Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development
Vol. 17, Issue 2, 2017
PRINT ISSN 2284-7995, E-ISSN 2285-3952

COST AND PROFIT ANALYSIS IN COTTON PRODUCTION IN ŞANLIURFA PROVINCE, TURKEY

Bahri KARLI[1], Fidan Merve KART[1], Mevlut GUL[1], Metin Göksel AKPINAR[2]

[1]Suleyman Demirel University, Engineering Faculty, Food Engineering Department, Faculty of Agriculture, Department of Agricultural Economics, 32260 Isparta, Turkey
[2]Akdeniz University, Faculty of Agriculture, Department of Agricultural Economics, 07070 Antalya, Turkey

Corresponding author: fmervekart@gmail.com

Abstract

Cotton is a strategically important plant, widely grown in 53 countries in the world with a wide area of uses. It is an industrial plant of high economic value with a lot of direct and indirect use in different sectors. Therefore, it provides important contributions to the development of a region or the country in terms of both employment and added value to overall economy. According to the International Cotton Advisory Committee's report on 2015/2016, Turkey ranks ninth in the cotton plantation area, eighth in cotton production, second in cotton yield, fourth in cotton import and fourth in cotton consumption in the world. Cotton is mainly grown in South-eastern Anatolia, Çukurova, Antalya and Aegean regions. In recent years, although the planting area has diminished, production has increased with yield. As Turkish textile industry grew after 1980s, the need for cotton in the textile production has expanded. This lead to decrease in cotton exports and increase in cotton imports. As a matter of fact, Turkey, which is a net cotton exporter until 1991, has become a net importer since 1992. About 48 thousand tons of fiber cotton was exported worth 76 million dollars in 2015, while 803 thousand tons of fiber cotton was imported with 1.24 billion worth. About 2.16 million tonnes of cotton were produced on 416 thousand hectares of land in 2016. When looked at the different regions, it can easily be seen that Şanlıurfa province has an important potential in cotton production. Şanlıurfa province accounted for 43.3% of Turkey's cotton plantations and 40.5% of its production in 2016. In this study, the development of cotton production cost and profitability in the case of Şanlıurfa province where significant cotton production was realized in Turkey was analysed. The data was obtained from the Şanlıurfa Provincial Directorate of Food, Agriculture and Livestock. The dataset covers the period 1996-2016.The cost of cotton production per hectare was calculated as 6,447 TL in 1996 and 6,289 TL in 2016 in real prices. There was a decrease in the cotton production cost. The most important cost elements were land rent and harvest-marketing. The relative profit was calculated as 1.78 for 2016. It can be concluded that it is important to ensure the sustainability of cotton production. The proper treatment of land, the appropriate seed variety, the use of adequate amounts of fertilizer, the correct application of the irrigation and the effective fighting of plant diseases are important factors for sustainability.

Key words**:** *cost, profit, Şanlıurfa, cotton, Turkey*

INTRODUCTION

According to the International Cotton Consultative Committee (ICAC) Between the 2011/12 production period and the 2015/16 season, an average of 33.4 million hectares of in land cotton production has been produced in the world, indicating a recent contraction in sowing areas. In the 2015/16 season, 37% of the 31 million hectares planted in cotton was planted in India. Cotton is considered as an important industrial plant for the economy of the country through job creation and value added, as well as significant contributions to exports. Cotton production is being made in 53 countries around the world. During the 2015/2016 production period, 30.5 million hectares of in area cotton were produced in the world. India ranks 1st in cotton production and China, the US, Pakistan and Uzbekistan comes next. Turkey is in the eighth place in production amount in the world.

In the world, about 21.8 million tons of fiber cotton is produced on an area of 30.5 million hectares. India ranks first in terms of total planting area as it is in production. Turkey ranks ninth in the world in terms of cotton cultivation area.

Textile and textile products play an important role in the Turkish economy. The

development of the textile and apparel industry and the increasing demand in parallel with this development made the cotton more important. Currently, cotton production does not meet domestic demand. As a matter of fact, in the 2015/2016 season, Turkey ranks fourth in world fiber cotton import and fiber cotton consumption [10].

Cotton is important for Turkish economy as it add value by job creation in textile and ready ware industry as well as income generation through exports.

In 2015, 738 thousand tons of fiber were produced in 434 thousand hectares. This amount could not meet the demand and in the same year so 803 thousand tons of fiber cotton was imported amounting to 1.233 billion dollars [19;7]. When textile and textile products are analysed in the world trade, in 2014 world exports in the textile sector amounted to 356 billion USD and ready-made clothing exports amounted to 473 billion USD. China takes the first place in world textile and apparel exports. Turkey, on the other hand, ranks seventh with an export value of 29.4 billion dollars [16]. In Turkey, cotton is mainly cultivated in the Aegean region, Mediterranean region (Antalya and Çukurova regions) and Southeast Anatolia region. Within the context of the South-eastern Anatolia Project (GAP), the South-eastern Anatolian region has taken its first place in cotton production with the opening of dry farming areas to irrigation gradually since 1995. In this region, Şanlıurfa province is the largest producer of cotton. According to TurkStat data, in 2016, 43.3% of the cotton cultivation areas in Turkey are located in Şanlıurfa province. The 40.5% of the total cotton production was carried out by Şanlıurfa province. Therefore, Şanlıurfa province has an important place both in cotton cultivation areas and in cotton production.

As in all economic sectors, cost is important in the agricultural sector in terms of assessing the results of business activities [9]. Different methods are used for the calculating the costs of agricultural products in Turkey. Although these methods look similar to each other, there are differences in detail. Cost calculations of agricultural products; The product variety varies depending on such factors as the cost of the calculation, the method of calculating the cost, and the purpose of the person or institution making the calculation [3] .

In this study, the change in cost and profitability of cotton production covering the period 1996-2016 in Şanlıurfa province was analysed.

MATERIALS AND METHODS

The main input for the study was the statistical records of the Şanlıurfa Provincial Directorate of the Ministry of Food, Agriculture and Livestock. The cotton product cost data set selected for the province covered the period 1996-2016. In addition, TURKSTAT data, research institute data, relevant national and international research findings were also utilized. Change in gross, absolute and relative profitability of the products are calculated. The following formulas were used for these indications. Gross profit = gross production value - changing costs, Net profit = gross production value - production costs, Relative profit = gross production value / production costs [1;12].

Different calculation methods can be used to calculate the costs according to the diversity of the products. In agricultural cost calculations, simple cost calculation method and combined cost calculation method are generally used. If a single product is obtained at the end of the production process, simple cost calculation method is used. At simple cost, the sum of the costs incurred for the activity is divided by the amount of the product obtained after the activity [12].

Unit product cost (TL / kg) = Total production costs (TL) / Production quantity (kg)

In the combined calculation method, if more than one product is obtained from a production activity, the products or products with low relative share in the total income from the products obtained from this activity are considered to be by-products. Other products or products are regarded as main,

purpose or compound product [12].

