

# A CULTIVATOR FOR FOREST TREE NURSERIES

JAMES LOTT and ROLAND STOLESON 1

A between-row cultivator for tree nurseries has been developed and tested, following an original suggestion from Lee Mason, Unit Nurseryman for the Coeur d' Alene National Forest. The cultivator (fig. 1) mounts on the front toolbar of tractors. Power is supplied by a hydraulic pump that can be driven by a tractor engine or power takeoff.

The various system components are located in figure 2. Power from the hydraulic pump drives a Char-Lynn #AC hydraulic orbit motor. This motor drives a shaft upon which several cultivating sections are mounted. The number and spacing of cultivating sections can be varied with the number of rows in each bed. Cultivators for eight-row and six-row beds have been fabricated.

1 Engineer and forester, respectively, U.S. Department of Agriculture, Forest Service, Equipment Development Center, Missoula, Mont.

Each cultivating section (fig. 3) consists essentially of a sprocket-driven pintle chain to which cultivating teeth are bolted. These teeth can be likened to small rototilling blades and have a mulching effect on the soil.

A flow divider in the hydraulic circuit allows adjustment of cultivator speed. During operation, the teeth should be moving at a slightly greater speed than the tractor. This gives effective cultivation without excessive soil displacement.

Preliminary testing of the cultivator took place at the Coeur d' Alene Nursery. Followup tests with improved models were made at the Wind River and Lucky Peak nurseries.

Problems encountered during the tests included rapid bearing and sprocket wear and buildup of soil, around 1-year-old Engelmann spruce seedlings. The latter problem was thought to have been

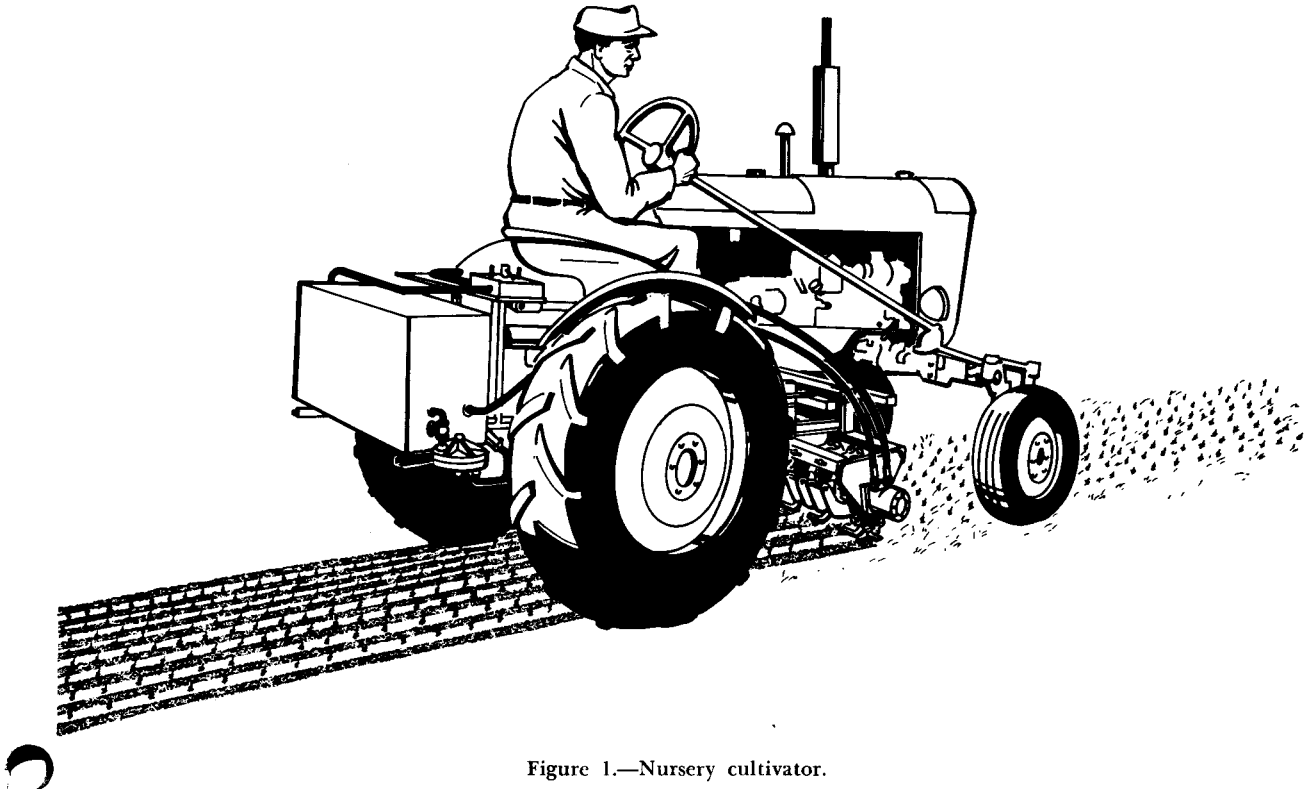


Figure 1.—Nursery cultivator.

