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**UNIVERSITY OF BELGRADE  
FACULTY OF AGRICULTURE**



## **Book of Proceedings**

### **The Seminar**

# **AGRICULTURE AND RURAL DEVELOPMENT - CHALLENGES OF TRANSITION AND INTEGRATION PROCESSES**

**50<sup>th</sup> Anniversary**

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**The Seminar**  
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**Challenges of Transition and Integration Processes**

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## **FRUIT PRODUCTION IN SERBIA DURING THE TRANSITION PERIOD<sup>1</sup>**

*Bojan Dimitrijević<sup>2</sup>, Branka Kalanović-Bulatović<sup>3</sup>, Slobodan Ceranić<sup>4</sup>*

### ***Summary***

*Difficult and long-term process of transition which the Republic of Serbia went through in the last more than twenty years, globalization, wars and embargo in the nineties of the 20<sup>th</sup> century and finally, world economic crisis that began in 2008 have contributed to changes in standard of living, unemployment rate and migration.*

*Under the given circumstances, fruit production represents a potential for mitigating and perhaps even overcoming the unemployment crisis, rural depopulation and increase of income of rural population.*

*Accordingly, there is a need to consider the condition realistically and to identify existing problems, their causes, some possibilities and further tendencies of resources and activities in the fruit production sector in order to develop a highly profitable agricultural branch in our country.*

*Data bases of the Statistical Bureau of the Republic of Serbia, Food and Agriculture Organization of the United Nations (FAO), Statistical Office of the European Union (Faostat) as well as scientific and research literature from the*

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<sup>2</sup> Bojan Dimitrijević, MSc., Teaching Assistant, Faculty of Agriculture, University of Belgrade, Nemanjina 6, 11080 Belgrade, + 381 11 2 615 315, ext. 336, e-mail: [bojandi@agrif.bg.ac.rs](mailto:bojandi@agrif.bg.ac.rs)

<sup>3</sup> Branka Kalanović-Bulatović, Ph.D., Associate Professor, Faculty of Agriculture, University of Belgrade, Nemanjina 6, 11080 Belgrade, + 381 11 2 615 315, ext. 495, e-mail: [brankal@agrif.bg.ac.rs](mailto:brankal@agrif.bg.ac.rs)

<sup>4</sup> Slobodan Ceranić, Ph.D., Full Professor, Faculty of Agriculture, University of Belgrade, Nemanjina 6, 11080 Belgrade, + 381 11 2 615 315, ext. 416, e-mail: [ceranic@agrif.bg.ac.rs](mailto:ceranic@agrif.bg.ac.rs)

*areas directly or indirectly related to the topic will be used as the sources of data for writing the work.*

*Several methods will be used in the work: content analysis method, descriptive statistics, comparison method and hypothetical-deductive method.*

**Key words:** *globalisation, transition, crises, fruit, production.*

**JEL classification:** *Q 10*

## **1. Introduction**

Fruit production, wherever present and developed, is one of important factors behind the development of agriculture and food industry as well as other industries such as cosmetic, pharmaceutical, chemicals industry, etc. Exporting of fresh fruits and fruit products could generate significant foreign exchange revenue. Therefore, fruit production certainly could have significant position in the overall economic development of a country.

That is precisely why the analysis of the current state and change in the scope and dynamics of fruit production in one country, and beyond, is an important prerequisite for the development of not only the primary fruit production, but also the entire food and other industries, and therefore the economy of a country as a whole. This becomes even more important if the economy of a country finds itself in conditions of very rapid and dynamic changes in all crucial aspects of its existence (political, economic, social), as was the case in Serbia in the last 25 years.

In this context, the aim of this research is to investigate the tendencies, regarding the extent, dynamics and structure of fruit production in Serbia for the period from 1988 to 2012 and to assess the present state of this agricultural branch. This analysis opens up the possibility of identifying some opportunities and future directions of resource movement and activities in the production and processing of fruit in Serbia in order to develop fruit growing as a highly profitable branch of agriculture in our country.

## **2. Materials and methods**

National and international statistical databases such as: Statistical Office of the Republic of Serbia, Food and Agriculture Organization of the United Nations (FAO), Eurostat (Statistical Office of the European Union) have been used as data resources for this research paper were. The results of previous research by other authors published as scientific literature in the field directly or indirectly related to the topic have also been analyzed.

Methods used during the development of this paper are content analysis method, method of descriptive statistical analysis, comparative method and hypothetico-deductive method.