The proportional share of the cost elements in the total cost was calculated for the products considered. Thus, the weights within the total cost were determined. Moreover, the change in product production cost and profitability over the years were presented with simple index. Cost and profitability indicators were converted to real values in 2016 using the Producer Price Index (UFE, 2016 = 100) calculated by TURKSTAT. Thus, over the years, the changes in profits, costs and elements, developments were determined and the causes were tried to be revealed. In addition, the current cotton cost and revenues for international comparisons were also divided by the current US dollar value, also calculated in US dollars.

RESULTS AND DISCUSSIONS

Agricultural Structure in Şanlıurfa Province

Agricultural Land Asset

The total amount of land used in agriculture in Şanlıurfa province is 11,543,201 decares according to the data of 2016. When the distributions according to usage areas of these lands were analysed, 76.70% of the total land was made of cereals and other cereals and other vegetable products, 12.88% were fruit, drink and spice plants, 14.12% fallow and 1.80% vegetable horticulture area (Table 1).

In Şanlıurfa province, the share of cereals and other herbal products in the total agricultural area has decreased in general, whereas there has been an increase in vegetables, fruits, beverages and spice.

Table 1. Agricultural land property of agricultural in Şanlıurfa

Years	Cereals and other herbal products		Fallow field		Vegetable gardens		Fruit, beverage and spice plants		Total area	
	Decare	%	Decare	%	Decare	%	Decare	%	Decare	%
1995	8,987,970	82.14	772,050	7.06	170,980	1.56	1,010,620	9.24	10,941,620	100
2000	9,802,750	89.59	871,480	7.96	201,140	1.84	969,840	8.86	11,845,210	100
2005	9,524,330	87.05	1,079,250	9.86	209,997	1.91	1,051,562	9.57	11,859,780	100
2010	9,951,744	90.95	1,423,814	13.01	178,284	1.63	1,037,615	9.48	12,591,457	100
2013	8,974,899	82.03	1,875,700	17.14	201,793	1.84	1,148,097	10.49	12,200,499	100
2014	8,837,904	80.77	1,627,989	14.88	203,148	1.86	1,146,839	10.48	11,815,900	100
2015	8,830,851	80.71	1,549,086	14.16	204,450	1.87	1,230,508	11.25	11,814,940	100
2016	8,392,152	76.70	1,544,997	14.12	196,550	1.80	1,409,477	12.88	11,543,201	100

1 decares equal 0.1 hectares
Source: TÜİK, 2017

Cotton foreign trade of Turkey

In Turkey, with the developments in the textile sector over the years' cotton demand of the sector has increased significantly and domestic production couldn't keep up with the increased the demand.

Therefore, the amount of cotton imports increased in 1992 and Turkey became one of the net importer countries. The import quantity and values between 1989-2015 of Turkey are given in Table 2.

While imports of fiber cotton in Turkey were 60 thousand tons in 1989, this increased gradually and reached 803 thousand tons in 2015. The increase in fiber cotton imports is mainly due to the increasing usage of cotton in textile and clothing industry firms and the inability of domestic cotton production to meet the demands of industrial firms. Turkey mainly imports cotton from USA, Greece, Brazil and Turkmenistan.

In Turkey in 2015, 48 thousand tons of fiber cotton exports were worth 76 million dollars. On the other hand, 803 thousand tons of cotton was imported, worth about $ 1.24 billion.

In 2015, import value decreased by 12.05% and export value decreased by 13.64% compared to the previous year. Turkey is a net cotton importer since 1992. The import coverage ratio of exports has decreased from 167% to 6%.

Costing in Agricultural Production

The agricultural is an important sector for Turkey. By 2015 the agriculture sector's share in total employment is 20.60%, its share in exports is 9.96% and its share in gross domestic product is 6.90% [19].

Table 2. Turkey fiber cotton export and import

Years	İmport quantity (tonnes)	Import Value (Million $)	Export quantity (tonnes)	Export Value (Million $)
1989	60	100	100	133
1990	76	136	95	161
1991	46	79	101	169
1992	135	174	34	45
1993	201	247	132	144
1994	147	239	27	31
1995	183	381	3	6
1996	168	300	76	124
1997	357	629	37	57
1998	380	600	45	55
1999	277	351	80	87
2000	567	676	27	36
2001	454	497	30	37
2002	540	492	33	38
2003	556	666	89	113
2004	585	836	48	77
2005	776	908	38	52
2006	754	970	62	69
2007	946	1,277	66	71
2008	613	1,000	60	111
2009	753	1,002	36	62
2010	889	1,720	29	64
2011	604	1,850	53	146
2012	614	1,274	52	106
2013	869	1,681	48	100
2014	913	1,750	46	88
2015	803	1,233	48	76

The 8% of the from total Gross domestic product is obtained from agriculture. The 23% of the active population is employed in agriculture sector. This data demonstrates the importance of agriculture for Turkey and shows that the agriculture sector can be analysed in every direction. This deliberation begins at the production stage and continues until the final consumer reaches. Because agriculture is an indispensable sector for every country. Improving the conditions of producers living in the agricultural sector and increasing the level of their prosperity has become an indispensable policy in almost all over the world. This forces governments to follow the link between agricultural prices and their costs. Agricultural policy decision makers and practitioners have to follow closely the cost studies of agricultural products [7].

In general, the concept of cost is the sum of production expenditures used in the production of a certain quantity of goods or services. The cost of agricultural production refers to the resources that must be consumed for the production of a particular product, in other words, the monetary value of goods and services. In general, the gross production value obtained during a production period is compared with the costs to try to determine the economic activity of the activity. Costs are divided into variable (variable) and fixed costs.

(i)Variable cost: Depending on the breadth of production activity used in crop production; variable costs such as increasing or decreasing seeds, fertilizers, agricultural combatants, water charges, tools and machinery fuel, repair and maintenance costs, temporary worker wages, product insurance premiums, marketing expenses and revolving fund interest.

(ii)Fixed costs: The costs incurred due to the existence of production factors, which are not dependent on production volume. For example; machinery, buildings, irrigation facilities and land are fixed costs. The interest and depreciation costs calculated for the fixed capital elements used in vegetable production are taken into consideration [12]. In order to calculate real costs in agricultural products, cost accounting is required to be implemented. Costs in agricultural enterprises vary from region to region and from operation to operation. Standard costs in agriculture are not possible. So every business has its own cost price [3]. Agricultural market conditions and price movements, as well as the changing nature of the conditions are under the influence. In order to have a successful working order in the field of agricultural activity intertwined with risks and uncertainties and to maintain this scheme and to adapt to the changing conditions, agricultural enterprises in more than one production activity have to keep accounting records. It is impossible to plan production and make decisions without accounting records [12]. In Turkey, only large size agricultural holdings hold agricultural accounts register.

Cotton

Developments in cotton harvested area and production for the Şanlıurfa province were given in Table 3. According to this, cotton planted area was 515,280 decares and 113,362 tons of cotton were produced in 1991. Cotton harvested area increased by about 3.5 times and reached 1,802,857 decares in 2016.

Şanlıurfa province constituted 43% in 2016 which constitutes 8.61% of the cotton harvested area at the beginning of the period. Improvement of irrigation facilities in GAP area was effective in this increase. The cotton production was 852,391 tons in 2016. The reason for production increase was the increase in the yield and the increase in the harvested area. Şanlıurfa accounted for 40.50% of Turkey cotton production in 2016. There was a decline in the cotton harvested area compared to the previous year in 2001, 2005, 2009, 2012, 2013, 2015 and 2016. Based on 1991, cotton production rose by 651% to 852,391 tons in 2016. The cotton yield was 473 kg in Şanlıurfa province, which was below Turkey's average yield in 2016.