caused by raindrops splashing the loosened soil from the cultivated strips onto the small seedlings. Cultivation in these beds was discontinued.

Bearing wear was reduced by using flange-mounted, sealed ball bearings rather than the original bronze bearings. Cast steel sprockets were substituted for cast iron, resulting in some improvement. However, sprocket wear can still be a problem in abrasive soils.

The cultivator teeth have shown good resistance to wear. One set has been used for more than 90 hours.

When possible, the cultivator should be attached to a tractor having sufficient power and proper

gearing to allow driving the hydraulic pump from the power takeoff. This type of pump installation is quite simple and eliminates some of the components necessary to drive the pump directly from the engine. The tractor must be geared low enough so that when moving at 1 mile per hour (normal cultivating speed) the power takeoff will be turning fast enough to drive a hydraulic pump supplying 5 g.p.m. at 500 p.s.i.

Drawings and additional information on the cultivator can be obtained by writing to the Equipment Development Center, Forest Service, U.S. Dept. of Agriculture, P.O. Drawer 6, Missoula, Mont., 59801.

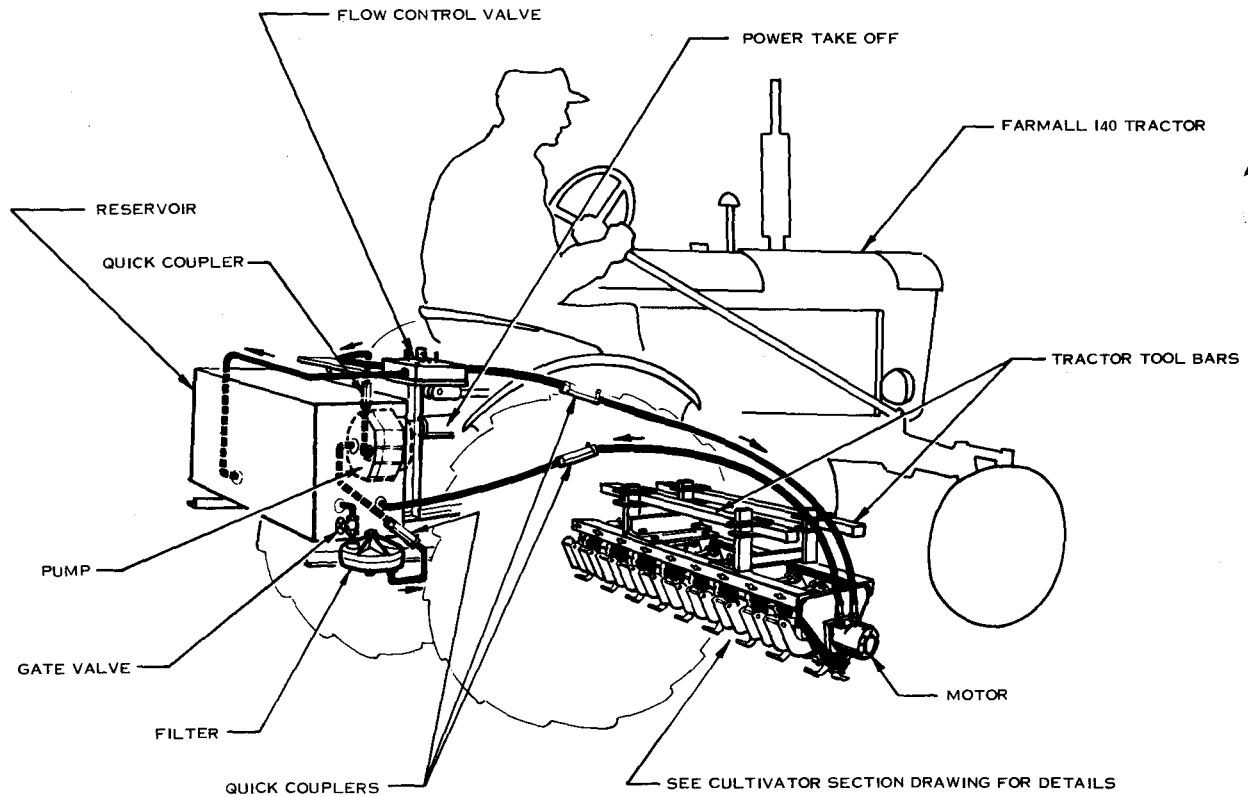


Figure 2.—Nursery cultivator installation.

