

THE HANSON-LOWTHER TREE PLANTER

Daniel L. Ricker
Chippewa National Forest, U. S. Forest Service
Cass Lake, Minn.

To date managers of forest lands have concentrated their efforts in putting into production old fields and similar easy planting areas. In many parts of the country the more difficult areas remain to be reforested or converted to more desirable species. For the most part attempts to plant these more difficult areas by common planting machine have not proved to be successful.

There is now available and in use a tree planting machine that, combined with the use of herbicides where necessary, has planted some of these more difficult areas in the Lake States (fig. 1). Examples of some of the more difficult areas that have been successfully planted are (1) dense stands of hazel and alder brush, (2) hillsides planted on the contour, (3) poor and medium stocked sapling and pole stands, (4) harvest cut areas with light to medium slash cover.

These areas have been planted without prior site preparation. Former methods used to plant similar areas required mechanical site preparation and hand planting. The use of this planting machine has resulted in the reduction of former planting costs from one-third to one-half while stocking per acre and tree survival have stayed within required limits.

The ability of this machine to operate in such conditions is primarily due to the planting trencher system invented by John C. Hanson of the U.S. Forest Service. Hanson's invention was patented and given to the Government in 1957 while he was stationed on the Upper Michigan National Forest. The Hanson trencher is so constructed that soil from the leading edge of the trencher flows up and around the trencher on one side with a straight wall of undisturbed soil on the off side (fig. 2). With this type of trencher the compaction of the soil back around the tree needs only to be done on the side of soil flow. This permits the use of one packing wheel. Such a simple thing does not appear to be revolutionary but nevertheless is the basis for this planting machine to perform in these more difficult areas.

In 1959, personnel of the Chippewa National Forest adapted the Hanson system to a Lowther Wild Land Tree Planter and after the initial success with this machine have cooperated with the Harry Lowther Co. to produce further improvements in this planting machine unit. The components of this planting machine system are as follows:

1. Hydraulic, tractor-mounted, 60-inch wide V blade (fig. 3). The purpose of the V blade is not to expose mineral soil but to remove from in front of the planting machine slash, fallen trees, loose rock, brush, and small standing trees. Material picked up by the blade flows out to the ends of the blade and is placed in a position parallel with the movement of the tractor. Much of the debris is trampled by the tracks of the tractor. The minimum size crawler tractor that can be used with this unit is the TD-6 or D-2 type.



Figure 1.--The Hanson-Lowther Planter.

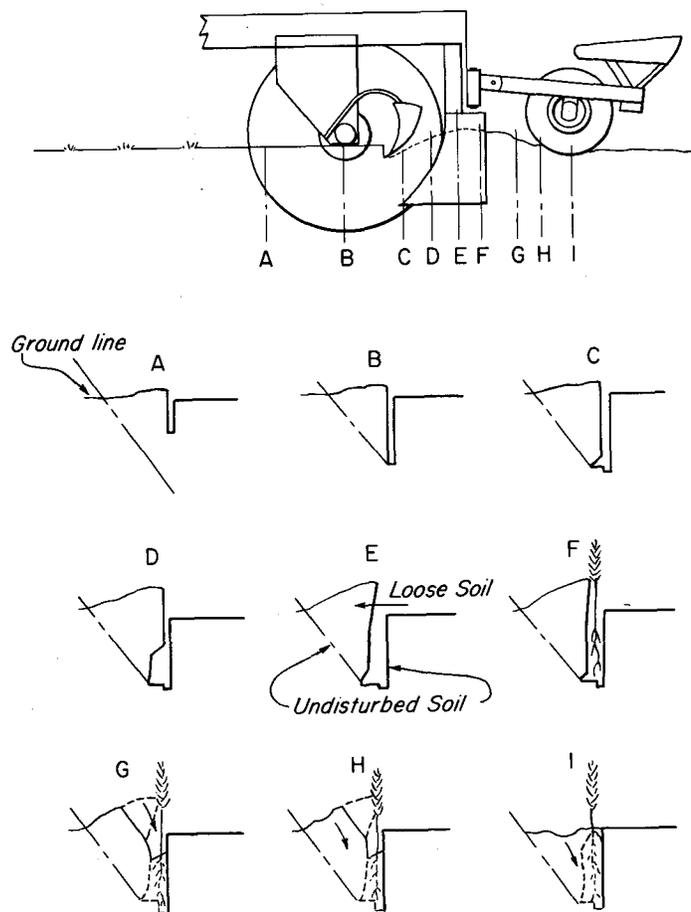


Figure 2.--Essential features and operation of the Hanson trencher looking at the planter from the rear. The soil to the right of the shoe is undisturbed and the soil to the left is loosened as the planter moves forward. At point F the tree is inserted. Drawings G and H show the loosened soil falling around the tree roots. At point I the packing wheel provides maximum soil compaction.

