

**POSSIBLE DEVELOPMENTS ISSUES IN ORGANIC VEGETABLE PRODUCTION IN R. OF
MACEDONIA**

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Abstract

Due to the presence of rural regions clean from industry and pollution, the usage of own inputs in the crop production, Republic of Macedonia has favorable pre-conditions for development of organic agriculture. As a result of that the certified area under organic production increased from 226 ha in 2005 to 3239.88 ha in 2016, while the number of farms from 50 increased to 562, for the same period. But despite satisfactory conditions for the development and increase of the organic production in RM, very experienced vegetable growers with long tradition of cultivating several crops there are still a number of issues that obstruct its development and need careful attention and effort by all stakeholders in the process of organic production in order to overcome them. Among these limitations primarily are included: lack of organic seeds and other inputs, lack of machines for cultivation of the soil, lack of markets for selling the products, inappropriate application of agro-technical measures (cultivation, crop rotation, plant protection, fertilizing, irrigation, harvest), disconnection of farmers in rural areas, poor infrastructure to the city markets, failure to meet market and consumer requirements regarding quality, quantity and continuous supply of organic plant products, lack of information for the new technology in the organic production, inadequate transportation, lack of storage facilities and very important package, economic crisis, etc. Although some of the plant protection products and fertilizers for organic production are present on the market, the reproductive material (seeds) still remains to be the largest constrain for organic vegetable production. These limitations are probably the reason for low participation of organic vegetable production in the overall organic scheme. In 2016 there are only 93.17 ha (in conversion and organic), that is only 2.87% of the total organic production. As future steps for accelerating the development of organic production in Macedonia must be considered: connecting of the farmers that have a common interest in associations, cooperatives, in order to supply cheaper input materials, group certification, support of trainings, information technology and so on.

Keywords: organic vegetable seeds, distribution channels, inputs, limitations, potential.

Introduction

The concept of organic agriculture developed in the early twentieth century, first in Europe and then in the United States (Tomaš-Simin and Glavaš-Trbić, 2016). Organic production is gaining an increasing share of the vegetable market since it is promoted and perceived by consumers as healthier and safer for the environment (Orsini et al, 2016, Sobieralski et al., 2013). Total area under organic vegetable production (almost 354000 ha) is 0,6% of the total area of vegetables grown in the world (58 million hectares) (FAOSTAT, 2013). The countries with the largest vegetable areas are the USA, China, Poland and Italy (each with areas over 20000ha). The USA reported 100000 ha of organic vegetables (Wiler and Lernoud, 2017). Conditions for vegetable and flower crop production- the comparative advantages of the territory of the Republic of Macedonia significantly cause vegetable production to be one of the most important area in agriculture. In terms of area of total 420000ha under arable land and gardens, vegetables are grown on more than 50000ha (12%) and after cereals (43%) is the largest area of the particular plant group. However, in the value of crop production, vegetable crops have the largest share (37,6%), while wheat covers 14,5% (Jankulovski et al., 2013).

Republic of Macedonia has favorable pre-conditions for development of organic agriculture such as having regions clean from industry and pollution and use of own inputs in production. The country has high potentials for recognition and utilization of natural resources appropriate for further development of organic farming. The organic sector is the fastest growing agricultural sector in Macedonia. The certified area under organic production increased from 226 ha in 2005 to 3,239.88 ha in 2016 and the number of farms from 50 increased to 562, for the same period. But despite favorable conditions for the development and intensification of the organic production in RM, there are still a number of constraints that hinder its development, that need careful attention and effort by all stakeholders in the process of organic production in order to overcome them. Among these limitations primarily are included: lack of organic seeds and other inputs, lack of machines for cultivation of the soil, lack of markets for selling the products, disconnection of farmers in rural areas, poor infrastructure to the city markets, lack of information for the new technology in the organic production, inadequate transportation, lack of storage facilities and very important package. These limitations and shortcomings in details will be discussed in the following sections of this paper.