The research covers the 1988 – 2012 time period, in order to analyse the situation a couple of years just before transition and all the way long through the whole transition period. For the purpose of analyzing the changes this research focuses on, generally, average values of the parameters observed for a period of three consecutive years have been taken into consideration. This is an attempt to ease noticeable fluctuations due to the changing climate, as well as other short-term factors that appeared in certain observation periods (social, economic, political, etc). Time periods between two average values within three-years during the observation period (1988-2012), coincide with the emergence and actions of distinct and complex political, economic and social changes (globalisation, wars, economic sanctions, global economic crisis, human migrations) that have had and still have far-reaching influence on the production and processing of fruits in the Republic of Serbia.

### **3. Results and discussion**

In total agricultural production value 68.5% comes from plant production (SORS, 2012). The total value of fruit production in 2012 was almost half a billion dollars and accounted for around 15% in the value of total plant production.

In the foreign trade of agricultural and food products, among the top ten products of agricultural origin in the value of export in 2012, out of fruits, in the third place are frozen roland raspberries, worth 136 million USD, and sour cherries in eighth place, worth 48 million USD. These data suggest that it is necessary to pay special attention to the production of fruits.

Fruit production in the Republic of Serbia has a centuries-old tradition, and for decades represents a significant branch of agriculture and profitable economic activity. The geographical position of Serbia and its climate factors are the key to the successful cultivation of mainly continental fruit crops of all kinds, both with extensive or intensive farming. This certainly contributes to the fact that Serbia is predominantly highland and mountainous, with many areas and locations with different soil types, different quality, but with good enough qualities to successfully organize intensive fruit production.

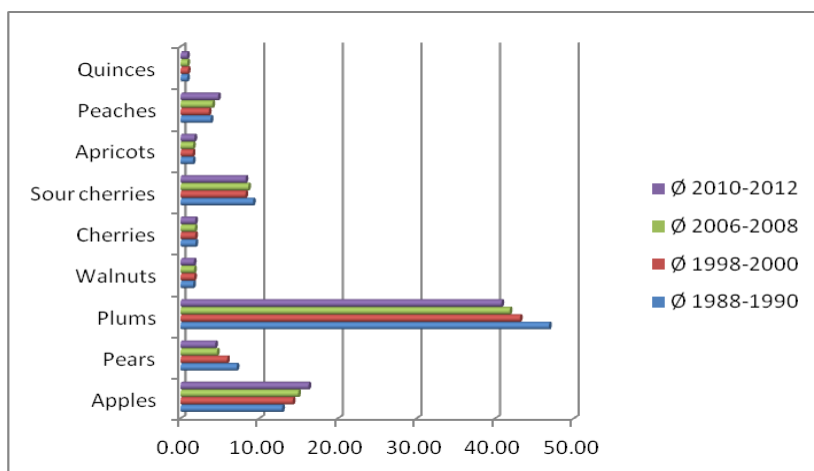
It should also be noted that in comparison with other branches of agriculture, fruit growing, is characterized by a number of comparative advantages. In the context of the problems observed, only a few of them should be pointed out. For this purpose can be used even soils with poorer physical, chemical and biological properties, as well as areas with greater slope, which gives this production orientation even

greater importance. Fruit production can reach from 10 to 20 times greater value of production per unit area than the production of wheat or corn (*Vlahovic, 2010, p. 265*).

The existence of large number of factors entails a high sensitivity of the fruit production to the changes in these factors. In other words, this agricultural branch has a very strong dependence on other industries, and therefore is dependent on general trends around the world and in the country. Changes in these areas have been very dynamic in recent decades.

This is why it can reasonably be assumed that it certainly resulted in changes, but also continued to affect changes in fruit production.

Changes of area harvested, i.e. number of productive trees and vines for the period (1988 – 2012) could be seen by analyzing data presented in Graphs 1 and 2.

