

Storage

For short term storage use gunny bag or cloth bag. For long term storage use polythene bag of > 700 gauge and dry the seeds to 8% moisture content. When compared with varieties, the hybrids and parental lines A & B lines are poor in storability. The order of the storage potential is R > F1 > B > A.

Seed Yield:-2,000kg-3,500kg/ha.

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PRODUCTIVITY OF SWEET CHERRY IN SOUTHERN UKRAINE UNDER STRESS CONDITIONS

Introduction. Sweet cherry is one of the most important stone fruit crops in Ukraine, with production level of 60-85 thousand t annually, with most of the industrial production concentrated in the Steppe zone [1]. The question of optimal cherry rootstock for intensive orchards is still very open, and the tendency of climate change observed throughout the world makes it more pressing nowadays. According to the meteorological data, in recent years, mean daily air temperature and sum of active temperatures in Melitopol increased compared to mean long-term values, while hydrothermal coefficient and air humidity decreased, more spring frosts in April-May are observed, and precipitation distribution shifted to heavy rains followed by prolonged periods of draught [2]. Thus, cherry rootstocks should be adaptive to a wide range of possible abiotic stress factors. The aim of our research was to assess the main production indices of sweet cherry trees grafted on different clonal rootstocks.

Materials and methods. The research was carried out in sweet cherry orchard planted in 2015 in Melitopol, Zaporizhzhia region, on ‘Melitopolska chorna’ and ‘Krupnoplidna’ cultivars. Trees were planted with a scheme of 5 x 3 m and trained as spindle bush canopies. The soil of the experimental site is southern light loamy chernozem. The field experiment had four replications with 8 trees in each replication. Due to Russian aggression against Ukraine, experimental orchard was not irrigated and fertilized, which further added to the stress of the plants. To analyse the results, 2-way ANOVA was conducted using Minitab 19 software with Tukey’s range test with an accuracy of 0.05 to determine the significant differences between the means.

Results and conclusions. Weather conditions of the winter of 2021-2022 were generally favourable for sweet cherry. The minimum air temperature was recorded at the level of minus 14.2 °C on 24.12.2021, and the damage to generative buds in winter amounted to 6-9%. Frosts after the restoration of plant vegetation, which were observed in March (up to minus 4.6 °C on 28.03.2022) and April (up to minus 2.5 °C on 05.04.2022) damaged 15-20% of flower pistils, which is not critical for this crop

under favourable conditions for flowering and fruit setting.

The flowering of experimental cherry orchard in 2022 was observed from late April to early May. As of the seventh leaf, cherry trees grafted on CAB 6P rootstock formed 4.6 thousand flowers/tree on average for both cultivars, which exceeded the trees of variants with Gisela 5 (control) and Gisela 6 rootstocks by 1.6-1.9 times (table 1). Trees of 'Melitopolska chorna' cultivar formed an average 1.5 times more flowers than trees of 'Krupnoplidna'. The degree of fruit set in 2022 was high, 33-36%, and did not depend on the variants of the experiment.

Table 1 – Productivity indices of sweet cherry trees, 2022

Variant	Flowers per tree	Fruit set, %	Yield, t/ha	Specific yield, kg/cm ² of TCSA	Fruit weight, g
Mean for rootstocks					
Gisela 5 (c)	2927 <i>b</i> *	33.9	5.2 <i>b</i>	0.21 <i>a</i>	8.2 <i>b</i>
Gisela 6	2561 <i>b</i>	35.2	4.8 <i>b</i>	0.16 <i>b</i>	8.8 <i>a</i>
CAB 6P	4600 <i>a</i>	36.9	8.8 <i>a</i>	0.18 <i>ab</i>	8.1 <i>b</i>
Mean for cultivars					
Melitopolska chorna	3935 <i>a</i>	34.9	6.7 <i>a</i>	0.20 <i>a</i>	7.5 <i>b</i>
Krupnoplidna	2790 <i>b</i>	35.7	5.8 <i>a</i>	0.17 <i>b</i>	9.3 <i>a</i>

*Different letters in the same column indicate significant difference between the means according to Tukey's test ($p < 0.05$).

The analysis of yield indices revealed the same trends that were observed during the flowering: the yield of the trees on CAB 6P rootstock was 1.7-2.0 times higher than when using Gisela 6 and Gisela 5 rootstocks. At the same time, the specific yield per unit of trunk cross-sectional area (TCSA) was the highest in the control variant – 0.21 kg/cm². The yield of trees of 'Melitopolska chorna' cultivar was 6.7 t/ha on average and exceeded 'Krupnoplidna' cultivar by 17% (5.8 t/ha), regardless of the rootstock used. While our previous research suggests that trees of 'Krupnoplidna' and on Gisela rootstocks enter fruit production earlier compared to 'Melitopolska chorna' and CAB 6P rootstock [3], the latter seem to be more adapted to stress, induced by extreme weather conditions, observed recently due to climate change. Other trials performed in similar climate conditions, also report higher yield of the trees grafted on CAB 6P rootstocks compared to more dwarfing Gisela 5 and 6 rootstocks [4].

The highest fruit quality was recorded in trees on Gisela 6 rootstock on both cultivars, which exceeded the other variants of the experiment by 7-9% in terms of mean fruit weight. Generally, the fruit size in this trial was lower than reported in other research, especially for 'Krupnoplidna' cultivar [5]. This can be explained by the lack of irrigation and fertilization in 2022.

In general, according to the range of indices of the formation of crop productivity, in 2022 the cultivar-rootstock combination 'Melitopolska chorna' / CAB 6P stood out, the yield of which was at the level of 9.5 t/ha, as well as 'Krupnoplidna' / CAB 6P with a yield of 8.2 t/ha. The highest fruit quality for both cultivars was observed in the trees grafted on Gisela 6 rootstock.