Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development
Vol. 22, Issue 4, 2022
PRINT ISSN 2284-7995, E-ISSN 2285-3952

ECONOMIC ANALYSIS OF TOBACCO PRODUCTION IN TURKEY: THE CASE OF USAK PROVINCE

Mevlüt GÜL, Sibel KÖSE, Bekir Sıtkı ŞİRİKÇİ, Bektaş KADAKOĞLU

Isparta University of Applied Sciences, Faculty of Agriculture, Department of Agricultural Economics, Isparta-Turkey, Phone: +902462146233, Fax: +902462146399, Emails: mevlutgul@isparta.edu.tr, sibell.64600@gmail.com, bekirsirikci@gmail.com, bektaskadakoglu@isparta.edu.tr,

Corresponding author: mevlutgul@isparta.edu.tr

Abstract

In this study, the cost structure and profitability of tobacco production were examined in the sample of Uşak province. Esme and Ulubey districts in Uşak were the districts with the highest tobacco production. It was determined that 71 tobacco farmers, calculated according to the stratified sampling method, should be interviewed in the villages of these districts. Data were obtained through face-to-face interviews with farmers in the producer survey. Tobacco farming is an important income activity in the region where the family workforce is utilised. Labour force, land rent, and machinery rent were determined as the most significant cost factors in tobacco production. We found that large-scale enterprises are more profitably. In addition, it was determined that the organisation of tobacco farmers was insufficient. With the organisation, farmers will be able to provide the inputs used in tobacco production under more favourable conditions, and the development of marketing opportunities will make a positive contribution.

Key words**:** *tobacco, production cost, profitability, Turkey*

INTRODUCTION

About 95% of the world's tobacco production is consumed as cigarettes. In the cigarette industry, Virginia, Burley and Oriental (Turkish type) tobaccos are generally used [18].

According to the data of FAOSTAT [3], tobacco is produced in 122 countries in the world. Of the 6 million tons of tobacco production in the world, 36.3% is produced in China, 12.9% in India, and 11.9% in Brazil. Turkey's contribution to world tobacco production is around 1.3%. In the historical process, the amount of tobacco production in Turkey and its share in the world have decreased since the 2000s.

The highest tobacco production in Turkey is in Adıyaman (it has a 21.9% share of production). Denizli follows this province in the second place with a 17.1% share, and Manisa in the third place with a 17.1% share. The province of Uşak, chosen as the research area, is an important production region where tobacco production in Turkey takes fourth place. The percentage of Uşak province is 9.4%. Turkey's tobacco production decreased by 41% in 2020 compared to 2004. At this point, the contraction in tobacco cultivation areas in Turkey is effective. On the other hand, in the province of Uşak, chosen as the research region, tobacco production increased by 35% in the years examined. It can be said that the increase in tobacco cultivation areas in Uşak province is effective in the increase in production [17].

While tobacco agriculture and trade was at a very important and strategic point for Turkey, became a series of problems in the following years and made it necessary to make some decisions regarding tobacco in various periods. The severe first measure taken by the state in this regard limited the tobacco cultivation areas and started a quota application in 1994. However, in this regard, it was realised that the current stocks did not melt, and the increase could not be prevented in the following years. The agenda created by the negative effect of tobacco products on human health, the prohibition of consumption of tobacco and tobacco products in certain areas in 1996 began a gradual decrease in

production. Tobacco, which has a 400-year history in Turkey, gained another dimension with the legal changes made in the 2000s. With Law No. 4733, which entered into force with the announcement of the Official Gazette No. 24635 dated January 9, 2002, support purchases, which are a radical change in the Turkish tobacco industry and an approximate 60-year practice, were abolished, and the contracted production system was started. With the law, tobacco production has become entirely free throughout the country. With this significant change in 2002, there was a remarkable shrinkage in tobacco cultivation areas and a remarkable decline in production [14]. Due to the decrease in production in Turkey, while more than 1 million people made a living from tobacco farming until 2008, the number decreased to 200,000 people in 2020. The privatisation of TEKEL has also been effective at this point.

