Choctawhatchee rootstock recommended for sand pine seed orchards

by

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Choctawhatchee sand pine rootstocks are preferable for sand pine seed orchards, but grafting onto these rootstocks has proved difficult. Growth stages of both scion and rootstock when grafted appear to be the keys to success. Grafting techniques presented in this article have achieved 60 to 75 percent success.

The Choctawhatchee variety of sand pine *(Pines clausa* (Chapm.) Vasey) is the most promising of the species tested for reforesting the several million acres of sandhills in Florida, Georgia, and the Carolinas currently dominated by scrub hardwoods (1, 2). To support this reforestation effort, a sand pine improvement program is underway. A number of outstanding Choctawhatchee sand pine (CSP) have been selected, and several clonal seed orchards are being established. Most of the scions collected have been grafted to rootstocks of either slash pine *(P. elliottii* Engelm.) or the Ocala variety of sand pine (OSP).

CSP rootstocks are preferable for several reasons, but successful grafting onto these rootstocks has proved difficult. Techniques that have achieved 60 to 75 percent grafting success are reported in this paper.

Using OSP or slash pine rootstocks may be a serious mistake, even though the grafting itself is relatively easy. Some sand-slash pine grafts have proved to be incompatible. And OSP is susceptible to a root rot pathogen, *Clitocvbe tabescens* Bres. (4). to which CSP is resistant. Each year, the disease kills a small but consistent percentage of the trees on OSP rootstocks in seed orchards. Even trees 4 to 6 years old are killed. No such mortality has been observed where CSP rootstocks were used,

Nursery Beds

Nursery bed grafting (5) is well suited for this job. Seedlings should be 9 to 12 inches tall at grafting time, and 1.0 CSP seedlings of this size can be produced in nursery beds with little difficulty. Optimum bed density is about five seedlings per square foot.

Excellent drainage of nursery beds is required. In most instances, the best drained portion of the nursery should he selected. Well drained, or what may seem to be excessively drained, sandy soil that is moderately fertile is preferable. An available soil phosphorus (P) level of 2 ppm (ammonium acetate (pH 4.8) extractable) is adequate, and application of P usually is not necessary. Nitrogen (N) and potassium (K) fertilization usually are needed. One hundred pounds of N and 50 pounds of K per acre should be applied in a split application-half in early June and the balance in mid-July. An additional 50 pounds of N and 25 pounds of K per acre may be applied in late August if the seedlings seem to be undersized at that time.

Grafting

Perhaps the primary cause for failures in grafting superior CSP scions to CSP rootstocks has been that scions or rootstocks were not in the proper growth stage when the grafts were made. Both the scion and the rootstock plants should have broken dormancy and just started terminal growth at grafting time. CSP is not nearly as' resinous as slash pine. and little or no sap flows to the freshly cut surface of a dormant CSP seedling. The wood feels quite dry to the touch. Under these conditions, a graft will almost certainly fail. When dormancy is broken and terminal growth starts, small amounts of slightly resinous material do accumulate on freshly cut surfaces. Grafts have been most successful when the rootstock seedlings had 2 to 3 inches of new terminal growth.

CSP scions should be gathered when the terminal buds begin to elongate, that is, when the tree begins to break dormancy. It is very unlikely that both scions and rootstock will reach the optimum stage for grafting at the same time. Growth generally will be more advanced on the candidate superior trees than on the seedling rootstocks. For that reason, provision should be made to store the scions collected. The scions can be collected at the appropriate stage in their development and stored in partially sealed plastic bags at approximately 5° C and high humidity. CSP scions have been stored for 2

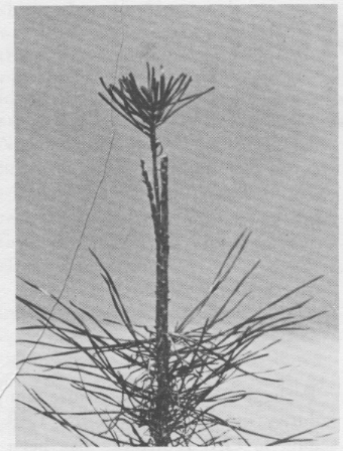

Figure 1.—Trim scion and place it in understock.

Figure 2.—Wrap the graft with rubber grafting tape and enclose in plastic greenhouse.

