



## Weed Control in the Landscape and Garden

Weed control is an issue for just about anyone with landscape plantings around the home. Weeds invade and compete with plants for nutrients, water, and sunlight. They are also unsightly in the landscape.

When the season first begins, most of us do a great job of keeping weeds under control. This is important in the short term, but the long-term battle with weeds is often lost as the season progresses and we get tired or head off to summer vacation. With some basic knowledge about weed biology and life cycles, we can maximize the effectiveness of control methods we use in the home landscape and garden areas.

### Understanding Weeds

Most weeds are classified as annual, biennial, or perennial. Annual and perennial weeds can be a grass or broadleaf species, while most biennial weeds are broadleaf. Annual weeds are prominent in the fall, winter, and early spring (winter annuals), or in the late spring, summer, and early fall (summer annuals). These weeds sprout from seed when conditions such as soil temperature are ideal for their growth.

Biennial weeds grow just two seasons. They grow vegetatively the first year, then send up a seed stalk the second year, and then die. Perennial grass and broadleaf weeds usually go dormant in the winter and grow back each season from permanent underground plant parts such as a crown or rhizome. Knowing the type of weed is important for determining when and how it should be controlled. For example, herbicides that affect weed seed germination should be applied well before the seeds start to grow. Perennial weeds are best controlled by herbicides in late summer—when they are actively growing and storing reserves.

Success is improved when we consider control from a weed ecology perspective that involves both environment and weed biology. Like all other plants, weeds are affected by environmental factors of light, air, temperature, and moisture. An important concern is limiting new weed seed introduction.

Weed seeds in the soil can be compared to making deposits and withdrawals from a bank, or a “weed seed bank.” Our actions (or lack of) lead to either a withdrawal or deposit of seed in the soil bank. Over time, enough seed withdrawals can be made to significantly reduce weed pressure. But if not managed, weed problems can increase due to new deposits. Weed seeds can have significant longevity in the soil (years and decades) and can be high in number depending on the site. Certain species may dominate the “bank” as well. When weeds are allowed to go to seed, a large percentage of these seeds cause problems the next year; and, another percentage will remain in the soil to periodically germinate, creating problems in future years.

Gardeners lose ground when weeds are allowed to go to seed or if they are unintentionally introduced. Manure and other un-composted materials are good organic matter additions to the garden; but, they can also contain weed seeds. Late-season weeds can be a major source of new weed seed deposits. By mid- to late summer, when it is too hot to work in the garden or we go on vacation, weeds can take over and go to seed.



Some weeds have the genetic characteristic of flowering when days get shorter in the fall. This day-length response results in weeds that quickly go to seed soon after they germinate, producing seeds on extremely small and young plants. For example, a spring-germinating pigweed will get quite large by the time seed heads form, while a late-summer germinating pigweed will form a seed head when the plant is only ankle height.

Both cultural and chemical techniques can be used to control weeds.

## Cultural, Organic Weed Control

Cultural (and organic) methods include mulching; hoeing or hand-pulling weeds; using a stale seed bed; solarization; using weeder geese; and flaming.

◆ Organic mulches (wood chips, newspaper, straw) and inorganic mulches (landscape fabrics, mats, and plastic mulch) do a good job of creating a barrier to weed emergence. But, these materials can make the tasks of transplanting shrubs and dividing perennials more difficult. Organic mulch, in combination with landscape fabric, provides exceptional weed control, although weeds from wind-blown seed can sprout in decaying mulches on top of the fabric. Research has shown that, if left unmanaged, landscape fabric covered with organic mulch can become as weedy as beds not covered with it within a few short years. Landscape rock would be a better choice of cover in the long term.

◆ The cultivating, hoeing, and hand-pulling method of weed control is effective for gardens, annual and perennial bed areas covered with organic mulch, and with exposed soil. Remove weeds when they are young and have not developed a strong root system; preferably soon after germination. Most weeds, especially newly sprouted weeds, can easily be killed by removing just the top, but others must be pulled by the roots or they will re-sprout; a good example is dandelion. Large-leafed garden plants such as sweet corn and broccoli, and perennials such as hostas, compete well with weeds by shading them out. Using transplants can also provide a competitive advantage compared to direct seeding of flowers and vegetables.

