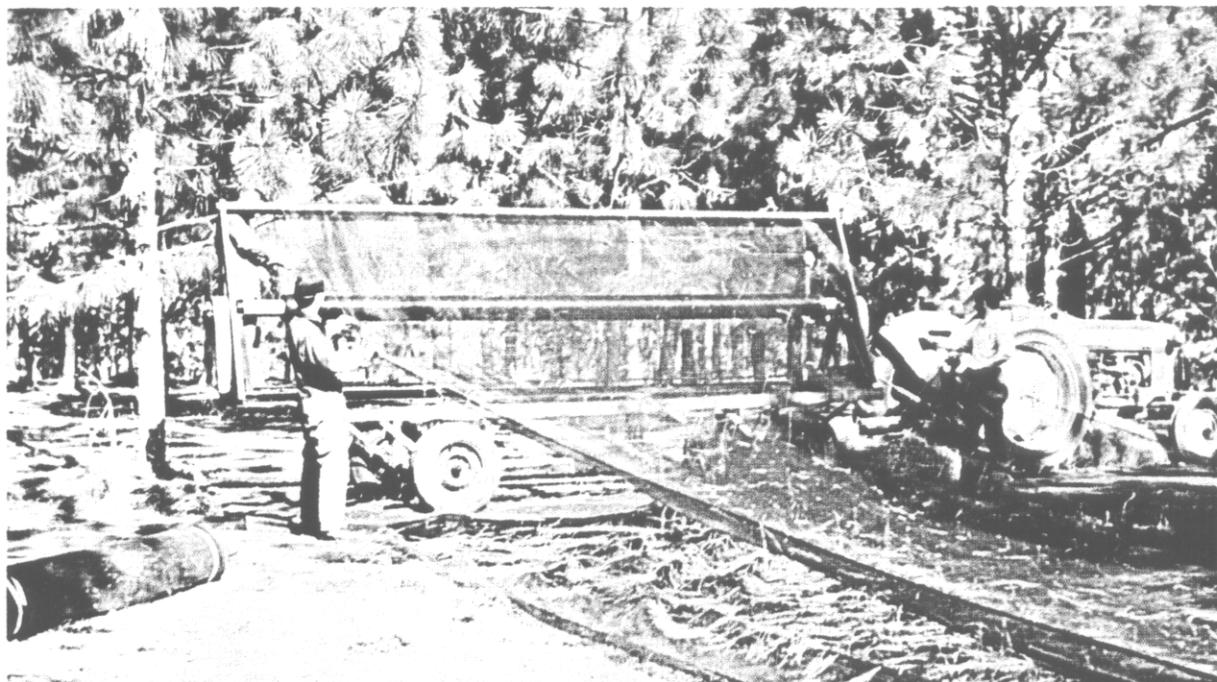


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BY

JIM WYNENS AND TERRELL BROOKS

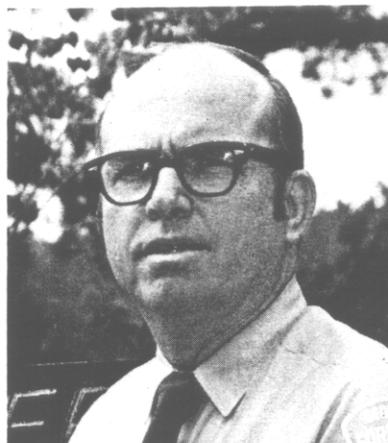


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SEED COLLECTION FROM LOBLOLLY PINE

BY JIM WYNENS AND TERRELL BROOKS

Loblolly pine (*Pinus taeda* L.) has become a popular choice for reforestation projects because of its wide range, its adaptability to a variety of sites, and its rapid growth. Providing adequate quantities of loblolly seed can be a problem, however. Seed orchards planted with genetically superior stock are only part of the answer. Also needed is an

economical system for large-scale seed collection.

The Georgia Forestry Commission (GFC), which now produces about 6,000 pounds of loblolly seed a year, has developed a promising collection system. Basically, it entails covering the orchard floor with a polypropylene net and using a tree shaker to dislodge the seed from the cones.

