FRUIT PRODUCTION ANALYSIS IN REPUBLIC OF SERBIA IN THE FUNCTION OF RURAL DEVELOPMENT[1]

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Abstract

Fruit growing is one of the most profitable branches of agriculture. During recent years, despite the difficulties that accompanied the production of fruit such as winterkill, drought, disease and pest attack, poor production technology, inadequate structure of varieties, etc., in the foreign trade export of fresh and processed fruit represent an important factor in the economy of Serbia. Fruit growing is economically very significant as agricultural segment showing a significant inflow of foreign funds which can achieve exports of fruits and fruit products. As a highly intensive production hires a lot of human labor which influences rather increase national income, especially if production is organized with the application of new scientific knowledge enabling cost-efficient and cost-effective operations. This paper presents the movement of fruit production volume (apple, pear, plum, strawberry, raspberry) in our country for the period 2000 -2013 as well as some of the measures for the intensive development of the fruit market in the country for the upcoming period.

Key words: *apple, pear, plum, strawberry, raspberry, production, measures for improvement.*

Introduction

Natural conditions of our country, especially some of the regions, are very favorable for the cultivation of fruit. In hilly - mountainous regions fruit production is significantly greater than the profitability of other crops because of

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natural conditions and it affection on this production, and in these areas, no other production can bring so much profit as fruit production. In hilly - mountainous regions the value which might be achieved is 10-15 times bigger, comparing to the production of corn and wheat per hectare, for example (Keserović, 2004).

The advantage of our fruit is also in the spatial and biological diversity, favorable climate and tradition in the production of fruit. There is an ongoing interest of farmers for fruit production, which, along with state incentives and the establishment of cooperatives (farmers' association), can achieve good results. However, despite the favorable natural and economic conditions, our agricultural production in the area is characterized by extensive fruit character, as can be inferred from the relatively low and irregular income. In order to achieve a higher level of finalization of the product, and thus raise the competitiveness of the market, it is necessary to intensify the production and processing of fruit. By raising the intensive planting state it should keep the volume of orchards area and fruit production intensification should expect an increase in the yield of certain areas, and in a development that increase the volume of fruit production. At the same time it is necessary to perform a gradual change of structure of production fostering deficient fruits, which have the greatest chance for the realization of the world market. Priority should be given to plantations for the production of fruit without the use of pesticides and fruit intended for certain types of processing.

Apple production

Apple is the most widely used and most useful types of fruits. It is considered as the most important type of fruits in the world and the leading type of fruit in Europe. It has a continuous season of consumption and is therefore very important from the economic point of view. Well adapted to different climates and thrives on wide expanses, it can also grow on 1000 m above sea level, but the optimal altitude for its successful cultivation is 200-700 m .

In mature apple fruit there is 85 % water existing, 14 % carbohydrates, 0,1-0,6 % of oil and protein, 7 mg of calcium, 10 mg of phosphorus, 110 mg of calcium, 40 mg of vitamin C, vitamin A, E B1, B23, B6 and beta-carotene and others. The volume of production of apples in the Republic of Serbia is given in Table 1.

Table 1. *The volume of apple production in the Republic of Serbia in the period 2000 – 2013.*

Year	Rep. of Serbia			Central Serbia			AP Vojvodina		
	Area planted apple (ha)	Total yield (t)	Yield (t/ha)	Area planted apple (ha)	Total yield (t)	Yield (t/ha)	Area planted apple (ha)	Total yield (t)	Yield (t/ha)
2000	14 265	197 490	13	9 706	120 805	12	4 559	76 685	16
2001	14 176	135 374	9	9 638	80 478	8	4 538	54 896	12
2002	14 445	95 584	6	9 882	72 747	7	4 563	22 837	5
2003	14 688	246 138	16	9 981	163 419	16	4 707	82 719	17
2004	14 889	183 571	12	10 123	110 116	10	4 766	73 455	15
2005	14 805	198 030	13	10 024	109 038	11	4 781	88 992	19
2006	14 658	240 320	16	9 980	147 132	15	4 678	93 188	20
2007	15 037	245 228	16	10 311	161 637	16	4 726	83 591	18
2008	15 224	235 601	15	10 204	152 910	15	5 020	82 691	17
2009	15 600	281 868	18	10 213	177 325	17	5 387	104 543	19
2010	15 880	239 945	15	10 362	135 284	13	5 518	104 661	19
2011	16 042	265 676	17	10 518	157 644	15	5 524	108 032	20
2012	16 904	178 713	11	10 559	100 109	9	6 345	78 604	12
2013	18 296	332 255	18	10 612	171 260	16	7 684	160 995	21
Aver.	15350.6	219 699.5	13.9	10150.9	132 850.3	12.9	5199.7	86 849.2	16.4

