

CUTT

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Conducting A Bioassay For Herbicide Residues

What is a Bioassay? A bioassay is a technique for determining if herbicide (or other chemical) residues are present in soil or water at high enough concentrations to adversely affect plant growth. This is a simple and direct method to determine if it is safe to plant turf or other landscape plants into areas previously treated with herbicides or into soil with an unknown history of herbicide use. ■

In its simplest form, a bioassay uses susceptible plants to identify if the herbicide is present in concentrations high enough to inhibit germination and/or growth. However, scientists sometimes use sensitive bioassays to estimate herbicide concentrations in soil and water, and to identify unknown herbicide residues from the symptoms of injury.

When is a Bioassay Warranted?

When turf is damaged by wear or other pests, residual herbicides, such as those applied for crabgrass control, can prevent turf emergence and establishment. Top soil brought onto the site often comes from abandoned farm land. These soils often contain herbicide residues, particularly atrazine, which can injure turf seedlings. Additionally, if you suspect that a herbicide contaminated product is responsible for some unusual turf injury, both the affected turf and the product can be tested.

How to Conduct a Bioassay

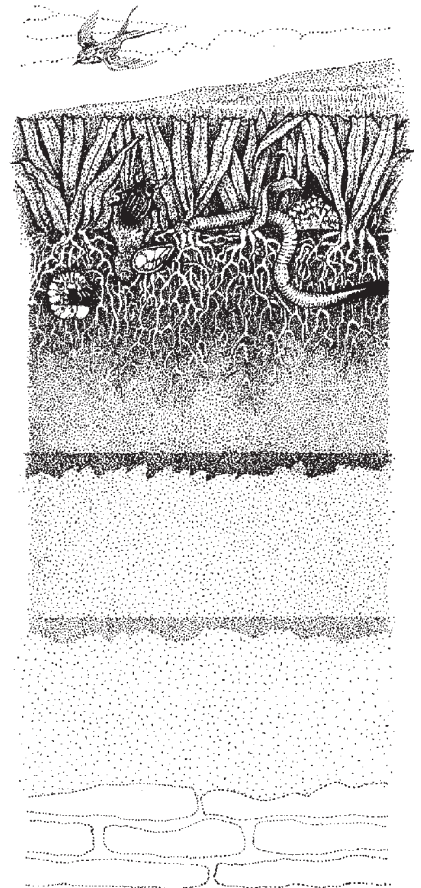
1. *Collect representative soil samples.*
 - a. Sample areas suspected of having herbicide residues as well as areas which are known to

be free of herbicides. You will use the herbicide-free soil for comparison.

- b. Take separate samples from high spots, low spots, and different soils. Also sample areas where sprayer overlap could have over-dosed the turf.
 - c. Take soil cores. Remove the thatch and keep only the upper two inches of soil. Most residual herbicides will be bound in the upper two inches of soil. On sandy soils sample to four inches.
 - d. Take several samples from an area and combine them. You need enough soil to fill a pot in which you will grow the bioassay plants (I suggest a 3 to 4 inch pot).
2. *Select the bioassay species.*

In general, the best bioassay species is the one you intend to grow. However, turfgrasses sometimes do not grow well indoors in pots, nor do they respond rapidly or decisively enough to be reliable bioassay species. Therefore, it is often advisable to select other species. For general bioassays, oats, cucumber, and tomato are

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