Using herbicides—chemicals that kill plants—in the home garden should be a last resort for controlling weeds. When necessary, herbicides should be used as a supplement to mechanical and cultural practices such as hoeing, pulling, cutting, fertilizer management, mulching, etc. Herbicides should not be a replacement for these methods. For many reasons, mechanical and cultural methods will not be possible for all gardeners under all circumstances. Since there are many herbicides registered for use in home gardens in Washington, it is necessary to know what they will do in various situations. Several herbicides are available for use on home grounds. Only a few of these will be discussed in this publication. More complete information is updated annually in the *Pacific Northwest Weed Control Handbook*.

It is important to remember that herbicides are plant killers. Unless you use them with extreme care, you may kill or seriously injure plants you plan to grow or want to keep. Always read the label of every herbicide carefully and thoroughly before each use.

### CONTROL METHODS

Essentially four separate methods exist for using chemicals to control the growth of undesirable plants on home grounds. They are categorized by the way the chemicals are applied, and the way they affect plants.

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Selective herbicides applied to foliage (post-emergence herbicides).</td>
</tr>
<tr>
<td>2</td>
<td>Selective herbicides applied to soil (pre-emergence herbicides).</td>
</tr>
<tr>
<td>3</td>
<td>Nonselective herbicides applied to foliage (both contact and systemic types).</td>
</tr>
<tr>
<td>4</td>
<td>Nonselective persistent herbicides applied to soil (soil</td>
</tr>
</tbody>
</table>
Selective Herbicides Applied to Foliage

A number of formulations are available. Selective herbicides are usually chemicals absorbed by plant tissues and moved within the plant's vascular system. They disrupt the plant's normal growth, causing it to die prematurely. Some kill broadleaf plants, but do not adversely affect grasses. Others kill grasses, and may not seriously injure some broadleaf plants. Still others kill certain plant species, but are ineffective on others. To use this type of weed killer safely, you need to know what weed species you want to kill, and to select a herbicide that will kill it without damaging the desired plants or crop.

Foliar-applied selective herbicides are useful chemical tools for controlling broadleaf weeds in lawns, and grass weeds among certain broadleaf plants. Apply them carefully to prevent accidental drift or volatilizing of the chemical onto or into nearby susceptible, desirable plants.

Problems and Chemicals Available

Herbicides 2,4-D, MCPP, MCPA, and dicamba will kill most broadleaf weeds in lawns and, if allowed to drift, can injure or kill adjacent plants. Be extremely careful using any product containing dicamba, since this chemical can injure or even kill susceptible trees and shrubs growing in or near lawn areas. It may be absorbed by the roots of these plants under the turf. For specific instructions on controlling weeds in lawns, consult EB0607, Lawn Weed Control.

Fluazifop (Grass-B-Gon) and sethoxydim (Poast) are foliar applied herbicides that will control annual grasses and suppress or control certain perennial grasses growing among broadleaf plants. They may be applied over the top of plants listed on the label.

Selective Herbicides Applied to Soil

These herbicides kill germinating seedlings among established plants. Pre-emergence herbicides usually remain in the upper soil layer where they are taken in by weed shoots or roots. The seedlings absorb enough to be killed. These herbicides will control many annual weeds in perennial plants, such as annual grass in lawns, and annual weeds in woody ornamentals and caneberry plantings. Some chemicals can be used to control weeds among certain vegetables and flowers.

Problems and Chemicals Available

Pre-emergent herbicides pendimethalin and bensulide control germinating annual bluegrass and crabgrass in lawns. They must be applied before the grass germinates. They will also inhibit or prevent the germination of desirable grass species if such seed is planted in soil treated with either chemical.

East of the Cascades, dichlobenil (Casoron) will control germinating weeds among woody plants and also will control perennial weed
regrowth (e.g., horsetail, quackgrass, Canada thistle).

Oryzalin (Surflan), pendimethalin, and trifluralin (Treflan) also are applied to weed-free soil and will control many weeds among many desirable plants. Consult labels for weeds and tolerant species.

### Nonselective Herbicides Applied to Foliage (Contact and Systemic)

Nonselective herbicides injure or kill most plants they contact. If used according to label instructions, they will not leave any long-lasting damaging residues in the soil. After a waiting period (see labels), treated areas can be used again.

These chemicals normally are used to destroy emerged weeds prior to planting desirable species. If carefully directed or applied, some (like glyphosate [Roundup]) can be used on weeds such as morning glory growing on or between good plants; however, they will injure or kill most desirable plants if they get on their foliage.

Contact herbicides (like diquat [Knock-Out] and glufosinate [Finale]) will kill only the tops of perennial weeds, which will then regrow from the roots; contact herbicides will, however, kill entire annual weeds. Systemic types are translocated via the vascular system of perennial weeds and will kill both tops and roots.

### Problems and Chemicals Available

- **Glyphosate (Roundup, Kleenup).** Systemic type. Controls a wide range of annual and perennial grasses and broadleaf plants, but in many cases requires very precise timing to be effective.

- **Triclopyr (Brush-B-Gon, and Blackberry and Brush Killer).** Systemic type. Controls many woody broadleaf plants when applied to foliage or cut stems. Somewhat selective, since it is safe around grass species.

- **2,4-D or trimec.** Systemic type. Controls many broadleaf herbaceous and woody weeds. Will not control grass species.

