



THE BIOAGRICULTURE-ECOLOGY SYNERGY

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ABSTRACT

Agriculture affects nature and natural resources, changes the environment, and causes environmental problems. But as an economic activity it is directly related to natural conditions and dependent on natural forces. And nature management leads to environmental consequences. Organic farming has a lesser impact on the environment and contributes to its protection.

The purpose of this study is to monitor the impact of organic farming on ecology and environmental protection. To achieve this goal the following tasks are solved: analyzing the state and development of organic farming in Bulgaria; studying the impact between organic farming and ecology; to substantiate the conclusions and recommendations of the study

The methods and approaches used to achieve the goal and solve the problems are analysis and synthesis, systematic, synergetic and structural approach, induction and deduction, statistical methods, expert evaluations.

The expectations of the study are to establish that there is a potential for the growth of organic farming which has an impact on environmental protection.

Key words: agriculture, production, land, animals, markets.

INTRODUCTION

Under the conditions of the market economy, the adequate policy for environmental protection is a decisive factor, and the basis for the restructuring of agriculture in order to maintain its sustainable and environmentally friendly development in the coming years. In Bulgaria, organic production has been growing rapidly in line with the increased number of agri-environmental measures in the Common Agricultural Policy (CAP), which ensure the implementation of good environmental practices.

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MATERIALS AND METHODS

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RESULTS AND DISCUSSION

The interaction between organic farming and ecology can be determined depending on the extent to which it contributes to the conservation of biodiversity, development of bioproduction, reduction of water and soil pollution, soil erosion. Determining the compatibility of organic farming with the environment is essential for society in the context of the CAP, market liberalization, the

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organic farming and sustainable agricultural development

The economic, social and institutional aspects of the synergy between agriculture and ecology have been extensively studied in EU Member States (1-3). Issues related to the greening of Bulgarian agriculture and its sustainable development have been studied by Yovchevska (4, 5), Bachev (6), Mitova (7) and others.

In Bulgaria, there are good preconditions for the development of organic farming - ecologically preserved areas, the realized benefits for the environment, as well as the growing demand and consumption of organic food by the population. For the period 2007 - 2017 the areas on which the methods of organic production in Bulgaria are applied

have increased many times, but are only 2.72% of the total usable agricultural area in the country. According to Eurostat data for EU countries, this indicator is about 7% and Bulgaria ranks 25th in the indicator ranking. Austria is at the top with a share of 23.3%, followed by Estonia - 19.6%, Sweden - 19.16%, Italy, the Czech Republic and others, with Romania behind Bulgaria with a share of 1.93%. According to data from the annual report of the Ministry of Agriculture and Food from 2019, for 2018 the areas for organic production in the country have increased - from 136,629.2 ha to 162,332.4 ha, which is 3.2% of the total utilized agricultural area in the country compared to 2017, 72% in the previous year. The areas that have passed the period of transition to organic farming for 2018 have been increasing (**Table 1**).

Table 1. Areas in transition (ha) according to crop types

Crop types	Areas that have passed the transition period	
	2017	2018
1.Cereals, including rice	6 192	17 028
2.Technical crops	8 517	22 565
3. Fresh vegetables melons, strawberries, cultivated mushrooms (total) 1 556	3 191	
4.Perennials	11 320	22 780
5. Permanent meadows and pastures	13 423	24 651
6. Fodder crops from arable land (Green crops)	4 601	842
7.Fallow land	2 328	3 345

Source: MAFP, according to data from the annual reports of the controllers of organic production.

From the areas with cereals, mainly wheat, maize, barley and oats are grown – they totally increase by more than 26% compared to the previous year, but according to Eurostat data the share of these crops decreases compared to the total area in the control system from 19% to about 13%, as a result of increased interest in organic farming and insufficient financial resources.

The areas with technical crops have increased by 36% compared to 2017, with an increase in the areas with aromatic crops, medicinal plants and spices. The largest share of this group of crops is occupied by the areas with lavender (7,021.5 ha), followed by fennel (3,948.2 ha), coriander (26,486 ha) and oil-bearing rose (2,255.2 ha). The areas with perennial plantations have increased by more than 25% compared to 2017. Since 2015, Bulgaria has ranked sixth or seventh in the EU (after Spain, France, Italy, Germany, Greece and Austria) in

areas with organically grown vineyards, which favors organic wine production. Our country occupies one of the leading positions (after Romania and Finland) in terms of certified areas for harvesting wild fruits, herbs and mushrooms, which makes it possible to increase the supply of this expanding market(8). The areas in the control system with fresh vegetables, melons, strawberries and cultivated mushrooms have almost doubled. The areas with permanent meadows and pastures have also increased (by about 2%). They are more easily transformed into the organic sector, are included in agri-environmental payments and contribute to environmental protection.

In conventional agriculture, yields are higher than those in organic farming - for example, in cereals they are two or more times higher. This shows that agri-environmental measures, in addition to contributing to the increase in

organic areas and the number of producers, need to stimulate the increase in yields and sales of organic products.

Organic animal husbandry in Bulgaria is developing more slowly than organic plant growing. In the country cattle, sheep, goats

and bee families are mainly raised in the organic way. According to the data in **Table 2**, the number of sheep in 2018 has increased more than 15 times compared to 2007, cattle - more than 26 times, goats more than 8 times and bee families - 7 times.

