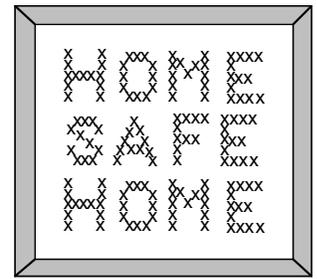


Alternatives

A Washington Toxics Coalition Fact Sheet



Weed Management for the Lawn and Garden

by David Johnson

What is a weed? A plant whose virtues have not yet been discovered.

—Ralph Waldo Emerson



Common Chickweed is an example of an annual which is easily hand-pulled in gardens. Although it is often considered a weed, the flowers and foliage can be eaten in salads. Always be 100% certain of your identification before eating any plant.

Weed management is probably the most time consuming and frustrating task facing the home gardener. No matter what we do, it seems there are always weeds to remove. Plants we define as weeds will always be part of our landscapes. It is not realistic to strive for complete elimination. Attempts to do so usually involve frequent herbicide applications which have unacceptable adverse effects on the environment. However, we can manage these pest plants in a manner that minimizes their impact. In order to develop strategies to outwit them, we need to learn what weeds are and how they grow.

Weed Definition and Classification

A weed may be defined as a plant that is not valued where it is growing. Thus, a plant may be considered a weed in one situation and a desirable plant in another. For example, Dutch White Clover is usually a weed in lawns, but it can be a desirable groundcover used to improve soil conditions and prevent erosion on slopes in new landscapes. Horsetails may be perfectly acceptable along a stream bank but are considered weeds in more formal landscapes.

We can classify weeds by placing them into one of three plant groups according to their life cycle. **Annuals** germinate, grow, flower, and set seed within one year. **Biennials** produce leaves and store food the first year; the second year they flower, produce seed, and die. **Perennials** live on from year to year. In many cases the tops will die to the ground, but the roots persist. Once a weed plant is classified into one of these three groups, we can begin to make a few generalizations about its habits and how it might be managed.

Annuals tend to be opportunistic. They are most often seen colonizing bare soil that has recently been disturbed. Examples of annuals are chickweed, snapweed, and groundsel. Their seed is either blown in or tends to persist in the soil for years until conditions are right for germination. Many annual weed seeds will germinate after the soil is turned and they are exposed to light. Once they germinate, annual weeds grow very quickly and in a short time are flowering and producing seed for new generations.

Biennial weeds, such as foxglove and money plant, are easy to spot in the winter garden because of their overwintering basal leaves, which form flat clumps without a visible stem. The food reserves stored in their thick roots promote rapid growth in the early spring.

Perennial weeds provide the most difficult challenge. Morning glory, horsetail, quackgrass, and buttercup are perennials which have achieved considerable notoriety. The most successful perennial weeds have a thick fleshy root system that stores extensive food reserves. When the leaves are removed, these reserves quickly provide the energy to produce new ones.

Weed Control: Philosophy and Tactics

An integrated approach to weed management begins with analyzing the problem. Identify the weeds and determine whether they are annual, biennial, or perennial. Establish a level of tolerance. You need to determine: (a) if the weeds are affecting the

growth of desirable plants, (b) if their presence is an aesthetic problem, and (c) what their potential is for spreading over the entire garden or lawn. You must develop a clear picture of the problem in order to formulate a strategy to solve it.

At this point in the process, we begin to consider specific weed control tactics. There are three general classes: (1) mechanical and physical controls, which include mowing, cultivation, burning, and paving; (2) horticultural controls, such as mulching and the establishment of desirable competitive plants; and (3) chemical controls, including both selective and non-selective herbicides. Chemical controls should be used only if the other management techniques are not adequate. These tactics may be used alone or in combination. Since most problems involve a mixture of weed types, a mixture of tactics is often required to achieve effective control.