As a result of the literature review, it was determined that there are many studies on the economic analysis of tobacco production in Turkey [6] [7] [8] [11] [12] [16], but there is no study on the economic analysis of tobacco production in the region where the research was conducted. This study aimed to analyse the cost and profitability of tobacco producers in the province of Uşak, which ranks fourth in tobacco production in Turkey.

MATERIALS AND METHODS

The main material of the research was the data obtained by the survey method from the producers in the villages producing tobacco in the province of Uşak. Secondary data related to the study are provided by TAPDK, FAO, TUIK, Provincial and District Directorates of Agriculture and Forestry obtained from institutions and organisations. In addition, national and international studies on the subject were also used. The data used in the research belonged to the 2018 production period.

Tobacco producers in Eşme and Ulubey districts in Uşak constitute the main mass of the enterprises from which the data used in the research were obtained. It was obtained by questionnaire method from 71 tobacco producers calculated according to the Stratified Sampling Method [19]. The distribution of sample enterprises according to groups was made using the "Neyman Method" [1]. The research was carried out in Eşme and Ulubey districts where production is the highest in Uşak. Of the tobacco producers interviewed, 66.20% were cultivating in the villages of Eşme district and 33.80% in the villages of Ulubey district. The enterprises were divided into three groups, considering the frequency distribution of the tobacco land they owned. Accordingly, enterprises with 1-14.99 decares of tobacco cultivation area are I. group (28 enterprises), enterprises with 15-30 decares of tobacco cultivation area are II. group (23 enterprises), and enterprises with a tobacco cultivation area of more than 30 decares are also included in III. group (20 enterprises) formed (Table 1).

We used the single product budget analysis method in calculating the cost items of the companies within the scope of the research. Cost elements are divided into two in terms of their economic characteristics. The first is fixed costs that do not depend on the production capacity (rent, insurance, etc.), and the second is the costs that decrease and increase according to the production volume [13]. Production costs in enterprises engaged in tobacco farming were analysed into two main categories variable and fixed costs.

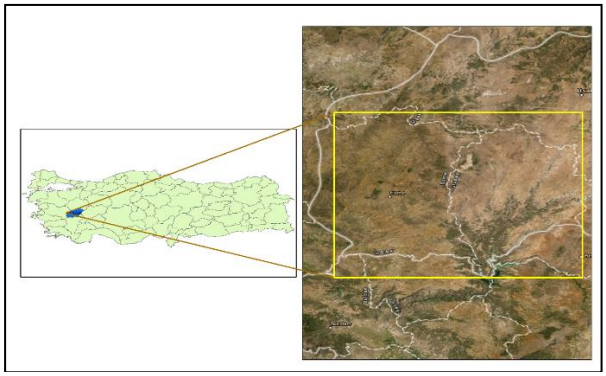
Table 1. Sample size

Farm groups	Tobacco production area (decares*)	Frequency	Percent
I	<15	28	39.44
II	15-30	23	32.39
III	>30	20	28.17
Total		71	100.00

*1 decares = 0.1 hectares
Source: Own calculation.

While evaluating the enterprises' annual operating results, GPV (Gross production value), gross profit, Production Costs, Net (Absolute) Profit and Relative Profit indicators were calculated.

The "Neyman Method" we used for sampling takes more samples from the layer with high variance. For this reason, we determined the regional weighted average using the method specified by [4] and [5]. The research area is given in Map 1.



Map 1. Location map of the study areas
Source: Own calculation.

RESULTS AND DISCUSSIONS

When the products grown by the enterprises were examined, the most cultivated product was tobacco. It was determined that the tobacco-producing area covers 65.72% of the total area in the average of the enterprises and 61.03% of the regional average. The share of tobacco cultivation areas in the total farmland in the farm groups ranged from 47.56% to 75.71% (Table 2).

