ARAŞTIRMA MAKALESİ	RESEARCH ARTICLE

Determination of Location Quotient of Organic Agriculture in Türkiye

Türkiye'de Organik Tarımın Yoğunlaşma Katsayısının Belirlenmesi

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Abstract

The main objective of the study is to determine in which provinces organic agriculture is clustered in Türkiye. Location quotient is one of the most widely used indices in regional concentration measurements and expresses the degree of specialization of a certain production activity within a country/region/sector or the relative concentration of a certain production activity in a certain region. In this direction, within the scope of the study, it is aimed to determine the location quotient of organic agriculture, which provides competitive advantage throughout Türkiye, and it is envisaged to determine the location quotient in this direction. In determining the location quotient, the amount of production, which is one of the best indicators of economic performance, was used. As a matter of fact, the amount of production is the most important indicator showing which production activity is more dominant and the location quotient to be calculated takes a value between 0 and infinity (∞). If the relevant production activity has a score greater than 1, it indicates that the activity is the main production activity that is concentrated/specialised in the region. However, if the score is less than 1, it indicates that the activity is a local one that is not sufficiently concentrated/specialised in the region. Following the analysis, Eastern Anatolia and Central Anatolia are the regions with the highest concentration of organic agriculture production. The top 10 provinces with the most concentrated organic agriculture production are Van (7), Ağrı (6), Ankara (6), Bayburt (6), Erzurum (6), Çanakkale (5), Kars (5), Muş (5), Niğde and Sivas. The most widely produced crops are alfalfa (18), wheat (16), tomato (15), apple (14), maize (12), barley (12), hazelnut (9), sainfoin (9), olive (9), oat (9) and vetch (9). Localized and intensified organic farming systems have proven effective in generating high income per unit of land, optimizing agricultural land utilization, and ensuring sustainability. They also provide specialized labour forces, sector-specific inputs, and the use of advanced technologies. Therefore, it is believed that the formations will enhance the economic, social, and environmental sustainability of the region by increasing productivity and promoting the growth of organic agriculture. This will lead to significant benefits for the region's development.

Keywords: Regional economic activity, Organic agriculture, Location quotient

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Öz

Çalışmanın temel amacı, Türkiye'de organik tarımın hangi illerde kümelendiğini belirlemektir. Konum katsayısı, bölgesel yoğunlaşma ölçümlerinde en yaygın kullanılan endekslerden biridir ve belirli bir üretim faaliyetinin bir ülke/bölge/sektör içindeki uzmanlaşma derecesini veya belirli bir üretim faaliyetinin belirli bir bölgedeki göreli yoğunlaşmasını ifade eder. Bu doğrultuda çalışma kapsamında Türkiye genelinde rekabet avantajı sağlayan organik tarımın konum katsayısının belirlenmesi amaçlanmış ve bu doğrultuda konum katsayısının belirlenmesi öngörülmüştür. Konum katsayısının belirlenmesinde ekonomik performansın en iyi göstergelerinden biri olan üretim miktarı kullanılmıştır. Nitekim üretim miktarı hangi üretim faaliyetinin daha baskın olduğunu gösteren en önemli göstergedir ve hesaplanacak konum katsayısı 0 ile sonsuz (∞) arasında bir değer alır. İlgili üretim faaliyetinin 1'den büyük bir skora sahip olması, ilgili faaliyetin bölgede yoğunlaşmış/uzmanlaşmış ana üretim faaliyeti olduğunu gösterir. Ancak puanın 1'den küçük olması, faaliyetin bölgede yeterince yoğunlaşmamış/uzmanlaşmamış yerel bir faaliyet olduğunu gösterir. Analiz sonucunda, Doğu Anadolu ve Orta Anadolu organik tarım üretiminin en yoğun olduğu bölgelerdir. Organik tarım üretiminin en yoğun olduğu ilk 10 il sırasıyla Van (7), Ağrı (6), Ankara (6), Bayburt (6), Erzurum (6), Çanakkale (5), Kars (5), Muş (5), Niğde ve Sivas'tır. En yaygın olarak üretilen ürünler yonca (18), buğday (16), domates (15), elma (14), mısır (12), arpa (12), fındık (9), korunga (9), zeytin (9), yulaf (9) ve fiğdir (9). Yerelleştirilmiş ve yoğunlaştırılmış organik tarım sistemlerinin birim arazi başına yüksek gelir elde etmede, tarımsal arazi kullanımını optimize etmede ve sürdürülebilirliği sağlamada etkili olduğu kanıtlanmıştır. Ayrıca uzmanlaşmış işgücü, sektöre özgü girdiler ve ileri teknolojilerin kullanımını da sağlamaktadırlar. Bu nedenle, oluşumların verimliliği artırarak ve organik tarımın büyümesini teşvik ederek bölgenin ekonomik, sosyal ve çevresel sürdürülebilirliğini geliştireceğine inanılmaktadır. Bu da bölgenin kalkınması için önemli faydalar sağlayacaktır.

Anahtar Kelimeler: Organik tarım, Bölgesel ekonomik faaliyet, Yoğunlaşma katsayısı

1. Introduction

Due to developments in international trade, the competitiveness of regions with abundant production factors based on cheap production has come to an end. Accordingly, the need has increased to review and redefine the competitiveness of regions that can be considered economically stagnant and to determine the factors that improve this strength. In line with this need, the regional competitiveness of companies is calculated, which shows their ability to offer the goods and services they produce to international markets due to low costs and quality.

Since each province has a different demographic structure, infrastructure, natural wealth, socio-cultural structure and agricultural structure, there are differences in the development, income and expenditure distribution, industrialization and social and economic development indicators of the provinces. Regional development strategies are important to reduce these differences between the provinces. Regional development strategies aim to determine the development potential of regions and eliminate development disparities between regions. By ensuring social and economic development, regional disparities are reduced and socio-economic development is achieved throughout the region. The development of the underdeveloped region, which is a part of the economic system, also supports the development of the upper region. This situation serves the same purpose by expressing the harmony between regional and national development. (Bayraktutan, 1994).