Source: *Authors' calculations based on data of the National Statistics Institute, Belgrade.*

The average area under apple orchards in Serbia for the research period is 15 350.6 ha. On the surface the average yields are 219 699.5 t which represents 13.9 t per ha. The highest production was recorded in 2013 representing 332 255 t in an area of 18 296 ha and the lowest production (95 584 t) was in 2002 on an area of 14 445 ha. In central Serbia an average production of 132 850.3 t on an area of 10,150.9 ha was achieved, which implies an average yield of 12.9 t per ha of apple production area. The highest production of the amount generated 2013. 171 260 t on an area of 10 612 ha. The yield was 12.9 t/ha. Conversely, the minimum output is generated in 2002 the (72 747 t) on the surface of 9 882 ha. The yield was 7 t / ha. District of Vojvodina is characterized by slightly lower production of apples in relation to central Serbia. The average yield of apples for the period amounted to 86 849.2 t on the average area of 5 119.7 hectares, which means an average yield of 16.4 t/ha. The highest production was recorded in 2011. 108 032 t in an area of 5 524 ha. The yields per ha was 20 t. The lowest yield was recorded in 2002 (22 837 t) over an area of 4563 ha. The yield per ha was 5 t.

Production of pears

Pear is one of the oldest, best and most profitable fruits. Chemical composition, usually dependent on the variety of ecological conditions of cultivation, of agricultural practices in the rearing and the like, include following: 80.4 to 87.9 % of lead, 11.85 % of carbohydrates, 0,1-0,6 % of total acid, 0.8 to 1.45 % of cellulose, 0.1-0.7 % of pectic substances, etc. One kilogram of ripe pear fruits has 400-610 calories, depending on the variety (Milić et al., 2003). Areal distribution of pear is very wide. This fruit grow best at an altitude of 600 m but can manage up to 900 m above sea level. It is nenefiting from the deep, loose soil type alluvium, minor smonica, agro red soil and chernozem. Pear production is mainly focused on family households dominated by autochthones varieties that have generally lower yield potential, and are grown on relatively extensive way, with limited use of agro-technical measures (Vlahović et al., 2006).
Movement of pear production in the Rep. of Serbia is shown in Table 2.

Table 2. *The volume of production of pears in the Republic of Serbia in the period 2000 – 2013.*

Year	Rep. of Serbia			Central Serbia			AP Vojvodina		
	Area planted pear (ha)	Total yield (t)	Yeald (t/ha)	Area planted pear (ha)	Total yield (t)	Yeald (t/ha)	Area planted pear (ha)	Total yield (t)	Yeald (t/ha)
2000	5 872	57 672	9	4 072	42 069	10	1 800	15 603	8
2001	5 384	43 431	8	4 014	33 634	8	1 370	9 797	7
2002	5 277	33 645	6	3 958	29 122	7	1 319	4 523	3
2003	5 243	68 752	13	3 957	56 301	14	1 286	12 451	9
2004	5 130	58 575	11	3 855	46 952	12	1 275	11 623	9
2005	4 958	46 739	9	3 743	36 633	10	1 215	10 106	8
2006	4 788	57 717	12	3 669	45 759	13	1 119	11 958	11
2007	4 723	60 523	13	3 682	49 935	14	1 041	10 588	10
2008	4 404	61 886	14	3 550	51 107	14	854	10 779	13
2009	4 471	67 771	15	3 510	55 414	16	961	12 357	13
2010	4 414	47 501	11	3 423	35 510	10	991	11 991	12
2011	4 528	65 289	14	3 489	51 767	15	1 039	13 522	13
2012	4 296	39 112	9	3 191	29 059	9	1 105	10 053	9
2013	4 355	68 121	16	3 142	45 621	15	1 213	22 500	19
Aver.	4845.9	55481.0	11.4	3661.1	43491.6	11.9	1184.9	11989.4	10.3

Source: *Authors' calculations based on data of the National Statistics Institute, Belgrade.*

