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PRESENT AND PERSPECTIVE OF ALMOND IN SOUTH-EASTERN ROMANIA

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Abstract

Almond is almost unknown to most people in our country, even abroad is widespread and appreciated for its fruit with many uses. At Research Station for Fruit Growing Constanta, during 1984-1994, it were studied over 45 cultivars of almonds. Currently germoplasm consists of 54 cultivars and selections of almonds that have been studied regarding behavior in the phenology and pollination process.

Key words: *Prunus amygdalus Bartock, cultivars, phenology, pollination.*

INTRODUCTION

Almond belongs to the group of nuts crops and has a major economic importance in nourishment industry, because of its many uses and multiple chemical components of the fruit. Almonds is considered an almost complete fruit; depending of the cultivar, ripening time and place of culture their sweet or bitter core containing large amounts of fat, protein substances, carbohydrates, minerals, etc. (Cociu, 2003, 2007).

Being classified as thermopile tree species, the almond found in the south east part of the country optimal climatically conditions for culture, although almond orchards declined greatly, in the last two decades.

Currently, almond became a 'luxury' fruit; their fruit being exported in high quantities in most advanced countries at a higher selling price.

The purpose of this study is to provide data on the almond assortment recommended for climatic conditions in Dobrogea.

MATERIALS AND METHODS

RSFG Constanta is located in the south-eastern Romania, in the area between the Danube and the Black Sea and has specific steppe climatic conditions. The mean yearly temperatures are 11.6°C, hard winters and very hot summers with low rainfalls. Frosts return is a quite often phenomena in spring, fact that affects fruit trees with early blooming as almond.

Absolute temperature beyond the limits of resistance of almond species: - 26°C, -30 °C or above + 40°C is rare (once in 20 or once 30 years). Rainfall is deficient to the requirements of the trees; the average amount of rainfall is around 400 mm, with unequal distribution in the active growing season (April 1 to September 30). Chernozem soil type is deep, with good condition for water circulation, well supplied with humus.

The almond genotypes were studied at RSFG Constanta more than ten years. The planting distance was 5 m between rows and 4 m between trees on row; the almond rootstock was bitter almond. The crown shape was vase. The trees were pruned every year, fertilized and irrigated; the phyto-sanitary treatments were applied uniformly in the field.

All studied cultivars were observed from the phenological point of view. The beginning of flowering was considered when the first open flower was visible and the end of it was noticed when the last petals of the flowers fell. The blooming intensity was noted from 0 (absent) to 5 (abundant), according with the research methodology of fruit tree breeding (Cociu, 1989).

The self fertility of almond cultivars was evaluated by isolating branches with flowers using paper bags. The fruit were numbered and were expressed as percentage. The kernel strengthening occurs when the embryo cotyledons pass from liquid to solid state, and it

was evaluated by using a large-sized needle. The fruit on the branches were pierced during their growth. The kernel was considered strengthened when the needle had not penetrated the fruit. The almond kernel yield was evaluated by weighing the tree crop (kg/tree).

RESULTS AND DISCUSSIONS

The beginning of the flowering was gradually, starting with Tuono (25.03), followed by Mari de stepa (29.03); the last one that flowering was Tardy non Pareille (18.04). Also, the end of the flowering was recorded between 16.04 (Mari de stepa) and 1.05 (Ai). The flowering on the same tree at the studied cultivars is gradually. That was noted to other fruit tree as peach and apricot (Manescu, 1975). The late flowering cultivars flowering time ranged from 12 to 14 days; the cultivars that bloom earlier had a longer flowering period, even over 30 days (Tuono). The flowering intensity was abundant and very abundant, being noted by 5 or 4-5 to all studied almond cultivars. The kernel strengthening of almond begins on 8.06 (Ferragnes) and finish on 20.08 (Teteny Botermo, Nikitski, Feraduel). The kernel strengthening phase has the highest requirements for water and nutrients consumption (critical phase). The fruit yield is reduced during the very dried growing seasons; many of them remain small, dry or incompletely formed; also, the phenomena was noticed by Cociu (1954). The ripening time started on 3.09 (Preanîi), followed by Mari de stepa, continuing every 2 or 3 days, until on 2.10 (Tuono) for a period of one month. All cultivars studied are auto incompatible in the pollination processes, as shown in table 2.