- **Diquat (Knock-out ) and glufosinate (Finale).** Contact type. Controls annual grasses and broadleaf weeds. Perennials will regrow from roots.

- **Herbicidal soap.** Contact type. Controls annuals. Perennials regrow from roots.

A broad-leaf herbaceous weed controlled with glyphosate (Roundup, Kleenup). Apply as a coarse spray when the plants are in active growth and have reached the bud to early flowering stage.

### Nonselective Persistent Herbicides Applied to Soil (Soil Residuals or Sterilants)

Blackberries, Poison Oak and Ivy, Broom, Morning Glory, Bamboo, and other Weed Grasses, Brush, etc.

Japanese knotweed (False Bamboo).
Nonselective herbicides in this class are only useful where no vegetation is desired, such as on driveways, walks, next to foundations, or along fences. These chemicals will kill all plant growth and remain active in the soil for a very long time, sometimes for several years. If roots of desirable plants are in the area, or if soil from treated areas is carried to areas of desirable plants, severe injury or death will result, depending on the herbicide.

**Problems and Chemicals Available**

Prometon, monobor chlorate, sodium chlorate, sodium metaborate. Check labels for precise usage.

**Special Problems and Chemicals Available**

2,4-D, glyphosate, and triclopyr may be applied full strength to freshly cut stumps of broadleaf woody plants to kill the root systems.

Elemental zinc. This must be applied very carefully to avoid drift to desirable landscape plants, which could be injured or killed upon chemical contact. Follow label instructions.

It is illegal for anyone not possessing an aquatic pesticide spray applicator's license to buy or to apply any pesticides to water environments in the state of Washington except for swimming pools and self-contained fish ponds.

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Originally by George Pinyuh, former Washington State University Cooperative Extension area horticulture agent, Seattle; revised by Robert Parker.

**Warning.**

Use pesticides with care. Apply them only to plants, animals, or sites listed on the label. When mixing and applying pesticides, follow all label precautions to protect yourself and others around you. It is a violation of the law to disregard label directions. If pesticides are spilled on skin or clothing, remove clothing and wash skin thoroughly. Store pesticides in their original containers and keep them out of the reach of children, pets, and livestock.

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**Weed Treatments and Times of Application for Home Landscapes**

<table>
<thead>
<tr>
<th>Weed</th>
<th>Cultivation(^1) (Soil drying)</th>
<th>Plastic mulch with bark</th>
<th>2,4-D</th>
<th>Triclopyr</th>
<th>Glyphosate</th>
<th>Dichlobenil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual weeds</td>
<td>any time</td>
<td>any time</td>
<td>vegetative</td>
<td>effective on some</td>
<td>spot treat</td>
<td>midwinter</td>
</tr>
<tr>
<td>Quackgrass</td>
<td>dry season(^2)</td>
<td>any time(^4)</td>
<td>not effective</td>
<td>not effective</td>
<td>May—active growth</td>
<td>midwinter</td>
</tr>
<tr>
<td>Field bindweed (morningglory)</td>
<td>any time</td>
<td>any time</td>
<td>prebloom treat 2 to 3 times a year(^2)</td>
<td>active growth</td>
<td>fullbloom(^2)</td>
<td>midwinter</td>
</tr>
<tr>
<td>Blackberry</td>
<td>not effective</td>
<td>not effective</td>
<td>growing</td>
<td>active</td>
<td>September</td>
<td>not effective</td>
</tr>
</tbody>
</table>
Canada thistle  ant time  any time  prebloom  active growth  early to mid-bloom  midwinter
Dandelion  (common and false)  any time  any time  growing season  active growth  any time (active growth)  midwinter
Poison-oak  any time  any time  growing season  active growth  midsummer before leaves turn red  not effective
Horsetail rush  dry season  any time  partially effective  not effective  not effective  midwinter
Yellow nutsedge  dry season  any time 4  not effective  not effective  before mid-June3  midwinter
Curly dock  any time  any time  growing season  active growth  prebloom  midwinter

1 Cultivation and complete hand removal every 2 to 3 weeks will starve perennial weeds and eventually cause death in 2 or more years.

2 Infestation suppressed.

3 Infestation suppressed slightly.

4 A woven mat is more effective against quackgrass and yellow nutsedge because it prevents emergence of sharp-pointed rhizomes except around plant holes.

Weed Control Options for Home Gardens and Orchards

<table>
<thead>
<tr>
<th>Weed management option</th>
<th>Vegetables*</th>
<th>Berries*</th>
<th>Tree fruits*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultivation or plowing</td>
<td>yes</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>Plastic mulch</td>
<td>no</td>
<td>no</td>
<td>sometimes</td>
</tr>
<tr>
<td>Interplanting</td>
<td>yes</td>
<td>turfgrass</td>
<td>turfgrass</td>
</tr>
<tr>
<td>oryzalin (Surflan)</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>trifluralin (Treflan)</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Dichlofentil (Casoron1)</td>
<td>no</td>
<td>midwinter</td>
<td>midwinter</td>
</tr>
<tr>
<td>Glyphosate (Roundup)</td>
<td>preplant</td>
<td>grapes only</td>
<td>yes</td>
</tr>
</tbody>
</table>

1 Lilly-Miller product only; apply in midwinter immediately before a cold rain.

*See labels for specific vegetables, berries, and tree fruits.

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College of Agriculture and Home Economics, Pullman, Washington

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