CONE COLLECTION METHODS FROM SEED PRODUCTION AREAS AND SEED ORCHARDS

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I have been assigned a subject which we feel needs more engineering research than possibly any other phase of our regeneration program. I have assembled limited inform[g]tion along with a few slides which will give you ideas on how others are going about cone collection. These ideas and facts are based mainly on our cone collection experiences from seed production areas during the past 8 years and from seed orchards during the past 3 years.

First, let's consider cone collection from seed production areas. Our collection from these stands of timber have been on a contract basis with people who have trained personnel and the know-how to climb and work safely in trees above 50 feet in height. Company labor picks up, grades, and bags cones after they are felled from the tree. Prior to cone maturity, an inventory is made of seed production areas to determine if trees have sufficient cones to justify climbing. We do not usually collect from trees with less than 1 bushel of cones per tree. Trees are flagged in order to be sure that cones are collected from approved trees. Brush and weeds are cut to avoid wasted time in picking up cones. The cutting is done with a light tractor and rotary mower. Our climbers use spurs for getting into the tree and rope for descending. We have not experienced any insect injury from the use of spurs, however, we remove all dead or diseased trees from seed production areas before an area is worked. Our cost has steadily reduced each year since our Company started cone collection from seed production areas in 1958.

Cost per pound of slash seed has been:

1958	1961	1962	1964
$ 6.43	$4.47	$4.33	$2.97

This includes cost of climbers, labor for picking up cones, transportation of cones to curing shed, and storage of cones during opening period. The annual reduction in cost per pound of seed is based on two factors. First, experience in effectively carrying on cone collection operations, and secondly, competition of tree surgery companies in submitting bids for climbing and putting cones on the ground. In recent years, we have contracted on a straight hourly basis. By this type agreement, contractors do not boost bids to take care of above average yield per tree.

CONE COLLECTION IN SEED ORCHARDS

The only methods we have used in collecting cones from our orchards lave been by climbing the trees and cutting or punching cones off, or

removing cones by working from a tractor—mounted ladder. Slash cones can be collected efficiently by either method at reasonable cost. Loblolly cones present more of a problem and the cost of collection, of course, is much greater. We prefer using a hawk—bill knife in collecting loblolly cones. Twisting or punching will completely girdle the branch or, oft times, break the branch off. We wait until the latest possible moment prior to opening of cones before collection. By doing this, there is less chance of injuring future cone crops; that is, we have not experienced any injury of trees or future cone crops by following this procedure. I do not have cost data available on cone collection from seed orchards since control—pollinated cones are collected along with open—pollinated cones, and as you know, all phases of cnntrol-pollination work require much time and care. We can, however, give you our yield per bushel for 1965 open—pollinated cones.

Slash	1.52 pounds per bushel
Loblolly	1.40 pounds per bushel

The maximum height of trees in our orchards is 30 feet and Company labor is presently used to collect the cones. As trees reach greater height, we will probably enter into contracts with experts in tree climbing such as is used on seed production areas. Also, as additional trees come into production and produce more and more cones, we cannot wait until cones are ready to open before harvesting. Therefore, as mentioned earlier, this is about to become an engineering problem.

I have been informed that a committee was recently appointed by the North Carolina State Tree Improvement Program to make a study of the most practical method of cone collection from seed orchards. This committee will make a report when all avenues to this problem have been given consideration and, I am sure, come up with the correct answer. I believe this group mainly works with loblolly trees, but any suggestions for, collecting loblolly cones will work even better in slash orchards.

We have a few slides which will show seed production areas, seed orchards, and equipment used for cone collection in these areas.

Slides

General view of seed production areas.

Tractor and light harrow knocking down brush and weeds beneath trees to be climbed. We now use a rotary mower for this work.

Climber going up tree on spurs. Note cone hook, rope, and paint mark on tree.

Climber working a tree. Note good cone crop even on lower branches. 4-1/2 bushels of cones were collected from this tree.

Another shot of a climber working a tree.

Climber working on a wide-crowned tree.

Climber just beginning work on a tree with a good cone crop.

Climber coming down a tree.

Climber just down from a tree. Note safety belt, saddle, and arrangement of rope.

Tractor-mounted ladder which is used for cane collection. It is also used for isolation and pollination in seed orchards. Note two sets of safety ropes and steel bracer which stabilizes the ladder. A longer and heavier ladder could be rigged and trees up to 40 feet in height worked safely by adding another set of *guy* ropes.

Another quick shot of a ladder.

A 15-foot folding ladder, used for cone collection on smaller trees.

Trailer-mounted platform for all phases of seed orchard work.

Pickup truck-mounted platform. This is extensively used in seed orchards for cone collection.

We are not going to make any predictions in regard to cone collection methods. We will leave that for the experts. In our own operation, I think, we will continue to harvest cones by climbing and cutting, or punching, until a better method has been proven.

Discussion

Q. (Russell) When do you use the spurs?

A. (Roberts) Just going up. The men come down by rope. We have used them since 1958 in our seed production area but haven't yet used them in the seed orchard.

Q. (Russell) You haven't found any damage?

A. (Roberts) None.