THE STUDY OF SUMMER APPLE VARIETIES GROWN IN THE NORTH-WESTERN PART OF ROMANIA

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Abstract

Due to the high production of 47.7 tonnes/ha fruits and harvesting period of 30 days, Prima variety is recommended to be extended to all areas of the apple crop and Romus 3 variety due to its vivid red color and its earliness is a variety with high demand in this period. Due to the special taste qualities it owns and sugar - acidity ratio, Prima variety is also recommended for the production of apple juice with special therapeutic qualities.

Key words: apple, main fructification phenophases, physico-chemical parameters of fruits

INTRODUCTION

The apple, by its highly appreciated fruits due to its food nutrients, organoleptic and therapeutic features, by its nutrients content and specific sugar / acidity balance, the harmony of taste, subtle perfume and pleasant texture place them in the category of food required in all periods of the year. The existence of a large number of varieties with staggered maturity of fruits at different times, contribute to increasing the importance of apples that provide fresh fruit consumption, much of the year.

Next to it, a number of other characteristics of the fruits are added: they tolerate the transport easier than other fruits, can be kept fresh for a long period of time and are raw material with high share in the food industry.

To the importance of apple culture, agro biological peculiarities of trees also contribute. Widely-spread species, well adapted to temperate climates, whose variations are incurred better than all the other species of fruits, the apple can be grown in very different pedo-climatic conditions of this environment, providing the highest yields. This species is suitable to a variety of culture systems, from giant trees to trees with reduced, intensive superintensive vigour and even artistic guided cultures.

Upgrading the fruit production and its intensification has in view to concentrate fruit growing in the dedicated basins and centers, the organization of new fruit growing farms with specialized assortment of varieties to ensure the fruit production in large quantities of high quality and with a low cost at any time of year.

Researchers around the world and those in Romania are concerned with creating scab and mildew resistant varieties. Among these varieties we

can mention: Pionier, Generos, Voinea, Delia, Romus 1, Romus 2, Romus 3 (Romanian varieties), as well as Florina, Prima, Elstar, Liberty, Baujade, Auriu de Bistrița, Jonagold, Vista Bella etc

Apple crop development, the achievement of high and quality yields are objectives whose solution is possible by finding and adopting some measures to increase production efficiency on the land occupied by this culture.

MATERIAL AND METHOD

Branches were taken from SCDP Oradea, from the following summer apple varieties: Prima, Vista Bella, Romus 3 and Red Melba.

These varieties were grafted on rootstock M 106 in the nursery of PFA Gite Daniela and were planted in the spring of 2004 with four meters between rows and two meters in the row (1250 trees per ha) liniarly with 12 trees per variant (4 repetitions of 3 trees).

Annually 150 kg N, 100 kg P_2O_5 and 200 kg K_2O were applied during the first four years after planting and 250 kg N, 250 kg P_2O_5, 250 kg K_2O in the coming years.

Between the rows, dead fallow was maintained through repeated works with disc and miller in the row, the works were performed manually in the first three years after planting; then Roundoup herbicide 3 l / ha as well as mechanical and manual mowing have been applied in the coming years.

Measurements and determinations were related to:

- main fructification phenophases

Flowering – there was a daily visit of the experience/experiment and it was noted the first flower blooming as well as the end of the flowering taken as the date when the petals were shaken under the tree.

Harvest Maturity - as of July 10, there was a dayly visit in front of each cultivar and it was noted the beginning and end of harvesting maturity

- surface of trunk section

Two diameters for each tree were measured with calipers and made the average to calculate the radius. The formula $\frac{\pi R^2}{2}$ was applied calculating the trunk sectional area in cm².

- production of fruit per ha

Fruit production – For every tree of the 12 on variant, the fruits were completely harvested and weighed in kg / tree, there was the sum of the 12 fruit trees and settled kg / variety, then they were reported per hectare.

- physico-chemical parameters of fruits (size index, weight and dry matter index determined refractometrically)

Size – the large diameter, small diameter and height were measured with the caliper on samples of 25 fruits, the average of the 75 measurements was made, after that the fruit size was calculated in millimeters according to the formula: $\frac{D + d + h}{3}$

Weight - sample of 50 fruits were weight with analytical balance and then the average weight in grams(g) was established.

Dry matter - determined refractometrically. All data were processed statistically by variance analysis method.

RESULTS AND DISCUSSIONS

Regarding the flowering, we notice that Vista Bella and Red Melba varieties begin to bloom on the date of 14.04 and Romus variety ends the flowering period on the date of 27.04. During the research years, there were no problems with the returning frosts from spring.

Regarding the harvest maturity, the harvesting begins on the date of 15.07 in two varieties Vista Bella and Romus 3 being very early varieties and Red Melba and Prima varieties begin to be harvested on the date of 15.08, with the mention that Prima variety has a harvesting period of over a month fact that recommends it in this regard.

