

Analysis of Vegetable Production in the European Union with Retrospection on the Conditions in Republic of Serbia¹

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Abstract

The objective of the research is to perceive basic trends of vegetable production in European Union, and then turning to production characteristics in Republic of Serbia. The paper analyzes some parameters of vegetable production, such as: harvested area, total yield and yield per area unit. Another research task is also the quantification of changes and identification of the factors that determined the manifested production movement.

Authors point out basic problems and state necessary measures, which will affect the increment of volume and needed quality of national vegetable production, in other words they present possible exits from the obvious crisis in which this branch has been in the last few years.

The research is based on available data. The research period is 2003-2007.

Key words: *vegetable, production, European Union, Republic of Serbia*

JEL Classification: *D24*

Introduction

Vegetable production in EU countries represents a developed and profitable branch of agricultural production. It means very intensive production, which refers to areas decreasing with yield increment per area unit.

In order to identify the Republic of Serbia's favourable agro-ecological conditions for vegetable production, it is necessary to determine the measures that will support production development on a highly-productive basis. In the frame of national agriculture production, vegetable growing represents an important field, which is characterized by a number of comparable advantages according to other agricultural branches. In perspective, this kind of production should be paid total attention.

¹ The paperwork is part of the research on the following projects: MNTR - 20075 - "Creation of vegetable sorts and hybrids for production in protected space" and MNTR -159004 - "Accession of Serbian economy into EU – planning and financing of regional and rural development, as companies development policy", financed by Ministry of science and environmental protection of Republic of Serbia.

Vegetable production could be a really profitable activity, especially if it is achieved the level of development which will enable vegetables to compete on the international market due to their quality, continuity and quantum.

Data Resources and Working Method

The data is mainly taken from the International organization for alimentation and agriculture – FAO (statistical bulletin - *Production and Trade Yearbook*) and the Republic statistical institute, Belgrade. The most important indicators are presented by tables and graphs, after the standard mathematical-statistical methods have been applied. The research is based on available data and it uses the *desk research* method. The period under study is 2003-2007.

Research Results

Vegetable Production in the European Union

In the period under study, vegetable production in the European Union was running on an average surface of 2.8 million hectares. Every year, the areas for vegetables on the mentioned territory recorded a constant decrease by the yearly rate of 4.28% (Figure 1). The underlined fact is also pointed out by the data according to which, in 2007, as compared to the beginning year of the observed period, the number of hectares on which vegetable growing was organised in the EU was reduced with 15%. As regards production structure, the production of tomatoes dominates, which covered 12.2% on average of the total areas for vegetables.

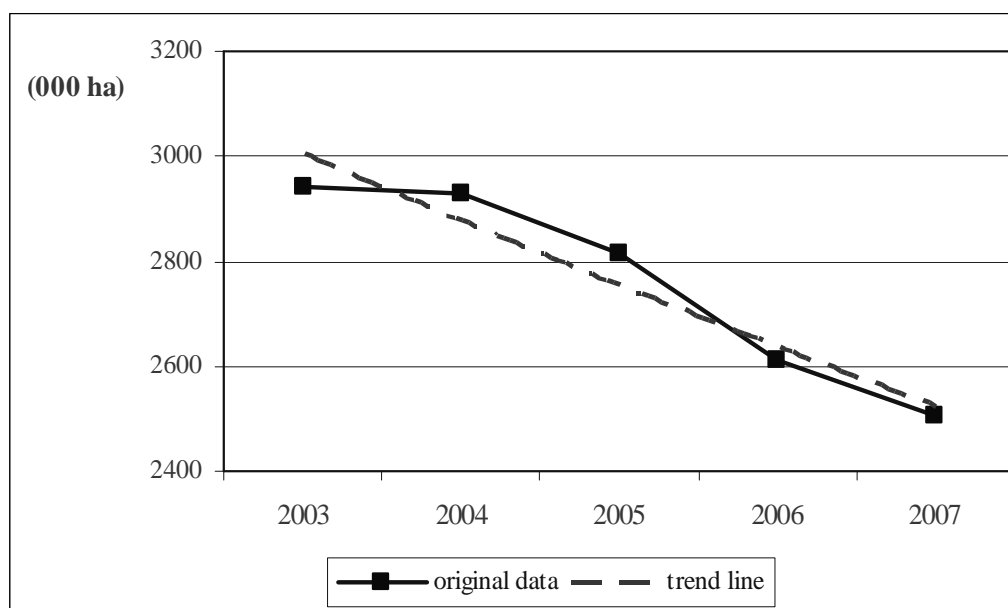


Fig. 1. Movement of areas under vegetable in EU, period 2003-2007 (in 000 ha)

According to their importance rate, tomatoes are followed by cabbage and cabbage-similar plant production, which was done on 7.6% of the total area for vegetables. Then the onion and joined cantaloupe and watermelon production, which were organized on 7.3% and 7.1% of the surface for vegetables. Carrot and peas production, in the observed period, were set up generally on 5.7% of the total surface, while other lines of vegetable production participated with less than 5% (beans, paprika, cucumber, garlic etc.) (Table 1).

