

FRUIT PLANTING MATERIAL STRUCTURE PRODUCED IN THE REPUBLIC OF SRPSKA (BiH) IN RELATION TO THE REQUIREMENTS OF FRUIT PRODUCERS

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ABSTRACT

Certification program has been officially introduced in the Republic of Srpska in 2009, but was never fully implemented because of several specificities of the Bosnia and Herzegovina market, which has had a negative impact on fruit planting material production in the Republic of Srpska. Analysis of fruit planting material production size and structure in the Republic of Srpska (BiH) was conducted based on the official documentation from inspection of fruit planting material for the period 1997-2016. Survey amongst fruit producers was conducted in October and November 2014, by using a questionnaire in order to acquire their opinion on domestically produced planting material in relation to their requirements. Majority of produced planting material belongs to the category of standard material (the lowest category in domestic legislation). Total recorded production in observed period was 25075875 fruit plants, majority belonging to apple (7547311 or 30.10%), raspberry (4281120 or 17.07%), plum (3807250 or 15.18%), pear (3181539 or 12.69%) and sour cherry (2455191 or 9.79%). Fruit producers have expressed partial satisfaction with domestic planting material, and are generally satisfied with variety structure. Variety structure reflects traditionalism in production, but steps are being made towards its modernisation. Legislation in the area of nursery production is complicated and represents a major obstacle in modernisation of variety structure, as well as the resistance of fruit producers towards change in traditional production.

Key words: certification, fruit production, category, variety structure.

STRUKTURA PRIDELAVE SADIK SADNIH RASTLIN V REPUBLIKI SRPSKI (BiH) GLEDE NA PRIČAKOVANJA SADJARJEV

POVZETEK

Program certifikacije sadik smo v Republiki Srbski uradno uvedli leta 2009, a se program, zaradi specifičnosti tržišča v Bosni in Hercegovini, do danes v praksi še ni v polnosti izvedel. Narejena je bila analiza sadilnega materiala (velikost proizvodnje in struktura proizvodnje) v Republiki Srpski (BIH) na osnovi uradne dokumentacije o sadilnem materialu zbrane v obdobju 1997-2016. Izvedena je bila tudi anketa med pridelovalci oktobra in novembra 2014. Anketa je temeljila na vprašalniku, ki je spraševal pridelovalce o domači pridelavi v povezavi z zahtevami proizvedenega sadilnega materiala. Večina pridelanih sadik je bila standardne kakovosti (zakonodajno najnižja kategorija pri domači pridelavi). Skupna pridelava v opazovanem obdobju je znašala 25.075.875 sadik sadnih rastlin, od tega je bilo največ

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jablanovih sadik (7.547.311 ali 30,10 %), sadik malin (4.281.120 ali 17,07 %), slivovih sadik (3.807.250 ali 15,18 %), hruševih sadik (3181539 ali 12,69 %) in sadik višnje (2.455.191 ali 9,79 %). Drevesničarji so izrazili delno zadovoljstvo z domačim sadilnim materialom in so bili v splošnem zadovoljni z vrstno strukturo. Vrstna struktura izraža tradicionalno usmeritev pridelave, a kažejo se določeni trendi modernizacije. Zakonodaja na drevesničarskem področju je komplicirana in predstavlja največjo oviro na poti modernizacije vrstne strukture, pa tudi pri obstanku drevesničarjev na poti sprememb iz tradicionalnega načina pridelave.

Ključne besede: certifikacija, sadjarstvo, kategorija, vrstna struktura

1. INTRODUCTION

First step in production of high-quality planting material is selection of appropriate varieties for specific production area and market. Varietal authenticity can only be guaranteed in conditions of strict production control that, among other things, imply establishment of controlled reproduction and production plantations. Quality of planting material, which is the result of nursery production, must be regulated through norms relating to the minimum requirements that planting material should meet, including adequate health state.