After tobacco, the most grown product was wheat. Wheat cultivation area constituted 15.44% of the total area in the average of enterprises and 19.49% of the regional average. In the farm groups, the share of wheat cultivation areas in the total farmland ranged from 6.53% to 28.26% (Table 2).

After wheat, the most grown products were barley (5.61%), thyme (4.98%), grapes (3.72%), chickpeas (3.52%) and poppy (1.55%) (Table 2). Enterprises in the region are engaged in dry farming. This limits the pattern of crops they grow.

Table 2. Grown products on farms (%)

Products	Farm groups (decares)			FA*	WA**
	<15	15-30	>30		
Tobacco	47.56	66.79	75.71	65.72	61.03
Wheat	28.26	17.25	6.53	15.44	19.49
Barley	6.94	4.71	5.46	5.61	5.71
Thyme	7.26	3.75	3.07	4.36	4.98
Grape	1.94	5.03	4.38	3.96	3.72
Chickpea	6.35	1.82	1.54	2.86	3.52
Poppy	1.69	0.64	3.31	2.06	1.55
Total	100.00	100.00	100.00	100.00	100.00

*FA: Farms Average; **WA: Research Region Weighted Average
Source: Own calculation.

GPV (Gross production value) was calculated as the sum of the values over market prices of the products obtained due to agricultural activities of the enterprises interviewed and the increase in fixtures in the said production activities.

According to the weighted average of the enterprises, we found GPV of 50924.43 TRY obtained from crop production, GPV received from livestock production activity as 5119.89 TRY, GPV obtained from non-operational agricultural activities as 1066.03 TRY and total GPV of 57110. 34 TRY. Accordingly, 89.17% of the GPV obtained by the enterprises in the region was from crop production, 8.96% from livestock production, and 1.87% from non-operational agricultural activities (Table 3).

The third groups were the enterprises that obtained the most GPV from the crop production activity. On the other hand, the enterprises that received the highest GPV from livestock production activities were in the first group. Non-farm agricultural income was in the first group (Table 3).

Table 3. Gross Production Value of the farm enterprises according to their production activities

Production activities	Farm groups (decares)			FA	WA
	<15	15-30	>30		
	Value (TRY*/farms)				
Plant	28,688.74	68,128.46	96,550.40	60,580.95	50,924.43
Livestock	7,517.86	2,696.09	2,250.00	4,471.97	5,119.89
Non-operating agricultural income	1,114.29	1,130.43	600.00	974.65	1,066.03
Total GPV	37,320.88	71,954.98	99,400.40	66,027.57	57,110.34
	Percent (%)				
Plant	76.87	94.68	97.13	91.75	89.17
Livestock	20.14	3.75	2.26	6.77	8.96
Non-operating agricultural income	2.99	1.57	0.60	1.48	1.87
Total GPV	100.00	100.00	100.00	100.00	100.00

*1 USD = 4.82 TRY for 2018 year
Source: Own calculation.

Variable costs are costs that increase or decrease depending on production volume. These costs arise when production is made and vary depending on output [9].

Another study [9] defines fixed costs as the costs that do not change depending on the production volume and whether or not production is made.

Fixed costs accounted for 59.01% of operating costs and variable costs for 40.99%. We calculated the changing costs as 17,257.13 TRY and the fixed costs as 24,847.50 TRY (Table 4).

The highest share of the changing cost was the wages of temporary workers with 17.19%. The average cost of temporary workers in enterprises was 7,239.87 TRY. Machinery rent was 4,161.77 TRY, the seed-seedling cost was 1,876.74 TRY, agricultural control cost was 1,328.45 TRY, marketing was 1142.33 TRY, fertilisation cost was 844.23 TRY, revolving fund interest was 663.74 TRY (Table 4).

The highest share in fixed costs was permanent-family labour wages with 47.56%. We calculated the permanent-family labour cost as 20,025.72 TRY on average for enterprises. Land rental costs were the second crucial fixed cost element with a share of 10.22% and 4,304.07 TRY. On average, general administrative expenses were 517.71 TRY for enterprises (Table 4).

