UDC 634.1.076:634.23(477)

INFLUENCE OF ROOTSTOCK-SCION COMBINATIONS AND CONDITIONS OF THE YEAR ON SWEET CHERRY FRUIT QUALITY IN THE CONDITIONS OF THE SOUTHERN STEPPE OF UKRAINE

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Sweet cherries are in great demand on the markets for fresh fruits around the world. One of the biggest values of sweet cherry is that it is one of the first crops to enter the market, thus taking a specific niche of fruit consumption, and when stored in a regulated atmosphere conditions, the period of consumption of sweet cherry stretches to 2–2,5 months.

As of recent, Ukraine shows a significant interest for selling sweet cherry on export markets. Mean fruit weight and diameter are the determining indicators of the marketability of sweet cherry fruits. According to the Ukrainian State Standard, the fruits of the first commercial grade for sweet cherry should have a diameter of not less than 18 mm. At the same time, the requirements of the global fresh fruit market are higher. In addition, the biochemical composition of cherries and their impact on human health are of considerable interest.

The goal of the research was to determine the influence of cultivars, rootstocks and interstems on the quality of sweet cherry fruits in the conditions of Southern Steppe of Ukraine in order to determine the most successful combinations for implementation in commercial orchards.

The field trial, set in 2016–2018, had three cultivars of Ukrainian origin – Valery Chkalov, Melitoposka chorna, and Krupnoplidna. Each of the cultivars was grafted on Mahaleb seedlings with VSL-2 interstem, as well as on just Mahaleb (control). Length of the interstem was 20 cm. Trees in the orchard were in the state of full production. Mean fruit weight, diameter, share of the pit in fruits was determined. Analysis of biochemical composition of the fruits included dry soluble solids content (SSC), total sugars, titratable acids, and ascorbic acid content. Statistical analysis of data consisted of ANOVA and Pearson's correlation.

All studied varieties exceeded the requirements of State Standard to the minimum diameter of the fruits, which indicates their high quality. During the years of research, Krupnoplidna cultivar had the biggest fruits, followed by Valery Chkalov and Melitopolska chorna. At the same time, Melitoposka chorna cultivar was characterized by the most consistent fruits (86,4% of the fruits were in range of "mean diameter ± 1 mm"). This index for Valery Chkalov cultivar

averaged 71,6%, for Krupnoplidna it was 64,4%. In general, the fruits were less uniform in size in 2018 compared to 2017.

In non-irrigated conditions that are traditional for cultivating sweet cherries in the Southern Steppe of Ukraine, the use of the combination Mahaleb / VSL-2 did not lead to the reduction of mean fruit weight and diameter compared to trees grafted on vigorous rootstock. This regularity was confirmed on all studied cultivars; only Valery Chkalov showed a tendency to decrease of mean fruit weight and diameter but it was not confirmed statistically.

During the analysis of biochemical composition of sweet cherry fruits it was determined that they accumulated 15,9 ... 19,4% of dry soluble solids, 9,5 ... 12,5% of total sugars, 0,8 ... 0,9% of titrated acids and 2,2 ... 5,8 mg/100 g of vitamin C, which generally corresponds to the data declared by the authors of the cultivars. Sugars in fruits were represented mainly by monosaccharides, the share of them in total sugar content was 95,5 ... 100%. The sugar-acid index ranged from 12,0 to 15,5 units, which is considered optimum for fresh consumption of sweet cherries.

Use of VSL-2 interstem on Valery Chkalov and Krupoplidna cultivats allowed to increase the content of dry soluble solids by an average of 14%, total sugars – by 10%, and on Krupoplidna cultivar - also the content of ascorbic acid by 36%.

According to the correlation analysis, a strong positive correlation was found between the content of dry soluble solids and sugars ($r = 0,768; p = 0,001$), which indicates the decisive role of the latter in the composition of dry soluble solids. The positive correlations of medium strength were found between mean fruit weight and total sugar content ($r = 0,472; p = 0,004$), SSC ($r = 0,333; p = 0,047$); however, no significant correlations were found between mean fruit weight and titrated acids content of ($r = 0,220; p = 0,197$); ascorbic acid content ($r = 0,095; p = 0,583$). This suggests that an increase in mean fruit weight leads to an increase in the content of soluble solids and sugars, but does not have a significant effect on the content of organic acids, including vitamin C.

Considering the positive influence of researched factors on mean fruit weight and diameter, biochemical composition of fruits, combinations Mahaleb / VSL-2 / Kropoplidna and Mahaleb / VSL-2 / Valery Chkalov can be recommended for use in commercial orchards.

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