Nursery production domain in the Republic of Srpska (RS) is regulated by the Law on planting material ("Official Gazette of the Republic of Srpska", no. 37/09 and 117/11) and the Law on plant protection in the Republic of Srpska ("Official Gazette of the Republic of Srpska", no. 25/09), as well as by a number of subsequent rulebooks. In addition to the mentioned regulations, fruit plant producers are required to comply with regulations in Bosnia and Herzegovina (BiH) that include two more laws and more than ten rulebooks that often do not comply with the regulations of the RS in all provisions. It is very important to emphasize the List of Varieties of BiH, which was adopted in 2010 and amended in 2012 without prior consent of producers in the RS, and as such is not helpful in the domain that it regulates. For this reason the RS's institutions and Producers' Union, together with the Federal Ministry of Agriculture, Water Management and Forestry of the Federation of BiH (FBiH), have asked for its withdrawal and drafting of a new document. Since 2012 the List of Varieties has not been amended, but due to the lack of consent its amendment will not be possible in the near future.

Non-compliance of the regulations, the emergence of unfair competition in the common market of BiH, as well as constant presence of marketing of planting material between the RS and FBiH that have different regulations of certification of planting material, have a negative impact on the production of certified planting material and entrance of domestic producers of planting material in the market of the European Union (EU). The introduction of the Common Phytosanitary Register and plant passports in BiH in 2011 has, in some way, regulated common planting material market, but even this system has not yet been fully implemented. However, in the last few years the changes in domestic market is evident, mainly because the producers have started with the production of certified planting material and the demand on this category of planting material has also increased. Also, several reproductive plantations with basic reproductive material have been established, which certainly indicates progress in this domain.

2. MATERIAL AND METHODS

Data for the analysis of the size and structure of fruit planting material production in the RS were collected from the documents created in the process of the official supervision of fruit planting material production (plants for planting and reproductive material) in the RS for the period 1997-2016. These documents were provided by the two officially authorized control institutions – the Institute for Horticulture of the Faculty of Agriculture (University of Banja Luka) and the Agricultural Institute of the RS. The paper presents an analysis of the structure of the total number of produced fruit plants, as well as the structure of produced fruit plants according to rootstocks and varieties in the observed time period, but only for the fruit species whose production exceeds 5% in total production size.

The other part of the research was conducted through a questionnaire intended for fruit producers in the RS (them being the end users of fruit planting material) in order to perceive their opinion on planting material produced in the RS. Data were collected by the direct contact with fruit producers or via e-mail during October and November 2014, and most of the producers were from the western part of the RS. The questionnaire comprised 14 questions, and some of the answers are presented in the chapter Results and Discussion.

3. RESULTS AND DISCUSSION

In the RS a total of 25.075.875 fruit plants was produced during the period 1997-2016. Half of this production are pome fruits (43.28%), about a third are stone fruits (31.99%) and about a quarter are berry fruits (23.02%) (Figure 1). Less than 2% of the total production comprise the nut fruits and other fruit species (e.g. fig, pomegranate, etc.). Analysis of the production size (Figure 2) shows that the number of the produced fruit plants exceeds the amount of 1 million in the year 2005 and it stayed over this value also during next years. The maximum number of fruit plants was produced in 2016 (2 683 688), while in 2009 and 2013 the number exceeded 2 million also. Furthermore, Figure 2 shows that during a relatively short period (2009-2016) some significant fluctuations in the quantities of produced fruit plants have been perceived. These fluctuations could possible negative effect the fruit production strategy planning in the RS. The leading fruit species regarding the production amount were apple (7547311 or 30.10%), raspberry (4281120 or 17.07%), plum (3807250 or 15.18%), pear (3181539 or 12.69%) and sour cherry (2455191 or 9.79%) during the observed period, while production of other fruit species did not exceed 5%.

The certified plants represented only 1.55% of the total fruit plant production during the observed period what is far below the number of plants of this category in the neighboring countries. For example, in Republic Croatia the production of certified fruit plants ranged between 13 and 15% of the total fruit plant production in the period of 2013-2015 (Hrvatski centar za poljoprivredu, hranu i selo, 2014; 2015; 2016).