Table 3. Developments in cotton harvested area and production in Şanlıurfa province

Years	Area harvested (da)	İndex (1991=100)	Share in agricultural areas of Turkey (%)	Production (ton)	İndex (1991=100)	Share in agricultural areas of Turkey (%)	Yield in Ş.Urfa (kg/da)	Yield in Turkey, kg per da
1991	515,280	100.00	8,61	113,362	100.00	7.50	220	253
1992	566,790	110.00	9.47	113,889	100.46	7.42	201	241
1993	623,750	121.05	10.42	168,299	148.46	10.78	270	275
1994	673,290	130.66	11.25	187,099	165.05	11.55	278	279
1995	919,200	178.39	15.36	277,696	244.96	12.49	302	294
1996	1,098,930	213.27	18.36	334,084	294.71	16.04	304	280
1997	1,233,930	239.47	20.61	401,603	354.27	19.08	325	292
1998	1,526,590	296.26	25.50	488,038	430.51	21.18	320	305
1999	1,749,340	339.49	29.22	462,655	408.12	22.84	264	282
2000	1,793,000	347.97	29.95	661,950	583.93	29.28	369	346
2001	1,572,000	305.08	26.26	566,775	499.97	24.04	361	344
2002	1,775,000	344.47	29.65	639,475	564.10	25.16	360	353
2003	1,686,000	327.20	28.16	649,960	573.35	27.71	386	368
2004	1,880,500	364.95	31.41	736,625	649.80	30.00	392	384
2005	1,837,500	356.60	30.70	734,532	647.95	32.79	400	410
2006	1,886,351	366.08	31.51	835,011	736.59	32.75	443	432
2007	1,896,270	368.01	31.68	821,896	725.02	36.13	433	429
2008	2,105,330	408.58	35.17	799,014	704.83	43.90	380	368
2009	1,623,592	315.09	27.12	668,951	590.10	38.78	412	411
2010	2,052,023	398.23	34.28	862,256	760.62	40.10	420	448
2011	2,096,688	406.90	35.03	970,771	856.35	37.63	463	476
2012	2,067,928	401.32	34.54	953,246	840.89	41.09	461	475
2013	2,033,195	394.58	33.96	948,464	836.67	42.15	466	499
2014	2,170,700	421.27	36.26	1,022,213	901.72	43.50	471	503
2015	2,060,353	399.85	34.42	916,298	808.29	44.70	445	472
2016	1,802,857	349.88	43.00	852,391	751.92	40.59	473	505

Source: TÜİK, 2017

The values and the changes in the cost elements of cotton production per hectares were given in Table 4 between the years 1996-2016 in Şanlıurfa province. The total cotton production costs calculated as 6,289 TRL in 2016 and TRL 6,447 in 1996. Therefore, cotton production costs decreased by 2.44% per period with real prices. The most important cost factor was the land rent with 1,500 TRL. The harvest-marketing cost was the second place with 1,356 TRL. Fertilizer costs were ranked third with 787 TRL. These were followed by irrigation with 573 TRL and ploughing cost with 508 TRL, respectively. Over the years, there were fluctuations in the total cotton production cost and its elements. The share of cost elements in production cost covering the years 1996-2016 was also examined in Şanlıurfa province. It was found that during the period 1996-2016, the components of cotton production costs showed fluctuations in the share of production costs in 2004-2016 period. Between 1996 and 2003, it was found that the cost elements increased in their share in the total cost. During the 2016 production period, 35.19% of the total cotton production costs were fixed costs and 64.1% of them was the variable cost. The land rent share was 35.19% in the production costs for 2016. In the period covered, it was determined that the most change was at the fertilizer cost. In 1996, this cost component accounted for 6.57% of total costs, while it was 11.92% in 2016.

Land Rent

Land prices were the most important cost

factor in the total cotton production costs at real prices in Şanlıurfa province. The land rent was 1415 TRL in 1996 and increased by 6.03% and rose to 1,500 TRL in 2016. There was a fluctuating course in the cost of land rent over the years, there was an upward trend. Land lease generated 21.9% of total costs in 1996. This rate rose to 23.9% in 2016. Land rent for cotton production increased from $ 305.64 in 1996 to $ 496.12 in 2016. So the cost of cotton production increased by about 1.62 times the cost of renting land. The highest rental rates were in 2008 ($ 962.16), 2009 ($ 964.92) and 2010 ($ 1,061.28) of the years. In his study, Chahudry [4] analysed the input costs of nine countries in cotton farming. According to Chahudry [4], the cost of land in cotton production is more than $ 500 in Spain while in the US, Iran, Pakistan, Syria, South Africa, Colombia and the Philippines the cost of this is around $ 200. In his study for ICAC in Chahudry [5], he found that land rent for cotton production was over $ 700 in Egypt, while in India, Syria and Turkey it was 514 dollars, 209 dollars and 313 dollars respectively. Varoğlu et al. [20] found that the most important cotton production cost elements were land rent and labour costs.

Fertilizer Cost

At real prices, the cost of fertilizer production in Şanlıurfa province in total cotton production costs increased from 456 TRL in 1996 to 787 TRL in 2016 with an increase of approximately 72.70%. Over the years there was also a fluctuation in the cost of fertilizers. Overall there was an upward trend. However, it was the lowest value in 1999 with 254 TRL. This cost was 328 TRL in 1998 and 399 TRL in 2000. The highest cost of fertilizer received in 2015 with 1,201 TRL. The fertilizer was found to account for 12.51% of total production costs. In calculations made in US dollars, the cost of hectare fertilizer for cotton production was 97.80 dollars in 1996 and rose to 260.20 dollars in 2016. The US dollar denominated fertilizer rate increased about 2.66 times. Fertilizer costs were highest in the years 2015 ($ 422.58) and 2010 ($ 386.26).

Chahudry [4] reported that fertilizer costs in the North Cape region of South Africa were at the highest level in the world. Chahudry calculated that the cost of fertilizer was $ 300 per hectare. He also calculated that the fertilizer cost was more than $ 200 in the Peru, Spain, the United States and Israel. He pointed out that it was costly in the China and Turkey because of the usage of higher nitrogenous fertilizers doses. Indeed, fertilizer costs in Turkey were over $ 300 hectares. In addition to high fertilizer cost, importing gibbons, as well as the development of irrigation facilities in the region, is effective in starting to use too much. Chahudry [5] calculated that the average cost of fertilizer for the first nine cotton producing countries in the world was 253 dollars.

Ploughing/Sowing Cost

The real ploughing/sowing cost in Şanlıurfa province was 289 TRL in 1996. In 2016, this figure increased by about 76.06% to 588 TRL. Over the years there was a fluctuation. Ploughing cost share was 4.5% in the total production costs in 1996, while in 2016 it was 8.1%. The change in energy costs in the world caused increases in this cost element and showed a fluctuating change. In calculations made in US dollars, ploughing/sowing cost per hectare increased from $ 62.35 in 1996 to $ 168.05 in 2016. This cost item increased by about 2.69 times. Ploughing/sowing cost was highest in 2010 ($ 2,719.55), 2011 ($ 2343.30), and 2012 ($ 2,457.33) years.

