

LONG-TERM SILVICULTURAL EXPERIMENT ON METHODS OF CUTTING

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IN OLD-GROWTH forests, untouched by axe or saw, growth in terms of usable wood is offset by losses. By judicious selection of trees for cutting, stands are converted into productive units by removal of slow-growing trees, trees most susceptible to insect attack, and trees in which decay is progressing most rapidly. At the same time, consideration is given to economic factors such as quality of logs and the minimum volume per acre that can be harvested profitably. In working with all-aged trees, the ultimate aim is to manipulate stands by periodic cutting and promotion of growth and restocking so that successive crops of equal or increasing value can be harvested.

In order to test for and demonstrate the best method of cutting in ponderosa pine on the lava plateau of northeastern California, a methods-of-cutting experiment was initiated in 1938. The number of cutting treatments varied from four to six, arranged in randomized blocks. Ten replications were contemplated, one to be established each year. To date, eight of these replications have been established. Each plot, on which a single treatment is applied, is 20 acres in area exclusive of border strips. A block of four plots utilizes approximately 120 acres. Whether four, five, or six plots are established in a replication depends upon the size of area which is uniform in timber stand and subordinate vegetation.

Cutting treatments differ with respect to volume and character of trees removed and length of time between successive cuts. The lightest cut removes only the trees of poor risk, with particular reference to bark-beetle attack, the object being to harvest these trees prior to loss and while still usable for lumber. The minimum volume that can be harvested economically, together with the rate at which trees become "poor risks," determines the frequency of such cuts. At present this light cutting removes 15 per cent of stand volumes, averaging 18,000 board feet per acre, and intervals between cuts vary from 5 to 15 years. The other treatments remove approximately 25 per cent, 60 per cent, 80 per cent, and 100 per cent, with succeeding cuts made in 15, 30, 60, and 140 years, respectively. Also one plot is left without any cutting, so the range of treatments is from no cutting to complete cutting. Four of these treatments appear in each annual replication, with the lightest cut being added if five plots are possible and the clear cut if six plots are possible.

Prior to cutting treatment the number of trees above 11.5 inches in diameter averages 500 per plot. Each tree is mapped, numbered, measured, and described. Appropriate measurements are taken to determine the volume in

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