The average yield of pears in the Rep. of Serbia amounted to 55 481 t in the average area of 4 854.9 ha. The average yield per 1 ha amounted to 11.4 and this production has surpassed in 2003 when it was recorded a total yield of 68 752 t pears in an area of 5 243 ha, while the lowest yield was recorded in 2002 (33 645 t) over an area of 5 277 ha with the actual average yield of 6 t/ha. In central Serbia, where the pear production is mostly concentrated, a realized average yield was 43 491.6 t on the average area of 3 661.0 ha. Yield per 1 ha of production area was amounted to 11.9 t. The greatest production of pears was achieved in 2003 and it went to 56 301 t in the area of 3 957 ha, and the lowest was in 2012 on an area of 3 191 ha. In Vojvodina, the average total yield pears amounted to 11989.4 t on the average area of 1 184.9 ha. Yield per 1 ha was 10.3 t. The largest volume of output was in 2013 – 22 500 t on an area of 1 213 ha and the smallest 2002nd year (4 523 t) over an area of 1 319 ha.

Plum production

In the structure of fruit plantations Serbian plum is the dominant fruit specie mainly grown in the hilly and mountainous areas. In our country there is a tradition of a very long plum. It is very adaptable fruit specie and can be successfully grown on as many as 1 000 m above sea level. This fruit is very rich in energy, protection, diet and therapeutic values. Contains 7-8 g / kg of proteins, 99-153 g / kg of carbohydrate , 1-2 g/kg of the fat, followed by vitamin C, B1, B2, B6, A, E, and minerals (K, Ca, Na, Mg, Fe), and water . Plum is used in a fresh state, but is used for processing of a greater number of products. Plum provides approximately 30 products in our country.

In the observed period (2000-2013) the average production of plums in the Republic of Serbia amounted to 497 359.7 t on the average area of 41,768.1 ha. Production per 1 ha of production area amounted to 11.7 t. Lately the increase plums production is noticed. The largest production was in 2013. Quantities of 738 278 t were noticed in an area of 39 530 ha. The lowest production was achieved in 2002 (197 486 t an area of 42 383 ha). In Central Serbia in the examined period, the average yield of 452 017.8 t was noticed in an area of 39 154.4 ha. Realized average yield was 11.2 t / ha. The highest production was recorded in 2013. (661 534 t in an area of 36 822 ha) and the lowest in 2002 (180 726 t over an area of 39 841 ha). In the area of Vojvodina an average of total production of plums was 45 341.9 t on an area of 2 613.7 ha. The average yield was 17.1 t / ha. The highest production was achieved by 2013. (76 744 t over an area of 2 708 ha) and the lowest in 2002 (16 760 t in the area of 2 542 ha). The volume of production is given in Table 3.

Table 3. *The volume of plum production in Serbia in the period 2000-2013.*

Year	Rep. of Serbia			Central Serbia			AP Vojvodina		
	Area planted plum (ha)	Total yield (t)	Yeald (t/ha)	Area planted plum (ha)	Total yield (t)	Yield (t/ha)	Area planted plum (ha)	Total yield (t)	Yeald (t/ha)
2000	43 104	351 307	8	40 515	318029	7	2 589	33 278	12
2001	42 597	333 106	7	40 106	295138	7	2 491	37 968	15
2002	42 383	197 486	4	39 841	180726	4	2 542	16 760	6
2003	42 454	570 913	13	39 865	524845	13	2 589	46 068	17
2004	42 514	561 199	13	39 905	515423	12	2 609	45 776	17
2005	42 582	304 351	7	39 950	263267	7	2 632	41 084	16
2006	41 796	556 227	13	39 195	505746	10	2 601	50 481	19
2007	41 885	680 566	16	39 268	635872	16	2 617	44 694	17
2008	41 885	606 767	14	39 254	555606	14	2 631	51 161	19
2009	41 601	662 631	16	38 960	605775	16	2 641	56 856	22
2010	41 171	426 846	10	38 523	380098	10	2 648	46 748	18
2011	40 822	581 874	14	38 192	529317	14	2 630	52 557	20
2012	40 429	391 485	10	37 765	356873	9	2 664	34 612	13
2013	39 530	738 278	19	36 822	661534	18	2 708	76 744	28
Aver.	41 768.1	497 359.7	11.7	391 54.4	452017.8	11.2	2613.7	45 341.9	17.1

Source: *Authors' calculations based on data of the National Statistics Institute, Belgrade.*

Strawberry production

Strawberry production in the country has a long tradition. Strawberry is characterized by early entry into rod, rapid return on investment in the establishment Jagodnjak modest requirements in terms of natural conditions of production, then a wide -range of distribution, easy process of growing, large utility value, high economic effects on production and so on (Milić et al., 2009). Strawberry flavor is sweet and very juicy, usually red but can be yellow depending on the variety. The fruits of strawberry have a value of low-calorie (27 g per 100 calories), containing 0.6 g of protein, 6.2 g of carbohydrates, without fats. Containing 1% of free organic acids which include malic, citric, tartaric and salicylic, and flavonoids. From vitamins contain carotene, vitamins of the B group, vitamin C and vitamin E, tannin, essential oil. From mineral substances they are containing potassium, calcium, iron and phosphorus (Štrbac, M., 2009).

