# CHANGES DURING CHERRIES RIPENING AND THEIR QUALITY AT ADRIANA, FERROVIA AND SKEENA VARIETIES, GRAFTED ON GISELA 6

# MODIFICĂRI ÎN TIMPUL MATURĂRII CIREŞELOR ŞI CALITATEA LOR LA SOIURILE ADRIANA, FERROVIA ŞI SKEENA, ALTOITE PE GISELA 6

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***Abstract.*** *Changes during ripening fruit are among the most important characteristics in the training and quality of the harvest cherries. This research was undertaken to examine the yield formation (n = 32) at cherry varieties Adriana, Ferrovia and Skeena, grafted on Gisela 6. Regardless of variety, branches bunch cherries mass decreases from 8.69 - 8.89 g annual branches to 7.19 - 7.49 g branches of three years. Harvest is uniformly biennial branches (27.27-39.21%), branches bunch of 1 year (from 27.27 to 31.22%) and branches bunch of 2 years (from 27.35 to 31.2%).*
**Key words:** cherry, variety, branches of fruit, harvest

***Rezumat.*** *Modificările în timpul maturării fructelor sunt printre cele mai importante caracteristici în formarea recoltei şi calităţii cireşelor. Această cercetare a fost întreprinsă pentru a examina formarea recoltei (n=32) la soiurile de cireş Adriana, Ferrovia şi Skeena, altoite pe Gisela 6. Indiferent de soi, masa cireşelor pe ramuri buchet se micşorează de la 8,69-8,89 g pe ramurile anuale la 7,19-7,49 g pe ramurile de 3 ani. Recolta este uniform repartizată pe ramuri bienale (27,27- 39,21 %), pe ramuri buchet de 1 an (27,27-31,22 %) şi pe ramuri buchet de 2 ani (27,35-31,2 %).*
**Cuvinte cheie:** cireş, soi, ramuri de rod, recoltă

## INTRODUCTION

Production potential and cherry fruit quality are determined by biological factors, agro technical, environmental, and also the time of harvest, collection and management practice after harvest (Yiannis *et al.*, 2013; Milošević *et al.,* 2015). Agro-technical measures of crop management, one of the most important is proper selection of variety but is equally important to succeed, that is the rootstock combination properly, and you find your own management system and cutting trees. (Milatović, 2013; Long *et al.,* 2014)

This is one of the main reasons for selecting the correct varietal and fruit growing technology. Rationale practice and perfecting the technology for

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producing high quality cherries, competitive market, and the efficient use of labor becomes an issue of great value to modern orchards.

## MATERIAL AND METHOD

They were studied, in terms of formation and development of trees, some new varieties of cherry crop in Moldova: Ferrovia, Adriana and Skeena, but widespread in the European Union (EU). The orchard was planted in 2010, varieties were grafted on Gisela 6 vegetative rootstock (*Prunus Cerasus vulgaris x canescens*). The distance between rows is 4m and between trees is 2m (1250 trees / ha). The experience includes 4 repetitions of 8 trees each (n = 32). On the other hand, measurements were made in field and laboratory conditions in accordance with the approved research methods in fruit growing.

Fruit harvesting was carried out at the stage of maturation, as skin color, as the color sheet CTIFL and soluble solids content. Establishing harvest for each variety was conducted by weighing individual fruit per trees in all 32 versions. Distribution cherry harvest (kg/tree) and fruit formations inside the crown were studied in four identical trees of every kind in the stage of full maturity of the fruit. Fruits were harvested separately biennial branches and branches bunch aged 1, 2 and 3 years. The average weight of the fruits was determined by weighing and counting them, a sample of 1 kg of cherries per each repetition.

The diameter and weight of cherries during the development and maturation of the fruits were identified using the template provided with openings 26, 28, 30, 32, 34 and 36 mm, corresponding to 8.5 mass; 10; 11.5; 13; 14.5; and 16 g accordingly. These analyzes were made on four samples in the cherry, 20 the same of every kind (n = 80).

