

PRODUCING GOOD FOREST PLANTING STOCK

W. H. Brener, Supervisor
Forest Nurseries, Wisconsin Conservation Department
Wisconsin Rapids, Wis.

Nursery husbandry is becoming more complicated and challenging--new pests continue to appear, labor costs are higher, and new innovations for planting stock are needed. In Wisconsin nurseries we have found that in order to produce quality planting stock, we must include certain biocide procedures when establishing a forest plantation. Some of the problem areas and the biocide procedures we use to correct them follow.

Soils

Application of soil fumigants such as Mylone, Vorlex, Vapam, and Trizone greatly aid in the

control of root rots such as *Cylindrocladium*, *Rhizoctonia*, and *Pythium*. The use of these fumigants reduces weed growth, and the planting stock grows better and has more vigor and color. While all four fumigants have given good results, Mylone is used on seedbed areas and Vorlex for transplants. These two fumigants are easy to apply, and tarp or polyethylene covers do not have to be picked up and laid down.

Mylone 50-D and Vorlex are effective at 250 pounds and 35 gallons per acre, respectively. Vapam and Trizone have been used at 100 gallons and 200 pounds per acre, respectively.

Insects

The white grub and the white pine bark louse or aphid are the current insect pests in Wisconsin nurseries.

The white grub can be completely controlled with the application of 100 pounds per acre of a 10 percent Chlordane dust. The dust is rototilled or worked into the soil to a depth of approximately 4 inches preceding each tree crop or every 2 or 3 years. However, due to the availability of the fumigants, which can also control the white grub, the Chlordane applications are no longer necessary.

The white pine aphid, which has been bothersome in white and red pine seedling beds, can be controlled with insecticides such as Nicotine Sulphate (40 percent), Malathion No. 8, and Lindane (20 percent) water emulsion concentrate. These materials are applied with spreader stickers such as Araclor extender (75 percent solutions), Plyac spreader sticker, and Tween-20 spreader.

Diseases

The needle blight stage of the *Cylindrocladium* rot, which is particularly damaging to the spruces, can be controlled by a Fermate (76 percent) (Ferbam) fungicide. Also, for immediate control of the *Cylindrocladium* during transplanting, the seedlings can be dipped in a 2 percent water solution of Captan 50 percent wettable powder. When postemergence damping-off (*Rhizoctonia* and *Pythium*) occurs, spray application of Tersan (75 percent) (Thiram) are used.

All of these soluble sprays are applied at the rate of approximately 150 gallons per acre or at a rate sufficient to thoroughly cover the nursery stock.

Weeds

Hand weeding has been reduced to a minor operation by the use of mineral spirits and a Dacthal herbicide. Weeds can be controlled by use of mineral spirits applied at approximately 50 gallons per acre and by Dacthal herbicide at 4 pounds (actual) per acre in water solution of 20 gallons or more per acre (fig. 1).

Fertilizers

Organic matter (peat and leaf mold) (fig. 2), fortified with a balanced NPK commercial fertilizer, is rototilled into the soil following the digging and shipping of each seedling and transplant crop. Green cover crop varieties are



Figure 1.--1-0 seedbeds. The area has been treated for control of weeds, insects, and disease.

used. Based on an annual soil analysis, lime and magnesium are added as needed. Topdressing of NPK fertilizers are applied when and where required during the growing season.

No serious damaging effects have been known to result from the use of the biocides. The addition of organic materials in the form of peat and leaf mold appears to reduce the

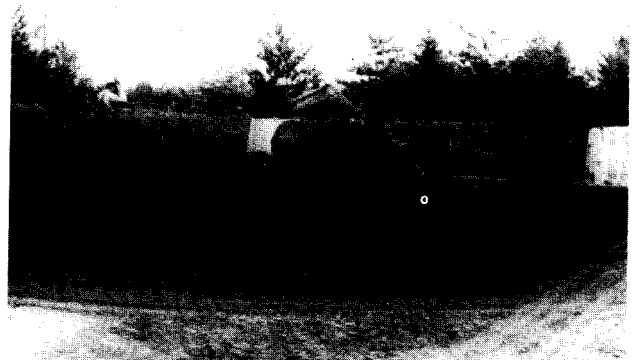


Figure 2.--Peat and leaf mold organic material for soil maintenance and improvement.

possible deleterious effects of biocide application (fig. 3).

Tests of soil quality have been and are continuing to be made by the University of Wisconsin's Forest Soils Section.

While some loss of Mycorrhiza appears soon after pesticide and herbicide applications, complete recovery follows at the end of one or two seasons.

Also, the stimulation of the stock's growth and vigor apparently did not lessen satisfactory field planting results.

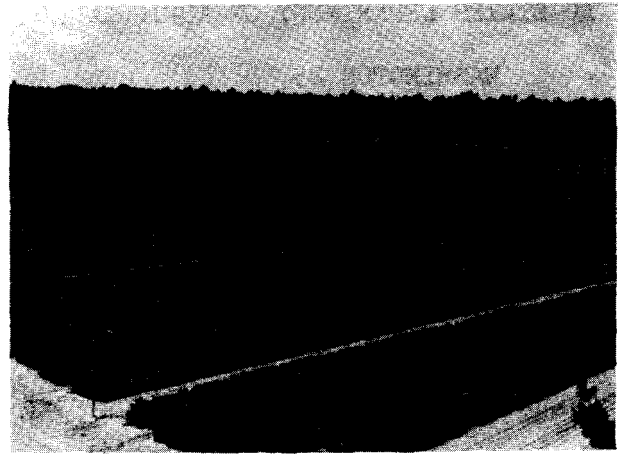


Figure 3.--2-0 seedbed section that has received fertilizer, pesticide, and herbicide care.