Production costs were calculated by adding fixed costs and variable costs. The average production costs of the enterprises were 42104.62 TRY (Table 4).

The estimated enterprises' production costs per unit (decare) were calculated as 1,513.34 TRY, and the regional average was 1,663.10 TRY. In the average of enterprises, the total variable costs per decare of tobacco were 620.26 TRY, and the total fixed costs were 893.08 TRY. In the regional average, the variable cost in tobacco production per decare was 631.02 TRY, while the fixed cost was 1,032.08 TRY. The fixed cost was higher than the variable cost in all enterprise groups. The fixed cost in enterprise groups changed between 643.78 TRY and 1,404.62 TRY, and the variable cost changed between 602.45 TRY and 686.25 TRY. As the scale of the enterprises increased, the variable and fixed cost per unit area decreased (Table 5).

Among the cost elements, the most critical was family labour in return for wages. This cost element changed between 501.72 TRY and 1,192.37 TRY in enterprise groups. We calculated 719.77 TRY for the average of enterprises and 842.06 TRY for the regional average. The second important cost element was the temporary labour wage. We have determined that this cost element varies between 192.15 TRY and 309.24 TRY in enterprise groups. We calculated it as 260.22 TRY for the enterprises and 233.80 TRY for the regional average. We found the third important cost factor to land rent. We also determined that this cost element changed between 123.99 TRY and 191.66 TRY in enterprise groups. We found it to be 154.70 TRY in the average enterprises and 171.09 TRY in the region average. We have determined that the fourth important cost

factor is machine rent. We found that this cost element varies between 112.99 TRY and 225.64 TRY in enterprise groups. We calculated it as 149.58 TRY for the enterprises and 170.01 TRY for the regional average. In the first group of enterprises, the order of cost per unit area was changing. In this enterprise group, machinery rental is in the third place, and temporary labour wage is in the fourth place among the cost elements (Table 5).

Table 4. Production costs in farms (TRY/farms)

Production Costs	Farm groups (decares)			FA	WA
	<15	15-30	>30		
	Cost (TRY/farms)				
Machine rental cost	2,956.64	4,408.70	5,565.00	4,161.77	3,786.92
Temporary labour costs	2,517.78	6,040.58	15,230.00	7,239.87	5,207.67
Seed-seedlings costs	1,169.75	1,830.00	2,920.27	1,876.74	1,607.01
Pesticide cost	848.79	1,498.35	1,804.60	1,328.45	1,197.88
Fertilisation cost	555.02	776.21	1,327.33	844.22	721.18
Marketing cost	598.28	1,334.91	1,682.53	1,142.33	994.19
Working capital interest	345.85	635.55	1,141.19	663.74	540.59
Total variable cost	8,992.12	16,524.29	29,670.90	17,257.13	14,055.44
General administration expenses	269.76	495.73	890.13	517.71	421.66
Land rent	2,511.39	4,919.13	6,106.50	4,304.07	3,810.89
Permanent-family labour	15,623.84	21,311.61	24,709.56	20,025.72	18,756.38
Total fixed cost	18,405.00	26,726.47	31,706.18	24,847.50	22,988.93
Total production costs	27,397.12	43,250.76	61,377.09	42,104.62	37,044.37
	The share in the production costs (%)				
Machine rental cost	10.79	10.19	9.07	9.88	10.22
Temporary labour costs	9.19	13.97	24.81	17.19	14.06
Seed-seedlings costs	4.27	4.23	4.76	4.46	4.34
Pesticide cost	3.10	3.46	2.94	3.16	3.23
Fertilisation cost	2.03	1.79	2.16	2.01	1.95
Marketing cost	2.18	3.09	2.74	2.71	2.68
Working capital interest	1.26	1.47	1.86	1.58	1.46
Total variable cost	32.82	38.21	48.34	40.99	37.94
General administration expenses	0.98	1.15	1.45	1.23	1.14
Land rent	9.17	11.37	9.95	10.22	10.29
Permanent-family labour	57.03	49.27	40.26	47.56	50.63
Total fixed cost	67.18	61.79	51.66	59.01	62.06
Total production costs	100.00	100.00	100.00	100.00	100.00

Source: Own calculation.