## RESULTS AND DISCUSSIONS

Cherry plantations productivity and fruit quality is correlated in time during harvest. During the days preceding the harvest of the first fruits and cherries have a sharp increase in both volume and weight while carrying taste and qualities. Unlike other species, cherry processes do not continue ripening after harvest, that must be gathered when ripe. Industrial harvesting of cherries is done in a single pass, although staggered maturation occurs in 5-6 days. The work of harvesting is 70-80% of annual labor.

Analysis of experimental data (tab.1) shows that in the 10 days prior to harvest cherries diameter increased at Adriana variety from 21.5 to 28.3 mm, at Ferrovia variety from 22.8 to 29.5 mm and at Skeena variety from 22.4 to 29.5 mm or an average of 26.3 to 31.7%. Growth in diameter between fruit ripening cherries was different. When fruits start to mature and skin color turns from green to yellow transparent growth rate is higher compared to the last period of maturation. For example, at Adriana variety, 10 days before harvest, cherries diameter was 21.5 mm and 5 days before harvest - 25.8 mm or 20% more. In the next 5 days fruit diameter increased by 3.5 mm or only 11.6%. The same regularity was registered at Ferrovia and Skeena varieties.

The harvest is closely correlated with fruit weight and diameter of fruit. The data presented demonstrate that in the days preceding the harvest cherries mass increase considerably. From the moment they start to mature, cherries fruit weight increased by 88.3% at Adriana variety, 80.2% at Ferrovia variety and 88 5% to Skeena, representing 10.11 g, 10.29 g and respectively 10.53 g. Hence, the determination of the optimal period to harvest cherries is the first step in obtaining quantitative and qualitative fruit

production. When harvested early pre considerably, decreases the harvest, the cherries are immature, small and tasteless specific to variety characteristics. Obviously, delayed harvesting of cherries cause great damage to fruit.

*Table 1*

**The diameter and mass cherries during fruit development and ripening**

| Date, month, year | Variety | | | | | |
|---|---|---|---|---|---|---|
| | Adriana | | Ferrovia | | Skeena | |
| | mm | g | mm | g | mm | g |
| 05.06.2016 | 21.5 | 5.37 | - | | | |
| 09.06.2016 | 25.8 | 8.43 | - | | | |
| 14.06.2016 | 28.3 | 10.11 | | | | |
| 10.06.2016 | - | | 22.8 | 5.71 | 22.4 | 5.60 |
| 14.06.2016 | - | | 26.5 | 8.66 | 26.6 | 8.70 |
| 19.06.2016 | - | | 28.8 | 10.29 | 29.5 | 10.53 |

Physiologically size of the fruit is in close correlation with age branches bunch (tab. 2). It is known that fruits formed on the biennial branches mature earlier than the fruit from on the bunch branches. Also fruit on older branches bunch ripen later than fruit bouquet younger branches.

*Table 2*

**The diameter and mass cherries depending on age branch bunch, mm**

| Variety | Branches bunch old | | | | | | LSD 5% | |
|---|---|---|---|---|---|---|---|---|
| | 1 year | | 2 years | | 3 years | | | |
| | mm | g | mm | g | mm | g | mm | g |
| Adriana | 26.2 | 8.69 | 23.7 | 7.35 | 22.7 | 7.42 | 3.24 | 1.17 |
| Ferrovia | 27.2 | 8.89 | 25.1 | 8.21 | 22.9 | 7.49 | 4.15 | 0.98 |
| Skeena | 27.1 | 8.88 | 25.0 | 8.17 | 22.0 | 7.19 | 3.74 | 1.23 |

The results show that on the diameter, 3-year-old branches bunch cherries form smaller fruit compared branches bunch of 1 and 2 years. Thus, the studied varieties, diameter branches constituted 26.2 to 27.2 mm annual bouquet while the branches of three years was only 22.0 to 22.9 mm, or less than 13.4 -18.8%. Fruit weight is also interdependent by age branches bunch. With increasing age, decreases branch bunch fruit weight. Regardless of variety, cherries mass decreases from 8.89 to 8.69 g and from 7.49 to 7.19 g annual branches of three years.

