand)	5-6	89.60	97.75	89.99	98.97	96.01
Loading + Transport	5-6	89.94	106.11	96.49	110,33	104.44
Total		**179.54**	**203.86**	**186.48**	**209.31**	**200.45**
(C) Various Inputs						
Seedling		74.42	72.94	76.39	77.44	75.83

(manually)						
Chemical Fertilizers and Agrochemicals						
Base Fertilizer (pure)	1	0.80	0.78	0.78	0.82	0.80
Fertilization (pure)	1	99.15	113.15	96.87	151.61	126.94
Foliar Fertilizer	1	2.35	2.45	2.39	2.50	2.45
Farm Fertilizer	1	13.46	19.32	15.08	13.55	15.32
Agricultural Pest Control Spraying (pesticide) (Insecticide)	1	36.77	38.35	45.18	41.44	40.71
Agricultural Pest Control Spraying (pesticide) (Fungicide)	1	21.33	43.82	40.66	42.64	39.80
Agricultural Pest Control Spraying (pesticide) (Herbicide)	1	6.82	6.43	12.73	8.46	8.46
Water Fee (Cooperative)	1	6.12	6.07	5.54	6.64	6.26
Total		**261.23**	**303.33**	**295.61**	**345.11**	**316.58**
Total Costs (A+B+C+Ç)		**669.83**	**729.16**	**721.33**	**796.08**	**752.04**
Revolving Fund Interest (4.50%)		30.14	32.81	32.46	35.82	33.84
Variable Costs Total (D)		**699.97**	**761.97**	**753.78**	**831.90**	**785.88**
General Administrative Expenses (3.00%)		**21.00**	**22.86**	**22.61**	**24.96**	**23.58**
Field Rent		46.33	42.72	44.58	49.40	46.66
Total Fixed Costs (E)		**67.33**	**65.58**	**67.20**	**74.35**	**70.24**
Total of General Costs (D+E)		**767.30**	**827.54**	**820.98**	**906.26**	**856.12**

It has been estimated that the amount spent per unit area for chemical fertilizers and pesticides is $316.58, and the expenses of the enterprises in the 1st group are the lowest with a sum of $261.23. The highest expenditure per unit area for chemical fertilizers and pesticides belong to the 4th group enterprises and it has been estimated as $345.11. The expense items for fertilization, insecticide and fungicide are relatively high, corresponding to 37.20%, 12.86% and 12.57% of the expenditure for chemical fertilizers and pesticides, respectively (Table 6).

The expenses incurred during the production processes have been calculated as $752.04 per unit area, in terms of the overall enterprise expenses. While the sum of expenses of the enterprises in the 1st group is the lowest, the enterprises in the 4th group have the highest rates (Table 6).

While the total of variable costs has been calculated as $785.88 per unit area, the total of fixed costs has been calculated as $70.24. Total general expenses have been found as $856.12. When the total general expenses are analyzed by enterprise groups, while the lowest total general expense with $767.30 belongs to the 1st group of enterprises, the highest total general expense with $906.26 belongs to the 4th group enterprises. As the enterprise size groups increase, it is seen that the costs per unit area increase as well (Table 6).

In their study Ali et al. (2017) determined that more money was spent for soil preparation, hoeing and irrigation activities in larger scale enterprises. They calculated that on average, 73.94 $/da was spent for fertilization, 40.62 $/da per unit area for soil preparation, 35.73 $/da for irrigation and 10.74 $/da for hoeing. It has been calculated that more financing is spent for seedlings and pesticides in medium-sized enterprises. It has been also determined that the seedling cost is 27.59$/da per unit area, and the cost of agricultural pest control is 55.51 $/da. It is stated that pass filling and harvesting costs are higher in small-scale enterprises. There is a cost of 4.50$/da per unit area for ploughing and 101.46$/da for harvesting. Although the distribution of cost items varies according to enterprise size groups, it is seen that labor-intensive works such as soil preparation, hoeing, pass filling and harvesting are significant cost factors.

It has been calculated that average table tomato yield is 7109.18 kg/da, average product sales price is 0.14 $/kg, and PV for the unit area is 985.52 $/da in the examined enterprises. Production cost per kilogram has been determined as 0.12 $/kg. It has been found that the average gross profit value in the enterprises producing table tomatoes is 199.92 $/da, the lowest value is in the 3rd group and the highest value is in the 4th group. It has been estimated that the average net profit of the enterprises is 129.41 $/da, and the lowest value is in the 3rd group and the highest value is in the 4th group. 4. While the net profit value of group enterprises is above the general enterprise average, the values of other enterprises are below the general average (Table 7).

