TRANSMISSION OF FRUIT ABUNDANCE IN JULY TO HYBRID DESCENDANTS OF ALMONDS

Gîtea Manuel*, Şcheau Viorel*, Şcheau Alexandru*

**University of Oradea, Faculty of Environmental Protection, 26 Gen. Magheru St., 410048 Oradea*

Abstract

The study of 447 hybrids belonging to 11 combinations revealed that the trait of high productivity is hard to obtain in the first generation of hybrids. Only the Texas x H1/9 – 1fa, Texas x Mari de stepă and Primorski x Tétényi bőtermő combinations produced hybrids that were more productive that their genitors.

Key words: genotypes, hybrids, fruit abundance in July

INTRODUCTION

The main problem that causes the difficult expansion of the almond is that more often than not, the production of kernel/ha does not surpass 500 kg (Şcheau V., 1998; Cociu V., 1973).

Even in countries with long traditions in cultivating almonds (Felipe A.J. 1976, Grassely Ch. 1980), the productivity of the breeds is the main subject for improvement.

MATERIAL AND METHODS

In 2003, two series of crossings were performed, having as maternal parents the Texas and Primorski cultivars, both of which are exceptional genitors when it comes to high productions of fruit.

In the spring of 2004, the hybrids 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, systematic studies were conducted, during which the hybrids were graded from 1 to 5, where 5 represents very high production.

The number of hybrids per combination varied from 6 for the Texas x Tétényi bőtermő to 86 for the Texas x pollen mixture combination.

RESULTS AND DISCUSSION

Table 1 presents fruit abundance of almond genitors and hybrids in July. With one exception, that is Texas x Saucaret, where the hybrids were variable within medium limits, the coefficients of variability classify the hybrids in all the other combinations as very variable within admissible limits.

As to the Primorski x Texas crossing, 32.35% of the hybrids received grades ≥4.

Table 1

Fruit abundance in almond genotypes and hybrids in July(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%)	Hybrid limits (grades)	Hybrids with grades ≥4%
1.	Texas x Polen mixture (Tétényi Bötermö + H 1/ 9-1 fa)	86	3.7	1.88	8.67	29.0	1.0-4.5	2.33
2.	Texas x Nikitski 62	23	3.0	1.34	6.98	24.9	1.0-3.0	0
3.	Texas x H 1 / 9-1 fa	47	3.5	2.42	4.17	26.4	1,0-3,5	0
4.	Texas x Mari de stepă	44	3.0	2.27	5.32	27.5	1.0-4.0	6.82
5.	Texas x Preanâi	27	3.5	2.06	3.63	28.5	1.0-4.5	7.41
6.	Texas x Tétényi Bötermö	6	4.0	1.92	1.00	27.5	1.0-4.0	16.66
7.	Texas x Saucaret	29	3.0	1.38	8..90	15.0	1.0-2.5	0
8.	Primorski x Texas	34	3.5	2.57	2.43	30.0	1.0-5.0	32.35
9.	Primorski x Saucaret	35	2.5	1.36	7.74	29.5	1.0-5.0	2.86
10	Primorski x Mari de stepă	52	2.5	1.76	6.06	25.9	1.0-3.5	0
11	Primorski x Tétényi Bötermö	64	3.5	2.27	5.86	30.0	1.0-5.0	12.50

Table 2 presents the comparative results regarding the fruit abundance of almond genitors and hybrids in July.

Regarding the series of crossings with the Texas cultivar, only two combinations led to an increase, that is Texas x Mari de stepă with a 17.6% growth, being ensured as distinctly significant and Texas x H1/9 – 1fa, with a 25.4% growth, ensured as very significant.

The series of crossings with the Primorski cultivar brought about just one combination, Primorski x Tétényi bőtermő, that showed a 17.6% increase, being statistically ensured as positive distinctly significant.

Table 2

Comparative results regarding fruit abundance in almond genotypes and hybrids in July (average values for 3 years)

