INFLUENCE OF THE BIOLOGICAL PARTICULARITIES OF THE NEW VARIETIES INTRODUCED FROM THE WORLD COLLECTION ON FRUIT QUALITY

INFLUENȚA PARTICULARITĂȚILOR BIOLOGICE ALE SOIURILOR NOI INTRODUSE DE CAIS DIN COLECȚIA MONDIALĂ ASUPRA CALITĂȚII FRUCTELOR

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Abstract. *The researches were carried out in the orchard of the company "Agroparc Management" LLC, during the 2019 year. Apricot trees were planted in the spring of 2015. The object of the research was the apricot trees Wonder Cot, Spring Blush, Magic Cot, Lilly Cot, Pinkcot, Perle Cot, Orange Red, Sweet Cot, Big Red, Kyoto, Faralia and Farbaly varieties , grafted on the Mirobalan 29C rootstock. It was established that the biological peculiarities of the variety influence on morphological parameters, shape index and redistribution of fruits in various quality classes.*
Key words: Apricot, variety, weight, shape index, quality.

Rezumat. *Cercetările s-au efectuat în livada întreprinderii SRL „Agroparc Management", în perioada anului 2019. Plantarea pomilor de cais s-a efectuat în primăvara anului 2015. Obiect al cercetărilor au fost pomii soiurilor de cais Wonder Cot, Spring Blush, Magic Cot, Lilly Cot, Pinkcot, Perle Cot, Orange Red, Sweet Cot, Big Red, Kioto, Faralia şi Farbaly, altoiți pe portaltoiul Mirobalan 29C. S-a stabilit că particularitățile biologice a soiului influențează parametrilor morfologici, indicele de formă şi redistribuirii fructelor în diverse clase de calitate.*
Cuvinte cheie: Cais, soi, greutate, indicele de formă, calitate.

INTRODUCTION

The culture of the apricot, whose fruits - apricots - are highly sought after, both for fresh consumption and in the food industry, has long been viewed with distrust, and considered risky, due to the traits related to low resistance to frost, sensitivity at specific diseases, premature loss of trees from plantations and short duration of fruit storage (Babuc, 2012; Balan *et al*., 2008; Cimpoieş, 2018; Cociu *et al*., 1993; Peşteanu *et al.,* 2018).

The primary task of fruit growers is to replace the old varieties, less corresponding to the requirements in force, with new ones, more suitable for the conditions of our country, more productive and already known by consumers in the markets we want to penetrate (Balan *et al.,* 2008; Lichou *et al*., 1988; Negru, 2018).

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This replacement may be possible based on the introduction of new modern varieties from the global range, which based on testing over 4-5 years on their adaptation to climatic, edaphic, biotic, abiotic and agrotechnical conditions in various areas of the country recommended in production (Cociu, 1993; Negru and Peşteanu, 2019; Pîntea, 2017).

Apricots being mostly intended for fresh consumption, they must meet certain requirements submitted by consumers, which are very difficult to achieve due to biological and technological features of the species (Cimpoieş, 2018, Cociu, 1993, Lichou *et al*., 1989; Peşteanu *et al.*, 2018).

In order to satisfy the consumer's necessities regarding the quality of the fruits and to penetrate new markets, the organoleptic apricots must be homogeneous in size, with a color specific to the variety, but priority is given to varieties where 60-80% of the fruit surface is red, medium weight, pulp firm, dry detachment, relatively small pips, attractive appearance and valuable nutritional biochemical composition (Balan *et al.* 2008; Cociu, 1993; Milatovic *et al*., 2013; Pîntea, 2019; Souty *et al*,. 1990).

The practical argumentation of the morphological characteristic and quality indices of fruits in various apricot varieties were the main objectives of the research in question.

MATERIAL AND METHOD

The researches carried out during the year 2019 in the intensive apricot orchard of the company "Agroparc Management". The plantation was founded in the spring of 2015, with one-year-old trees from the Wonder Cot, Spring Blush, Magic Cot, Lilly Cot, Pinkcot, Perle Cot, Orange Red, Sweet Cot, Big Red, Kyoto, Faralia and Farbaly varieties, grafted onto the Mirobalan 29C rootstock. The Kyoto variety, which has the same maturation period as the native Nadejda apricot variety, was taken as a witness. Planting distance 5.0x3.0m.

