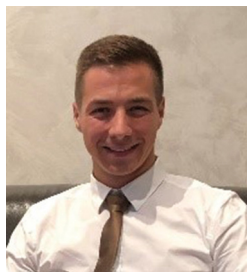
UDC: 338.43(497.11)
346.544:638.1(497.11)
Original scientific paper
DOI: 10.46793/83138.005.153VT
Received: 26.05.2025.
Approved on: 04.06.2025.
Pages 153-170



Jelena Vapa Tankosić[1], Bojan Vapa[2]

SUSTAINABLE AGRICULTURE WITHIN THE FRAMEWORK OF THE COMMON AGRICULTURAL POLICY: ORGANIC BEEKEEPING IN THE REPUBLIC OF SERBIA AND THE EUROPEAN UNION

Abstract: The Common Agricultural Policy (CAP) of the European Union represents a fundamental framework for the development of sustainable and organic agriculture, including beekeeping. This paper analyzes the historical background and evolution of the CAP, with a particular focus on the legal foundations and implementation of regulations related to organic production. Special attention is given to organic beekeeping as a distinct and important segment of organic agriculture. The legal frameworks and institutional support mechanisms in both the EU and Republic of Serbia are compared. The paper highlights the importance of state incentives, control mechanisms, and certification systems, as well as the challenges faced by organic beekeepers in both regulatory environments. It concludes that the future development of organic beekeeping depends on a stable legal foundation, producer education, and stronger institutional support.

Key words: Common Agricultural Policy (CAP), European Union, Republic of Serbia, legal regulation, organic beekeeping.

Introduction

The economies of the Western Balkans countries on the way to European integration depend on increasing the economic efficiency and performance of their

1 Prof. dr Jelena Vapa Tankosić, University of Economics Academy in Novi Sad, Faculty of Economics and Engeneering Management, e-mail: jvapa@fimek.edu.rs, https://orcid.org/0000-0001-8062-1154
2 Dr Bojan Vapa, University „Union- Nikola Tesla“, Faculty of Economics and Finance, e-mail: bojan-vapa@gmail.com, https://orcid.org/0000-0002-8528-7957

companies. „The countries of the Western Balkans face challenges in the modernization of their agricultural sectors, but also great opportunities for integration into European standards through financial mechanisms such as IPARD funds. (Vapa Tankosić et al., 2013, 217)". The surplus in export of agricultural products has an important role in improving the competitiveness of the agriculture of the Republic of Serbia in the process of integration into the European economic environmentm (Ignjatijević et al., 2025), although the results point to "an underdeveloped relationship with international distributors and agents" (Vapa, B., Vapa Tankosić, 2019, 43) and that the „Serbian SMEs need to improve quality of advertising, the ability to improve sales and direct marketing on the international market" (Vapa, B., Vapa Tankosić, 2022, 17).

On the other hand, the European Union's Green Agenda for the Western Balkans is an extension of the EU's ambitious strategy known as the European Green Deal, which aims to achieve climate neutrality by 2050. This agenda defines clear priorities in the areas of decarbonization, protection of natural resources, circular economy and sustainable agriculture. "Agriculture and the food industry in the strategic planning and development documents of the Republic of Serbia represent one of the sectors on whose comparative advantages the country's economic policy should be based and which are expected to start a new investment and development cycle" (Vapa Tankosić, Mirkov 2025, 1506).

Republic of Serbia gained EU candidate status on 1 March 2012 and the EU accession negotiations for Serbia's membership of the EU were opened officially on 21 January 2014. Republic of Serbia plans to continue the process of transposition of the acquis of the EU in the field of agriculture and rural development, which is carried out through the harmonization of the national agricultural policy. „The action plan for Chapter 11, which covers the period 2018-2023, defines the way and dynamics of harmonizing national legislation with the acquis communautaire in the field of agriculture and rural development" (Vapa Tankosić et al., 2023a, 959).

The new EU's agricultural policy emphasizes the multi functionality of agriculture and integrates the environmental component in the form of the environmental management that encourages the sustainable "green agriculture" and the implementation of environmental measures.„The agro ecological measures are connected with the application of good agricultural practices and link financial support to EU rules on the environment, as well as human, plant and animal health" (Vapa Tankosić et al., 2023b, 2).

The European Union (EU) has played a key role in shaping the legal and institutional framework for organic production through its Common Agricultural Policy (CAP). Since its inception, the CAP has evolved to support environmentally friendly farming practices, promote rural development, and harmonize agricultural standards across member states. Organic beekeeping has gradually been integrated into this policy framework, benefiting from various forms of institutional and financial support.

Organic agriculture has gained increasing importance in recent decades as a response to growing concerns about environmental sustainability, food safety, and biodiversity. Within this framework, organic beekeeping represents a specialized and ecologically significant branch of agricultural production, contributing not only to the preservation of bee populations but also to the maintenance of ecological balance and pollination services. Even in times of Covid-19 pandemic "our findings point out that the majority of consumers in times of COVID-19 pandemic have a very positive attitude towards nutritional values of organic products, in relation to the conventional products " (Vapa Tankosić et al., 2022, 478). "The findings indicate that the respondents in Serbia

are willing to pay 20–30% more for the organic honey, while their willingness to pay for the local honey is slightly lower (10–20% more for the local honey)" (Vapa Tankosić et al., 2020a, 15).

In the Republic of Serbia, the development of organic beekeeping has been influenced by efforts to align national legislation with EU standards, particularly in the context of the country's EU accession process. Despite certain progress, organic beekeeping in Serbia still faces numerous challenges, including limited institutional support, insufficient education and awareness among producers, and complex certification procedures. This paper explores the history of the creation of the CAP, historical and legal aspects of organic production within the CAP, with a special focus on organic beekeeping in the EU and Republic of Serbia. By comparing regulatory approaches and support mechanisms, the study aims to identify opportunities for strengthening organic beekeeping in Serbia and ensuring its alignment with EU best practices.