A total of 7547311 apple plants were produced in the observed period and only 55.900 were certified plants, which were produced in 2015 and 2016. In the structure of used apple rootstocks, M9 and its clones dominated (85.56%), MM 106 has a significant presence (10.08%) and seedlings of *Malus sylvestris* (L.) Mill. were represented with only 1.91%. This structure of used rootstocks indicates that the apple production in the RS is mainly based on the intensive plantations when it comes to planting density (Mičić *et al.*, 1995; Đurić *et al.*, 2009). Analysis of the apple cultivar structure in the plant production can be valued as less favorable because of the dominance of cv. 'Idared' (30.98%), which remained dominant in

the previous period (Cvetković *et al.*, 2010). 'Idared' is mainly used as pollinator, while in the market it lost its value and was replaced with new and qualitative more important cultivars (Mičić *et al.*, 2005). The presence of cv. 'Golden Delicious', which is one of the leading varieties in developed countries (Mičić *et al.*, 2005; Angelini, 2008; Štampar, 2014), is high (16.03%). Among new cultivars, 'Gala' (10,20%), 'Fuji' (4.46%) and 'Braeburn' (3.13%) also have good presence, which can be considered a positive trend. Apple plant nursery production consists of a large number of apple cultivars, including a number of domestic cultivars, which can be explained by the desire to maintain certain old varieties in the production.

Production of raspberry plants in the RS began in 2000, when an amount of 4281120 raspberry plants have been produced, in the form of rooted basal shoots. From this number, in 2015 and 2016 a total of 197000 certified raspberry plants were produced. 'Willamette' is the most used cultivar (80.75%), and together with 'Meeker' have been only two raspberry varieties in the production in the RS for a long time. Since 2015 cultivars 'Autumn Bliss', 'Polka' and 'Tulameen' were introduced into the production of raspberry plants. 'Willamette' is the most represented cultivar in the production of berry fruits, not only in the RS and BiH, but also in Serbia, where the presence of this cultivar in the total fruit production exceed more than 90% (Kurtović *et al.*, 2012; Lepasavić *et al.*, 2013). Using this fact and the increased occurrence of pathogens, such as *Botrytis cinerea* in commercial production sites in Serbia (Tanović *et al.*, 2015), it is easy to explain the expansion of raspberry planting material production and its export to this county.

The production of plum planting material in the RS's nurseries reached 3.807.250 plum plants during the observed period, while certified plum plants (48.100 pieces) were produced only in 2015 and 2016. Around 98% of plum plants are produced by using *Prunus cerasifera* Ehrh. seedlings as rootstocks, and around 2% by using *Prunus myrabolana* (L.) Loisel seedlings. Insight into the plum variety structure shows that most plum fruits are being used for processing (usually in distillates and for drying), and smaller part for direct consumption. 'Čačanska rodna', as cultivar was only used for processing and 'Stenley', a cultivar of combined features, comprise 61.65% of the total plum plant production, which is also the trend in neighboring countries (Milošević and Glišić, 2013). The positive trend in the production of plum plants consists also of the participation of cv. 'Čačanska leptica' (19.08%), which is primarily used for the direct placement on the market. Among other table varieties, two selections developed at the Fruit Research Institute in Čačak (Serbia) are also present: 'Čačanska najbolja' (8.10%) and 'Čačanska rana' (3.50%). Although a number of newly created varieties ('Hanita', 'Elena', 'Katinka') are also present in nurseries, they have no significant share in plum plant production. Somewhat greater significance shows cv. 'Grossa di Felisio', which has been significantly expanding in recent years thanks to its ripening period and good storage capabilities.

The total number of produced pear plants is 3181539 plants during the observed period, where 61130 plants belong to the certified material category and were produced in the period 2014-2016. *Pyrus communis* L. seedlings have the greatest representation in the used rootstock structure (75.06%), due to the simplicity of its production, the soils where the pears are produced and also due to the increased resistance to fire blight. The most represented vegetative rootstock for pear is quince BA 29 (16.93%). The leading place in pear cultivar structure has cv. 'Williams' (52.33%), as the main cultivar for fruit markets and due to the favorable conditions for its cultivation. Cv. 'Santa Maria' also has a significant place in the cultivar structure (15.95%) as pollinator for cv. 'Williams', while a slightly lower presence

had cultivars 'Butirra Precoce Morettini' and 'Bella di Giugno' (around 7%) with a relatively good placement in the market. From domestic cultivars the major presence has cv. 'Karamut'.

