TRANSMISSION OF FLOWERING PHASE TO HYBRID DESCENDANTS OF ALMONDS

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Abstract

The study of 432 hybrids belonging to 11 combinations regarding the manner in which the flowering phase is transmitted to offspring, led to the conclusion that this trait is a quantitative one. Primorski x Mari de stepă is recommended for extra-early flowering, whereas Texas x Nikitski 62, Texas x Saucaret and Primorski x Teaxs are suggested for late flowering.

Key words: hybrid, genitors, flowering phase

INTRODUCTION

The European mainstream initiative regarding flowering phase is to obtain breeds with very late flowering (Godini A., 1977; Kester D.E. 1990).

Given the climatic conditions of the Oradea area, it would be most desirable to obtain extra-early breeds, which can surpass the -2 or -3°C temperatures of the last ten to twenty days of April, as well as very late breeds, but the latter, having very short flowering periods, of only 5-7 days, sometimes (2-3 times in 10 years of study), because of cold rainy days during the flowering period and the lack of involvement of bees in the pollination process, can lead to significant production losses (Cociu V. 1973; Şcheau V. 1998).

MATERIAL AND METHODS

In 2003, two series of crossings were performed, having as maternal parents the Texas and Primorski cultivars.

In the spring of 2004, the hybrid seeds were planted in plastic flower pots, and then, in June, in the field at 5/1 m.

During the first three years, normal culture treatments were performed, whereas during the following three years, the hybrids were systematically studied and graded from 1 to 5, where 1 means extra-early and 5 means very late.

Out of the 432 surveyed hybrids belonging to 11 combinations, the number varied from 7 for the Texas x Tétényi bőtermő to 74 for the Texas x pollen mixture combination.

RESULTS AND DISCUSSIONS

Table 1 presents the flowering phases of almond genotypes and hybrids. What is worth mentioning is that the hybrids' averages top the genitors' average in all combinations, thus giving us the possibility to choose exquisite elites.

With one exception, that is Texas x H1/9-1fa, whose coefficient of variability was 19.9, all the other combinations revealed hybrids that were very variable within admissible limits.

Table 1

Flowering phase in almond genotypes and hybrids (average values for 3 years)

No	Combination	No. of analyzed hybrids	Average of genitors (grades)	Average of hibrids (grades)	Standard deviation (s)	Coefficient of variability (s%)	Hybrids limits (grades)	Hybrids writh grades ≥ 4%
1.	Texas x Polen mixture (Tétény Bötermö + H 1/ 9-1 fa)	80	3.0	2.66	0.71	29.6	1.0-5.0	16.25
2.	Texas x Nikitski 62	31	3.5	1.84	0.55	22.9	1.0-4.0	3.22
3.	Texas x H 1/ 9-1 fa	46	2.5	3.16	0.69	28.8	1.0-5.0	32.60
4.	Texas x Mari de stepă	52	2.5	2.97	0.60	25.0	1.0-4.5	40.38
5.	Texas x Preanâi	29	3.0	2.48	0.68	28.3	1.0-5.0	10.34
6.	Texas x Tétényi Bötermö	7	3.5	2.14	0.49	20.4	1.0-3.5	0.00
7.	Texas x Saucaret	27	3.0	1.96	0.58	24.2	1.0-4.0	7.40
8.	Primorski x Texas	33	3.0	2.18	0.57	23.8	1.0-4.0	9.09
9.	Primorski x Saucaret	32	3.0	2.20	0.56	23.3	1.0-4.0	9.38
10.	Primorski x Mari de stepă	51	2.5	2.12	0.72	30.0	1.0-5.0	7.84
11.	Primorski x Tétényi Bötermö	63	3.5	2.70	0.70	29.2	1.0-5.0	25.39

Table 2 presents the comparative results regarding the flowering phase of almond genitors and hybrids.

As to the series of crossings with Texas as maternal partner, the hybrids of Texas x Preanâi stand out, revealing an increase of 15.8%, statistically significant and those of Texas x Nikitski 62, with a 20.5% growth, and Texas x Saucaret, with a 21.1% growth, ensured as very significant.

