PROGRESS IN SEED-COLLECTION METHODS

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The proportion of pine regeneration money being spent to obtain adequate seed is increasing. And why shouldn't it be? The demand for more and better seeds is increasing, and we are still collecting them in much the same way as we always have. Probably, entirely new collection systems are needed. Some of the possible alternatives are discussed in this paper. They are being tried at the Auburn Engineering Project of the Southern Forest Experiment Station, and elsewhere.

With most conifers, including pine, we do not collect seeds directly. We collect cones and then go through the expensive process of removing the seeds from them. The cones must be picked during the short period after the seeds have matured but before the cones open. Hence, a large amount of hand labor is needed for a short picking season.

COLLECTING SEEDS DIRECTLY FROM TREES

In natural regeneration, a cone remains attached to the tree until its seeds have fallen. A system in which seeds rather than cones are collected might, therefore, be preferable for biological as well as practical reasons. Several such systems have been proposed. I have divided them, according to their approach, into mass and individual tree collection systems. Another possibility--collection from individual cones--has not yet been sufficiently explored to yield a tentative system.

Mass collection systems

Collections from several trees at once are ideally suited for seed orchards. A number of such systems have been proposed, and at least two appear to have promise:

1. Water flush.--The entire orchard must be on a slope, with tree rows running up the slope. The space between rows is hollowed into shallow ditches and planted with grass. During the season when seeds are falling, the grass is cut short and the grass flumes are flushed daily with water. The seeds are thereby washed away from the trees and carried downslope. At the bottom of the hill, they are strained from the water. The water is re-used.

2. Vacuum pickup.--In this system the fallen seeds are vacuumed daily from the orchard floor. A well kept grass mat is needed beneath the trees.

Individual tree s stems

Individual tree systems may be used in either seed orchards or seed production areas. Two possibilities are:

1. Overhead tree capsule.--A capsule made of a perforated material

is draped over the crown from the top of the tree and cinched at the bottom. The fallen seeds are then collected daily from the cinched area near the trunk. Engineers at the U. S. Forest Service's Equipment Development and Testing Laboratory near Missoula, Montana, plan to test such a system this fall.

2. Underslung tree capsule.--A capsule made of a perforated material is cinched at the trunk, then ballooned upward around the crown of the tree, and cinched again near the top of the tree. The fallen seeds are collected daily near the trunk. A test of this system is planned this fall on the National Forests in Alabama.

In both tests, the capsule will be made from tobacco cloth. State and Private forestry units in the South are planning similar tests.

While extensive research is being done on seed collection, improvements in cone collection are not being neglected. Several devices have been developed to pick peaches and pecans by shaking the trees. They produce high—frequency, low—amplitude vibrations that impart a twist and pull on the fruit. This action is precisely what is needed to be adequate for these species.

Loblolly, shortleaf, Virginia, and sand pine cones have highly fibrous stems that cannot be detached by the simple twist, pull technique. However, these cone stems will break under a sharp blow struck parallel to the twig on which the cone is attached, and toward the tree trunk. A shaking unit that produces high—amplitude, low—frequency vibrations will remove these cones. Presently available tree shakers have been adjusted to do a fair job of detaching cones, but they do not produce the appropriate vibrations very efficiently.

Mechanized cone and seed collection systems are clearly needed. Preliminary evaluations and tests have shown that such systems are feasible. In a relatively short time, equipment and techniques will be improved, and these systems will become practical.

Discussion

Q. (Darby) What effect would you have using the tree shaker annually?

A. (Taylor) Don't know yet.

Q. (McBee) Do you tend to get the weaker cones or stronger cones?

A. (Taylor) It is more a matter of location. The way this *rig* works, the cone stays still as the tree shakes; therefore, we don't get those which fall in the nodes. We got about 80 percent of those on slash pine trees in our tests.

COMMENTS (Russell). We got about 80 percent of the closed cones on the tree. No open cones fell. It was also more favorable on slash than on longleaf which we think is easy to collect.

COMMENTS (Taylor). This probably has to do with the structure of the tree.

Q. (Bengtson) Did you get any first-year cones?

A. (Taylor) We did get some of these. The shorter the period of shaking, the fewer we got.