Controlling Weeds Under Trees

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The use of the combination of post and pre-emergence herbicides to control weeds under trees in nurseries, park areas, golf courses, and other landscape situations is increasing rapidly.

Herbicide tests designed to evaluate five combinations of post emergence herbicides with Simazine in the control of weeds beneath trees were conducted in a commercial nursery in New Carlisle, Ohio during the summer of 1971.

The specific objectives of these experiments were to ascertain the extent of weed control, degree of weed regrowth and to observe any phytotoxicity.

Treatments were sprayed on a 2½' band in a row of newly planted Radiant Crabapples on June 11, 1971 with weeds 6-15" in height. The area between the rows was maintained in sod and mowed periodically. Results were evaluated on July 15 and August 17, 1971.

TREATMENT — RATE AIA	RATING	COMMENTS
Daconate 4# + Simazine 2#	Poor	Extensive smartweed and Flower-of-An-Hour present
Amitrol T 2# + Simazine 2#	Good	Lambsquarters present
Amizine 7#	Good	As above with lambsquarters and smartweed recovering
Phytar 560 2# + Simazine 2#	Good	Lambsquarters recovering
Paraquat 2# + Simazine 2#	Excellent	Nearly complete control

The observations in July were rated as indicated below with the following values:

Excellent—Nearly all annual weeds controlled.

Good—Acceptable control, 1 or 2 species uncontrolled.

Fair—Acceptable, with several species uncontrolled.

Poor—Unacceptable weed control.

Two months following application the Simazine in all plots was continuing to effectively control the growth of annual weeds. Those existing weeds which were not completely killed with the post-emergence spray had regained vigor and were quite large, particularly the lambsquarters and smartweed.

There was no evidence of damage to the foliage or trunk of the Crabapples with any of the treatments. The leaves of the suckers which were sprayed were injured or defoliated, however, the woody stem growth remained.

The most effective treatment in this study for the control of weeds beneath trees was the combination of Paraquat and Simazine. The Phytar 560 + Simazine combination was slightly more effective than the combinations of amino triazole and Simazine.

USDA Scientists Study Air Pollution

Everybody talks about how air pollution affects people, but polluted air also injures crops and other plant life. With a view to reducing or eliminating this damage to plants, scientists in the Agricultural Research Service are making intensive studies of the ways in which pollution injury occurs and in finding ways to reduce grower losses.

The need for such studies is becombing critical. Air pollution injury to vegetation is increasing across the United States, according to Dr. Howard E. Heggestad, plant pathologist and Head of the ARS Plant Air Pollution Laboratory in Beltsville, Md. It is currently causing losses estimated at more than half a billion dollars annually . . . and these losses are rising.

In 1969, 281 million tons of pollutants were released into the air over the United States. Many Americans — most notably the 150 million urban residents — have to live with this polluted air for most of the year.

Although the problem is a general

one, some areas are affected to a greater extent than others. The major pollution problem in the eastern United States, for example, extends generally from North Carolina to Massachusetts. However, it seems to be most severe within 100 miles of the coastline.

In line with this observation, Dr. Heggestad found that levels of plant-damaging oxidants, primarily ozone in Washington, D. C., doubled between 1961 and 1970. The problem became most acute during four days of severe air pollution in late July 1970. Following the episode, the National Park Service reported foliar injury on a wide variety of tree species in Washington, D. C. when leaves began to yellow and turn brown. Also, in early June 1971 an episode occurred when relatively heavy concentration of photochemical smog were formed in the atmosphere. These toxicants are created by the action of sunlight on products of fuel consumption (nitrogen dioxide and unburned gasoline).

Dr. Heggestad and his associates also found that plants grown under humid conditions in the eastern United States are much more sensitive to air pollutants than those grown in the arid West. He also noted that pollution damage to vegetation varies by season. More damage occurs in summer months, primarily because of higher temperatures which favor photochemical reactions and the production of ozone and other oxidants.

Research studies representing a scientific effort to head off the air pollution threat to plants have been underway since 1968 at the Plant Air Pollution Laboratory and several field stations. This research focuses on the mechanisms of air pollution damage to ornamental plants and food crops, the role of trees in removing pollutants from the air, and the development of pollutant-resistant plants.

Among the more promising approaches being taken in the Laboratory's research programs are experiments to determine which plants are most resistant to — or tolerant of — air pollution.

Even within a given plant species, some forms have shown more resistance than others. Furthermore, some plants exhibit greater resistance at certain stages of development than at others. Slow growing plants are generally more resistant than soft, rapidly growing plants. By the same token, young leaves and older leaves are usually more resistant than recently matured leaves.

Other specialized studies concerning the effects of air pollutants on plant life are being conducted by Dr. C. L. Wilson, plant pathologist, and Dr. B. R. Roberts, plant physiologist, at an ARS field facility — the Shade Tree and Ornamental Plant Laboratory in Delaware, Ohio. One result of this work is a finding that certain tree species take up more gaseous pollutants into their leaves than other species. Although this usually injures the plants, they continue to absorb the toxic gases as long as the leaf tissue remains functional. Because their needles do not drop off, evergreen-type plants take up pollutants year-round. Uptake of the pollutants may cause growth reduction and some quality changes.

Removal of pollutants by plants helps reduce the level of the pollutants in the atmosphere. Research at USDA in Beltsville, Md. and Stanford Research Institute in California, show that soil microbes remove pollutants such as ethylene and carbon monoxide which are not removed by higher plants.