RESULTS OF RESEARCH ON THE PLUM ASSORTMENT FOR THE NE AREA OF MOLDAVIA (ROMANIA)

REZULTATE ALE CERCETĂRII PRIVIND SORTIMENTUL DE PRUN PENTRU ZONA DE NE A MOLDOVEI

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Abstract*. A major objectiv for breeders from Fruit Growing Developemnt Station Iasi are the choice and extend in culture on soil and climate area for the must valueble plume tree cultivars for production, with superior quality fruits, available for fresh consumption and processing, with diseases resistence or tolerance. The soil and the climate conditions (except year 2007) are very favorable for plume trees culture in Iasi area, with great and constant fruit yields. Taking to account the parameters whitch decided the cultivars and the assurance of spacing fruit maturity, productivity and fruits quality for fresh consumption and processing, it propose for Iasi area the next plume trees assortment: Stanley, Centenar, Silvia, Tuleu gras and Carpatin. By remarkable cultivars studied was breed and take to account in last ten years, at Fruit Growing Development Station Iasi influence area, 44700 trees Stanley cultivar, 33000 trees Centenar cultivar, 23500 trees Tuleu gras cultivar, 11200 trees Silvia cultivar and 1500 trees Carpatin cultivar.*

Rezumat. *Alegerea şi extinderea în cultură pe zone pedoclimatice a celor mai valoroase soiuri de prun productive, cu fructe de calitate superioară, pretabile pentru consum în stare proaspătă şi pentru prelucrări industriale, rezistente sau tolerante la boli, cu epoci diferite de maturare şi o eşalonare cât mai lungă, a recoltării fructelor, au constituit un obiectiv major pentru cercetătorii amelioratori de la SCDP Iaşi. Solul şi clima (cu excepţia anului 2007) sunt considerate favorabile culturii prunului pentru zona Iaşi, obţinându-se producţii mari şi constante de fructe. Ţinând cont de parametrii care decid valoarea soiurilor respectiv asigurarea eşalonării maturării fructelor, a productivităţii, calităţii şi pretabilităţii fructelor pentru consum în stare proaspătă şi pentru industrializare se propune pentru zona Iaşi următorul sortiment de prun: Stanley, Centenar, Silvia, Tuleu gras, Carpatin. Din soiurile care s-au remarcat în anii de studiu s-au înmulţit şi valorificat în ultimii 10 ani, în zona de influenţă a SCDP Iaşi, 44700 pomi din soiul Stanley, 33000 pomi din soiul Centenar, 23500 pomi din soiul Tuleu gras, 11200 pomi din soiul Silvia şi 1500 pomi din soiul Carpatin.*

Key words: plum tree, assortment, cultivar, tree vigor, trunk section surface.

The choice and extension in culture by pedo-climatic areas of the most valuable and productive plum breeds, with high quality fruits good for consumption in fresh state and industrial processing, resistant or tolerant to diseases, with different periods of maturation and a wide spacing out for fruit harvesting, were the major objective for the meliorating researchers from FGDS Iaşi. To attain these objectives we effectuated researches focusing on the improvement of the plum assortment by studying in comparative cultures the newest creations made in the country and abroad (1,2,3,4,5).

To improve the plum assortment from the area of Iasi and in the area of influence of the station (counties Iaşi, Botoşani and Vaslui) with autochthonous and foreign

creations, in the interval 1987-2007 we studied a comparative culture of 12 breeds and four plum hybrids from FGDS Bistrița (6,7,8,9).

MATERIAL AND METHODS

The studies were made in the interval 1987-2007, having as a research material 16 plum genotypes. The tress grafted on wax cherry trees were planted at distances of 3,5 m x 4 m and guided under the form of a free fan-shaped espalier with oblique arms. The plantation was located on a land with a slight slope from NV to SE, with an average slope of 5%, and an altitude of 165 m. The soil is of the black earth leached type, weakly eroded, on loess and clay deposits, having a clayish and sandy texture, with pH 6,3-6,9, index N 3,21, the contents in mobile phosphor of 47-75 (p.p.m) and the contents in mobile potassium of 175-500 (p.p.m). The climatic conditions were generally favourable to the growth and fructification of the plum trees, except for 1990, 1993, 1994 and especially 2007, when in February, after a very warm January (3,8° C the month average value as compared to the normal value of -3,3°C) they registered -20,5°C, a temperature that affected the buds and destroyed the fruit production in proportion of 90-100 %.

For the breed Silvia they registered damages to tress that dried off partially or totally. In 2007 in the first six months they registered a great deficit of rain (180,5 mm), with the perspective to register a quantity much under the multi-annual average of 527,6 mm. We registered data on the tree vigor (surface of the trunk section), the unfolding of the fructification pheno-phases, the maturation for harvesting, the fruit production, their quality and resistance to the limitative factors of production.

