THE OTTAWA DEBRIS PLOW AND SCALPER

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Because most of the remaining planting sites on the Ottawa National Forest were brushy, full of half rotted virgin pine stumps, and littered with partly decayed fallen trees and logs, a debris plow was needed in front of the planting machine. At first a light hydraulic-operated bulldozer blade was attached to the International TD-9 tractor that pulled the Lowther tree planting machine. This performed fairly well but had some serious faults such as keeping the operator too busy raising and lowering the blade. A V-shaped front-end plow that floated on shoes was mounted with hydraulic cylinders on the TD-9 tractor. A scalped area for the trees was considered necessary. The Lowther scalpers were not satisfactory in the heavy clay soil because they plugged with clay, roots, and sod. However, it was decided to put a scalper on the new debris blade. About this time it was noticed that the trencher part of the planter did not readily sink deep enough into the heavy clay soil to insure proper planting depth. To remedy this situation a device in the form of a breaker knife was added to the scalper point.

After about three planting seasons of experimenting and rebuilding in the field the present debris plow was developed (figs. 1 and 2). It works exceedingly well and performs the following tasks:

1. Pushes aside all down logs, brush, and trees and clears a strip of ground

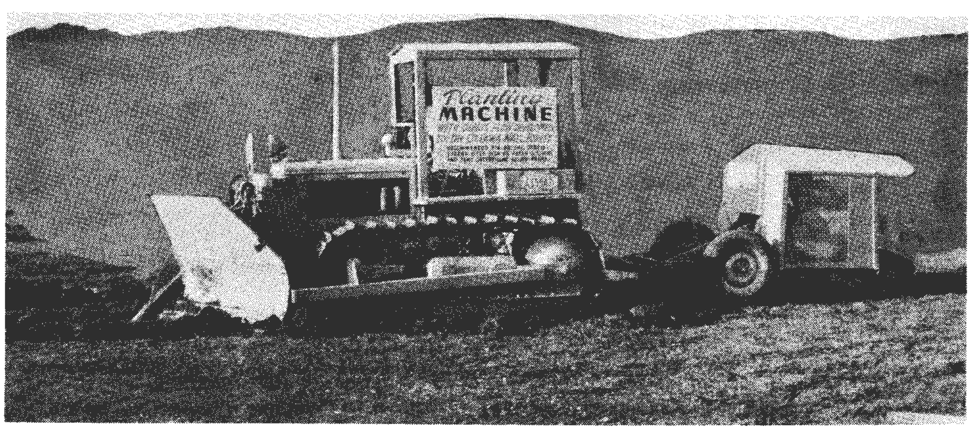

Figure 1. Debris plow and scalper ready for use in front of a planting machine.

about 6 feet wide

2. Knocks down all standing small trees to about a 4-inch diameter and all partly rotted pine stumps. Debris plow construction is such that trees do not fall back on the tractor but are pitched forward.

3. Uproots and pushes aside boulders up to 1 1/2 feet in diameter.

4. Makes a continuous scalp 20 inches wide and 3 inches deep.

5. Blade floats on ground so operator does not touch hydraulic control except for turning at end of furrow and for loading machine on trailer.

6. Beak on point of blade tears out roots and rocks and loosens soil so planting machine trencher sinks to proper depth.

7. Debris pushed out 3 feet on each side helps the operator maintain a 6 foot spacing of the furrows.

The main V part of the plow is made from the moldboard of a grader with the grader blade attached. Each half is 4 1/2 feet long and both pieces are welded together to form a V slightly blunter than a 45° angle. Its height is about 1 1/2 feet. Next two pieces of 1/4 inch plates each measuring 33 inches on top, 4 1/2 feet on the bottom and 28 inches wide are welded to the top of the moldboard slanting forward. This keeps trees from falling back into the tractor. On the bottom of the moldboard and blade, a shoe made of 1/4-inch plate 8 inches wide is welded so as to run the entire length of the V, in other words, 1 1/2 feet on each side. This prevents the blade from cutting into the soil and lets it float on top of the ground. On the point of the plow 2. scalping blades, of grader blade steel about 8 by 12 inches, are welded so that they cut 4 inches below the shoe. They cut out a strip of sod 20 inches wide and 3 inches deep. A spike or knife, also made of grader blades, is welded at the very point in such a manner that it will cut 4 inches deeper than the scalper blade, 8 inches below the shoe. This digs a slot, rock and root free so the planting machine trencher will sink deep enough to get proper tree planting depth.