Table 2

Comparative results regarding the flowering phase
of almond genotypes and hybrids (average values for 3 years)

No	Hybrid combination	$\bar{x}$ genitors		±d	s	$\bar{x}$ hybrids		±d	s
		grades	%			grades	%		
1.	TEXAS x AMESTEC POLEN (TÉTÉNYI BÖTERMÖ +H 1/9- 1 fa)	3.0	100	-	-	2.66	110.8	+0.26	-
2.	TEXAS x NIKITSKI 62	3.5	116.7	+0.5	**	1.84	76.7	-0.56	00
3.	TEXAS x H 1/9- 1 fa	2.5	83.3	-0.5	00	3.16	131.7	+0.76	***
4.	TEXAS x MARI DE STEPĂ	2.5	83.3	-0.5	00	2.97	123.8	+0.15	**
5.	TEXAS x PREANÂI	3.0	100	-	-	2.48	103.3	+0.08	-
6.	TEXAS x TÉTÉNYI BÖTERMÖ	3.5	11.0	+0.5	**	2.14	89.2	-0.26	-
7.	TEXAS x SAUCARET	3.0	100	-	-	1.96	81.7	-0.44	00
8.	PRIMORSKI x TEXAS	3.0	100	-	-	2.18	90.8	-0.22	-
9.	PRIMORSKI x SAUCARET	3.0	100	-	-	2.20	91.7	-0.20	-
10.	PRIMORSKI x MARI DE STEPĂ	2.5	83.3	-0.5	00	2.12	88.3	-0.28	-
11.	PRIMORSKI x TÉTÉNYI BÖTERMÖ	3.5	116.7	+0.5	**	2.70	112.5	+0.30	*
12.	$\bar{x}$ genitors x $\bar{x}$ hybrids	3.0	100	-	-	2.40	100	-	-

$LSD_{5\%}$= 0.33 $LSD_{5\%}$= 0.29
$LSD_{1\%}$= 0.48 $LSD_{1\%}$= 0.41
$LSD_{0.1\%}$=0.68 $LSD_{0.1\%}$=0.59

Figures 1 and 2 present the correlations between the averages of genitors x the average of hybrids, regardless and considering the number of hybrids.

The average of genitors x the average of hybrids regardless of the number of hybrids (fig. 1) is statistically ensured as very significant, with a correlation coefficient of r^2=0.5921***, which means that genitors transmit the trait of flowering phase to hybrid descendants.

Concerning a very late flowering phase, the series of crossings with Primorski as maternal partner led to hybrids that showed a 27.9% increase for Primorski x Texas, statistically ensured as very significant, whereas regarding very early flowering periods, the Primorski x Mari de stepă was ensured as very significant.

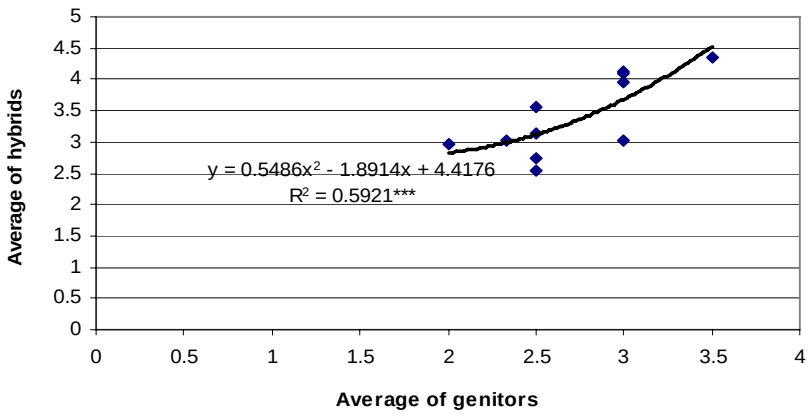

Fig.1 Correlation between average of genitors x average of hybrids in flowering phase regardless of the number of hybrids

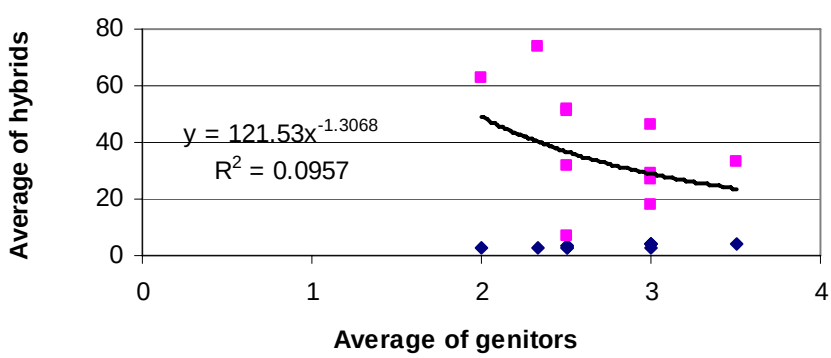

Fig. 2 Correlation between average of genitors x average of hybrids in flowering phase considering the number of hybrids

CONCLUSIONS

The crossing between Primorski x Mari de stepă is used in order to obtain hybrids with an extra-early flowering phase, while the combinations Texas x Nikitski 62, Texas x Saucaret and especially Primorski x Texas are used for a very late flowering phase.

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