The average weight of the fruits was calculated by the weighing method, and the height, small and large diameter of the fruits by the measuring method. The shape of the fruits was expressed on the basis of the shape index, which was the correlation between the height of the fruit and the large diameter of the fruit.

The quality of apricots was determined by the method of measuring the large diameter in the equatorial area of the fruits. According to the quality and marketing requirements for fresh fruits and vegetables, apricots with a diameter of less than 30 mm may not be marketed. Apricots with a diameter of 30-35 mm are assigned to quality category I and II fruits, or are marked with the letter C, and those with a diameter greater than 35 mm to the extra quality category. Apricots of extra quality category are divided into the following classes: B - diameter 35-40 mm; A - diameter 40-45 mm; 2A - diameter 45-50 mm; 3A - diameter 50-55 mm and 4A - diameter 55 mm and larger.

The average value of the index under study was calculated at the main morphological parameters.

RESULTS AND DISCUSSIONS

The size and shape of the fruits influence the market value and are important indicators in the study of varieties, because they are directly related to

the quality of the product obtained, productivity in sorting and packaging of fruits.

The following study shows that the biological characteristics of the varieties also influenced the average weight of the fruits. By size, the apricot varieties studied can be divided into the following groups. The Sweet Cot variety is attributed to the group of very small varieties, weighing between 20-30 g, which has borne fruits in abundance and for the future in order to obtain competitive productions it is necessary to regulate the fruits load from the tree crown by manual thinning. The Lilly Cot, Perle Cot and Wonder Cot varieties are assigned to the group of those with small fruits whose average weight falls in the values of 31-40 g. To the group of varieties with medium fruits are placed the varieties Spring Blush, Orange Red, Big Red and Farbaly, whose average fruits weight was 41-50 g. The varieties Pinkcot and Faralia, according to the average weight of the fruits, belong to the group of varieties with large fruits (50-60 g), and the variety Magic Cot to the group of varieties with extra-large fruits, whose value was greater than 60 g.

The shape of the fruit is in strict accordance with the biological characteristics of the variety and can be from spherical, oval to ellipsoidal. Deviations from the fruit form indicate an incomplete development due to water insufficiency during fruit development (Mitrea, 2007; Piagnani, 2013).

Table 1

The morphological parameters of apricots according to the biological particularities of the variety, 2019

Variety	Weight, g	Height, mm	Large diameter, mm	Small diameter, mm	Shape index
Wonder Cot	38.5	49.7	39.3	36.4	1.26
Spring Blush	42.2	44.5	43.2	38.9	1.03
Magic Cot	62.2	53.0	46.1	45.7	1.15
Lilly Cot	31.1	40.2	38.4	32.8	1.05
Pinkcot	55.5	46.8	45.5	43.2	1.03
Perle Cot	31.5	40.8	39.6	35.6	1.03
Orange Red	41.2	46.8	44.5	37.8	1.05
Sweet Cot	24.7	37.6	36.3	32.7	1.04
Big Red	40.1	43.0	41.8	39.6	1.03
Kioto (w)	47.4	44.9	44.4	41.4	1.01
Faralia	50.6	54.7	46.9	42.0	1.07
Farbaly	40.1	47.1	36.1	39.6	1.12
Average	42.1	45.7	42.3	38.4	1.07

The height and large diameter of the apricots are the characteristics that define the shape of the fruit. Differences in fruit height are genetic in nature. The lowest fruit heights were recorded in the Sweet Cot variety (37.6 mm), and the highest in the Faralia variety (57.7 mm). In general, all apricot varieties studied can be divided according to the height of the fruits into 3 groups. That is, varieties with fruits height up to 40 mm are assigned the variety Sweet Cot, varieties with a height of 40-50 mm where most of the studied varieties include Wonder Cot, Spring Blush, Lilly Cot, Pinkcot, Perle Cot, Orange Red, Big Red, Kyoto and Farbaly. The Magic Cot and Faralia varieties recorded values higher than 50 mm.

The large diameter and small diameter of the varieties studied were influenced by the biological characteristics of the variety. If, for example, in most apricot varieties after the large diameter values greater than 40 mm were recorded, then in the varieties Wonder Cot, Lilly Cot, Sweet Cot and Perle Cot had a diameter between 36.3-39.6 mm. According to the values of the small diameter we register diametrically opposite correlations. In this case, only for the Magic Cot, Kyoto and Faralia varieties, the diameter of apricot fruits had values higher than 40 mm, and for the other varieties studied they varied from 32.7 to 39.6 mm.