The arms to lift the blade are made of 4-inch construction channel steel boxed with 3/16-inch sheet metal. The arms are raised by means of 2 hydraulic cylinders 3 by 16 inches mounted vertically to the front frame of the tractor. Two 3-inch top-guarded sheaves or pulleys are attached by pins to the top of the ram. These pulleys act on two 3/8-inch cables each 5 feet long. One end of the cable is attached to the plow and the other end is fastened to the mounting plate of the cylinder. When the cable is slack the plow blade will float on the shoe and follow the land contours without the hydraulic control being touched.

Total cost of materials used, including 2 cylinders, pump, cable, hose control valve and steel, is estimated at $180. About 80 hours of mechanic's labor is involved.

Most of the mechanical ideas and details were developed jointly by Oscar Stabo, Ranger, Bergland District, and Theodore L. England, Shop Superintendent and Supervising Mechanic, both of the Ottawa National Forest.

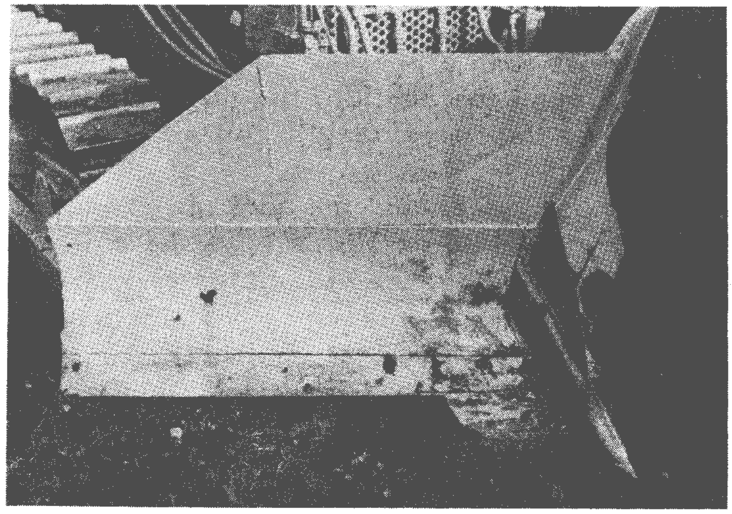

Figure 2. Debris plow with tree-throwing plates at top, shoe, scalping blades, and front spike.

LOWTHER TREE PLANTER MODIFIED FOR SILT AND CLAY SOILS

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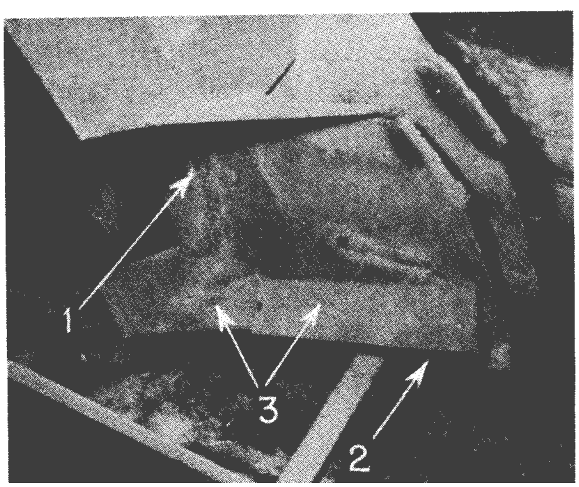
The Lowther tree planting machine plants trees well in light sandy soils. In heavy soils, such as silts and clays, the wedge-shaped trencher of the Lowther compresses the soil laterally with a greater force than the packing wheels can exert to replace the soil around the roots of the planted tree. This results in an open slit with the roots of the trees dangling in a pocket of soil air.