The determination of the primary sector in a region in the economy is generally determined by the distribution of the employment structure of workers in that region across sectors. This distribution among main and non-main sectors can be calculated not only by employment, but also by the number of enterprises, production value, labor wages, production volume or foreign trade volume. Three methods are commonly used to examine these economies. The first of these methods is the hypothetical method. This is a qualitative method in which the sectors are hypothetically determined main on sector knowledge, experience and experience in determining the dominant sector in the region. The second method is the minimum requirements method, in which comparisons are made with regions of a similar size and conclusions are drawn on the basis of similarities. The third method is the location quotient method, which is a quantitative analysis. This method uses various indicators to determine the predominant sector or production activity in a region. These indicators are generally quantitative data such as employment, production volume, production value, wages and number of companies. The main objective of this study is to identify the organic agricultural products concentrated in each province. To achieve this goal, the study calculates concentration ratios main on the production values of organic products in each province, revealing which organic product is the primary production activity in each province. When interpreting the specialization of provinces and production activities, it is not sufficient to evaluate each province on its own. For this reason, a location quotient is needed that allows both regional and production activities to be interpreted together, taking into account the share of each product volume in the total country. In addition, the calculated coefficient can easily be interpreted as a specialization ratio, as it compares the provinces and production activities with each other and with the country (Öztürk, 2018).

The location quotient has been used in the international literature to calculate concentration in many different sectors and regions (Leigh, 1970; Miller et al., 1991; Chiang, 2009; Campaniaris et al., 2015; Weterings and Marsili, 2015; Brosnan, 2017)and in Türkiye, the differences between regions have been examined by using the location quotient especially in entrepreneurship (Öztürk, 2018), manufacturing industry (Eser and Köse, 2005; Falcioğlu and Akgüngör, 2008; Yavan and Şahin, 2014; Altuğ, 2017), production activities (Öz, 2004), agriculture sector (Kazancık, 2007), logistics sector (Deliktaş and Çelik, 2019), textile sector (Urhan and Sandal, 2019) and education sector (Çiftçi, 2018).

The location quotient is a widely used measure in the agricultural sector for identifying the main sectors and sub-sectors by province and district. This measure has been studied by various authors. However, while calculating the location coefficient, agricultural income is sometimes used in some studies, employment and production values are used in other studies. (Wicaksono, 2011; Irham and Mulyo, 2016; Kartikawati and Sundari, 2019; Kim et al., 2019; Lee, 2020; Anwar et al., 2021; Sausan et al., 2022). Some studies have used location quotient with micro data to measure the economic potential of a region (Aliyu et al., 2023) and to investigate the characteristics of agricultural community activities by region (Lee, 2020). In some studies, it is emphasized that producing in regions with high LQ values increases specialization. (Kim et al., 2019). Therefore, this coefficient was used in the study to identify regions where organic agriculture is more advantageous. The study tested the hypothesis that there is a difference between provinces with high production and provinces with high concentration. For this reason, the

location coefficient was calculated to investigate the homogeneity of organic production activities among provinces in Türkiye. We aimed to determine the reasons for the differentiation of this distribution by geographical units and how these differences contribute to the agricultural sustainability of the enterprises and the region. Identifying the regions where organic agriculture is concentrated can reveal potential opportunities for its development.

This paper focuses on the amount of production as the main variable, which is an indicator of the economic size and importance of a sector or activity. Unlike other empirical studies, subjective evaluations are excluded from this analysis. This paper focuses on the amount of production as the main variable, which is an indicator of the economic size and importance of a sector or activity. Using output as a variable can reveal the efficiency, effectiveness, and competitiveness of a sector or activity in a region compared to other regions or countries. This information can be valuable for regional development and planning.

2. Materials and Methods

The data used in the study were taken from the Organic Farming Information System (OTBIS) of the Ministry of Agriculture and Forestry and the production data for the year 2022 were analyzed. With the help of statistics for each province and product, the location quotient of organic agriculture in Türkiye was analyzed. In this context, the location quotient used in the study shows the degree of specialization of a certain production activity within the country/region/sector and expresses the relative concentration of a certain production activity in a certain region. This method, developed by Hildebrand and Mace (1950),was first used to determine in which sectors the labor force was concentrated in Los Angeles, USA. This coefficient is determined by the following formula for sector i/production activity operating in the region at the time.

$$LQ_i = (\frac{e_i}{e_T} / \frac{E_i}{E_T}) * 100 \qquad \text{(Eq 1)}.$$

LQ stands for the location quotient, "e" stands for the provinces of Türkiye, "E" stands for Türkiye, "i" stands for the volume of production in the respective production activity and "T" stands for the total volume of production of organic products. In determining the location quotient, the production volume was used, which is one of the most meaningful indicators of economic performance. The scale of production is the most important indicator showing which production activity is more dominant, and this coefficient to be calculated takes a value between 0 and infinity (∞). If the corresponding production branch is greater than 1, it means that this production branch is the most important specialised production branch in the region, and if it is less than 1, it means that this production branch is the local production branch that is not sufficiently specialised in the region (*Table 1*) (Yardımcı, 2014; Alkan and Bilim, 2021). As a result of the analysis, it was determined which organic products are considered basic production or local production in which regions.

