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Investigation of Changes of Organic Crops Production in Turkey

Türkiye'de Organik Bitkisel Üretim Miktarının Değişiminin İncelenmesi

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ABSTRACT

Agricultural production is a vital need in terms of ensuring the continuity of the human population and meeting their requirements. Yet, the applications during agricultural production have a determining role on the quality of the final product. In addition to the amount of agricultural production and its economic value, the quality of the obtained product is very important. In this sense, it is known that the products produced with the organic agricultural practices are more nutritious, high quality, they have below the pesticide residue of limited levels or none, compared to conventional. The accessibility to organic food products and the decrease in their prices can be achieved by increasing the amount of production. Evaluating the amount of organic crops production during the pandemic, which has affected all the countries, is important in terms of determining the problems in the production and developing solutions to these problems. The aim of this study was to evaluate the amount of organic crops production during the pandemic period compare to prior periods it in Turkey. In the study, a decrease in the amount of organic crops production was revealed statistically and some suggestions given for increasing it, and in addition, the differences of organic farming production method from other methods were included.

Keywords: Sustainability, organic, conventional, quantity of production, coronavirus

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ÖZET

Tarımsal üretim, insan nüfusunun devamlılığının sağlanması ve ihtiyaçlarının karşılanması açısından hayati bir öneme sahiptir. Ancak, tarımsal üretim sırasında uygulanan işlemler son ürün kalitesi üzerinde belirleyici bir rol oynamaktadır. Tarımsal üretim miktarı ve ekonomik değerinin yanında elde edilen ürünün kalitesi de oldukça önemlidir. Bu anlamda organik tarım uygulamaları ile üretilen ürünlerin konvansiyonel ürünlere kıyasla daha besleyici, kaliteli, sınırlı düzeyde veya hiç pestisit kalıntısına sahip olduğu bilinmektedir. Organik gıda ürünlerine ulaşılabilirlik ve fiyatlarındaki düşüş, üretim miktarı artırılarak sağlanabilir. Tüm ülkeleri etkisi altına alan salgın sürecinde organik bitkisel üretim miktarının değerlendirilmesi, üretimde var olan sorunların belirlenmesi ve bu sorunlara çözüm geliştirilmesi açısından önemlidir. Bu çalışmanın amacı, Türkiye'de salgın dönemindeki organik bitkisel üretim miktarını öncesindeki dönemlerle karşılaştırmalı olarak değerlendirmektir. Çalışmada, organik bitkisel üretim miktarındaki azalma, istatistiksel olarak ortaya konulmuş ve artırılması konusunda verilen bazı önerilere ek olarak organik tarımsal üretim yönteminin diğer yöntemlerden farklarına da değinilmiştir.

Anahtar kelimeler: Sürdürülebilirlik, organik, konvansiyonel, üretim miktarı, korona virüsü

INTRODUCTION

Agricultural production is a vital need in terms of ensuring the continuity of the human population and meeting their requirements. Agriculture refers to the ways in which the global human population and its intended goals are sustained by obtaining food and other products from crops, nature, living things, animals, etc. in nature. Conventional farming generally refers to a mode of production in which agrochemical practices are applied intensively (Kaya, 2021b), including the cultivation of genetically modified high yielding crops varieties (Arslan et al., 2020). In conventional farming, chemical inputs are used regardless of whether they are certified based on products and after the application, these crops are harvested and marketed without waiting for the pesticide and chemical ingredients to leave the products (Keskin et al., 2021). Thus, there is the consumption of products containing intense chemical, pesticide, and growth promoting hormone (Arslan, 2021).

The sustainable agricultural activities is important such as good agricultural practices or organic farming to reduce environmental damage (Ak, 2004; Merdan, 2014). Organic farming is classified among sustainable farming methods, the use of synthetic and certain chemical pesticides, growth promoting hormones, and synthetic mineral fertilizers is prohibited, and many environmentally friendly techniques such as organic and green fertilization, soil conservation, and rotation are recommended (Arslan, 2021). Organic agricultural products are considered as superior in quality to products obtained by conventional methods (Bickel & Rossier, 2015; Arslan, 2021). Organic farming aims not only to increase the amount of production but also to increase the quality of agricultural products (Bickel & Rossier, 2015). Food products obtained by the organic farming method are subjected to pesticide residue analysis before they are presented to market. As a result of the research examining the reason for consumers to prefer organic products in the USA in 2017, 26% of them prefer organic products because they are healthy and nutritious, 26% of them because they are more delicious, 45% of them prefer organic products because they are hormone and chemical free, 24% of them prefer organic products because they have positive effects on environment (Hartman, 2017). Increasing farmer income and environmental awareness is among the main reasons for the transition to organic farming (Kaya & Bay, 2020). Organic farming is carried out all over the world and the amount of demand for this is increasing as its importance is understood.