Modification of the existing trencher and the addition of sideplates (fig. 1) relieves the lateral compressing action and allows the soil to be well packed around the tree roots. The action of the sideplates is to lift and fold the soil upward and outward; after the tree is placed in position and the trencher passes, the soil folds back into its original position. The packing wheels can exert enough pressure on this folded soil to assure good root-soil contact and the exclusion of drying air.

Sideplates on tree planting trenchers are not new, but we believe this modification will assure better results from the Lowther tree planter.



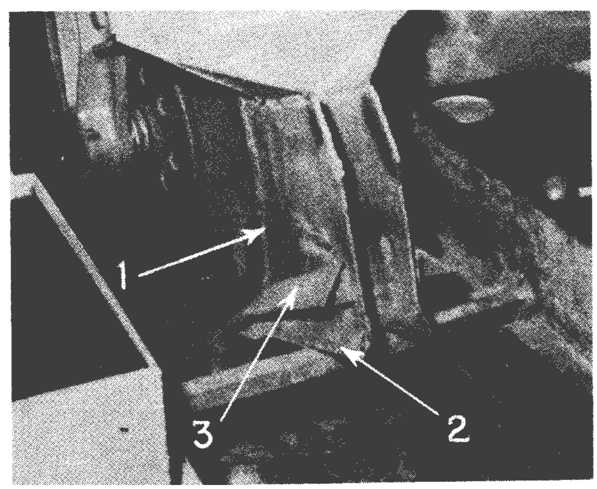


Figure 1. Trencher modification: (1) A Vee of metal added to make leading edge knife shaped and reduce wedging action; (2) flared bottom of original trencher cut to eliminate flare and hence the wedging action; (3) sideplates added, left part is -gelded permanently, rear part is bolted and adjustable.

SIMPLE TOOL FOR PLANTING ACORNS

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A handy, inexpensive tool for planting acorns has been developed at the Delta Research Center of the Southern Forest Experiment Station and used successfully in experimental plantings. One of its merits is that it ensures a planting hole of exactly the desired depth.

Several types of footings can be attached to the same basic handle (fig. 1). When more than one acorn is to be planted per spot, the appropriate number of rods are welded or screwed into position. The 3- by 5-inch foot plate may be detached from the handle and replaced by other plates that carry rods sized for different species. For example, a single 1- by 2-inch rod serves for Nuttall or overcup oak acorns; 1/2- by 1-inch multiple rods are appropriate for cherrybark or willow oak.

After the litter is scuffed away to expose mineral soil, the tool is pressed into the ground by foot, and the acorns dropped into the holes and covered by kicking in the side of the opening.

Under certain moisture conditions, heavy clays may stick to the rods. Then, however, planting by any technique is difficult.

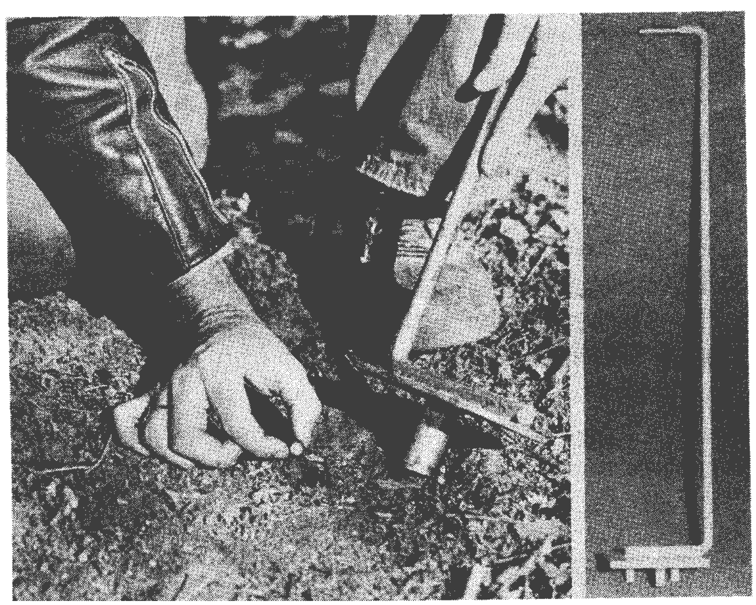

Figure 1. Tool for planting acorns; right, with multiple rods.