History of the creation of the CAP

Every country in the world takes a serious approach to food production, but transnational, common policies and financing models are rare, unlike agricultural financing in the European Union. In 1962, the European Union began implementing the Common Agricultural Policy, one of the first supranational economic policies in modern times. According to the author Jovanović (2006), CAP contains two dimensions:

a) Internal dimension: which consists of a guaranteed established price level on the domestic market, if the price falls below the intervention price, the excess stock must be purchased by the state intervention stations in order to maintain the internal price at the guaranteed minimum level;

b) The external dimension: which deals with determining the lowest price level at which a foreign product can be imported, and this threshold protects the internal market from foreign competitors and price fluctuations on the foreign market.

This project brought significant positive effects: the stability of the market for agricultural and food products, an increase in producer income, security of supply and independence from imports, but its strong and direct actions also caused some negative consequences that were reflected in large budget spending, differences appeared between producers and regions in the EU itself, but also environmental problems arising from excessive production, i.e. use of chemicals and excessive use of resources. According to the authors Vapa-Tankosić and Stojsavljević (2014), in order to solve the problems and adapt the agricultural policy to the needs of each member country, the European Commission introduced a series of Common Policy reforms.

The first European Commissioner for Agriculture, Mansholt, proposed the first reform of the CAP in 1968, because the implementation of the CAP, despite the increase in productivity and the constant increase in subsidies, did not improve the standard of farmers. He suggested moving towards consolidation of agricultural holdings, as well as their specialization and modernization. With the wave of expansion from 1973 and the entry of Great Britain, Denmark and Ireland, there was a need for the integration of these countries into the Common Market and the CAP, which paved the way for new reforms of the CAP.

One of the most significant changes in the CAP was carried out by the reform in 1992 initiated by the European Commissioner for Agriculture McSherry.

Baldwin and Wyplosz (2010) point out that precisely the surpluses of agricultural and food products, as well as large differences in the member states, forced the Union

authorities to make changes and abandon indirect measures in order to increase the share of direct financing of producers in the EU agricultural budget. Support measures and price controls on the internal market are being abolished and direct payments to farmers are being made as compensation for reduced prices in order to reduce allocations from the common budget. Vapa-Tankosić and Stojsavljević (2014) state that the reform of 1992 was successful, but the changes that occurred in the following period, such as the enlargement of the EU by joining the countries of Central and Eastern Europe, the introduction of the euro common currency, the increase in the competitiveness of products from third countries and the new round of negotiations in the World Trade Organization, required further adjustments.

Then a new program appeared - the so-called "Agenda 2000" - which in 1999 initiated the additional strengthening of financing of the "second pillar (rural development)". We notice that slowly the policy and funds intended for rural development are becoming more and more important. As an illustration of the adaptability and long-term planning of agricultural development by European organizations, we can cite an example of a special program that was created in 1999 as part of "Agenda 2000" in order to prepare and help the countries of Central and Eastern Europe, which at that time were in the process of joining the EU.

Another significant reform of the CAP followed in 2003 and was initiated by Fischler, Commissioner for Agriculture and Rural Development. According to the Paun (2012), the "Fischler reform" introduced "two new instruments for the future development of CAP:

1) "Sectoral reforms - continued reduction of price support with changes in market regimes for commodities such as durum wheat, rice and rye, and
2) "Modulation" - transfer of funds from pillar 1 to another pillar, i.e. subsidies for rural development by reducing subsidies to large farms".

The reform of the CAP in the new program period (2014-2020) was started in 2011. As the European Commission (2010) points out, the reform process was based on the following strategic goals:

- "preserving sustainable food production throughout the EU to guarantee long-term food security for European citizens and contributing to the growing global demand for food as food demand is expected to increase by as much as 70% by 2050 according to FAO forecasts;
- supporting farming communities that provide quality, value and diversity of food;
- encouraging the balanced development of all rural areas of the EU where agriculture is an important economic activity that creates new jobs with multiple economic, social, ecological and territorial benefits" (European Commission, 2010).

Table 1 . Total allocations from the CAP by EU countries in 2017 (in euros)

EU countries	Direct payments	Market regulation measures	Rural development	Total
Belgium	508,564	80,801	97,175	686,540
Bulgaria	774,080	37,500	340,410	1,151,991
Czech Republic	837,551	27,728	344,509	1,209,788

Denmark	844,288	21,195	144,868	1,010,351
Germany	4,846,569	201,534	1,404,073	6,452,176
Estonia	113,912	10,360	122,865	247,137
Ireland	1,208,265	22,897	313,007	1,544,170
Greece	2,021,458	65,786	703,471	2,790,715
Spain	5,063,903	555,848	1,185,553	6,805,304
France	7,365,412	640,058	1,665,778	9,671,247
Croatia	198,895	10,384	282,343	491,621
Italy	3,794,981	649,301	1,493,380	5,937,663
Cyprus	49,742	7,265	18,895	75,902
Latvia	203,771	14,496	155,139	373,407
Lithuania	437,174	8,006	230,452	675,632
Luxembourg	33,311	1,200	14,366	48,878
Hungary	1,257,586	54,857	488,621	1,801,064
Malta	5,043	490	13,915	19,448
Netherlands	734,734	87,112	118,357	940,203
Austria	692,626	29,166	562,468	1,284,260
Poland	3,354,843	118,943	1,192,025	4,665,812
Portugal	654,897	114,208	579,806	1,348,910
Romania	1,690,659	42,904	1,186,544	2,920,107
Slovenia	135,771	8,581	119,684	264,036
Slovakia	432,057	11,737	215,357	659,151
Finland	523,378	14,410	340,009	877,797
Sweden	685,731	21,409	249,386	956,526
Great Britain	3,081,954	90,435	754,570	3,926,959
EU28	41,551,156	3,001,112	14,337,027	58,889,295

Source: European Commission Directorate General for Agriculture and Rural Development (DG Agri) - European Commission. 2018. https://ec.europa.eu/agriculture/statistics/factsheets_en

Regarding the total budget allocations from the CAP by EU countries in 2017, the largest recipient of funds from the CAP is France (16.4% of the total allocations from the CAP budget in 2017), with Spain, Germany, Italy, Poland and Great Britain also receiving significant funds (two-thirds of the total allocations from the CAP are allocated to these six countries), which is in line with reports from previous years where these countries stand out as the biggest beneficiaries of CAP funds (Table 1).

