

Using dephenamid herbicide for seedbed weed control cuts hand-weeding labor 75 percent

by Stephen E. McDonald, John A. Isaacson, and Beatrice E. Fisher.

In 1968, after hearing of successes in seedbed weed control using diphenamid herbicide at the Forest Service Nursery at Carbondale, Colorado, we initiated a herbicide screening and testing program at Coeur d'Alene. The object was to find an effective herbicide that would not injure tree seedlings or result in residual toxicity problems over the long run. Because the climate and soil are different at each tree nursery, herbicide techniques used at one nursery cannot necessarily be applied to another nursery without risk. Therefore, we decided that the following steps would be taken at Coeur d'Alene:

1. Screen a number of potentially effective herbicides to see if they injure very young seedlings of any of the six tree species grown at Coeur d'Alene.
2. Following the screening, select the herbicides causing no seedling damage and conduct limited production level tests to evaluate the effectiveness of weed control provided in each case.
3. Select the safest and most effective herbicide(s) for operational use and monitor the areas where the chemical(s) is used for any symptoms of residual toxicity buildup and problems.

¹ Respectively, supervisory forester, supervisory forestry technician, and forestry technician, Coeur d'Alene Nursery, Coeur d'Alene National Forest, Idaho.

Screening for Safety
This step was accomplished during the 1969 field season. After consultations with researchers, chemical industry representatives, and other nurserymen, six herbicides were selected for evaluation. These herbicides were applied to all six commercial timber species grown at the Nursery (lodgepole pine, ponderosa pine, Englemann spruce, western larch, Rocky Mountain Douglas-fir, and grand fir). Applications were made under carefully controlled conditions and in a replicated design. The following chemicals were applied to each species a week after germination was completed:

1. *Dymid-A* diphenamid manufactured by Elanco. Applied at a rate of 4 pounds active per acre.
2. *Simazine-A* triazine manufactured by Geigy. Applied at a rate of 2 pounds active per acre.
3. *Dacthal-A* dimethyl ester of tetrachloroterephthalic acid manufactured by Diamond Shamrock Corp. Applied at 9 pounds active per acre.
4. *Amiben-An* ammonium salt of 3-amino-2,5-dichlorobenzoic acid manufactured by Amchem. Applied at 1 quart active per acre.
5. *Treflan-A* trifluralin manufactured by Elanco. Applied at .5 pound active per acre.
6. Casaron-Dichlorobenil (2 per

cent active) manufactured by the Thompson-Hayward Company. A granular applied at 2 tablespoons per 10 square feet of area.

The soil at Coeur d'Alene is sandy loam in texture with organic matter about 2 percent. Annual precipitation averages 26 inches. After application of the above chemicals, the areas treated were irrigated (avoiding puddling and overland flow).

The object of this portion of the program was to ascertain if the herbicides injured the seedlings. Mortality counts and observations on the relative well-being of the seedlings were made periodically. Different species of trees were noted to have different degrees of tolerance toward the various herbicides.

Dacthal, Dymid, and Treflan were universally well tolerated and even seemed to stimulate growth in some species. On the other hand, Amiben, Simazine, and Casaron killed large percentages of the seedlings (with the exception of Simazine in ponderosa and lodgepole pine).

At the conclusion of the screening portion of this study, there was some assurance that Dymid, Dacthal, and Treflan could be used here, at the rates of application given, without undue risk of killing seedlings of any of our major species. The other herbicides, given the conditions at Coeur d'Alene and the rates of application used, failed.

Evaluating Effectiveness

Conducted in the 1970 season, this phase of the study constituted a relatively large scale semi-production usage of each of the three non-toxic herbicides from the previous year's work. The objective was twofold: (a) To provide more conclusive evidence of the safety of using the chemicals on tree seedlings and (b) to measure relative weed control effectiveness of the three herbicides.

The test was conducted using Dacthal, Dymid, and Treflan on both newly germinated seedlings and on seedlings entering their second year of seedbed growth on all six of the species tested in 1969. The design involved 90 50-foot long plots in the Nursery. Each plot was replicated three times in each species and age class. Each treatment plot was paired with a check (untreated) plot as in the screening study. Data were collected from the plots to analyze weed populations and tree mortality every 6 weeks during the season. The following spray regimes were used:

1. Dacthal-The application rate was 12 pounds per acre of "Dacthal W-75" applied to new 1-0 stock once approximately 2 weeks after germination was completed. It was dissolved in 50 gallons of water as a spray per acre. The same application was made to 2-0 stock (entering its second year) on April 30.
2. Dymid-The application rate was 6 pounds of Dymid 80W dissolved in 50 gallons of water as a spray. It was applied to 1-0 stock 10 days after germination was complete; again 2 weeks later, and at 6-week intervals after that until frost. On 2-0 stock, Dymid was applied April 20 and every 6 weeks thereafter until frost.
3. Treflan-The application rate was 1 pint of concentrate (44.5 percent of active) per acre in 40

gallon of water as a spray.

It was applied 10 days after germination was complete, again 2 weeks later, and every 6 weeks thereafter until frost. It was applied to 2-0 stock on April 20 and every 6 weeks afterward until frost.

The results of this part of the study were highly encouraging. Given the rates and techniques of application and the soil and climate conditions at Coeur d'Alene, none of the three herbicides caused increased mortality or any stunting of seedlings.

The weed control effectiveness data from this work is harder to interpret because of the variability in weed distribution over the nursery. Consequently, general averages were used and to simplify display of the data, composite results are presented in Table 1.