LONGLEAF CONE PRODUCTION. DOUBLED BY RINGING

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Ringing or partial girdling has more than doubled cone and seed production on some second-growth longleaf trees near Alexandria, La. Since this treatment is easy to apply, it may be useful in the management of seed-producing areas or as an aid in securing natural regeneration on areas lacking adequate seed trees.

The study, started in the summer of 1952, was made with open-grown trees ranging from 6 to 12 inches d.b.h, and grouped into 2-inch diameter classes. Ringing was done by cutting two half circles through the cambium on opposite sides of the bole slightly above stump height (fig. 1). The half circles were spaced about 4 inches apart and overlapped 1 inch on each end. Incisions were 1 inch wide and were made quickly with a bark hack of a kind used in turpentining. Once the men became accustomed to the hack, the ringing progressed very fast.

Three years after treatment, the larger ringed trees produced significantly more cones than unringed trees of comparable size. In the 12-inch d.b.h. class, ringed trees averaged 120 cones and unringed trees 51. Similarly, 10-inch ringed trees averaged 77 cones, and unringed trees 37. Ringing was ineffective ox trees smaller than 10 inches, probably because they were too small to bear cones abundantly.

Seed tests showed that ringing had no effect on the number of sound seeds per cone or the germinability of the seed. Therefore, seed yields as well as cone yields were stimulated by the ringing.

The fresh incisions on some of the trees attracted black turpentine beetles. The infestations subsided quickly without treatment, and no mortality occurred. However, spraying the bole around the rings with benzene hexachloride may be a wise precaution.

About 1-1/2 years after treatment, the rings started to callus over. This new tissue was easily removed with a chisel, and no further callusing has been noted.

Strangulation, by placing a tight metal band around the tree trunk at stump height or at 16 feet, had no effect on cone yields. Similarly, there was no response to a 0. 2-percent concentration of 2, 4-D placed in small incisions around the base of the bole.