The backbone of the CAP is divided into two pillars. The first pillar consists of direct payments and market regulation measures and is financed through the European Agricultural Guarantee Fund (EAGF). The second pillar includes rural development and the measures of the second pillar are financed through the European Agricultural Fund for Rural Development (EAFRD). CAP in the program period from 2014-2020. makes

up 38% of the total EU budget, that is, a total of 411.7 billion euros was allocated for the mentioned period, of which 312.7 billion euros (76%) is allocated to the first pillar, while the remaining amount of 99 billion euros is allocated to the second pillar (24%).

Stolze et al. (2016) state that the Member states must use 30% of the maximum amount determined for pillar 1 for these payments, which amounts to a maximum of 89.3 billion euros or 24% of the total EU budget for agriculture. Similar to the previous program period for 2007-2013., each national and regional program for rural development (RDP) should use 30% of the total funds allocated under Pillar 2 for climate change mitigation and adaptation, as well as environmental protection issues. These measures account for 7.2% of the total EU budget for agriculture and are aimed at fees for converting or maintaining organic production, so it can be said that this reform directs a total of 28.9% of the total EU budget for agriculture to measures related to environmental and climate issues.

Within the first pillar, expenditures for direct payments represented about 70% of expenditures. For EU members, the implementation of the basic payment program, agro-ecological payments ("greening") and payment for young farmers is mandatory. Other measures within direct payments are voluntary (optional). The basic payment scheme is subject to internal convergence. In this way, the difference between member countries in the average payment per hectare is reduced. Within the first pillar, expenditures for direct payments represented about 70% of the total planned CAP expenditures. Production limits for milk, sugar, vineyards, common customs tariff, market standards are also significant market regulation mechanisms. Jurušić (2012) states that The European Agricultural Guarantee Fund (EAFRD) implements its activities in the member states through rural development programmes. Member States can notify a single program for the entire territory or a series of regional programs. The second pillar also focuses on competitiveness and innovation, climate change and environmental protection. The new agricultural policy of the EU until 2020 specifically emphasizes "small agricultural producers".

In the National Program for Agriculture for the period 2018–2020. of the Republic of Serbia, it is stated that the first pillar has been improved with new elements: "the introduction of agro-ecological criteria in the area of direct payments (agro-ecological payments or "greening"), the redistribution of budget funds between beneficiaries at the member country level, as well as between member countries and regions, the introduction of a focus on young farmers, the redefinition of the term "active farmer", the abolition of production quotas, changes in the mechanism and role of market interventions, support for farmers' organizations, innovations and investments and second".Vapa-Tankosić and Lekić (2018) emphasize the importance of agroecological payments per acceptable hectare of agricultural land. Farmers must comply with prescribed requirements to receive agri-environmental payments, and non-compliance is punishable by reduced payments and fines. Stojsavljević et al. (2017) stated that in the previous cycle of implementation of CAP measures (2007-2013), no specific mechanism was foreseen to support exclusively organic agriculture, and it was supported mainly through the measure "agro-ecological payments", which made up almost a fifth of the payments as part of the rural development policy. In this cycle, areas under organic production are those that have met the agro-ecological criteria regarding direct payments without the need to meet additional requirements. Each farm receives an additional payment per hectare for implementing certain agricultural practices to preserve climatic and ecological factors.

IFOAM EU, FiBL, Marche Polytechnic University and Naturland (2016) calculated that the total EAFRD contribution to organic payments for the period 2014–2020. is

6.3 billion euros or 6.4% of the total budget of 99 billion euros for rural development programs, which corresponds to the percentage of total organic agricultural land in the EU of 5.7% in 2014. Regarding the importance that EU member states attach to organic agriculture, there is no uniform pattern due to factors such as differentiation of payments according to land use type, different economic assumptions and different costs and lost income components in the calculation of payments. Therefore, they conclude that the importance that member states give to organic agriculture and the associated budget allocations and restrictions can determine the payment rate as well as its policy for the development of organic agriculture.

History and legal aspects of organic production in the European Union

The World Health Organization (WHO) and the Food and Agriculture Organization of the United Nations - FAO (World Health Organization, Food and Agriculture Organization of the United Nations) state that the Codex alimentarius defines organic agriculture as "a system of ecological management of agricultural production that promotes and improves the health of agroecosystems, including biodiversity, biological cycles and biological activity of the soil. It is based on the minimal use of substances not originating from agricultural holdings, bearing in mind that regional conditions require locally adapted systems." is achieved by the use, where possible, of cultural, biological and mechanical methods, as opposed to the use of synthetic materials, to fulfill any specific function within the system, based on agrotechnical measures that restore, maintain and improve the ecological balance".

The International Federation of Organic Agriculture Movements (IFOAM, http://www.ifoam.bio/en/organic-landmarks/definition-organic-agriculture) defines organic production as "a production system that maintains the health of soil, ecosystems and people by relying on ecological processes, biodiversity and production adapted to local conditions, with limited use of inputs. Organic agriculture combines tradition, innovation and science in order to achieve mutual benefits and promotes fair relations and a good quality of life for all involved in this production system." Organic production aims to completely eliminate or greatly reduce the use of synthetic chemical inputs such as fertilizers, pesticides, additives and medicinal products. Some of the differences between organic and conventional production are detailed in Table 2.

