

PRODUCTION OF CERTIFIED CONTAINER SEEDLINGS OF VEGETABLES IN BOSNIA AND HERZEGOVINA

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Abstract

Certified vegetable seedlings are young plants with 4-10 permanent leaves produced in a protected area, in accordance with the Law on Seeds and Seedlings. The seedlings grown in containers has a completely regular and equal spacing size, which allows for a steady growing of plants and uniformity of seedlings. The aim of the paper is to present the certified container production of vegetable seedlings in the Federation of Bosnia and Herzegovina (BiH). Production of certified vegetable seedlings in BiH started in 2006 with 905,000 seedling units. An increased need for certified seedlings of vegetables in 2010 resulted in the production of 9,552,230 seedlings, at increased compared to 2006 by 10.5 times. Demand for certified seedlings is increasing every year in developed agricultural areas. Because of the narrow crop rotation the vegetable production in protected areas has resulted in the production of grafted seedlings in registered nurseries in Bosnia and Herzegovina. This is a result of the demands of producers in monoculture vegetable production. The production of grafted seedlings started in 2007 with test 40,000 seedling. In 2010 year, this production is achieved 729,500 seedlings, that is 182 times more. Grafted seedlings production is most present in Herzegovina region due to big areas under greenhouses with long production history, where 50% of all certified vegetable seedlings produced in Bosnia and Herzegovina is coming from municipality Chaplin.

Keywords: vegetable, seedling, container, certified seedling, crop rotation.

INTRODUCTION

The seedlings are young plants with 4-10 permanent leaves produced in greenhouses or in open fields. Production of vegetables via seedlings allow successful growing of thermophile species.

The goals of producing seedlings according to Popovic (1987) are:

- earlier maturation of vegetables for 6-8 weeks compared to direct sowing
- growing period in the field is shortened and more harvest from the same area
- protection of plants from plant diseases, pests and other adverse effects is more efficient

- losses in the seed are reduced to a minimum (hybrid seed has a high cost)
- rational use of energy resources.

Seedlings grown in containers has a completely regular and equal spacing size, which allows a steady growth and uniformity of plants and seedlings. By cultivation of seedlings in containers the plant grows in substrate that permeates the root system and the seedling is planted into soil together with that substrate. Upon planting such plants do not experience stress as those transplanted with "bare root", and they are easier adopted and replanting is almost unnecessary. Container seedlings compared to those with a "bare root" can be planted (if necessary) on the ground that is not of optimal humidity. Planting can be carried out throughout the day, allowing better use of existing equipment for planting, and planting over large areas in optimal agronomical timing. The vegetables from container seedlings have earlier maturation and early harvesting. These plants give higher yields than plants from the nursery planted as "bare root" grown on beds. Container seedling cultivation method is particularly suitable for the production of hybrid vegetable seeds because they are expensive. This method of growing of seedling from each seed produces a quality plant.

Intensive production of vegetables in protected areas is fraught with numerous difficulties. Preparation of a culture in a number of production cycles in succession results in fatigue of the soil, the appearance of a variety of diseases and pests, and reduced yield of grown culture (Kurtović 2008). The grafting of desired cultivars - hybrid to the wild ancestor or the bred substrate, the production flows with the minimum risk of the aforementioned diseases and pests. Today on the territory of BiH the registered nurseries of seedlings produce grafted seedlings of watermelon, tomatoes, peppers and cucumbers. (Kurtovic 2008).

The aim of the paper is to present production of certified container vegetable seedlings in the Federation of Bosnia and Herzegovina. The presented data aimed to be available to producers of vegetables in the open field and in greenhouses to obtain quality seedlings to achieve the highest possible yield.

MATERIALS AND METHODS

In the period from 2005 to 2011 in the registered nurseries for production of seedlings of vegetables in Bosnia and Herzegovina, the dynamics of seedling production by culture and method of production was studied. The investigations were carried out in the nurseries „Sunce” in Chaplin;

D.O.O „Bojka“ in Vitina; „Adria Histili“ in Chaplin; „Edas Plast“ in Jelah; „Bios“ in Visoko; „Musa“ and D.O.O. „Plant“ in Tuzla. These nurseries meet all the required standards for the production of vegetable transplants possessing appropriate facilities (greenhouses and plastic houses) and necessary equipment for the smooth performance of the activity. The analysis of production of seedlings of vegetables in the registered nurseries covered the classical production and production by the graft system in wild ancestor or breded carrier.

Table 1. Varieties and hybrids grown in Bosnia and Herzegovina seedling nurseries

Culture	Variety/hybrid
Tomato (<i>Lycopersicum esculentum</i> L.)	Buran,Rally,Belle,Yeremy,Monroe,Volovsko srce,Optima
Pepper (<i>Capsicum annuum</i> L.)	Bianca, Delta, Vedrana, Slonovo uvo, Blondy,Istra
Cucumber (<i>Cucumis sativus</i> L.)	Tornac, Levina, Motiva, Sunčani potok,Edona,Dinero,Darina
Salad (<i>Lactuca sativa</i> L.)	Noisette, Fatima, Tatiana, Vanity, Funway, Nobeline, Chentore
Cabbage (<i>Brassica sp.</i> L.)	Resistor, Kalabishi, Qvisor, Gloria, Ditmar, Panadion, Calabresse, Montop,
Eggplant (<i>Solanum melongena</i> L.)	Cllasic, Madona

RESULTS AND DISCUSSION

The results of the production of vegetable seedlings in the studied registered nurseries showed a continuing growth in production from year to year. Total production of seedlings in 2006 amounted to 905,000 pieces. Production of seedlings in 2007 increased by 5.2 times, in 2008 by 5.8 times, in 2009 by 6.3 times, and in 2010 by 10.5 times, compared to 2006. Production of seedlings in 2010 was 9,552.230 pieces. The Figure 1 show that the dominant culture in BiH is a salad, followed by papper, tomato, cabbage and cucumber.