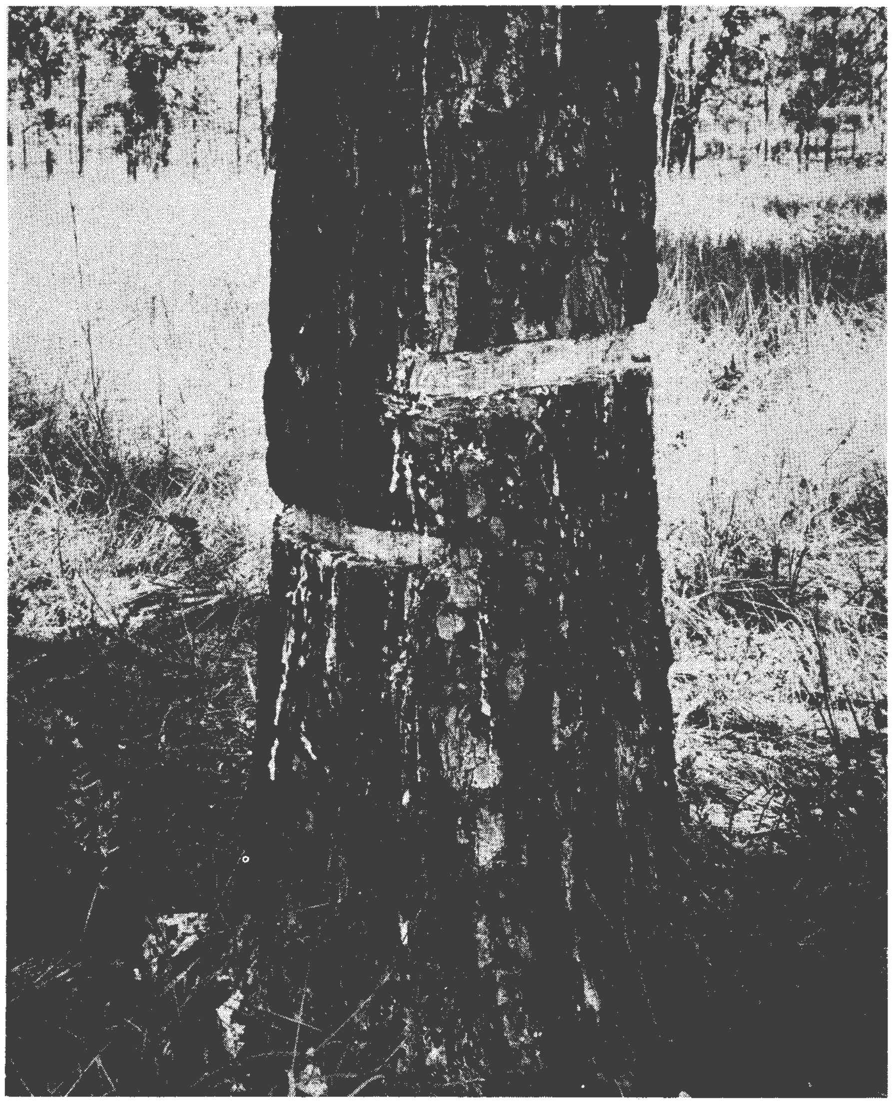

Figure 1. Ringing was done by cutting two half circles through the cambium. The half circles were about 4 inches apart and overlapped an inch on each end. (Photo by Louisiana Forestry Commission).

NEW BIRD REPELLENTS FOR LONGLEAF SEED 1/

Brooke Meanley, W. F. Mann, Jr., and H. J. Derr 2/

Morkit, used extensively in central Louisiana last fall as a bird repellent in direct-seeding of longleaf pine, has been withdrawn from the U. S. market. Several other chemicals are promising substitutes, though not yet fully proven.

In recent tests at Alexandria, good results were secured from Arasan Seed Disinfectant and Protectant (50% tetramethyl thiuram disulphide), produced by DuPont. Other Arasan compounds have not been tested as yet, and may be either ineffective or harmful to the seeds.

On a light rough in November 1955, longleaf seedling yields per acre averaged 5, 580, 5, 360, 2, 250, and 306 for Arasan, crude anthraquinone, Morkit, and untreated seed, respectively. Unfortunately, until licensing negotiations have been completed, crude anthraquinone cannot be sold as a bird repellent. On a fresh burn in December 1955, Arasan produced 6, 500 seedlings, Morkit 5, 700, and untreated seed only 33. In a spring test on a light rough, Arasan gave 7, 000 seedlings per acre, as against 2, 500 for Morkit and 140 for no treatment. Observations in all tests indicated that Arasan has rodent-repellent qualities. Although 50% Arasan is an effective repellent, it has some minor disadvantages. It is slightly irritating to the eyes, nose, and throat. Seed should be sown as soon as possible after being coated, as viability may be impaired by storage.

Recommended rate of application is 1 pound of 50% Arasan to 6 pounds of seed.

1/ Reprinted from Southern Forestry Notes 105, September 1956.

2/ Brooke Meanley, U. S. Fish & Wildlife Service, Alexandria, La.;
W. F. Mann, Jr., and H. J. Derr, Alexandria Research Center, Southern Forest Experiment Station, U. S. F. S. , Alexandria, La.