The study carried out on the shape of the fruits by means of the shape index shows that in all the studied varieties values higher than 1.0 was registered. If in the varieties Spring Blush, Sweet Cot, Lilly Cot, Pinkcot, Perle Cot, Big Red, Orange Red and Kyoto the shape index varied from 1.01 to 1.05, which highlights the spherical shape of the fruits, then in the varieties Wonder Cot, Magic Cot, Faralia and Farbaly this index registered values of 1.15-1.26, that is, the fruits had a spherical elongated and cordiform shape.

The dimensions of the fruits are of special importance because depending on them the fruits are redistributed on different quality classes, on which then depends the selling price, so implicitly the economic efficiency. Particularly important is the diameter of the fruit in the equatorial plane, which is a very important quality element, which in addition to hereditary influences is strongly conditioned by environmental and cultural factors.

The investigations show that from the studied varieties, quality category I and II fruits (class C) are registered in the Wonder Cot varieties (2.11%) and in the Lilly Cot variety (22.0%). In the other varieties, the fruits had a diameter greater than 35 mm and were assigned to quality class B. More than 50% of the fruit in that class was registered in the Wonder Cot variety (58.47%), Lilly Cot (76.9%), Perle Cot (55.2%) and the Sweet Cot variety (78, 0%). In the Faralia (3.0%), Kyoto (6.0%), Big Red (10.7%) and Orange Red (10.8%) varieties, an insignificant share of fruits was registered in the respective class.

In quality class A, a higher share of fruits returned to the varieties Spring Blush (81.5%), Pinkcot (39.75%), Pearl elbow (44.8%), Big Red (89.3%) and Farbaly (96.7%). The varieties Magic Cot, Lilly Cot, Orange Red, Kyoto and Faralia formed a lower share of fruits in that class (16.3-34.6%) Apricot fruits

with a diameter greater than 45 mm (class 2A and 3A) enjoys a popularity among consumers. Values higher than 50% in class 2A were registered for the varieties Magic Cot (70.6%), Pinkcot (60.25%), Orange Red (63.4%), Kyoto (59.4%) and the Faralia variety. (74.8%). A limited amount of fruit was assigned to quality class 3A.

Table 2

The influence of the biological particularities of apricot varieties on the quality of fruits by diameter and weight, %, 2019

Variety	By diameter				
	C	B	A	AA	AAA
Wonder Cot	2.11	58.47	39.42	-	-
Spring Blush	-	-	81.50	18.50	-
Magic Cot	-	-	24.00	70.60	5.40
Pinkcot	-	-	22.75	62.41	14.84
Perle Cot	-	55.20	44.80	-	-
Orange Red	-	10.8	25.8	63.4	-
Sweet Cot	22.00	78.00	-	-	-
Lilly Cot	-	76.90	23.10	-	-
Big Red	-	10.70	89.30	-	-
Kioto (w)	-	6.00	34.60	59.40	-
Faralia	-	-	16.30	74.80	8.90
Farbaly	-	3.30	96.70	-	-

Thus, the biological characteristics of the variety and the conditions recorded during fruits development directly influence the quality of the fruits.

CONCLUSIONS

The biological particularities of the varieties and the temperatures during the optional rest and the vegetation period influence the onset of the phenophase, the beginning of the flowering and the maturation of the harvest.

Morphological parameters are a valuable tool in assessing fruits quality, which is valuable information for fruit growers, who need to pay more attention to technological elements for cultivated fruits to be successful among consumers.

Most of the studied apricot varieties have a spherical fruit shape and only in the Wonder Cot, Magic Cot, Faralia and Farbaly varieties did the fruits have an elongated spherical and cordiform shape.

Of the studied varieties, a higher share of quality class A and 2A fruits was registered in the varieties Spring Blush, Magic Cot, Pinkcot, Big Red, Orange

Red, Kyoto Faralia and Farbaly. The other varieties formed more quality class B fruits to the detriment of those with a larger diameter. In order to obtain higher quality harvests for the varieties in question, it is recommended to regulate the fruits load.

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