

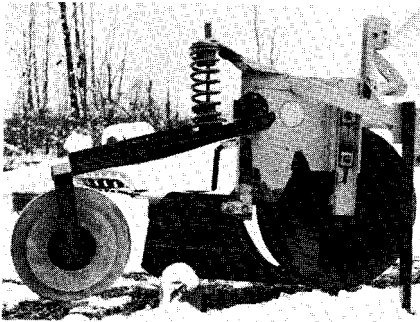
Wildland Tree Planter Does King-Size Job

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A mechanical tree planter which will plant stock of various sizes under the most adverse conditions is illustrated and described in this article. This planter was designed, built, and improved over a 25-year period by the author. Note how the design of each component of the machine contributes to the success of the complete operation.

Figure 1.—Side view of planter resting on stand and trencher resting on a cement block covered with snow.



Our Wildland tree planting machine consists basically of four parts: (1) A rolling coultter, (2) a trencher, (3) an operator's seat, and (4) a packing wheel.

These parts are attached to a sturdy frame equipped with a three-point hitch for use on a conventional tractor with hydraulic lift.

The rolling coultter used is 33 inches in diameter, large enough to cut to a depth of 13 or 14 inches or about an inch below the maximum depth of the trencher. It is positioned in such a way that it runs alongside and directly adjacent the point of the trencher (fig. 1). This feature has the advantage of permitting the planter to roll up and over large obstacles like boulders, rocks, stumps, and large roots which the coultter cannot cut through. It also, in most cases, prevents small roots from being picked up by the trencher. The coultter is bolted to a hub mounted on an axle with roller bearings such as those used in wheel assemblies of late model cars. The axle is welded to a heavy channel iron bolted to the frame in such a way that the coultter is adjustable (fig. 1) to permit lowering it to compensate for decrease in its diameter from wear.

The design of the trencher is the primary reason for the proven success of the machine. Its purpose is to make an opening in the soil sufficiently wide and deep to receive the roots of the tree

being planted so they are well distributed without being twisted, bent, or crowded into a single plane. For satisfactory operation, the trencher should be at least 12 inches deep with an inside width of 1.5 inches and an outside width of 2 1/8 inches (fig. 2).

The trencher used on this planter is essentially a conventional moldboard plow cut down to 2 1/8 inch width, with the moldboard cut away and replaced by a metal side parallel with the landside (fig. 1).

The point of the trencher is directly alongside the coultter, almost but not quite touching it, causing the landside of the trencher to follow the cut made by the coultter (fig. 3), and leaving the soil along this side of the trench practically undisturbed. This maintenance of the soil structure is important to the survival of trees being planted because capillarity of water through the pores in the intact soil prevents drying out of the soil and keeps water moving toward the trench.

The front of the trencher is shaped so that it lifts all of the soil from the trench upward and to the right side where it remains until the trencher has passed. Then it is deposited back into the trench from above, falling downward among the roots of the tree being planted, carrying the roots downward while maintaining good distribution of the branch rootlets. The very gradual downward pitch on the front of the trencher (fig. 1) achieves three important

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Figure 2.—Rear view of planter showing width of trencher; also the position, size, and shape of the packer wheel.

functions: 1) It provides downward draft on the trencher so that it penetrates all of soil from the lightest sand to the heaviest clay; 2) it reduces friction with the soil to a minimum, permitting this planter to be pulled by a light twoplow tractor (about 30 H.P.) without chains. (The parallel sides of the trencher also contribute to reduced friction with the soil and resultant light draft); 3) having a very gradual pitch on the front of the trencher creates a considerable opening between the upper front of the trencher and the coulter (fig. 1), thus permitting easy cleanout of the roots or trash that may occasionally become lodged on the front of the shoe or trencher.

The third component of the planter is the seat for the operator. This is located at the left and about even with the upper part of the trencher, clearing the ground level by only a very few inches when the planter is in operation. The seat is fastened to a metal bar made of spring steel (fig. 4) which swings so that the operator can adjust his distance from the trencher to his convenience. In front of the seat is a metal platform with a shield ahead of it to protect the operator from brush and dust that might come at him from below (fig. 4). The operator faces forward and on his lap or outstretched legs holds a supply of planting stock with roots pointed forward and a plastic sheet folded around them to prevent drying out.

The operator takes from this supply desired distance from the stem of the periodically 10-12 seedlings, with his left seedling being planted. Furthermore, it is in his hand, separating one at a time from the firmly supported by axle and roller rest. A separated plant is held in bearing assembly from cars, the same as readiness between the thumb and used to support the coulter and also the forefinger to be grasped easily and packer wheel proper. The axle holding the quickly by the right hand and then placed packer wheel arm is bolted to the frame of the in the "boot", or open portion, in the back planter with four bolts so that the position of the end of the trencher.



Figure 3.—Front view of planter showing a alignment of coulter, trencher, and packer wheel. (Note shield in front of operator seat for protection against debris.)

There it is held with the collar of the plant at soil level (fig. 2) until the soil flows around it holding it in place while the packer wheel comes alongside, about 1 inch from the stem of the plant, securing it in place.

The packing device on this machine is a wheel, preferably 3 inches wide and about 23 inches in diameter, with another wheel or portion of the same wheel of smaller diameter (about 18 inches diameter and 3 inches wide) alongside (fig. 2) to act as a sort of depth gauge to prevent the packer wheel proper from burying itself too deeply in soft sandy or muddy soil. This packer wheel is weighted with concrete so that it weighs 120 pounds, and the arm which supports it and allows it to oscillate up and down is spring loaded (fig. 4) to provide an additional 200 pounds of pressure. This support arm has sufficient rigidity to hold the wheel positively the

Use of the single packer wheel with a 3-

inch width is critical to adequate firming of the soil around the planted tree because the packing process must be limited to the area where the soil has been loosened. Wider wheels tried for this purpose resulted in inadequate packing of the soil and had to be discarded.

To space the trees properly, we used a device made by fastening a bicycle bell at the end of a rubber hose in which a metal pin is inserted and retained by a rubber stopper placed in the other end (fig. 4). This device is fastened to a wheel of suitable circumference which may be the packer wheel if it happens to be the desirable dimension. At each revolution of the wheel, the bell sounds, telling the operator when to plant.

A planter employing the features described above is being manufactured by The Mechanical Transplanter Company of Holland, Mich.

Figure 4.—View from left and rear showing the attachment of the seat to the metal shield under the operator. Also shown is the timing device fastened to the packer wheel.

