

USE OF HERBICIDES AROUND YOUR TREES¹

by John A. Meade

Abstract. Trees and herbicides (weed killers) can co-exist in harmony but occasionally injury occurs. The broadleaf lawn weed killers or brush controls are sometimes at fault but more often it is the total vegetation material which moves from the site (or tree roots grow into the site) and hence are absorbed. Once in the tree, little can be done to stop the action. Best advice is don't fertilize or water. These encourage the tree to make new growth and that's where the herbicide is acting. On the good side, herbicides can safely be used to trim the base of trees thus allowing a 6-8" band of vegetation free area around the base to keep the mowers away.

There are several ways in which herbicides and trees may interact. Some of these are accidental and may cause injury to trees; others are planned and there are herbicides that can safely be used around the base of trees.

The major categories of herbicides that might be used in the vicinity of trees are: 1) preemergence crabgrass preventers, 2) postemergence crabgrass killers, 3) broadleaf turf herbicides, 4) cleanup materials, and 5) soil residual materials (TVC).

Preemergence Crabgrass Preventers have been used on lawns for years and have been shown to be safe. They have no activity on tree roots. The compounds used for this purpose are:

Balan (benefin) Elanco

Betasan (bensulide) Stauffer Chemical Co.

Dacthal (DCPA) Diamond-Shamrock

Ronstar (oxadiazon) Rhone-Poulenc

Tupersan (siduron) E.I. DuPont

The names in parenthesis are generic names and are included because companies other than basic manufacturers sometimes formulate them or use their own label and normally use only the generic name. Most of these are also used for weed control in ornamentals. They are usually applied only one time during the year in early spring prior to germination of annual grasses.

Postemergence Crabgrass Killers are applied to

turf areas after the crabgrass has germinated. They have not caused injury to tree roots. They are all organic arsonates and include:

Disodium methylarsonate DSMA

Monosodium methylarsonate MSMA

Calcium acid methylarsonate CAMA

These are formulated by many companies and in general are labeled as "crabgrass killers." This form of arsenic is relatively non-toxic to humans and pets. They are applied later in the season but even under hot summer conditions no volatility damage has been reported.

Broadleaf Turf Herbicides are capable of injuring trees and have been known to do so when misapplied. The most commonly used materials are:

2,4-D

MCP — mecoprop

Banvel — dicamba

These are often used in combination with each other and all three together. The 2,4-D and MCP are not normally absorbed and translocated by tree roots. The dicamba, however, does enter tree roots and has caused damage. The rates being used now are low enough that tree injury occurs much less frequently than in the past.

Besides root absorption there are 2 other ways that these broadleaf herbicides interact with trees. One is movement of spray particles from the sprayer to the tree leaves. This occurs when the spray particles are very small and light or when the wind speed is excessive. These spray droplets are absorbed and translocated throughout the tree, usually to actively growing tissue. Hence, injury shows up in the young leaves. The second method of interaction occurs when spray applications are performed during period of high air temperature. The herbicides are deposited on the weed foliage but then, in response to the high temperature, evaporate and move as a vapor through the air to be intercepted by tree leaves. There are means of reducing this evaporation in-

1. Presented at the annual conference of the International Society of Arboriculture in Indianapolis, Indiana in August 1983.

cluding less volatile formulations and avoiding spraying when temperatures exceed 85-90°F.

The degree of injury to the tree from these different methods is dependent on the amount of herbicide intercepted, the growth activity of the tree and the species. Once the material is absorbed there is no treatment to alleviate the symptoms except to avoid watering and fertilization. Removal of the tree should wait the second year because often a tree will recover and over a period of one to two years will regain its former appearance.

Cleanup Materials are used to remove existing weeds without injury to trees. These have little or no soil activity and so are not injurious to roots. they are nonselective so care should be taken to avoid application to desirable plants. They include:

Paraquat/Gramoxone

cacodylic acid (also known as dimethylarsinic acid)

Amitrol-T

Roundup

The first two, Paraquat and cacodylic acid are not translocated within the plant. They will kill most green tissue on contact. The Paraquat is the only one of the herbicides that is quite toxic to the applicator and should be handled with care. Roundup and Amitrol-T are translocated and are thus more active on perennials such as quackgrass and woody plants. All of these have little or no activity in the soil so they can be safely used around trees. They have been used extensively in turf renovations because the treated areas can be seeded or sodded within a few days. As with the broadleaf turf herbicides, drift of spray particles can cause extensive damage to desirable plants. Some of this injury shows up soon after contact but with Roundup, injury may not show up until the next year and then will cause leaves to be very much reduced in size and to cause leaves to grow on hard wood where they are not normally produced.