Techniques and Strategies

When considering control options for **annual** weeds, one has to move quickly to successfully interrupt the cycle of seed production. The presence of a mulch will deter annual weeds in several ways. It creates a physical barrier that blocks light from reaching the soil, prevents seed from coming in contact with the soil, and smothers germinating seed underneath. In areas where a thick mulch is not practical, such as in a vegetable garden, it is necessary to remove weeds frequently before they develop seed and use a light mulch of grass clippings or leaves. Annual weeds can be easily pulled by hand.

Biennial weeds are in many ways easier to control than annual weeds. Their life cycle, extending over two years, provides ample opportunity for effective control. The overwintering leaves may be rapidly removed with a hoe or by hand pulling. As their flower stalks shoot up in the Spring, they may be easily pulled. However, if you wait too long, the seed will be dispersed and another cycle will begin.

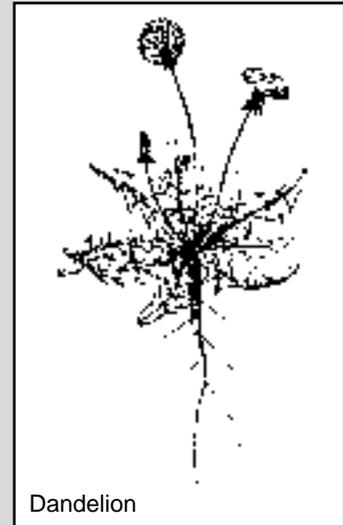
The key to controlling **perennial** weeds lies in the destruction of their root systems by physically digging them out, repeatedly pulling the tops to deplete the food reserves stored in the roots, or, if nothing else will work, by using the least-toxic effective herbicide. Once the weeds have been killed or removed, **long-term management relies on establishing conditions which do not favor weed growth.**

In a vegetable garden, a mix of control tactics may be used. Because of soil preparation and harvesting, vegetable gardens frequently contain large areas of bare, disturbed soil perfect for weed establishment. To inhibit weed growth, it is necessary to shallowly cultivate the soil frequently to kill weed seedlings. Use grass or leaf mulches when possible, and cover unused areas with a living mulch of crimson clover, vetch, or annual rye grass. Frequent turning of the soil should be discouraged since it can bring dormant weed seed to the surface. Soil amendments can be spread on the surface and scratched in rather than turned. Use of herbicides is inappropriate near food crops.

Two techniques can reduce the spread of weeds from neighboring yards. Invading roots from morning glory or quackgrass can be turned away by burying a barrier of aluminum flashing

Common Perennial Weeds

Dandelion is a common perennial weed that invades both lawn and garden beds. It becomes established through wind-dispersed seed. Dandelions have a long thick tap root that stores food reserves. Control is achieved by hand digging, making sure that the whole root is removed. In large lawns, this is easiest with a tool which allows pulling the roots rapidly while working



Dandelion

in a standing position. If the root breaks while pulling, as they often do, the plant can resprout from the piece remaining in the soil. To minimize spreading of dandelions, the flowers should not be allowed to go to seed. Mow often to keep the flowers from maturing. In lawns, the removal of dandelion plants leaves small bare areas where new weed seed can germinate. Be sure to spread a little grass seed in those spots to prevent weed establishment.

Morning Glory. This weedy vine will twine all over the garden, covering your ornamental plants to the point of smothering them. It is usually introduced by seed or invasive roots from under the neighbor's fence. Its success as a weed lies in its thick fleshy roots which travel long distances just under the soil surface. It prefers loose organic soils. Since morning glory is a perennial weed, control lies in removing the root system. Hand weeding can remove large quantities of roots, but any broken pieces are capable of sprouting new growth. Repeated, persistent rototilling or flame weeding as the new growth sprouts can deplete the food reserves and allow a groundcover to compete successfully. If chemical control is required, do not spray. Paint the leaves with the least-toxic systemic herbicide available, which will move from the leaves through the plant's vascular system. Once the roots are killed, the top growth dies.