Table 2. Differences between organic and conventional production

ORGANIC PRODUCTION	CONVENTIONAL PRODUCTION
Use of organic fertilizers in order to maintain soil fertility	Use of synthetic fertilizers to feed plants
Reduced cultivation, mulching and cover crops	Deep cultivation and fallow
Mechanical weeding is fine	Use of herbicides
Flower belt for beneficial and harmful insects	Monoculture
Control of pests, diseases and weeds through natural antagonisms	Pesticide use
Pollination by bees and other insects	Spraying with pollen suspensions
Fertility regulation naturally	Chemical thinning of fruits

Water supply by capillary action	Irrigation
Preservation of the diversity of the living world	Destruction of harmful and beneficial insects using insecticides
Composting, returning plant residues to the soil	Use of synthetic and soil structure improvers
Preservation and protection of the environment	Pesticide pollution

Source: Vukoje et al. (2015)

The idea of organic production originates from the German philosopher Rudolf Steiner (1861-1925) and botanist of Sir Albert Howard (1873-1947) and Lady Evelyn Barbara Balfour (1898-1990) from Great Britain. Rudolf Steiner was one of the first proponents of biodynamic agriculture. During 1940, Lady Balfour founded the British association for organic agriculture "The Soil Association" and the scientific journal "Mother Earth", as well as launched the "Haughley" experiment (the first long-term experiment on organic agriculture), which followed organic and conventional production systems for more than thirty years. Organic agriculture developed almost independently in German and English-speaking countries at the beginning of the 20th century. Lockeretz (2007) states that the development of organic agriculture was stimulated by these events:

(i) crisis in agriculture and agricultural science;
(ii) the emergence of biologically oriented agricultural science;
(iii) life and food reform "Life and Food Reform movements"; and
(iv) growing Western awareness of the agricultural cultures of the Far East .

Padel and Vine (2010) state that in 1967, the Standards for Organic Agriculture of the British association "The Soil Association" were first published. In Versailles in 1972, the "International Federation of Organic Agriculture Movements (IFOAM)" was formed with the aim of global dissemination of information on the principles of organic production, aimed at producers and consumers.

Lockeretz (2007) states that during the 1970s and 1980s organic agriculture became popular and there was a need for organic production to be regulated by law, as well as to define standards related to the certification of organic products. By 1991, most EU member states had defined a legal framework for organic production. Denmark was the first country to introduce financial support for producers during the conversion period, as part of the 1987 law on organic farming. Other Scandinavian countries followed suit. In 1989, Germany became the first country to use incentives from the CAP to introduce a support program for conversion to organic production.

In the mid-1980s, several specialized certification organizations started operating, such as SKAL (Netherlands), KRAV (Sweden) and Farm Verified Organic (USA). France introduced the first Law on Organic Production in 1980, followed by Austria in the same year, and Denmark in 1987. The EU adopted the first regulation on organic production in 1991. In accordance with the European Action Plan for Organic Food and Agriculture, in 2005 the European Commission started the process of revising the organic legislative framework. The organic legislative framework was subsequently amended and revised several times in 2007/08, which led to the adoption of the new Council Regulation (EC) 834/2007 on organic production and labeling of organic products, as well as Commission Regulation (EC) 889/2008 on establishing detailed rules for the implementation of Council Regulation (EC) 834/2007 on organic production and labeling of organic products, labeling and control. It can be noted that the EU is constantly working on the

development and improvement of the legislative framework for organic production.

The new EU logo "Euro-Leaf" in use for organic products throughout the EU was introduced on July 1, 2010. The use of the EU organic logo is mandatory for all organic products that are produced in any EU member state. The EU organic logo can be used voluntarily on products originating from the EU, which were not previously packaged, or on any organic product imported from third countries, only if the product is produced in accordance with Regulation (EEC) no. 2092/91 and its implementing regulations or Council Regulation (EC) no. 834/2007 and Commission Regulation (EU) no. 271/2010. The EU organic logo cannot be used if less than 95% of the product's agricultural ingredients are produced organically.

Organic beekeeping in the Republic of Serbia and the European Union

The development of organic beekeeping largely depends on the existence of clear and detailed legal regulations that prescribe standards and conditions for the organic production of bee products. The European Union and many other countries have introduced legal frameworks that regulate all aspects of organic beekeeping, from location selection, movement of bee colonies, application of natural remedies, to quality control and product certification. These regulations aim to ensure compliance with the principles of organic production, as well as the health of bee colonies and the preservation of the environment. In addition, there are numerous support programs, both financial and educational, that are implemented at the national and international level, in order to encourage the production of organic bee products and inform producers about best practices.

In organic beekeeping, the choice of bee breed is of great importance because it determines the adaptability of bees to natural conditions and resistance to diseases. Autochthonous breeds that have been present in a certain region for a long time are preferred, because they better tolerate local climatic conditions and have natural defense mechanisms against parasites and diseases. Biological material used to establish apiaries, such as queens and bee colonies, must be of high quality and obtained from verified sources that adhere to organic standards. In this process, the use of genetically modified organisms and chemical preparations that can negatively affect the health of bees is avoided.

Wax plays an extremely important role in organic beekeeping, as it is a material for building honeycombs, and its quality directly affects the health of bee colonies. In organic production, only natural beeswax is used, which is not contaminated with chemical residues or other pollutants. In addition, the practice of regularly replacing the old comb with a new one is important, in order to reduce the risk of the accumulation of toxic substances and the development of diseases. The origin of the wax must be precisely controlled and confirmed by certificates of organic origin, in order to fulfill all standard obligations and ensure the complete safety of the product.

The location of the apiary in organic beekeeping must be carefully selected, taking into account the quality of the environment and the absence of pollutants. The optimal place for setting up apiaries is in areas with rich plant diversity, away from industrial zones, roads, landfills and other sources of contamination. In addition, it is important that the area provides the bees with unhindered access to nutrition, i.e. nectar and pollen sources from organic crops and natural pastures. Localities that meet these conditions enable the development of healthy bee colonies and good production of organic bee products.

Apiary relocation is an important process in organic beekeeping, as it allows bees access to a variety of food sources throughout the season. This practice must be carried out in a way that does not violate organic standards, that is, without the use of chemical agents that can harm bees or the environment. Beekeepers take care of the time and method of moving, taking into account the needs of the bee colonies and the conditions at the new location. The move enables the bees to develop better and increases the yield of quality honey and other bee products.

