unsatisfactory results may be experienced. This "tool" when properly used in the hands oi the nurseryman can greatly reduce the cost of weeding as well as increase the number of plantable trees.

## CIL SPRAY WEEDING AS APPLIED Tb FOREST NURSERIES IN PENNSYLVANIA

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During the summer of 1950 the Pennsylvania Department of Forests and Waters conducted experiments at the Mont Alto Nursery on the use of mineral spirits for weed control, similar to those conducted. by Cossitt and Eliason.

Materials used in the tests consisted of two dry cleaning fluids; Sovasol #5, made by the Socony Vacuum Oil Co.; and Esso Weed Killer it35, a product of Standard Oil. The tests were conducted on two species, white and red pine, planted in the spring of 1950.

Applications at the rate of 40, 60, 80, 100, and 120 gallons per acre were made using hand sprayers of the type used around the house to apply insect sprays. Test plots were 80 sq. ft. in area.

All plots were sprayed at least twice during the summer and those plots treated with the lighter applications (40 and 60 gal. per acre) were sprayed three times. When the first application was made, between June 16 and 20, many seed coats still remained on the seedlings but no apparent injury resulted.

A good weed kill was obtained on all except the Esso 40 gal. per acre white pine plot. The poor control on this plot was due to the fact that the weeds were too large when the first application was made and consequently the weeds were not killed and soon overran the plot. This emphasizes a point of extreme importance in the use of mineral spirits, namely, that weeds should not be allowed to get too large before being treated.

It was difficult to tell whether any of the seedlings were killed by the sprays. Seedling counts made for this purpose showed some mortality on untreated as well as treated plots, which was probably due to drought. No permanent injury was observed. Seedlings on the treated plots had a chlorotic appearance and the tips of many of the needles appeared burned. This condition was very slight or almost non-existent on the areas sprayed with the lighter applications but became more apparent as the volume of oil per acre was increased. Three or four weeks after spraying the

coloration began to improve and by October when the seedlings were mulched for the winter, the coloration was again about normal.

Experience and observations from the experiment indicate that early sprayings with light applications (40-60 gal. per acre) when seed coats are still on the seedlings will control the weeds and cause no harm to the trees. Spraying should be repeated whenever necessary to control the weeds but it should be remembered that best control is obtained if weeds are not allowed to get too large between sprayings. Supplementary hand weeding should accompany the chemical treatment in order to control those few weeds which are resistant to the spray.

Difficulty in getting an even distribution of the spray material was encountered in the use of the hand sprayers. Some type of mechanical sprayer is being contemplated for future use, but even with the crude methods used it was possible to reduce weeding costs as much as 50 percent.

## VARSOL TRIED ON BLACK LOCUST SEEDBEDS

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During the summer of 1950 we had occasion to try Varsol on black locust seedbeds at TVA's Clinton Nursery. It wasn't a planned experiment, but rather a case of necessity. We had a long period of wet weather and couldn't get on four of our beds with cultivators. Rather than lose these beds to crabgrass, we decided to try spraying with Varsol.

We used an application rate of 25 gallons per acre on two of the 400-foot beds and 35 gallons per acre on the other two. Each bed was sprayed twice, with an interval of three weeks between sprayings. The first was applied when the black locust seedlings were about four inches high, and still green and succulent. The crab grass was half this high and completely covered the beds.

This first spraying killed about half of the grass--and about a third of the seedlings. That's roughly 27,000 of the estimated 80,000 in the four beds.

At the time of the second spraying the seedlings had reached a height of eight inches and their foliage made a tight canopy over the beds. Some of the grass and weeds protruded above this canopy but the bulk was underneath. As a result only the exposed portions were killed by spraying. The locust seedlings suffered a 50 percent temporary defoliation; practically none were killed-