Quackgrass. Quackgrass is a perennial weed that is difficult to control. The white fleshy roots form dense spreading mats. If weeded by hand, the broken pieces of root left in the soil can sprout new growth. When hand weeding in the garden, sift the soil carefully to make sure you remove all root pieces. A layer of black plastic can smother the weed if it is left in place for two growing seasons. Mulches will usually not be effective since the roots contain sufficient energy reserves to grow foliage through the mulch layer. If mowed regularly, quackgrass does not seriously detract from the appearance of a lawn. The mowing will gradually cause the quackgrass to decline. As with Morning Glory, a root barrier can keep out invasions from neighboring yards. If chemical control is necessary, wipe the foliage as described above when the plants are about 8" tall.



Buttercup

Buttercup. This low spreading evergreen weed can occur both in lawns and garden beds. Its intense yellow flowers are quite attractive. It usually comes into the garden by seed, and then spreads by roots and seed once it is established. In garden beds it can be controlled by hand weeding if you

are careful to get all of the little plants and roots in the vicinity. In lawns it can also be hand dug, but this often results in extensive damage to the turf and reseeding is necessary. Presence of buttercups may indicate poor soil drainage or too much shade. In wet areas, install proper drainage. If excessive soil wetness is due to a compacted soil surface, it may help to aerate the soil.

Horsetail. An ancient plant that can be attractive in a natural setting but easily becomes a real pest in the garden. It spreads by spores or its invasive root system. It is difficult to control because of its extensive root system which can be as deep as 12 feet. The most effective control is to hand pull or hoe the above ground growth as it appears. Over time this will deplete its energy reserves and control will be achieved. Persistence is the key element here. Since the weed dies down in winter, it is possible to cover an area with black plastic for two years to achieve control of severe infestations. Even then, the roots may still be able to push up new growth.

under your fence. A depth of about 18" should be adequate in most cases, but 24 - 36" may be required for horsetail. A windbreak of trees or shrubs around your yard will help keep out windblown seeds while it encourages birds.

Although non-chemical control tactics are favored, it may sometimes be necessary to resort to chemical herbicides when the problem involves aggressive perennial weeds or labor is not available for other control methods. All too often chemicals are used as the only weed management tool. This approach kills a lot of weeds but also can create larger and more serious problems. An area cleared of weeds with the use of a chemical is usually left bare of all growth. We know that bare ground is prime weed habitat, so recolonization occurs rapidly and repeat applications are required. This can lead to a situation where weeds that are resistant to the herbicide will colonize the area. These new weeds can often be more difficult to control than the originals. In addition, chemicals can have wide-ranging impacts on birds, soil microorganisms, beneficial insects, aquatic wildlife, human health, and even groundwater. Chemical controls may be effective in initially clearing out an infested area, but they should not be relied upon for long-term maintenance.

Plan for the Long-term

The permanent solution for weed control lies in designing out weed habitats—treating the cause of the problem rather than just the symptoms. Avoid creating conditions which optimize weed growth; try instead to foster conditions unfavorable to weed encroachment. Once weeds are cleared from an area, apply a 3 - 4" mulch layer and install plantings which will eventually cover the mulch. Mulches are really a short-term solution to weed control, since they eventually break down to form soil in which weeds can grow. But they do make a good interim barrier to weeds while plants are getting established, and they can be replenished. Permanent weed management lies in having a landscape covered with desirable plantings that form a multi-layered groundcover within which weeds cannot get established. This approach to weed management is based on gardening skills that focus on blending appropriate plant types together in a manner that emphasizes plant health, soil fertility, and garden aesthetics. That is what gardening is all about!

Tools for Weeding

Using the proper tools will make hand-weeding easier and more effective, reducing your need to resort to chemical control.

■ Hoes

Hoing is recommended in vegetable gardens or annual flower beds. A very effective type is a stirrup hoe, shown on the next page. The blade is a flat metal loop attached to the handle at an angle that places the blade parallel with the soil. The blade is moved forward and back just under the soil surface, slicing off weeds at the root line. Any hoe that minimizes soil disturbance and cuts weeds just under the soil line is more effective than a hoe that chops them. Chopping weeds tends to pull them from the ground, but the roots often remain attached and reestablish.



Stirrup hoe is designed to slice off weeds below the soil surface so they don't grow back.