In organic beekeeping, proper and natural bee nutrition is essential for their health and productivity. Bees should have access to diverse and healthy sources of nectar and pollen, which have been grown without the use of pesticides and other chemicals. In cases where natural food is not sufficient, only organic permitted additives are applied, such as natural sugar syrups or bee bread, with strict compliance with regulations. This approach contributes to maintaining a strong immune system of bees and reduces the risk of disease.

The processing and packaging of honey in organic beekeeping requires special attention in order to preserve its natural quality. Honey centrifugation, as the basic process of extracting honey from the comb, is performed in a way that does not damage its structure and does not introduce any chemical additives. The honey is then packed in environmentally friendly and safe packaging that guarantees protection against contamination and the longevity of the product. All steps are monitored and controlled in accordance with the standards of organic production, so that the final product is of high quality and safe for consumers.

Proper storage and transportation of organic bee products are key to preserving their freshness and quality. Organic products must be stored in places that are dry, ventilated and protected from direct sunlight, to prevent degradation and loss of nutritional properties. Transport must be organized in a way that ensures hygienic conditions and prevents any possible contamination. Vehicles and warehouses used for this process must comply with organic standards, and all participants in the supply chain must adhere to prescribed procedures.

Maintaining the health of bee colonies is one of the most important aspects of organic beekeeping. Disease and parasite prevention is based on the application of natural methods, such as good hive hygiene, regular control and proper organization of the apiary. In case of need for treatment, only natural medicines and preparations allowed in organic production are used, which do not leave toxic residues in honey and other bee products. This approach ensures the health of bees, as well as the safety and quality of organic products.

National Organic Standards Board. (2010) has issued recommendations for the improvement of organic beekeeping. The new standards encourage measures aimed at reducing the exposure of bee colonies to contamination through the establishment of protective zones. During the flowering period, bee colonies should be located in zones where there is no significant risk of pollution. Bee nests should be away from sources of pollution such as urban areas, highways, industrial zones, landfills, waste water processing and other sources that may endanger the environment.

In addition, it is recommended to form and monitor a protective belt outside the grazing zone, in order to prevent harmful activities that may affect the health of the beehives. The new standards also regulate the choice of materials for beehives - they should be made of natural materials that cannot cause contamination of the environment or bee products. Special attention is paid to the regular replacement of old combs with new ones on an hourly basis, because old combs represent a significant risk for the health

of the bee colony (SECPA, 2018).

According to the available data, slightly more than 12,000 organic beehives were registered in Serbia in 2021, which indicates the presence and potential for further development of organic beekeeping. Organic , though beekeeping in Serbia more it is always in phase development and represents specific segment within entire beekeeping production . Although Serbia is country with long by tradition beekeeping and suitable natural conditions for dealing with this one by activity , number registered organic hive and further is relatively low in comparison with total by number hive on territories countries , according to which the last one data about a million (Agromedia , 2021).

One from main development challenges organic beekeeping yes complex and long-lasting process conversions with conventional on organic way During the work this one process The beekeeper must strictly maintains prescribed standards and method production , which include ban uses chemical funds and antibiotics , strict control nutrition bee , like and mandatory distance apiary from polluted and intensively processed agricultural surface .

In addition to technical and regulatory requires additional challenge represents and lack knowledge and experiences about organic beekeeping, which makes it difficult beginners to enter thissector However, it is encouraging that country recognizes importance and offers incentives for organic beekeeping. So, for example, beekeepers which they own organic beehives they have right on bigger subsidy in relation to conventional producers - in the amount of 1,008 dinars by beehives (Agromedia , 2021).

In 2021, approximately 2.73 million beehives in organic beekeeping were recorded in the world, which is about 3% of the total number of beehives globally. The highest concentration of organic apiaries was recorded in Europe (39.1%) and Latin America (37.8%). Among the countries, Brazil stands out as the leader in the number of organic beehives (about 630,000), followed by Zambia (almost 370,000) and Mexico (over 260,000). Compared to 2007, the number of organic apiaries has increased more than five times, since slightly more than 535,000 hives were recorded then (Willer, Schlatter, Trávníček, 2023) . The above is given in graph 2.

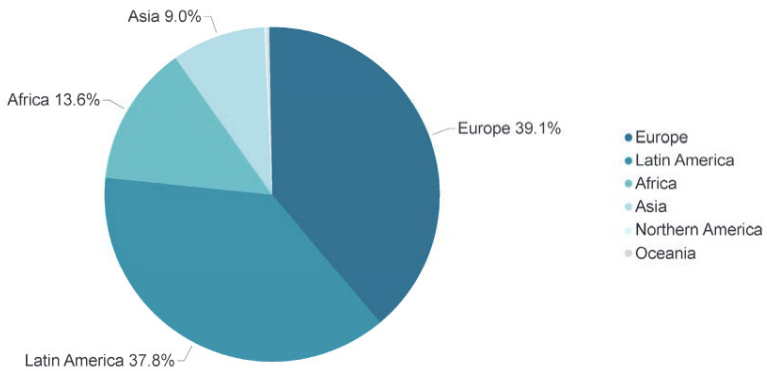


Chart 1. Share of EU organic beekeeping in world organic beekeeping (Willer, Schlatter, Trávníček, 2023)

One of the main challenges faced by new producers in organic beekeeping is the process of transitioning from a conventional to an organic way of working. This transition is often hampered by insufficient availability of knowledge about organic

beekeeping techniques, as well as ambiguities regarding the process of obtaining organic certification. In addition, the production of quality organic honey, as well as the control of Varroa parasites in a natural way, represent significant obstacles in this sector. According to the data, the number of organic apiaries varies considerably from country to country.

Table 3. Number of organic apiaries by EU countries

Italy: 171,094
Romania: 170,789
France: 122,647
Spain: 81,650
Portugal: 48,604
Germany: 35,000
Switzerland: 5,202
Slovenia: 1,814
Bulgaria: 232,072
Croatia: 2,367

Source: Willer, Schlatter , Trávníček (2023)

Beekeeping is present in all European countries, where production conditions, yields and work methods are largely diverse. Europe is the second largest producer of honey in the world, right after China. During 2021, the European continent participated in over 13% of world production, with a total of 1,772 thousand tons of honey. A year later, the number of beehives in Europe exceeded 20.2 million, and during the previous five years this figure had been continuously growing at an average annual rate of 4%.

