

diameter seedlings did maintain their original diameter advantage. Only four of the 200 trees planted in this study died during the 3-year period.

#### Discussion and Conclusions

Root fibrosity of black walnut seedlings was increased by pruning radicles of germinating nuts, by pruning roots of seedlings in seedbeds, and by growing seedlings in sandy soils. However, the additional fibrous roots did not

significantly benefit subsequent rooted seedlings. New root formation occurs primarily on fibrous roots. Therefore, the loss of fibrous roots, through poor lifting or handling, may cause poor survival and growth, especially under drought conditions. Thus, the the seedlings attain a suitable size for planting.

During planting, the fibrous roots were easily twisted, which could cause poor growth at a later age. Greater care during planting may be required for more fibrous

subsequent rooted seedlings. New root formation occurs primarily on fibrous roots. Therefore, the loss of fibrous roots, through poor lifting or handling, may cause poor survival and growth, especially under drought conditions. Thus, the fibrous roots present on black walnut seedlings should be preserved, but it does *not* appear necessary or desirable to increase root fibrosity of these seedlings by cultural methods.

## NEWS & REVIEWS...

### Research Underway On Loblolly Seed Loss ...

At the Forestry Sciences Laboratory in Athens, Ga. scientists are finding ways to reduce seed losses in seed orchards. The seed-production potential in seed orchards of loblolly pine is reduced one-third by cone and seed insects. These insects greatly increase the costs of producing genetically superior trees. Without adequate controls, the size and cost of second generation orchards will have to be increased by 50 percent to supply the needed quantity of sound seed.

About 8 percent of the yield of loblolly pine per acre is lost because of attack by rust diseases. Researchers at Athens hope to reduce this loss to 3 percent. The most promising research strategy is to breed and

culture loblolly pines that have inherent resistance to rust.

### In Search of The City Tree

City trees should grow to desired heights; tolerate air pollution, salt, bumps from cars and drought; resist diseases, insects; and not clog sewers or crack pavement. They should provide shade and be beautiful. To date, the sycamore has come closest to meeting many of these standards. Frank S. Santamour Jr., a research geneticist at the National Arboretum believes a super city tree is possible and since mid-1967 he has been working to develop better varieties of urban trees. At present, he is cross-breeding 20 different kinds of trees in search of one that can best withstand the urban life of the 20th Century:

### Alternative to Chemicals

Genetically resistant seedlings may provide a useful alternative to chemical repellents for reducing damage by deer and hare in planted Douglas-fir forests. Forest Service research detected such resistance in ponderosa pine as far back as 1927 and confirmed it in 1962. Recent work in the Pacific Northwest proves both the presence and the heritability of resistance traits in Douglas-fir. Unlike artificial repellents, resistant trees could provide year-round protection for as long as needed. However, it may take a decade to intensify resistance or to breed seedling stock in the numbers required. Physiological research is underway to determine chemical factors underlying resistance.

*(Continued on page 29)*

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1970. Overwinter cold storage of nursery stock. *N.E. Area State and Private Forest., Proc. N.E. Area Nurserymen's Conf., Orono, Me., Aug. 11, 1970:* 45-49.
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## NEWS & REVIEWS...

(Continued from page 25)

### Books

Toussoun, T. A., R. V. Bega, and P. E. Nelson (eds.).

1970. Root diseases and soil-borne pathogens. Univ. Calif. Press, Berkeley, Los Angeles, London. 252 p., illus. The ecology of major root diseases of forest and tropical plantation crops is discussed in a book edited by Forest Service scientists.

### New Publications

Cordell, Harold K. and George A. James

1971. Supplementing vegetation on southern Appalachian recreation sites with small trees and shrubs.

Small, unballied tree and shrub seedlings were planted in a developed campground in the southern Appalachians to de-

termine the suitability of supplementing existing vegetation with small planting stock. Seedling loss was high and height growth was poor, primarily because of vegetative competition and site maintenance activities.

Dillow, Martha K., and Hawker, Norman L.

1971. Annotated bibliography of walnut — supplement No. 1. USDA Forest Serv. Res. Pap. NC-70, 23 p. N. Cent. Forest Exp. Sta., St. Paul, Minn.

A supplement to Research Paper NC-9 published in 1966, this list covers 208 additional references dealing with the growth and production of walnut.

Dochinger, L.S.

1971. The symptoms of air

pollution injuries to broad-leaved forest trees. *In* Methods for the identification and evaluation of air pollutants injurious to forests. Working Group on Fume Damage, Sect. 24, XV Congr. IUFRO. Heft. 92: 7-32. Gainesville, Fla.

Air pollution appears to be an ever-increasing problem for trees in the United States. Ozone, sulfur dioxide, and fluoride are of special significance in our contaminated air. Implementing high standards of air quality is necessary to alleviate this serious problem.

Jeffers, Richard M.

1971. Research at the Institute of Forest Genetics, Rhinelander, Wisconsin. N. Cent. Forest Exp. Sta., St. Paul, Minn. 31 p., illus.

(USDA Forest Serv. Res. Pap NC-67)

Reports research at the Forest Genetics Institute in Rhinelander, Wisconsin, since its beginning in 1957. Describes the physical plant, study objectives, and work program. The latter includes studies of seed source, inheritance in white spruce, disease and insect resistance, interspecific hybridization, radiation genetics and radiobiology, vegetative propagation, cell biology, and tree improvement.

McAlpine, Robert G. and Paul P. Kormanik

1971. Rooting cuttings from select yellow-poplar trees. *In* Proc. Eleventh South. Conf. Forest Tree Impr. Proc. 1971: 241-43.

Meskimen, George

1971. Fertilizer tablets stimulate eucalyptus in Florida trial. Southeast. Forest Exp. Stn., USDA Forest Serv. Res. Note SE-162, 8pp.

Eucalyptus plantings in south

Florida must grow rapidly to withstand first-year frosts and dominate herbaceous competition. Fertilizer tablets in the planting holes of *E. camaldulensis* stimulated immediate growth, resulting in stems 50 percent taller and 83 percent thicker than check trees at 6 months.

Phares, Robert E. and Williams, Robert D.

1971. Crown release promotes faster diameter growth of pole-size black walnut. U.S. Forest Service Research Note NC-124.

Complete crown release more than doubled the diameter growth of pole-size black walnut trees in southern Indiana over a 10-year period. Partially released trees grew about 50 percent more than unreleased trees. The faster growth of the released trees was directly related to increases in crown-area expansion. Most of the study trees produced bole sprouts; however, the incidence of sprouting was higher and the sprouts were larger on the completely released trees than

on the unreleased trees. Controlling understory growth during the last 6 years of the study had no significant effect on growth of the walnut trees.

Ruehle, John L., and Campbell, W. A.

1971. Adaptability of geographic selections of shortleaf pine to littleleaf sites. Southeast. Forest Exp. Stn., USDA Forest Serv. Res. Pap. SE-87, 8 pp.

Growth and condition of geographic sources of shortleaf pine were evaluated after 16 years on three littleleaf sites in the Piedmont. A trend of healthier trees from sources west to east was indicated at three plantations, and upland sources were healthier at all three plantations than were sources from Coastal Plain sites. Variation among trees from different seed sources was evident in height and condition. General conclusion is that shortleaf pine can be successfully selected for adaptability to littleleaf sites.