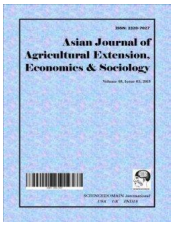

Asian Journal of Agricultural Extension, Economics & Sociology

23(1): 1-10, 2018; Article no.AJAEES.39462
ISSN: 2320-7027

Mulberry Production Economy in District of Adiyaman

İsmail Ukav[1*]

[1]Department of Accounting and Tax, Adiyaman University, Adiyaman, Turkey.

Author's contribution

The sole author designed, analyzed and interpreted and prepared the manuscript.

Article Information

DOI: 10.9734/AJAEES/2018/39462
Editor(s):
(1) Ian McFarlane, School of Agriculture Policy and Development, University of Reading, UK.
Reviewers:
(1) Rogers Andrew, Sokoine University of Agriculture, Tanzania.
(2) H. L. Garbharran, Durban University of Technology, South Africa.
(3) Leomara Battisti Telles, Federal University of Technology of Paraná, & Federal Institute of Paraná, Brasil.
Complete Peer review History: http://www.sciencedomain.org/review-history/23507

Short Research Article

Received 18th December 2017
Accepted 28th February 2018
Published 7th March 2018

ABSTRACT

The mulberry, which is cultivated generally in mild and subtropical regions, is cultivated in our country extensively. However, this potential cannot be assessed enough. Cultivation of mulberry has started to earn importance in Adıyaman in recent years. Mulberry has a great market potential thanks to its nutritive features of processed products and the fresh consumption of it. Dozens of products such as molasses, jams, fruit pulp, mulberry butter, dried mulberry, fruit ice cream, walnut sausage, vinegar, fruit juice concentrate, alcohol are made from its fruit. In this study, the general economic features of mulberry cultivation in Adıyaman is tried to be put forth. For this purpose, the statistics that are published by Turkish Statistical Institute and other data sources have been taken as references. In the study, the initial evaluation subjects were carried out about the cultivation areas, the number of the trees, and the amount of production and the production amount according to districts in Turkey. After that, the data were examined so as to put forth the economical features of mulberry cultivation in Adıyaman.

According to TSI data of the year 2005, the area of collective fruits produced as a commercial enterprise in the line of industry demands of mulberry is 12000 decare area and the number of products is 55000 tons from 2120000 efficient trees. In 2010, the figures raised above 75000 tons and it was 69334 tons in 2015. Average yield per tree varies from 25 to 30 kg within the examined

**Corresponding author: E-mail: iukav@adiyaman.edu.tr;*

period. Mulberry production in Adıyaman is not very common; however, the fruit is presented to the market as fresh for a short time and in order to apprise the producers redundant. Producers didn't use to harvest the fruit as it was thought to be worthless in previous years. But today, it has become one of the most important income sources. The mulberry production area in Adıyaman has increased twenty times in the last decade. It is remarkable to see that the increase in the production areas in last few years. Thanks to local people's realizing the support of the mulberry for their economies and establishing new production areas have a great effect on this increase. Total tree number and a good bearer numbers have been doubled. While Adıyaman's mulberry production was 661 tons in 2005, it reached 1629 tons in 2015. The production increased about 2.5 times within this period. Average yield per tree varies from 25 to 30 kg. When the potential that Adıyaman has in mulberry production is appraised, it will contribute local economy in coming years. Mulberry will be an important fruit for the development of the region as it creates added value and employment increase.

Keywords: Mulberry production; utilization; Adıyaman.

1. INTRODUCTION

Mulberry, cultivated in temperate and subtropical regions in the world, is widely grown in Turkey. Mulberry varieties that are common in Turkey are white mulberry (97%), black mulberry and red or purple mulberry. The homeland of mulberry is China, India, Turkey, Russia and Middle East countries. Mulberry cultivation has been performed in Turkey since ancient times and there is a rich genetic potential. Dairy production is the most intense in Diyarbakır, Malatya, Ankara, Erzincan, Elazığ, Erzurum and Kahramanmaraş [1].