However, honey production in Europe has been unpredictable and subject to fluctuations in recent years. From 2018 to 2021, the total production volume decreased from 274,600 to 228,300 tons, indicating a downward trend. However, there was a significant recovery in 2022, when 285,700 tons of honey were recorded, which translates into an average growth of 1% per year for the entire period from 2018 to 2022.

The decrease in production in the mentioned period is mostly attributed to the negative consequences of the COVID-19 pandemic, as well as the drastic reduction of the bee stock. The main causes of this decline are bee diseases, especially the spread of the Varroa destructor parasite, the intensive use of chemical agents and pesticides in agriculture, but also changes in the environment, including climate change. Additional pressure on the beekeeping sector was created by economic challenges, such as rising inflation and the energy crisis, which call into question the sustainability of this type of production.

According to the organizations Copa and Cogeca, the positive growth in 2022 is the result of a favorable season in the northern parts of Europe, which was contributed by abundant flowering, good nectar grazing and moderate rainfall. However, despite this recovery, European beekeepers are still in a very challenging position, and future trends in production are difficult to predict. What is certain is that the lack of stable domestic production could open additional opportunities for exporters from developing countries, who can provide constant quality and quantity of honey for the European market (Willer, Schlatter, Trávníček, 2023)

Challenges of organic beekeeping in the European Union

Organic beekeeping is an important segment of agriculture in the European Union (EU), because it contributes to the preservation of biodiversity, environmental protection and the production of high-quality honey and bee products without the use of synthetic chemicals. However, despite its many advantages, organic beekeeping faces a number of challenges that hinder its development and wider application in the EU. The first and one of the most significant challenges is the problem of bee pasture contamination. Bees are very sensitive to pollution in the environment, and organic beekeepers often encounter the problem of the presence of pesticides, herbicides and other chemicals in the plants from which the bees collect pollen and nectar. Although organic farms are strictly regulated, due to the proximity of conventional agricultural plots, there is an intermingling and uncontrolled exposure of bees to harmful substances. This significantly complicates the maintenance of organic status and affects the quality and safety of bee products.

Another challenge relates to the management of bee colonies in accordance with organic standards. Organic beekeeping implies the use of natural materials for making hives, organic nutrition and strict disease control without the use of chemical preparations. The treatment of bees must be based on natural methods, such as the application of essential oils, lactic acid or heat. These methods are often less effective in the fight against parasites such as varroa (Varroa destructor), which represents one of the biggest threats to bee colonies. The lack of strong and permitted treatments can result in greater losses of bee colonies, which demotivates beekeepers to engage in organic beekeeping.

The third challenge is reflected in administrative and regulatory obstacles. Although the EU has specific regulations on organic production, beekeeping as a sector is often neglected within those rules. There is a lack of clear guidelines and standardized procedures for the certification of organic beekeepers, which can lead to different interpretations and make market access difficult. Also, beekeepers often face high costs of certification and administration, which can be an obstacle for small producers. More support and education is needed to facilitate the transition to organic production. „Beekeepers should be encouraged and supported to follow the organic certification procedures in order to obtain high-quality products. This will be beneficial for producers, consumers, and the environment“ (Pocol et al. 2021, 15).

Another challenge is the change in climate conditions and its impact on the bee pasture and the survival of bee colonies. Climate change affects the flowering of plants, the availability of forage and the activity time of bees, which can directly reduce the productivity and health of bee colonies. Organic beekeepers are often less resistant to these changes because they do not use synthetic preparations that can help maintain bees under stressful conditions. Adaptation to climate change requires additional efforts in the planning and management of bee colonies. Survey analysis revealed beekeepers who were classified as ‘heavily impacted’ by climate change and these beekeepers reported lower average honey yields, higher colony winter loss rates and a stronger perceived contribution of honey bees to pollination and biodiversity (Van Espen et al., 2023).

Also, there is a problem with education and availability of knowledge specific to organic beekeeping. Many beekeepers who want to switch to organic production do not have access to adequate information about the application of natural methods and new approaches to bee protection. The development of specialized training programs, research support and exchange of experiences between beekeepers within the EU is needed.

Finally, market challenges and demand for organic bee products are also a

significant factor. Although there is growing consumer interest in organic products, organic honey and other bee products are often more expensive due to higher production costs and lower productivity. In addition, the presence of non-organic products on the market can make it difficult to recognize and promote organic products, as well as their competitiveness.

Despite these challenges, organic beekeeping has great potential to contribute to the sustainable development of rural areas, nature conservation and consumer health. It is crucial to establish better cooperation between legislative bodies, scientific institutions and the beekeeping community in order to overcome existing obstacles and create favorable conditions for the development of this sector in the European Union.

Challenges of organic beekeeping in the Republic of Serbia

Organic beekeeping in the Republic of Serbia represents an important segment of rural development and environmental preservation. Considering the richness of the plant world and the favorable climate zone, Serbia has the potential to develop organic production of honey and other bee products, which are increasingly in demand both on the domestic and foreign markets. However, organic beekeeping in Serbia faces numerous challenges that slow down its development and limit the full utilization of natural potential.

One of the key challenges is the lack of adequate infrastructure and support for certification and control of organic production. The process of obtaining a certificate for organic beekeeping is complex and expensive, especially for smaller producers, who make up the majority in Serbia. Lack of financial resources, as well as administrative burdens, deter many beekeepers from switching to organic production. In addition, there is an insufficiently developed network of institutions that would provide technical support and education in the field of organic beekeeping (Šeremešić, et al. 2017).

Another problem is the lack of awareness and knowledge about the specifics of organic production. Many beekeepers do not have enough information about natural methods of controlling diseases and pests, as well as about the proper management of organic production in accordance with legal regulations. Parasites such as varroa are particularly difficult to control without the use of synthetic chemicals, which can lead to greater losses in bee colonies and increase the risk to beekeepers trying to maintain organic status.