◆ Using a stale seed bed simply involves repeated cultivation or tillage in an area to encourage new flushes of weeds. At least a two-week period is allowed between tilling to allow time for weed seeds to germinate and grow. This method helps reduce populations in the weed seed bank.

◆ Solarization, or covering bare soil areas with clear plastic, sterilizes the soil and kills a percentage of weed seeds. Solarization must be done in the heat of the summer. It is mostly used in the Southwest and desert climates, but it can be effective in the Midwest if the summer is hot and the plastic stays in place at least 6 to 10 weeks. The soil should be finely worked and leveled out, and the plastic should be laid tightly against the soil for maximum contact. Its main disadvantage is that the site is taken out of production for the main summer growing season.

◆ Pond geese that are allowed to range over the garden do a surprisingly fair job of removing weed seedlings from between garden plants, although small garden plants will also be at risk.

◆ The flaming method involves using a small, portable propane burner to torch new weed seedlings soon after they emerge.

## Chemical Weed Control

There are several chemical weed control tools that can be used in home gardens and landscapes. Pesticides that kill weeds are *herbicides*, and these herbicides are either classified as “pre-emergence” or “post-emergence” in their action. **When using any chemical product, carefully read and follow all label directions.**

◆ Pre-emergence materials are applied to the soil to prevent weed seed germination. As the name implies, the material needs to be in the soil *before* weeds germinate. Thus, depending on whether weeds are winter or summer annuals, timing the application is critical. Apply too early, and the herbicide dissipates before weed seeds start to germinate; apply too late, and the seed has already germinated and will not be affected.



There are several pre-emergence herbicides that are recommended for home garden use, and they are sold under different trade names. Check the label for these “active” ingredients: bensulide, DCPA, napropamide, and trifluralin. Preen™ is probably the most commonly available pre-emergence herbicide, and it is made from trifluralin. Corn gluten meal is an example of an organic pre-emergence herbicide that has been shown to inhibit weed germination. Each pre-emergence material has certain weed species it is most effective against. When two of these chemicals are combined, a broader spectrum of control is achieved. Remember that some established garden and landscape plants can be sensitive to pre-emergence herbicides, so carefully read and follow all label directions, noting any sensitivity warnings.

◆ The second type of herbicide is post-emergence, meaning it is applied to green tissue of living plants. These herbicides can be *selective*, which means they will not harm certain species of plants, or *non-selective*, with the potential to kill whatever they are sprayed on. They can also be classified as *contact* herbicides, which burn and kill above-ground plant parts, or *translocated*, meaning the herbicide is moved from the leaves to the roots by the plant, effectively killing the entire plant. This is important when considering perennial weeds which emerge each year from underground root structures. Round-up™ is an example of a non-selective, translocated, post-emergence herbicide. As related to weed biology, these herbicides are most effective on perennial weeds when applied late summer as the plant translocates or moves nutrients downward for winter storage. Vinegar has recently been formulated into an organic, post-emergence contact herbicide, which acts by burning green tissue.



If mulch is not thick enough, weeds like this crabgrass will emerge.

## The Bottom Line . . .

Regardless of the control method used, try to think about how weed biology and ecology are affected by your actions.

For example, some weeds need brief sunlight exposure to germinate, and mulching prevents that exposure. More importantly, minimizing soil disturbance reduces weed seed exposure to light and other things that stimulate germination. Shallow cultivation or hoeing keeps new seed from being brought up, as does “gently” pulling large weeds. Hoe weeds when they are young or just emerging and during the hottest part of the day, so they are less likely to re-root. Young weeds are always more easily killed than older weeds. Flaming and post-emergence herbicides limit soil disturbance.

When watering, use drip or soaker hoses that put water near the plants and not over the entire garden. This watering technique will limit weed germination between rows. Never allow weeds to go to seed.

Knowing the biology of weeds and applying the best management tools at appropriate times will help reduce the amount of time you spend on this chore. For more information about weed control, consult the *Home, Yard and Garden Pest Guide* (#C1391) available from your local U of I Extension office.



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