Abstract

EVALUATION OF UTILITY CHARACTERISTICS OF SELECTED BIOTYPES OF CORNELIAN CHERRY (*CORNUS MAS* L.) CULTIVATED IN THE CONDITIONS OF NORTH-EASTERN POLAND

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Cornelian cherry is a little-known orchard species suitable for organic cultivation. Due to the high health-promoting values of the fruit, it is attracting more and more interest from both consumers and the processing industry. Its fruits can be used on a large scale in the food, pharmaceutical and cosmetic industries. The research presented in this paper was conducted in the area of north-eastern Poland within Olsztyn in the years 2018-2021. The subject of the study was 30 biotypes of generative origin.

In the study, the morphological parameters of the bushes and the physico-chemical parameters of the fruits obtained from them were assessed. The effect of rooting stimulators and two types of shoot base pruning on the effectiveness of alternative vegetative propagation by semi-hardwood cuttings was also investigated. During the research period, two experiments were carried out, the aim of which was to assess the effect of gibberellins, ether and chemical and mechanical scarification on breaking cornel seed dormancy.

The size of the examined shrubs ranged from 8.05 m^2 (B1) to 2.53 m^2 (B42). Most of the assessed shrubs (40%) had an erect habit. Based on the obtained results, significant differences in yielding were found and physical parameters of the fruit. The yields obtained ranged from 0.54 kg/bush (B13) to 3.71 kg/bush (B1). The characteristics of the fruits of the tested biotypes ranged from 1.75 g (B17) and 1.76 g (B44) to 4.65 g (B5) for the weight of a individual fruit; 0.26 g (B20) - 0.56 g (B26) for stone weight; 10.86% (B2) - 19.55% (B3) for stone percentage; 1.11 (B18) - 1.90 (B21) for fruit shape index. Among the tested biotypes, 33.3% had oval-shaped fruits. In 23.3% of the biotypes pear-shaped fruits were found, while in 26.7% the fruits were spherical. Few bushes had bottle-shaped fruits.

The dry matter content in the fruit ranged from 16.27% (B31) to 21.83% (B13). The extract content varied depending on the biotype from 13.79% (B20) to 20.07% and 20.12% in

B13 and B44 fruits, respectively. The highest content of vitamin C was determined in fruits of the B20 biotype and amounted to 100.76 mg/100g, and the lowest 54.42 mg/100g in B25 fruits. The lowest concentration of pectins in fruit, ranging from 1.02% to 1.04%, was found in fruits of biotypes: B44, B13 and B42. The highest pectin content, 1.53% and 1.52%, was recorded in fruits of biotypes B18 and B45. The acidity of the tested fruits ranged from 4.51% (B2) to 3.22% (B13). In the case of total and reducing sugars, the lowest concentrations of 6.58% and 5.87% were found in fruits of biotype B42. The highest content of given sugars, amounting to 11.46% (total sugars) and 10.77% (reducing sugars), was found in B45 fruits. The highest content of total polyphenols was determined in fruits of the B7 biotype (533.39 mg/100g), and the lowest in B25 fruits (280.64 mg/100g). The brightest were fruits of biotype B17 and contained 19.15 mg/100g of anthocyanins. The darkest fruits had biotype B9, in which the content of anthocyanins was at the level of 124.64 mg/100g. Half of the tested biotypes were cherry-colored fruits (50-100 mg/100 g of anthocyanins). In the case of 12 biotypes, the sheep were red (below 50 mg/100g of anthocyanins). Dark fruit had the fewest biotypes, with anthocyanin content above 100 mg/100g.

The material in the experiment concerning the propagation of dogwood by semi-hardwood cuttings were 2-node fragments of shoots taken from biotypes: B1, B2, B9, B30 and B45. Rooting was carried out in a greenhouse on heated tables with automatic fogging. The highest results (70.67%) were obtained when rooting fragments of shoots with a straight base treated with Rhizopon AA 1%. Cutting the base reduced the effectiveness of rooting. Cuttings obtained from biotypes B45 (37.64%) and B1 (35.56%) had the best rooting. In the absence of chemical stimulation, shoot rooting was negligible.

Dogwood seeds require warm-cold stratification to break dormancy. The best results were achieved in two stratification models: 18-week warm phase with cyclically changing temperature of $15^{o}C/25^{o}C$ and $20/30^{o}C$ + 18-week cold phase with temperature and $4^{o}C$. Pre-sowing treatments (soaking, scarification, treatment with chemical compounds) shorten the germination time and increase its efficiency. Treating the seeds with gibberellin GA3, the highest percentage of germinated seeds was obtained using it at a concentration of 1500 ppm and it was 68% of germinated seeds for the temperature of $20^{o}C/30^{o}C$, and 65.33% for the temperature of $15^{o}C/25^{o}C$. In the conducted experiments, the highest percentage of germinated seeds (81.33%) was obtained using the GA31500 ppm treatment in combination with mechanical scarification in the $15^{o}C/25^{o}C$. temperature model. Using chemical scarification

with the same chemical compound and temperature range, germination was recorded at the level of 70.67%. By treating the seeds with 0.5% ether in combination with mechanical scarification, the largest share of germinating seeds was found at $15^{o}C/25^{o}C$. and it was 58.67%. Using 1% ether in combination with mechanical or chemical scarification, a negative effect on the degree of seed germination was found, especially in the case of cut seeds. When used on unscarified seeds at temperatures of $15^{o}C/25^{o}C$., germination was recorded at the level of 78.67%.