

Evaluation of selected apricot cultivars based on many years of research in the collection of RIH in Skierniewice, Poland

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Abstract

The apricot cultivar assortment in Poland is characterized by small number of cultivars and a short period of ripening. In the Polish National List of Fruit Plant Varieties there are 9 cultivars only, and most apricot fruits are harvested in July/August. In order to improve the apricot cultivar assortment the creation of new domestic cultivars and introduction of foreign cultivars is realized. However, taking under consideration Polish climatic conditions, the only some cultivars having flower buds adequately resistant/tolerating to harsh winters and blooms adequately resistant to late spring frosts, and producing high yield of good-quality fruit can be recommended for growing. The apricot field collection in possession of the Research Institute of Horticulture in Skierniewice, Poland, contains over 100 cultivars, selections and seedlings of apricots. The research carried out in the collection are main source of information on apricot cultivars agronomical value for Polish fruit growers. On the basis of many years of observation in the collection, the cultivars best suited to the climatic conditions of Poland were selected, belong to them: 'Darina', 'Dobrzyńska', 'Harostar', 'Kijewskij Krasen', 'Krojczynka', 'Apricot from Ukraine', 'Pietropawłowski', 'Poleskij Krupnopłodnyj', 'Veharda', 'Hungarian Early'.

Keywords: apricot collection, resistance to frost, agronomical value, fruit attributes

INTRODUCTION

Accordingly to the Central Statistical Office of Poland, in the year 2016 harvested production of apricots in Poland was 4 thousand tons, what constituted 0.11% of total fruit production from trees. In an unfavorable year 2017 the production of apricots was half as much as in 2016. Generally, in the last five years no progress in yielding of apricot trees was recorded. The importance of apricot growing in Poland is small, because of harsh climatic conditions. The cold winters with temperature drops even below -20°C occur quite often, causing significant damages to apricot flower buds, and even to branches and young twigs from time to time. In addition, cold weather during flowering very often limit the fruitlet formation. After such winters/springs, as a result, apricot trees do not produce any fruits or the crop load is very low (Jakubowski, 2001, 2004; Szymajda et al., 2013a). Taking the above under consideration, in countries located in colder climatic regions, such as Poland, the only some cultivars having flower buds adequately resistant/tolerating to harsh winters and blooms adequately resistant to late spring frosts, and producing high yield of good-quality fruit can be recommended for growing. Actually, in the Polish National List of Fruit Plant Varieties there are 9 cultivars only.

Apricot cultivation due to their high thermal requirements is best managed in the south-western and south-eastern regions of Poland in the following provinces: Dolnośląskie, Podkarpackie, Świętokrzyskie, Lubelskie, Małopolskie (Jakubowski, 2004). The average orchard size is small and in the majority of orchards agricultural practices such as pruning, fertilization, irrigation and diseases control are not applied to an optimal level. The main rootstock used is Myrobalan (*Prunus cerasifera* Ehrh.) seedling, therefore trees are vigorous and planting density is low. However, in the experiments genotypes of apricot specially selected for seed and rootstock production, like A4 and M46, were positively evaluated (Sitarek and Bartosiewicz, 2011; Szymajda et al., 2013b). Two basic problems in apricot



cultivation are tree short life caused by freeze injury or bacterial cancer or a combination of the two, and irregular yields due to damage of flowers by late spring frosts. In Poland, the accumulation of chilling hours generally begins in September and by the end of December, the buds already receive sufficient chilling requirements and complete endodormancy. The coldest month is January, and spring frosts can happen even in the first days of May.

The apricot field collection in possession of the Research Institute of Horticulture in Skierniewice, Poland, is not as rich as those in the countries of Southern Europe well-known from apricot production. Over 100 cultivars, selections and seedlings of apricots are now being evaluated in the collection established in 1995. The research carried out in the collection are main source of information on apricot cultivars value for Polish fruit growers (Grzyb, 2004; Jakubowski and Grzyb, 2004). The paper presents agronomical efficiency and fruit attributes of apricot cultivars well-tolerating conditions of Polish climate, positively evaluated in 2009-2018 – ‘Darina’, ‘Dobrzyńska’, ‘Harostar’, ‘Kijewskij Krasen’, ‘Krojczynka’, ‘Apricot from Ukraine’, ‘Pietropawłowski’, ‘Poleskij Krupnopłodnyj’, ‘Veharda’, ‘Hungarian Early’. Two of them (‘Dobrzyńska’, ‘Krojczynka’) are Polish selection.