Vegetable production in the EU represents an important branch of agricultural production. According to the calculations, it could be concluded that vegetable areas in the EU represent only 5.4% of the total world vegetable surfaces. However, vegetable production in many EU member states is based on highly productive principles, so vegetables are grown on intensive technical and technological basis.

Table 1. Vegetable production in EU, per production lines (period 2003-2007)

| Plant Species | Harvested area (in 000 ha) | Structure (total = 100%) | Yield | |
|----------------------------|-------------------------------|-----------------------------|---------------------|----------------------|
| | | | Total (in 000 t) | Per hectar (t/ha) |
| Tomato | 337 | 12.2 | 17,700 | 52.4 |
| Cabbage and similar plants | 210 | 7.6 | 5,800 | 27.5 |
| Onion | 201 | 7.3 | 5,600 | 27.9 |
| Cantaloupe and Watermelon | 196 | 7.1 | 5,200 | 26.5 |
| Carrot | 157 | 5.7 | 5,800 | 36.9 |
| Peas | 156 | 5.7 | 1,200 | 7.7 |
| Beans | 133 | 4.8 | 1,300 | 10.0 |
| Paprika | 80 | 2.9 | 2,500 | 30.9 |
| Cucumber | 63 | 2.3 | 2,700 | 42.6 |
| Garlic | 43 | 1.6 | 320 | 7.4 |
| Other | 1,184 | 42.9 | 21,200 | - |
| Total | 2,760 | 100.0 | 69,300 | - |

Source: FAO and authors' calculation

Vegetable production in the EU is characterized by certain trends, which have been more and more presented and accepted by consumers. One of the trends of increasing importance nowadays is the mini-vegetable production. According to its name, the 'mini-vegetable' production is represented by non-standard, small yields (products) of certain plant species, which are consumed by the so-called principle: "one product-one bite". They are obtained by using special sorts, or through particular technological processes.

Mini vegetable production has originated in Europe, more precisely in France, which represents, as research leader, both the production and the export leader of this kind of vegetables. In Holland few seed companies have got involved creating mini sorts of tomato, carrot, lettuce, eggplant and cabbage. A good example is also Belgium, where it is noticed a 10% increase per year in the sales of such vegetables. In Deutschland increased market participation comes from the mini lettuce (sorts Romana and Little gem) whose head size is similar to a tennis ball. This is due to its extremely fragile and fine consistency, less prominent central leaf nerve and better taste. Previous experiences show that it is possible to satisfy both sides: producers, if the focus is on the profit, and consumers, if the focus is on the quality and price of the mini vegetable².

Some countries have an important role in vegetable production for EU markets. They are characterized by greater participation in terms of used surfaces, as in the case of higher production intensity, which is reflected in the achieved yield per area unit. As regards production structure of EU countries, Italy is very involved, with more than 20% of the total vegetable areas in its possession. Then, it is followed by Spain, France, Romania and Poland (Table 2).

In the observed period, in the above-mentioned countries, the surfaces on which production has been organised contributed with 66% on average to the total vegetable production. These

² Đurovka, M., Ilin, Ž., Milenković, L., *Značaj i rezultati proizvodnje mini povrća u Srbiji*, XII savetovanje o biotehnologiji - sa međunarodnim učešćem, Čačak, 2007.

countries also face a tendency of vegetable areas decrease in the researched period. In comparison to 2003, in the last year of the observed period, areas in France are reduced with 47%. Vegetable production in France is characterized by intensity and permanent development, which influenced the total vegetable yield. If we compare the starting period and the last year of the period under study, it was decreased with only 33% as a result of a considerable decrease of vegetable areas.

Table 2. Vegetable production in some EU countries (period 2004-2007)

| Country | Harvested area (in 000 ha) | Structure (total = 100%) | Total yield (in 000 t) |
|--------------|-------------------------------|-----------------------------|---------------------------|
| Italy | 576 | 20.9 | 15,100 |
| Spain | 384 | 13.9 | 13,000 |
| France | 376 | 13.6 | 7,500 |
| Romania | 284 | 10.3 | 4,100 |
| Poland | 222 | 8.0 | 5,600 |
| Other | 919 | 33.3 | 24,000 |
| Total | 2.760 | 100.0 | 69,300 |

Source: FAO

Vegetable production in EU countries is based on intensive technical-technological basis, and decreasing of involved surfaces has bigger intensity comparing with decreasing of total yield. Reason of this is permanent intensifying of production which is resulted by yield increment per area unit, what affects on creation of total yield on acceptable level.