Table 1. Location quotient group values and clustering status

Group	LQ	Cluster Status
1	Less than 0.50	None
2	between 0.50-0.99	Very Low
3	Between 1.00-1.09	Centre
4	1.10-1.24	High
5	1.25 and above	Very high

3. Results and Discussion

3.1. Organic agriculture in Türkiye: area and production distribution by province

Regional economic differences in the agricultural sector show the imbalances between agricultural production and income levels in different regions. These differences result from the interaction of many factors and include many variables that influence the agricultural economy. Economic differences are usually caused by a combination of factors such as geography, climate, soil structure, investment opportunities, technological infrastructure, agricultural policy and marketing opportunities. Alternative agricultural systems are discussed to eliminate these differences, in other words, to reduce economic disparities between regions.

Alternative farming systems in the agricultural sector include cultivation practices such as organic farming, good agricultural practices, greenhouse production systems, underwater cultivation, etc. Among these practices, organic farming is recognized as the most important nature-friendly, environmentally friendly and sustainable agricultural approach. Organic farming is described as "an agricultural system that takes into account human and animal health, considers the soil, water and other environmental factors with a holistic approach, prohibits the use of chemical agents, contributes to the reconstruction of the ecosystem and thus protects the ecological balance. At the same time, organic farming is referred to as "certified production" because it is certified and controlled within the framework of international and national legislation (Kirazlar, 2001; Demir and Gül, 2004; Turhan, 2005; Çakmakçı and Erdoğan, 2005; Ayla, 2011; Merdan and Kaya, 2013; Demiryürek, 2016; Çetin et al., 2020; Süzer, 2020; Bayramoğlu et al., 2021).

Table 2. Total number of organic agriculture farmers, production area and production amount by province

City's	Number of Farmers	Total Area (hectare)	Production Amount (Tonnes)	City's	Number of Farmers	Total Area (hectare)	Production Amount (Tonnes)
Adana	76	8779.61	20541.99	Kahramanmaraş	118	765.46	6831.76
Adıyaman	92	450.31	6559.48	Karaman	103	261.70	1299.21
Afyonkarahisar	812	3068.74	37207.09	Kars	930	17281.14	86611.43
Ağrı	842	21185.48	52852.95	Kastamonu	32	7217.65	3515.33
Aksaray	4	7.92	190.13	Kayseri	42	92.66	6367.94
Amasya	7	62.16	124.27	Kırıkkale	3	8.11	70.46
Ankara	56	3773.37	19676.93	Kırklareli	6	27.74	79.43
Antalya	44	4761.34	15470.02	Kırşehir	5	69.01	142.25
Artvin	2035	2767.02	3353.47	Kilis	297	2217.65	5464.24
Aydın	6606	38802.67	140741.10	Kocaeli	11	107.98	1374.89
Balıkesir	148	2108.38	3012.03	Konya	394	1959.10	20375.42
Bartın	124	191.51	593.71	Kütahya	27	171.33	564.72
Batman	10	363.78	1682.52	Malatya	893	4629.08	49046.97
Bayburt	28	99.65	582.05	Manisa	1526	11200.27	167891.20
Bilecik	68	90.42	1432.70	Mardin	160	7473.98	53452.38
Bitlis	82	1514.18	6661.81	Mersin	123	588.83	8672.81
Bolu	8	38.38	969.68	Muğla	510	2860.38	6717.18
Burdur	21	165.41	470.36	Muş	425	6834.66	24273.60
Bursa	82	326.38	3225.14	Nevşehir	25	121.42	259.71
Çanakkale	275	2063.48	8999.59	Niğde	313	7270.45	164311.30
Çorum	5	7.21	43.03	Ordu	1149	3035.85	7074.73
Denizli	22	122.39	1086.73	Osmaniye	1	19.54	33.42
Diyarbakır	78	194.52	248.45	Rize	10566	3913.44	47820.89
Düzce	289	857.88	3220.00	Sakarya	324	736.91	2264.53
Edirne	2	35.74	35.12	Samsun	1352	4424.54	27199.25
Elazığ	92	666.77	5307.12	Sinop	30	1541.07	559.66
Erzincan	80	767.78	5618.95	Sivas	327	7743.30	18791.74
Erzurum	55	983.07	3702.77	Şanlıurfa	198	6857.73	32676.20
Eskişehir	13	622.26	11188.81	Tekirdağ	5	59.04	318.70
Gaziantep	68	887.83	2628.67	Tokat	52	101.94	995.66
Giresun	19	109.08	157.64	Trabzon	1700	1977.87	3625.97
Gümüşhane	3	1.15	2.05	Tunceli	96	352.56	1068.22
Hatay	48	337.74	2551.61	Uşak	5	18.63	51.00
Iğdır	1	1.88	15.04	Van	51	594.70	2465.24
Isparta	21	100.51	1390.37	Yalova	13	68.19	118.15
İstanbul	14	60.53	431.41	Yozgat	5	196.48	184.91
İzmir	1552	13499.27	34868.41	Zonguldak	832	1425.45	3747.52

TOB (2022)

Organic farming, which is one of the alternative agricultural systems that produce enough to meet the needs of the population without disturbing the ecological balance and polluting the environment, has ushered in a new phase of structural change in the production process. This structural change has gained momentum due to the high awareness of healthy living in the countries. It is believed to play an important role in reducing inter-regional disparities due to environmental protection, quality production, sustainable use of renewable resources, protection of human health, rural development and increased income. The multiplier effect of organic farming, its contribution to employment in rural areas and the fact that trade in organic products is more profitable demonstrate the impact of this agricultural production system on the rural economy and regional development. Organic agriculture is seen as a potential solution to increase the subsistence income of smallholders (Smith and Marsden,

2004; Blanc and Kledal, 2012), while increasing the agricultural motivation of operators who benefit from state support, enabling them to contribute to the environment and rural development (De Master, 2012). A study conducted in Kenya found that organic agriculture has a positive impact on poverty reduction (Ayuya et al., 2015). Another common view on this issue is that organic agriculture increases employment. Studies conducted in the UK (Lobley et al., 2009), Japan (McGreevy, 2012) and Türkiye (Yolcu, 2013) have found that organic agriculture has a positive impact on rural development by increasing employment.