Seed Cost

Within real cost, Şanlıurfa province's seed costs per hectare increased from 113 TRL in 1996 to about 160 TRL in 2016, increasing by about 41.37%. While seed costs accounted for 1.8% in the total costs in 1996, this rate was 2.5% in 2016.

In the calculation of the US dollar, the seed cost was $ 52.92 in 2016, while compared with $ 24.51 in 1996. The seed cost was increased by about 2.15 times. The years of highest seed costs were 2012 ($ 76.66), 2013 ($ 78.72), and 2014 ($ 75.26). Seed is the basic input that has the greatest effect on yield and quality formation in plants. According to the study by Chahudry [5], the highest seed cost was in Colombia. He calculated that per hectares seed cost was 102 dollars. He reported that seed costs were high in China and in the United States. He also stated that

seed cost was high in India and Pakistan due to the high competition among hybrid seed varieties.

Harvesting – Marketing Cost

Within real prices, Şanlıurfa province's harvest costs per hectare increased from 1,511 TRL in 1996 to about 1,356 TRL in 2016, decreasing by about 10.26%.

Over the years there is also a fluctuating course in harvest costs. While the harvest cost constituted 23.4% of total costs in 1996, this ratio decreased to 21.6% in 2016.

In the calculations made in US dollars, the harvest cost was 326.42 dollars in 1996 and 448.40 dollars in 2016. This year's cost was about 1.37 times higher than 1996 years. Harvest costs were highest in 2008 ($ 958.35) and 2014 ($ 788.98). According to the Chahudry [5] report, Pakistan was the lowest cotton harvesting cost with $ 63 per hectare in the world, and Syria was the highest cost with $ *433.*

Irrigation Cost

Within real price, irrigation cost per hectares in Şanlıurfa province was 951 TRL in 1996 and decreased by 60.27% to 573 TRL in 2016. While the increase was between 1996 and 2000, there were fluctuations between the years 2000-2016. Irrigation costs accounted for 14.7% of total costs in 1996, while in 2016 this rate was 9.1%. There was not much change in irrigation costs in the examined period. It can be said that the reason for the decrease in irrigation costs is the development of the irrigation facilities in the region and the increase in the usage.

In calculations made in US dollars, per hectare irrigation cost was 195.61 dollars in 1996, and 189.52 dollars in 2016. Cotton production costs decreased by 3.12% in irrigation costs. The highest irrigation costs are in the years 2010 ($ 391.35) and 2007 ($ 374.68). According to Chahudry [5], the highest irrigation cost with $ 600 per hectare was Syria. The irrigation costs in the US in irrigated areas were reported to be $ 114.

Hoeing Cost

In Şanlıurfa province, the hoeing cost per hectare was 272 TRL in 1996 while it decreased by 24.96% in 2016 to 231 TRL. The share of hoeing cost was 4.2% of total costs in 1996, while in 2016 it was 3.7%. In calculations made in US dollars, the hoeing cost per hectare was $ 58.68 in 1996 and $ 76.40 in 2016. This cost was increased by about 1.30 and highest was in 2006 ($ 111.26) and 2012 ($ 126.81) years.

Chahudry's [6] concluded that the highest hoeing cost was in Syria with $ 135 per hectare. Yilmaz et al. [22] compared the cotton production cost and income between the regions in Turkey. They found that there were significant differences between the costs and the income components among the provinces.

Pesticide Cost

Within real cost, pesticide cost was 184 TRL in 1996 in Şanlıurfa province, which increased by 158.66% to 501 TRL in 2016. It was determined that there was an increase in pesticide cost between 1996 and 2001 and fluctuations between 2000 and 2016. While the pesticide cost was constituted 3% of total costs in 1996, this ratio was increased to 8% in 2016. In calculations made in US dollars, the pesticide cost for cotton production was increased from $ 41.57 in 1996 to $ 165.57 in 2016. It was found that the pesticide cost was increased by about 3.98 times. The highest pesticide costs were in 2013 ($ 241.42) and 2014 ($ 246.77.68).

Chahudry [5] stated that the pesticide cost for cotton producing cotton in the world was 219 dollars.

Changes in cotton production cost items were calculated based on 1996 year in Şanlıurfa province. According to this, the highest increases were found in the pesticide cost (158.66%) and the ploughing/sowing cost (76.06%). Likewise, the fertilizers costs, seeds, land rent were increased compared to these periods. Other cost items (harvest-marketing, irrigation, hoeing) decreased compared to the beginning of the period.

For example, irrigation costs decreased by 39.73%. It can be said that the increase in the prices of the inputs used, the applied agricultural policies, the changes in the interest rates and the exchange rates were very effective on the fluctuation course in the cost items.

Table 4. Cotton production cost per hectare (with real cost TRL in 2016) and price growth rate (%) 1996=100

Years	Land rent	Seed	Ploughing/Sowing	Fertilizer	Pesticide/herbicide	Irrigation	Hoeing	Harvesting-marketing	Operating interest rate	General administrative expenses
1996	1,415	113	289	456	194	951	272	1,511	1,092	156
1997	1,556	101	285	532	212	1,899	254	1,555	1,343	192
1998	1,811	127	341	326	226	1,513	272	1,235	1,228	175
1999	1,775	118	325	254	266	1,515	320	1,296	1,233	176
2000	1,719	137	500	399	277	1,516	293	1,309	1,292	185
2001	3,143	121	1124	740	411	1,982	532	1,973	3,760	301
2002	2,416	97	899	596	329	1,585	425	1,575	1,584	238
2003	2,181	92	752	544	269	1,283	346	1,276	607	202
2004	2,309	69	643	539	240	1,070	216	1,362	580	193
2005	2,347	64	646	501	235	992	203	1,355	571	190
2006	1,962	59	477	461	216	883	314	1,733	549	183
2007	1,846	66	491	574	227	904	157	1,811	547	182
2008	2,047	64	508	639	213	770	216	1,679	552	184
2009	2,426	146	582	768	461	857	218	1,812	654	218
2010	2,385	164	611	760	507	880	209	1,759	655	218
2011	1,798	148	550	684	456	792	188	1,583	558	186
2012	1,265	175	560	880	540	491	289	1,095	476	159
2013	1,513	182	533	853	557	466	266	1,307	511	170
2014	1,504	181	531	823	594	432	242	2,307	595	198
2015	1,564	167	530	1,201	309	431	241	1,964	577	192
2016	1,500	160	508	787	501	573	231	1,356	505	168
1996	100	100	100	100	100	100	100	100	100	100
1997	110	89	99	117	109	200	93	103	123	123
1998	128	112	118	72	117	159	100	82	113	113
1999	125	105	113	56	138	159	118	86	113	113
2000	122	121	173	88	143	159	108	87	118	118
2001	222	107	390	162	212	209	196	131	344	193
2002	171	85	311	131	170	167	157	104	145	152
2003	154	82	260	119	139	135	128	84	56	130
2004	163	61	223	118	124	113	79	90	53	124
2005	166	57	224	110	121	104	75	90	52	122
2006	139	52	165	101	112	93	116	115	50	117
2007	130	59	170	126	117	95	58	120	50	117
2008	145	56	176	140	110	81	80	111	51	118
2009	172	129	202	169	238	90	80	120	60	140
2010	169	145	212	167	262	93	77	116	60	140
2011	127	130	191	150	236	83	69	105	51	119
2012	89	154	194	193	279	52	106	72	44	102
2013	107	160	185	187	288	49	98	87	47	109
2014	106	160	184	181	307	45	89	153	55	127
2015	111	147	184	264	160	45	89	130	53	123
2016	106	141	176	173	259	60	85	90	46	108

