

# Growth Characteristics of Spruce Population Under Canopy of Birch Forests of Southern Taiga in Russian Plain

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**Keywords:** southern taiga, birch forests, under-canopy spruce stand, growth

Dynamics of forest resources in the center of Russian plain can be characterized by an increase of soft-leaved breed stand square. Spruce population resumes under such stand canopy. These stand often develop spontaneously. This fact shows the relevance of studying the processes of formation of soft-leaved breed stand with spruce growing under their canopy.

The aim of this research was to study the growth characteristics of spruce under the canopy of birch forests of the southern taiga. Method of sample-trees was used. In total 400 sample-trees of different habitus were involved. The trees were sawn into segments and the cuts were measured according to the methodology adopted for the analysis of tree trunks. The measurement results were processed with a special program for personal computers.

It was identified that tree growth is largely determined by the period of spruces regeneration –  $T_w$  (the difference between the age of the birch and spruce age). On the dynamics of growth in the height of the selected three generations for  $T_w$ : 1–25, 26–40, 41–50 years.

At the age of 35 years the first generation reaches the lower height threshold (6.3 m) of the second tier of the stand. The average height of the second and third tree generations at this age does not exceed the height of the regrowth.

For the first two generations the current average-for-the-period height increase reaches its maximum value at the age of 35–40 years, while the second generation significantly inferior to the first one in growth value. For the trees of the first generation the equality of the current average-for-the-period and average height increments observed at the age of 60 years. After that age the changes in the vertical structure of the emerging spruce forest are unlikely. In this generation, at the age of 15 years leading trees start to stand out, the minimum height of these leading trees is equal to 0,7 m.

Spruce trees with higher tapering and low marketability of wood dominate in the canopy of birch forests.

The growth characteristics of spruce growing under the canopy of birch significantly inferior to the characteristics of spruce, growing in forest stands without the participation of soft-leaved breeds. At the age of 60 years, the average growth in height is 40 % smaller, and average growth in the trunk volume is 80 % less than for trees in stands of II grade of locality spruce, which are the most common in the study region.