Vegetable Production in Republic of Serbia

Vegetable farming has a significant role in Serbian agriculture. It enables the achievement of high value production, organized on a relatively small area. The biggest producers are located in the Northern part of Serbia, as well as in central and southern Serbia. Vegetable production in Serbia is characterized by a small number of market oriented producers, insufficient investments in new technologies and equipment, undeveloped market and modest support to agrarian policy measures.³

Vegetable production in Republic of Serbia, in the observed period, was yearly organized on 160.000 hectares on average, with decreasing tendency. In 2007, the used areas were reduced with 5.2% as compared to the first year of this study.

Focusing on sowing structure, the largest areas were under beans production, which occupied 14.6% on average of total used areas in vegetable production. After that, a significant contribution came from: cabbage and kale (13.5%), tomato (13%), onion (12.3%) and paprika (12.2%).

Besides the decrease in the used areas, a great problem is also the instability of yields per area unit. Because of drought, yield per hectare at some vegetable significantly dropped in 2007, as compared to 2006. Yield of paprika per hectare decreased with 15%, yield of tomato with 18%, while the greatest decrease, with 60% as compared to the previous year, was recorded by beans production.

By enlargement of irrigation systems capacity it could be possible to increase yields per area unit, which besides the stoppage of used surfaces decreasing will lead first to stabilization, and then to increment of total achieved yield.

³ Cvijanović, D., Vlahović, B., Paraušić, V., *Uloga međunarodnog marketinga u kreiranju konkurentnosti domaćih proizvođača povrća - stanje, šanse i perspektive*, Savremeni povrtar, br. 28, Poljoprivredni fakultet, Novi Sad, 2008.

Table 3. Vegetable production in Republic of Serbia, per production lines (period 2003-2007)

| Plant Species | Harvested area (in ha) | Structure (total = 100%) | Yield | |
|---------------------------|------------------------|--------------------------|------------------|--------------------|
| | | | Total (in t) | Per hectare (t/ha) |
| Beans | 23,400 | 14.6 | 34,400 | 1.3 |
| Cabbage and kale | 21,600 | 13.5 | 296,700 | 13.8 |
| Tomato | 20,800 | 13.0 | 171,700 | 8.3 |
| Onion | 19,600 | 12.3 | 124,500 | 6.4 |
| Paprika | 19,500 | 12.2 | 153,000 | 7.8 |
| Cantaloupe and Watermelon | 16,900 | 10.6 | 254,800 | 15.1 |
| Peas | 12,700 | 7.9 | 32,500 | 2.6 |
| Garlic | 8,900 | 5.6 | 24,600 | 2.8 |
| Cucumber | 8,900 | 5.6 | 61,000 | 6.9 |
| Carrot | 7,600 | 4.8 | 60,400 | 7.9 |
| Total | 159,900 | 100,0 | 1.213,600 | - |

Source: Republic Statistic Institute, Belgrade and authors calculation

Vegetable production in Republic of Serbia is characterized by decrement of used surfaces, which is not followed by proper production intensification. Yield variation per area unit and the tendency of area reduction caused instable vegetable production. A significant problem in national vegetable production is dependence on weather conditions, in other words lack of irrigation systems, which represents one of the key elements of stable production.

In order to ensure continuity and enough vegetable quantum, associations of agricultural producers (cooperatives) have a great importance. They significantly contribute to the integral development, efficient sales and profit achievement. They are established at local level by individual agricultural producers, with the main goal of adequate company managing.

The cooperative as an organization of joined agricultural producers is a precondition for more economic input purchase, as well as for the efficient positioning on the market as single seller. Cooperatives have to be modern, business oriented organizations of agriculturalists, enabled for entrepreneurship. Joined producers, together with management, have to define their production with a view to a known buyer.

Because of that, besides adequate personnel, cooperatives have to know what the market needs at the most, in other words what exactly should be produced⁴. As concerns production of enough vegetable quantum and continuous supply of specified market segment, single producers could produce adequate volume only in exceptional cases. By vegetable producers' cooperation, the problem of continuity achievement in delivering the needed volumes could be solved. By association, producers get significant advantages, such as united purchase, better and sure sale, common accession to the fairs (lower costs), cheaper credits, better support of Ministry of Agriculture, based on higher competitiveness of association in relation to single producer etc.

Existing problems in vegetable production of Republic of Serbia could be mitigated by active involvement of specific government institutions, in other words with redefining, and then implementation of agrarian policy measures. The limitation factors which influence vegetable production development are:

1. small size of estates disables rational production (households atomization);
2. undeveloped national seed production and import dependence;

⁴ modified according to Babović, J., Lazić, B., Malešević, M., Gajić, Ž., *Agrobiznis u ekološkoj proizvodnji hrane*, Naučni institut za ratarstvo i povrtarstvo, Novi Sad, 2005.