Source: ŞGTHB, 2017

Table 5. The share of cotton production costs in total production cost

Years	Land rent	Seed	Ploughing/Sowing	Fertilizer	Pesticide /herbicide	Irrigation	Hoeing	Harvesting-marketing	Operating interest rate	General administrative expenses
1996	21.9	1.8	4.5	7.1	3.0	14.7	4.2	23.4	16.9	2.4
1997	19.6	1.3	3.6	6.7	2.7	24.0	3.2	19.6	16.9	2.4
1998	25.0	1.7	4.7	4.5	3.1	20.9	3.7	17.0	16.9	2.4
1999	24.4	1.6	4.5	3.5	3.7	20.8	4.4	17.8	16.9	2.4
2000	22.5	1.8	6.6	5.2	3.6	19.9	3.8	17.2	16.9	2.4
2001	22.3	0.9	8.0	5.3	2.9	14.1	3.8	14.0	26.7	2.1
2002	24.8	1.0	9.2	6.1	3.4	16.3	4.4	16.2	16.3	2.4
2003	28.9	1.2	10.0	7.2	3.6	17.0	4.6	16.9	8.0	2.7
2004	32.0	1.0	8.9	7.5	3.3	14.8	3.0	18.9	8.0	2.7
2005	33.0	0.9	9.1	7.1	3.3	14.0	2.9	19.1	8.0	2.7
2006	28.7	0.9	7.0	6.7	3.2	12.9	4.6	25.3	8.0	2.7
2007	27.1	1.0	7.2	8.4	3.3	13.3	2.3	26.6	8.0	2.7
2008	29.8	0.9	7.4	9.3	3.1	11.2	3.1	24.4	8.0	2.7
2009	29.8	1.8	7.2	9.4	5.7	10.5	2.7	22.2	8.0	2.7
2010	29.3	2.0	7.5	9.3	6.2	10.8	2.6	21.6	8.0	2.7
2011	25.9	2.1	7.9	9.9	6.6	11.4	2.7	22.8	8.0	2.7
2012	21.3	2.9	9.4	14.8	9.1	8.3	4.9	18.5	8.0	2.7
2013	23.8	2.9	8.4	13.4	8.8	7.3	4.2	20.6	8.0	2.7
2014	20.3	2.4	7.2	11.1	8.0	5.8	3.3	31.1	8.0	2.7
2015	21.8	2.3	7.4	16.7	4.3	6.0	3.4	27.4	8.0	2.7
2016	23.9	2.5	8.1	12.5	8.0	9.1	3.7	21.6	8.0	2.7

Table 6. Cotton production cost (per hectares, USD) and cotton production cost growth rate (%), 1996=100

Years	Land rent	Seed	Ploughing/Sowing	Fertilizer	Pesticide/herbicide	Irrigation	Hoeing	Harvesting-marketing	Operating interest rate	General administrative expenses
1996	306	24	62	98	42	205	59	326	236	34
1997	327	21	60	112	45	399	53	327	282	40
1998	381	27	72	69	47	318	57	260	259	37
1999	355	24	65	51	53	303	64	259	247	35
2000	351	28	102	82	57	310	60	267	264	38
2001	528	20	189	124	69	333	89	331	631	51
2002	496	20	184	122	67	325	87	323	325	49
2003	567	24	195	141	70	333	90	332	158	53
2004	700	21	195	163	73	324	65	413	176	59
2005	816	22	225	174	82	345	71	471	199	66
2006	695	21	169	163	76	313	111	614	195	65
2007	765	28	203	238	94	375	65	750	227	76
2008	962	30	239	300	100	362	102	789	260	87
2009	965	58	232	306	183	341	87	720	260	87
2010	1061	73	272	338	226	391	93	783	291	97
2011	799	66	244	304	203	352	83	703	248	83
2012	555	77	246	386	237	215	127	481	209	70
2013	656	79	231	370	241	202	115	567	222	74
2014	625	75	221	342	247	180	100	958	247	82
2015	550	59	186	423	109	152	85	691	203	68
2016	496	53	168	260	166	190	76	448	167	56
1996	100	100	100	100	100	100	100	100	100	100
1997	107	87	96	114	106	194	91	100	120	120
1998	125	109	115	70	114	155	97	80	110	110
1999	116	97	104	52	127	148	109	79	105	105
2000	115	114	164	83	135	151	102	82	112	112
2001	173	83	303	126	165	162	152	102	268	150
2002	162	81	296	124	161	158	149	99	138	145
2003	185	98	313	144	167	162	153	102	67	156
2004	229	86	313	166	174	158	111	126	75	174
2005	267	91	361	177	195	168	120	144	84	196
2006	228	85	271	166	183	152	190	188	83	193
2007	250	113	326	242	225	182	111	230	96	224
2008	315	123	383	305	239	176	173	242	110	257
2009	316	237	371	310	438	166	148	221	110	257
2010	347	298	436	344	539	191	158	240	124	288
2011	261	268	392	309	485	171	142	215	105	245
2012	182	314	394	392	566	105	216	147	89	207
2013	215	322	370	376	577	98	197	174	94	219
2014	204	308	354	347	590	87	171	294	105	245
2015	180	240	299	429	260	74	144	212	86	201
2016	162	216	270	264	396	92	130	137	71	165

The main reason for the increase in agricultural inputs in dollar terms was the increase in exchange rates. In addition, in the increase in chemical fertilizers, agricultural chemicals and ploughing/sowing costs which constitute production input costs were based on imported goods (chemical fertilizers, agrochemicals, diesel) and exchange rates was increased in these periods. The increase in irrigation opportunities in the region and the use of mechanized harvesting in the system have also resulted in improvements in the total costs.

Yılmaz et al. [21] determined that net income could not cover cotton production costs. They found that the most important cost items were labour, machinery costs, land rent and agricultural chemicals costs. Gul et al. [9] calculated that the technical efficiency of cotton-growing enterprises in Çukurova region was 0.80. According to the findings they obtained that the cotton producers could increase efficiency scores with 20% by the same inputs and.

ICAC [11]reported that the land rent and management cost of many countries were not included in the production cost. It was also found that there was no difference in productivity between the countries. The cotton production cost was high in the US and Zimbabwe. The cost was found to be lower in Australia, Pakistan and Argentina.

