

Influence of peat substrate composition on indicators of physiological vitality of cloudberry *Rubus chamaemorus* during the rooting period

The growing of cloudberry in Latvia and globally is still done in rather small areas and harvests are mainly produced in wild stands, thus making cloudberry cultivation a promising research field. Berry plantations in extracted peat bogs are known to protect the upper peat layer from wind erosion and water loss, and to reduce GHG emissions. Production of high-quality berry yields contribute to the local economic development.

The aim of the study was to determine the most suitable substrate composition for successful rooting of cloudberry. A hermaphroditic cloudberry variety Nyby was vegetatively propagated by dividing rhizomes and then planted in 3 variations of peat substrate with different levels of acidity and nutrient supply. Variations were formed by mixing bare peat (K) with limed and fertilized peat substrate (M1) in the following proportions: 1) K, 2) 1K:1M1, 3) M1.

The survival and vitality of plants were recorded by measuring chlorophyll fluorescence activity (Fv/Fm), a complex fluorescence parameter (Performance Index), and the concentration of total chlorophyll in SPAD units, which indicate the overall physiological status of plants. Morphological parameters as number of young shoots, leaf amount and size were recorded.

First year results marked higher young shoot vitality and photosynthetic productivity of variant (K), which held the highest values of all three chlorophyll-related parameters ($p < 0,05$). The lowest values for these indicators were recorded in substrate M1. The highest survival rates (number of shoots and leaves) were also observed in variant K, the lowest – in variant M1.

Although rooting of cloudberry in M1 was the least successful, in the second year of development the highest number of shoots per pot (on average 4.1), which described cloudberry productivity, corresponded to M1. There were no significant differences between the variants regarding the size of leaf blades in the first year. However, in the second year, the largest leaves also corresponded to M1 - on average 5.23 cm, as for the K1 variant - 4.59 cm.

Successful cloudberry rooting is essential for high survival rates of rhizomes and their ability to form young shoots and leaves. Results indicate that unfertilized peat (K) is most suitable for cloudberry rooting, as it ensured the highest survival and vitality of plants. However, in the second year, higher green mass production in M1 indicates the positive effect of fertilization on the rooted cloudberry in further development.

Key words: cloudberry, rooting, peat, shoot physiological status, chlorophyll fluorescence.

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