Sour cherry plant production in the RS based almost only on generative rootstocks or rooted base shoots which are used in the reproductive process. In the RS, 2455191 sour cherry plants were produced, after the main part of this amount was produced after 2012. The involvement of certified plants in sour cherry plant production is not significant. High percentage of rooted basal shoots (51.16%) in nursery production is based solely on the presence of cv. 'Oblačinska' regarding cultivar structure, and this is the main form of propagation of sour cherry. The high presence of *Prunus mahaleb* L. seedlings in rootstock structure (45.86%) can be explained by its suitability for growing in the ecological conditions of Herzegovina region, where this species is mainly produced. Leading variety in sour cherry plant production, regardless of rootstock or propagation system, is 'Oblačinska' (86.70%), which is also a leading cultivar in the neighboring countries (Nikolić *et al.*, 2011; Sredojević, 2011). The large amount of the research based on the clonal selection of 'Oblačinska' pointed to the great importance of this cultivar in the cultivar structure (Nikolić *et al.*, 2011; Fotirić Akšić *et al.*, 2014a; Fotirić Akšić *et al.*, 2014b). Additionally, a greater significance has cv. 'Maraska' (5.81%), intended primarily for confectionery industry and a smaller number of Hungarian cultivars used for fresh consumption.

The survey with 26 fruit producers, whose production mainly consists of apples and pears, showed that they are partially satisfied with the quality of fruit planting material produced in the RS, while they expressed greater satisfaction with planting material imported from the neighboring countries (mostly from Serbia and the EU). However, 46% of surveyed fruit producers satisfy their demand for planting material from domestic production, although there is a number of them who produce their own planting material by using reproductive material from fruit production plantations. The producers themselves are aware of the shortcomings of planting material obtained in this way, and therefore 92% of them answered that they would rather use certified planting material of domestic cultivars for plantation establishment. As the main factor influencing this kind of answer, the producers referred to the lower price of certified planting material domestically produced compared with that from the import. The fact that fruit producers choose the fruit planting material from the market in the RS first by quality and health status, and then by the characteristics of cultivars, shows that, in the fruit production in RS, a lot of traditionalism and the resistance to the introduction of new cultivars is still present. However, in the production of planting material of certain species, such as apple, the trends are starting to change, therefore also changes in the cultivar structure in the fruit production in the RS can be expected in the future.

4. CONCLUSIONS

Legislation regulating nursery production in the RS and BiH is very extensive, in some cases not well balanced, hard to understand and interpret and strongly not adjusted to the situation in the market. The List of Varieties of BiH is inconsistent with production conditions and is a significant obstacle for fruit variety structure improvements in domestic production. In addition to this, the resistance of fruit producers, as end users of planting material, towards variety changes further complicates the situation in the market of planting material in the RS. However, producers of planting material, in recent years, have shown a willingness to follow the European trend in terms of product assortment, which they proved through the production of certified planting material, although still at a very small scale. In addition to reach the high standards for quality and health of the planting material, additional efforts to modify and

adapt habits of fruit producers and consumers have to be made, with the aim of placing domestic production in European and world markets.