Table 7: Net profit and gross profit values of table tomato production

Income-Expense Summary	Layers				Enterprise Average
	1	2	3	4	
Yield (kg/da)	6 014.15	6 651.05	6 548.67	7 325.67	7 109.18
Product Sales Price ($/kg)	0.144	0.135	0.135	0.144	0.139

PV ($/da)	866.10	895.16	881.38	1 054.98	985.52
Cost ($/da)	767.30	827.54	820.98	906.26	856.12
Cost ($/kg)	0.13	0.12	0.13	0.12	0.12
Gross Profit ($/da)	166.13	133.19	127.60	223.07	199.65
Net Profit ($/da)	98.80	67.62	60.40	148.72	129.41
Relative Profit	1.13	1.08	1.07	1.16	1.15

Baksh et al. (2015), in a study they conducted in Bangladesh, determined that the variable costs were 349.10 $/da, the gross profit was 1373.70 $/da and benefit-expenditure ratio was 4.63.

Bayramoğlu et al. (2021) determined that the cost of producing 1 kg of tomato was 0.35 $, the gross profit was 0.051$ and net profit was -0.038 $. According to the research; seedling, fertilizer and pesticide costs affect the cost positively. The research reveals that the cost and profit advantage provided by scale economies cannot be achieved. Although there is a similarity in terms of production costs in this study, it is seen that net profit increases as the size of the enterprise increases.

Khadka and Adhikari (2021) have estimated that open field table tomato production cost is 518.95 $/da, variable costs are 450.64 $/da, gross profit is 657.77 $/da, net profit is 589.46 $/da, and benefit-cost ratio is 2.06. The yield obtained from tomato production is 1703.18 kg/da.

Comparing the data obtained within the scope of the research with the literature, it is seen that tomato production does not have sufficient profitability. Various studies to measure the competitiveness of tomato production in Turkey clearly show that Turkey has competitive power in tomato production (Erkan et al., 2015; Bashimov, 2016; Güvenç, 2019).

5. Conclusion and Recommendations

Although a total of 312 people live in the surveyed enterprises, the average household size has been found as 3.15 people. The average Male Workforce Unit (MWU) in enterprises is 2.21. When the educational status of the enterprise owners is examined, it is understood that primary school graduates are in the first place with a rate of 44.44%.

The total plant production area of the enterprises included in the research is 24162.55 decares, and in 7.44% of this area, table tomatoes are produced. The average plant production area per enterprise is 54.90 decares and the area allocated for table tomato cultivation corresponds to 33.10% of this area. The production value obtained from plant production in

general is $14434111.57, and 12.60% of this value is obtained from table tomato production. It has been determined that 12778750.00 kg of table tomato are produced in the enterprises and yield of table tomato is 7109.18 kg/da. In the study, per unit area in table tomato production; 1016.67 seedlings, 48.92 kg/da of pure manure, 0.62 lt of pesticides, 38.28 lt of diesel fuel have been used.

Sales price of table tomatoes in the enterprises within the scope of the research is 0.14 $/kg, production value per unit area is 985.52 $/da, total cost is 856.12 $/da, gross income is 199.65 $/da, net income is 129.41 $/da and the relative profit has been determined as 1.15. Table tomato is a very crucial product in terms of its contribution to the provincial economy, and while the producer price of the product was 0.26 $/kg in the 2019 production season, the average sales price was estimated as 0.14 $/kg in the study. In the same period, the consumer price was determined as 0.58 $/kg (TOB, 2021).

The largeness of the gap between producer and consumer price negatively affects the profitability of the product. Considering the cost of the product, it does not seem possible for the manufacturers to be satisfied with the price they received. Hence, the production of table tomatoes requires a labor-intensive mode of production in terms of planting work, hoeing and harvesting. In addition to all these activities that increase production costs, the fact that the product is vulnerable due to the nature of fresh fruits and vegetables makes the transportation and shipment activities to be delicate. However, there is no organized structure in the region that may be necessary to minimize all these issues. It is necessary to adopt an organized structure that will function properly in order to ensure tomato production at the quality standards demanded by the market, to ensure price stability in the market, to regulate the market and to offer market guarantees to the producers.

On the other hand, studies conducted to measure the competitiveness of tomato products reveal that tomato is a highly self-sufficient product as well as being competitive product among others. In order to benefit from the current competitiveness at the highest level, it is necessary to improve the storage conditions after harvest, to establish pre-cooling rooms or cold storage rooms, to diversify the market by introducing the product to the market with added value. It is thought that profitability of the product will be increased if facilities that will prove added value to the product are established and their number is increased.

In the study, it has been determined that pesticides are used in almost every irrigation in the research area. It is considered that the high usage of pesticides may cause an increase in the rate of chemical residues, exceed the limits specified in exports, and create a significant obstacle to exports. For this reason, the production stage of table tomatoes should be designed

considering the maximum residue criteria, the producers should be made aware of this issue and the controlled use of pesticides should be ensured.

It is thought that the high production costs and the low prices received by the producers limit the profitability of table tomato production. In this context, this study, which reveals the economic analysis of table tomato production, is of great significance in terms of ensuring the rational use of inputs in the research area both in middle and long term basis as well as allowing continuity and sustainability of profit in production.

6. References

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7. Acknowledgement

This article was based on the Master's Thesis entitled "Economic Analysis of Table Tomato Production in Open Field: The Example of The Central District of Çanakkale Province" and prepared in Çanakkale Onsekiz Mart University School of Graduate Studies, Department of Agricultural Economics.