

Site Preparation on the Chippewa National Forest

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The reforestation program on the Chippewa National Forest has reached the stage where the open areas and easy chances are largely planted and the primary job remaining is the conversion of low-grade hardwoods and poor-site aspen. The Forest has been trying out different methods of site preparation to determine the cheapest and most satisfactory method for various conditions. Furrowing, discing, brush chopping, shearing, and burning have been tried under various conditions. The tour passed along the edge of an area of more than 300 acres that has been cleared by mechanical means but did not make a stop there. The tour did stop at a second area on which more than 100 acres have been cleared by prescribed burning.

Furrowing has been the cheapest and has been satisfactory in brush and small sapling stands. Heavy slash or stump concentrations prevent a good job of furrowing. Furrowing costs have run from \$5.25 to \$22.00 per acre, averaging \$5.50 to \$7.00 per acre.

Discing had been used extensively up to about 1959 when other types of clearing equipment became available. Discing is cheaper than brush chopping or shearing but generally results in heavy sprouting. Heavy stump concentrations prevent a good job. Plantings in disced areas appear to have suffered heavier losses from drought conditions than those in brush-chopped areas. No comparisons are yet available with sheared areas. Discing costs have varied from \$8.45 to \$16.00 per acre.

Brush chopping has been used rather extensively and has given good results where the stand was not too heavy and stumps were not a problem. It has been used primarily on areas covered with brush, saplings, or small poles. It has been most effective in aspen stands on sandy soils. Again heavy stump concentrations prevent a good job. Stands too dense for discing can be brush chopped. Optimum stands for brush chopping are those containing very few trees over 8 inches d.b.h. Brush-chopped areas cannot be machine planted, and they usually require release earlier than sheared or burned areas. Costs have varied from \$22 to \$33 per acre, averaging \$31.

5/ Respectively Timber Management staff officer, Chippewa National Forest, and District Ranger, Cass Lake District, Chippewa National Forest.

Shearing with a Rome K/G blade was started in 1962. Heavier stocked stands can be cleared and larger trees handled than by any other method tried. Trees up to 13 inches present no problem. Red and white oak 18 inches d.b.h. have been sheared in winter, but we feel it is not economical to shear trees over 13 inches d.b.h. Shearing when the ground is frozen is easier and cheaper but results in heavier sprouting. Shearing in light soils in unfrozen ground results in more uprooting than shearing.

Windrows after winter shearing are reasonably compact, contain very little soil, and can be burned easily the following summer. Summer windrowing generally contains too much soil to burn easily. In windrowing, the greater the distance the trees are pushed the more soil there is in the windrows. We feel the optimum distance apart for the windrows is 125 to 150 feet. At this distance the windrows generally occupy from 10 to 15 percent of the area. Windrow area in winter shearing has been as low as 8 percent.

Sheared area can be machine planted, although a small hand crew is generally necessary to fill in beside the windrows.

Shearing costs have varied from \$27.40 to \$38.00 per acre. The increased cost is partially compensated by the lower costs of machine planting.

Prescribed burning has been tried at several seasons. In general, summer fires have proved to be safer and more effective than spring fires. Prescribed burning is used predominantly on cutover areas. In some instances brush on an area has been deadened by chemical sprays before the area has been burned. Burned areas usually can be planted by machine, and release is not required as soon as on brush-chopped areas.

Prescribed burning costs have ranged from \$10 to \$20 per acre with the mode about \$13 to \$15.

Field stops were not made on the Chippewa National Forest to examine areas where mechanical ground preparation methods had been used because similar conditions had been viewed the previous day. The tour did, however, pass by a sizable area on the Cass Lake District on part of which brush chopping had been done during the summer of 1961 and on another part of which shearing had been done in the fall of 1962. These areas were pointed out in passing. Most of them had been planted between the fall of 1961 and the spring of 1963.

A field stop was made at two burns on the Cass Lake District. One, of 63 acres, had been burned in May 1960 at a cost of \$11.23 per acre and planted with red pine transplants shortly thereafter. The area was replanted in the spring of 1961 and again in the fall of 1961 and was released in the summer of 1961 by an aerial spray of 1 pounds per acre of 50-50 mixture of 2,4-D and 2,4,5-T. On an adjoining area of 99 acres, 30 acres had been burned in August 1962 at a cost of \$16 per acre. It was planted in the fall of 1962 with 2-1 red pine.