■ Stringtrimmers

These machines are appropriate for cutting down the vegetation in rough areas. They are often used to mow down seed heads before they ripen to prevent seed dispersal

■ Black Plastic

This material is best used on the surface to smother perennial weeds. If used during the summer with the edges sealed with soil, it blocks light and heats the soil underneath to the point where most roots will die. Its use as a permanent barrier under bark mulch is discouraged, since it effectively seals the soil from the atmosphere, which can cause a decline in plant health. It also increases soil erosion, since water cannot penetrate the plastic layer. In addition, it is made from a nonrenewable resource and is unattractive.

■ Flame Weeders

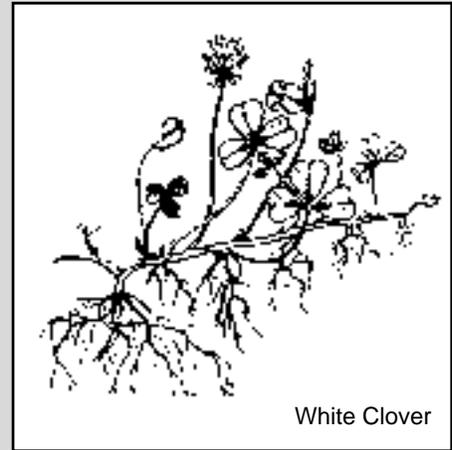
These are hand-held or tractor-mounted propane torches used to quickly sear plants to kill the leaves. Ideal for weeds in driveways. Several treatments are required for perennials. ■

Disposal of Herbicides

Herbicides are pesticides. They should never be put down the drain or in the trash. Take unwanted pesticides to a household hazardous waste collection site. In the Seattle/King County area, call the Hazards Line at 206-296-4692.

Moss. Moss is a natural part of the Pacific Northwest. It is our native bottom story groundcover. If moss is thriving in your lawn, consider leaving it there. Most mosses prefer shade, moisture, and poor, acid soils. Immediate control is achieved by raking it out of lawns or by applying an iron-based product which turns the moss black as it dies. For long-term control, correcting the conditions that encourage moss growth is more effective than chemicals. Water infrequently but deeply, making sure the water is penetrating and not running off. Proper aeration and thatching of lawns will ensure good water retention. Do not apply water faster than the soil can absorb it. Soil should be limed and fertilized to encourage the growth of the desired plants or turf. Consider letting the moss spread in planting beds to form an attractive groundcover.

Clover. Several types of clover are often found in lawns and gardens, and they do provide certain benefits. The small blossoms form an attractive mass of color over large lawn areas. If left in the lawn, clover provides some soil fertility and attracts bees, which can present a hazard to those using the lawn if stepped on. Clovers are legumes and are encouraged by phosphate, potash, and sulfur fertilizers. They can be controlled somewhat with fertilizer high in nitrogen and low in phosphorous. Do not over-fertilize, however, because excess chemicals can run off and contaminate water.



White Clover

Tips for Least-Toxic Weed Management

- ❖ Don't attempt total eradication. Set your weed tolerance at a realistic level.
- ❖ Identify the weed. For most annual and biennial weeds, mechanical or horticultural methods should be adequate. Hand pull as much as possible. Hire your children or have a weeding party.
- ❖ Don't use herbicides as a preventative tactic. Avoid "weed and feed" mixtures. Corn-gluten herbicides may be useful to reduce the spread of weeds via seeds. They are very low in toxicity.
- ❖ For long-term control, design out weed habitats and concentrate on proper plant selection and horticulture.
- ❖ Do not use herbicides in food gardens. Hoe or hand pull, use grass or leaf mulches, plant living mulches, and minimize turning of the soil.
- ❖ Chemical control is the last resort. If chemical control is necessary, choose the least-toxic product possible and read the label.
- ❖ Buy the smallest amount of herbicide you can, even if it costs more per unit. Do not use at greater than recommended concentration or application rate. More is **not** better.
- ❖ Avoid broadcast or spray applications. Paint or squirt product directly onto individual plants or leaves.