In 2022, Türkiye's organic farming sector saw 36,431 farmers producing 1.153.161.20 tonnes of organic products on 214.101.6 hectares. Rize has the highest number of farmers engaged in organic agriculture, with 10.566 farmers (*Table 2*). Aydın has the largest cultivated area, with 6.606 farmers producing 140.741.10 tonnes of organic products on 38.802.67 hectares. Manisa has the highest production potential. In Manisa, 1526 farmers produced 167891.20 tonnes of organic products on 11200.27 hectares. The highest productivity per cultivated area was found in Kayseri province, with 68.73 tonnes per hectare, while the highest productivity per enterprise was determined in Eskişehir province, with 860.68 tonnes.

Table 3. Number of farmers, production area and production amount by organic products in Türkiye

City's	Number of Farmers	Total Area (hectare)	Production Amount (Tonnes)	City's	Number of Farmers	Total Area (hectare)	Production Amount (Tonnes)
Grape	1766.00	5683.35	127562.61	Soya Bean	29.00	740.13	4731.20
Wheat	2762.00	31138.14	110667.42	Silage Maize	52.00	162.58	4584.43
Olive	8120.00	37085.37	100474.93	Strawberry	272.00	405.64	4572.27
Apple	824.00	6020.91	89785.22	Pistachio	218.00	1668.01	4417.88
Hawthorn	22.00	3156.17	79740.39	Walnut	892.00	2297.73	4297.33
Maize	315.00	3810.51	68519.14	Lentil	138.00	2305.54	4275.34
Fig	4106.00	11365.09	66283.38	Lemon	92.00	96.86	4269.92
Barley	1968.00	15881.70	57905.54	Erik	356.00	694.20	4242.57
Apricot	1348.00	4829.11	53317.98	Chickpea	296.00	1818.68	3131.95
Tea	11575.00	3729.75	48515.95	Tangerine	95.00	119.08	3040.59
Hazelnut	6982.00	14261.65	34562.34	Carrot	61.00	51.83	2975.41
Alfalfa	978.00	5514.24	32283.15	Pear	257.00	1773.67	2828.78
Pomegranate	281.00	1795.08	29131.99	Potato	98.00	65.15	2654.48
Oats	771.00	4524.92	19579.94	Mulberry	204.00	2332.31	2366.08
Tomato	273.00	266.39	16920.23	Beet (Sugar)	61.00	65.07	2115.26
Cherry	1147.00	1453.52	16885.57	Cucumber	160.00	22.89	2036.38
Sainfoin	671.00	3992.65	16261.69	Broccoli	81.00	73.85	2014.81
Vetch	294.00	2308.59	14151.68	Watermelon	122.00	53.97	1938.87
Cotton	197.00	3213.25	13859.00	Beans	276.00	210.80	1930.73
Carob (Harnup)	10.00	4241.39	12975.40	Pine Nuts	675.00	8016.87	1721.50
Sour cherry	892.00	2442.19	12557.06	Cauliflower	73.00	25.83	1481.60
Meadow Grass	729.00	3694.55	10448.01	Eggplant	143.00	14.91	1333.39
Chestnut	1524.00	2636.14	8193.62	Artificial Meadow Pasture	7.00	268.25	1294.51
Pepper	198.00	83.73	8166.02	Banana	19.00	15.89	1125.07
Sunflower	113.00	2200.52	5514.39	Triticale	60.00	303.44	1040.70
Orange	93.00	143.59	5503.37	Others	4503.00	13192.82	18014.78
Almond	268.00	1833.18	4959.28				

TOB (2022)

Türkiye cultivates 246 types of organic products, including grapes, wheat, olives, apples, hawthorn, corn, figs, pear, barley, apricots, and tea. The top three organic crops produced in Türkiye, with a production of over 100,000 tonnes, are grapes, wheat, and olives. The table in the source text shows that organic grapes are produced on 5684.35 hectares by 1766 farmers, with a total production of 127562.61 tonnes. Only 3.07% of the farmers produce organic grapes, which constitute 2.65% of the total organic agricultural area and 11.06% of the total production. Manisa is the leading region in organic grape production, with 1,086 farmers producing 120,926.39 tonnes on 4652.23 hectares of land. Manisa's climate is ideal for grape cultivation due to its location in the Aegean Region, which is characterized by mild winters and hot summers. The number of sunny days, temperature, and rainfall in Manisa are all favorable for grape growth. Additionally, the fertile soils in Manisa are rich in minerals. Manisa province has accumulated knowledge in traditional grape cultivation, which provides an important advantage in transitioning to organic grape cultivation. Additionally, its proximity to major ports such as Izmir Port and a large city offers advantages for marketing and distributing organic grapes. Currently, organic wheat accounts for 4.81% of the total number of farmers, 14.54% of the total cultivated area, and 9.60% of the total production. Organic

wheat is predominantly produced in the Eastern Anatolia Region. Organic wheat production is particularly prominent in the provinces of Kars, Mardin, Ağrı, Muş and Şanlıurfa, which account for 81.21% of the total production. This is due to the fertile soils and natural mineral wealth of these regions, as well as the limited use of chemicals resulting from fewer industrial activities. Additionally, colder winters limit the presence of certain pest species and diseases in these areas. In addition, these regions are rich in *Triticum boeoticum* (2n=14, AA) and *Aegilops speltoides* (2n=14, BB), as well as the tetraploid wheat species *Triticum dicoccoides*, which is a close relative of durum wheat, and archaeological excavations have determined that it has a rich biodiversity in terms of local wheat varieties. (Aktaş et al., 2018). Organic olives are the second most cultivated product after organic grapes and wheat. In total, 100.474.93 tonnes of organic olives are produced on 37,085.37 hectares by 8,120 farmers. Approximately 65% of these olives are produced in Aydın province. The Mediterranean climate is preferred by organic olives, which is characterized by mild winters and hot summers. Olive trees are sensitive to cold winters and frosts, which can cause damage in regions with harsh winter conditions. The optimal temperature range for olive tree growth is between 10°C and 35°C. Regions with an average temperature of 15°C and above and rainfall between 300 and 600 mm per year are considered suitable for olive cultivation. Olive trees are typically cultivated in microclimate areas at an altitude of 400-1000 m. Therefore, the soils of Aydın province are deemed suitable for olive tree cultivation (Çolakoğlu and tunalıoğlu, 2010).