Differences of Organic Farming from Other Agricultural Practices

There are many differences but similar ways of defining organic farming. The most important feature that distinguishes organic farming from other farming methods is that the use of GMO seeds or seedlings is prohibited. Secondly, growth hormones cannot be used in organic crops production. In addition, the synthetic fertilizers and pesticides are prohibited and certain chemicals are

prohibited or restricted. Further, various pesticide residue limit values are examined before or after harvest, and those below the limit can be sold with organic labels, but those above the limit cannot be sold with organic labels. Another difference from other production methods is that it has a label and logo that will provide its own production method and traceability. Also, before an area can be certified as organic, it must undergo a conversion process, which may take 2-3 years depending on the crops. The facilities where organic products are stored and processed must have sufficient qualification conditions. Restricting the differences of organic farming from other agricultural production methods may cause deficient identification of the differences, so these differences have been explained since they are determinant factors.

The organic farming system is environmentally friendly, providing equal or more nutritious foods with less (or no) pesticide residue compared to conventional farming (Reganold & Wachter, 2016). During the coronavirus pandemic, the importance of access to healthy food has been understood at the present time and, although the demand for organic products is expected to increase, there may be a decrease in production, imports and exports due to problems in production or supply chains. The aim of this study was to evaluate the amount of organic crops production during the pandemic period compare to prior periods it in Turkey and put forward statistical results of the situation.

Material and Method

The amount of organic crops production is important for the world and Turkey. In this study, amount of organic crops production was evaluated during the pandemic period compare to prior periods in the world and Turkey and, the statistical results of the situation were presented. For this purpose, the statistical data in the world and Turkey were examined. The TUIK (2021), FIBL statistics, report of FIBL and IFOAM sources, where statistics are kept, were evaluated in order to reveal the organic crops production quantities. In Turkey, organic crops production data were compared according to regions (7 regions) and provinces. Additionally, the data compared consist of an amount of area used for organic farming, amount of organic production, number of organic farmers, exported and imported organic product quantity, income obtained from the organic products, and farming area of organic crops production.

Result and Discussion

Organic Crops Production in the World

It has been estimated that the agricultural area in the world is approximately 5 Billion hectares and the agricultural area in the world constitutes 37% of the total terrestrial area (FAO, 2019). The area harvested in the world is 1.384 billion hectares (FAO, 2019) and organic farming is carried out in 187 countries in a total area of 72.3 million ha according to the data end of 2019 (Willer et al., 2021). According to the 2019 year-end-data, the organic farming area constituted 1.5% of the total agricultural areas (Willer et al., 2021). Most of the organic farming countries (93 different standards in 93 countries) have their own organic farming legislation, but in the products exported, compliance with the country's export standards can be observed (Willer et al., 2020). Some countries are very strict about the rules, while some are more flexible. Australia has the largest organic farming area (35.6 million hectares), followed by Argentina (3.4 million hectares) and China (3 million hectares) (Willer & Lernoud, 2019). The countries with the largest share in terms of total organic farming area are Liechtenstein (37.9%), Samoa (37.6%), and Austria (24%), respectively (Willer & Lernoud, 2019). In 2017, it was reported that the income from organic agricultural products in the world was 90 billion Euros (97 billion US dollars) and the countries that earned the highest income from organic products were US (40 billion euros/ 45.2 US billion $) Germany (10 billion euros / 11.3 US billion $) and France (7.9 billion euros/8.9 US billion $), respectively (Willer & Lernoud, 2019). The average per capita expenditure for organic agricultural products was reported to be 12.8 US dollars (10.8 euros) in the world, and the countries with the highest level of consumption per capita for organic products were Switzerland (288 euros / 325 US dollars), Denmark (278 euros / 315 US dollars) and Sweden (237 euros / 268 US dollars), respectively in 2017 (Willer & Lernoud, 2019).

