TRANSMISSION OF FLOWERING ABUNDANCE TO HYBRID DESCENDANTS OF ALMONDS

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Abstract

The study of 457 hybrids from 11 combinations revealed that the abundance of flowering is a polygenic character and that elites with abundant flowering can be selected from the combinations Texas x H1/9 – 1fa, Texas x Mari de stepă and Primorski x Tétényi bőtermő.

Key words: flowering period, genotypes, hybrids.

INTRODUCTION

Flowering abundance represents an attribute of improvement in almonds, being an element that ensures adequate productions of fruit (Grassely Ch. 1972, Monastra F. 1985, Şcheau V. 2007).

MATERIAL AND METHODS

In 2003, two series of hybridizations were performed, having as maternal breeds the Texas and Primorski cultivars. In the spring of 2004, 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 applied, whereas during the following three years, they were systematically monitored and graded from 1 to 5, where 1 means no floral induction and 5 means maximum induction.

The number of hybrids per combinations varied from 7 for the Texas x Tétényi bőtermő to 80 for the Texas x pollen mixture combination.

RESULTS AND DISCUSSION

Table 1 presents the abundance of flowering in almond genotypes and hybrids. The hybrids' averages are higher than those of the genitors in only two combinations, Texas x H1/9-1fa and Texas x Mari de stepă.

The coefficients of variability, having values between 20.4 in Texas x Tétényi bőtermő and 30.0 in Primorski x Mari de stepă, classify the hybrids as very variable individuals, within the admissible limits.

Except for the Texas x Tétényi bőtermő combination, the hybrids from all the other 10 have grades above or equal to 4.

Table 1

Flowering abundance in almond genotypes and hybrids(average values for three years)

No	Combination	No. of analyzed hybrids	Average of genitors (grades)	Average of hybrids (grades)	Standard deviation (s)	Coefficient of variability (s%)	Hybrid limits (grades)	Hybrids with 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 abundance of flowering in almond genotypes and hybrids.

As for the series of crossings with the Texas cultivar as mother partner, only two combinations, that is Texas x Mari de stepă and Texas x H1/9 – 1fa, led to increases of 23.8% and 31.7%, being statistically ensured as distinctly significant (the former) and very significant (the latter), also providing the most varied possibility of choosing hybrids with abundant flowering.

As to the series of crossings with the Primorski genotype as maternal partner, there is only one instance, Primorski x Tétényi bőtermő, in which the increase of 12.5% is statistically ensured as significant.

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

Neither of the two correlations is ensured statistically, which means that the genitors do not significantly transmit the character of flowering abundance to the first hybrid generation.

Table 2

Comparative results regarding flowering abundance in almond genotypes and hybrids (average values for3 years)

Nr.	Hybrid combination	$\bar{x}$ genitors		±d	s	$\bar{x}$ hybrids		±d	s
		grades	%			grades	%		
1.	Texas x Polen mixture (Tétény 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.	$\bar{x}$ genitori x $\bar{x}$ hibrizi	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

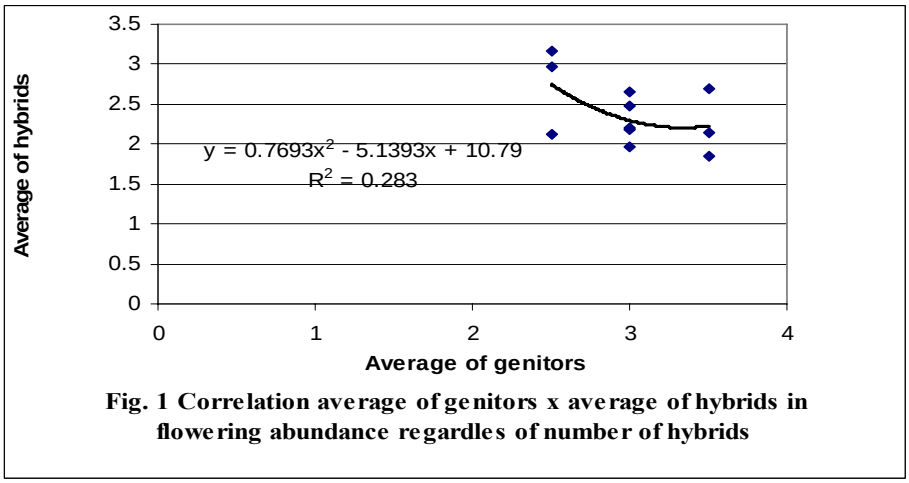

Fig. 1 Correlation average of genitors x average of hybrids in flowering abundance regardles of number of hybrids

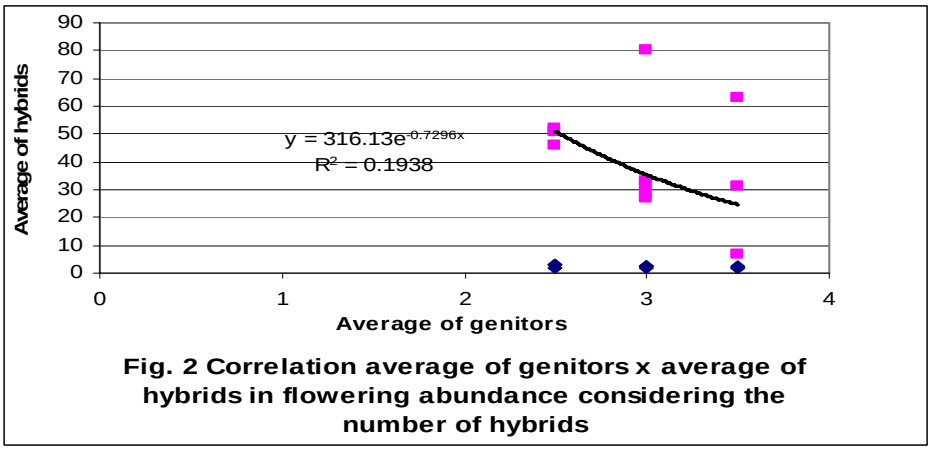

Fig. 2 Correlation average of genitors x average of hybrids in flowering abundance considering the number of hybrids

CONCLUSIONS

The study of the 457 hybrids belonging to the 11 combinations leads to the conclusion that in the cases of the Texas x H1/9-1fa, Texas x Mari de stepă and Primorski x Tétényi bőtermő combinations, the percentages are high, being statistically ensured, having hybrids with abundant flowering, thus having good perspectives regarding the choice of very productive elites.

REFERENCES

1. Grasselly Ch., 1972, L'amandier: caracteres morfologiques et physiologiques des varietes, modalite de leurs transmissions chez les hibrides de premiere generation. These pour obtenir le grade de docteur de l'Universite.
2. Monastra F., G. Della Strada, C. Fidechelli, R. Quarta, 1985, Progres genetique de l'amandier a l'Instituto Spermentale per la Fruticoltura di Roma, G.R.E.M.P.A. VI Coll., Tessalonique (Greece), 10-12 Juin, Opt. Medit. 1985-1.
3. Şcheau V., 2007, Ameliorarea plantelor horticole, Ed. Universității din Oradea.
4 .Şcheau V., 1998, Migdalul, Ed. Imprimeriei de Vest, Oradea.