3.2. Location quotient in organic agriculture

Regionally concentrated clusters are recognized as explanatory parameters of economic development. These clusters are both the cause and result of innovations and technologies, particularly entrepreneurship. As concentration increases, the supply of physical and intangible capital elements required by enterprises, particularly input supply, becomes more accessible, accelerating development and setting an example for new initiatives. However, organic agriculture clusters are also viewed as a potential outcome of expanding organic production areas. These clusters involve entrepreneurs or pioneer farmers in the region taking on production and marketing risks. Within the scope of this study, we calculated the location quotient to investigate the homogeneity of organic production activities across provinces in Türkiye. We aimed to identify the reasons for the differentiation of this distribution by geographical units and how these differences contribute to the agricultural sustainability of enterprises and the region.

Merely having a high share of production activities within provincial borders is insufficient for sustainable production in a region. This is because a production activity with a high production amount in one province may not have a relative advantage when compared with other provinces. To determine the main production activities in a province, it is important to evaluate their sustainability by comparing their relative positions with other provinces, rather than solely relying on the absolute position of the relevant product within the province. The production potentials, sustainability, and superiority of the provinces were investigated using the location quotient calculation. Table 4 shows the relative positions of provinces in Türkiye regarding the concentration levels of organic agricultural products. The Aegean Region (33.94%) and Central Anatolia Region (21.07%) have the highest concentration of organic agriculture production in Türkiye. However, the Eastern Anatolia Region has the highest concentration of organic agriculture production activities in terms of geographical regions. Table 4 and Figure 1 show that the top 10 provinces for organic agriculture production are Van (7), Ağrı (6), Ankara (6), Bayburt (6), Erzurum (6), Çanakkale (5), Kars (5), Muş (5), Niğde (5), and Sivas (5). The crops with the highest concentration of production activities are alfalfa (18), wheat (16), tomato (15), apple (14), corn (12), barley (12), hazelnut (9), sainfoin (9), olive (9), oat (9), and vetch (9). One of the main findings is that the crops identified in Türkiye can be key or basic production activities.

Table 4 shows that the coefficient value is above 1, indicating that the related production activities are above the average in Türkiye. However, it is worth noting that the coefficient value does not necessarily reflect the quality of the production. Organic agriculture is more commonly produced in the Aegean and Central Anatolia regions due to factors such as soil and climate conditions, cultural and traditional approaches, employment opportunities, and government policies (Kılıç et al., 2023). For instance, although Isparta and Karaman provinces are prominent in intensive apple cultivation using traditional methods, they do not produce organic apples. Conversely, Afyonkarahisar, Eskişehir, Tokat, Erzincan, Kahramanmaraş, and Niğde are leading in organic apple production. This disparity is due to the agricultural transformation processes in these provinces. Organic agriculture is often concentrated in regions outside of the top conventional agriculture producers due to production and marketing

challenges, as well as the profitability of conventional agriculture. Soil and climate conditions, environmental and health awareness, consumer demands, and infrastructure facilities are among the factors that influence provinces' approaches to organic agriculture. It is worth noting that the Black Sea region is the most suitable for traditional tea and hazelnut production, and it is also where organic hazelnut and tea products are concentrated. For the sustainability of agricultural production, it is necessary to adopt an approach in which enterprises carrying out similar or related activities concentrate in a certain region and cooperate with each other to gain an advantage. This approach ensures knowledge and experience sharing, cooperation, and solidarity, as well as the use of technology, market access, and environmental sustainability. It also contributes to reducing socio-economic differences between regions.

In this study, we calculated the concentration coefficient of organic agriculture in Türkiye and investigated the organic agriculture potentials of the provinces. To determine in which provinces organic agriculture is more advantageous, we used the location quotient. Similarly, location quotient has been used in many studies to determine the concentration levels of products according to regions. In these studies, employment, income and trade indicators have been used to determine which products should be produced more (Restiatun, 2009; Basuki and Mujiraharjo, 2017). According to the results obtained from the literature, the potential commodity to be developed is different from each region (Sausan et al., 2022). This may be due to the comparative advantages of the potential commodity from the natural resources that support it or the competitive advantages of the potential commodity from its ability to compete with others (Rozaki et al., 2021). Therefore, a location coefficient value of more than one means that the commodity in the specified region has the potential to be developed (Humaidi and Kertayoga, 2022). Higher value means higher potential. Kim et al. (2019) suggest that the production rate should be above 1% of the national scale and 10% of the provincial scale and the LQ value should be above 2.0, considering the agricultural characteristics of the products. Although this value is not a criterion, it can be considered as an important threshold value in terms of specialization of agricultural products. Lee (2020) found that the results of the LQ analysis show that the specialized regions are different for each activity. Therefore, as a result of the differentiation of LQ values in each region and production activity, LQ values can be used to create strategies for regional planning or community activation. At the same time, LQ value is also used to determine the export potential of products (Darmanto et al., 2020). Accordingly, the export potential of certain products in regions with high LQ values can be evaluated.

