

Partitioning of Carbohydrates and Biomass of Needles in Scots Pine Canopy

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The study was aimed at the quantitative evaluation of the temporal and spatial partitioning of non-structural carbohydrates and needle biomass in a canopy of Scots pine (*Pinus sylvestris* L.) growing in a *Myrtillus* site type forest stand (predominant in Estonia). The tree canopy was divided into ten equal layers and the material for the spatial partitioning of the investigated characteristics was sampled from all layers. Our findings revealed a significant variation in morphology and in the partitioning of carbohydrates in needles in different layers of the canopy. The study of the temporal dynamics of carbohydrates showed that starch content in needles started to increase in early spring before budbreak, which was accompanied by a decline in soluble carbohydrates. In October, the starch content of needles was low, but the concentration of soluble sugars started to increase attaining a maximum in winter. Regression analysis indicated that before budbreak, the partitioning of soluble sugars in different canopy layers was relatively weakly correlated with the height of the layer; however, a strong correlation was observed for starch. In autumn, when the growth of trees stopped and daily temperatures decreased, the allocation of soluble sugars was correlated with the height of the canopy layer.