

SELF-PROPELLED WAGON FOR HAND WEEDING IN TREE NURSERIES

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A method for greatly reducing the cost of hand weeding and for speeding up this operation has been developed by the Union Bag-Camp Paper Corporation Tree Nursery at Bellville, Ga. A self-propelled four-wheel wagon, which is manned by two people, is used. During the 1961 season use of this machine brought about the following: 1. reduced labor requirements and costs by 75 percent, 2. complete elimination of the need for temporary weeding labor, 3. the change of an expensive and unpopular job to an easy and routine operation.

The basic unit of the vehicle is a regular four-wheel farm wagon with the platform removed (fig. 1). When the weeding season is over, the wagon can easily be reconverted by removing the propelling unit and replacing the platform. If a suitable wagon is not available, a frame can easily be built and fitted with wheels.

The wagon is powered by a 4-horsepower Briggs and Stratton air-cooled engine. Power is transmitted through a 4:1 reduction gear and a 4-speed truck transmission to a rear end assembly superimposed above the rear wheels of the trailer (fig. 2). Wheels without tires are fitted on the ends of the slightly extended rear end and are adjusted to make tight contact with the rear trailer wheels. Propulsion is accomplished in this manner with little or no loss of power, and is free from the troubles normally associated with chain and sprocket drives. Required bed clearance generally precludes the use of a fixed-axle type drive.

The speed of this machine ranges from .5 to 8 m.p.h. However, virtually any speed range can be obtained by varying combinations of sprockets, transmissions,



Figure 1.--Self-propelled wagon for hand weeding (front view).

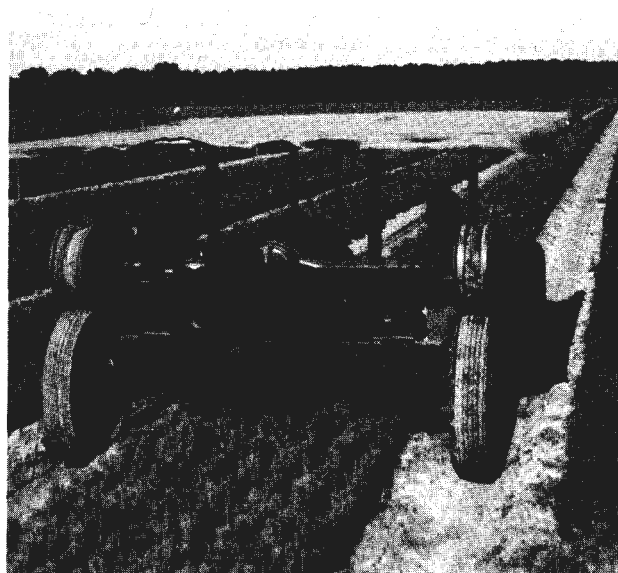


Figure 2.--Wagon with 4-speed truck transmission at rear end assembly.

pulleys, and reduction gears. Also, suitable performance can probably be obtained with a smaller engine, in the neighborhood of 3 horsepower.

During the 1961 weeding season, the Union Bag-Camp machine was operated at an average speed of about 2 m.p.h. and weeding from 1 to 1.5 acres per hour was possible, depending on the number of weeds to be pulled. The entire 31 acres of seedbed was weeded nine times during the season with a total expenditure of 490 man-hours. The only other expense was gasoline, totaling \$15. Therefore, the total hand weeding cost for the 1961 season was less than \$0.03 per thousand seedlings.

In the Union Bag-Camp Nursery, as in most southern tree nurseries, hand weeding is merely a supplement to the application of mineral spirits. An average of approximately 500 gallons per acre is applied during the season, at a cost of about \$102 per acre, including \$85 for mineral spirits and \$17 for labor and equipment. This amounts to \$0.10 to \$0.12 per thousand seedlings produced.

Fortunately, the most prevalent weeds and grasses can be controlled with mineral spirits, but a few resistant species usually persist, which must be hand weeded until a satisfactory preplanting treatment or an improved selective spray is available.

The Union Bag-Camp machine, using the already owned trailer and several secondhand parts, cost approximately \$300. Subsequent machines can possibly be built considerably cheaper, depending on the number of parts to be purchased.

Additional information on this machine can be obtained from the Union Bag-Camp Tree Nursery, Bellville, Ga.