Sağlam [17]determined that 28.23% of the total material costs were in fertilizer, 54.19% in pesticide, 7.12% in seed, and 10.47% in irrigation in Çukurova region. In the study conducted in Antalya region, 29.32% of the total material costs were found to be fertilizer, 57.42% of pesticide, 5.10% of seed and

8.17% of irrigation cost in 2001 [22]. Yilmaz and Gul [24] found that the labour cost with 36.18% as the biggest share of cotton production costs per unit area in Antalya and the second most important cost was the machinery rent costs and it was changed between 8.92-17.05% in the farms groups and 14.11% in the average. They reported that fertilizer, land rent, pesticide, irrigation, were proportionally important. They calculated that their share in the production cost of per hectare was 13.62%, 11.58%, 11.22% and 4.74%, respectively. They found the relative profit to be 1.02 in cotton production.

According to the works carried out in the year 2000, the share of fertilizer and irrigation costs were increased, and the share of pesticide and seed costs was decreased. It can be said that this factor was caused by the changes in the amounts of input and the changes in prices.

Cotton Supports

The first application for premium payment to cotton producers was made by the Ministry of Industry and Trade in the 1993. In this context, a premium of 3,000 TL per kg was paid to the producers of 1993 cotton seed cotton. The system, which was restarted in 1998, has been up to date and has been carried out by the Ministry of Food, Agriculture and Livestock. Despite positive results from the differential payment system in 1993, this practice was terminated. Since the 1998/99 production period, the cotton premium system has begun to be reapplied and a premium payment has been made to the producers for a certain amount of documents.

Since 2001, 10% of the premium amount to be awarded in addition to the premium amount has been started to be paid to the producers who produce and certify the mass cotton by using certified seed, and since 2004, the certificate difference has started to be paid at 20%. As of 2012, support has been given to producers using seeds produced and certified only, and should be supported with the Agricultural Law, which entered into force in 2006; direct income support, differential payment support, compensatory payments, animal husbandry support, agricultural insurance payments, rural development support, environmental agri-food protection program support and other support payments. Under this law, differential payment support continued to be granted. Firstly, the fuel-oil given in 2003 and the fertilizer support given for the first time in 2005 have continued regularly since 2007. In addition, it is necessary to carry out soil analysis in order to benefit from the fertilizer subsidy payment of 50 decares registered on the Farmer Registration System and every agricultural land. Support for soil analysis was 2.5 TL per decares. Today, the "Agricultural Basin Production and Support Model" developed by the Ministry of Food, Agriculture and Livestock in 2011 was being used and as of 2011, payments have started to be made under the name of "Differential Payment Support for Agricultural Villages Production and Support Model" in Turkey. Today, this model is still used. It is decided to realize difference payment for cotton producers of year 2012 based on TUİK district yield productivity.

The Ministry of Food, Agriculture and Livestock has been included in the support of difference payment of cotton production in 13 basins. These basins are; GAP Basin, Western GAP Basin, Eastern Mediterranean Basin, Coastal Mediterranean Basin, Aegean Basin, and Euphrates Basin are the basins of the Southern Marmara Basin, Coastal Aegean Basin, Ida Basin, Inner Aegean Basin, Gediz Basin, Karacadağ Basin, Zap Basin. Ministry of Food, Agriculture and Livestock determined the difference payment support given to cotton in 2015 as 0.65 TL per kg. Also cotton producers can benefit from 7.90 TL per decares of diesel fuel and 8.25 TL per decares of fertilizer support [15].

Profitability Indicators in Cotton Production

The developments in the profitability per hectare cotton production for 1996-2016 in Şanlıurfa province were given in Table 7. The yield per hectare of cotton was 4,750 kg in the 2016 and it was below the average of Turkey. Cotton yield was 3,000 kg per hectare in 1996. It was increased by 1.58 times to 4750 kg per hectare. This was due to the increase in irrigation facilities and the increase in the use of inputs.

Cotton production cost was TRL 6,288 at real

prices for 2016. In 1996 it was 6,446 TRL. It was determined that the year 2001 (14,086 TRL) was the highest cotton cost in the 20-year period, and the year 2012 was the lowest (5,929 TRL). Gross production value was calculated as 7,280 TRL for 1996, and as 11,210 TRL in 2016. The per hectare gross production value was lowest in 2000 (5,275 TRL) and the highest in 2011 (12,681 TRL). The absolute profit, which sets forth the difference between gross production value and production costs, was determined to be 4,921 TRL hectare for 2016 and 853.43 TRL for 1996. Absolute profits were negative in 2001, 2000 and 2002. It can be said that premium support is not implemented in these years and increases in foreign exchange price and interest rates were effective in the negative profit.

Table 7. Profitability indicators for cotton per hectares (TRL)

Years	Yield per hectare (kg)	Index (1996=100)	Production cost per hectare (TRL)	Index (1996=100)	Gross production value per hectare (TRL)	Index (1996=100)	Absolute profit per hectare (TRL)	Index (1996=100)	Relative profit	Index (1996=100)
1996	3,000	100	6,446.52	100	7,299.95	100	853.43	100	1.13	100
1997	3,500	117	7,927.78	123	8,061.75	110	133.97	16	1.02	90
1998	3,500	117	7,252.96	113	8,242.08	113	989.12	116	1.14	100
1999	3,500	117	7,278.81	113	7,870.07	108	591.26	69	1.08	95
2000	2,700	90	7,627.53	118	5,275.16	72	-2,352.36	-276	0.69	61
2001	3,500	117	14,086.33	219	7,277.03	100	-6,809.30	-798	0.52	46
2002	4,180	139	9,742.70	151	9,155.89	125	-586.80	-69	0.94	83
2003	4,000	133	7,552.32	117	9,235.43	127	1,683.10	197	1.22	108
2004	4,000	133	7,223.70	112	10,160.70	139	2,937.00	344	1.41	124
2005	4,600	153	7,104.10	110	8,832.77	121	1,728.66	203	1.24	110
2006	4,600	153	6,837.36	106	8,575.35	117	1,737.99	204	1.25	111
2007	5,150	172	6,805.83	106	10,361.84	142	3,556.01	417	1.52	134
2008	5,000	167	6,870.67	107	10,644.53	146	3,773.86	442	1.55	137
2009	4,500	150	8,143.88	126	10,555.14	145	2,411.26	283	1.30	114
2010	4,500	150	8,147.57	126	10,733.04	147	2,585.47	303	1.32	116
2011	4,500	150	6,943.74	108	12,681.34	174	5,737.60	672	1.83	161
2012	4,930	164	5,928.61	92	12,471.73	171	6,543.12	767	2.10	186
2013	4,600	153	6,358.52	99	10,692.28	146	4,333.76	508	1.68	148
2014	4,800	160	7,408.74	115	10,805.11	148	3,396.37	398	1.46	129
2015	4,750	158	7,176.69	111	7,629.40	105	452.71	53	1.06	94
2016	4,750	158	6,288.91	98	11,210.00	154	4,921.09	577	1.78	157

Source: ŞGTHB, 2017

Relative profit was calculated by divided the gross production value to the production cost. The relative profit was calculated as 1.78 for cotton in 2016. That is, it was determined that 1.78 TRL income was obtained for 1 TRL made in cotton production. While the income of 1.13 TL was obtained in 1996 compared to 1 TL for cotton production, this value increased by 57.5% in 2016. The highest relative profit in cotton production in 1996-2016 was obtained in 2012 (2.10) and the lowest was in 2001 (0.52). Absolute profit was seen to increase by 477% compared to the beginning of the term. The relative profit rate was found to increase by 57%.