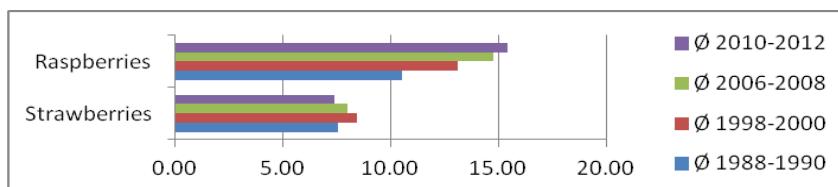


**Source:** Authors, based on data of Statistical Office of Serbia

**Note:** Without data for Kosovo and Metohija

**Graph 1** Trends in the number of trees of productive age in Serbia in the period 1988 – 2012 (000.000)

Average annual growth rate for harvested areas of planted fruits or of a number of harvested fruit tree stubs or grapevines, was at its low for the entire analyzed period (1988-2012). Negative rate of growth was noticed at the harvested areas of grapevine (-2.33%), of pears (-2.12), of plums (-0.65), sour cherries (-0.52) and cherries (-0.13). Positive area rate of growth was noticed with the planted crops of quinces (0.19), walnuts (0.20), apricots (0.64), apples (1.16), peaches (1.27) and raspberries (2.25%).

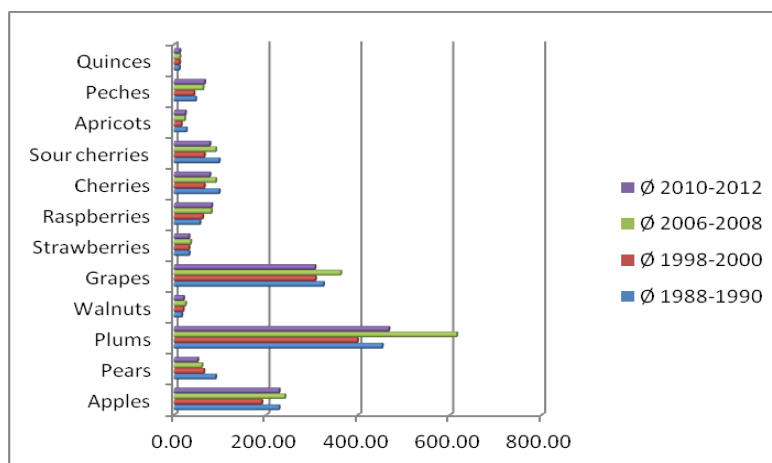


Source: Authors, based on data of Statistical Office of Serbia

Note: Without data for Kosovo and Metohija

**Graph 2** Trends in the number of hectares of Raspberries and Strawberries in Serbia in the period 1988 – 2012 (000)

Tendencies, concerning changes in scope, dynamics and structure of fruit production in Serbia can be detected through data analysis presented in Graph 3.



Source: Authors, based on data of Statistical Office of Serbia

Note: Without data for Kosovo and Metohija

**Graph 3** The scope and dynamics of fruit production in Serbia in the period 1988 – 2012 (000 tons)

**Fruit production - the total volume** in Serbia over the last three years (2010-2012), was, with the notable fluctuation, in average about 1,400,000 tonnes. The average annual growth rate of the total fruit production for the entire analyzed period amounted to - 0.98%. Compared to the average three-year pre-transition sub-period (1988-1990), the total fruit production in the three-year sub-period (1998-2000) decreased by 12.7%. This is by all means a consequence of all the events in Serbia in the last decade of the 20<sup>th</sup> century.



The second sub-period, however, is characterized by a significant increase in the total volume of fruit production by as much as 32.5%, when compared to three-year averages between just before the outbreak of the great global financial crisis (2006-2008) and the end of the last century. Even when the pre-crisis sub-period is compared to the pre-transition three-year average, there is an indication of the increase in the total volume of fruit production by 15.8%.

Decrease of 14.9% has been registered when compared the average for the last three years of the observed sub-period (2010-2012) and the average of the pre-crisis sub-period (2006-2008). However, comparing the average of the last three-year sub-period (2010-2012) to the last three-year of the previous century, one can note growth in the total volume of fruit production by 12.8%. It is interesting to establish that the last (2010-2012) and the first (1988-1990) three-year averages, for the whole observed period, differ by a little more than 1.5% to the benefit of the pre-transition sub-period.

Average annual growth rate of the entire production of fruits for the whole analyzed period (1988 - 2012) was -0.98%. Positive annual growth rate was noticed only for production of raspberries (1.34%) and peaches (1.32%), but negative for production of plums -1.05%, grapes - 1.71%, apples -0.42%, sour cherries -1.01%, pears -3.28%, and of the rest of the fruit -0.31%.

