

USE OF HERBICIDES

by

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The U. S. Forest Service Mt. Sopris Nursery is located 20 miles east of Glenwood Springs, Colorado on State Highway 82. Elevation of the Nursery is approximately 6450 feet.

The Nursery site was purchased by the Forest Service in 1961. Prior to that time the site was used as a farm. Most of the area was in improved pasture at the time the Nursery development began. Adjoining farms are raising hay and forage crops at the present time.

Weed control has been the No. 1 problem at Mt. Sopris Nursery. In 1965 approximately 50 people were employed as hand weederes to weed 32 acres of seed beds. In addition to the 50 people, a contract was issued to weed one 4-acre field and the contractor used 10 weederes. Weeding costs ran almost one-third of the total budget. As a result, experimental plots were set up to test a variety of herbicides.

By 1968 the weed control program was as follows:

1. Prior to sowing, fumigate with methyl-bromide at a rate of 435 lbs. per acre.
2. Ten days after germination is complete apply Dymid at a rate of 4 lbs. per acre and repeat this treatment every 6 weeks until mid-October.
3. On older age stock, apply Dymid every 6 weeks from mid-May through mid-October at the 4 lbs. per acre rate.
4. Hand weed as necessary

Results were not too good. The 1-0 stock required hand weeding 3 to 4 times per season and older age classes were weeded 3 times. The weeding crew consisted of 15-20 people. Costs were as follows:

Costs per acre (Average of 1965, 66, 67 seasons)	
Fumigation (Methyl Bromide)	\$1476.00
Herbicides (Dymid, Amitrol, Simizine, Sodium TCA, Dalapon)	64.00
(Stoddard Solvent)	48.00
Hand Weeding	652.00
Average Cost Per Acre	\$10,100.00

The costs and results of the program were studied and several changes made for 1969-70. The use of Methyl Bromide was discontinued. Fumigation with Methyl Bromide **did** not give weed control. In addition, costs of applying the fumigant, covering with poly-film, and later removing the poly-film, have exceeded **\$1400** per acre of seed bed treated. Also, the soil temperature four inches deep must be at least 50° F. for the fumigant to work. This delays spring seeding until May 25 to June 10. Due to the short growing season at Mt. Sopris, seeding should be completed by May 15. In view of these problems, it was decided to follow the example of several other nurseries and change from spring applications of Methyl Bromide to fall applications of Mylone 50-D.

Mylone 50-D is a powdered fumigant, which is applied dry. At high rates it can be used as a temporary soil sterilant. It forms a toxic vapor in the soil which kills annual weed seeds and small weeds. It is not to be used on or near existing conifer seedlings. All applications should be made in the fall before frost. After ground preparation is completed, the Mylone is applied at a rate of 12 pounds per 400 ft. bed, using an Ezee-flow EW-55 fertilizer spreader. The material is worked into the soil with a spring-tooth harrow and the field is irrigated for 2 to 3 hours to seal the surface of the soil and to activate the fumigant. The field is then left over winter. Prior to spring seeding, soil samples are collected from the area and radishes and beans planted in them. If the radishes and beans germinate normally, the ground is safe for planting tree seed. If it is necessary to treat an area in the spring with Mylone, the same procedures are used. A delay of 14 to 21 **days** is recommended before planting. Cost per acre of Mylone applications is approximately \$216.00.

Dymid is a selective pre-emergence herbicide manufactured by Eli Lilly and Company. It is available as an 80% wettable powder (Dymid 80W) and as a 5% granule (Dymid 5G). Cost of the Dymid 80W is approximately \$3.10 per pound FOB Mt. Sopris Nursery.

Dymid 80W is mixed with water and applied with a low pressure spray rig. Fifteen pounds of Dymid 80W is mixed with 100 gallons of water and applied at a rate of 50 gallons per acre. One hour of overhead irrigation follows the **Dymid** application to incorporate the material into the soil.

Dymid 80W can be safely used on new seeding 10 days after germination is complete. It can be used on Engelmann Spruce, Lodgepole Pine, Ponderosa Pine, **Douglas-fir**, and White Fir seedlings, with no damage to the stock.

Dymid breaks down in the soil in 4 to 6 weeks. It will leach through sandy soils. Cultivation does not reduce the effectiveness of Dymid. Dymid is not effective on established weeds. Dymid is a mildly toxic substance, the lethal dosage for a 150 pound man being approximately the same as the lethal dosage of common aspirin.

At the present time our weed control program is based on the use of machine cultivation, chemical control and supplemental hand weeding for all species and age classes:

1-0

In fall before sowing fumigate with mylone 501? at 212 pounds per acre

10 days after germination is complete, apply 6 pounds per acre of Dymid and repeat treatment every 6 weeks until November.

10 days after germination is complete, cultivate with tractor mounted cultivator. Cultivation is carried on once every two weeks until November.

Hand weed as necessary.

2-0, 3-0

After the ground thaws in spring, (April 15) apply Dymid at 6 pounds per acre.

Continue Dyraid applications every six weeks until ground freezes.

Cultivate every two weeks until trees are too large to clear the cultivator.

Hand weed as necessary.

COSTS PER ACRE OF PRESENT PROGRAM

FUMIGATION (MYLONE)	\$228.00
HERBICIDES (DYMID)	90.00
HAND WEEDING	48.00
MECHANICAL CULTIVATION	16.00

AVERAGE COST PER ACRE PER SEASON: \$187.00