Significantly larger areas planted with strawberries are located in Central Serbia in relation to Vojvodina but in Vojvodina can be seen higher growth rates of return strawberries in relation to central Serbia.

In recent years in our country is increasingly raising modern strawberries planting as outdoors, as well as different types of enclosures. Strawberry market is one of the most lucrative one for manufacturers of fruit. Only a small percentage of the total produced strawberries are exported. Most goes to the domestic market, due to the widespread consumption of fresh fruit and strawberry products since the strawberries used in the manufacture of jams, marmalades, fruit juice, canned fruit, candy, fruit yogurt supplement and the like.

Table 4 shows the movement of production volume strawberries for a research period from 2000 to 2013. The average value of the area planted with strawberries for the mentioned period was 8 038.9 ha. At least planted area was in 2013 (6 747 ha) and the highest in 2003 (9 116 ha).

Table 4. *The volume of production of strawberries in the Republic of Serbia for the period 2000-2013.*

Year	Rep. of Serbia			Central Serbia			AP Vojvodina		
	Area planted strawberries (ha)	Total yield (t)	Yeald (t/ha)	Area planted strawberries (ha)	Total yield (t)	Yield (t/ha)	Area planted strawberries (ha)	Total yield (t)	Yeald (t/ha)
2000	8 642	24 910	2,9	8 088	23 945	3,0	554	965	1,7
2001	8 294	34 696	4,2	7 733	33 654	4,4	561	1 042	1,9
2002	8 880	34 577	3,9	8 399	33 810	4,0	481	767	1,6
2003	9 116	29 868	3,3	8 565	29 222	3,4	551	646	1,2
2004	8 572	33 855	3,9	8 025	32 701	4,1	547	1 154	1,2
2005	8 354	32 299	3,9	7 890	31 421	4,0	464	878	1,9
2006	8 173	34 324	4,2	7 641	33 036	4,3	532	1 288	2,4
2007	7 829	33 129	4,2	7 263	31 741	4,4	566	1 388	2,4
2008	7 923	37 924	4,8	7 351	36 091	4,9	572	1 833	3,2
2009	7 916	35 799	4,5	7 189	33 827	4,7	727	1972	2,7
2010	7 603	32 973	4,3	6 929	30 472	4,1	647	2 501	3,7
2011	7 425	36 161	4,9	6 716	34 064	4,7	709	2 097	3,0
2012	7 071	26 507	3,7	6 348	24 229	3,8	723	2 278	3,2
2013	6 747	28 929	4,3	6 086	26 468	4,3	661	2 461	3,7
Aver.	8 038.9	32 567.9	4,1	7 444.5	31 048.6	4,2	592.5	1 519.3	2,4

Source: *Authors' calculations based on data of the National Statistics Institute, Belgrade.*

The average yield was 32 567.9 t including 4.1 t/ha. The highest yield was achieved in 2008 (37 924 t) from 4.8 t/ha, while the lowest was in 2000 (24 910 t) from 2.9 t / ha. These figures relate to the whole territory of Serbia.

On the other hand, in Central Serbia the production of strawberries in respect of Vojvodina is dominated, and the average area planted with strawberries was 7 444.5 ha, with an average production of 31 048.6 t and an average yield of 4.2 t/ha. The biggest production volume of strawberries was realized in the 2002 (33 810 t) over an area of 8399 ha with an average yield of 4.0 t/ha. In contrast, the lowest yields were obtained in 2000 (23 945 t) on the surface of 8 088 ha with an average yield of 3.0 t/ha. On the territory of AP Vojvodina, strawberry production for the previous research period 2000-2013, varied in the range from 646 t in an area of 551 ha (2003) with a average yield of 1.2 t/ha, up to 2 501 t in 2010 on the surface of 647 ha with a recorded average yield of 3 7 t/ ha . The total average production of strawberries was 1 519.3 t at an average area of 592.5 ha with actual average yield of 2.4 t / ha.