Soil Residual Materials are capable of causing great injury to trees. They are sold under a wide variety of trade names. Those marketed by major manufacturers and formulators are concentrated and need to be diluted according to directions. Several formulators sell a pre-diluted mixture for application directly from the container. This is a

"convenience" item and the purchaser pays for that convenience. These "Ready-To-Apply" herbicides are usually sold by non-pesticide companies and the buyer often is not educated as to the danger of using these "convenience" herbicides in the vicinity of trees. These compounds often contain prometon (Pramitol) or bromacil (Hyvar). These are useful compounds when used properly.

Other herbicides that are injurious to trees include Spike from Elanco. This herbicide has taught us a lot about the length of tree roots. When applied on a given area, it has killed trees many feet from the site of application. The adage, "treat beyond the drip line" may apply to broadleaf turf herbicides but not to those more potent herbicides such as Pramitol, Hyvar, Spike and Tordon.

A special word about Pramitol (prometon). This is one of the ingredients in the herbicide, Triox, sold by Ortho. The wide-spread marketing patterns of Ortho make this compound one of the most widely available materials. Hence, when investigating tree mortality, it would be wise to look about for or inquire about Triox. My Mentor, Spencer Davis, often told me that it takes a great deal of detective work to solve tree mortality problems. Adroit questioning plus casual glances into the garage may reveal evidence of what actually happened.

Herbicides and tree interactions are not all bad! To quote Spencer Davis again, "One of the leading causes of sick trees is the damage inflicted by an over zealous person mowing too close to the trunk." The answer to this very serious problem is to keep the mower away from the base of the tree by creating a vegetation-free ring around the tree. This is accomplished by spraying or wiping an herbicide on the existing vegetation. Those materials safe for this purpose are:

Roundup

Paraquat

cacodylic acid

Amitrol-T

Most of the research has centered around the use of Paraquat and Roundup. The ability to kill perennials has given Roundup an edge in this area. These materials can be used at any time during the year but spring or late fall treatment results

in fewer "brown-out" problems. These compounds can be applied with a sprayer or wiped with a sponge or rolled with a paint roller. Since neither Paraquat or Roundup has activity on germinating seeds the killed areas will rapidly fill in with annuals. To prevent germination of these annuals, we suggest the use of a preemergence herbicide in with the Roundup. Professor John Ahrens of the Connecticut Agricultural Experiment Station, Valley Laboratory, Windsor, Connecticut, provides these formulas for use in a sprayer to control existing germination of weed seeds.

Dosages in Cups of Product for
3 Gallons of Water

*Landscape or other tree plantings where runoff
into turf is not a problem*

Princep 80W — 1/2 cup +
Surflan 75W — 1/2 cup +
Roundup — 3/8 cup

*Plantings where runoff onto turf could be a
problem*

Surflan 75W — 1 cup + Roundup — 3/8 cup

Use a hollow core or a flat nozzle. The vegetation should be sprayed just to wet. Since these are combinations of wettable powders, they would not work well in a wiper. A combination of Roundup + Betasan could be used in the wiper.

How big a circle to make? I favor a 4-6" band around the tree. This gives adequate protection from the mower and still doesn't look unsightly.

Trees and herbicides can co-exist in the environment but care must be exercised to bring them together in a proper manner.

*Specialist in Weed Science
Soils and Crops Department
Rutgers University
New Brunswick, New Jersey 08903*

ABSTRACT

FUNK, R. and R. RATHJENS. 1983. **Fertilizer guide for trees.** Weeds, Trees & Turf 22(12): 32-35, 37.

Fertilization of landscape trees and shrubs is important because they are often grown out of their native habitat and are subject to adverse soil and environmental conditions. Compacted soils, poor drainage, restricted root areas, highway salts, air pollutants, and competition from turfgrass contribute to plant stress and increase the importance of regular fertilization to maintain healthy growth. Vigorous, well-maintained trees are more resistant to many insect and disease pests, are more attractive, and a greater asset to properties. Trees absorb and utilize at least 13 elements from the soil. Of these, only nitrogen, phosphorus, and potassium are normally considered when fertilizing. Supplemental nutrients, such as iron and manganese, may be necessary for certain species growing in alkaline soils. Nitrogen is required in greater amounts than the other nutrient elements and is more often deficient in soils. Plants generally respond to applications of nitrogen, often with dramatic improvements in shoot growth and leaf color. Heavy applications of nitrogen alone may stimulate shoot growth more than root growth, disturbing the natural root:shoot ratio. Soil analysis for nitrogen is not particularly useful due to its transitory nature in soils and the large amount extracted by plants. The need for supplemental phosphorus and potassium is difficult to determine since they normally do not produce a visible response except on young or newly transplanted trees and shrubs.