In 2007 the production of grafted seedlings of vegetables has started in BiH with 40,000 pieces. Production in 2008 increased by 1.27 times, in 2009 by 1.37 times, in 2010 by 182,37 times, compared to 2007. Production of grafted seedlings of vegetables in 2010 amounted to 729,500 pieces (Table 2)

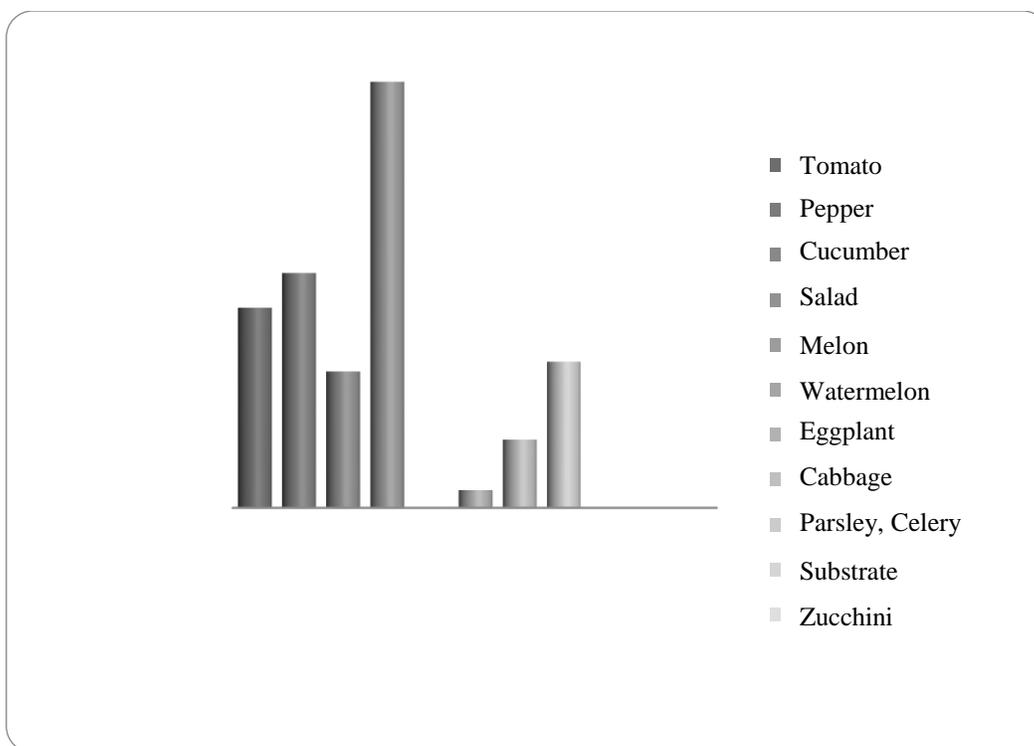


Figure 1. Structure of the seedling production in Bosnia and Herzegovina, 2010

Table 2. Production of grafted seedling of vegetable in Bosnia and Herzegovina for 2007-2010.

Year	Pieces of seedling
2007	40 000
2008	51 000
2009	55 000
2010	729 500

In protected areas, respecting crop rotation in conventional vegetable production is increasingly difficult. The presence of certain plant diseases and pests in the soil affects the production, reduces yields and quality, thus increasing the cost of production due to applying greater amounts of plant protection agents.

Grafting is also preferred because the roots of breded carriers are significantly stronger than own-root of variety/hybrid of listed cultures, therefore guaranteeing the high quality of products even on soil of poor quality. Grafted plants grow faster, more robust and have a significantly lower number of plants per unit area than classical planting. The yield is significantly higher per unit area with considerably larger and better fruits with less plants per area.

Carriers for grafting watermelon are: Cucurbitace ficifolija, Emphasis (S&G), Macis (Nunhem), Strong Tosa (S&G), Cirrus F1 NiZ, Nimbus F1 NiZ, Vita, Friend, Lagenaria

Carriers for grafting cucumber are: Cucurbitae ficifolija, „Harry“ S&G

Carriers for grafting tomato are: Hires 1210, He-man F1, Buford, Maxiford

Carriers for grafting pepper are: Snocker, Robusto.

Yearly, the grafted seedling increasing for about 5-9 % of the total production in Bosnia and Herzegovina. There is a significant trend of increasing production of grafted seedlings of vegetables in 2010 compared to previous years.

CONCLUSIONS

Production of vegetable seedlings in Bosnia and Herzegovina is constantly growing. Production of seedlings in 2010 increased by 10.5 times compared to 2006, and by 182 % compared to 2007. The commitment of producers to purchase vegetable seedlings in nurseries imposes the need for increasing the number of nurseries in order to increase production significantly. Production of the certified vegetable seedlings are grown on about 50% area in the municipality of Chaplin. Existing nurseries have mastered modern technology of production with the best equipment for automatic seeding, pricking and irrigation. The certified seedlings are high quality and significantly increases the yields per unit area of agricultural producers.

References

- Federal institute for agriculture. 2010: Production of vegetable seedlings in 2010. Sarajevo
December 2010.
- Kurtović O. 2008: Proizvodnja u plastenicima. Pen Tuzla.
- Popović, M., Lazić, B. 1987: production of vegetables in protected area. Nolit Beograd.