

VARIABILITY OF VINEYARD PEACH TREE CHARACTERISTICS

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Zec G, S. Čolić, D. Marinkovic and D.Nikolic (2008):
Variability of vineyard peach tree characteristics.– Genetika, Vol. 40,
No. 1, 1-7.

Vineyard peach seedlings are the most important rootstock for peach in Serbia and abroad. High variability is a characteristic of the vineyard peach planting material that is used as rootstock in nursery production. Through work of many years, vineyard peach genotypes with qualitative traits were selected and collected. Seedlings that are progeny of the nine selected genotypes and resulted from self and open pollination were examined. The vineyard peach seedlings resulted from uncontrolled pollination and with different geographical origin served as reference. A goal of research was to get vineyard peach genotypes that would give more uniform generative progeny with qualitative traits. This paper presents the results of two-year research of morphological traits of more than 500 vineyard seedlings. Based on the results, positive genotypes were selected for further inbreeding. Further, the seedlings of the selection 6

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have the lowest coefficients of variation for trunk thickness, tree height and number of branches, which points to the self-pollination as a good method for getting more uniform progeny.

Key words: vineyard peach, tree, characteristic, variability

INTRODUCTION

In Serbia Vineyard peach population is presented with a great number of native genotypes of peach (*Prunus persica* (L.) Batsch.) that have been cultivated or spontaneously grown in nature. Autochthon populations of vineyard peach are rich source of genetic variability. That can contribute to an improvement of the most economically important characteristics of the contemporary growing peach cultivars and rootstocks for peach. SCORCA *et al.* (1985) emphasize that a genetic variability of the most important cultivars is limited, so continuity in examinations and collections of the vineyard peach genotypes for gene banks is necessary. IEZZONI *et al.* (1991) said that richness of *Prunus* germplasm in Europe is an important source that can ensure success in peach breeding.

Vineyard peach seedlings are the most important rootstock in our country (MIŠIĆ *et al.*, 1988).

LAYNE *et al.* (1976) believe that some characteristics of the grafted peach cultivars such as vigor, ageing, ramification angle and cropping significantly depend on a rootstock influence. LAYNE (1987) also emphasizes that genetic variability and lack of uniformity in nursery and orchard are the main problems when it comes to usage of the vineyard peach seedlings as a peach rootstock. VUJANIĆ-VARGA *et al.* (1990) single out selection of vineyard peach that gives less vigor seedlings and 30% shorter fruit trees than the trees on unselected peach seedlings. MIŠIĆ (2002) emphasize that medium vigor is one of the breeding goals for peach rootstock.

Research of izoenzymatic systems of the 33 peach cultivars and 79 vineyard peach selections (GAŠIĆ and OGNJANOV, 2000) showed higher genetic variability then established up to now.

Vineyard peach seeds, developed from open pollination of a great number of genotypes, are used in Serbian contemporary nursery production. The result is uniformity of the rootstocks for fruit trees.

The goal of this research was an evaluation and selection of the peach genotypes that would give uniform and less vigor progeny. The seedlings of these selections can be used as rootstocks for standard and high-density peach orchards.

MATERIALS AND METHODS

To design experimental-production peach and nectarine high-density orchard (one *ha*), the rootstocks were planted in the trial field in Padinska Skela in 2004. Container vineyard peach trees were planted on the fixed places, in the

beginning of June, on distance 3.5x1.0 m. In the beginning of the spring 2005, the seedlings were cut down, and grafted at the place in the beginning of September. Data was collected during 2004 and 2005.

The groups of seedlings, derived from self (6, 7 and 8) and open-pollination (1, 2, 3, 5 and 9) of selected vineyard peach genotypes were used as a research material. As the references were taken two groups of peach seedlings (Padinska Skela and Southeast Serbia) derived from uncontrolled pollination of a great number of genotypes, with different geographical origin. This paper presents the results of research of morphological traits of more than 500 vineyard seedlings. The basic biometric indicators (average, coefficient of variance) were calculated according to HADŽIVUKOVIĆ (1991) for all examined traits.

RESULTS AND DISCUSSION

Table 1 shows the average values of morphological traits of the researched seedlings. The lowest trunk thickness (1.94cm), tree height (115.5cm) and width (71.4cm), as well as the most favorable branching angle (47°, picture 1) and lowest internodes length (1.53cm) are the characteristics of the seedlings of the selection 2.

Table 1. Average values of morphological traits of examined vineyard peach seedlings (2004- 2005)

Selection	Trunk thickness (cm)	Tree height (cm)	Tree width (cm)	Number of branches	Angle of branching (°)	Internodes length (cm)
SE	2.52	159.1	95.9	25.0	35	2.44
Serbia						
1	2.62	145.6	79.9	18.7	37	2.29
2	1.94	115.5	71.4	18.0	47	1.53
3	2.20	146.6	88.7	19.3	43	1.86
5	2.78	141.7	93.4	23.1	41	1.86
6	2.33	136.7	81.3	22.2	40	1.79
7	2.29	138.6	83.7	20.7	41	1.82
8	2.49	150.1	100.6	21.4	45	1.89
9	2.22	148.9	77.8	13.7	37	2.17
P. Skela	2.28	141.1	83.0	20.5	40	2.05



Picture 1. Progeny (seedlings) of selection 2.