RESULTS AND DISCUSSIONS

On the plum plantation in the 20th year of planting, they measured the trunk diameter and they calculated the surface of its section, and the registered data are presented in table 1. The lowest vigor of trees, expressed by the surface of the trunk section was registered for the hybrid BN. 68 (161,6 cm^2) and the breed Blue free (167 cm^2), and the highest vigor was registered for the breeds Dâmbovița (138,6 cm^2) and Superb (137,3 cm^2).

The fruit production registered (the average of the last 10 years) was different from one breed to another and from one year to another. The largest production was obtained by the breed Stanley (21,4 t/ha) but good productions may also be considered the ones registered by the breeds Prezident, Valor, BN. 68, Joris plum and BN 5-125-5 where they obtained between 17,6-20,0 t/ha. Making a correlation between the tree vigor and the fruit production, we notice that the largest fruit productions were registered by the breeds with an average and small vigor, whereas the high vigor breeds registered modest productions (4,7-9,7 t/ha).

The start of the main fructification pheno-phases in the conditions of years 1991-2007 occurred within large limits depending on the breed features and the climatic characteristics of the years under study (table 2).

The start of blossoming for the breeds and hybrids under study took place the earliest between March 24th and April 15th and the latest between April 30th and May 2nd and the duration of blossoming was for 7-15 days. The breeds Stanley, Carpatin, Tuleu gras, Superb, Blue free and hybrids BN 7-237-7 and BN 61-4 registered a late

blossoming. The natural fertility ranged between 1,2 % for the breed Valor and 62 % for the hybrid BN. 68. Self-fertility registered values ranging between 0 for the hybrid BN 7-237-7 and 43% for the hybrid BN. 68. The breeds Blue free (20,6%) and Stanley (17,9%) as well as the hybrid BN 61-4 (30%) manifested self-fertility too.

Table 1

Dates concerning tree vigor and yield registered until 20th year from plantation at 16 plum genotypes

Genotypes	Trunk section surface (cm^2)	Calculated given the cultivars average		Average yield on last 10 years (t/ha)
		%	Difference	
Dâmbovița	310,8	138,6	86,6	8,3
Superb	307,9	137,3	83,7	4,5
BN 7-237-7	278,3	124,1	54,1	9,7
Minerva	278,1	124,0	53,9	11,4
Silvia	238,5	106,3	14,3	7,2
Carpatin	228,3	101,8	4,1	7,8
Joris Plum	225	100,3	0,8	20,0
Average	224,2	100	0	-
BN 5-125-5	207	92,3	-17,2	17,6
Prezident	203,9	90,9	-20,3	18,9
BN 61-4	203,9	90,9	-20,3	7,9
Valor	203,1	90,5	-21,1	18,6
Stanley	201,8	90,0	-22,4	21,4
Tuleu gras	191,8	85,5	-32,4	6,5
Centenar	180,6	80,5	-43,6	15,4
Blue free	167	74,5	-57,2	15,4
BN.68	161,6	72,1	-62,6	18,2

The harvesting maturity was spaced out for a period of 56-63 days, the first breeds harvested being in order: Minerva, Carpatin and Centenar, and the latest BN. 68, Prezident and Joris plum (6.09-27.09). The number of days from the end of blossoming up to the harvesting maturity was between 75 for the breed Minerva and 164 for the breed Prezident. The main physical-chemical characteristics of fruits are presented in table 3. The average weight of a fruit registered values between 16,5 g for the hybrid BN. 68 and 54,5 g for the breed Dâmbovița. The breeds Blue free (52,5 g), Prezident and Carpatin (51,5 g) also had big fruits. The percentage of wastes (as compared to the average weight of a fruit) registered the lowest values for the breeds Carpatin (2,9%), BN 7-239-7 and Centenar (3,3%).

The adherence to the stone was considered normal (good) for the hybrid BN 5-125-5 and the breeds Valor and Joris plum, poor for Stanley, BN. 68, BN 7-237-7, Dâmbovița, Prezident and Bue free very poor for Superb, Silvia, Carpatin, Centenar, BN 61-4, Tuleu gras and Minerva.

The contents in dry substance were the highest for the breed Tuleu gras (17-22%) and the lowest for the breed Silvia (11-14%).

Table 2

The main growth stages at plum genotypes studied to Fruit Growing Research and Development Station Iasi