Mulberry, with its fresh consumption, processed products and nutritive features, increases its market potential gradually. Fruit juice is processed in various forms to produce products such as molasses, jam, fruit pulp, mulberry paste, mulberry fruit, fruit ice cream, walnut sausage, vinegar, fruit juice concentrate, spirits. The especially black mulberry fruit has become a popular drink in recent years and it has become a fruit to be sought. Mulberry fruits are traditionally used in Turkey for the production of molasses and for the production of dry food. In addition to this, varieties of black mulberry and red mulberry are traditionally considered to be commercially available. The vast majority of the mulberry fruits produced in Turkey is used for the production of molasses; some of them are processed in jam, some as paste, köme (kind of dessert with nuts and paste), dry mulberry and table. In many countries, fruit is consumed fresh and dry as well as bread, donuts, pies, puddings, mulberry wine and ice creams. In this context, Adıyaman shows an important potential in terms of the mulberry economy and in the future it is expected that the mulberry will become an important product by evaluating this potential. In this study, the production and consumption structure, trade and marketing possibilities of the mulberry in Adıyaman were revealed. Some of the studies considered to be related to the subject are given below.

Polat [2], found that trees in Antakya and surrounding areas are scattered in the garden or in the form of border trees, technical and cultural maintenance procedures are not performed, collected fruits are used as a table to meet family needs, only the necessary surplus is sold in bazaars and commercial mulberry production is not done. In this study, it has been determined that in Turkey, there is little commercial growth of mulberry cultivation for fruits, while mulberry trees are given importance in the aspect of silkworms. In addition, it has been determined that domestic and foreign mulberry types have been selected for this purpose and mulberry trees have been cut off or destroyed as firewood in regions where production has been made and for economic and social reasons.

Erdoğan and Parlak [3], stated that mulberry is an important vitamin and energy source in Anatolia, as it is one of the oldest cultures in Anatolia, mulberry is produced almost every city in Turkey, which is the motherland of many species of fruit. Mulberry fruit is consumed fresh and dried in Turkey, and molasses, pulp, vinegar, köme, alcohol are obtained from its fruit, as well. They stated that in other countries fresh fruit is consumed as in the raw materials, while dried ones are used as thickeners in bread, jam, wine and puddings. After that, it was stated that it would be possible to earn an economic profit by improving the consumption of mulberries and preservation techniques.

Akbulut et al. [4], found that most of the important traditional foods can be produced from sugar-rich fruits such as grape, mulberry, carob, and fig, while mulberry (*Morus alba* L.) grow in almost every region of Turkey especially in Ankara, Malatya, Erzincan, Erzurum and Elazığ. According to the study, the fruit is consumed fresh or dried but it is also used by the local people in the production of sweet products such as molasses and pulp. Traditional mulberry molasses can be produced in Turkey using modern production techniques at industrial level as well as using traditional methods by local people.

Şahin and Cengiz [5], examined two basic issues that affected the Ottoman silk industry. The first one was the Global Price Revolution in the 16th century, and the other is the Ottoman-Iranian wars. According to this, the silk industry in Bursa, which is the most important mulberry and silkworm center of the Ottoman Empire, was affected negatively by the developments in terms of production and employment and also the non-tariff barriers created by Iranian wars and foreign trade weakened the relations arising from the silk trade between the two countries, led to a decline in tax revenues, which ultimately proved that the two countries were adversely affected.

The development and construction of the mulberry eco-industry play an important role not only in the comprehensive management of the ecological cycle in China, but also in the expansion and enrichment of the sericulture industry chain and in the creation of the circulation economy; ecologically and economically sustainable eco-systems to sustainable development [6].

Ertürk and Geçer [7], evaluated the economic size of some grapefruits. According to this, in Turkey, the common types of staphylo-fruits are berries, strawberries, raspberries and cranberries, which are widely used in the production of seedlings and saplings for gardening, as well as freshly consumed or packed for consumers. It has been determined that it contributes to the economy of the country because it is an important raw material. In addition, due to the delicate structure of the fruits, there is a role of increasing employment as an intensive activity line because the products are required to be over-sensitized at the stages of harvest, packaging, and transport to the market and presentation to the consumers. Encouraging the production and consumption of these products, it will increase considerably, thus it will be able to attract a serious set of immigration by providing social prosperity and peace, allowing consumers to diversify the products they can demand and allowing the fruit processing industry to meet raw material demands.