Material and methods

In this paper are given tables with data for organic production in R. Macedonia taken from Ministry of Agriculture, Forestry and Water Economy in R. Macedonia. The paper presents current situation of organic plant production in R. Macedonia with special focus on vegetables, major constraints and limitations following with recommendation what should be done in order to promote organic vegetable production in R. Macedonia.

Results and discussion

Due to the evidence for the good environmental performance of organic farming and the trust in organic foods, there are high expectations of organic farming for the future in the Republic of Macedonia. The analysis was done for organic production development in Republic of Macedonia for the period 2005-2016 presented in the following tables.

Table 1. Capacities under organic production in RM

Year	Total certified production area/ha	Number of operators
2005	266.00	50
2006	509.42	102
2007	714.47	150
2008	1029.00	226
2009	1373.83	321
2010	5228.00	562
2011	6580.92	780
2012	4663.08	576
2013	3167.85	400
2014	2359.49	344
2015	2631.96	481
2016	3239.88	533

Source: Ministry of Agriculture, Forestry and Water Economy in R. Macedonia

In table 1 are given data for capacity of organic production in R. Macedonia. The total certified production area (ha) and numbers of operators are increasing from 2005 (266.00 ha, 50 operators) till 2011 where total certified area and number of operators reaches highest peak 6580.92 ha and 780 operators. After that period the production area and operators decline and raise reaching 3239.88 ha and 533 operators in 2016. This is partly due to public awareness for organic know-how and undeveloped domestic market for organic products.

Table 2. Organic plant production in RM for 2014, 2015 and 2016 in ha

Organic plant production in RM									
Crop	2014			2015			2016		
	In conversion	Organic	Total	In conversion	Organic	Total	In conversion	Organic	Total
Wheat	193.90	702.50	896.40	187.29	417.13	604.42	358.82	579.58	938.40
Feed	69.48	454.51	523.99	231.65	745.68	977.33	209.60	539.38	748.98
Industrial	-	-	-	-	-	-	-	-	-
Oilseeds	24.02	95.51	119.53	82.7	20.86	103.56	10.00	32.84	42.84
Fruits	317.97	109.15	427.12	220.28	179.91	400.19	178.01	244.13	422.14
Vineyards	71.05	25.49	96.54	49.71	26.68	76.39	11.29	6.25	17.54
Vegetables	30.24	22.17	52.41	42.36	41.52	83.88	53.23	39.94	93.17
Fallow land	204.22	38.98	243.20	103.28	539.01	642.29	171.69	230.45	402.14

Source: Ministry of Agriculture, Forestry and Water Economy in R. Macedonia

Organic plant production in Republic of Macedonia for 2014, 2015 and 2016 is given in table 2. According to the data the highest area in conversion, organic and total in the three years is under wheat production while there is no organic production for industrial crops. The vegetables cover small area in conversion, organic and total in comparison with other crops. Although the area with vegetables organic production is small there is a trend of increasing the area with vegetables within the years. In 2014 the area under vegetables in conversion, organic and total is 30.24 ha, 22.17 ha and 52.41 ha respectively. The following year 2015 the area increase and reaches 42.36 ha in conversion, 41.52 ha organic and 83.88 ha total. In the last year 2016 the total area under vegetables in conversion (53.23 ha) and organic (39.94 ha) is 93.17 ha which is only 2.87% (both organic and conversion to organic) of the total organic production (table 3).

Table 3. Organic vegetable production in the Republic of Macedonia in the period of 2010-2016

Year	Total certified organic area (ha)	Total vegetable area organic + conversion(ha)	% of the total organic area
2010	5.228,00	199,9 ha	3,82
2011	6.580,92	263, 19 ha	3,99
2012	4.663,06	57, 68 ha	1,23
2013	3.167,85	121,37 ha	3,83
2014	2359,49	52,41 ha	2,21
2015	2.631,96	83.88 ha	3,18
2016	3.239,88	92.18 ha	2,84