SURVIVAL AND EARLY GROWTH OF AN EASTERN COTTONWOOD PLANTATION ON THE PIEDMONT

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This note records initial survival and height growth of an eastern cottonwood (*Populus deltoides* Bartr.) plantation in a river bottom of the Georgia Piedmont. There have been few, if any, eastern cottonwood plantations in the southeastern states until the past several years and no known plantings in the lower Piedmont. This lack of interest has prevailed even though the species grows well naturally, individual trees attaining as much as an inch of diameter growth per year.

A 1/2-acre area in an overflow bottom along the Oconee River near Greensboro, Georgia, was disc-harrowed in the fall of 1955. Unrooted cuttings obtained from the Delta Research Center, Southern Forest Experiment Station, U. S. F. S. , were planted in January 1956, with approximately 14 inches of cutting underground and 6 inches above the soil. Spacing was 9 x 9 feet. Two cultivations were made during the 1956 growing season.

The planting area was flooded for three days after planting and again flooded for a slightly shorter period in late April after leafing had occurred. Rainfall was 4 inches below normal for the growing season.

Out of the 252 cuttings planted, over 88 percent rooted and survived the first growing season. Average height growth was 7 feet, and over 10 percent of the surviving cuttings grew 9 feet or more in height. Maximum height growth was 10.8 feet and several cuttings reached close to an inch in diameter at breast height. Well developed branches were present on many stems.

Additional plantings are planned for the next several growing seasons to determine whether this high survival rate and good height growth is the general rule.

A METHOD FOR ASPEN AND COTTONWOOD SEED EXTRACTION

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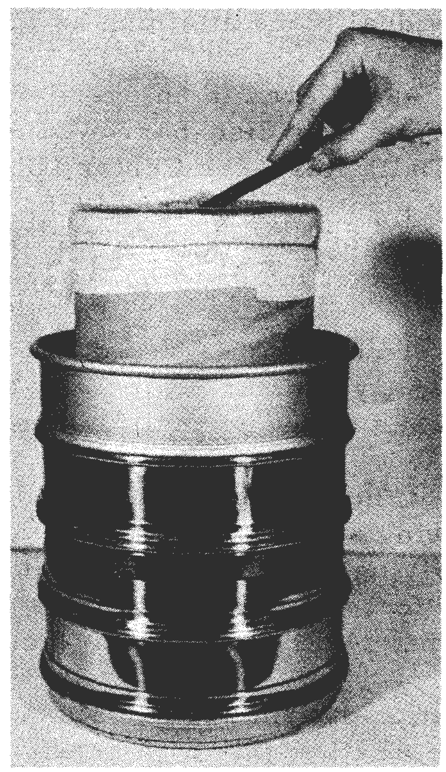
Increased importance of aspen in the Lake States and cottonwood on bottomland areas in the Midwest and the South has resulted in the need for producing these species of Populus from seed. One of the problems involved in seedling production is the extraction of the seed from cotton. The simple method described produces extremely clean seed with little seed injury and a high percent seed recovery.

The materials needed consist of a 4- to 6 inch section of 6-inch diameter paperboard tubing, a small circle of plastic window screen fastened over the top of the tube and a small piece of polyethylene sheeting in which a 1-inch slit has been cut as illustrated. The paperboard tube with the window screen on top and catkins inside is placed on a series of standard sieves. The sizes used in extracting aspen seed are from top to bottom, 20-mesh, 20-mesh, 40-mesh and 60-mesh. Next, the sheet of polyethylene is placed over the window screen to prevent the seed from flying out. A 30-pound compressed air line is directed at high velocity through the slit in the polyethylene and into the paperboard tube. After a few minutes of rapid tumbling the extraction is complete and the seeds are collected on the 40- and 60-mesh screens. Cottonwood seed being larger requires larger mesh screens.



If very clean seeds are desired or the catkins to be extracted are not open fully, the cotton should be removed from the catkins and only the cotton with the attached seed should be placed in the extractor. If, however, there are large numb ors of fully opened catkins or the seed doesn't need to be especially clean, the catkins can be placed directly into the extractor.

1 / Research Assistant and Technical Assistant, respectively.