SOME PRACTICAL ASPECTS OF SEED ORCHARD MANAGEMENT IN THE SOUTH

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The nation's population is increasing at a rapid rate, while at the same time productive land acreage is decreasing. Competition for land usage will bring many future problems, and we will be compelled to grow more timber volume on fewer acres.

The forest tree improvement program was initiated with this fact in view and is making steady progress toward a superior forest.

To produce this superior forest we must have a reliable seed source; thus the seed orchard became a must to practically every land-holding company in the South.

It is through continued cooperative efforts such as this today that we have made real progress in the field of tree improvement.

Site

The most important factor pertinent to successful seed orchard management other than tree selection is site. A seed orchard is both an expensive and a long term investment. It requires the best site available. A good site will minimize all management problems.

When selecting a site, one should very carefully evaluate the soil properties for nutrient-supplying and water-holding capacity. The soil profile should be examined and mapped to a depth of four feet. Soil samples should be analyzed for available nutrients, fertilizer recommendations, and soil pests.

The site should be well drained, and if not accessible, made so by proper road construction. If drainage is necessary, construct roads when possible that will serve both for drainage and accessibility.

Isolation should be considered and planned well in advance of seed orchard establishment.

When selecting an orchard site, look at abandoned farm land, upland areas bordering hardwood swamps, and pine and pine-hardwood

islands within hardwood stands. Hardwood swamps and drains serve well as isolation strips for pine orchards.

I feel that minimum requirements for an orchard site would be a site index for slash pine of 85 feet and loblolly of 90 feet. A sandy loam or loamy sand with a depth of 18 to 36 inches over a sandy clay is ideal. Stay away from heavy, poorly drained soils.

Orchard Size and Design

Future seed needs should determine orchard size. Seriously consider future needs, then think in terms of over-supplying rather than bare minimum needs.

Today orchards vary considerably in size -- from five to 600 acres in area. The average orchard size is around 65 acres.

Personally, I would rather have two 50-acre orchards with two different locations than to have one 100-acre orchard. Catastrophies often happen such as hurricanes, fires, ice storms, etc. that could seriously damage a single orchard. It is not wise to place all your eggs in one basket.

Outplanting design varies somewhat from one organization to another. Accepted designs are square, rectangular, diagonal, and combinations of the three. The most common is the square design with random location of clones.

Design is a personal touch to the orchard, and any of the above mentioned will be satisfactory providing clone placement and spacing are carefully considered.

Clones should be so placed that two alike clones will be two removed from each other.

Slash, loblolly, and longleaf orchards should be planted to allow a minimum spacing of 30 feet by 30 feet following roguing. Forty feet by forty feet is not at all unreasonable.

Grafting

Grafting is the best method to propagate pines in the seed orchard. The cleft and side grafts are more widely used.

Other grafting techniques used to supplement seasonal grafting are bottle grafting and inarching.

Air-layering is being used with varying degrees of success.

There are as many ideas about successful grafting as there are grafters present, so my advice to you is, if you have a grafting technique that is giving you satisfactory results - stick with it. Grafting is a skill that improves with practice. Hold on to the skilled grafter.

Grafting can take place in the field, pots, or nursery bed. Each location has its advantages and disadvantages, but do not discount any of the three. They all have a place in the establishment of a seed orchard.

Field Grafting

Two **or** three seedlings are placed at the spacing desired in the seed orchard. The seedlings are allowed to grow through the summer and field grafted the following spring. Field grafting usually gives good survival and no transplanting problem. However, the grafter is at the mercy of the weather and much time is lost moving from one graft to another.

Field grafting is the best method to propagate longleaf pine orchards.

Pot Grafting

Pot grafting has received much unfavorable criticism stemming from earlier trials. All of you are familiar with pot binding and orchard loss due to root girdling. Rootstocks were allowed to stay in pots too long before grafting. In some cases rootstocks were allowed to stay in pots two seasons before grafting.