2. Hydraulic ram to lift the planting machine out of the ground. This piece of equipment not only aids transporting the planting machine from area to area but is most important in limiting to the minimum time lost due to tractor and planting machine hangups.

3. Adjustable, heavy-duty sod scalpers. These scalpers not only remove plant competition from around the newly planted tree but the removal of the surface root mass allows free upward soil flow around the trencher and improved compaction by the packing wheel.

4. Rolling coulter and Hanson trencher (fig. 4). The outer few inches of the rolling coulter overlap and are against the vertical side of the trencher. This method of construction prevents roots, sod, branches, and other debris from building up on the leading edge of the trencher. A buildup of such debris not only causes the trencher to rise out of the ground but also interferes with the flow of soil around the side of the trencher.

5. Heavy-duty machine frame and protective cage for the tree planter. This assembly lessens the chance of breakdowns in the field and provides protection to the person planting the trees. The weight of this assembly also insures that the trencher will be working at the proper planting depth unless an obstruction forces the machine out of the ground.

6. Single rubber-tired packing wheel assembly with torsion sprung tree planter seat. The packing wheel assembly is so constructed that it follows the ground

contour. The assembly can move left or right and thus remains in proper position to pack the trees during changes in the direction of travel. The torsion sprung seat is for the comfort and safety of the tree planter.

What do these features add up to? They add up to produce a tree planting machine that will plant the type of areas listed in the first part of this article. Due to the features described, this machine has the ability to plant through areas that would stop other planters and when faced with a tree that is too large to knock down, or a similar obstruction, to go around the tree and continue to plant trees while doing so. Repeated tests have shown that trees planted on a tight turn as well as on a straight of way have not been planted with "L" roots even though the planting stock may have roots 9 to 91 inches long. The packing wheel does not ride across the planted trees on turns but continually remains in the proper position to pack.

Unpacked trees are very rare even in these most difficult planting chances. One would perhaps assume that contour planting would require frequent adjustments of the

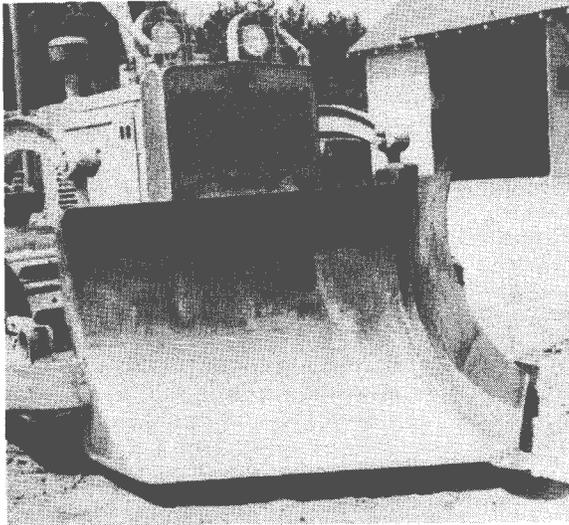


Figure 3.--V blade floats on ground to remove debris from in front of the planting machine.

packing wheel assembly and the sod scalpers. Experience in planting glacial moraines showed that adjustments were not necessary regardless of the direction traveled.

One of the basic premises from which Hanson worked in building his machines was that the tree planter must be placed in the

machine so that the knuckles of the hand planting the tree could touch the soil and still have the operator in a comfortable position. This objective has been carried over to the Hanson-Lowther machine. Trees to be planted are held just at the point above where they are to be planted at ground line. The roots are flipped into the trencher. The tree is then held with the knuckles of the planting hand lightly resting on the surface of the ground until the packing wheel has done its work.

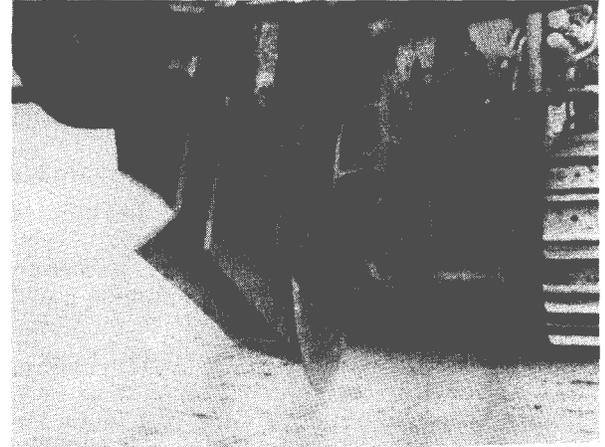


Figure 4.--Coulter-trencher assembly.