Raspberry production

Raspberry is our most profitable fruit specie. Its commodity production in Serbia began after World War I (around 1920) and a large volume in production was reached during the last twenty years. It is very appreciated and sought fruit because of its attractive fruits containing a wide variety of inorganic and organic components, which are very tasty, with excellent flavor, juicy, high nutrition, diet and technological values . Because of the specific chemical composition, especially due to the high content of vitamins, mineral substances, trace elements and some other, raspberries have a significant therapeutic effect. In folk medicine it is used as a blood and kidney cleanser, as a remedy to relieve rheumatic pain and as a mild sedative. Raspberry leaf is also used, particularly root. Raspberry leaf can replace some tea, such as Indian, Georgian and Russian. Raspberry has a number of advantages compared to other types of fruit. It is easy to replicate, it starts to give birth in the first or second year after planting in the third year comes to a lot of fruiting, and reaches full yield. The favorable agro - ecological conditions, is the use of modern agricultural measures, raspberry achieves extremely high yields. Light and easy to grow, production risk is much lower than that of large fruit per unit area because it employs a lot of manpower, especially in the affairs of the harvest. Investments in raising plantations are relatively high, but the invested funds come back quickly, as the raspberry quickly enters the race, copiously and regularly produces a fruit achieved a high price in the domestic and international market (Petrović et al., 1997).

In Serbia, 95 % of the area is cultivated with raspberry cultivar Willamette (Willamette), and the remaining 5 % belongs to Meeker, Tulameen, Polana and more. In recent years, the variety Willamette slowly pushes Meeker, and other

fruiting varieties (Nikolić et al., 2011.). The economic importance of raspberries is reflected in a very high degree of market ability and competitiveness of the European Union where increased demand for frozen raspberries produced in our geographical - ecological conditions is noticed. Consumer confidence in the quality of imported raspberries from Republic of Serbia follows a long tradition of production and specific environmental conditions of the area in which it is grown. Special economic importances of raspberry are determined by the following stakeholder groups:

1) the relatively large value of production, income and profit per unit of invested capital and labor;
2) labor-intensive character of production, which significantly alleviates the problem of unemployment in the big part of the Republic of Serbia;
3) the impact of raspberry on the overall economic development, which is achieved by building and expanding the capacity of the food industry, an indirect influence on the development of supporting economic activity, significant net foreign exchange effect, a very significant allocation of storage for the construction of infrastructure (particularly local roads) as a basic prerequisite for overall socio-economic development (Misić et al., 2004).

Specific economic significance of raspberries is determined by the following factors: high and varied use-value fruit; relatively high rate of return in favorable agro-ecological conditions; high marketability of the product; additional employment of labor and indirect impact on the overall socio- economic development; as raspberry nectar and others (Petrović et al., 2002). Serbia in the cultivation of raspberries has existed for over a century. Raspberries has begun to be breed before 1880, but initially only as an ornamental plant. Commodity production began after World War I, specifically in 1920, when the raspberries were produced for the local market; it was mainly for the sweet syrup and pulp. After World War II, the demand for raspberries has become greater, and it was followed by the higher prices of fruits. Department of raspberry production in Serbia reached a large volume at the end of the twentieth century, when the Serbian raspberry become the most important export product. Serbia in Europe became known for" raspberry as a national product," fighting with bigger competition in the selective western market (Popovic et al., 2003).

Each period in raspberry production in the country is characterized by certain peculiarities. By the mid-seventies raspberry production in Serbia had extensive character. In the mid-seventies the production intensified, first in Arilje a few years later in Valjevo, introduced by high productivity and high quality varieties, row system of growing, processing, care, fertilization and phytosanitary protection plantations.

A multi-year period from 1981 -1990 was characterized by high annual growth rate of 16.3 %. Markedly increase production in this period was caused by multiple factors: 1) an increase in demand for raspberries in the world market depending on its quality in comparison to other countries as producers of raspberries; 2) changes in varieties and technologies in our raspberry; 3) modernization of existing and construction of new refrigerator as storage facilities; 4) economic motivation of producers for this type of production and so on.

The period from 1990 – 1996 was characterized by extreme volatility in production, first, because of the very low purchase price in 1990s. Then, in due to the high cost of fertilizers and plant phytosanitary caused by hyperinflation and extreme weather conditions since 1993. Than in 1996. again begun overproduction of raspberries , which is held to this day with some varying of each year (Petrović et al., 2003). Several factors influenced the development of this segment of the fruit production in Serbia.