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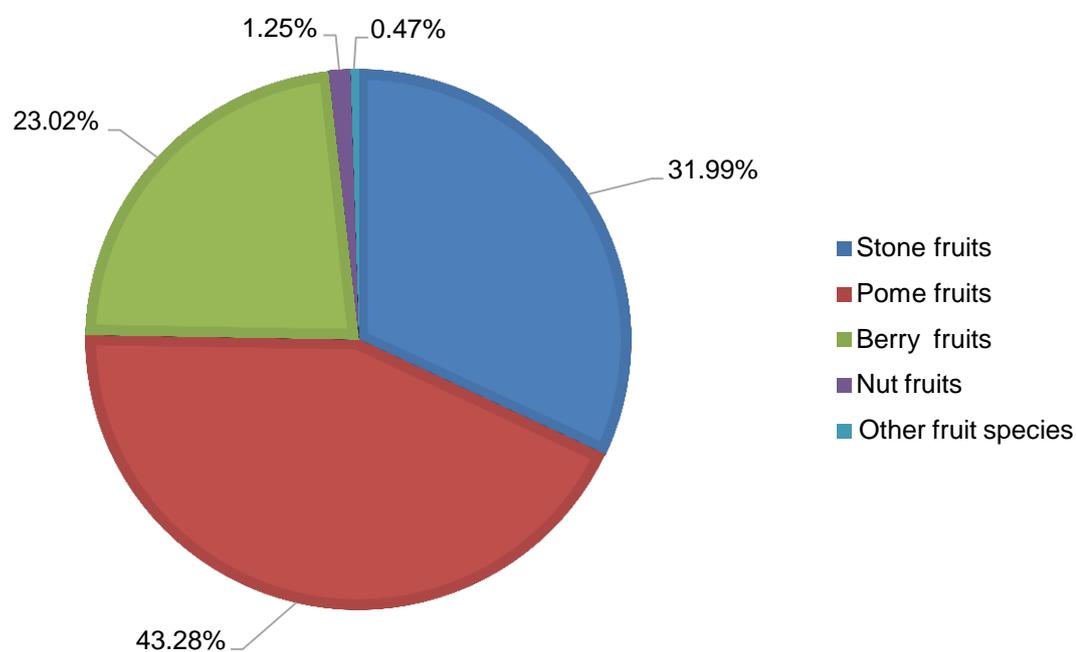


Figure 1: Fruit plant production structure in the Republic of Srpska (1997-2016) by the individual fruit groups (Author's own).

Slika 1: Struktura pridelave sadnih rastlin po posameznih sadnih vrstah v Republiki Srpski (1997-2016).

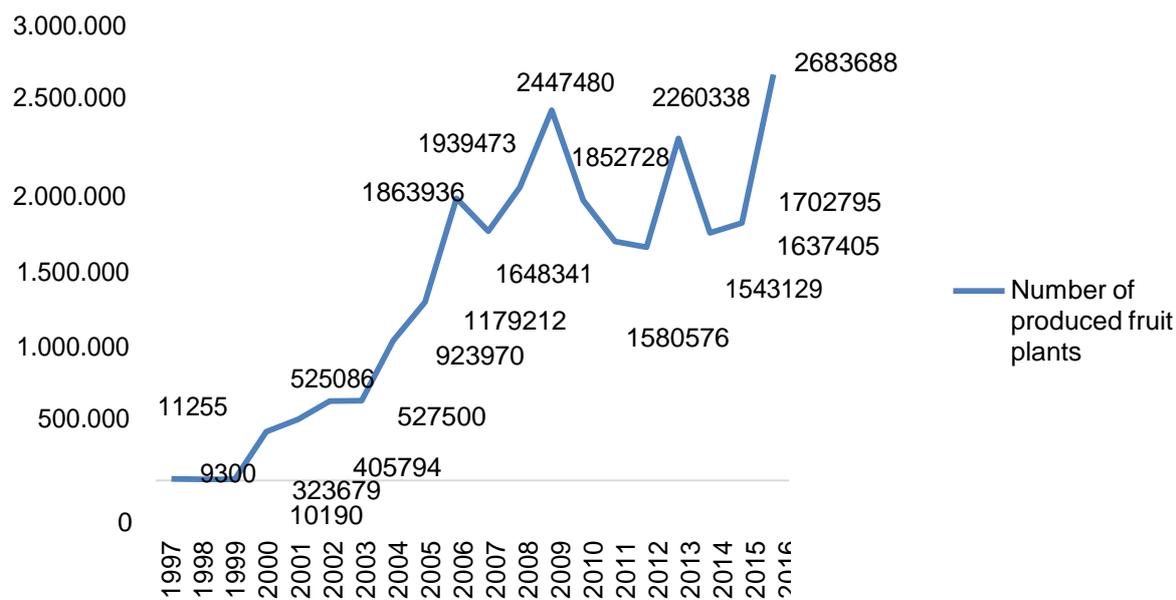


Figure 2: Fruit plant production dynamics in the Republic of Srpska (1997-2016).

Slika 2: Dinamika pridelave sadnih rastlin v Republiki Srpski (1997-2016).