

Discussion

These studies collectively show that northern red oak can be established on forested Cumberland Plateau sites with conventional, bar-slit planting. Intensive hole-planting methods are not needed and offer no advantages in survival or growth.

May 1962 was the driest May in central Tennessee since 1951. The summer of 1963 was also dry, moisture stress being severe even on the normally favorable north slopes. The excellent initial survival on both sites thus indicates that bare-rooted northern red oak seedlings are fairly hardy. Tubelings or other specialized plant forms, while they may be worthwhile for late planting, do not seem necessary during the normal planting season.

If roots and tops are not trimmed at the nursery, they can be shortened in the field. Root pruning is particularly advantageous with bar planting, to avoid curling the taproot when inserting it in the planting slit. Cutting roots shorter than about 8 inches is unnecessary and, as indicated in one study, may retard first-year growth. The faster initial growth of top-clipped seedlings tends to compensate for height loss incurred by treatment. Their sprouting capability should also help young red oaks recover from moderate injury by animals.

Selective weeding was discontinued when it appeared that planted seedlings would be able to stay ahead of invading brush. But we underestimated the vigor of established hardwoods and shrubs, and many seedlings were soon overtopped or severely crowded. The poorer growth and survival in the cove probably reflect the more intense competition on this rich site. Optimum performance on clearcut areas will require either a more thorough initial treatment than in these studies, or more intensive post-planting cultivation. Moreover, planting of northern red oak will be practical only if growth rates can be increased sufficiently-through genetic improvement or other measures-to offset the high costs of competition control.

"Path Cultivator" Controls Weeds in Nursery Seedbeds

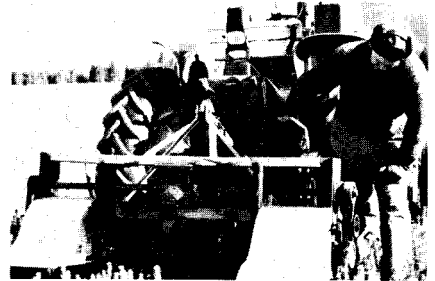
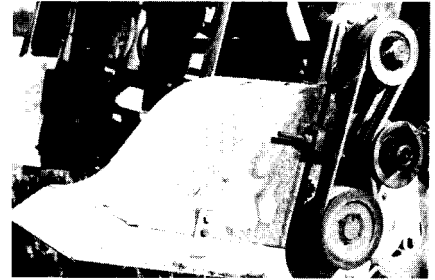
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At the Coeur d'Alene Nursery in Idaho, seedbeds are hand-weeded and various herbicides are used to control weed growth. The paths between seedbeds also are a problem because unless weeded, become a weed source, and unless cultivated, become somewhat compacted, restricting water infiltration during irrigation. Then too, without cultivation, these tend to sod-in or contribute to seedbed erosion. A "cultivator" was constructed by the nursery to help solve most of these problems.

The "path-cultivator" rototills the paths between 40 inch wide seedbeds. The unit has two 13-inch "buckets" with tiller blades mounted inside which run about 2 inches deep into the soil in the paths behind the tractor tires. The two sets of "bucketed" blades are driven by a gear box in the center of the unit directly behind the power takeoff of the tractor. This device chews the weeds up while it loosens and fluffs the soil in the paths for better water absorption. The tractor should be driven slowly for thorough weeding and to allow the driver to avoid damaging seedbeds of each side.

Originally, the driver shafts to each bucket drove the tiller blades by a pair of gear chains. This did not allow for any slippage, or flexibility, in case the tiller blades happened to become clogged up inside the bucket with large rocks. The result might have been a broken blade or two, or chain damage. So the driving mechanism was modified (from



the chain drive on the inner sides of the buckets) to belt drives mounted on the outer sides of the buckets, or unit. These belts allow slippage and the unit can operate more trouble free.

This path-cultivator is frequently used at this nursery, and has eliminated most of the problems stated earlier. Coeur d' Alene has also constructed similar units for use at other nurseries at Wind River, Wash. and Lucky Peak in southern Idaho.