In a study conducted in Kenya, problems arising in mulberry breeding and marketing were examined. According to this; sericulture has the potential of poverty eradication and economic empowerment especially for women and youth in Kenya because it is a labour intensive venture. Silk production has the potential of serving as a supplement to the textile industry in Kenya due to the dwindling cotton production. Despite the fact that the sericulture has been going on in Kenya for more than 45 years, there have been several challenges that have crippled the success of sericulture. The major bottleneck is the lack of domestic demand for the finished products due to unclear goals in quality and minimal product awareness, lack of well-established government policies and lack of capacity and insufficient technical skills on mulberry and silkworm rearing. The study recommends that proper agronomical practices should be used to increase yield, intensive research is required on the available species of mulberry in Kenya. As a result of the successful production of mulberry, training is needed for skilled labour in mulberry growing and silkworm rearing for high production [8].

The ecological and economic values of mulberry production in China, mulberry applications and the development of the mulberry industry have been examined. Mulberry trees have long been cultivated for silkworm rearing. In recent years, the roles of mulberry trees in the prevention and control of desertification, water and soil conservation, saline-land management and returning the grain plots to forestry have been identified. Meanwhile, multi-usage of mulberry as forage for livestock, for fruit and tea preparation has been gradually explored. Therefore, an innovation occurred in the mulberry industry [6].

A study that examines Turkey's marketing problem in the field of fruit-making reveals that there are more quality problems than the production in the sector, difficulties in supplying quality products suitable for changing market demands, short supply period due to shortening of the harvest period and the biggest producer position in many kinds of fruit in the world it is determined that they do not evaluate this

situation well. In order to prevent this, it is stated that Turkey needs to plan new investments, knowing the advantages of each ecological zone and to take measures to increase the quantity of marketable products received from the unit area, and it is stated that a significant export income can be obtained when it can be used like the existing fruit growing potential [9].

In a study, TR63 Region (Hatay, Kahramanmaraş, Osmaniye) which is one of the most important agricultural production centers of Turkey in terms of production volume and product variety is higher than the average of Turkey in terms of per capita crop production value, it was determined to have value. The fresh fruit and vegetable sector, including the mulberry, is one of the most important economic activities for Turkey and also for the region concerned, by means of input channels to the production process, product production process, product preparation, preservation, processing, distribution in cold chain and food sector has been expressed. Some productions of fresh vegetables and fruits in this region are much higher than the average of Turkey and some proposals have been made for the development of fresh vegetable and fruit sector in Turkey and the region [10].

Research conducted for mulberry cultivation in Turkey is inadequate when it is compared to other fruit species of products utilized in various ways. The work conducted in Adıyaman for this product is too few to be tried. Studies on mulberry cultivation have focused on the characteristics of mulberry leaves in terms of feeding silkworms [11,12,13]. However, the mulberry has an important potential in both inside and outside market. With this study, it is aimed to determine the potential of Adıyaman in mulberry cultivation and to reveal the economic contributions that the region and country economy can provide in terms of income and employment in the coming years.

2. METHODS

In this study, general economic characteristics of mulberry cultivation in Adıyaman were tried to be revealed. For this purpose, the statistics published by the Turkish Statistical Institute have benefited from various sources. In the study, firstly, assessments were made on the areas of cultivation in Turkey, the number of trees, the amount of production and the amount of production according to each case. In addition, information on consumption quantities and qualification levels and foreign trade issues were also provided. Later on, the data were examined to reveal the general economic characteristics of mulberry cultivation in Adıyaman. The area of mulberry production, production amount, number of fruit trees and fruit trees that belonged to Adıyaman in 2005-2015 were examined and analyzed according to the provinces. Production figures have not been reached to the desired level as the mulberry leaf used in silk beetle breeding has become the foreground rather than the mulberry production in the world.

3. MULBERRY PRODUCTION IN THE WORLD

Especially in eastern, western and southeastern Asia, southern Europe, south of North America, northwestern part of South America and part of Africa, mulberry is common. Mulberry species benefited from fruit and widely grown are Morusalba, Morusnigra and Morusrubra. The motherland of Morusalba is China, Japan, Malaysia, Thailand and Burmese. Morusnigra's homeland is Turkey, Iran, Arabia, parts of Russia located in South Asia, and Syria. The homeland of Morusrubra is North America [3]. However, natural sprawl areas of the mulberry have been largely altered by the intervention of mankind. Although it is spread over a very large area, it is not possible to find records of the world mulberry production amount because it is used for growing silkworm cultivation more than fruit. In a study conducted in India, regression analysis, coefficient of variation, growth rate were used to reach the objectives of the research. It was determined that the raw silk production (96.49%) that the traditional states received the biggest share (82.90%) in mulberry cultivation in 2012-2013. Karnataka, Andra Pradesh and West Bengal have contributed to the maximum production among traditional states, while Maharashtra, Manipur and Madhya Pradesh have been found to be the major contributors to the total production of raw silk among non-traditional states in India [14].