THE PROBLEM

Until recently the GFC got all its loblolly seed from wild cone collections. Then in 1964 our first orchards began producing genetically improved seed. By 1975 all our loblolly seedlings were products of improved seed collected from orchards. Today we are continuing to increase the size of our orchards in an effort to meet present and future demands.

Harvesting seed from these orchards became increasingly difficult as the trees matured and grew out of reach for hand collections. Typically, 75 percent of the cones are

in the top 25 percent of the crown. Several methods of gathering cones, including platforms, poles, wagons, bucket trucks, etc., were tried. All proved too slow for large-scale production. In addition, loblolly cones are so firmly attached to the branch that as the mature, second-year cones are removed, pieces of branch and immature, first-year conelets also break off. Loss of the conelets, of course, reduces the following year's seed crop.

Tree shakers are also unsuitable for collecting loblolly cones. These machines work well on cones attached to the limb by a visible

petiole such as those of slash (*Pinus Taeda* L.) and longleaf (*P. Palustris* Mill.) pine. Loblolly cones, however, become a part of the branch as they mature and resist being shaken off.

Obviously, the GFC had to find a new approach to seed collections for loblolly, and there were few precedents to guide us. The North Carolina Cooperative Program was working on a seed vacuum harvester, but results then did not suggest it was feasible for immediate large-scale operation. We decided to try using a ground cloth, or net.



Fabric is shown on the ground and in place under the trees in center and at right. The tractor in the distance is pulling the fabric from the machine that will reroll the material. The fabric machine is powered by a power take off (PTO) shaft from tractor.



Fabric is shown ready for the collection of cones.

THE SOLUTION

The polypropylene net was made to our specifications by Patchoque Plymouth, a manufacturer of carpet backing. Polypropylene is sensitive to sunlight; so to prepare the fabric for prolonged outdoor use, ultraviolet inhibitors were added. Weave count of netting can be varied for specific uses. Each section of net was made 16.5 feet wide by 345 feet long. This size is well suited to the old GFC orchards where trees are spaced 16 feet apart in a block layout (20 trees x 20 trees).

Once the netting was designed, personnel at the GFC shop built a machine to unroll and retrieve it. This machine clasps the end of the

net and winds it on a 4-inch diameter cardboard core; the core is turned by the power take-off shaft on a tractor.

To lay the net, the fabric is unrolled from its cardboard core as a tractor pulls it through the orchard. Each section covers one aisle (the area between two rows of trees) for the entire length of the block (354 feet). As another section is unrolled down the next aisle, workers fasten the overlapping edges with a heavy-duty paper stapler. In this way, the whole orchard is covered with a "wall-to-wall carpet."

Nets are generally laid in the second week of October since seed

dispersal begins in our area in early October and continues through November. When maturity checks and visual observations indicate the trees are at the right stage for seed removal, the seed are dislodged from the cones with a tree shaker and fall to the net. Because cone ripening dates differ among clones, the trees are shaken at two intervals to be sure the majority of the seed is taken.

Weather conditions are a major factor in timing the seed collection. Loblolly cones fail to open sufficiently and release seed when the humidity is above 50 percent. Moist conditions within 10 hours

before or after shaking the trees could reduce seedfall.

After the seed fall from the cones, the tractors pull the net sections containing the seed and various debris back over themselves. (Staples connecting the net sections are pulled loose in the process.) Each net section is deposited in a

windrow at the end of the block of trees. A modified peanut combine is passed over the windrow, removing most of the debris and leaving the seed. Then the seed are sent to the Macon seed processing plant for final cleaning.

A refinement of the orchard cleaning process is being developed

by the USDA Forest Service's Equipment Development Center in Missoula, Montana. This machine would roll the net on the core for storage, collect all seed and debris, and separate the seed from the debris in one operation, thus eliminating some of the handwork.

THE ADVANTAGES

The net developed for collecting loblolly seed has worked well in

mature orchards where tree height complicates cone collection. Ad-

vantages of the system include the following:

1. It minimizes crown damage and loss of first-year conelets.
2. It eliminates cone handling.
3. The cost per acre for seed collection is constant, and large seed crops reduce the cost per pound of seed.
4. The net fabric is long-lasting. It has already been in use for 7 years, and it apparently will last several more.



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