It is primarily a rich tradition of growing raspberries in rural parts of Serbia, which for generations are grown on small rural farms with plots of the average area of 0.36 ha. The second condition is soil composition (by physical, chemical and water features) and specificity of microclimate conducive to the cultivation of raspberries. The third and probably the most important factor are price trends on the world market, as growth in demand occurred, prices have contributed to this production and growing became extremely profitable.

So specific morphological, soil and microclimate conditions, uniform varieties, a special "culture of growing raspberries" and high yields of high quality fruits are the factors that make our country special for raspberries growing. Because of the very significant place raspberry has in a total market value and the exercise of great value production in small areas, the interest of producers rose and large areas were planted with raspberries, and still is, and its production is increasing. However, during the latest years the concurrencies of the better organized producers are presented (Nikolić et al., 2008).

The largest area planted with raspberries (as much as 98 %) in Serbia is carried out in central part of Serbia, consequently, since it is the most successfully grown in the hilly-mountainous areas. Region of Vojvodina is not represented with the raspberry growth compared to central Serbia. The values of raspberry in Serbia for the period 2000 – 2013 are shown in Table 5.

Table 5. *The volume of raspberry production in Serbia for the period 2000-2013.*

Year	Rep. of Serbia			Central Serbia			AP Vojvodina		
	Area planted raspberry (ha)	Total yield (t)	Yeald (t/ha)	Area planted raspberry (ha)	Total yield (t)	Yield (t/ha)	Area planted raspberry (ha)	Total yield (t)	Yeald (t/ha)
2000	13 519	55 999	4,14	13 238	55 530	4,20	281	469	1,67
2001	14 753	77 781	5,27	14 385	77 068	5,36	368	713	1,94
2002	15 293	93 982	6,15	14 943	93 572	6,26	350	410	1,17
2003	16 354	78 974	4,83	15 987	78 664	4,92	367	310	0,85
2004	15 995	91 725	5,73	15 589	90 861	5,83	406	864	2,13
2005	15 413	84 331	5,47	15 063	83 777	5,56	350	554	1,58
2006	15 024	79 680	5,30	14 672	78 929	5,38	352	751	2,13
2007	14 496	76 991	5,31	14 116	76 185	5,40	380	806	2,12
2008	14 680	84 299	5,74	14 174	83 335	5,88	506	964	1,91
2009	14 957	86 961	5,81	14 441	85 302	5,91	516	1 659	3,21
2010	15 174	83 870	5,53	14 709	81 240	5,52	462	2 630	5,70
2011	15 354	89 602	5,80	14 874	88 372	5,94	480	1 230	2,60
2012	15 748	70 320	4,50	15 278	69 408	4,54	470	912	2,00
2013	15 433	68 458	4,43	14 976	67 334	4,50	457	1 124	2,46
Aver.	15 157	80 212	*5,29*	14 746	79 256	*5,37*	410	651	2,25

Source: *Authors' calculations based on data of the National Statistics Institute, Belgrade.*

The average area planted with raspberries for the observed multi-year period in the Republic of Serbia amounted to 15,157 ha. Central Serbia, with an average area of 14,746 ha, accounting for about 97.4 % of the total acreage planted with raspberries in Serbia and Vojvodina, with an average area planted with raspberries from 410 ha, to participate in the total production of only 2.6 %.

Apart from minor deviations analyzed, the average surface covered with raspberries showed a slight tendency to increase in Serbia. In Vojvodina, the increase in the area under raspberry is slightly more pronounced in relation to central Serbia. Raspberry production expressed in tons on average for the period 2000 - 2013 in the Republic of Serbia was 80.212t , with the lowest production observed in the initial year of the year (55 999 t), and the highest in 2002 (93 982 t). Central Serbia with an average production of 79 256 t takes a share of 98.9 % in the total production of raspberries in Serbia. The remaining 1.1 % is the share of AP Vojvodina in the total production of raspberries in Serbia. Total raspberry production in Serbia is increased in the analyzed period, with the intensity of output growth much more pronounced in Vojvodina in relation to central Serbia.