Mulberry cultivation also has great importance in silk production. The major silk producing countries in the world are; China, India, Uzbekistan, Brazil, Japan, Republic of Korea, Thailand, Vietnam, DPR Korea, Iran, etc. Few other countries are also engaged in the production of cocoons and raw silk in negligible quantities; Kenya, Botswana, Nigeria, Zambia, Zimbabwe, Bangladesh, Colombia, Egypt,

Table 1. Global silk production (in Metric Tonnes)

Country	2010	2011	2012	2013	2014	2015	2016
Bangladesh	40	38	42.50	43	44.5	44	44
Brazil	770	558	614	550	560	600	650
Bulgaria	9.4	6	8.5	8.5	8	8	9
China	115000	104000	126000	130000	146000	170000	158400
Colombia	0.6	0.6	0.6	0.6	0.5	0.5	0
Egypt	0.3	0.7	0.7	0.7	0.82	0.83	1.2
India	21005	23060	23679	26480	28708	28523	30348
Indonesia	20	29	20	16	10	8	4
Iran	75	120	123	123	110	120	125
Japan	54	42	30	30	30	30	32
North Korea	-	300	300	300	320	150	365
SouthKorea	3	3	1.5	1.6	1.2	1	1
Philippines	1	1	0.89	1	1.1	1.2	182
Syria	0.6	0.5	0.5	0.7	0.5	0.3	0.25
Thailand	655	655	655	680	692	698	712
Tunisia	0.12	3	3.95	4	4	3	2
Turkey	18	22	22	25	32	30	32
Uzbekistan	940	940	940	980	1100	1200	1256
Vietnam	550	500	450	475	420	450	523
Madagascar	16	16	18	18	15	5	6
Total	139100.02	129661.80	152845.64	159737.10	178057.62	202072.83	192692.45

Source: Global Silk Industry .Statistics International Sericultural Commission 2016. http://inserco.org/en/statistics [15]

Japan, Nepal, Bulgaria, Turkey, Uganda, Malaysia, Romania, Bolivia, etc (Table 1). Even though silk has a small percentage of the global textile market - less than 0.2% (the precise global value is difficult to assess, since reliable data on finished silk products is lacking in most importing countries) - its production base is spread over 60 countries in the world. While the major producers are in Asia (90% of mulberry production and almost 100% of non-mulberry silk), sericulture industries have been lately established in Brazil, Bulgaria, Egypt and Madagascar as well. Sericulture is labour-intensive. About 1 million workers are employed in the silk sector in China. Silk Industry provides employment to 7.9 million people in India, and 20,000 weaving families in Thailand. China is the world's single biggest producer and chief supplier of silk to the world markets. India is the world's second largest producer. Sericulture can help keeping the rural population employed and to prevent migration to big cities and securing remunerative employment; it requires small investments while providing the raw material for textile industries [15]. In a study conducted in India, it was determined that the growth of mulberry trees has been decreasing every year due to the low cocoon prices in the major states that have grown in such important landmines as Karnataka, Andra Pradesh, as well as the analysis of the growth, the fertile lands sold to non-agricultural activities, Tamil Nadu, West Bengal and Jammu and Kashmir. Despite the decrease in the area of mulberry cultivation, the production and productivity of the mulberry field have increased due to the technological interventions or improvements made by different institutions and the adoption of these technologies developed by farmers in silk [16].

4. MULBBERY PRODUCTION IN TURKEY

Like many fruit species, Anatolia is the motherland and one of the oldest cultural areas of the mulberry. The area of commercial fruit produced in the direction of industrial demand was 12,000 decares according to the data of 2005 TSI (Turkish Statistical Institute) but increased to over 20000 decares in 2015. 2,120,000 fruits and 55,000 tons of mulberries were obtained from the tree in this area [17]. In 2010, the production exceeded 75,000 tons, and 69.334 tons in 2015 (Table 2). Mulberry production, which followed a fluctuating course during the period examined, increased by 26% compared to the beginning of the year. This

increase is of course affected by the increase in the area of production and the increase in the total number of trees. Average yield per tree varies between 25-30 kg during the period studied.

