



# Using Preemergence Herbicides for Weed Control in the Home Landscape

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Weeds are constant (and unwanted) companions in our gardens and landscapes. Some years, when we get a bit of extra moisture and the temperatures are just right, we get a bumper crop in our gardens as well as in vacant lots and disturbed soil areas along roadsides and other bare areas. Where do these weeds magically come from? Their seeds have been stored in the soil for years, waiting for the right conditions to germinate and grow. If your weed problem is major, you may consider the use of a product called a preemergence herbicide to control these unwanted germinating seeds.

## What are preemergence herbicides, and how are they used?

Herbicides are chemicals that kill plants. No single herbicide will kill every type of weed, unfortunately, so it's essential to match the product to the specific weed problem. Some herbicides are applied to actively growing plant foliage and are referred to as postemergence herbicides.

Preemergence herbicides, on the other hand, are applied before weed seeds germinate. They are used to control annual grass and broadleaf weeds. These products are applied to the soil, often as dry granules and sometimes as a liquid spray, and are then watered into the top inch or so of soil. Generally, at least one-half inch of water is necessary to move the product into the soil, so the average rainstorm in western Nevada (0.26 inches) is not enough. Gardeners will need to use a hose or sprinkler to water in the product thoroughly.

## How do preemergence herbicides work?

It's a common misperception that preemergence herbicides kill seeds directly. Instead, when sprouting seeds encounter the herbicide, cell

### Tips for using preemergence herbicides effectively:

- Apply the product before weed seeds germinate.
- Remove any dead vegetation, trash or other debris from the site before applying the product.
- Read and follow label directions carefully and completely. For most products, you must water it into the soil. If you don't, it won't work!
- Make one application in the fall to control winter annuals, and another in spring to control summer annuals. Apply when fall rains start in order to control next year's crop of winter annuals.
- Avoid disturbing the soil in the application area to avoid holes in the chemical barrier. Traffic from dogs, vehicles or other sources across the treated area can cause the application to fail.
- Don't use them in areas where you plan to grow plants from seed. Preemergence herbicides affect many germinating seeds, not just those of weeds.

division in the young root system is inhibited, resulting in death of the young seedling. These products generally do not control established vegetation, so it's important to remove existing weeds from the site prior to applying the preemergence herbicide.

The active period for most products varies from three to 12 months or more. Read the product label to determine the persistence. In dry soils, preemergence herbicides break down more slowly and will likely remain active for the specified period.

The label will also specify the sites and situations in which these products may be used. Some preemergence herbicides are specifically designed for industrial sites such as roadways, railroad yards and unplanted or non-crop areas. Plant damage or death of established vegetation may result if these products are used inappropriately. Other products are intended for application around specific types of plants and cannot be applied around plants not listed on the label. Check the label before applying preemergence herbicides to areas that you plan to plant with seed to determine how long you must wait to avoid damaging desirable seedlings. Also, dirt clods, weed residues, prunings and trash must be removed from the site before applying preemergence herbicides.

It's important to keep in mind that preemergence herbicides, for the most part, are not very discriminating, and affect many seedlings equally, whether weeds or desired plants. In areas where you are planning to establish plants from seed, such as a lawn or garden bed, avoid the use of these products unless you can leave the area fallow for a sufficient time period that the herbicide will have degraded. Study product labels to determine effectiveness on the weed species of interest, and potential damage to desirable species.

Also consider the sites in which you're applying the product. Some preemergence herbicides cannot be used with some food crops, for instance, and others may damage certain types of adjacent vegetation. The label will advise you on these issues. A

comparison of products is found in Table 1 (see next page).

### **When should you apply a preemergence herbicide?**

Since preemergence herbicides must be applied prior to weed seed germination, correct timing of application is essential. Some of our most prevalent weeds, including cheatgrass and mustards, sprout in the fall in response to onset of seasonal precipitation. These weeds are called winter annuals, and they get a head start on other plants by sprouting in the fall, lying dormant through the winter, and then growing very early in the spring. Because they have already established their root system in the fall, a spring preemergence herbicide application will not control them. Instead, a fall application is needed. Wait for the onset of fall rains and incorporate the herbicide according to label directions in October or November. If there are no fall rains, apply at this time and water the herbicide in thoroughly according to label directions.