The average yield of raspberry expressed in t/ha, in the period 2000 - 2013 in the Republic of Serbia amounted to 5.29 t / ha. The central Serbia yield per unit area was significantly higher (5.37 t/ha) as compared to Vojvodina (2.25 t / ha). The largest and most famous raspberry area is Arilje - Pozega (which includes the area Moravice and Dragačeva) and Valjevo. Municipalities that stand out in raspberry production are Kosjerić , Uzice, Arilje, Pozega, Valjevo, Mionica, Osečina, Koceljeva, Krupanj, Ljubovija, Gornji Milanovac, Cacak, Lucani, Bruce, Aleksandrovac. In these areas native raspberry with a variety of types that represent the wealth of genetic resources for this type of fruit are represented. Of great importance is that the native material has outstanding adaptability to soil and climatic conditions of the environment in which it is located. Diverse genotypes have some important features that stand out, especially the aroma of fruits and specific pleasant taste.

Problems associated with fruit production in Serbia and measures to improve

Fruit production as plant production is characterized by a number of comparative advantages in relation to other branches of agriculture. In addition to employment opportunities for large numbers of workers, fruit can be attractive not only for farmers, but for the enterprising people of all other occupations (Milić and Radojević, 2003).

Growing assorted as fruit trees in backyards, in gardens and along road sides, paths, channel and land areas can achieve far greater benefits than to allow to those areas to remain empty. It also allows the use of areas with different climatic conditions, local character and use of soil of less productive capacity, and land less productive and less favorable in terms of physical, chemical and other properties, and land on steeper slopes.

The importance of fruit as food is reflected in the fact that it contains within itself important amount of essential vitamins (A, B, C. ..) and mineral which are deficient in the human diet (Milić et al., 2009) According to Vlahović (1999) one of the fruits categorization is :

- Fruits rich in water (lemon, grape, raspberry, cherry, apple…) containing up to 95 % water, low energy value, fats and proteins in small amounts. It consists of significant amounts of minerals and vitamins (A, C. ..) , and
- Fruits rich in fats (walnuts, almonds, peanuts, hazelnuts, chestnuts ...) with high energy value, with significant amounts of fat, protein, carbohydrates and a small amount of water.

The economic importance of fruit production is reflected in the following:

1) Fruit and its manufactures provide significant funds in the Serbian economy, which can be further increased in modern conditions of production;
2) Fruit has a very important role in the human diet, perhaps even more of importance compared to other foodstuffs;
3) The planting of fruit can be used on various terrains (sandy, eroded, hilly, mountain, etc.) which, due to the configuration and other characteristics, are not suitable for growing other crops and plants;
4) The fruit is employing a large number of skilled labors which reduces or relieves unemployment in some regions. At the time of pruning and harvesting free labor force is usually engaged, manufacturing production is activated along with transportation equipment, and the like;
5) Development of fruit indirectly affect the development of other economic sectors , such as machinery and tractor industry, fruit processing , packaging industry, wood industry, etc.;
6) Than fruit production increases the value of land, as in raising plantations are invested a large sums of money per unit area (especially in highly intensive plantations), and so on. (Milić et al., 2013).

On the whole, regardless of the favorable natural conditions, fruit production in Serbia is in pretty bad shape. Fragmentation of land under plantations of fruit hampers the implementation of more productive machinery and performs the necessary agro-technical measures. The high share of obsolete (outdated) varieties and a large variety of cultivars are significant difficulties with the supply of standard quality fruit. Many other outstanding issues (production of quality planting material, the necessary funding for the establishment and regular production of fruit, etc.) are also serious obstacles to stop long-term stagnation of fruit production.

On the other hand, the production of fruit has great prospects for development due to favorable natural conditions for pulling off almost all continental species of fruit as well as due to the increasing demand in the domestic and in the world market. It could be argued that a large part of total agricultural trade deficit (about 60 %) in the rich countries of Europe and North America just comes from fruits and vegetables. Natural conditions in Serbia, and especially some regions, have climate and soil very favorable for the cultivation of fruit. Temperate continental climate, highly productive soil, high production capacity, very favorable physical, chemical and water - air properties, as well as good water resources , unfortunately, still untapped enough, all very favorable for fruit production.

Great damage in fruit can cause inadequate tillage, poor care, inappropriate use of fertilizers and the like. One of the most important factors that significantly influence the improvement of fruit production is the production of quality planting material. In Serbia to raise parent base plant for the production of surface coil and twigs and it is of great importance. Genetic resources that Serbia has in fruit are very important. The production program should not rely on the old varieties that have potential for the development of high-quality fruit, and the world market should appear with organic production, which is very popular. Serbia has long tradition in fruit production. However, there are weaknesses in terms of adapting to the new assortment, new manufacturing technology of the production, as well as restraint in adopting new ideas and technologies. The plot on which fruit production is carried is fragmented and need to make their augmentation to increase production.