4.1 Mulberry Production According to Cities

In mid-climate regions fruit trees are grown for fruit and leaves, and silk leaves are used for silkworm. The first region in the production of mulberry berries in Turkey with a total production of 70 thousand tons is the Upper Euphrates. This region accounts for about 30% of Turkey's total production. The Erzurum-Kars Division in the north-east of this area is one of the regions where the production of mulberries is intensively done. Diyarbakır started to stand out in the production of mulberries from 2008 onwards, while Erzincan, Malatya and Ankara mulberry productions emerged intensely in Turkey until the beginning of 2008. As shown by data of 2014 and 2015, 10% of Turkey's total mulberry production is realized in Diyarbakir (Table 3). It is followed by Malatya, Erzurum, Elazığ, Erzincan and Ankara. Other cities that stand out in mulberry production are Kahramanmaraş, Samsun, Tokat, Mersin and Kütahya. In Turkey, mulberry fruit is often used as table to meet family needs; on the other hand, the surplus is sold in markets [2].

4.2 Foreign Trade of Mulberry

Turkey's mulberry exports have seen increases in recent years. Exports, which were 753 tons in 2010, have increased over the years and reached 3,773 tons in 2014 (Table 4). This value is around 5% of total mulberry production. Considering the potential of mulberry production, it is expected that exports will increase in the coming years. Mulberry imports are also made in Turkey. During the last five years, there has been a fluctuating trend in imports of mulberry. It is determined that more mulberry imports are made from mulberry exports in 2014. This is quite remarkable. It can be said that the fruit sector and some consumers have increased import demand for different reasons such as taste, aroma, and so on.

4.3 Mulberry Consumption and Proficiency Level in Turkey

Mulberry is an important source of vitamin and energy. Mulberry fruit is traditionally used in Turkey for the production of molasses and for the production of dry food (molasses, pulp, köme). In addition, black mulberry and red mulberry varieties are traditionally used in the jam industry. Mulberry consumption per capita in Turkey is below one kilogram (Table 5). Since mulberry is a very healthy food ingredient and it will lead people to more and more natural products. The orientation of people to local products will increase the demand for mulberry. Therefore, the increase in the demand for mulberry will be a reason for the increase of mulberry production in the coming years. When the efficiency level of the mulberry production is examined, it has been determined that it has reached a sufficiency level of 100% [18]. This value, which exceeds 100% in the years of increased production, has declined in some years due to the negative climatic conditions, resulting in a decline in the level of qualification.

Table 2. Mulberry production area, production quantity, number of trees and yields in Turkey

Years	Area (da)	Production (Ton)	Average yield per Tree (kg)	Number of fruit trees	Number of fruitless trees	Total number of trees
2005	12.000	55.000	26	2.120.000	366.000	2.486.000
2006	12.797	51.558	25	2.029.207	353.078	2.382.285
2007	13.127	61.665	29	2.094.715	540.426	2.655.141
2008	17.628	65.540	28	2.300.689	539.122	2.839.811
2009	17.029	67.986	28	2.392.609	537.264	2.929.873
2010	18.662	75.096	30	2.479.192	507.465	2.986.657
2011	18.864	76.643	31	2.453.440	359.740	2.813.180
2012	20.500	74.170	30	2.446.907	379.146	2.826.053
2013	20.650	74.600	31	2.423.000	380.000	2.803.000
2014	20.773	62.879	27	2.325.580	437.836	2.763.416
2015	20.806	69.334	29	2.415.959	300.358	2.716.317

Source: TSI, 2016. (Crop Production Statistics) [17]

Table 3. Mulberry production in certain cities

Cities	2014				2015			
	Area (da)	Production (Ton)	Share in production (%)	Total tree number	Area (da)	Production (Ton)	Share in production (%)	Total tree number
Diyarbakır	10.052	6.007	9,55	538.631	10.065	8.881	12,81	535.968
Malatya	291	3.941	6,27	142.100	288	7.317	10,55	142.765
Erzurum	1.900	5.921	9,42	70.119	1.899	5.084	7,33	67.591
Elazığ	120	4.108	6,53	126.596	170	4.768	6,88	127.449
Erzincan	165	5.134	8,16	152.031	165	4.242	6,12	146.531
Ankara	276	4.224	6.72	113.825	496	3.300	4,76	93.440
K.Maraş	300	2.205	3,51	67.330	300	2.055	2,96	60.465
Samsun	0	2.107	3,35	69.637	1	2.157	3,11	69.577
Tokat	0	1.753	2,79	42.185	0	1.753	2,53	42.185
Mersin	626	1.510	2,40	33.135	623	1.528	2,20	35.045
Kütahya	36	1.968	3,13	53.780	37	1.297	1,87	53.415
Turkey			100.00		20.806		100.00	2.716.317
Total	20.773	62.879		2.763.416		69.334		