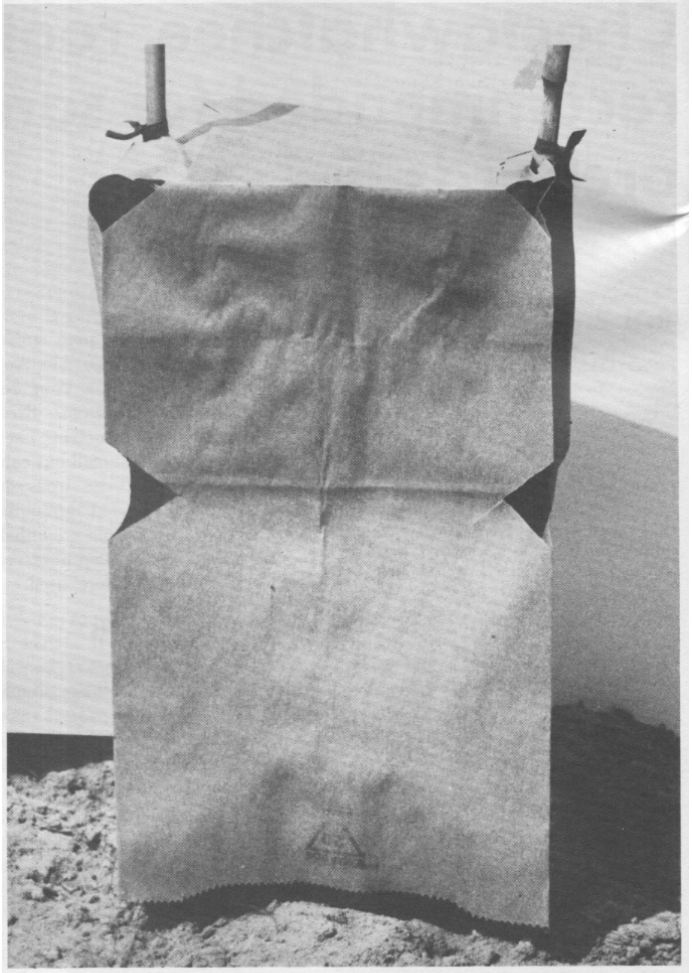

Figure 3.—Shade grafted plant with kraft bag.

weeks under these conditions without reducing grafting success.

The cleft graft (3) is recommended. Cut the scion to a long wedge, sever the top from the stock plant, split the stock, insert the scion stem in the split (fig. 1), and bind it in place with a rubber grafting strip. Remove from the stock plant only those needles and branchlets that will interfere with the mechanics of grafting. The graft should be made as high as feasible in the stock plant so as to cause the least possible reduction in its vigor.

For several weeks after the scion is in place, it is essential that each graft receive tender loving care. Keep soil moisture at optimum levels. To prevent desiccation of the scion, place a polyethylene sleeve (plastic bag with bottom cut out) over the scion and entire stock plant (fig. 2). This sleeve traps moisture and produces an excellent humid atmosphere around the scion, but considerable heat could develop inside the polyethylene cover. So to avoid heat damage, place a ventilated kraft paper bag over each graft for shade (fig. 3).

About 6 weeks after the graft is completed. a satisfactory union will have developed and the scion is now

ready to face a harsher environment. Remove the kraft bag in late afternoon or on a cloudy day and water frequently for several days to bring the plants through this change in growth environment. Remove the polyethylene bag about 2 days after the kraft bag has been removed.

Carefully check each successful graft at regular intervals until it is transplanted to the seed orchard. Prune overly vigorous branches of the stock plant to permit the scion to remain dominant. Promptly control any harmful insects or diseases that appear.

Time for transplanting the grafts from the nursery bed to the seed orchard is somewhat dependent upon the environment of the seed orchard site. In the Lower Coastal Plain where summer rainfall is usually plentiful, the grafts are often transplanted in late July or August. If summer droughts can be expected, the grafts should be transplanted during the normal fall or winter tree planting season. Transplanting mortality will be minimized if a 5- to 6-inch. diameter transplanting tool-either manual or machine operated-is utilized. These devices lift a ball of nursery soil with the graft. To keep the ball of nursery soil intact and prevent root damage. we place the lifted grafts in kraft bags in No. 10 cans.

One more precaution: The CSP seed orchard should be established on a well-drained sandy soil.

If the procedures described here are followed. the manager can anticipate having a CSP seed orchard as trouble free as any well-managed southern pine seed orchard.

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News & Reviews

(Continued from p. 24)

Urban People Need More Plants UCD Scientist Finds

People have a psychological need for contact with plants.

"One cause of the flight to the suburbs and dramatic increase in wilderness recreation use is a basic desire for contact with vegetation" according to Dr. Seymour M. Gold, an urban planner in the Department of Environmental Horticulture at the University of California, Davis.

Research by behavioral scientists, Gold added, indicates that the current popularity of indoor and outdoor gardening is a result of this same frustrated desire as well as an attempt to modify the sterility and ugliness of most cities.

The human response to plants in urban environments. Gold added. provides a frontier for research to link the plant and the social scientist in new ways to solve environmental problems.

Research on the use of plants in cities to satisfy human needs, Gold said, could result in several social benefits:

-Less need to escape from cities just to enjoy plants and green landscapes. "With the prospect of prolonged fuel rationing or shortages, it is essential to make our cities and suburbs more enjoyable. attractive. and diverse places." Gold said. "For example, 30 percent of all automobile use is for leisure and outdoor recreation. Some of this use could be reduced by providing better local public and private recreation opportunities that could give people the same perceived sense of relief or natural character that they now seek in regional parks and wilderness areas."

-Better use of existing local parks, which are often sterile because they lack adequate landscaping. Gold said his research indicates that fewer people are using neighborhood parks in many cities. and there is a strong relationship between nonuse and the lack of trees, shrubs, and flowers.

-More stable property values and less change in neighborhood populations because of the type and quality of landscape plantings. Gold suggests that "people are attracted to and more reluctant to leave the well landscaped areas of most cities. Property values are higher and more stable for houses near well landscaped parks and on streets with mature shade trees." He also notes that "these well landscaped areas usually have less neighbor conflict and higher degrees of social interaction and identity."

Gold said, "Perhaps no single item could dramatically change the physical and social character of urban America more quickly, and be less controversial and costly, than plants. At the same time, this massive application of plants could save substantial amounts of gasoline because people would learn to enjoy cities and rely on urban parks instead of traveling long distances to wilderness areas or vacation homes for simple contact with vegetation."

(From a cooperative extension report, University of California. Davis.)