Also one of the problems is the increasing number of elderly households with the need to create conditions for the return of young people in the village. Workforce to perform unskilled positions is enough but it is still in the process of harvesting labor imported from Bulgaria and Romania because they are young in our uninterested in performing these tasks. It is necessary to organize seminars to educate producers, especially for the cost-effective production planning in order to achieve secure and higher yields of high quality fruits.

The potential of fruit in Serbia is just the quality of fruits and fruit products. It is necessary to invest more in marketing and brand creating. The big problem is too broad representation of foreign companies in the domestic market. Association of the manufacturer is supposed to represent the interests of all growers which have to be realized with the general advice, pricing, promotion, etc. The main motifs of the association are:

- Legal support and security;
- Awareness of the inputs;
- Rational development of production processes;
- Easier handling and storage of finished products;
- Faster and more efficient marketing of products;
- Financial support (loans, grants, etc.)
- Better infrastructure;
- Better utilization of capacity;
- Education on quality improvement (standards, etc.)
- Higher labor productivity;
- Loss of smaller and more efficient production;
- Better and greater profitability, etc.

Suggestions for fruit production improvement

Serbia has a very favorable fruit growing conditions, and good prospects for their exports. In order to improve their production and marketing, it is necessary to take appropriate organizational measures. It is necessary to:

- to develop a National program of fruit production in Serbia;
- to make zoning and form registers manufacturer of fruit;
- to encourage the introduction of good agricultural practices in the production;
- to encourage the pooling of small producers and organize the financial and institutional support to the product purchasing;
- to modernized technology - from primary production to processing and packaging, and to continue with the introduction of European standards;
- to analyze the global and European market for better positioning of Serbian producers and processors;
- introduce better investment support for building new modern plantation and better varieties; application of modern machinery and irrigation systems;
- to support with money and organizational performances producers and processors of fruits on the most important international trade fairs;
- to promote fruit products and manufacturers in the domestic and international markets and support the joint performance of companies in foreign markets.

For successful production, it is necessary to obtain attraction of foreign customers and secure placement of fruit, essential quality, quantity and continuity. It is necessary to develop a long-term strategy in orchards in order to provide guidance to avoid or mitigate possible risks when raising seedlings, as well as the implementation of management practices. That would be risky in growing fruit to a minimum, and manufacturers would be motivated to engage in these productions. Despite the problems plaguing the fruit production in Serbia, trends, growth areas, yield, production and export of this fruit in the analyzed period were positive. Elimination or reduction of the above mentioned problems might lead toward the even more positive trends. All this would contribute to greater profits for producers, processors and exporters, and therefore improvement of fruit production.

Conclusion

Natural conditions in Serbia and especially in some regions, climate and soil are very favorable for the cultivation of fruit. None of the agricultural sector can bring so much profit as fruit growing, especially in mountainous areas. It is one

of the most productive agricultural industries, which is significantly greater than the profitability of other agricultural industries. Fruit growing is one of the few branches of agriculture which has undergone a major shift in the introduction of new technologies and the changing structure of varieties, which is a great merit of science, art and manufacturers have embraced the new technology. The fact that the fruit is one of the most important export products says that this branch should be given much more attention. In general, regardless of the favorable natural conditions, fruit Serbia is in pretty bad shape. Fragmentation of land under plantations of fruit hampers the implementation of more productive machinery and perform the necessary agro-technical measures. The high share of obsolete (outdated) varieties and a large variety of cultivars are significant difficulties with the supply of standard quality fruit. Many other outstanding issues (production of quality planting material, the necessary funding for the establishment and regular production of fruit, etc..) Are also serious obstacles to stop long-term stagnation of fruit production. The yields from year to year vary widely. Such a variation in yield from year to year, the most affected by winterkill low winter temperatures, especially from late spring frosts, but was also influenced by many other factors: the city, the attack of pests and diseases, drought, high temperature. For faster improvement of fruit one of the most important factors is the production of quality planting material. It is good that Serbia started with raising the stem base plantations for the production of substrates and graft branches. On the other hand, the production of fruit has great prospects for development due to favorable natural conditions for pulling off almost all continental species of fruit as well as due to the increasing demand in the domestic fruit but more on the world market. It could be argued that a large part of total agricultural trade deficit (about 60%) in the rich countries of Europe and North America just comes from fruits and vegetables.

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