Source: TSI, 2016 (Crop Production Statistics) [17]

Table 4. Turkey's Mulberry foreign trade

Years	Export (Ton)	Export (Ton) AB 27-28	Import (Ton)	Import (Ton) AB 27-28
2010	753	473	1.232	30
2011	1.095	517	2.088	41
2012	1.924	1.238	886	117
2013	3.751	2.067	630	79
2014	3.773	2.070	4.616	145

Source: TSI, 2016 (Crop Production Statistics) [17]

Table 5. Mulberry consumption and Mulberry adequacy grade

Years	Consumption (Ton)	Consumption per capita (Kg)	Degree of qualification (%)
2010	64 002	0.9	99,3
2011	65 784	0.9	98,6
2012	61 823	0.8	101,6
2013	60 270	0.8	104,8
2014	53 996	0.7	98,6

Source: TSI, 2016. (www.tuik.gov.tr/PdfGetir.do?id=2166) [18]

5. MULBERRY PRODUCTION IN ADIYAMAN

Mulberry cultivation in Adıyaman is not very common, and the mulberry fruit is presented to the market freshly for a short time and for the purpose of evaluating the needs of the growers. However, in recent years Tut, one of the districts of Adiyaman, has come to the forefront with the mulberry identified with his name (Dut is the Turkish translation of the mulberry). The mulberries, which the producers did not even need to collect because they were seen as worthless, nowadays become one of the most important income sources of the local people. The area of mulberry production in Adıyaman has increased by 20 times in the last decade. Especially in the last few years, the increase in the field of production is striking (Table 6). Because of the local people's awareness of the contribution of the mulberry to their own economy, establishing a new mulberry field played a role in this increase. The total number of trees and the number of trees giving fruit also doubled.

While the production of mulberry in Adıyaman was 661 tons in 2005, it reached 1,629 tons in 2015. During this period of production, an increase of 2.5 times has been realized. Mass

Table 6. Mulberry production area, production amount, tree count and yields in Adıyaman

Years	Area (da)	Production (Ton)	% change	Tree per average yield (kg)	Number of fruit trees	Number of fruitless trees	Total number of trees
2005	70	661	-	23	28.640	15.360	44.000
2006	79	579	-12.0	19	30.245	14.270	44.515
2007	57	718	24.0	21	33.700	13.720	47.420
2008	57	728	1.4	22	33.840	13.605	47.445
2009	57	901	23.8	23	39.700	12.755	52.455
2010	127	1.180	31.0	23	50.265	11.690	61.955
2011	345	1.477	25.2	29	51.780	12.350	64.130
2012	371	1.502	1.7	28	53.620	10.750	64.370
2013	560	1.484	-1.0	28	53.585	11.985	65.570
2014	1.014	1 319	-110	24	54.490	16.667	71.157
2015	1.384	1.629	23.5	26	61.941	15.156	77.097

Source: TSI, 2016 (Crop Production Statistics) [17]

Table 7. Mulberry production area, production amount, trees counted in Adıyaman provinces

Districts	2013			2014			2015		
	Area (da)	Production (Ton)	Total tree number	Area (da)	Production (Ton)	Total tree number	Area (da)	Production (Ton)	Total tree number
Centre	60	379	15.620	65	394	15.680	70	407	16.190
Besni	6	7	395	4	8	422	4	8	432
Çelikhan	5	210	8.060	5	72	8.200	5	148	8.800
Gerger	0	269	14.000	0	216	14.000	0	203	14.000
Gölbaşı	5	38	1.660	5	39	1.660	5	42	1.660
Kahta	0	424	15.100	0	426	14.900	0	426	14.900
Samsat	0	12	700	0	14	700	0	14	700
Sincik	0	3	210	0	3	260	0	8	700
Tut	484	142	9.825	935	147	15.335	1.300	373	19.715
Total	560	1.484	65.570	1.014	1.319	71.157	1.384	1.629	77.097

Source: TSI, 2016 (Crop Production Statistics) [17]

increase in production should be expected with the passing of the newly established mulberry fields in the coming years. In this way, Adıyaman will be able to take the position of a candidate to be in the first place in mulberry production in Turkey. Average yield per tree varies over the years due to seasonal factors. This value ranges between 20 kg and 30 kg and is close to Turkey average.