Pot grafting can be very successful and helpful in setting up orchards if properly handled.

Grow seedlings in the nursery bed at a wide spacing (8 to 12 inches) and transplant to pots in late November or December. Grafting can take place in January, February, or March. The graft is transplanted to the field when well pin-feathered, usually in April, May, or June. Do not hold rootstocks in pots from one season to another. Pot grafting concentrates grafting efforts and gives the grafter advantage over the weather.

It does, however, remove valuable nursery soil and cause a transplant problem.

Nursery Bed Grafting

Seedlings are grown in the nursery bed at a wide spacing (8 to 12 inches) and grafted while still in the nursery bed. The grafts can be lifted and transplanted to the orchard during early summer or transplanted in the fall.

Nursery bed grafting is somewhat of a compromise between field grafting and pot grafting. It concentrates the grafting problem and calls for less supervision of grafts. As in pot grafting valuable nursery soil is removed in the process of lifting, and the transplant problem is more difficult.

If you are establishing a new orchard and a large number of grafts are necessary, seriously consider the merits of all three grafting locations. Think in terms of taking advantage of the weather and best use of personnel who will be doing the grafting.

CULTURAL PRACTICES

Irrigation

Irrigation of seed orchards is not recommended after establishment. Some watering of small grafts will be necessary when establishing the orchard.

Weed Control

Some degree of weed control must be maintained around small grafts after they have been transplanted to the orchard. This is particularly important during the first two to three years. Weeding around grafts is no small chore. We have scalped around young grafts with a hoe, but it is my understanding that reliable chemicals for weed control are now available. A word of advice — Use Chemicals With Caution.

The ground cover can best be maintained by mowing. We mow twice a year, during the latter half of May and again in late August or early September before cone harvest.

Disking is not recommended. Continued disking is harmful to tree roots and creates an erosion problem.

Work toward a turf, preferably one of the native grasses of your area, then maintain by mowing.

Fertilization

Wise use of fertilizers is recommended in the seed orchard. I do not believe in throwing fertilizer around because it is relatively cheap. We should have some basis for fertilizing our orchards. There are too many unknowns connected with fertilization to take unnecessary chances. One should strive to keep a balance of soil nutrients in his orchard. This will require periodic soil tests and fertilizer recommendations from qualified personnel.

Until more information is available, I plan to stay away from high rates of nitrogen and stick with complete fertilizers such as 10-10-10, 13-13-13, and 18-18-18.

Pruning

After plants are grafted, some degree of pruning will be necessary on the stock plant. During the early weeks after the graft has taken, make sure the graft stays in a dominant position, clipping off any side limbs that will compete with graft. After graft is well established, remove all limbs from the rootstock.

Pruning will continue to be a necessary tool as the orchard progresses. We go through our orchard during each winter season checking each tree and prune off lower limbs that are drooping, dead limbs, cankered limbs, ramiform branches, and doctor trees with forks and trees that have been the subject of storms. We occasionally find it necessary to top prune a tree, but do not encourage this practice. If necessary to remove a tree from the orchard, we remove the whole tree, root included, with a bulldozer.

All wounds are sprayed or painted with a tree wound compound.

Spraying

Periodic inspection of orchards should be maintained throughout the year to insure early detection of insects and disease. Orchard specialists should familiarize themselves with symptoms and be in a position to consult with a specialist if he does not have a ready cure.

It should be emphasized that use of chemical pesticides can be overdone. Regular scheduled spraying only as a precaution is not recommended. Misuse of insecticides can create problems by destroying natural predators. Spray when necessary, but know what you are spraying for and with, and take all necessary precautions.

Young grafts will need protection from red spider, aphids, and tip-moth. We spray with Malathion for red spider and aphids and apply Thimet to control tip-moth.

Record Keeping

At the beginning of this paper I intimated that tree selection is the most important phase of orchard management with site selection running a close second. This is true, because without the tree and a good site to grow it, there would be no orchard. Progress is also important. Progress is measured by the records you keep.