Table 5. Production costs per unit area in farms

Production Costs	Farm groups (decares)			FA	WA
	I	II	III		
	Cost (TRY per decares)				
Machine rental cost	225.64	162.63	112.99	149.58	170.01
Temporary labour costs	192.15	222.83	309.24	260.22	233.80
Seed-seedlings costs	89.27	67.51	59.29	67.45	72.15
Pesticide cost	64.78	55.27	36.64	47.75	53.78
Fertilisation cost	42.36	28.63	26.95	30.34	32.38
Marketing cost	45.66	49.24	34.16	41.06	44.63
Working capital interest	26.39	23.44	23.17	23.86	24.27
Total variable cost	686.25	609.56	602.45	620.26	631.02
General administration expenses	20.59	18.29	18.07	18.61	18.93
Land rent	191.66	181.46	123.99	154.70	171.09
Permanent-family labour	1,192.37	786.15	501.72	719.77	842.06
Total fixed cost	1,404.62	985.90	643.78	893.08	1,032.08
Total production costs	2,090.87	1,595.46	1,246.24	1,513.34	1,663.10

Source: Own calculation.

Gross Production Value is the sum of the market prices of the products obtained as a result of agricultural activities in a production branch and the annual productive fixture increases that occur in the said production activities [13]. The GPV was calculated by multiplying the tobacco production by the selling price.

The average GPV per enterprise across all enterprises was determined as 46,628.10 TRY. On the regional average, the GPV was calculated as 39,106.55 TRY. GPV in tobacco production in the region was 1,755.68 TRY per decare, and 1,675.92 TRY in the average of the enterprises interviewed. The GPV value obtained from tobacco per decare in enterprise groups changed between 1,516.12 TRY and 1,931.00 TRY. The GPV was above the operating average in the second group of enterprises and was determined as 1931 TRY per decare (Table 6).

Gross profit is equal to the difference between the GPV and the sum of the variable costs of this branch of production [13]. Gross profit is an important criterion that determines the competitiveness of production activities and shows the success of the enterprise's organisation [2]. Gross profit was calculated by subtracting the variable costs for tobacco from the GPV derived from tobacco.

The gross profit value in tobacco production in the region was calculated as 1,124.66 TRY per decare. This value was determined as 1,055.66 TRY in the average of the enterprises interviewed. The gross profit value in the second group of enterprises is above the average of the enterprises. The gross profit of the second group of enterprises was calculated as 1,321.44 TRY per decare (Table 6).

Absolute (net) profit is obtained by subtracting the total production costs from the GPV obtained as a result of crop production. This value allows for determining the success of agricultural enterprises within themselves [10]. Net profit was calculated by subtracting the total production costs for tobacco from the GPV from tobacco.

Absolute (net) profit is obtained by subtracting the total production costs from the GPV obtained as a result of crop production. This value allows for determining the success of agricultural enterprises within themselves [10]. Net profit was calculated by subtracting the total production costs for tobacco from the GPV from tobacco.

Net profit was determined as 4,523.47 TRY in the average of enterprises. The net profit obtained from tobacco per decare was 162.58 TRY. The net profit obtained from tobacco per decare was 92.58 TRY in the regional average. In the first group of enterprises, the net profit was calculated as the lowest with -5,495.96 TRY per enterprise. Net profit was determined as 9,096.18 TRY per enterprise in the second group, and 13,292.06 TRY in the third group. The net profit of the enterprises from tobacco per decare was 92.58 TRY on the region average, and 162.58 TRY on the average of the enterprises interviewed (Table 6).

Relative profit represents the ratio of GPV to production costs. In other words, it is an indicator of how much income the farmer earns for the cost of 1 TRY during the economic activity [10]. The relative profit was calculated by dividing the GPV from tobacco by the total production costs for tobacco.

