PIGMENT CONTENT IN THE LEAVES OF DIFFERENT CHERRY VARIETIES

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Sweet cherry productivity is ensured by both the supply of nutrients from the soil and the synthesis of nutrients in the green assimilation organs of the tree - the leaves. The intensity of photosynthesis determines the biological and economic productivity of trees. Leaves on trees are the main organs that produce organic matter, from which tree biomass is created, as absorbed solar light energy [1]. The primary source of organic matter formation is photosynthesis, which is associated with the most important processes of plant life, and as a result, the formation of a high yield. It is known that the intensity of photosynthesis, and with it the accumulation of organic matter, depends on the size of the leaf surface, which is determined by the biometric parameters of plants and the duration of the active activity of the assimilation apparatus [2, 3].

The pigment system of leaves is one of the most important indicators of photosynthetic activity in plants. Its main components are green pigments – chlorophylls “a” and “b”. Their accumulation in the leaves, as well as in the whole plant, further affects the synthesis of biomass and the formation of tree yields [2].

The formation of the expected and future harvest (laying of generative formations) has a significant connection with the course of physiological processes in the leaves and the accumulation of plant mass. A decrease in the chlorophyll content in the leaves negatively affects the condition of the plant and leads to a weakening of shoot growth.

The objects of research were 12 varieties of sweet cherries of different ripening periods. The trees were grafted on a forest sweet cherry rootstock, planted according to the 6 x 4 m scheme. The soil between the rows was kept under black steam.

The collection of plant material – sweet cherry leaves was carried out in the phases of flowering, fruiting, and in the fall after fruiting. The content of chlorophylls and carotenoids was determined spectrophotometrically. The pigments were extracted by grinding the raw materials with ethyl alcohol under maximum shading conditions, and then centrifuged at 5000 rpm for 10 minutes. The optical density of the extract was determined at the wavelengths corresponding to the absorbance maxima of chlorophylls a and b and carotenoids in the extract, using the extract as a comparison solution. The results were recalculated and expressed in mg/100 g dry weight. The sum of chlorophylls a and b (Chl a+b), the ratio of chlorophyll a to chlorophyll b (Chl a/b), and the ratio of carotenoids to the sum of chlorophylls a+b (Car/Chl a+b) were measured. All extraction procedures were performed under low light conditions to

avoid pigment degradation.

According to the data obtained, the chlorophyll content in the leaves largely depended on the characteristics of the pomological variety.

The high content of chlorophyll a in the group of early ripening was observed in the leaves of the control variety Zoriana, in the group of medium ripening in the varieties Mirage, and among the late ripening it was found for the variety Drogana yellow. Compared to the variety Drogana yellow, a higher content of chlorophyll a was recorded for the control varieties Zoriana, Meotida, as well as Mliivska yellow and Mirazh.

Table - Pigment content in sweet cherry leaves of different ripening periods, mg/100g of fresh weight

Pomological varieties	Chlorophyll			Carotenoids
	«a»	«b»	summa «a+b»	
Early ripening varieties				
Dar Mlieva	62,47	29,39	88,47	39,84
Zoriana (k)	84,34	35,77	118,33	47,96
Mliyevska yellow	82,28	36,18	118,44	47,04
Mid-season varieties				
Mirage	97,82	36,09	131,58	57,24
Alyonushka	75,70	29,96	105,95	45,28
Aborigenka	70,99	32,39	103,82	45,44
Melitopol mottled	73,89	31,18	103,83	45,79
Meotida (k)	96,68	46,28	142,28	56,13
Late-ripening varieties				
Biryuza	67,21	30,09	94,88	42,35
Donetsk coal	75,59	32,09	107,49	44,45
Drogana yellow (k)	76,19	31,09	112,68	42,01
Amazonka	75,92	25,35	102,78	39,48
HIP $_{05}$	*3,14*	*2,66*	*5,83*	*1,41*

The content of chlorophyll b in sweet cherry leaves was half that of chlorophyll a. In addition, on average over three years, among the early ripening varieties, the highest content of chlorophyll b was characterized by the variety Mliyivska yellow, and slightly lower – by the control variety Zoriana. The control variety Meotida was also characterized by the highest content in mid-season, and Donetsk coal was characterized by the highest content in late-season. The control variety Drogana yellow was also characterized by a relatively high content of chlorophyll b in the late-ripening group, its content was higher than that of the varieties Zoriana, Mliivska yellow, Mirazh, Aborigenka, Meotida and Donetsk coal.

Cherry varieties with a higher total chlorophyll a+b content were distinguished by

a higher chlorophyll b content – Mliyivska yellow, Meotida and Donetsk coal. Accordingly, the total chlorophyll content was higher than the control only in the early ripening group – Mliivska yellow variety, in the groups of medium and late ripening, the highest content was characterized by the control varieties Meotida and Drogana yellow.

Carotenoids are an important part of the pigment spectrum in the leaves of perennial crops. As a result of the analyzes, it was found that in the leaves of sweet cherry varieties, those varieties with a high content of chlorophylls “a” and “b” were characterized by a significant content of carotenoids – in the group of early ripening varieties Zoryana and Dar Mlieva; medium ripening – Mirage and Meotida; late ripening – Donetsk coal.

Thus, in sweet cherry leaves of different ripening periods, the pigment content was determined by the pomological characteristics of the variety and no dependence on other factors was found.

References

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