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FOREST RESEARCH NOTES

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USE OF DOMINANT TREE HEIGHTS IN DETERMINING SITE INDEX FOR DOUGLAS-FIR

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Measuring heights of Douglas-fir trees for the determination of **site index** is a time-consuming job, especially in dense stands. Both dominant and codominant trees must be measured since site index curves represent the average height of dominants and codominants.^{2/} It has been suggested that considerable time might be saved if only dominant trees were measured, since these trees extend above the general crown level and are frequently in or at the edge of openings; hence, their tops are much more easily spotted from a distance.

To make use of an average height determined from dominant trees, it should only be necessary to apply a correction to convert it to the average height of dominants and codominants. The computed height might then be read into the site curves or tables of the yield bulletin.

Height data from growth and yield permanent sample plots in the Douglas-fir type were analyzed to get such a correction figure. The average height of the dominant trees measured on the plot was determined. Also computed was the average height of the dominant and codominant trees. The averages were determined for the first and last measurements made on each of the sample plots giving 83 pairs of observations.

^{1/} Full credit is given to Mrs. Edgel Skinner, Statistical Clerk, for the analysis of data.

^{2/} McArdle, R. E. and Meyer, W. H. Yield of Douglas fir in the Pacific Northwest. U.S. Dept. Agric. Tech. Bul. 201, 64 p. 1930.

The difference between the average height of the dominant trees and the corresponding average of dominants and codominants was correlated with the height of the dominants and a linear regression fitted by least squares with this result:

$$\text{Difference} = 2.66 + .040 \times \text{average height of dominants}$$

The coefficient of correlation for this regression equation is .51 and the standard deviation from regression 3.3 feet. This equation will give a reasonably accurate correction, which is subtracted from the average height of the dominant trees to get a figure that may be used to determine site index.

For ease in use, this correction equation has been plotted in figure 1. Here the height of the dominants and codominants may be read directly for any height of dominant trees.

In those stands in which a somewhat less precise determination of site index is sufficient, and when time may be saved by measuring only dominant trees, this chart may be used to good advantage. All that is necessary is to read the height of the dominant and codominant trees for the measured height of dominants only and use the resulting height in the site index tables.

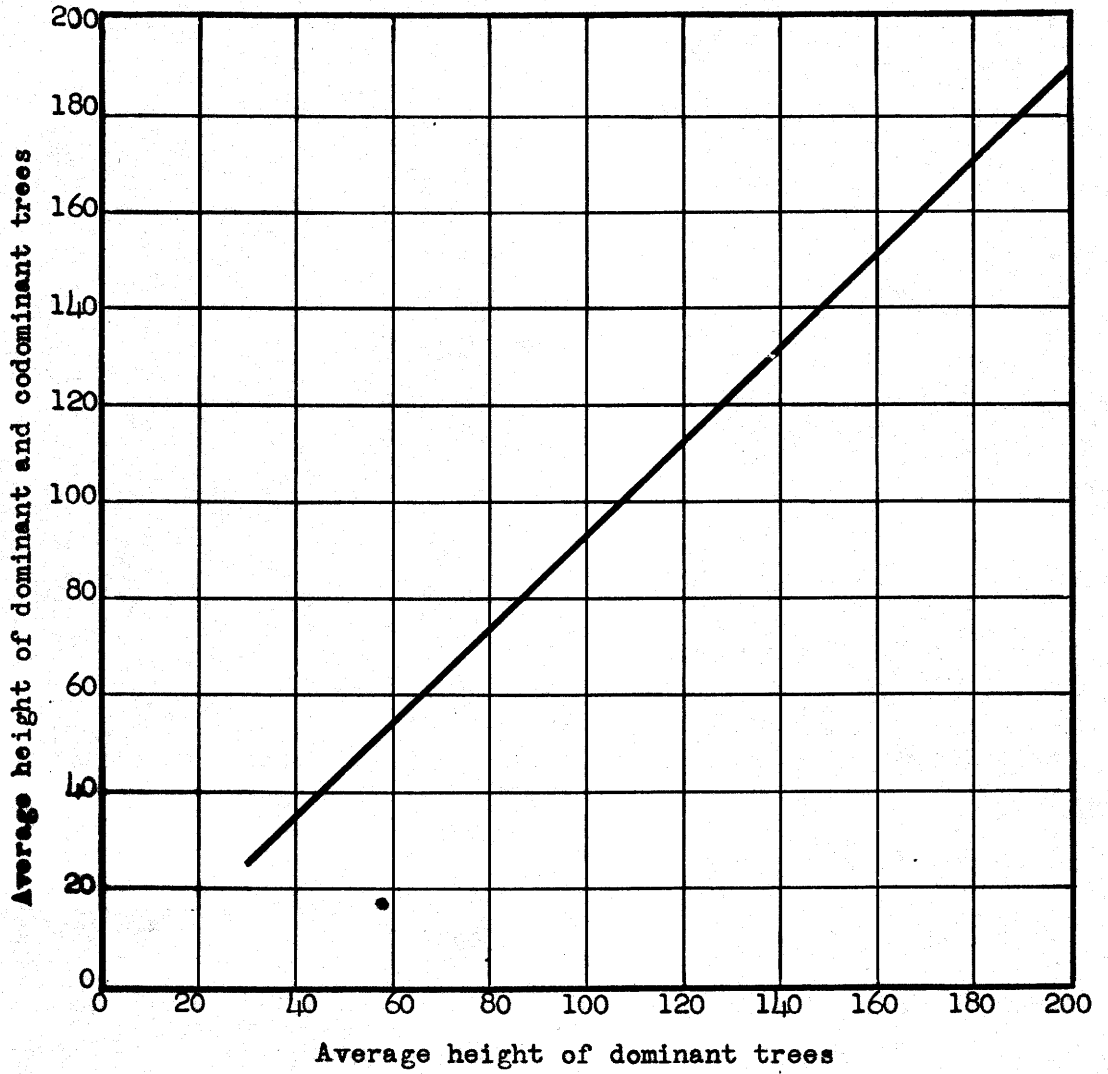


Fig. 1.--Relation of average height of dominant and codominant Douglas-fir trees to average height of dominant trees