Another significant challenge concerns the contamination of pastures and the environment. In Serbia, bees are often exposed to pesticides and other chemicals used in conventional agriculture and industrial production, which makes it difficult to maintain organic status. Water and soil pollution also affect the quality of bee products. The lack of controlled, ecologically clean areas for grazing is a serious obstacle to the development of organic beekeeping.

Also, the market of organic bee products in Serbia is not sufficiently developed and standardized. The lack of a clear and recognizable label for organic products, as well as limited promotion on the domestic and international markets, hinders the placement and higher profitability of organic beekeepers. Consumers often do not have enough information about the benefits of organic products, which affects low demand and return on investment. “Awareness creation can be raised through intensive training and workshops for the beekeepers.Experts of different faculties and research institutes, willing to work with the society of beekeepers, need to assure service provisions to beekeepers with the aim of assuring help and support in the introduction of the new

technologies and promotion of investment in the R&D“ (Vapa Tankosić et al., 2020b).

Finally, cooperation between state institutions, scientific centers and beekeeping organizations in Serbia is still not at a satisfactory level. There is a need to strengthen coordination and joint programs that would include education, financial support and promotion of organic production of bee products (Vapa Tankosić et al., 2020a). However, realizing this potential requires concerted efforts to address the challenges and barriers that hinder the widespread adoption of beekeeping practices. Through collaborative action and integrated approaches, it can unlock the transformative power of apiculture and build resilient, vibrant, and sustainable rural communities for generations to come (Prodanović et al., 2024). All the mentioned obstacles indicate the need for a systematic approach and greater investment in organic beekeeping in Serbia. The development of this sector could significantly contribute to the preservation of bee colonies, environmental protection and improvement of the rural economy.

Conclusion

Organic beekeeping, as a specific and high-quality form of production of honey and bee products, represents a growing trend both in the European Union and in Serbia. However, despite the potential, this type of beekeeping faces numerous challenges - from technological and environmental to regulatory and economic.

According to data from 2021, there were about 2.73 million organic beehives in the world, which is about 3% of the total number of beehives. Of this, Europe participated with 39.1%, while the highest number of organic beehives was recorded in Brazil, Zambia and Mexico. In Europe, although it represents one of the most developed honey markets with over 20.2 million hives, the number of organic producers is still limited in relation to the total volume of the beekeeping industry. In the period from 2018 to 2021, honey production in the EU recorded a decline, but in 2022 there was a significant recovery, which indicates fluctuations due to climatic, ecological and economic factors.

On the other hand, in Serbia, despite the favorable natural conditions and the great tradition of beekeeping, the number of organic beekeepers and hives is still small. The main obstacles are the complex conversion process, lack of knowledge about organic beekeeping techniques, as well as limited market access and certification. Nevertheless, government incentives and the growing demand for healthy food provide a good basis for the future development of this sector. “It is necessary to further investigate the extent to which Serbian consumers of the organic and local honey products value the regional provenance. The labeling of different types of honey, and the additional information on organic and local honey, as well as the preference of direct contact with the honey producers, can potentially contribute to the higher WTP levels and should be further examined” (Vapa Tankosić et al., 2020, 15). “Additionally, supporting sustainable and ecofriendly agricultural practices helps promote a healthier environment and food system. Consumer awareness plays a crucial role in driving change in farming practices and influencing food supply chains”. (Puvača et al, 2024, 564).

In order to overcome the challenges, additional investment in the education of beekeepers, simplification of administrative procedures, improvement of the infrastructure for certification, as well as strengthening of cooperation with EU institutions is necessary. Only in this way can organic beekeeping in Serbia reach full maturity and participate equally in the European market, while preserving biodiversity and the health of consumers.

Literature

1. Agromedia (2021). U organskom pčelarstvu je najteža prva godina kada se vrši konverzija, https://www.agromedia.rs/agro-teme/pcelarstvo/u-organskom-pcelarstvu-je-najteza-prva-godina-kada-se-vrsi-konverzija/
2. Baldwin, R., Wyplosz, C., (2004). The Economics of European Integration, McGrawHill, London.
3. European Commission Directorate General for Agriculture and Rural Development (DG Agri) 2018, https://ec.europa.eu/agriculture/statistics/factsheets_en
4. European Commission, 2010. The CAP towards 2020: Meeting the food. natural resources and territorial challenges of the future. https://ec.europa.eu/agriculture/sites/agriculture/files/cap-post-2013/communication/com2010-672_en.pdf).
5. IFOAM EU, FiBL, Marche Polytechnic University and Naturland (2016). Organic in Europe. Prospects and Developments. Brussels: IFOAM.
6. IFOAM, http://www.ifoam.bio/en/organic-landmarks/definition-organic-agriculture
7. Ignjatijević, S., Vapa-Tankosić, J., Čavlin, M., Gardašević, J., Nastić, S., Mirkov, M. (2025). On the empirical distribution of the Balassa and Grubel Lloyd index of Serbian food products. Economics of Agriculture,72(2), 617–630. https://doi.org/10.59267/ekoPolj2502617I
8. Jovanović, M. (2004). European Economic Integration, Faculty of Economics in Belgrade, Belgrade.
9. Jurišić, Ž. (2014). Hrvatska poljoprivreda u zajedničkoj poljoprivrednoj politici Europske unije: sadašnjost i sutrašnjica. Civitas Crisiensis 1: 207–221.
10. Lockeretz, W. (Ed.). (2007). Organic Farming: An International History. Wallingford: CABI Publishing.
11. National Organic Standards Board. (2010). Apiculture: Apiculture production (final recommendation). United States Department of Agriculture. https://www.ams.usda.gov/sites/default/files/media/NOP%20Final%20Rec%20Apiculture.pdf
12. Puvača, N.; Bursić, V, Vapa Tankosić, J., Prodanović, R., Vuković, G., Vještica , S.Lekić, S., Vapa, I., Gvozdenac, S. (2024). Toxicological assessment of honey for conventional and organic production and risk assessment for public health, Journal of Central European agriculture, 25(2), 554-566, DOI: /10.5513/JCEA01/25.2.4210
13. Padel, S., Vine, J. (2010). Development of Organic Certification under Regulation (EEC) 2092/91“, In: „The European Regulatory Framework and its Implementation in Influencing Organic Inspection and Certifikation Systems in the EU“ (ed. Padel, S.), CERTCOST project, pp. 28–37.
14. Pocol, C. B., Šedík, P., Brumă, I. S., Amuza, A., & Chirsanova, A. (2021). Organic Beekeeping Practices in Romania: Status and Perspectives towards a Sustainable Development. Agriculture, 11(4), 281. https://doi.org/10.3390/agriculture11040281
15. Prodanović, R.; Brkić, I.; Soleša, K.; Ljubojević Pelić, D.; Pelić, M.; Bursić, V.; Vapa Tankosić, J. (2024). Beekeeping as a Tool for Sustainable Rural Development. J Agron Technol Eng Manag 2024, 7(2), 1054-1066. DOI: 10.55817/IXVM2800