No	Hybrid combination	$\bar{x}$ genitors		±d	s	$\bar{x}$ hybrids		±d	s
		grades	%			grades	%		
1.	Texas x Polen mixture (Tétényi Bötermö +hH1/9- 1 fa)	3.7	115.6	+0.5	*	1.88	97.4	-0.05	-
2.	Texas x Nikitski 62	3.0	93.8	-0.2	-	1.34	69.4	-0.54	000
3.	Texas x H 1/9- 1 fa	3.5	109.4	+0.3	-	2.42	125.4	+0.48	***
4.	Texas x Mari de stepă	3.0	93.8	-0.2	-	2.27	117.6	+0.34	**
5.	Texas x Preanâi	3.5	109.4	+0.3	-	2.06	106.7	+0.13	-
6.	Texas x Tétényi Bötermö	4.0	125.0	+0.8	***	1.92	99.5	-0.01	-
7.	Texas x Saucaret	3.0	93.8	-0.2	-	1.38	71.5	-0.55	000
8.	Primorski x Texas	3.5	109.4	+0.3	-	2.57	133.2	+0.64	***
9.	Primorski x Saucaret	2.5	78.1	-0.7	00	1.36	70.5	-0.57	000
10.	Primorski x Mari de stepă	2.5	78.1	-0.7	00	1.76	91.2	-0.17	-
11.	Primorski x Tétényi Bötermö	3.5	109.4	+0.3	-	2.27	117.6	+0.34	**
12.	$\bar{x}$ genitori x $\bar{x}$ hibrizi	3.2	100.0	-	-	1.93	100.0	-	-

LSD $_{5\%}$= 0.38	LSD $_{5\%}$= 0.23
LSD $_{1\%}$= 0.55	LSD $_{1\%}$= 0.33
LSD $_{0.1\%}$=0.77	LSD $_{0.1\%}$=0.47

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

The average of genitors x the average of genitors regardless of number of hybrids (fig. 1) is 95% correlated, that is significantly (r^2=0.3451*); this means that the genitors' productivity is transmitted to hybrid descendants.

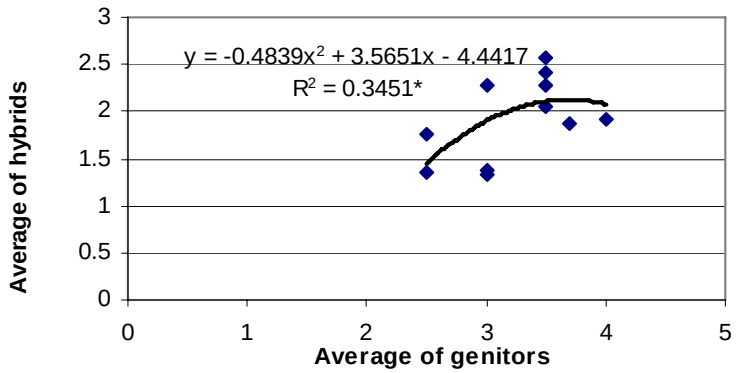

Fig.1 Correlation between average of genitors x average of hybrids in fruit abundance in July regardless of number of hybrids

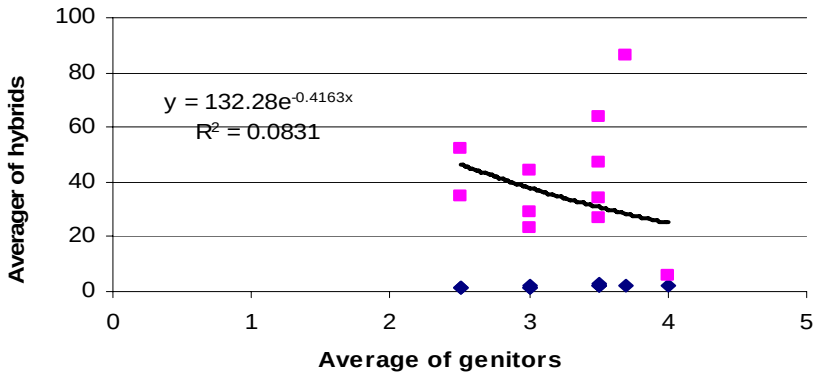

Fig.2 Correlation between average of genitors x average of hybrids considering the number of hybrids

CONCLUSIONS

It seems that productivity is the most "refractory" trait that must be transmitted to hybrid generations.

Elites with higher productivity than their genitors can be selected from the following combinations: Texas x H1/9-1fa, Texas x Mari de stepă, Primorski x Texas and Primorski x Tétényi bőtermő.

REFERENCES

1. Cociu V., Gh. Stanciu, 1973, Alunul şi migdalul, Ed. Ceres, Bucureşti.
2. Felipe A. J., 1976, La production d'amandes en Espagne, Options Mediterraneennes, 32.
3. Grasselly Ch., P. Crossa – Raynaud, 1972, L'amandier, G.P. Maisonneuse et Larose, Paris.
4. Şcheau V., 1998, Migdalul, Ed. Imprimeriei de Vest, Oradea.