Table 1. The phenology of flower buds and ripening time of almond at Valu lui Traian, south-eastern Romania (multiannual date)

Cultivar	Beginning of flowering	End of flowering	Flowering time (days)	Intensity	Kernel strengthening	Ripening time
Preanîi	3.04	21.04	18	5	17.06	3.09
Mari de stepa	29.03	16.04	19	4	10.06	6.09
Teteny Botermo	6.04	22.04	16	5	20.06	10.09
Lovrin	5.04	22.04	17	5	11.06	17.09
Pomorie	3.04	21.04	18	4-5	8.06	18.09
Thompson	8.04	27.04	19	5	17.06	19.09
Nikitski	9.04	27.04	18	3-4	21.06	22.09
Feraduel	16.04	28.04	12	5	20.06	28.09
Ferragnes	16.04	30.04	14	5	8.06	1.10
Ai	14.04	1.05	17	4-5	11.06	20.09
Tardy non pareille	18.04	30.04	12	4-5	10.06	20.09
Marcona	10.04	27.04	17	4-5	19.06	26.09
Tuono	25.03	28.04	34	2	9.06	2.10

Table 2. The pollination behavior of almond cultivars, Valu lui Traian

Cultivar	Self pollination			Open pollination	
	Number of flowers in paper bags	Number of fruits	%	Number of flowers	Number of fruits
Preanîi	264	0	0	-	-
Mari de stepă	-	-	-	98	16
Teteny Botermo	240	0	0	-	-
Lovrin	153	0	0	-	-
Thompson	315	0	0	458	36
Nikitski	250	0	0	420	159
Feraduel					
Ferragnes	320	0	0	197	40
Ai	255	1	0	-	-
Marcona	338	0	0	-	-

The highest yields were recorded at Preanîi (8.8 kg /tree), followed by Lovrin (7.0 kg/ tree) and Ferragnes (6.7 kg/tree), table 3. A big kernel weight was recorded to Feraduel (1.7 g). The shells of the studied cultivars were both hard and thin, table 3.

At RSFG Constanta the present assortment has the following cultivars and selections: Sabina, Sandi, Cristi, Adela, April, Ana (created at RSFG Oradea) and Autofertil 1 Autofertil 2 Autofertil 3 (hybrids obtained at RSFG Constanta) Teteny Record BT almond 1-12, Migdal RT 70-12, Migdal T.B. 12-24/61, 12-25/51 Kedvenk, T.B. 12-27, Apolka 12-33/36, Andosa, Szeget (almond cultivars and selections introduced from Hungary).

In 2012, a number of 54 genotypes were grafted in order to be introduced in germplasm found.

Table 3. Average yield of almond at Valu lui Traian, south-eastern Romania (multiannual date)

Cultivar	Average yield kg/tree	Shell weight (g)	Kernel weight (g)	Softness of shell
Preanîi	8.8	1.8	1.0	soft
Mari de stepa	3.4	3.5	1.4	hard
Teteny Botermo	3.8	2.2	1.0	soft
Lovrin	7.0	4.6	1.2	hard
Thompson	3.0	3.1	1.0	soft
Nikitski	3.5	4.0	1.4	soft
Feraduel	5.0	5.9	1.7	hard
Ferragnes	6.7	3.5	1.4	hard
Ai	3.5	3.0	1.5	soft
Marcona	5.0	1.5	0.8	hard
Tuono	1.0	-	-	hard

CONCLUSIONS

The almond cultivars studied provide good yields and can be recommended to be planted in orchards in south-eastern part of Romania although flowering time occurs earlier than in other fruit species.

The almond cultivars studied are auto incompatible; therefore it should be provided pollinators cultivars for orchard.

Studied cultivars yielding for one month, starting in early September (Preanîi) until early October (Tuono).

REFERENCES

Cociu V., 1954. Migdalul. Ed. Agro-Silvica de Stat, Bucuresti.

Cociu V., Oprea St., 1989. Metode de cercetare în ameliorarea plantelor pomicole. Ed. Dacia, Cluj-Napoca

Cociu V., 2003. Culturile nucifere. Ed. Ceres, Bucuresti.

Cociu V., 2007. Sa ne cunoastem si sa ne iubim pomii: nucul, alunul, migdalul. Ed. M.A.S.T., Bucuresti, 2007.

Manescu Creola, Baciu Eugenia, Cosmin Silvia, 1985. Controlul biologic în pomicultura. Ed. Ceres, Bucuresti.


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