SEED ORCHARD MANAGEMENT

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I have been asked to talk to you this morning about seed orchard management. There have been many seed orchards established in the last few years, with as many management programs as there are orchards. This being the case, I will present to you our program and management techniques. It is fairly typical. You can make appropriate comparisons.

The program was instituted in 1962 with the leasing of a 400-acre tract of land near DeRidder, Louisiana. Two hundred forty acres are devoted to pine production areas as follow:

Loblolly	100 acres (60 percent complete)
Slash	112 acres (40 percent complete)
Longleaf	28 acres (none yet)
Total	240 acres

The remaining 160 acres are devoted to isolation areas, which according to A. E. Squillace (1) can be used as additional production areas if needed.

Seed production from our currently planned 240-acre production area should yield an estimated number of plantable seedlings as follows:

Loblolly	25,000,000
Slash	14,500,000
Longleaf	3,000,000

These figures are based upon 1/2-pound of seed per tree per year, with 50 trees per acre (loblolly, 10,000 seedlings per pound, slash, 6,500; and longleaf, 2,000).

We plan this fall to establish 25 to 40 acres of longleaf seedling orchard near Merryville, Louisiana. The seed used is from stock developed by the Alexandria Branch of the Southern Forest Experiment Station. This progeny shows a definite tendency of growing out of

the grass stage rapidly and has also indicated a strong resistance to brown spot needle blight. Beauregard Nursery is now growing the planting stock for this project.

The following slides will graphically illustrate the various techniques of our orchard management program.

Slide 1.--Nursery bed grafting is used entirely. For a large operation, such as ours, I think that it is the most efficient and successful method developed. Loblolly and slash rootstock is obtained from Beauregard Nursery. The stock is outplanted in nursery beds with a dibble. They are spaced 1- x 1-foot in the beds and are 1-1 stock when grafted.

The next several slides I will run through hurriedly as most of you are familiar with the operation discussed.

Slide 2.--The grafter is matching up the scion with the rootstock.

Slide 3.--The stem of the rootstock is being cut at the desired location.

Slide 4.--Of the various types, the Cleft method of grafting is being used. The wedge cut is made on the scion.

Slide 5.--Then the cleft in the rootstock is made.

Slide 6.--The scion is now inserted into the cleft with the cambium layers carefully matched.

Slide 7.--A spring-type clothespin is used to hold the scion in place to free the grafter's hands.

Slide 8.--The graft union is now firmly wrapped with a rubber grafting strip.

Slide 9.--Identification tags are affixed to the graft.

Slide 10.--A bamboo stake is attached with a twist-em for stabilization and to support the protective bag.

Slide 11.--Polyethylene bags are placed over the grafts for humidity control.

Slide 12.--Insecticides and fungicides are then applied inside the bag.

Slide 13.--Two-ply kraft nail bags are installed for shade purposes. A change in attaching the bags to the grafts has been made.

Wire was previously used, but now we are using plier stapling guns. I find that this method is highly successful. It is more efficient, easier to use, and facilitates bag removal and replacement for periodic graft inspections.

Slide 14.--One staple on either side of the stem is used. Two staples are used in most cases, but more can be used if necessary.

Slide 15.--The bags are now in place and stapled.

Slide 16.--Completed grafts are left in the beds for one growing season. They are outplanted during the months of November, December, and January. During previous seasons, we have transplanted an average of 75 per day.

Slide 17.--In making an effort to obtain maximum production during the relatively short grafting season, I designed and built a grafting shelter. It is designed to straddle the beds and is pulled by a tractor. The covering is clear plastic. With the use of this shelter, which was constructed midway in the grafting season, we were able to graft an additional 13 days this past year that otherwise would have been lost due to unsuitable weather conditions.

Slide 18.--An opening in the rear of the shelter allows it to pass over the finished grafts.

Slide 19.--The front of the shelter can be raised by the tractor's hydraulic system so that it can be advanced over the rootstock without damaging them.

Slide 20.--One pin through the tractor's draw-bar and shelter hitch allows it to swivel so that it can be more easily maneuvered.

Slide 21.--On cold days a catalitic heater is used inside the grafting shelter. It emits no fumes and has no flame. The grafters stay comfortable and their fingers are kept nimble, which is very important for quality grafting and greater production. Under these favorable working conditions, grafters are less likely to cut themselves thereby reducing the possibility of lost-time by a highly skilled employee.

Slide 22.--The grafted seedlings are processed utilizing an assembly line technique. One person maintains accurate field records and also prepares the scions and tags. Another grafts while a third man attaches the bamboo stake, tags, and bags. Using this method, we are able to produce an average of 175 quality grafts per day.

Slide 23.--Locating and staking ramet positions is a laborious and time cnnsuming task. The stakes are on a 30- x 30-foot spacing. Cull broom handles are used for staking material and are

penta-treated for durability. The untreated stakes cost about two cents each and we do our own treating.

Slide 24.--To save time, a modification in the ramet location operation was devised. Base lines are put in with a transit, then I use field glasses taped onto a dowel. It is not shown here, but below and out of the picture is a carpenter's line level attached to the dowel which helps to orientate it in a vertical position. It is much more efficient than a transit after the base lines have been established. Malac's (2) shifting clone design for placing clones randomly in the orchard is used.

Slide 25.--After the staking operation is done, a post hole is dug at each ramet location to facilitate vertical water movement during the first year. The hole is then refilled (preferably with topsoil). Note the mounds. These are being placed at each location to help alleviate a drainage problem that exists at the orchard.

Slide 26.--The grafts are transplanted from the nursery beds to the field in paper pulp pots. Two sizes are used (12 x 13½ and 10 x 11½). The pots facilitate the transplanting operation and is much quicker than burlaping. The pot is planted along with the grafts in the previously dug post hole. We are currently experiencing 2½ to 3½ percent mortality in the field after transplantation. At this point in the orchard establishment procedure, this mortality percentage is acceptable and is generally considered as low.

Slide 27.--A water tank trailer is used to water the grafts during the first year that they are outplanted in the field. The tank is a common skid tank. Note the rope attached which actuates a spring-loaded valve allowing the tractor operator to accomplish this operation alone.

Slide 28.--Insect control is accomplished by using a hydraulic spray rig. It is a modified John Bean sprayer acquired from one of the nurseries. The booms were removed and a hose and hand gun attached. Two men are required when spraying tall trees, such as these 6-year-old grafted slash. One man can operate it from the tractor on the younger and smaller trees. The platform has been added and will telescope up to 4 feet higher than pictured. It not only facilitates spraying tall trees, but is useful for collecting scion material, controlled-pollinating, and otherwise working in the tops of taller trees. It also provides a mobile vantage point for general inspections of the orchard.

LITERATURE CITED

1. Squillace, A. E. 1967. Effectiveness of a 400-foot isolation around a slash pine seed orchard. *J.* Forestry 65(11):823-824.

2. Malac, Barry F. (Personal correspondence).