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Weed Management in the Landscape

Introduction

A weed is defined as a plant growing where it is not wanted and is competing with cultivated plants for water, light and mineral nutrients. Weed management in landscape plantings can be complicated because the landscaped area is usually a mix of annual and perennial ornamentals. Weeds, like other garden pests, are best managed using multiple strategies. These may include prevention, mechanical or cultural practices, and herbicides. Following the steps below should provide you with the highest level of success in managing weeds. This approach is called integrated pest management which is often abbreviated "IPM".

Step 1 - Identify the Plant

Many weeds can be easily recognized and found in reference books or on websites to understand their life cycle. If you do not recognize the weed, collect a sample (preferably with flowers and roots), place it in a plastic bag, and bring it to your local Cooperative Extension office, nursery, or garden center. Samples can usually be stored for several days in the refrigerator.

Step 2 - Determine the Weed's Biology and Life Cycle

Below are descriptions of plant lifecycles. If you have knowledge about the weed's life cycle, it is easier to identify its vulnerabilities, and ultimately, develop successful management strategies.

Annual weed species complete their life cycle within one growing season.

- **Summer annuals** germinate from seed in early summer, mature in summer, produce seeds in the fall, and die with the first frost. Examples: redroot pigweed, Russian thistle, puncture vine, buffalobur, *Kochia*, and spurge.
- **Winter annuals** germinate from seeds from late summer through early spring, grow in winter and die in late spring or early summer when temperatures exceed 85°. Examples: filaree, many brome grasses, foxtail, annual bluegrass, and mustards.

Biennial weed species complete their life cycle over two growing seasons. Examples: common mullein, wild carrot, and poison hemlock.

Herbaceous perennial weeds are non-woody plants that grow for more than two growing seasons. Some flourish in cool months and go dormant at the onset of summer heat and others grow actively in summer and are suppressed with the first frost. The "roots" can be rhizomes, stolons, fleshy tap roots, corms, or tubers. Examples: field bindweed, bermudagrass, dandelion, nutsedges, and johnsongrass.

Woody Perennials are perennial weeds that grow into a tree or shrub. Examples are tree of heaven, Siberian elm, Russian olive, saltcedar. Himalaya berry, and English ivy.

Step 3 - Determine the Best Management Method

There are several options for managing weeds. Read about the management methods below and think of them in terms of a toolbox from which you can select the appropriate tools for the weeds you are trying to manage.

1. Mechanical (pull, mow, till, etc.)

Annual weeds reproduce from seeds, so cut, pull, or hoe before the weeds go to seed. If they are already in bloom, cover seed-head with plastic bag to keep seeds from spreading. Mowing is sometimes ineffective because plants (e.g. dandelions) will simply flower closer to the soil. Perennial weeds reproduce from roots. If hand digging, do so when the soil is moist, as pieces of root often break off and will sprout new plants.

2. Cultural Practices

- **Prevention** is employed after you consider how weed seeds and propagules could be introduced to your property. These introduction methods could include: imported soil/manures, borrowed or rented equipment, the soles of your shoes or vehicle tires, use of ditch-delivered irrigation water, grazing animals, wildlife, etc. Knowing the source of materials, equipment cleaning, and awareness are key to weed prevention.
- **Solarization** uses clear plastic spread over tilled, irrigated soil and sealed around the edges to kill weed seeds and soil-borne pathogens. Solarization is done during the heat of summer - make sure soil is not too hard (compacted clay) or too sandy. Irrigate soil thoroughly and cover the bed with a single sheet of 2 to 4 mm clear plastic. Lay the edge of sheeting in a trench and cover it securely with soil so no heat escapes. Leave plastic in place for at least 6 weeks.

- **Plant competition** is the introduction of more desirable species like perennial wildflowers, native or cultivated pasture grasses, that will compete with weeds at their peak growing season. Weeds will occupy available space in your landscape to take advantage of moisture and nutrients. By occupying that space with desirable plants, you minimize space available for weeds.
- **Mulch** is a layer of material applied to the surface of an area of soil. A three inch deep layer of mulch, can prevent annual weeds, but will not prevent perennial weeds. Inorganic mulches (gravel, rock), organic mulches (bark, chopped tree trimmings, pine needles, compost, etc.), and synthetic mulches (landscape cloth) are all effective. Impervious plastic mulches are not recommended as they impede water infiltration and decrease oxygen availability to plant roots in the soil.

3. Biological

- **Managed grazing** with chickens, goats, sheep, etc. can help manage weeds.
- **Introduced insects** can often manage invasive or noxious weeds. However, this practice is only employed on large populations and, at best, only prevents weed spread.

4. Chemical

Chemical control strategies can be employed for herbaceous or woody perennial weeds and/or large weed populations. These chemicals are called herbicides.

- **Pre-emergent herbicides** kill germinating seeds, not established plants. They work best on annual weeds, but can control perennial species prior to establishment. Apply the pre-emergent in the fall for cool season weeds, and apply in the spring for warm season weeds. The product label will indicate if that pre-emergent works on broadleaf and/or grassy weeds. Some pre-emergent products are designed to be made into a solution and sprayed on while others are granular and can be applied with a rotary or drop-type spreader.
- **Post-emergent herbicides** kill weeds that are actively growing. **Selective** herbicides will kill targeted weeds. There are selective herbicides that kill broadleaf plants and not grasses and visa versa. **Non-selective** herbicides kill all vegetation when correctly applied.
- **Systemic herbicides** are translocated to the roots of perennial weeds to prevent regrowth from roots and rhizomes. Apply when the weed is actively growing, not when under drought stress or in a semi-dormant state. For example, it is best to irrigate and fertilize bermudagrass in the summer prior to treatment to get the best kill.
- **Soil sterilants** (products containing imazapyr or prometone) are not recommended for home landscapes due to the potential for harm to non-target plants. These chemicals move downward and laterally with water in soils and can injure or kill desirable plants. Nearby trees and ornamental plants can also be injured or killed when roots grow into soil treated with soil sterilants.

Step 4 - Monitor and Evaluate

Monitor to see if your management method was effective, and modify if necessary. It may take several years of management, as weed seeds can remain in the soil for a long time.

Sample Herbicide Ingredients:

- ***Pre-emergent:*** oryzalin, trifluralin, isoxabin
- ***Systemic***: glyphosate, 2,4-D
- ***Contact:*** diquat (more traditional approach), pelargonic acid, acetic acid (acids are considered "least toxic").

Read herbicide labels; some work in warm weather, others in cool weather. In addition, it is the user's responsibility to mix and apply pesticides in accordance with label instructions. Doing otherwise is a violation of Federal Law.

Resources:

Weed identification:

- Weeds of the West, Univ of Wyoming
- http://cals.arizona.edu/yavapaiplants
- Local Cooperative Extension office

Weed Management:

- http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7441.html

Naming of companies or products is neither meant to imply endorsement by the author nor criticism of similar companies or products not mentioned. Always read product labels and MSDS.

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http://extension.arizona.edu/yavapai