Depending on how long the product is active, a second application in mid-March to mid-May, or when forsythia have bloomed and the petals are falling, is needed to control lawn weeds such as dandelions, or summer annual weeds such as puncturevine and tumbleweeds.

### **Is there a natural product I can use? Is the product approved for organic production?**

Iowa State University (ISU) has studied the use of corn gluten meal as a preemergence herbicide and fertilizer. The product stops roots from forming in germinating plants. It is essential that a short dry period be maintained after seeds have germinated in order to kill the seedlings. It is not appropriate for use in seeded garden crops, but can be used with transplants or mature plants. ISU suggests the product will be effective for five to six weeks after application. In addition to killing germinating weeds, the corn gluten meal slowly releases nitrogen into the soil as it decomposes, feeding existing plants.

**Table 1. Common preemergence herbicides and their properties (data from Sensiman, 2007)**

Active ingredient	Sample brand names*	Persistence (average field half life)	Leaching concerns	Sites for use	Weed species controlled
<b>Corn gluten meal**</b>	Preen Organic; also check with garden shops or online vendors	(product labels suggest 4-6 week active period)		Lawns, vegetable transplants that have true leaves and are 2-3 inches tall	Grass and broadleaf weeds in established lawns and in vegetable beds, including annual bluegrass, clover, crabgrass, creeping bentgrass, green and yellow foxtail, smart weed, dandelions, redroot pigweed, purslane, lambsquarter, foxtail, barnyard grass, Bermuda grass (see product label). Does not control plants that spread from living plant parts, such as rhizomes.
<b>Dichlobenil</b>	Casoron 4G, Lilly Miller Casoron Granules, etc.	60 days	Moderate potential for leaching to groundwater	Fruit and nut trees, woody ornamentals, non-crop areas	Many annual grass and broadleaf weeds and certain biennial weeds. Also used to control certain perennial weeds, including Canada thistle, quackgrass and Russian knapweed (see product label).
<b>Oryzalin</b>	Surflan, Weed Impede, Oryzalin, etc.	20 – 128 days		Non-bearing fruit and nut crops, vineyards, rights-of-way, landscape nurseries	Annual grasses and many broadleaf weeds, including puncturevine, knotweed, pigweed and lambsquarters (see product label). Provides suppression only for some broadleaf weeds, including prickly lettuce and common mallow.
<b>Trifluralin</b>	Green Thumb Garden Weed Stopper, Miracle-Gro Garden Weed Preventer, Preen Garden Weed Preventer, Treflan TR-10, etc.	45 days		Crops, nursery stock, ornamental shrubs, ground covers, established flowers, under paved surfaces	Many annual grasses and broadleaf weeds, including foxtail species, cheatgrass, sandbur, knotweed, common lambsquarters, pigweed species, puncturevine and common purslane (see product label)

\*Brand names are used for illustration purposes only, and do not constitute an endorsement by Cooperative Extension.

\*\*Minimum risk pesticide exempt from federal registration under FIFRA 25(b). After application, must be watered in and then a short drying period is essential to inhibit root formation in sprouting weeds. See [http://www.epa.gov/opppppd1/biopesticides/ingredients/tech\\_docs/brad\\_100137.pdf](http://www.epa.gov/opppppd1/biopesticides/ingredients/tech_docs/brad_100137.pdf) for more technical information.

There are many rules that govern how organic food is grown, and which products can be used in organic production. The Organic Materials Review Institute (OMRI) maintains a searchable list of products that satisfy USDA organic standards at [www.omri.org](http://www.omri.org). It lists corn gluten as a pesticide that can be allowed with restrictions. Each specific product containing corn gluten must be separately evaluated for compliance.

### **What risks should I consider when using preemergence herbicides?**

Read the product label for specific advisories and safety procedures. Note the signal word. The signal word "Caution" indicates the least toxic product. Use appropriate personal protective equipment to protect yourself from harm. Check the label to determine what you'll need to wear when mixing a product or making an application.

As mentioned earlier, most preemergence herbicides are not very selective, and affect many types of germinating weed seeds (see Table 1). They are unsuitable for use in areas where the landscape will be seeded.

Preemergence herbicides have low water solubility and stick (adsorb) to the surface of soil particles, so they tend to stay where they are applied, unless

wind, water or some outside activity moves the soil. Movement with water, or leaching, is a greater risk in sandy soils. Leaching can contaminate surface and ground water. Products that have a longer persistence have a greater possibility of contaminating water.

### **References**

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