The bouquet branches of cherry dominate, these are up to 75-80% from flowering buds and only 20-25% on the branches medium and ventures.

The results obtained highlight the fact that Adriana crop varieties, Ferrovia and Skeena, grafted on Gisela 6 during fruiting and growth is broadly based on biennial branches and branches bunch aged 1-3 years (tab. 3). Regardless of variety, 27.27- 39.21% of harvest was formed on the biennial branches, from 27.27 to 31.22% - branches bunch of one year, from 27.35 to 31.2% - 2 years branches bunch and 8.7 to 13.88% - 3 years branches bunch.

Cherry trees, grafted on rootstock Gisela 6 began to fructify the 4th year after grafting. The first harvest was the level of 625-1125 kg/ha (tab. 4).

*Table 3*

**Distribution cherry harvest on the fruit formations, kg/tree**

| Variety | Biennial branches | | Branches bunch age | | | | | | kg/tree |
|---|---|---|---|---|---|---|---|---|---|
| | | | 1 year | | 2 years | | 3 years | | |
| | Kg | % | Kg | % | Kg | % | Kg | % | |
| Adriana | 4.99 | 27.27 | 5.46 | 29.84 | 5.50 | 29.56 | 2.35 | 13.33 | 18.30 |
| Ferrovia | 5.40 | 27.55 | 6.12 | 31.22 | 5.36 | 27.35 | 2.70 | 13.88 | 19.60 |
| Skeena | 5.57 | 39.21 | 5.78 | 27.27 | 6.92 | 32.65 | 2.92 | 8.70 | 21.19 |

*Table 4*

**Cherry fruit production according to the sort, kg/ha.**

| Variety | Year 2013 | Year 2014 | Year 2015 | Year 2016 | Average (2013-2016) |
|---|---|---|---|---|---|
| Adriana | 625 | 4375 | 11875 | 8455 | 6332.5 |
| Ferrovia | 1125 | 4875 | 13250 | 10327 | 7394.3 |
| Skeena | 625 | 4250 | 16000 | 7680 | 7138.8 |
| DL 5% | | 435.2 | 971.8 | 1205.9 | |

In two fructification, productivity was increased and amounted to 4250-4875kg/ha. In 2015 fruit harvest was increased significantly and amounted to 11875 kg/ha at Adriana variety up at 16000 kg/ha at Skeena variety. In the 4th year of fruiting the crop was reduced as compared to the previous year and varied from 7680 kg/ha at Skeena variety, to 10327 kg/ha at Ferrovia variety. This decrease is due to adverse weather crop conditions during the flowering trees, expressed in precipitation and cloudiness. On average the first 4 years of fruiting varieties Ferrovia (7394.3 t/ha) and Skeena (7138.8t/ha) were more productive than the variety Adriana (6332.5 t/ha).

## CONCLUSIONS

Research on quality training cherries have shown that bigger fruit, crisp handling and more resistant to scratches and transport are obtained from the branches and branches bunch biennial aged 1-3 years.

Fruit sizes are interdependent to age branches bunch. Regardless of variety, branches bunch cherries mass decreases from 8.69 - 8.89 g annual branches to 7.19 - 7.49 g branches of three years. Adriana, Ferrovia and Skeena crop varieties, grafted on Gisela 6, during fruiting and growth of the tree, is uniformly formed on biennial branches (27.27 - 39.21%), branches bunch of 1 year (from 27.27 to 31 22%), branches bunch 2 years (from 27.35 to 31.2%) and branches bunch of 3 years (8.7 to 13.88).

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