The total increase parameters in organic farming between 2008 and 2019 in the world are given in Table 1. According to the results of this analysis, the organic farming area increased by 2.1 times, the number of farmers in organic farming increased by 2.2 times, and the income from organic farming increased by 3.1 times.

Table 1. Organic agricultural production in the world

Year	Organic area (million ha)	Organic farmers (million)	Organic retail sales (million €)
2008	34.5	1.4	34.1
2009	36.3	1.8	36.9
2010	35.7	1.6	41.3
2011	36.7	1.8	43.9
2012	36.8	1.9	49.6
2013	43.1	1.9	54.9
2014	48.7	2.1	61.4
2015	50.4	2.2	75.3
2016	58.2	2.5	84.5
2017	69.5	2.9	92.1
2018	71.5	2.8	96.7
2019	72.3	3.1	106.4

*FIBL Statistics (2020)

Organic Crops Production in Turkey

Kızılaslan & Olgun (2012) stated that Turkey is suitable for organic farming system in terms of both biological and genetic diversity. Turkey has started organic production with raisins, dried figs, dried apricots, and hazelnuts for export with the contracted agriculture system under the leadership of European organic farming companies since the 1980s (Demiryurek, 2004), and presently there is an increase in processed organic products. There are serious increases in the growing area and production amount of organic products (Kaya, 2021b).

Turkey ranks first among the European countries in terms of having the biggest number of farmers in the field of organic farming but it ranks eighth among the countries with the highest area in organic farming in the world (Willer & Lernoud, 2019). Turkey, ranked seventeenth in total areas of organic farming (520 886 ha) in the world by the end of 2017 (Willer & Lernoud, 2019). Organic product varieties grown in Turkey are reported being as 213 (TUIK, 2020). According to the result of statistical indicators in Turkey from 2008 until 2018; organic agricultural production area increased approximately by 5.9 times, the number of organic farmers by 5.2 times, the income derived from organic sales approximately by 19.5 times (until 2014) and the amount of organic agricultural production by 4.8 times (Table 3). When the development in Turkey between 2008 and 2018 is examined, thus increasing organic land use, organic farmer and organic product revenues have increased more rapidly in Turkey than in the world. Organic farming activities started in the Aegean region (Deviren and Celik, 2017), and spread all over Turkey. In the 2000s, it gained a new dimension and reached a sectoral range that could be classified as organic crops, processed organic food products, and other organic food and agricultural products. While only 8 products (Deviren and Celik, 2017) (in Aegean Region) were grown in the first years, a total of 213 organic product varieties were grown in 2019. In the future, organic farming activities are expected to increase in Turkey (Kaya, 2021a).

However, as of 2019, a decrease occurred with the coronavirus pandemic that affected the whole world.

Although this decrease cannot be directly associated with the coronavirus pandemic, it can be said to be effective (Table 3). While organic agricultural area was 646.2 thousand ha in 2018, this value decreased by approximately 2.4 times and reached 267.9 thousand ha. The number of farmers decreased by approximately 1.9 times and the amount of production decreased by 2.2 times.

Table 2. Organic crops production in Turkey

Year	Organic area (million ha)	Organic farmers (thousand)	Organic retail sales (million €)	Production (million ton)
2008	109.4	15.4	2.4	0.5
2009	325.8	35.6	10.9	0.9
2010	383.8	43.1	19.8	1.3
2011	442.6	43.7	23.5	1.7
2012	523.6	57.3	34.2	1.8
2013	461.4	65.0	37.4	1.6
2014	491.9	71.5	46.2	1.6
2015	486.1	69.9		1.8
2016	523.8	67.9		2.5
2017	520.9	75.1		2.4
2018	646.2	79.6	No Data	2.4
2019	**386.1**	**53.8**		**2.0**
2020	**267.9**	**40.9**		**1.1**

*FIBL Statistics (2020) and TUIK (2020)

According to the statistical data of 2018, 2019 and 2020, out of 213 organic products grown in Turkey, the amount of the 10 most grown organic products is given in Table 4. According to 2018 data, it is seen that the most produced organic crops in Turkey were olive (213.4 thousand ton), wheat (195.1 thousand ton) and apple (171.6 thousand ton), respectively. For 2019, they were olive (154.7 thousand ton), grape (131.8 thousand ton) and wheat (126.7 thousand ton) products, respectively. By 2020, it was determined that the first three products were grapes (115.8 thousand ton), olives (114.4 thousand ton) and wheat (93.7 thousand ton), respectively. According to the data, despite a decrease in the amount of production after 2018, the most produced product types were the same in general. A decrease in the amount of production is clearly seen. Increasing the amount of production of these products, which have high economic and nutritional value, will be beneficial for the country.