Table 2. Farm animals in the control system (including animals in transition)

Animal types	Number of animals, reared organically			Total number of animals, reared in 2018	Share of organically reared animals in the total number of animals in 2018
	2007	2017	2018		
Cattle	395	10 400	11 359	526 491	2,2%
Sheep	1 690	25 959	23 636	1 350 033	1,8%
Goats	1 058	9 023	9 393	271 734	3,4%
Bee colonies	35 747	250 434	264 069	783 348	33,7%

Source: MAF "Agrostatistics" and data from the annual reports of the controllers of organic production

As the number of organically reared animals increases, so does the organically produced animal production. According to data from the Ministry of Agriculture and Food for 2018, 5,280 tons of raw milk were produced organically; 57 tons of cream; 10.5 tons of oil; 244 tons of cheese; 3 203 tons of honey and bee products; 1,500 tons of biological mussels. The market of organic products in Bulgaria is new, but it is developing rapidly - the number of specialized stores and retail outlets offering organic food is increasing(9). A significant part of Bulgarian organic food and products is sold on foreign markets. The country is a traditional producer of several types of organically certified honey and bee products, which are well received on the world market. Bulgarian organic fresh fruits and vegetables, milk and dairy products, jam, lutenitsa, dried fruits and nuts are highly valued on both the European and world markets. Bulgaria is a leader in the export of

organic oil-bearing rose and lavender. The demand for organic food on the European and world market is ahead of their supply, which opens up great opportunities for Bulgarian organic producers.

According to data from the Ministry of Agriculture and Food as of the end of 2018 the total number of registered biological operators in our country is 6,660. Of these 6,214. are producers, 234 are processors of organic products and 212 - traders (importers, exporters, wholesalers and retailers). The number of operators in the control system in organic production for 2018 is nearly 7.2% out of the total registered farmers in the country. There is a relative stability of the previous year level and a significantly increasing trend towards the rise in the number of producers of organic production as a whole, who have a leading role in the total number of certified operators (**Table 3**).

Table 3. Certified operators, number, years

Years	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Operators Number	339	311	476	820	1 054	3 750	3 995	4 092	6 173	7 262	6 822	6 660

Source: Eurostat and MAF

Since 2007 until now, the number of operators in organic farming in Bulgaria has increased nearly 20 times, which is a result of both the priority support of this sector and the protection of the environment through organic production.

The funds for environmental protection in the Rural Development Program (RDP) 2014-2020 in Bulgaria account to nearly half of the program budget. The planned funds for organic farming have increased more than 4 times compared to those of the RDP 2007-2013, reaching 151.6 million euros, as new areas

such as organic livestock have been added and production in transition has been separated.

The introduction of green direct payments in the CAP 2014-2020 is aimed at improving and protecting the environment. The measures set there, such as crop diversification, maintenance of permanently grassed areas and creation of ecologically oriented areas, will lead to an increase in costs and, respectively, a reduction in farmers' incomes or lost benefits for a certain period of time. But the areas in organic farming by default are approved for the so-called. "Green payments". The support is in the form of compensatory payments to farmers. These payments are a good incentive to attract them into organic production.

The main purpose of payments for the conversion or maintenance of areas for organic farming and organic livestock is to motivate and stimulate the participation of farmers in such production schemes that provide the population with environmentally friendly and good-tasting products, as well as to apply such agricultural practices that protect the environment.

CONCLUSION

As a result of the study, the following conclusions can be drawn:

organic farming is an attractive sector of Bulgarian agriculture and has good prospects for development;

the share of organic farming in the utilized agricultural area is small and needs to be increased to reach the EU average;

the areas in transition to organic farming are significantly increasing and are a guarantee for the increase in organic products on the market, as well as for the growing interest of agricultural producers in organic farming;

it is necessary to stimulate the increase of the yields from organic production and the sale of organic products;

the provided compensatory payments in organic farming support and stimulate the agricultural producers to apply environmentally friendly production practices;

the synergy between organic farming and ecology is two-way - on the one hand it is directly related to natural conditions, uses natural resources and is directly dependent on ecology, on the other hand, organic farming affects the environment and can solve environmental problems.

REFERENCES

1. Defrancesco, E., Gatto, P., Runge, F. & Trestini, S. (2008). Factors affecting farmers' participation in agri-environmental measures: A Northern Italian perspective. *Journal of agricultural economics*, 59(1), 114-131.
2. Dobbs, T. L. & Pretty, J. (2008). Case study of agri-environmental payments: *The United Kingdom. Ecological economics*, 65(4), 765-775.
3. Peerlings, J. & Polman, N. (2009). Farm choice between agri-environmental contracts in the European Union. *Journal of Environmental Planning and Management*, 52(5), 593-612.
4. Yovchevska, P. (2010). Ecological culture in the modernizing society. "*Environmental Imperative and Traditional Agricultural Practices: Relationships and Synergies*", ISBN 978-954-323-724-1, Avangard Prima, p. 121.
5. Yovchevska, P. (2012). Dimensions of ecological culture. "The Common Agricultural Policy (2014-2020) - a response to environmental concerns of society", p. 150.
6. Bachev, H., Yovchevska, P., Mitova, D., Toteva, D., & Mitov, A. (2013). Environmental Management in Bulgarian Agriculture. Available at SSRN 2367418.
7. Mitov, A., 2019, Review of the institutional mechanisms for eco-management of agricultural holdings in Bulgaria, *Journal of Economics and Management of Agriculture*, 64.4 pp.34-47 C.
8. Barbu, C. (2012). Management and Environmental Protection, ASERS Publishing.
9. Ivanov, B., R. Popov, N. Koteva, D. Mitova et al., 2020, Challenges for Bulgarian agriculture and rural areas for the implementation of the new CAP, IAI, ISBN978-954-8612-26-5, p.125 -135.
10. Agrarian reports, 2008-2019, MAF.
11. MAF Annual reports of the control bodies of the organic production
12. NSI, Statistical Yearbook, S., 2008-2019.
13. PDRA 2014-2020. MAF, 2017.