Despite the increase of total organic plant production area, vegetables cover very small portion in the total organic area which is not comparable with the total conventional vegetable area. The major constraints are: still small operational farms, lack of organic seeds and other inputs, lack of machines for cultivation of the soil, inappropriate application of agro-technical measures (cultivation, crop rotation, plant protection, fertilizing, irrigation, harvest), poor infrastructure to the city markets, lack of continuous supply of organic plant products, lack of information for the new technology in the organic production, lack of storage facilities, inadequate transportation and very important package. As regarding limitations there is still lack of information regarding organic production at all levels, limited availability of approved inputs, still lack of trained advisors, lack of contract farming for organic production. These limitations are probably the reason for low participation of organic vegetable production in the overall organic scheme. The organic seeds supply is one of the biggest

problem. Farmers use their own seeds from landraces and non-treated seeds from well-established varieties. They are cultivated in a traditional way in the garden, in a very small space in a rural areas without the use of pesticides (Agic et al., 2013). The same authors stated that in collection missions (2005-2010) in R. Macedonia, 507 accessions from 29 vegetable crops were inventoried, collected, described and documented. This landraces are valuable material and suitable for small scale organic production in rural areas and for the local market. But the quantities are not sufficient to cover demand for larger organic vegetable producers. From 2017, there is only one Macedonian company representative of organic seed from Swiss company that is available for import of organic seeds, but the prices are much too high for the local producers. Local producers can purchase seed from this company only on order for certain variety or cultivar mainly intended for export. However there is a wide range of available input materials such as organic fertilizers and plant protection products on the market in R. Macedonia. But there is still insufficient knowledge and expertise of organic producers about possibilities and methods of use of allowed inputs during production. So, know-how training of organic producers is necessary and is a very good tool for overcoming any production obstacles. The level of formal and non-formal education and research in this area still insufficient. The main role of education in organic farming is to increase the level of public awareness, knowledge and information of organic issues among experts, farmers, and other stakeholders in the organic chain. In order to have proper development of this sector, research activities should be initiated for organic farming techniques, availability of natural resources and the national and international market demands (Agic et al., 2012). Another problem, is that there is no marketing strategy for selling organic products. Organic producers sell their product by themselves on open-air markets, supermarkets or organic shops in bigger cities where the demand is very high in comparison to rural areas. Here is important to mention that in healthy food stores there is lacking of fresh organic produce such as vegetables and fruits although the demand is very high. This can be result in disconnection of farmers in rural areas and poor infrastructure to the city markets. So, there is a need of overcoming these obstacles in distribution channels with networking a small scale suppliers which could further boost and channel organic production in the future. Another limitation is improper packaging of organic vegetables. The package should protect the produce from foreign matter and give all necessary information on the label concerning identification, nature of the produce, origin of produce, commercial specifications, official control mark and logo for organic produce. Assumed the fact that the demand for organic products increases in our country (especially in large cities) and in the European countries, which is a good challenge, it is necessary to take appropriate measures to overcome the above constraints for accelerating the development of organic production in Macedonia. As future steps must be considered: connecting of the farmers that have a common interest in associations, cooperatives, in order to supply cheaper and improvement of availability of organic farming inputs, possibilities for group certification, support of trainings, information technology, revitalization of landraces, production of sufficient quantities and assortment of organic products. Also, major wholesalers/traders/consolidators should be involved in organizing and selling (exporting) of organic products. They could serve as valuable source of information regarding current product features such as product packaging, instruct the producers on type and quantities of products needed by the retailers. Also in R. Macedonia there is an organization IME (Increasing Market Employability) with following activities: increasing market transparency, increasing public awareness and recognition and visibility for Macedonian organic products, stimulate ecotourism development with organic products, increasing sales of Macedonian organic products on export markets and increasing the knowledge on export markets and competitiveness of Macedonian organic products. IME also support promotion of organic products at the world leading organic fair at BIOFACH. According to their market research for fresh organic products as most demanded at the consumer level are: organic potatoes, broccoli, carrots, beetroot, spinach, tomato, pepper and from fruits: apples, pears and cherries. Macedonia has a developed sector of processing fruits and vegetables. However, only a small number of processing entities are involved or are considering to get involved in organic production. There is a need for closer

cooperation of organic production and processing companies. Today, despite growing trends for organic products, the supply of processed organic products is almost insignificant. The reasons for this situation are following:

- lack of knowledge of processing technology of organic products;
- insufficient quantities of certified raw material for processing entities;
- processing entities are not involved in planning the primary production and there is no practice of contractual farming;
- lack of certified/allowed products for processing organic products;
- ignorance of processing entities about the existing support for organic product processing.
- lack of information to processing entities about access to organic product markets;
- insufficient involvement of the state in promotion of organic processed products;
- insufficient support for processing organic products.