The relative profit in enterprises groups was between 0.80 and 1.22. It was calculated at the rate of 1.11 in the average of enterprises and 1.06 in the average of the region. Relative profit was highest in the third group enterprises (1.22) and lowest in the first group enterprises (0.80) (Table 6).

Another study [15] calculated the relative profit as 1.22 in the average of enterprises and 1.07 in the average of the region. In the study, the author found the relative profit to be highest (1.37) in large enterprises and below one in small enterprises.

The enterprises' unit (kg) tobacco production costs were calculated by proportioning the production costs to tobacco production. The cost of one kg of tobacco was determined as 18.84 TRY in the average of enterprises, and 19.74 TRY in the region average. The highest tobacco production cost was in small-scale enterprises. The sales price per kg of tobacco was 20.87 TRY on the average of the enterprises interviewed, and 20.84 TRY on the region average (Table 6).

The yield obtained from the unit area (decare) was found to be 80.32 kg in the average of enterprises and 84.26 kg in the average of the region. While the group with the highest tobacco yield per unit area among the farm groups was the second group, the group with the least yield was determined to be the farms in the third group (Table 6).

Another study [15] calculated the tobacco yield as 96.55 kg in the average of enterprises and 94.67 kg in the average of the region.

Table 6. Profitability in tobacco production

Indicators	Farm groups (da)			FA	WA
	I	II	III		
GPV (TRY/farms)	21,901.15	52,346.93	74,669.15	46,628.10	39,106.55
GPV (TRY per decares)	1,671.43	1,931.00	1,516.12	1,675.92	1,755.68
Gross profit (TRY/farms)	12,909.03	35,822.65	44,998.25	29,370.97	25,051.10
Gross profit (TRY per decares)	985.18	1,321.44	913.67	1,055.66	1,124.66
Net profit (TRY/farms)	-5,495.96	9,096.18	13,292.06	4,523.47	2,062.17
Net profit (TRY per decares)	-419.44	335.54	269.89	162.58	92.58
Relative profit	0.80	1.21	1.22	1.11	1.06
Production cost per kg (TRY)	25.84	17.27	17.20	18.84	19.74
Sale price per kg (TRY)	20.66	20.90	20.92	20.87	20.84
Yield (kg per decares)	80.92	92.38	72.46	80.32	84.26

Source: Own calculation.

The relative profit in the examined enterprises changed between 0.29 and 1.99. At this point, some enterprises were below one value of the relative profit (Fig. 1). The labour force was a vital cost to tobacco enterprises in the region. On the other hand, the interviewed enterprises were carrying out tobacco farming by utilising the workforce of their family members. This explains why enterprises continue tobacco farming by using the family workforce, despite the relative profit being less than one.

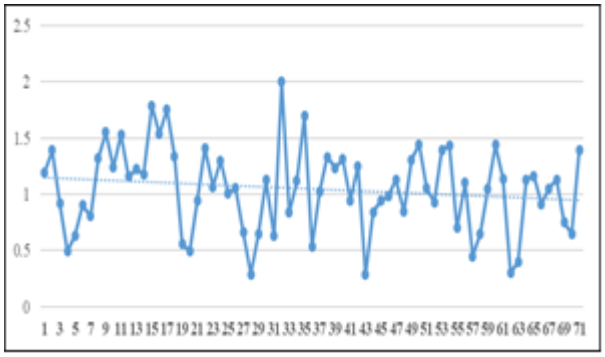


Fig. 1. Relative profit values of tobacco producing farms
Source: Own calculation.

CONCLUSIONS

Tobacco production was carried out by making intensive use of family labour in the region. This respect explains that the enterprises continue tobacco farming, despite the lack of profitability, especially in small enterprises. The organisation is considered necessary to continue tobacco production activities in the region. With the organisation of the producers, it can be stated that the producers can buy the inputs they use at a more affordable price. At the same time, they will impact price by developing marketing opportunities at the organisational level. This will enable a reduction in tobacco production costs.