Our analysis revealed that Türkiye's organic agriculture concentration coefficients are low, indicating that Türkiye should better evaluate its organic agriculture potential. Türkiye has a suitable climate, soil, water, and biodiversity resources for organic agriculture. Additionally, there is an increasing demand for organic products in both domestic and foreign markets. Therefore, the development of organic agriculture is crucial for regional development and competitiveness. This agricultural method does not harm the environment or human health, limits the use of chemical inputs, and preserves soil fertility and biodiversity. Organic agriculture can efficiently use regional resources, prevent rural depopulation, revitalize local economies, improve regional income distribution, ensure regional branding, and strengthen regional identity. Türkiye should develop policies and strategies to increase the concentration coefficient of organic agriculture.

The LQ value was calculated to identify a region as a superior commodity with the idea that it can sustainably compete with other regions in the production of the same commodity. The LQ value can show a comparison of a region's ability to produce agricultural commodities compared to regional agricultural commodity production. With the LQ value, the ability of a region to produce a commodity can be seen. Therefore, a sectoral approach is needed to identify leading sectors. Finding the results of the main agricultural sub-sector that will become the capability of the sector is necessary to achieve sustainable development results. For this reason, according to the results of our analysis Türkiye's organic agriculture concentration coefficients are low, indicating that Türkiye should better evaluate its organic agriculture potential. Türkiye has a suitable climate, soil, water, and biodiversity resources for organic agriculture. Additionally, there is an increasing demand for organic products in both domestic and foreign markets. Therefore, the development of organic agriculture is crucial for regional development and

Table 4. Location quotient of organic agriculture by province

City/Crops	Grape	Wheat	Olive	Apple	Hawthorn	Maize	Fig	Barley	Apricot	Tea	Hazelnut	Alfalfa	Pomegranate	Oats	Tomato	Chery	Sainfoin	Wetch	Cotton	Carob	Sour Cherry	Meadow Grass
Adana	0.01	0.00	0.02	0.57	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.06	17.53	0.00	0.01	0.11	0.00	0.00	0.00	0.09	0.47	0.00
Adıyaman	0.11	0.00	0.06	0.00	0.00	0.00	0.06	0.17	0.00	0.00	0.00	0.00	30.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Afyon	0.00	0.41	0.00	3.18	0.00	0.03	0.00	0.69	0.04	0.00	0.00	0.46	0.00	0.19	0.32	20.22	0.00	0.14	0.00	0.00	14.55	0.36
Ağrı	0.00	3.80	0.00	0.02	0.00	0.00	0.00	3.65	0.00	0.00	0.00	6.41	0.00	0.07	0.00	0.00	7.23	1.09	0.00	0.00	0.00	5.15
Aksaray	0.03	0.00	0.00	1.87	0.32	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ankara	0.06	0.98	0.00	0.43	0.00	0.05	0.00	1.19	0.50	0.00	0.00	3.14	0.00	2.79	4.86	1.38	0.79	0.05	0.00	0.00	0.05	8.92
Antalya	0.01	0.12	0.02	0.00	0.00	0.00	0.00	0.10	0.02	0.00	0.00	0.01	0.56	0.00	0.41	0.13	0.02	0.02	0.00	72.23	0.00	0.00
Artvin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.41	25.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aydın	0.01	0.10	5.34	0.01	0.00	0.64	6.41	0.03	0.01	0.00	0.00	0.25	0.17	0.01	0.08	0.06	0.00	0.18	3.50	0.00	0.00	0.01
Balıkesir	0.00	0.10	4.69	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	2.08	0.00	0.00	10.08	0.10	0.00	0.00	0.00	0.00	0.00	0.00
Bartın	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	32.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Batman	0.00	8.84	0.00	0.03	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bayburt	0.00	0.67	0.00	0.00	0.00	0.00	0.00	1.14	0.00	0.00	0.00	11.13	0.00	8.07	0.00	0.00	4.07	6.12	0.00	0.00	0.00	2.80
Bilecik	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.04	36.48	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bitlis	0.00	1.40	0.00	0.17	0.00	0.00	0.00	0.89	0.02	0.00	0.00	17.21	0.00	0.00	0.00	0.00	12.69	0.00	0.00	0.00	0.00	6.81
Bolu	0.00	0.25	0.00	0.00	0.00	1.05	0.00	0.34	0.00	0.00	0.00	0.50	0.00	0.21	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Burdur	0.00	2.07	0.01	0.27	0.00	1.23	0.00	0.89	0.00	0.00	0.00	0.38	0.00	0.38	2.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bursa	0.01	0.01	0.05	0.04	0.00	0.01	0.02	0.00	0.01	0.00	0.00	2.02	0.02	0.00	2.25	0.98	0.17	0.11	0.00	0.00	0.21	0.00
Çanakkale	1.05	0.02	3.43	0.03	0.00	2.81	0.00	0.46	0.01	0.00	0.00	5.74	0.01	0.52	0.01	0.03	0.00	1.14	0.00	0.00	0.01	0.00
Çorum	0.04	0.00	0.00	1.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Denizli	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.64	0.00	0.00	0.00	0.00	1.17	11.93	0.00	0.00	0.00
Diyarbakır	5.79	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Düzce	0.01	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	33.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Elazığ	0.52	0.15	0.00	0.01	0.00	0.00	0.00	0.78	16.60	0.00	0.00	0.10	0.00	0.29	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00
Erzincan	0.01	0.89	0.00	5.93	0.00	0.00	0.00	1.99	0.42	0.00	0.00	0.67	0.00	2.62	0.00	0.38	0.03	0.00	0.00	0.00	22.59	0.07
Erzurum	0.00	1.73	0.00	0.14	0.00	0.00	0.00	0.74	0.00	0.00	0.00	11.73	0.00	7.27	0.00	0.00	3.30	2.88	0.00	0.00	0.00	6.60
Eskişehir	0.04	0.00	0.00	11.85	0.00	0.28	0.00	0.01	0.01	0.00	0.00	0.04	0.13	0.30	0.01	0.00	0.00	0.00	0.00	0.00	0.43	0.00
Gaziantep	0.05	1.08	4.73	0.00	0.00	0.44	0.04	1.12	0.00	0.00	0.00	0.00	1.66	0.00	0.00	0.97	0.00	0.00	0.00	0.00	0.00	0.00
Giresun	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	32.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gümüşhane	0.00	6.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hatay	0.00	0.06	6.68	0.01	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	11.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Iğdır	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	35.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Isparta	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
İstanbul	0.08	0.82	0.00	0.60	0.00	0.09	0.05	0.21	0.06	0.00	0.04	0.05	0.02	0.00	7.90	0.22	0.00	0.92	0.00	0.00	0.26	3.79
İzmir	0.64	0.03	3.12	0.01	0.00	0.44	7.14	0.00	0.03	0.00	0.00	0.05	0.30	0.00	1.47	0.09	0.00	0.03	0.00	0.00	0.00	0.00
K.Maraş	0.13	0.02	0.18	5.77	0.00	0.00	0.00	0.08	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 4. Continued