Table 1

Main fruiting phenophases in apple varieties and hybrids
(average 2012-2014)

Crt. no.	Variety or hybrid	Flowering			Harvest maturity	
		Beginning	Peak	End	Beginning	End
1	Prima	16 - IV	21 - IV	25 - IV	15 – VIII	20– IX
2	Vista Bella	14 - IV	18 – IV	26 – IV	15 – VII	10 – VIII
3	Romus 3	16 - IV	20 – IV	27 – IV	15 – VII	05 – VIII
4	Red Melba	14 - IV	18 - IV	24 - IV	15 – VIII	30 – VIII

The surface of the trunk section has very significant positive values in Prima variety, significantly distinct positive in Vista Belle variety and very negatively significant with respect to the average of varieties in the Romus 3 variety.

Table 2

Surface of trunk section in the 11th year after planting in apple varieties and hybrids

Crt. no.	Variety or hybrid	Surface of trunk section - 2014		±d (cm^2)	Significance
		Absolute (cm^2)	Relative (%)		
1	Prima	68.9	125.5	+14.0	xxx
2	Vista Bella	66.3	120.77	+11.4	xx
3	Media(Mt)	54.9	100.0	0.0	-
4	Red Melba	47.8	87.07	-7.1	-
5	Romus 3	36.7	66.85	-18.2	000

LSD 5% = 6.6
LSD 1% = 9.5
LSD 0.1% = 13.9

The fruit production has values of 47.7 tonnes / ha in Prima variety provided statistically distinct positive significant than the average of varieties, Vista Bella has an average of 40.2 tons / ha over the average of varieties and varieties Red Melba with 34.6 tons / ha and Romus 3 with 25.5 tons / ha are statistically negative than the average of varieties.

Table 3

Fruit production in disease-resistant apple varieties (2012- 2014)

Crt. no.	Variety or hybrid	Production(t/ha)			Average production		±d (t/ha)	Significance
		2012	2013	2014	Absolute (t/ha)	Relative (%)		
1	Prima	48.4	51.3	43.4	47.7	120.3	+ 8.3	xx
2	Vista Bella	38.2	41.7	40.6	40.2	102.0	+ 0.8	-
3	Media(Mt)	33.3	38.5	50.7	39.4	100.0	-	-
4	Red Melba	28.4	34.2	41.3	34.6	87.82	- 4.8	0
5	Romus 3	17.4	26.8	32.3	25,5	64,7	- 13.9	000

LSD 5% = 4.7
LSD 1% = 6.8
LSD 0.1 = 9.9

Prima and Red Melba varieties have medium to large size fruits of 76.4 mm and 72.8 mm, and Bella Vista and Romus 3 varieties have medium-sized fruits of 69.2 mm and 59.8 mm; even if the fruits are smaller they are in a greater demand being among the first apple varieties appearing on the market.

The average weight ranges between 184.4 g in Prima variety and 127.7 g in Romus 3 variety. The dry matter has values over 12% in all varieties.

Table 4

Physico-chemical properties of the fruits

Crt. no.	Variety or hybrid	Size index (mm)	Weight index (g)	Dry matter (%)
1	Prima	76.4	184.4	12.3
6	Vista Bella	69.2	154.3	12.6
8	Romus 3	59.8	127.7	12.2
12	Red Melba	72.8	172.6	12.2
13	Media(Mt)	69.5	159.7	12.3

CONCLUSIONS

As regards the flowering, it is noted that Vista Bella and Red Melba varieties begin to bloom on the date of 14.04 and Romus 3 variety ends the flowering period on the date of 27.04.

Regarding the harvesting maturity in the two varieties Bella Vista and Romus 3, the harvesting begins on the date of 15.07 being very early varieties and Red Melba and Prima varieties begin to be harvested on the date of 15.08, with the mention that Prima variety has a harvesting period over a month fact that recommends it in this regard.

Due to the special taste qualities it owns and sugar - acidity ratio, Prima variety is recommended for the production of apple juice with special therapeutic qualities.

The fruit production has values of 47.7 tonnes / ha for Prima variety statistically distinct and positively significant with respect to the average of varieties; Vista Bella variety has an average of 40.2 tons / ha over the average of varieties and Red Melba with 34.6 tons / ha and Romus 3 with 25.5 tons / ha are statistically negative with respect to the average of varieties

Prima and Red Melba varieties have medium to large fruit size of 76.4 mm and 72.8 mm, and Vista Bella and Romus 3 varieties have medium-sized fruit of 69.2 mm and 59.8 mm.

Due to the high production of 47.7 tonnes / ha and the harvesting period of 30 days in Prima variety, it is recommended to expand the culture in all areas of the apple crop and Romus 3 variety due to its vivid red color and its earliness is a widely-demanded variety during this period.

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