Genotypes	Blossoming		Natural fertility (%)	Self-fertility (%)	Harvest date	Days between end of blossoming from harvest
	Start blossoming	Days between start from end blossom				
Stanley	25.03-02.05	8-11	10,2-32,8	1,0-17,9	29.08-14.09	111-137
BN 68	24.03-30.04	8-10	32,5-62,0	33,0-43,1	6.09-21.09	131-158
BN 5-125-5	26.03-30.04	10-15	11,1-48,8	0-2,3	26.08-18.09	107-147
BN 7-237-7	30.03-2.05	9-12	3,3-25,8	0	8.08-24.08	91-128
Superb	13.04-2.05	7-10	4,5-47,3	0-1,1	11.08-23.08	105-127
Silvia	12.04-30.04	7-9	5,4-44,0	0-0,4	2.08-24.08	85-123
Carpatin	25.03-2.05	7-9	1,3-38,0	0-3,7	25.07-10.08	79-111
Centenar	25.03-30.04	8-10	5,1-21,3	0-0,8	28.07-10.08	84-115
BN 61-4	15.04-2.05	8-10	5,5-27,2	1,0-30,0	21.08-28.08	104-130
Tuleu gras	15.04-2.05	8-10	8,6-52,0	0-2,4	18.08-30.08	104-129
Dâmboviţa	15.04-1.05	8-10	2,1-28,4	0-06	22.08-30.08	105-137
Valor	14.04-1.05	6-10	1,2-35,0	0-0	29.08-8.09	110-148
Prezident	13.04-30.04	8-10	14,2-40,2	0-3,5	11.09-27.09	123-164
Joris plum	11.04-30.04	8-9	17,9-41,8	0-0,8	9.09-16.09	130-160
Minerva	14.04-1.05	7-8	6,0-35,0	0-1,1	18.07-26.07	75-106
Blue free	15.04-2.05	8-11	10,0-53,0	15,2-20,6	29.08-14.09	110-153

Table 3

Fruit main characteristics at 16 plum genotypes (1997 – 2006)

Cultivar	Average fruit weight	Offals (%)	DM %	Adherence at stone	Fund colour	Shape	Destination of yield
Stanley	22-31	5,2	13-18	Low adherent	Dark blueish	Reverse oblong	Fresh consumption, distillation.
BN 68	13-20	7,8	13-16	Low adherent	Violet	Ellipsoidal	Fresh consumption, distillation.
BN 5-125-5	42-56	4,2	14-20	Adherent	Blueish violet	Ellipsoidal	Fresh consumption, distillation.
BN 7-237-7	37-48	3,3	13-20	Low adherent	Dark blueish	Oblong	Fresh consumption, distillation.
Superb	33-47	3,9	16-21	Non-adherent	Blueish violet	Oblong	Fresh consumption, distillation.
Silvia	35-54	4,3	11-14	Non-adherent	Violet	Spherical	Fresh consumption.
Carpatin	45-58	2,9	13-17	Non-adherent	Dark blue	Oblong	Fresh consumption, distillation.
Centenar	32-48	3,3	12-15	Non-adherent	Dark blueish	Reverse oblong	Fresh consumption.
BN 61-4	40-46	3,5	14-18	Non-adherent	Violet	Oblong	Fresh consumption.
Tuleu gras	30-35	4,1	17-22	Non-adherent	Dark blueish	Reverse oblong	Fresh consumption, processing, dehydrating.
Dâmboviţa	44-65	4,2	12-16	Low adherent	Dark blueish	Oblong	Fresh consumption.
Valor	43-50	5,8	15-18	Adherent	Violet	Oblong	Fresh consumption, dehydrating..
Prezident	45-58	4,3	14-19	Low adherent	Blueish violet	Reverse oblong	Fresh consumption, dehydrating.
Joris plum	50-60	5,8	16-20	Adherent	Dark blueish	Oblong	Fresh consumption, dehydrating.
Minerva	30-44	4,4	12-15	Non-adherent	Blueish violet	Oblong	Fresh consumption.
Blue free	52-63	3,5	15-17	Low adherent	Dark blueish	Oblong	Fresh consumption, distillation.

The background color ranged from purplish-blue for BN. 68, Silvia, BN 61-4 and Valor up to dark blue for Stanley, BN 7-237-7, Centenar, Tuleu gras, Dâmbovița, Joris plum and Blue free.

The resistance of the breeds to the diseases specific to the plum tree was conditioned by the breed, most of them and hybrids manifesting a good resistance to monilia disease, piercing and red staining. A slight sensitivity to piercing was manifested by the hybrids BN. 68 and BN 5-125-5. As for the breeds' and hybrids' sensitivity to plum pox, it affected the breeds Carpatin and Centenar and the hybrids BN. 68 and BN 5-125-5. In 2007, the breed Silvia proved to be sensitive to drought being affected in proportion of 50-80%.

CONCLUSIONS

1. The breed, soil and climate (except for 2007) are considered to be favourable to the plum tree culture in the area of Iasi, obtaining large and steady productions of fruits.

2. Taking into account the parameters deciding the value of breeds and the insurance of spacing out for the fruit maturity, productivity, quality and adaptability of fruits for consumption in fresh state and for industrialization, we propose the following plum tree assortment for the Iasi area: Stanley, Centenar, Silvia, Tuleu gras, Carpatin.

3. Among the breeds that stood out in the years of study, we bred and put to good use, in the last 10 years, in the area of influence of SCDP Iaşi, 44700 tress of the breed Stanley, 33000 tress of the breed Centenar, 23500 tress of the breed Tuleu gras, 11200 tress of the breed Silvia and 1500 tress of the breed Carpatin.

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