

Modification of a Tree Planter To Include Herbicide Application

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An open-field tree planter was modified to spray herbicide for sod control as trees are planted.

The use of tree planting equipment to apply herbicides at the time of planting was reported in a previous Tree Planters' Notes article by Gilbert (1). Using some of Gilbert's techniques, the Virginia Division of Forestry modified a Reynolds-Lowther TM3 three-point-hitch tree planter for herbicide application. Our objective was to develop an operational method of herbicide application that was self-contained and could be used on a variety of farm tractors.

The weights were removed from the machine and the three-point-hitch arms were extended to clear the pump, which had been attached to the power take off (PTO) of the tractor. Brackets were added to the top of the machine to carry a stainless steel tank. These brackets were carefully engineered because the TM3 is transported on a bomb-carrier-type trailer. (This would not be a problem with other systems of transport.) The tank has baffles to reduce sloshing and the bottom is sloped toward the center outlet.

From the bottom of the stainless steel tank, a hose goes to a centrifugal pump powered by the PTO of the tractor (fig. 1). The discharge hose from the pump goes to an adjustable pressure control regulator and a pressure gauge. A bypass hose runs from the pressure control regulator to the top of the mix tank and extends almost to the bottom of the inside of the tank to provide continuous agitation. The discharge hose goes to a short boom mounted behind the seat of the planter. This boom has a Tee-jet nozzle (size 8004) mounted at each end. The location of the nozzle is adjustable to provide spray coverage over the planted

seedlings or to leave an unsprayed swath depending on the chemical used.

Calibration of the unit is simple. The system was designed to apply 50 gallons of spray-mix per acre. Spray swaths are usually 4 feet wide (fig. 2). The 50-gallon mix actually covers 2.5 planted acres when the planting rows are 10 feet apart. The unit was tested on a Ford 5000 tractor. At 1,500 revolutions per minute in second gear, low range (1.5 mi/h), the sprayer delivers 50 gallons of mix per acre at 30 pounds per square inch. This speed is as fast as the person on the planter can comfortably and properly plant seedlings all day. Further tests showed that the

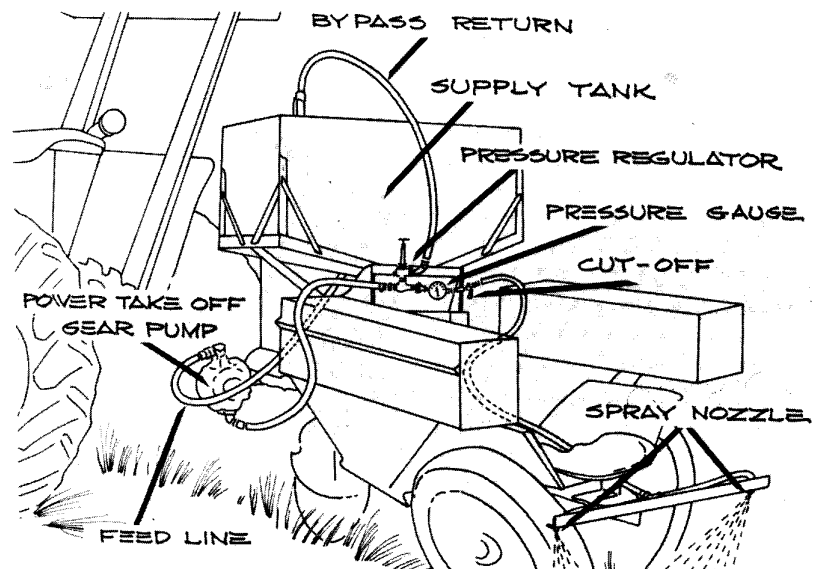


Figure 1.—Schematic diagram of tree planter-herbicide applicator combination.

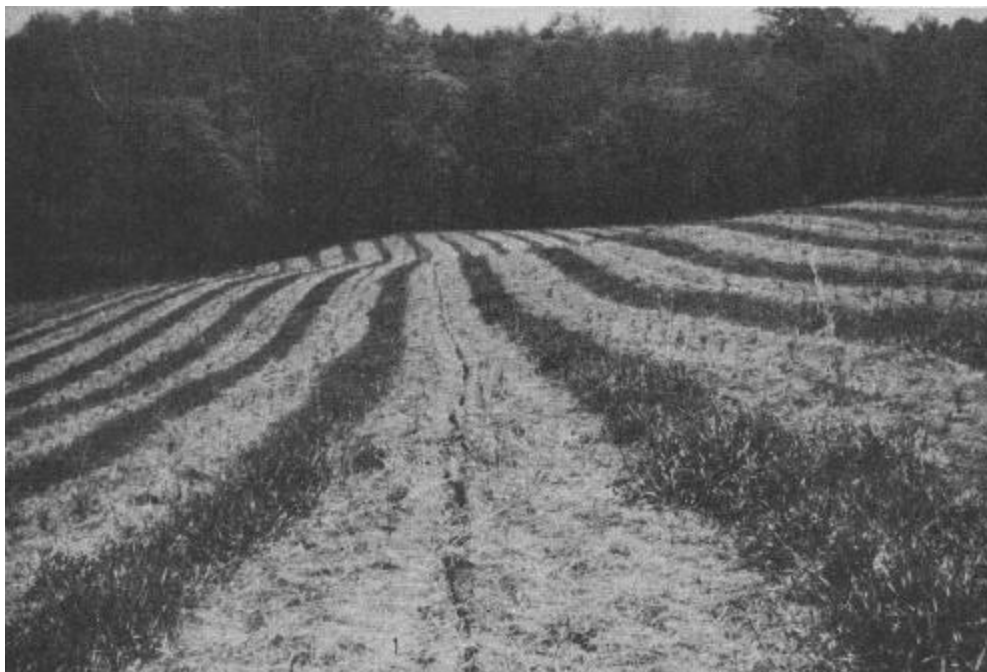


Figure 2.—*Effect of herbicide application showing width of spray swaths.*

relationship between volume applied and engine speed is linear within the normal operating range. If the driver slows the tractor for any reason, the pressure drops proportionally without a significant change in the amount of spray-mix delivered per acre. This amounts to 1 gallon of spray from each nozzle for each 436 feet traveled. Calibration is made by tying a 1-gallon plastic jug to one of the nozzles and adjusting tractor speed to fill the jug in 436 feet at 30 pounds per square inch.

During the tests, operational functions of the machine were observed and modified. By the end of the first season, the machine functioned as planned and maintenance was minor. It is, however, necessary for the machine to be thoroughly flushed and cleaned each day. The weight of the unit is its only disadvantage. It requires a tractor equivalent to a Ford 5000 or larger. Smaller units are unable to lift the machine or pull it properly in heavy land with dense vegetation.

The machine is now fully operational. Five additional planters have been modified for herbicide application, including two smaller Whitfield planters, which allow the use of smaller farm tractors. Information about these equipment modifications can be obtained from:

Virginia Division of Forestry
P.O. Box 3758
Charlottesville, VA 22903.

Literature Cited

1. Gilbert, R. C. A. Sprayer equipped planter applies herbicide at planting time. *Tree Planters' Notes* 23(2):8-10; 1972.