[粕屋演習林]6.Relation between growth and wood properties of Chamaecyparis obtusa

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6. Relation between growth and wood properties of Chamaecyparis obtusa

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Summary

Wood properties in forest trees have great variation which is controled by the environmental factors and the hereditary factors, within and among trees. Therefore, if the variation is controled mainly by the hereditary factors, the breeding for wood properties should be possible.

The objects of this study are to investigate the variation patterns of tracheid length in a tree at experiment 1, and stand variations and individual tree variation of ring width and tracheid length as wood properties at experiment 2.

Experiment 1. Variation within a tree

The materials for this experiment were taken from HINOKI (Chamaecyparis obtusa Sieb. et Zucc.) tree growing in Kasuya school forest of Kyushu University. The survey was made to determine the variation of tracheid length. The disks for this experiment were cut from the sample tree at different heights above the ground level (at 0m, 1m, 1.3m, and every 2m higher up to the top). Test specimens were taken from the disks at each growth ring along the four directions from the pith.

There were variations of tracheid length in the radial directions and the same growth layers, but not among the four directions. The diagram of distribution of tracheid length in the stem (Fig. 5) was made from the data.

As the result, it is possible to estimate tracheid length of the sample trees by small samples extracted from the stem between 1 m and 3 m above the ground level.

Experiment 2. Variation among trees and stands

Stand variation and tree variation in ring width and tracheid length were assessed from small samples in trees belonging to four different stands in Taira and Unzen ranger districts of Nagasaki district forest office.

Significant differences at 1 percent level in ring width and tracheid length were found among stands.

As to variation among trees, the significant difference in ring width was not found in the II stand, but such differences were significant at 1 percent level in the other stands. On the other hand, significant differences in tracheid length were found among trees in each stand.

An attempt was made to find the relation between growth characters and wood properties. These relations were shown in Table 6 and Figs. 8 and 11. Ring width and diameter at breast

height were closely related. Ring width was found to have a high correlation with tree height and stem taperness. There was a significant correlation between tree height and tracheid length. However, diameter at breast height or stem taperness were not recognized to have a significant correlation with tracheid length.

The relation between ring width and tracheid length had no significant correlation.

The fact that the trees within the same stand had high variability in tracheid length suggests the possibility of hereditary variation among trees.