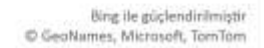| Province																						
Karaman	3.45	0.47	0.00	0.00	0.00	7.26	0.00	0.06	2.19	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.02	0.00
Kars	0.00	3.43	0.00	0.00	0.00	0.01	0.00	7.03	0.02	0.00	0.00	0.80	0.00	10.07	0.00	0.00	5.39	3.47	0.00	0.00	0.00	0.01
Kastamonu	0.00	0.15	0.00	3.07	0.21	0.00	0.00	0.02	0.00	0.00	0.00	0.43	0.00	0.53	0.00	1.99	0.24	0.00	0.00	0.00	2.69	0.00
Kayseri	0.10	0.00	0.00	0.04	0.00	0.01	0.00	0.05	0.06	0.00	0.00	0.30	0.00	0.00	0.79	0.04	0.00	0.00	0.00	0.00	0.00	0.00
Kırıkkale	0.00	0.00	0.00	0.13	0.00	0.03	0.00	0.52	0.00	0.00	0.00	0.41	0.00	0.00	10.20	0.14	0.00	0.00	0.00	0.00	0.00	0.00
Kırklareli	0.04	0.33	0.00	1.21	0.00	2.25	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	18.88	0.80	0.00	0.00	0.00	0.00	0.84	0.00
Kırşehir	0.21	1.51	0.00	1.78	0.07	0.00	0.00	0.45	0.11	0.00	0.00	0.00	0.00	0.00	4.91	0.29	0.00	0.00	0.00	0.00	0.45	0.00
Kilis	0.07	0.00	11.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kocaeli	0.00	0.25	0.00	0.03	0.00	3.94	0.01	0.08	0.00	0.00	0.02	1.77	0.01	16.85	0.78	0.04	0.00	0.00	0.00	0.00	0.00	0.00
Konya	0.06	0.62	0.00	1.28	0.00	0.29	0.00	0.81	0.00	0.00	0.00	0.08	0.00	0.07	0.33	13.73	0.00	0.00	0.00	0.00	17.92	0.00
Kütahya	0.00	0.69	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.00	0.00	0.63	0.00	0.00	10.22	0.00	0.00	0.00	0.00	0.00	64.29	0.00
Malatya	0.03	0.12	0.00	0.04	0.00	0.00	0.00	0.06	20.53	0.00	0.00	0.14	0.00	0.27	0.11	0.07	0.04	0.00	0.00	0.00	0.00	0.00
Manisa	6.51	0.05	0.50	0.00	0.00	1.03	0.00	0.06	0.00	0.00	0.00	0.10	0.85	0.08	5.15	0.06	0.00	0.66	1.34	0.00	0.00	0.00
Mardin	0.00	4.05	0.00	0.00	0.00	8.36	0.00	0.48	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.64	0.00	0.00	0.00	0.00
Mersin	0.01	0.04	2.09	0.04	0.00	0.06	0.00	0.00	0.11	0.00	0.00	0.15	0.10	0.00	2.98	0.23	0.42	0.00	0.00	3.89	0.00	0.00
Muğla	0.50	0.01	7.62	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	4.40	0.00	0.26	0.00	0.00	0.00	0.00	0.02	0.00	0.00
Muş	0.02	5.14	0.00	0.06	0.00	0.00	0.00	3.02	0.01	0.00	0.00	3.41	0.00	0.27	0.01	0.03	1.06	0.91	0.00	0.00	0.00	22.27
Nevşehir	0.63	0.67	0.00	0.42	0.00	0.00	0.00	0.00	1.58	0.00	0.00	1.05	0.00	0.02	3.81	1.47	0.00	0.00	0.00	0.00	0.05	0.00
Niğde	0.02	0.05	0.00	4.56	7.01	1.01	0.00	0.02	0.06	0.00	0.00	1.32	0.00	0.04	0.00	0.21	0.00	2.30	0.00	0.00	0.12	0.00
Ordu	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Osmaniye	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	39.77	20.44	0.00	0.00	0.00	0.00	0.00	0.00
Rize	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	23.23	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sakarya	0.00	0.05	0.00	0.02	0.00	1.97	0.00	0.03	0.00	0.00	25.93	0.26	0.01	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.01	0.00
Samsun	0.00	0.09	0.00	0.01	0.00	4.78	0.00	0.00	0.00	0.00	15.49	0.00	0.00	0.00	0.01	0.01	0.00	8.15	0.00	0.00	0.00	0.07
Sinop	0.34	0.00	0.00	2.36	0.03	0.00	1.28	0.00	0.00	0.00	0.00	0.00	0.39	0.00	0.00	6.96	0.00	0.00	0.00	0.00	1.27	0.00
Sivas	0.00	4.05	0.00	0.01	0.00	0.17	0.00	4.68	0.42	0.00	0.00	1.68	0.00	5.00	0.00	0.01	7.80	0.17	0.00	0.00	0.00	0.65
Şanlıurfa	0.00	2.98	0.05	0.02	0.00	2.10	0.00	1.14	0.00	0.00	0.00	0.00	7.62	0.00	0.00	0.00	0.00	0.00	11.89	0.00	0.00	0.00
Tekirdağ	5.42	0.42	0.00	0.00	0.00	0.00	0.00	0.59	0.00	0.00	0.00	3.58	0.00	1.30	0.64	0.15	1.34	0.00	0.00	0.00	0.00	0.00
Tokat	0.05	0.35	0.00	3.98	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.51	0.00	0.32	0.32	0.04	0.42	0.00	0.00	0.00	36.81	0.00
Trabzon	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	6.61	22.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.48
Tunceli	0.01	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.98	0.00	0.00	0.00	0.00	0.20	0.53	0.00	0.00	0.00	0.15
Uşak	0.00	5.12	0.00	0.00	0.00	0.00	0.00	1.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Van	0.00	1.54	0.00	2.40	0.00	0.16	0.00	1.34	0.02	0.00	0.00	10.17	0.00	0.00	4.67	0.00	3.36	0.00	0.00	0.00	0.00	17.06
Yalova	0.00	0.77	0.19	0.11	0.03	0.04	0.06	0.00	0.00	0.00	0.06	9.17	0.17	7.78	0.04	0.00	0.00	3.10	0.00	0.00	0.00	0.23
Yozgat	0.03	3.65	0.00	0.00	0.00	0.03	0.00	2.73	0.00	0.00	0.00	0.00	0.00	0.00	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zonguldak	0.00	0.00	0.00	0.04	0.00	0.01	0.00	0.00	0.00	0.00	32.17	0.00	0.00	0.00	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.00