MATERIALS AND METHODS

Study of apricot cultivars was carried out at the Experimental Orchard in Dąbrowice near Skierniewice (Central Poland, at 145 m altitude, 51°54' N/20°06' E). The apricot field collection of the Research Institute of Horticulture in Skierniewice, Poland, was established in 1995. The rootstock was Myrobalan seedling, and spacing was 5×3 m. The trees were not irrigated, poorly pruned, and fruitlet thinning was not practiced in the orchard. Herbicides and fertilizers were applied according to the standard recommendations for commercial apricot orchards. Investigations of apricot cultivars (listed in Table 1) in this orchard were carried out in a period of ten years (2009-2018) on trees planted in the spring of 2006. The data collected included tree health status using a scale ranged from 1 to 9, flowering time, time of maturing, productivity using a scale ranged from 1 to 9, fruit weight and content of soluble solids in fruit determined on the sample of 50 fruits per cultivar.

Table 1. Vegetative traits of apricot cultivars in 2009-2018.

Cultivar	Time of flowering		Time of maturing		Time of maturing in respect to Early Orange	Tree health status (Scale 1-9) ^a
	Earliest	Latest	Earliest	Latest		
Darina	3.04	29.04	20.07	24.08	21 (+)	9
Apricot from Ukraine	2.04	18.04	10.07	24.07	6 (+)	8
Harostar	12.04	27.04	19.07	24.07	11 (+)	8
Kijewskij Krasen	11.04	18.04	22.07	14.08	21 (+)	7
Pietropawłowski	31.03	15.04	10.07	24.07	9 (+)	7
Dobrzyńska	31.03	29.04	10.07	20.07	7 (+)	8
Poleskij Krupnopłodnyj	31.03	28.04	22.07	1.08	6 (+)	8
Veharda	31.03	17.04	9.07	22.07	7 (+)	8
Hungarian Early	12.04	14.04	1.07	12.07	0 (=)	8
Krojczynka	30.03	17.04	30.06	15.07	4 (-)	7

^a1 – dying tree; 9 – healthy tree.

RESULTS AND DISCUSSION

Search for new valuable apricot cultivars for commercial orchards are realizing in many countries of Europe (Vachůn et al., 1995; Cociu, 2006; Milatović et al., 2012). Introduction of new cultivars to cultivation may take place on the basis of local breeding programs or by obtaining foreign cultivars. In Poland, both directions are attempted. However, due to harsh climate importing and introducing to the production of cultivars from countries with long breeding traditions like Spain, Italy, Greece, but with a much warmer climate than Polish, is impossible. Therefore, in the collection cultivars of native selection and cultivars originating from countries with a climatic conditions close to Polish are mainly evaluating.

The results presented in Tables 1 and 2 show large differences between both cultivars and years of research. These differences concern almost all observations and features studied. The largest regularity of yield was obtained from 'Darina' trees (in 9 out of 10 years of the studies) and the smallest from 'Poleskij Krupnoplodnyj' and 'Veharda' (in 5 out of 10 years of the studies). Tree productivity was assessed usually as low (3) or medium (5). In general, the health condition of all trees should be considered good. The largest fruits produced cultivars 'Darina', 'Kijewskij Krasen', 'Pietropawłowski', 'Dobrzyńska', 'Poleskij Krupnoplodnyj'.

Table 2. Productivity and fruit quality of apricot cultivars in 2009-2018.

Cultivar	Number of years with fruiting	Productivity (scale 1-9) ^a	Fruit weight (g)		Soluble solids (%)
			Min.	Max.	
Darina	9/10	4	49	110	12.1
Apricot from Ukraine	8/10	5	22	57	12.5
Harostar	6/10	5	30	54	17.0
Kijewskij Krasen	8/10	3	48	107	11.6
Pietropawłowski	6/10	3	49	145	15.2
Dobrzyńska	7/10	5	46	96	16.0
Poleskij Krupnoplodnyj	5/10	3	41	120	14.0
Veharda	5/10	5	34	58	14.2
Hungarian Early	6/10	3	54	60	15.6
Krojczynka	6/10	4	29	38	18.5

^a1 – no fruit; 9 – very abundant fruiting.

Taking into account all studied characteristics over a period of ten years of research, in particular regularity of yielding, tree productivity and fruit quality, the best for growing in Polish conditions are 'Darina', 'Kijewskij Krasen' and 'Dobrzyńska'. The last of them ('Dobrzyńska') was entered in the Polish National List of Fruit Plant Varieties in 2013.

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