According to calculations made in U.S. dollars, the cost production per hectare increased from US $ 1.393 in 1996 to US $ 2,080 in 2016 with an increase of 49%. The lowest production cost was in 1996 and the highest year was 2010 with 3,625 dollars. The gross production value per hectare was increased by 135% from $ 1577 in 1996 to 3,708 dollars in 2016. The highest gross production value was in 2011 with $ 5,632. The lowest was with 1077 dollars in 2000 year. There were fluctuations in cost and profitability ratios relative to calculations made in dollar terms. These fluctuations were due to the changes in interest rates and exchange rates applied. While the fixed exchange rate was applied in Turkey until 2000, the free exchange rate policy started to be applied from 2000. In this case, as of many years, costs have been fluctuating, leading to an upward trend.

Sağlam [17] found that the absolute profit in cotton production was negative and relative

profit was 0.83 in Çukurova region. Absolute profit in the study carried out in Antalya again in 2001 was negative and the relative profit was 0.85 [22]. Budak et al. [2] found that the net profit in the cotton production enterprises was positive in Çukurova region. As a result, it was seen that in Şanlıurfa province, after the year 2002, they have improved their cotton.

Table 8. Profitability indicators for cotton per hectares ($)

Years	Production cost		Gross production value		Absolute profit	
	Value per hectare ($)	Index (1996=100)	Value per hectare ($)	Index (1996=100)	Value per hectare ($)	Index (1996=100)
1996	1,393	100	1,577	100	184	100
1997	1,667	120	1,695	107	28	15
1998	1,527	110	1,735	110	208	113
1999	1,457	105	1,575	100	118	64
2000	1,557	112	1,077	68	-480	-260
2001	2,366	170	1,222	78	-1,144	-620
2002	1,999	144	1,879	119	-120	-65
2003	1,962	141	2,400	152	437	237
2004	2,189	157	3,079	195	890	483
2005	2,472	177	3,073	195	601	326
2006	2,423	174	3,039	193	616	334
2007	2,819	202	4,292	272	1,473	799
2008	3,229	232	5,003	317	1,774	962
2009	3,239	233	4,197	266	959	520
2010	3,625	260	4,776	303	1,150	624
2011	3,084	221	5,632	357	2,548	1,382
2012	2,602	187	5,474	347	2,872	1,558
2013	2,756	198	4,635	294	1,879	1,019
2014	3,078	221	4,488	285	1,411	765
2015	2,525	181	2,684	170	159	86
2016	2,080	149	3,708	235	1,628	883

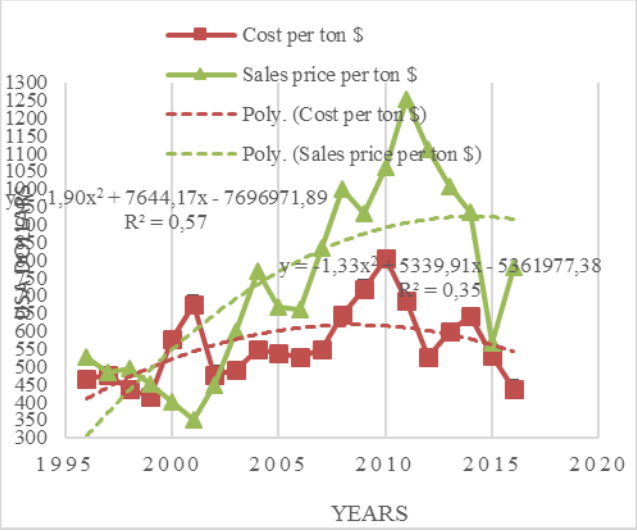

Fig.1. Change in cost and selling price ($)

The change in cotton sales price and cost per ton was given in Chart 1 on a US dollar. It was seen that they were a fluctuating course. The cotton selling price was $ 525.70 per ton in 1996 while it rose to $ 780.57 in 2016. The lowest sales price was 2001 with $ 349.22. The highest was in 2011 with $ 1251.45. The cotton cost per ton was also fluctuated between 1996 and 2016. While the cost was $ 464.24 in 1996, it decreased to $ 437.91 in 2016. The highest cost was in 2010 with $ 805.64. The lowest was in 1999 with $ 416.26. The sales price made on a dollar basis was higher than the real TRL price according to calculations. This was due to the fact that calculations made on a dollar basis were made at current prices and the exchange rate was different by the years.

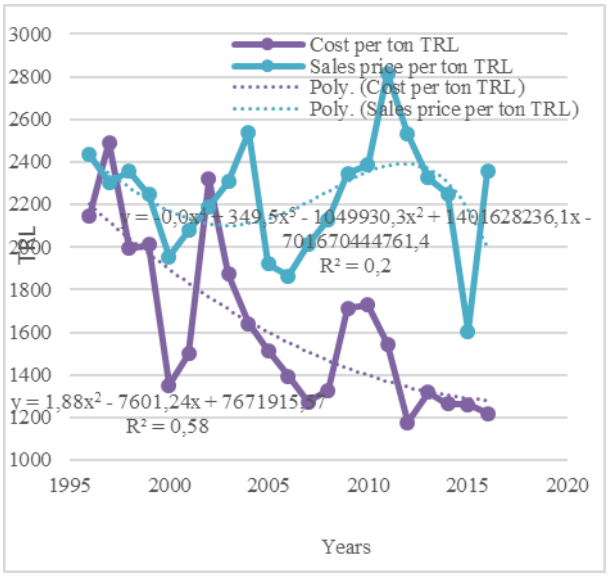

Fig. 2. Change in cost and selling price (TL)

The real price TRL based change in cotton

sales prices was shown in Graph 2. In real TRL-based calculations, the cotton sales prices were fluctuating. According to the calculations made, the selling price which was 2,433.32 TL in 1996 increased to 2,360 TL in 2016. The lowest sales price was in 2006 with 1,864.21 TL. The highest was in 2011 with 2,818.08 TL. In the cotton cost per ton, it was seen a downward trend with a fluctuating course during the period of 1996-2016., While the cotton cost per ton was 2,148.84 TL in 1996, it decreased to 1,220 TL in 2016. The highest cotton cost per ton was in 1997 with 2,490.12 TL. The lowest was with the 1,262.01 TL in 2015.

Yilmaz and Gul [24] found that the gross production value of cotton production was 8,174 TRL in the 2011 production period in Antalya province and the cotton yield per hectare was 3,913 kg. They calculated one kg cotton cost as 2.05 TL, and absolute profit as 163.5 TRL. They found that relative profit was 1.02. In the province of Antalya, the cotton relative profit was found to vary between 0.93-1.36 between 1992-1998 [13].

Şanlıurfa province has the highest yield in cotton production, compared to 1996, with an increase of 166.67% in 2008. The lowest production cost was realized in 2015 with a decrease of 91.97%.

CONCLUSIONS

In this study, change in cost and profitability of cotton production was analysed in Şanlıurfa province. Data obtained from the statistical records of the Ministry of Food, Agriculture and Livestock Şanlıurfa province and TURKSTAT used together with the related national and international research findings.

