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SELECTION FOR FUTURE ON PEACHES CULTURE

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ABSTRACT. *Common Peach (Prunus persica L. [Batsch]) present a diversity of forms and varieties, being involved in obtaining the peach cultivars for culture. Inter- and intraspecific hybridization, natural and directed, had created, over time, a large number of varieties, which are distinguished by morphological features and characteristics of fruit trees. In a research program conducted by the University of Craiova and research stations for fruit growing in the south of Romania, two varieties of dwarf nectarines ('Minival' and 'Nectval') have been obtained and proposed for approval, to complete the assortment for peach in Romania. The genotypes were studied in terms of phenology, and physical -chemical assessments have been carried out on productivity, ripening time and reaction to diseases and pests.*

KEYWORDS: *peach, breeding, assortment, dwarf*

INTRODUCTION

Peach *(Prunus persica* L. Batsch.) is a fruit growing species with high commercial potential and a strong trend to modernizing the culture. The evolution and development of culture are ongoing trend due to high ecological plasticity of peaches. Fideghelli et al. (1998), Ivascu (2002),

Cepoiu et al. (2006), considered peach as one of the major fruit species, mainly due to characteristics of early fruitfulness, fruit quality and high yields. Monet (1983) and Scorzè (1986) were concerned with explaining the dwarf phenomenon and they obtained new varieties of dwarf peach. Monogenic character of dwarfism is controlled by a single recessive gene dw. Genotype of dwarf peach is recessive type dw-dw. Clear advantages offered by such dwarf plants were taken under consideration to be placed in culture. Peach varieties with gene dw (dwarf peach) present small size, high number of ramifications, short annual growth, compact foliage, significant basitonie (for cultivation on their own roots). These plants have also some disadvantages (strong attack of diseases, inadequate fruit coloration, sometimes lower quality of fruit flavor and size, low resistance to temperatures below -22^0 C). Researches by Hansch (1986) had conducted to valuable cultivars. The recessive gene for nectarines was introduced in the genome of those cultivars. Great prospects offered by this kind of dwarf plants with high production potential and technology level suitable for a super culture, led us to carry out a rigorous selection in hybrid populations of dwarf peach (Baciu 2011; Baciu et al. 2009). Characteristics of the two selections (‘PDW-8 VL’ and ‘PDV-9 VL’), approved as varieties (‘Minival’ and ‘Nectval’) are presented in the paper.

MATERIAL AND METHOD

Since 2000 at the University of Craiova, SCDP Valcea, SCDP Constanta and SCDP Baneasa, progeny of dwarf peaches and nectarines, including varieties (‘Puiu’, ‘Liviu’, ‘Silver prolific’ and other selections) were obtained by cross- and self-fertilization. Cultures and micro cultures were developed for biological material used in research. Every objective has its own specific method. Research has been conducted on varieties and hybrids of peach, nectarine, pavia and clingstone. Plantations’ maintenance (pruning, fertilization, trees irrigation, preventing and fighting various pathogens attack) was recommended by modern technologies.

Periodical observations and determinations were made on: crop potential; fruit form; quality parameters (firmness, carbohydrate content, carothenoids, anthocyanins); attack of diseases (*Cytospora cincta* and *Taphrina deformas*). Observations allowed the identification and selection of genetic sources, important

in terms of quality and productivity. Biometric parameters studied in this stage were: fruit size, shape index, production / tree and production / ha.

RESULTS AND DISCUSSION

Hybrids obtained at SCDP Vâlcea on own roots are grown at a distance of 3 x 1 m (density of 3333 trees / ha). In the dwarf field of peach hybrids, two elite were selected: 'PDW-8 VL' and 'PDV-9 VL' - a variety obtained by self-pollination of 'Liviu' cultivar. At the age of 10 years the plants achieved a very low growth, close to the reference variety (Table 1). Plant height is 1.55 m to 1.65 m, crown diameter 1.45 m to 1.85 m and crown volume 11.5 m^3 ('DW-9 VL') and 16.6 m^3 ('PDW-8 VL'). The growth type is basitonic with 4-6 stems in both selections. The two selections have a natural tendency to tilt outward strains for a large production.

'PDW-8 VL' and 'PDW-9 VL' selections were found to be very productive (Table 2). They enter into commercial fruition 4 years after planting and produce on average 17.6 t / ha ('PDW-8 VL') and 14.9 t / ha ('PDW-9 VL'). Compared with the reference variety ('Liviu'), the two selections are more productive. Dwarf nectarine selections obtained at SCDP Vâlcea, require a sum of active temperatures above 6.5°C between 102.3°C to 179.0°C to start flowering, and 1787.2°C to 2051.3°C for fruit ripening (Table 3).