The results indicate that both "Dymid" and "Dacthal" were effective in weed control while Treflan was not. We should note that directions for use for both Dymid and Treflan specify surface incorporation to some degree for maximum effectiveness. Evidently, this is more true for Treflan than the other chemical. Later, small scale tests with Treflan around shrubbery at the Nursery indicated the chemical is

effective here if incorporated properly.

We concluded that Dymid and Dacthal are effective and safe weed control agents for use in this Nursery, especially since they are both relatively short-lived and degrade rather quickly, especially Dymid.

Operation Evaluation

For the 1971 field season, Dacthal and Dymid were both used on 1.0 and 2-0 seedbed stock in the Nursery. Half the 1-0 stock of each species was treated with one chemical, the other half with the other chemical. The 2-0 seedlings were treated in the same manner. Scattered small weed count and mortality plots were maintained throughout the season in the various species, age classes, and treatment areas. The resultant data, coupled with observation of overall weed populations indicated that Dacthal was highly variable in control effectiveness while Dymid was more constant in effect and more effective in its degree of weed control. Consequently, for the 1972 and 1973 seasons, Dacthal was abandoned in favor of Dymid. In the interim, Upjohn's Enide 50W form of diphenamid herbicide has been employed in the same relative strength of spray solution as with Dymid and found to be similar in effect.

TABLE 1.—General averages to simplify display of data used and composite results

First year seedlings (1-0)			
Herbicide	Weed control		Percent Control
	Treated plots	Untreated plots	
"Dacthal"	71	183	62
"Dymid"	135	579	77
"Treflan"	205	195	—
Second year seedlings (2-0)			
"Dacthal"	265	478	45
"Dymid"	268	512	48
"Treflan"	463	396	—

No evidence of accumulations of undesirable chemicals or toxicity resulting from the use of these diphenamid herbicides was found.

Diphenamid does have several drawbacks:

1. It provides a somewhat limited spectrum of weed control (the mustards, goatweed, dandelions, and all perennials are not affected.)
2. Since we apply it after the trees are up, weeds that germinated with the trees must be manually removed. Diphenamid kills germinating weed seeds in the surface layer of the soil.
3. It requires periodic application because the chemical is rapidly broken down.

Despite these drawbacks, diphenamid herbicide applied as described has reduced hand weeding at this Nursery by 70 to 80 percent resulting in much lower labor costs.

This report constitutes a summary of several years' work. More complete details can be obtained by writing the Coeur d'Alene Nursery, Route 1, Box 245, Coeur d'Alene, Idaho 83814.

NOTE: Articles in this periodical may contain information about pesticides. The following notations are offered for your protection:

Caution: Pesticides can be injurious to humans, domestic animals, desirable plants, and fish or other wildlife-if they are not handled or applied properly. Use all pesticides selectively and carefully as described. Follow recommended practices for the disposal of surplus pesticides and pesticide containers.

Warning: Recommendations for use of pesticides are reviewed regularly. The registrations on all suggested uses of pesticides in this publication were in effect at press time. Check with your County Agricultural Agent, State Agricultural Experiment Station, or local forester to determine if these recommendations are still current.

News & Reviews

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Soviet Tree Planting Pleases Md. Neighbors

Whatever course Soviet-American detente may take at the summit, it is thriving in the town of Centreville on Maryland's Eastern Shore. The reason, officials feel, may be trees.

Staff members at the Soviet Embassy in Washington are planting trees by the hundreds during weekends at Pioneer Point, the embassy's retreat on the Chester River.

The work is being done with the help of local forestry officials and the warm approval of the Soviets' Queen Annes Country neighbors.

"Tree planting is a custom in our country," said Vladimir Mikoyan, an embassy staffer who helped set out 2,000 loblolly pines and 50 walnut seedlings over the past two weekends.

Every parent teaches the child to plant at least one tree for the good of all people. It is a habit to plant trees wherever possible."

The project began last month when John R. Riley, regional forester for the state, and Jay Dunbar, county forester, received a routine request from a not-so-routine source.

According to Riley, he and Dunbar were contacted by four Soviet Embassy representatives, who invited them to Pioneer Point to discuss plans for tree planting based on a map of the estate drawn by Anatoly F. Dobrynin, the Russian ambassador in Washington.

Once at the retreat, Riley recalled, the Russians couldn't do enough for their American guests.

The foresters had shiskebab and shared lunchtime toasts of Russian vodka in the dining room of the estates's mansion house. One of the toasts, Riley said, was to Smokey Bear.

When the Soviets purchased 40 acres and the two main residences on the former John Jacob Rasco estate in 1972, there was some ill feeling among local residents. Today, there is little sign of strain between the two groups.

Mikoyan, who spends weekends at Pioneer Point with his wife and their 8-month-old daughter, noted that he has passed the same local man on the streets of Centreville two weekends in a row. On the second occasion, Mikoyan continued, he was greeted as an old friend.

"It was very nice," the embassy staffer said.

Riley said the Russians seem to want friendly relations with their Eastern Shore neighbors. "and what better way is there than planting trees?"

(from the Washington Star-News, April 1974)

"Oldest" Status In Question

New York Times quotes a Chinese professor of botany in Taiwan as claiming to have discovered a tree older than the Methuselah bristlecone pine in the Inyo NF. He says it is at least 6,000 years old. Located near Taipei, it was not identified by species.

Seedlings From Methuselah

Los Angeles Times reports the FS Institute of Forest Genetics at Placerville is now growing 48 seedlings from Methuselah, the bristlecone pine on FS land in the White Mountains near Bishop. The 4,500-year-old tree is considered the world's oldest living organism. This is one of the many projects by the lab described in the Times article.

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