The cultivation of mulberries in Adıyaman has also been examined in district base. The Tut district is at the forefront of this evaluation. According to the evaluation of the last three years, the field of mulberry production has increased about three times (Table 7). As of 2015, Tut's share in the production area is 94%. In terms of the total number of trees, the superiority of the Tut province is also mentioned. In other districts it is understood that mulberry cultivation is more scattered than mass production. According to the mulberry production, Kahta district is in first place with 426 tons as of 2015 while it is followed by the Central district with 407 tons. Tut is in 3rd place with 373 tons. However, it is estimated that there will be large increases in production as new production areas and fruitless trees become fruitful.

6. CONCLUSIONS AND RECOMMENDATIONS

Along with having a wide spread in the world, mulberry is not yet known in many countries. Although Turkey is one of the motherland and natural sprawl areas of mulberry, it cannot sufficiently evaluate this potential. By increasing the consumption alternatives of the mulberries and improving the protection techniques, it will be possible to contribute to the economy. Considering the potential for export with domestic consumption, it is anticipated that the demand for mulberry and its products will increase further in the coming period. In foreign

markets, local products are attracting interest and are more preferred. This situation should be assessed well and the quality of the local varieties of Turkey should be increased through breeding. In this context, geographical marking, branding and promotional activities should be given importance. In addition, the taste and preferences of the consumers in the exporting countries should be considered in particular and the types and varieties appropriate to the market demands of these countries should be determined. For example, fresh mulberry juice is said to be very popular in China, Japan and Korea, and that it has been produced commercially in recent years. Similarly, in America and Europe, the black mulberry juice market can be similarly evaluated. In recent years, the roles of mulberry trees in the prevention and control of desertification, water and soil conservation, saline-land management and returning the grain plots to forestry have been identified. Meanwhile, multi-usage of mulberry as forage for livestock, for fruit and tea preparation has been gradually explored. Therefore, an innovation occurred in the mulberry industry [19].

When Adıyaman's potential in mulberry cultivation is assessed, it can provide significant contributions to the local economy in the coming years. Mulberry can become a very important product in the development of the region with the added value and employment increase it creates. Encouragement of the production and consumption of the mulberry and its products will contribute to the regional and rural development, which will significantly increase the incomes of small and medium-sized enterprises [7].

Mulberry cultivation in Tut province is an important part of agricultural activity. One of the areas of evaluation of the mulberry leaves is silkworm. Feeding silk bugs only with mulberry leaves will indirectly stimulate mulberry production and increase the demand for mulberry cultivation. This advantage of the climate and location of the Tut province will translate into a significant economic advantage. The production of silk bug, although small, will provide great contributions to the county in terms of employment creation. Some suggestions such as marketing the mulberry leaf as herbal tea and adding it to the products like cake, biscuits and donuts can be put forward. Using mulberry and mulberry leaves, the patents to be taken for the products to be produced in the pharmaceuticals, cosmetics etc. industries should be kept in sight. Mulberry leaf is an important input used in the feed industry as a feed plant for animal fattening. Therefore, this factor has an important potential in mulberry cultivation.

DISCLAIMER

This manuscript was presented at a conference.
Conference Name: "International Conference on Food and Agricultural Economics".
Conference link:
"http://ageconalanya.com/CONFERENCE%20PROGRAMME.pdf"
Date:- 27- 28th April 2017.

COMPETING INTERESTS

Author has declared that no competing interests exist.