Additional reason for this may be the fact that when processing entities get interested for organic products, organic farmers raise the prices enormously in spite of the subsidies they receive. This further discourages the processing entities. Unfortunately, in Macedonia there is no tradition of contractual farming between primary producers and processing companies, but contrary to this, business is done opportunistically, each hoping the other one will find themselves in unenviable situation to be forced to sell the products by low prices or to buy the products by high prices. Market potential for European investors in the agriculture and particularly the organic agriculture sector, as far as demand in Europe and especially in Germany is concerned, is mostly in sourcing products, raw materials and processed goods. Berries, selected vegetables, soy and cereal products might therefore prove to be of highest interest (Simic, 2017). Taking into consideration that Europe has widely open doors only for organic products, it would be necessary to build more serious approach towards the organic agriculture in Macedonia.

Conclusions

Given the fact that interest in organic products increases in our country (especially in large cities) and in the European countries, which is a good challenge, it is necessary to take appropriate measures to overcome the above constraints to accelerate the development of organic production in Macedonia. Future steps must be connecting of the farmers that have a common interest in associations, cooperatives, in order to supply cheaper input materials, group certification, support of trainings, information technology and so on. Efforts should be done for increasing education among experts, farmers and other stakeholders in organic chain. Also there is a need for upgrading the extension services, strengthening university partnerships, increasing the exchange of academic staff and promoting membership in various international associations for organic production. This would help to develop the market and the supply chains by stronger promotion of modern technologies, processing and market systems. With such assistance of appropriate measures Macedonia may hope speedily and efficiently reach national, regional and global organic markets.

References

1. Agic, R., Popsimonova, G. (2013). Current status and future perspectives of vegetable genetic resources in R. Macedonia. Symposium proceedings. International Symposium for agriculture and food. 12-14 December, Volume I, Skopje, 522-529
2. Agic, R., Popsimonova, G., Ibusoska, A., Bogevska, Z., Davitkovska, M., Ristovska, B., Iljovski, I. (2012). Perspective of the Organic Production in Macedonia. *Acta Horticulturae* 960, 263-268.
3. FAOSTAT, 2013. <http://www.fao.org/faostat/en/#data/QC>
4. Jankulovski, D., Hadji-Pecova, S., Martinovski, Gj., Popsimonova, G., Rukie, A. (2013). Recent trends in vegetable and flower crop production in Republic of Macedonia. Symposium Proceedings. International Symposium for agriculture and food. 12-14 December, Volume I, Skopje, 512-520
5. Orsinia, F., Maggiob, A., Roupaelb, Y., De Pascaleb, S. (2016). "Physiological quality" of organically grown vegetables. *Scientia Horticulturae* 208: 131–139

6. Simic, I. (2017). Organic agriculture in Serbia at a glance 2017. National Assosiation Serbia Organica. ISBN 978-86-88997-09-6.
7. Sobieralski, K., Siwulski, M., Sas-Golak, I. (2013). Nutritive and health-promoting value of organic vegetables. *Acta Sci. Pol., Technol. Aliment.* 12(1): 113-123.
8. Tomaš-Simin, M., Glavaš-Trbić, D. (2016). Historical development of organic production. *Economics of Agriculture*, (63) 3: 1083-1099.
9. Wiler, H., Lernoud, J., 2017. The world of organic agriculture statistics and emerging trends. IFOAM – Organics international and FIBL. ISBN 978-3-03736-040-8., 126