The lowest numbers of branches (13.7) have seedlings of the selection 9. Seedlings of Southeast group have the highest height (159.1cm), number of branches (25), lowest branching angle (35° , picture 2) and the highest internodes length (2.44cm). The highest trunks thicknesses (2.78 cm) have seedlings of group 5, and the highest trees widths (100.6cm) have seedlings of group 8.



Picture 2. Seedling of South-East Serbia group

Table 2 shows the average values of coefficients of variation for examined morphological traits during 2004 and 2005. A coefficient of variation for tree

height ranged from 9.91 (sel. 6) to 15.37 (sel. 2). Examined material has higher uniformity than seedlings derived from open-pollination and that were examined by MILUTINOVIĆ *et al.* (2000) who found the coefficient of variation for tree height ranging from 15 to 30 for 90% of genotypes. According to ZEC (1997) coefficient of variation for tree height of a different vineyard peach selection (from open - pollination) ranged from 15 to 22.

Table 2. Coefficients of variation (Cv) of morphological traits of examined vineyard peach seedlings (2004- 2005)

Selection	Trunk thickness	Tree height	Tree width	Number of branches	Angle of branching
SE Serbia	21.95	13.58	22.51	28.47	17.7
1	19.31	13.78	25.05	28.58	16.8
2	20.64	15.37	24.53	33.29	14.4
3	18.39	11.89	22.6	54.76	19.9
5	15.81	10.58	21.93	22.24	18.2
6	15.03	9.91	22.13	21.34	17.2
7	21.02	13.91	18.75	26.38	17.4
8	21.72	12.08	21.49	31.50	14.2
9	20.42	10.61	24.70	34.86	16.5
P.Skela	20.44	13.52	21.56	22.25	19.4

Progeny of the selection 6, derived from self-pollination, has the lowest coefficients of variation for trunk thickness, tree height and number of branches.

The lowest coefficient of variation for tree width has progeny of the selection 7, while progeny of the selection 8 has the lowest coefficient of variation for branching angle.

The highest coefficients of variation were calculated for trunk thickness of the SE Serbia progeny (21.9), for tree height of the selection 2 progeny (15.4), for tree width of the selection 1 progeny (25). Progeny of the selection 3 has the highest coefficient of variation for number of branches (54.8) and branching angle (19.9).

CONCLUSION

The examined progenies of some vineyard peach selections, whether they derived from self or open pollination of few genotypes, or from uncontrolled pollination of many genotypes, showed a great morphological variability and inequality.

Based on number of the positive traits, seedlings derived from open pollination of selection 2 are singled out. Most of the progeny of the selection 2 have low vigor and good branching angle that make them appropriate as the peach rootstocks.

Seedlings of the selection 6 have the lowest coefficients of variation for trunk thickness, tree height and number of branches. That shows self-pollination can be a good method for getting more uniform progeny. Chosen seedlings, originated from the selections 2 and 6 will be basic material for further inbreeding in the aim for getting quality and more uniform generative progeny.

Received November 25th, 2007

Accepted February 28th, 2008

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**VARIJABILNOST OSOBINA STABLA SEJANACA VINOGRADSKE
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Sejanci vinogradske breskve su najvažnija podloga za breskvu u našoj zemlji i šire. Sadni materijal vinogradske breskve koji se koristi u rasadničarstvu kao podloga, karakteriše velika neujednačenost. Višegodišnjim radom su odabrani i kolekcionisani genotipovi sa kvalitetnim svojstvima. Ispitivanja su obavljena na sejancima koji predstavljaju potomstva devet odabranih genotipova, nastala samooplodnjom i slobodnom oplodnjom. Standard su predstavljali sejanci koji su nastali nekontrolisanom oplodnjom većeg broja genotipova, različitog geografskog porekla. Cilj rada je dobijanje genotipova vinogradske breskve koji će davati ujednačeno generativno potomstvo sa kvalitetnim osobinama. U radu su prikazani dvogodišnji rezultati ispitivanja morfoloških osobina stabla preko 500 sejana vinogradske breskve. Na osnovu dobijenih rezultata izdvojeni su pozitivni genotipovi za dalji inbriding. Najmanji koeficijenti varijacije kod sejana selekcije 6 za debljinu debla, visinu stabla i broj grana ukazuju da se samooplodnjom može dobiti potomstvo veće ujednačenosti.

Primljeno 25. XI 2007.

Odobreno 28. II. 2008.