REFERENCES

[1]Cicek, A., Erkan, O., 1996, Agricultural economics research and sampling methods (in Turkish). Gaziosmanpasa University Agricultural Faculty, Publications No: 12, 118p.
[2]Erkus, A., Bulbul, M., Kiral, T., Acil, A.F., Demirci, R., 1995, Agricultural economics (in Turkish). Ankara University Agricultural Faculty Publications, 298p.
[3]FAOSTAT, 2022, Food and Agriculture Organization of the United Nations. https://www.fao.org/faostat/en/#data/QCL, Accessed on 30 February 2022.
[4]Gul, M., 1998, Production cost and producer problems of maize in irrigated areas of Yüregir province (in Turkish). M.Sc. Thesis, Cukurova University, Adana, 118p.
[5]Gul, M., 2005, Economic analysis of apple farming in the trans-Taurus mountains region (in Turkish). PhD. Thesis, Cukurova University, Adana, 405p.
[6]Gul, M., Saluk, N., 2018, Analysis of the capital structure of tobacco producers in Denizli. Conference on Agriculture, Forest, Food Sciences and Technologies (ICAFOF 2018), April 2-5, Izmir, Turkey, 28p.
[7]Gul, M., Saluk, N., 2017, Economic structures of tobacco farms: The case of Denizli province in Turkey. Columella, J. Agric. Environ. Sci., 2017, 4 (1):217-222.
[8]Gul, U., Arisoy, H., Sivuk, H., Ataseven, Y., 2009, Comparison of profitableness between tobacco and some products in scope of alternative product project (in Turkish). J. Tekirdag Agric. Fac., 2009, 6 (3):215-226.

[9]Inan, I.H., 2006, Agricultural economics and management (in Turkish). Namik Kemal University Agricultural Faculty Publications, 372p.
[10]Kiral, T., Kasnakoglu, H., Tatlidil, F.F., Fidan, H., Gundogmus, E., 1999, Cost calculation methodology and database guide for agricultural products (in Turkish). Agricultural Economics and Research Institute, TEPGE Report No: 1999-13, p. 143, Ankara.
[11]Oren, M.N., Alemdar, T., 2006, Technical efficiency analysis of tobacco farming in Southeastern Anatolia. Turk J. Agric. For., 2006, 30 (2):165-172.
[12]Ozavci, O., 2007, Turkey's tobacco economy and policies from the republic to today: A Comparison with EU's countries (in Turkish). M.Sc. Thesis, Osmangazi University, Eskisehir, 212 p.
[13]Rehber, E., 1993, Agricultural management and planning (in Turkish). Uludag Üniversitesi, Güçlendirme Vakfı, Publications No: 84, 177p.
[14]Sahin, G., Tasligil, N., 2014, Historical development and geographical distribution of tobacco (Nicotiana tabacum L.) culture in Turkey (in Turkish). East Geography Rev., 2014, 18 (30):71-102.
[15]Saluk, N., 2018, Effects of privatization on tobacco farmers: A case of Denizli province (in Turkish). M.Sc. Thesis, Suleyman Demirel University, Isparta, 134p.
[16]Saluk, N., Gul, M., 2018, Production cost and profitability of tobacco producers in Denizli. Conference on Agriculture, Forest, Food Sciences and Technologies (ICAFOF 2018), April, 2-5, Izmir, Turkey, 27p.
[17]TURKSTAT, 2021, Turkish Statistical Institute. https://biruni.tuik.gov.tr/medas/?kn=92&locale=tr, Accessed on 13 November 2021.
[18]Yagac, C., 2015, Determination of yield and quality characters of tobacco cultivars of Aegeon Region in Denizli conditions (in Turkish). M.Sc. Thesis, Namik Kemal University, Tekirdag, 54p.
[19]Yamane, T., 2001, Basic sampling methods. Translators: A. Esin, M.A. Bakir, C. Aydin, E. Gurbuzsel, Publishing of Literatür, No: 53, İstanbul.