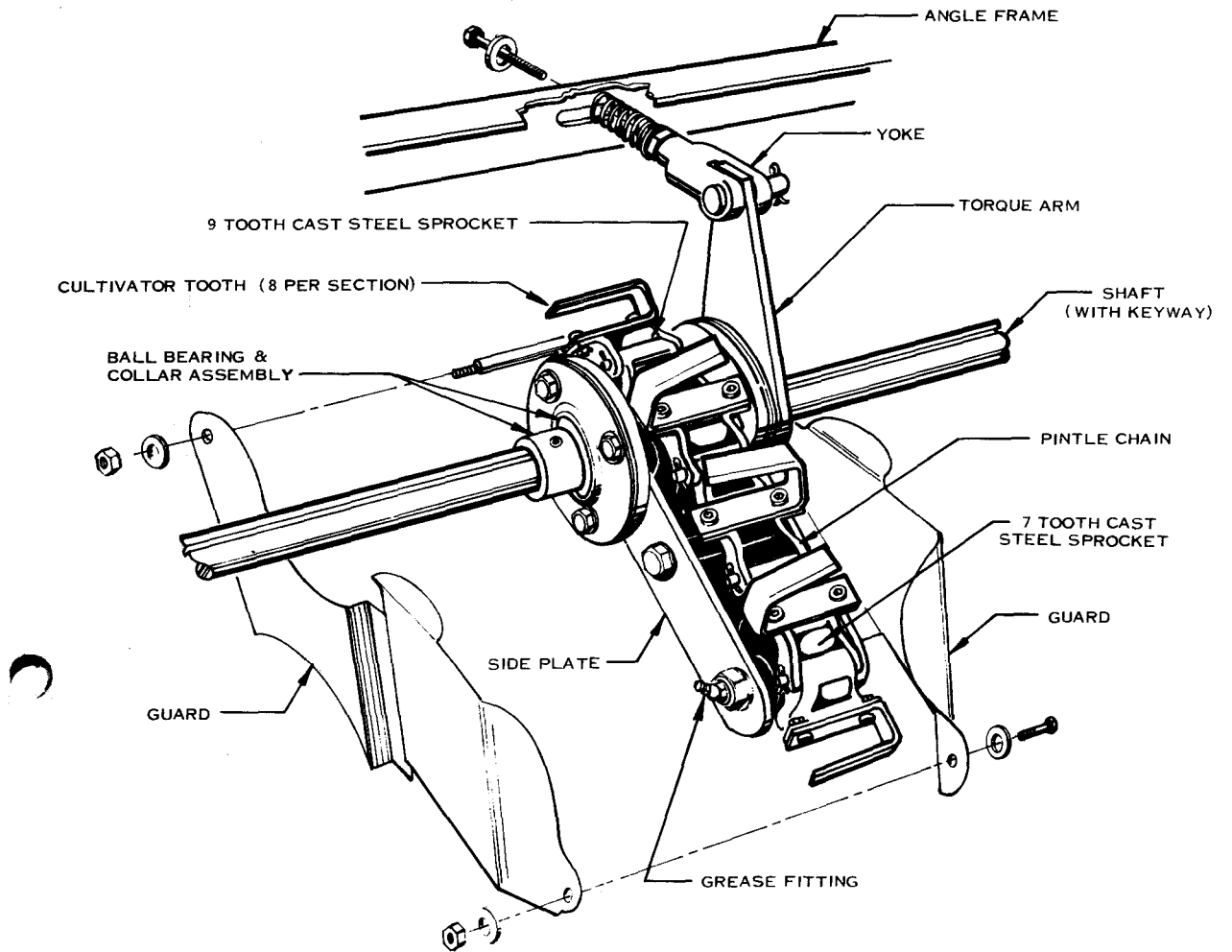


Figure 3.—Cultivator section.



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