3. inadequate capacities of irrigation systems;
4. low interest of banks in production crediting (in case of financial loans, interests are too high, in other words not customized to agricultural production cycles and possibilities of debt repayment);
5. lack of agricultural producer's cooperation whose main goal could be decreasing of input purchasing costs, better production capacities usage and stronger market presence;
6. inadequately developed extension service system.

Development possibilities for vegetable production could be considered through a SWOT analysis, which is applied as qualitative method in strategic planning. It is based on bringing face to face of internal characteristics (strengths and weaknesses) and conditions from surrounding. In that way, the analysis combined estimation of internal factors with those that come from external resources that cannot be under the system's control. The SWOT analysis of vegetable production in Republic of Serbia⁵ could look as follows:

Strengths

- Significant economic playability;
- Highly nutritive value;
- Maximal soil usage.

Weakness

- Labour intensive production;
- Weak or non-standard product quality;
- Lack of usage of "good agricultural practice" (GAP) principles;
- Limited irrigation capacities.

Opportunities

- Integral, intensive production;
- Organic production;
- Handcraft processing and consumption in fresh condition.

Threats

- Market limitations;
- Consumers habits;
- Undeveloped livestock breeding.

Successful sale of produced vegetable through big retail chains requires that producers own the Global GAP certificate, in other words this proves that vegetables are produced according to the principles of good agricultural practice.

Global GAP represents a private institution which set its own standards of good agricultural practice, for agricultural products certifying. The main goal of standard usage is quality assurance and health safety of products, or better said it brings under control all measures that will preserve the environment, employees' rights and animal welfare.

Standards implementation and certification has not been legislated yet, but it is a precondition for producers and big retail traders cooperation. Control is multiphase, and it includes all production activities (from control of inputs to transport and stocking control).⁶

⁵ Novković, N., Ilin, Ž., Janošević, M., Mutavdžić, B., Značaj proizvodnje povrća za multifunkcionalni ruralni razvoj, *Multifunkcionalna poljoprivreda i ruralni razvoj (III)*, IEP, Beograd, 2008.

⁶ www.globalgap.org

Guarding of rules which are considered under certificate Global GAP contribute to next:

1. Producers have a trustful way to prove that vegetable production is done under controlled conditions, and that obtained products are healthy and safe;
2. By purchasing products which are certified by Global GAP, consumers are sure that vegetables are sanitary safe.

Development of vegetable production in Serbia depends directly on the convergence with the conditions in the agriculture of developed EU countries.

For continuous production of adequate vegetable quantum it is needed, beside stabilization of used surfaces, production development on intensive technical-technological basis. It is necessary to balance products' quality according to the criteria which are determined for the markets of the European Union.

Moreover, besides production in basic lines of vegetable farming, special attention should be paid to the extensive presence of modern trends in this branch of agriculture, and thus to securing of additional profit.

Conclusion

According to the study, it could be concluded that vegetable production in EU countries is based on intensive technical-technological basis, indicated by relatively stable yields as compared to noticeable decrement of used areas during the observed period. In this case, reduction of used surfaces has higher intensity as compared to the decrease in total yield.

Vegetable production in Republic of Serbia is characterized by reduction of used areas, which is not followed by increment of production intensity. Variation of yields per area unit and production surfaces decrease caused oscillations in vegetable production.

Cooperation is one of the imperatives of vegetable production development in Republic of Serbia, with the aim of a decrease in production costs, better capacities usage and more efficient positioning on the market. By introducing Global GAP standards, it would be an opportunity for increased Serbian vegetable participation on developed countries' markets, which will affect the possibility for production improvement from the technical and technological point of view.

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Analiza producției de legume din Uniunea Europeană comparativ cu condițiile din Republica Serbia

Rezumat

Obiectivul cercetării este acela de a identifica tendințele de bază din cadrul producției de legume din Uniunea Europeană și apoi de a reveni la caracteristicile producției din Republica Serbia. Articolul analizează parametrii producției de legume, precum: zona cultivată, productivitatea totală și profitul pe zonă. O altă sarcină a cercetării este de a cuantifica schimbările apărute și factorii care au determinat modificări la nivelul producției.

Autorii subliniază problemele de bază și indică măsurile necesare care vor genera creșterea volumului și a calității producției naționale de legume; cu alte cuvinte, ei prezintă posibilele căi de depășire din criza evidentă în care se află această ramură în ultimii ani.

Cercetarea se bazează pe datele disponibile. Perioada studiată este 2003-2007.