Figure 1. Concentration of organic agricultural products by province

competitiveness. This agricultural method does not harm the environment or human health, limits the use of chemical inputs, and preserves soil fertility and biodiversity. Organic agriculture can efficiently use regional resources, prevent rural depopulation, revitalize local economies, improve regional income distribution, ensure regional branding, and strengthen regional identity. Türkiye should develop policies and strategies to increase the concentration coefficient of organic agriculture.

4. Conclusions

The theory of economies of location aims to support regional economic development by making the best use of local resources and advantages and increasing the economic resilience of communities through the location of economic activities in a particular region and the establishment of strong links between businesses, suppliers, service providers, and consumers in that region. This approach utilizes natural resources and the labour force more efficiently, mitigates the impact of global external shocks, preserves regional identity and culture, and is considered an important tool for balancing the regional economy.

The study calculated the location quotient in the organic farming sector. This coefficient is important for regional economic development, strengthening local businesses, promoting environmental sustainability, increasing economic resilience, protecting local identity and culture, and encouraging the adoption and promotion of organic farming as a sustainable agricultural model that contributes to the local economy, environment and social well-being. According to the theory of location economies, businesses in the same sector can cluster in certain regions due to economies of scale, positive externalities and knowledge creation and transfer. In order to ensure regional sustainability and increase specialization in production activities, it is necessary to investigate the technical suitability of locally produced organic agricultural products. Regional suitability maps should be developed to identify the basins and products suitable for organic farming in each region. To improve soil management, maintenance, harvesting and marketing, it is recommended to organize training activities based on main production activities at regional level. In addition, strategies and action plans for production and research activities should be developed. Investment incentive certificates can be prepared to support production activities, and financial support can be provided to enterprises with these certificates. Support can also be provided for the construction of processing and storage facilities, branding and geographical indications. Group certifications in accordance with international standards should be developed, and various institutions and organizations should organize training for organic agricultural producers to strengthen promotion activities. Input and product price support mechanisms should be put in place during transition periods in the organic agriculture sector. In this context, to ensure regional sustainability and increase specialization in production activities;

- Investigating the technical feasibility of regionally concentrated organic agricultural products

- Organizing training activities on land management, maintenance, harvesting and marketing operations according to basic production activities at regional level

- Establishing a strategy and action plans for production and research activities in organic agriculture at local and regional level

- Increasing technical and market information resources by developing training modules for organic agriculture producers and preparing trainings for "beginner", "transition" and "production period" producers

- To increase organization according to basic production activities, subsidies are given to organizations at the beginning of the production period,

- Preparing investment incentive certificates to support basic production activities and providing financial support to enterprises with these certificates,

- Only allowing the opening of facilities with processing, production, marketing, export, etc. activities in districts with basic production activities and providing the necessary infrastructure such as cold storage, packing house, etc. with support

- Contributing to the creation of added value by providing information on branding in districts with basic production activities,

- Development of group certifications to reduce certification costs,

- Realization of certification procedures in international standards,

- Organizing trainings for organic agriculture producers by various institutions and organizations in order to increase promotional activities

- Training on crop rotation, green fertilization and similar practices should be planned at the production stage according to the regions.

As a result, specialized labour, sectoral inputs and similar technologies are used in localized/intensified organic farming formations, which play an important role in providing high income per unit area, optimal use of agricultural land and ensuring sustainability. Therefore, it is expected that the benefits arising from these formations will contribute to the economic, social and environmental sustainability of the region by increasing productivity and will also provide significant benefits for the development of organic agriculture.

Ethical Statement

There is no need to obtain permission from the ethics committee for this study.

Conflicts of Interest

We declare that there is no conflict of interest between us as the article authors.

Authorship Contribution Statement

Concept: Bayramoğlu, Z.; Design: Ağızan, S.; Data Collection or Processing: Ağızan, S., Ağızan, K.; Statistical Analyses: Ağızan, K.; Literature Search: Ağızan, K.; Writing, Review and Editing: Ağızan, S., Ağızan, K.

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