

SIMAZINE WEED CONTROL

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Reducing weed control costs is a challenge for tree nurserymen. Even today a certain amount of hand weeding is still required. However, hand labor must be kept at a minimum if seedling production costs are to remain the same or be reduced. The solution to the problem seems to be the successful use of chemicals for weed control. The success of chemical weed control depends on finding the correct chemical, the correct rate and method of application, and the correct time of treatment.

We considered the use of Simazine because of its success elsewhere. The use of Simazine in transplant beds has proved successful at the Idaho State Tree Nursery, University of Idaho, where the nursery soil is silt loam. The Idaho Nursery is receiving 90-percent weed control with Simazine 80 W at the rate of 2 to 3 pounds per acre without damage to the seedlings.

We established six experimental areas in northern Utah in 1962, 1963, and 1964 to determine the rates of Simazine 80 W required to achieve satisfactory weed control. The soil in the experimental areas was loam to clay loam. A spray solution of 4 to 6 gallons of water per thousand square feet was applied with a small hand sprayer.

The tree species involved in the experiment were blue spruce, eastern red cedar, ponderosa pine, and Douglas-fir. The weeds present in the six areas were redroot, mallow, wild rye, Russian thistle, morning glory, prickly lettuce, ground cherry, June grass, crested wheatgrass, bromegrass, chickweed, dandelion, and milkweed.

Areas 1, 2, 3, and 4 were sprayed in November 1963, area 5 in May 1963, and area 6 in June 1964. This was the second growing season for the Christmas tree plantations in

areas 1, 3, 4, and 6, and the fifth growing season for the windbreaks in areas 2 and 5 (table 1).

The success of Simazine in conifer tree plantings depends on the proper penetration of chemical into the soil. The majority of the weed seed that germinates is in the upper 2 inches of soil, so chemical penetration to that depth only is desirable. Simazine is absorbed by the roots of the weed seedlings, and kills by interfering with the formation of chlorophyll.

Some chlorosis appeared in the ponderosa pine seedling beds during the summer of the first growing season when Simazine had been applied at rates of 1.25 to 1.75 ounces per 1,000 square feet in the fall. No chlorosis was present, however, with the 2.0 rate applied in the spring. Slight reduction in the growth rate of the affected ponderosa pine occurred, but by late fall normal color had returned to the seedlings. Heavy chlorosis in the ponderosa pine occurred in summer 1964 when the watering system was modified to a row-type system in areas 2 and 3 and the seedlings were watered weekly. This indicates that the heavy watering carried the chemical too deep into the soil. Ponderosa pine appears to be more sensitive to the chemical than blue spruce, eastern redcedar, and Douglas-fir--the other, three species in the study--so Simazine should be applied to it at lower rates or in the spring.

Simazine applied at higher rates serves as a soil sterilant. For this reason Simazine 80 W should be applied at the rate of 6 to 8 ounces per 1,000 square feet along roadways, buildings, waterlines, and walkways. The length of time that the soil remains sterile depends upon amount of moisture and soil type.

TABLE 1.--Summary of areas sprayed with Simazine, rate of application, and methods used

Area	Species	Method of irrigation	Rate of application ¹	Average No. of weeds per square foot	
				8-1-1963	9-1-1964
			<i>Ounces</i>	<i>Number</i>	<i>Number</i>
1.....	Ponderosa pine	Row irrigation	0.75	4	6.5
	Douglas-fir		1.25	3	4.5
	Blue spruce		1.75	3	2.6
2.....	Ponderosa pine	Water in basin	.00	32	36.0
	Eastern red-cedar	around trees	1.50	0	.0
			.00	63	66.0
3.....	Blue spruce	Sprinkle	1.00	0	--
	Douglas-fir	irrigation	.00	42	--
4.....	Blue spruce	Sprinkle	.75	10	--
	Douglas-fir	irrigation	1.25	2	--
			.00	44	--
5.....	Ponderosa pine	Water in basin	2.00	2	2.5
	Eastern red-cedar	around trees	.00	67	62.0
6.....	Blue spruce	Row irrigation	1.25	--	.4
			.00	--	8.2

¹ Per 1,000 square feet.

The residual effects of the chemical depend upon the amount of chemical used, type of soil, soil organic matter content, and the amount of moisture received. Simazine when applied at the rate of 0.75 ounces per 1,000 square feet will lose most of its weed-controlling capability after 2 to 4 months with moist conditions. At the rate of 1.0 to 1.75 ounces per 1,000 square feet, it provides good control for 1 to 2 years.

Simazine applied at rates higher than 1.25 ounces per 1,000 square feet gives little additional control of annual weeds. Only ground cherry and morning glory were not effectively controlled by the chemical. With a reduced number of weeds present, those not affected by the chemical grew at a faster rate because of reduced competition.

Treatment can be made during almost any season of the year; however, fall is usually

recommended where winter annuals create a problem. Clean cultivation before spraying to kill the perennial weeds will improve the overall weed control. Early spring or summer application after clean cultivation provides good control, but irrigation or rain is necessary to move the chemical down into the weed root zone.

Simazine is unique in that it is economical, needs to be applied only once a year, can be applied at almost any season, and can be sprayed directly over young trees without damage. Application of Simazine in the six study areas in Utah provided 77- to 100-percent weed control. Weed control costs were reduced 50 to 75 percent. We believe that Simazine and other chemicals certainly have a place in tree nurseries in reducing weed control costs.