**Table 1:** Structure of total fruit production in Serbia  
in the period 1988 – 2012 (%)

Product	Ø 1988-1990	Ø 1998-2000	Ø 2006-2008	Ø 2010-2012
Apples	16,17	15,48	14,74	16,43
Pears	6,37	5,23	3,68	3,65
Quinces	0,78	0,91	0,74	0,86
Plums	32,10	32,38	37,67	33,62
Cherries	2,12	1,90	1,66	1,75
Sour cherries	6,92	5,29	5,52	5,56
Apricots	1,85	1,23	1,37	1,73
Peaches	3,29	3,47	3,83	4,75
Raspberries	3,95	5,00	4,92	5,85
Strawberries	2,29	2,58	2,18	2,30
Grapes	23,02	24,95	22,19	22,05
Walnuts	1,14	1,58	1,49	1,45
Total	100,00	100,00	100,00	100,00

Source: Author's calculations based on data of Statistical Office of Serbia

Note: Without data for Kosovo and Metohija

Therefore, the oscillations were distinct, which means that the production was quite unstable, especially the production of some types of fruits. This can be noted by analyzing the productive results of the most important fruit cultures, observed by participation in the total quantity of fruit produced in the Republic of Serbia. This group primarily includes plums, grapes and apples, which account for approximately three-quarters of the total production for the entire analyzed period (1988-2012). In the same period, immediately after are the raspberries, cherries, peaches and pears, which together with the aforementioned group, make up about 92% of the total production, as can be seen from the Table 1.

#### **4. Conclusion**

While analyzing the share of fruit in plant production (15%), the share of plant production in the value of agricultural production (68.5%), the share of agriculture and food industry in creating the country's domestic product (which is around 17%, and more than 40% when considered its indirect contribution to creating GDP), we can see that the fruit growing is an important branch of industry in the Republic of Serbia. However, in spite of this fact and many other favorable predispositions for its development, this production in our country, for the entire analyzed period of 25 years (1988-2012) showed great instability that is particularly visible in certain fruit crops, and insufficient use of available productive recourses. In addition to this, given the economic importance of fruit production, it could have been expected that in such a long period of time the areas with orchards and vineyards, as well as yields, significantly increase, but the results of the conducted research showed that such expectations would have been unrealistic. Such is the current situation that the capacities for the production and processing of fruits available in our country as well as the potentials for export are still unexploited enough and that the Serbian fruit growing is facing major challenges in its struggle to survive, not just in the European and world market, but also in the domestic one.

Reasons for this should be looked for in many of the occurrences and processes that befell the economy of our country during the analyzed period. Long lasting and very difficult process of transition that has been going on for more than twenty years, wars and embargoes in the nineteen-nineties, globalization, European integration and the great global crisis, all affected the economy, standard of living and migration. All of this brought great fluctuation in fruit production, as seen in the analysis given in this paper. Namely, changes in the fruit production coincided with the emergence of stated occurrences and processes.

Observed by participation in the total quantity of fruit produced in Serbia, plums, grapes and apples account for approximately three-quarters for the entire analyzed period (1988-2012). Immediately after are the raspberries, sour cherries, peaches

and pears, which together with the aforementioned group, make up about 92% of total production. This ratio has not changed significantly during the entire analyzed period.

Share of areas with orchards and vineyards in total agricultural land is very small (4,71 and 1,1%). This state should point out that the future development should be directed towards increasing the amount of those areas and their participation in the structure of arable and complete agricultural land, given the fact that the conditions exist and that the fruit production is certainly more cost-efficient than the production of many of the agricultural crops that currently occupy the largest areas in Serbia, especially when it comes to export.

In addition to that, production should be intensified, which should be characterized by high yields and good fruit quality, and to modernize and specialize processing capacities. However, fruit production can be highly profitable if only in compliance with the requirements of the market. Besides, it is necessary to increase the volume of production and export of fruits, especially export to countries with higher purchasing power of the population. The export structure should quickly be increased with the participation of high quality and final products. However, european and global market of fresh fruit is extremely demanding, well-organized, with tough competition, but with high profits. The penetration and survival in such market is a complex process and requires a lot of initiatives and investments. Successful exporting of fruits demands good production planning, well-organized logistics and marketing. Therefore, there is a need to increase the competitiveness and recognizability of Serbian fruit.

Development of the fruit production can have a positive impact on the development of primary agricultural production, but also on the overall economy of the country. Thereby, special attention should be given to planning the organization of fruit production in rural areas, and thus to their development.

Fruit consumption per capita in Serbia is very low (around 60 kg). It is necessary to work on raising awareness of the importance of consuming fresh fruits, as the governments of European countries do by participating in such campaigns.

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