The cost items for cotton production, their proportional share in the total cost and profits were analysed by years. Cost and profitability indicators were expressed in terms of real values. Over the years, the changes in profit and, cost elements were looked through and the main causes of the changes are determined accordingly.

According to results, it was found that the most important cost factor in cotton production was land rent. In the period, Şanlıurfa cotton production cost was declined but according to years these declines showed a fluctuating course. Gross production value was showed a fluctuating trend.

In recent 20 years, cotton production in Turkey does not meet the cotton demand. Cotton consumption has increased rapidly in Turkey with the development of the textile and ready ware industry, especially after the 1990s. During this period, the same rate of increase in cotton production couldn't keep up with the increase in demand. On the contrary, the production increase in the limited area has been realized due to the increase of the yield and also the harvested areas have decreased. Currently, Turkey is among one of the world's largest consumer of cotton and importer countries.

Despite high productivity in cotton production, the increase in input prices lead to decline in production and threatens its sustainability. Input prices, problems brought by small scale farm structure, labour costs are important cost elements of the cotton production. In this context, multifaceted studies should be carried out in order to increase the yield and quality in cultivated areas. For this reason, it is important to ensure sustainability in cotton production in Turkey.

Sustainability can be achieved, through the efficient processing of land, the identification of certified and appropriate seed species, the use of the required amount of fertilizer in sufficient quantities, the correct method for irrigation, the effective fighting of plant diseases, and the maintenance and harvesting. These applications with better cotton production incentive policies will help to reduce production costs, increase productivity and will lead to sustainability.

In regards to ensure environmental sustainability; the implementation of a good crop monitoring system, protection of soil for future generations, and reduction of environmental pollution are very important. The sustainability of cotton farming in terms of social aspects can be ensured by ensuring that producers continue production, improving their living conditions of creating on-site employment.

As a result, the production of cotton, an important industrial plant for the Turkish economy, needs to be sustainable for all the parties including the producers, industrial companies and exporters.

REFERENCES

[1]Açıl, A.F., Demirci, R., 1984, Agricultural Economics Courses (In Turkısh). Ankara University Faculty of Agriculture Publications.p:245-372 , Ankara.

[2]Budak, F., Budak, D., Dağıstan, E., 2001, Cost Of AgriculturalProduct In Çukurova, In Part 5, Fregional Comparison Of Profit and Cost Of Major Agricultural Pruducts In Turkey, (In Turkısh). Agricultural Economics Research, Project Report 2001-14, April, Ankara.

[3]Çakır, S., 2005, Evaluation Of Production Cost Accounting Methods Of AgriculturalInstitutes In Adana, Master Thesis (ın Turkısh). Cukurova University Graduate School of Natural and Applied Sciences, P:125

[4]Chaudhry, M, R., 1995, Cost of Producing a Kilogram of Cotton (In Englısh). Internatıonal Cotton Advisory Committee Report. USA on October.

[5] Chaudhry, M, R., 2001, Cost of Production Of Raw Cotton (In Englısh).Presented at the III Brazilian Cotton Congress, Campo Grande, Brazil on August 31.

[6]Food and Agriculture Organization Of The United Nations (FAOSTAT), Access Date: 28.02.2017 http/www.faostat.org/faostat/data

[7] Gökalp, H.Y., 2001, Input Usage and Product Cost in Important Products for Some Regions in Turkey(In Turkısh). Project Report. 2001-14.,Ankara.

[8]Gül, M., Koç, B., Dağıstan, E., Akpınar, M.G., Parlakay, O., 2009, Determination of Technical Efficiency in Cotton Growing Farms in Turkey: A Case Study of Cukurova Region (In Turkısh). African Journal of Agricultural Research, 4(10), 944-949.

[9] Güneş, T., Kıral, T., Arıkan, R., Bülbül, M., Çetin, B., Tatlıdil. F.F., Albayrak, N., Meşhur, M., Çelen, H., 1988, Main Agricultural Products Cost Research Project (In Turkısh). Land Crop Office In Turkey, Ankara.

[10]ICAC, 2017, Cotton Today. Erişim Tarihi: 30.01.2017. www.icac.org/production.

[11]ICAC, 1999, Cotton Today. Erişim Tarihi: 30.01.2017. www.icac.org/production.

[12] Kıral, T., Kasnakoğlu, H., Tatlidil, F., Fidan, H., Gündoğmuş, E., 1999, Data Base Guide and Production Cost Methodology for Agricultural Products (In Turkish). Agricultural Economics Research Institute, Publication No. 37, Ankara

[13]Kuzgun, M., Özkan, B., Yılmaz, İ., 1999, Determination of cotton production cost in regions where production is intense in Antalya province (In Turkısh). Ministry of Agriculture and Rural Affairs.

[14]General Directorate of Agricultural Research, Mediterranean Agricultural Research Institute Directorate Development Report (In Turkısh). P:213-218, Antalya.

[15] Ministry of Customs and Trade Cotton Report, (In Turkısh). 2015

[16]Ministry of Science, Industry and Technology, 2017. Textile, Garment and Leather Goods Sector Report (2015/2) (In Turkısh). General Directorate of Industry, Ankara.

[17] Sağlam, C., 2000, Effective factors on the cotton production cost and success of farm enterprisers on the irrigated areas of Yüreğir district of Adana province (Inn Turkish). Çukurova University Institute of Science and Technology, Master Thesis, p:64, Adana.

[18] ŞGTHB, 2017, T.C. Ministry of Food, Agriculture and Livestock Sanliurfa Provincial Directorate Records, (In Turkısh). Şanlıurfa.

[19]Turkish Statistical Institute (TURKSTAT), 2015. Crop Production Statistics Database. Access Date: 28.02.2017, https://biruni.tuik.gov.tr/bitkiselapp/bitkisel.zul, 2017.

[20]Varoğlu, M., Kayaoğlu, İ, A., Tosun, G., 1983, Activities and Costs of Cotton Inputs (In Turkısh). Ministry of Agriculture and Forestry. Cotton Research Journal, Ankara.

[21]Yılmaz, İ., Akçaoz, H., Özkan, B., 2004, An Analysis of Energy Use and Input Costs for Cotton Production in Turkey (In Turkısh). Renewable Energy. 30/2. 145-155.

[22] Yılmaz, İ, 2001, Functional analysis of wheat and cotton production inputs and production in plains of central province of Antalya and Serik (In Turkısh). Turkish Agricultural Chambers Union Publications No: 207, P:78, Ankara.

[23]Yılmaz, H., Demircan, V., 2005, A Comparative Investigation of Raw Cotton Production Cost in Interregional, South Eastern Anatolia Project IV (In Turkısh). Agriculture Congress.1. September 21-23 P:381-394.

[24]Yılmaz, Ş., Gül, M., 2015, Evaluation of Cotton Production Costs and Profitability Level in Agricultural Farms: The Case of Antalya Province (In Turkish). Mustafa Kemal University Journal of Agricultural Faculty, 20 (2), 27-41. Retrieved from http://dergipark.gov.tr/mkuzfd/issue/19638/209651