Table 3. Top 10 most produced organic products in Turkey in 2018, 2019 and 2020

Rank	2018		2019		2020	
	Product	Quantity (thousand ton)	Product	Quantity (thousand ton)	Product	Quantity (thousand ton)
1	Olive	213.4	Olive	154.7	Grape	115.8
2	Wheat	195.1	Grape	131.8	Olive	114.4
3	Apple	171.6	Wheat	126.7	Apple	93.7
4	Alfalfa	133.4	Apple	116.5	Wheat	88.5
5	Grape	116.3	Alfalfa	108.9	Fig	82.2
6	Fig	89.5	Fig	85.0	Barley	74.9
7	Trefoil	67.9	Barley	63.1	Apricot	53.3
8	Pomegranate	59.2	Apricot	60.6	Alfalfa	46.2
9	Apricot	58.8	Oat	49.0	Corn	46.0
10	Barley	56.3	Trefoil	47.9	Oat	39.6

Ministry of Agriculture and Forestry of Turkey (2021)

In Turkey, according to 2018 data, the Eastern Anatolia region is the region that performs the highest level of organic agricultural activities (Table 5). As a result of the comparison of the total agricultural area and organic farming areas in the regions, it is seen that the region with the highest percentage is Eastern Anatolia, followed by the Aegean and Black Sea regions, respectively. The regions with the highest number of organic farmers were the Black Sea (25.7 thousand), Aegean (23.9 thousand) and Eastern Anatolia (14.6 thousand) regions, respectively in 2018. The reason for these differences may be that the tendencies towards organic farming are affected by geographical conditions, level of consciousness, education and many factors. The Eastern Anatolia region is considered as suitable soils and, accordingly, the transition time to organic farming in this region may be shorter than that in other regions. By increasing the encouragement for organic farming in these suitable lands, it can be ensured that farmers with low organic farming tendencies can participate in this production method. Organic farming can easily almost anywhere in Turkey, which is rich in terms of ecological conditions.

However, as of 2019, a decrease was observed in the amount of production, the number of farmers and the total area where organic farming is practiced. This may be related to the decrease in purchasing power as a result of the increase in the inputs used in the cultivation of crops. As of 2019, the biggest decrease in terms of the organic farming area was in the Central Anatolia region with a rate of approximately 26.7% (2018: 82.1 thousand ha 2020: 21.9 thousand ha). Organic land area, which was 626.8 thousand hectares in 2018, decreased to 386.1 thousand hectares in 2019 and to 267.9 thousand hectares in 2020. While the amount of organic agricultural production was 2.4 million ton in 2018, it decreased to 1.4 million ton in 2019 and to1.1 million ton in 2020. While the number of organic farmers was 79.5 thousand in 2018, it decreased to 53.8 thousand in 2019 and 40.9 thousand in 2020. Organic agricultural production is important in terms of increasing nutrition quality of final products. However, according to statistics, it is clearly seen that the amount of organic agricultural production has decreased in recent years.

Table 4. Distribution of organic agricultural parameters in Turkey according to regions