REFERENCES

1. Durmuş E, Yiğit A. Türkiye'nin Meyve Üretim Yöreleri. Fırat Üniversitesi Sosyal Bilimler Dergisi. 2003;13(2):23-54.
2. Polat AA. Hatay'ın Antakya İlçesinde Yetiştirilen Bazı Dut Tiplerinin Meyve Özelliklerinin Belirlenmesi. BAHÇE. 2004; 33(1-2):67–73.
3. Erdoğan Ü, Pırlak L. Ülkemizde Dut (*Morus spp.)* Üretimi ve Değerlendirilmesi, Alatarım. 2005;4(2):38-43.
4. Akbulut M, Batu A, Çoklar H. Dut Pekmezinin Bazı Fizikokimyasal Özellikleri ve Üretim Teknikleri. Gıda Teknolojileri Elektronik Dergisi. 2007;2:25-31.
   ISSN: 1306-7648.
5. Şahin A, Cengiz S. 16'ncı Yüzyıl Fiyat Devrimi ve Osmanlı İran Savaşlarının Osmanlı İpekçilik Endüstrisi Üzerine Etkileri. İşletme ve Ekonomi Araştırmaları Dergisi. 2010;1(1): 69-82.
   ISSN: 1309-2448.
6. LI Shun-xiang, Tong Zhi-yuan, Yan Xin-Pei, Cai Guang-Xian, Zheng Qun-Yi, Huang Dan (TCM University of Hunan, Changsha, Hunan 410013, China); The Pharmaceutical Study and Application of Mulberry[J]; Journal of Traditional Chinese Medicine University of Hunan. 2010-08.
7. Ertürk YE, Geçer MK. Üzümsü Meyveler Ekonomisi. IV. Ulusal Üzümsü Meyveler Sempozyumu. 3 5 October 2012. Akdeniz Üniversitesi Ziraat Fakültesi Bahçe Bitkileri Bölümü. 1-18.

8. Tuigong DR, Kipkurgat TK, Madara DS. Mulberry and silk production in Kenya. J Textile Sci Eng 2015;5(201):1-7. DOİ: 10.4172/2165-8064.1000220
9. TOBB (The Union of Chambers and Commodity Exchanges of Turkey) Türkiye Tarım Sektörü Raporu. TOBB Yayın No: 2014/230; 2013. ISBN: 978-605-137-388 s.98 İnternet Available:www.tobb.org.tr (Accessed on 15.07.2016)
10. Doğaka, 2015. TR63 Bölgesi Yaş Sebze Meyve Sektör Raporu 2015. Available:www.dogaka.gov.tr (Accessed on 12.07.2016)
11. Yıldız K, Çekiç Ç, Güneş M. Farklı Dönemlerde Alınan Kara Dut Morus Nigra L Çelik Tiplerinde Köklenme Başarısının Belirlenmesi. Gaziosmanpaşa Üniversitesi Ziraat Fakültesi Dergisi. 2014;26(1):1-5.
12. Güneş M, Çekiç Ç. Tokat Yöresinde Yetiştirilen Farklı Dut Türlerinin Fenolojik ve Pomolojik Özelliklerinin Belirlenmesi. Ulusal Kivi ve Üzümsü Meyveler Sempozyumu. 23-25 October 2013. Ordu. 2004;413-417.
13. Barıtcı İ, Adıgüzel C, Kanat M. General situation of silkworm breeding in Diyarbakir. Dicle Üniversitesi Fen Bilimleri Enstitüsü Dergisi DUFED. 2017;6(2): 77-82.
14. Bhat TA, Choure T. An economic analysis of mulberry raw silk production in traditional and non-traditional states of India. World Journal of Economic and Finance. 2014;1(3):016-020.
15. Global Silk Industry. Statistics International Sericultural Commission; 2016. Available:http://inserco.org/en/statistics (Accessed on 15.01.2018)
16. Manjunath M, Narayanaswamy KC, Savithramma, Harish Babu S, Harishkumar HV. Scenario of mulberry and cocoon production in major silk producing States of India- Application of exponential growth function. Indian Journal of Economics and Development. 2015;(3)8:1-8. ISSN (online): 2320-9836.
17. (TSI) Turkish Statistical Institute. Crop Production Statistics; 2016. Available:www.tuik.gov.tr/PreTablo.do?alt_id=1001 (Accessed on 20.02.2017)
18. (TSI) Turkish Statistical Institute. Crop Product Balance Sheets; 2016. Available:www.tuik.gov.tr/PdfGetir.do?id=2166 (Accessed on 20.02.2017)
19. Qin J, He N, Wang Y, Xiang Z. Ecological ıssues of mulberry and sustainable development. Journal of Resources and Ecology. 2012;3(4):330-339.

Peer-review history:
The peer review history for this paper can be accessed here:
http://www.sciencedomain.org/review-history/23507