16. Serbian Crop Protection Association – SECPA. (n.d.). Kako sačuvati pčele u uslovima održive poljoprivrede? Brošura. http://spos.info/wp-content/uploads/2016/05/Brosura_Kako-sacuvati-pcele_justified.pdf
17. Šeremešić, S., et al. (2017). Organska poljoprivreda u službi biodiverziteta i zdravlja. Univerzitet u Novom Sadu, Poljoprivredni fakultet.
18. Stojsavljević, M. Ivaniš, M., Vapa-Tankosić, J. (2017). Organska poljoprivredna proizvodnja u Evropskoj uniji i tranzicionim ekonomijama u funkciji zaštite životne sredine, Ecologica 24(85): 5–12, ISBN 0354-3285, UDK 502.33/.34:631.852/.878
19. Stolze, M., Sanders, J., Kasperczyk, N., Madsen, G. and Meredith, S. (2016). CAP 2014-2020: Organic farming and the prospects for stimulating public goods, IFOAM, Brussels.
20. Van Espen M, Williams JH, Alves F, Hung Y, de Graaf DC, Verbeke W. Beekeeping in Europe facing climate change: A mixed methods study on perceived impacts and the need to adapt according to stakeholders and beekeepers. Sci Total Environ. 2023 Aug 25;888:164255. doi: 10.1016/j.scitotenv.2023.164255. Epub 2023 May 16. PMID: 37196971; PMCID: PMC10280316.
21. Vapa Tankosić, J. (2023a). Agri-environmental Climate Measures in the Serbian Agricultural Policy in Relation to the Common Agricultural Policy. J Agron Technol Eng Manag 2023, 6(6), 958-964. DOI: 10.55817/HBNT7451
22. Vapa Tankosić, J., Ignjatijević, S., Kiurski, J., Milenković, J., Milojević, I. (2020a). Analysis of consumers' willingness to pay for organic and local honey in Serbia. Sustainability 2020, 12, (11), 4686, 1-23. https://doi.org/10.3390/su12114686
23. Vapa-Tankosić, J., Miler-Jerković, V., Jeremić, D., Stanojević, S. , Radović, G. (2020b). Investment in Research and Development and New Technological Adoption for the Sustainable Beekeeping Sector, Sustainability, 12(14), 5825, pp.1-17; https://doi.org/10.3390/su12145825
24. Vapa Tankosić, J., Lekić, S. (2018). Analysis of measures and instruments of agro-ecological financial support for organic production. Kultura polisa 36: 663-676. UDC 332.2.
25. Vapa Tankosić, J., Mirkov, M. (2025) Foreign Trade Exchange of Agricultural and Food Products of the Republic of Serbia with the European Union and CEFTA. J Agron Technol Eng Manag, 8(2), 1506-1517. DOI: 10.55817/SKRW9756
26. Vapa Tankosić, J., Prodanović, R., Medović, V., (2023b). Analysis of Agri - Environmental Management Practices and their Implementation in the Agricultural Policies of the Republic of Serbia, Sustainability, 15(16):12476, DOI: 10.3390/su151612476
27. Vapa Tankosić, J., Redžepagić, S., Stojsavljević, M., (2013). Trade, Regional Integration and Economic Growth: MEDA Region and the Western Balkan Countries. In M. Peeters, S. Nidal, S.Wassim (Eds.) Financial Integration: A Focus on the Mediterranean Region Series: Financial and Monetary Policy Studies, Vol. 36. Berlin Heidelberg: Springer Verlag. pp.215-229. ISBN: 978-3-642-35696-4
28. Vapa Tankosić, J., Stojsavljević, M. (2014). EU Common Agricultural Policy and Pre-Accession Assistance Measures for Rural Development. Economics of Agriculture, 61(1), pp.195–210, UDC: 005.51:631EU, ISSN 0352-3462.

29. Vapa Tankosić, J.; Hanić, H.; Bugarčić, M. (2022). Consumer's characteristics and attitudes towards organic food products in times of Covid-19 pandemic. Economics of Agriculture 2022, 69, (2), 469-481. https://doi.org/10.5937/ekoPolj2202469V
30. Vapa, B., Vapa Tankosić, J. (2022). Analysis of the SMES international promotion factors in the function of enhancing organisational resilience . Journal of Entrepreneurship and Business Resilience, 5(2), 15–23.
31. Vapa, B., Vapa Tankosić, J. (2019). Management of the international distribution channels in the SMES international business strategy, School of Business,1/2019, pp. 32-46 UDC 339.5:334.72(497.11) DOI 10.5937/skolbiz1-23086
32. Vukoje, V., Tomaš Simin, M., Trkulja, U., Klještanović, S.. Krompić, J. (2015). Priručnik: Inovativni program unapređenja organske proizvodnje. Novi Sad: Poljoprivredni fakultet.
33. Willer, H., Schlatter B. & Trávníček, J. (2023). The World of Organic Agriculture Statistics and Emerging Trends 2023, Research Institute of Organic Agriculture FiBL IFOAM – Organics International, Bonn.