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
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 2.72% in the previous year. The areas that have passed the period of transition to organic farming for 2018 have been increasing (Table 1).

<table>
<thead>
<tr>
<th>Crop types</th>
<th>Areas that have passed the transition period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cereals, including rice</td>
<td>6,192</td>
</tr>
<tr>
<td>Technical crops</td>
<td>8,517</td>
</tr>
<tr>
<td>Fresh vegetables melons, strawberries, cultivated mushrooms (total)</td>
<td>3,191</td>
</tr>
<tr>
<td>Perennials</td>
<td>11,320</td>
</tr>
<tr>
<td>Permanent meadows and pastures</td>
<td>13,423</td>
</tr>
<tr>
<td>Fodder crops from arable land (Green crops)</td>
<td>4,601</td>
</tr>
<tr>
<td>Fallow land</td>
<td>2,328</td>
</tr>
</tbody>
</table>

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

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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)

<table>
<thead>
<tr>
<th>Animal types</th>
<th>Number of animals, reared organically</th>
<th>Total number of animals, reared in 2018</th>
<th>Share of organically reared animals in the total number of animals in 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2007</td>
<td>2017</td>
<td>2018</td>
</tr>
<tr>
<td>Cattle</td>
<td>395</td>
<td>10 400</td>
<td>11 359</td>
</tr>
<tr>
<td>Sheep</td>
<td>1 690</td>
<td>25 959</td>
<td>23 636</td>
</tr>
<tr>
<td>Goats</td>
<td>1 058</td>
<td>9 023</td>
<td>9 393</td>
</tr>
<tr>
<td>Bee colonies</td>
<td>35 747</td>
<td>250 434</td>
<td>264 069</td>
</tr>
</tbody>
</table>

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

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</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>339</td>
<td>311</td>
<td>476</td>
<td>820</td>
<td>1 054</td>
<td>3 750</td>
<td>3 995</td>
<td>4 092</td>
<td>6 173</td>
<td>7 262</td>
<td>6 822</td>
<td>6 660</td>
</tr>
</tbody>
</table>

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.

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