Hong (2005) and Borg et al. (2009) show in their work the importance of morphological development of flowers. Fruit size and weight are 10-20 % higher than control, but still lower than standard varieties of nectarines. Fruit thinning is necessary (Table 4). The fruit skin color is dark red ('PDW-8 VL') and deep red ('PDW-9 VL') on the sunny side, and pink with iridescent on the shaded side (Table 5, Figure 1). Compared to the control, the selections have a more intense color. Yellow-orange pulp ('PDW-8 VL') and orange ('PDW-9 VL') is not adhering to the stone and has a sweet, pleasant taste. The dry matter determined in the two selections is between 12% to 13.3% values.

In 2010 at ISTIS it was recorded a special nectarine used for processing, called "clingstone". It is recommended also for fresh consumption, having

the advantage of better resistance at transport and retention. The tree has medium vigor, self-pollinated, precocious (it yields fruits in the second year after planting) and productive (mature fruit trees produce about 28-30 kg/tree). Flowering is profuse and occurs in April; the flowers are simple, campanula type, with tiny petals, purple-pink color. The fruit skin is smooth without fuzz, glossy (as nectarines), orange, red on app. 85% of fruit area, very attractive. The flesh is yellow-orange, firm, rubbery, juicy, sweet-sour, refreshing, it does not decompose to a boil and intensify its flavor in the processing. Average yield is 23-25 tons/ha for a density of 833 trees/ha, being 13.6 % higher than 'Liviu' cultivar (control).

It provides high quality fruit, dry matter is between 13.1 and 14.3%, acidity is between 0.35 and 0.47% (mg/100 g pulp malic acid), it has a pleasant aroma; kernel is 9.6 % of fruit.

Table 1. The vigor of dwarf nectarine selections

No. crt.	Selection / variety	Plant size (10 years)			
		Tree height (m)	Crown Diameter		Crown volume ($m^{3)}$
			D_1 (m)	D_2 (m)	
1.	'PDW-8 VL'	1.65	1.75	1.85	16.6
2.	'PDW-9 VL'	1.55	1.45	1.50	11.5
3.	'Liviu' (control)	1.75	1.60	1.65	11.8

Table 2. The yield of dwarf nectarine selections

No. crt.	Selection/ variety	Production of fruit (trees on own roots; T/ha)							
		year 4	year 5	year 6	year 7	year 8	year 9	year 10	Mean
1.	'PDW-8 VL'	8.4	14.7	24.3	33.0	15.6	14.2	13.1	17.6
2.	'PDW-9 VL'	8.1	12.8	19.7	26.6	12.5	12.4	11.9	14.9
3.	'Liviu' (control)	7.4	9.1	12.4	14.2	14.0	13.6	12.4	11.8

Table 3. Blooming and fruit ripening of dwarf nectarine selections under conditions of Vâlcea county (2010-2011)

No. crt.	Selection/ variety	Beginning of blooming		End of blooming	Fruit ripening	
		Period	Σt> 6.5°C		Period	Σt> 6.5°C
1.	'PDW-8 VL'	3.04-10.04.	102.3-175.1	16.04-23.04.	14.08-17.08	1787.2-1845.4
2.	'PDW-9 VL'	3.04-11.04.	102.3-179.0	17.04-4.04.	25.08-27.08	1972.1-2000.9
3.	'Liviu' (control)	3.04-11.04.	102.3-179.0	17.04-23.04.	27.08-30.08	2000.9-2051.3

Table 4. The main indicators of fruit size

No. crt.	Selection/ variety	Fruit size (mm)			Index size {(D + d + H) / 3} (mm)	Weight fruit (g)	Weight kernel (g)
		D	d	H			
1.	'PDW-8 VL'	54.0	50.5	49.1	51.2	76.1	4.2
2.	'PDW-9 VL'	55.9	52.7	48.5	52.4	82.4	4.6
3.	'Liviu' (control)	57.8	58.1	56.9	57.6	69.4	5.3

Table 5. Fruit characteristics (2010-2011)

No. crt.	Selection / Variety	Skin color			Pulp color	Kernel adherence	Dry matter (%)
		Background colored	Covering color	Area of covering color (%)			
1.	'PDW-8 VL'	Green-yellow	purple	85	yellow-orange	we adherent	12
2.	'PDW-9 VL'	Green-yellow	crimson	60	orange	we adherent	12.3
	'Liviu' (control)	Green-yellow	purple	70	orange	semi adherent	11.9

Figure 1. Fruits of dwarf nectarine selections

CONCLUSIONS

Oltenia has a rich source of genes in common peach. We consider useful to use the natural populations of common peach for breeding programs because they possess special qualities, productivity, better resistance to diseases and pests, frost and high temperature resistance and fruit flavor.

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