

PERFORMANCE OF TREE-PLANTING MACHINES ON PENNYRILE STATE FOREST

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Over one quarter million trees were planted on the Pennyrile State Forest, located near Dawson Springs, Kentucky, during the spring planting season of 1952. Almost all of the area was planted by the use of tree-planting machines. Most of the trees planted were pine but a few tulip poplar and white ash were also planted. The size of stock ranged from 6 to 10 inch tops; the roots were in keeping with the tops. The areas planted were old abandoned fields which had a cover of brooms edge, briars, and brush. The soils were heavy, consisting mostly of clay loam with little topsoil. The topography was level to rolling with no slopes over 30 percent. The size of the planting areas were from 2 acres to 20 acres with the average being 5 acres.

The planting machines used for this work were as follows:

LOWTHER, standard model, trailer type, used with a Farmall M Tractor.

ROOTSPRED, floating type, used with a Ferguson Tractor.

WHITFIELD, floating type, used with a Ford Tractor.

All of the tree-planting machines used had rubber tired packing wheels.

The following specific comparisons of the tree planters apply only to conditions found on areas comparable to the planting sites on the Pennyrile State Forest. The degree of performance used in comparison of the tree planters are: excellent, good, average, fair, and poor.

	LOWTHER	ROOTSPRED	WHITFIELD
STABILITY (while tree planter is in operation)	Excellent	Average	Good ¹

(Continued)	LOWTHER	ROOTSPRED	WHITFIELD
OPERATIONAL (ease on operator while actually planting)	Good ²	Average	Excellent
MANEUVERABILITY (ability to plant in corners & close areas)	Poor	Excellent	Excellent
PROTECTION (protection to operator from brush, etc.)	Excellent	Poor	Good
VERSATILITY (ability of planter to be used on all types of soil & conditions)	Fair	Average	Good
PLANTABILITY (ability to open sufficient slit before planting & close slit after planting)	Good	Fair ³	Good
CONSTRUCTION (general makeup & sturdiness)	Good	Fair	Excellent

1 / Stability can be improved by the use of strap braces from the two lower points of suspension to the tractor. These braces are standard equipment for Ford or Ferguson tractors.

2 / Improved by moving the hub caps completely into the hubs of the packing wheels to give the operator's hand more room between the packing wheels. This is also a safety measure.

3 / Plantability was improved when the rear packing wheels were made as stable as possible. Set screws in hub of packing wheels have a tendency to work loose and the wheels fall off while planting.

The following are general advantages and disadvantages of the three planting machines as applied to Pennyrile State Forest planting conditions:

LOWTHER

Advantages - In :large areas of well-drained soil where the rows are long and there are no sharp turns or small areas to be planted, the Lowther tree-planting machine is the best to use. This machine can be operated with any tractor the size of a standard Ford tractor or larger.

Disadvantages - The Lowther tree-planting machine is hard to turn and takes considerable area to make a 180° turn. Time is consumed on all sharp turns as the tree-planting operator must lift the plow out of the ground by a lever hydraulic system. *The* tree-planting machine will not operate in heavy, wet soils as the so will ball up in the packing wheels.

ROOTSPRED

Advantages - On uneven and steep ground this planter will follow the contour and not bind or slide. It can also plant in small areas and can start planting near any obstacle. On any turn the tractor operator can easily and quickly raise the planting machine out of the ground.

Disadvantages - The articulation of the rear portion of the tree planter makes the planter unsteady for the tree-planting operator while the planter is out of the ground and making a turn. Practically no protection is offered the tree-planting operator by the planting machine as the foot rests on the sides of the machine are made up of single steel bar stirrups, This planter can be used only on equipment that has power lift and 3-point suspension. The adjustments on the packing wheels makes this portion of the planter less sturdy; and if the wheels are not tightened periodically there is wheel wobble.

WHITFIELD

Advantages - On any turn the tractor operator can easily and quickly raise the planting machine out of the ground. Small or large areas can be planted equally as well with this planting machine. It will plant in most type soils and plant fairly well in wet heavy soils. The machine is sturdy and the angle of the back packing wheels facilitates ease of planting and firm packing. This planting machine protects the operator from brush.

Disadvantages - This planter can be used only on equipment that has a power lift and 3-point suspension.

General remarks - This planter was used with one operator. One of the seats was removed and the other was shifted to the back center of the tree planter. If two operators are used on the Whitfield the exhaust pipe on the tractor should be extended away from the operator. On standard Ford or Ferguson tractors this exhaust is practically in the face of one of the operators.

All three planting machines had difficulty in planting large and small stock. The ideal stock to plant is trees with 8 to 12 inch tops and 8 inch roots.