Regions in Turkey	Year	Total farming area (million ha)	Organic farming area (thousand ha)	Organic farming area (%)	Organic crops production (ton)	Organic farmers (thousand)
Eastern Anatolia	2018	2.5	208.9	8.4	778 395	14.6
	2019	2.5	181.1	7.2	515 953	13.6
	2020	2.5	95.5	3.8	332 294	6.3
Aegean	2018	2.8	136.9	4.9	751 900	23.9
	2019	2.8	94.7	3.4	476 398	17.7
	2020	2.8	77.2	2.8	380 529	13.3
Black Sea	2018	2.8	84.9	3.0	165 005	25.7
	2019	2.8	53.2	1.9	111 741	17.5
	2020	2.8	34.2	1.2	91 390	17.4
Central Anatolia	2018	7.8	82.1	1.1	279 694	2.1
	2019	7.7	18.5	0.2	137 653	1.8
	2020	7.7	21.9	0.3	181 688	1.6
Southeastern Anatolia	2018	2.8	69.2	2.5	272 745	9.4
	2019	2.8	16.9	0.6	69 845	1.6
	2020	2.8	16.0	0.6	71 125	0.9
Mediterranean	2018	2.3	21.9	1.0	79 164	1.5
	2019	2.2	15.2	0.7	40 767	0.6
	2020	2.2	17.3	0.8	44 414	0.5
Marmara	2018	2.3	19.4	0.8	43 976	2.3
	2019	2.3	6.5	0.3	22 177	0.9
	2020	2.3	5.7	0.2	21 969	0.9
Total	2018	23.3	626.8	2.7	2 370 879	79.5
	2019	23.1	386.1	1.7	1 374 534	53.8
	2020	23.1	267.9	1.2	1 123 409	40.9

Ministry of Agriculture and Forestry of Turkey (2021)

According to the statistical data of 2018 and 2019 in Turkey, the most exported products are given in Table 5. The results showed that the wheat and wheat products (2018: 41.6; 2019: 31.2 thousand ton), the fruit and fruit products (2018: 25.9; 2019: 16.7 thousand ton) and the grape and grape products (2018: 10.6; 2019: 9.5 thousand ton) are the most exported ones of 213 varieties of organic crops produced in Turkey, respectively. Approximately 4.3% (104 291 / 2 370 879*100) of the total organic crops produced in Turkey were exported in 2018 and 5.6% (76 860 / 1 374 534*100) in 2019 were exported. Although there was a decrease in all exported vegetable products between the two years, there was an increase in figs and fig products and peanut products. In addition to the exported products, the determination and implementation of the necessary policies to increase production will both contribute to the country's economy and make positive contributions to the income level of the farmers. Exports can supply an ever-increasing demand at higher prices, and thus farmers can convert their conventional production to organic production (Boz & Kaynakci, 2019).

Table 5. Organic products exported to the other countries in 2018 and 2019 by Turkey

Year	Products	Production (ton)	Income (million $)
2018	**(1)** Wheat and wheat products	**41 634**	131.1
2019		31 195	11.9
2018	**(2)** Fruit and fruit products	**25 964**	48.3
2019		16 734	65.2
2018	**(3)** Grape and grape products	**10 572**	26.4
2019		9 536	27.9
2018	Fig and fig products	6 896	40.3
2019		7 997	51.9
2018	Nut and nut products	5 357	40.0
2019		4 441	31.9
2018	Apricot and apricot products	4 774	22.6
2019		3 744	14.7
2019	Vegetable and vegetable products	5 407	5.9
2019		1 147	1.7
2018	Other products	2 979	9.3
2019		1 665	5.2
2018	Olive and oil products	708	4.1
2019		178	0.4
2018	Spices	1 028	4.5
2019		138	1.9
2018	Pistachios	27	0.8
2019		86	1.6
2018	**Total**	**104 291**	**361 134 369**
2019		**76 860**	**214 411746**

Ministry of Agriculture and Forestry of Turkey (2020)

Conclusions

Organic agricultural production can be seen as a means of sustainable production for the environment, human beings, and living creatures in nature and future generations. In this sense, it is very important to increase the production of organic farming, which is one of the sustainable methods, and ensure the sustainability. Until the end of 2018, organic agricultural production followed a highly increasing trend all over the world. However, although it cannot be directly associated with the pandemic, it has been determined that it started to decline in 2019. The decreasing may be due to increased costs, inflation and deterioration in the health status of the farmers or increased costs of inputs in organic farming. Determining the reasons for the decrease in production will contribute to the development of solutions to increase the production amount. Increasing organic agricultural production can be achieved by bringing into fertile lands that are not used for agriculture but suitable for farming, enhancing the working conditions of farmers and presenting them a good business opportunity. For this purpose, the vertical farming method can also be used to increase organic production. With the right marketing strategies, the organic product consumption tendencies of consumers can be increased. Product price affects demand and purchasing, for this reason, appropriate methods should be defined and implemented to reduce the cost of organic products. Further, presentation of organic products in places where consumers can easily obtain them, such as supermarkets, can also contribute to enhancement of the market.

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