

What to Do About Weeds

Lesson Description

Weeds affect us all, from homeowners to farmers to recreationists. Weeds steal moisture and nutrients from new seedlings, shade out older plants, decrease the nutritional value of forage, and may even kill or injure livestock or people. They can also cause problems in lawns and household landscaping, along roads, and in parks. Weed infestations can decrease forage yields and lower the value of pastures.

Weed problems often result from poor land management practices. Practices such as overgrazing, creating bare ground, and overwatering or underwatering all contribute to weed invasion. This lesson provides information useful to all land managers on identifying, preventing and managing weeds.

Lesson Objectives

1. Understand Washington state weed law and landowner responsibilities.
2. Be able to inventory your property, identify your weed species (with help if needed), and determine the extent of your weed problems.
3. Learn techniques to prevent (further) weed invasion and spread.
4. Learn the common methods of weed control and how to decide which method to use.
5. Design, implement and monitor a management plan on your land that includes the use of integrated weed management techniques.



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What to Do About Weeds

Activity Worksheets

1. Losses and Damages Caused by Weeds Information Sheet
2. Preventing the Spread of Weeds Information Sheet
3. Ten Steps to Effective Weed Control Information Sheet
4. Weed Management Plan Checklist Activity Sheet
5. Herbicide Safety Tips Information Sheet
6. Reading Herbicide Labels Activity Sheet
7. Weed Management Plan Activity Sheet

Supplemental Resources

Clark County Weeds Poisonous to Livestock & Horses

Washington State Noxious Weed List

Noxious Weeds That Harm Washington State: Western WA Field Guide, Washington NWCB

Noxious Weed Identification, WSU Extension King County

Controlling Noxious Weeds on the Farm, WSU Extension King County

Managing Weeds in Pastures, Washington County Soil and Water Conservation District

Weed Seedling Identification Guide, Montana Extension

Homework assignment

1. Inventory your property for weeds, identify the weeds, and formulate a weed management plan for your property. Use the Weed Management Plan Activity Sheet.
2. Begin to implement your weed management plan.
3. Continue to monitor your results, and identify and correct any problems with the plan.



What to Do About Weeds

Crop Weeds - Broadleaf Weed Seedling Key

From: Montana State University – Weed Science Program

<http://store.msuextension.org/publications/AgandNaturalResources/EB0215.pdf>

Introduction

Identification of broadleaf weed seedlings is critical to their control. Weed species vary in their response to herbicides: therefore it is necessary to select the right herbicide to control a particular species. Controlling weeds in the early stages of growth not only increases the effectiveness of control measures, but also reduces crop losses due to weed competition. This key provides an easy and reliable means for identifying broadleaf weed seedlings. To use the key you need to understand how the key is organized and be able to recognize a few simple characteristics used to identify broadleaf weeds. Broadleaf seedlings must be examined with great care. One characteristic is seldom enough to identify the weed. The following steps will help you use the identification key and ensure correct seedling identification.

1. Collect several samples of the plant to be identified.
2. Use a hand lens when available to make characteristics easier to see.
3. Begin at the top of the key and proceed downwards. Do not miss any steps.

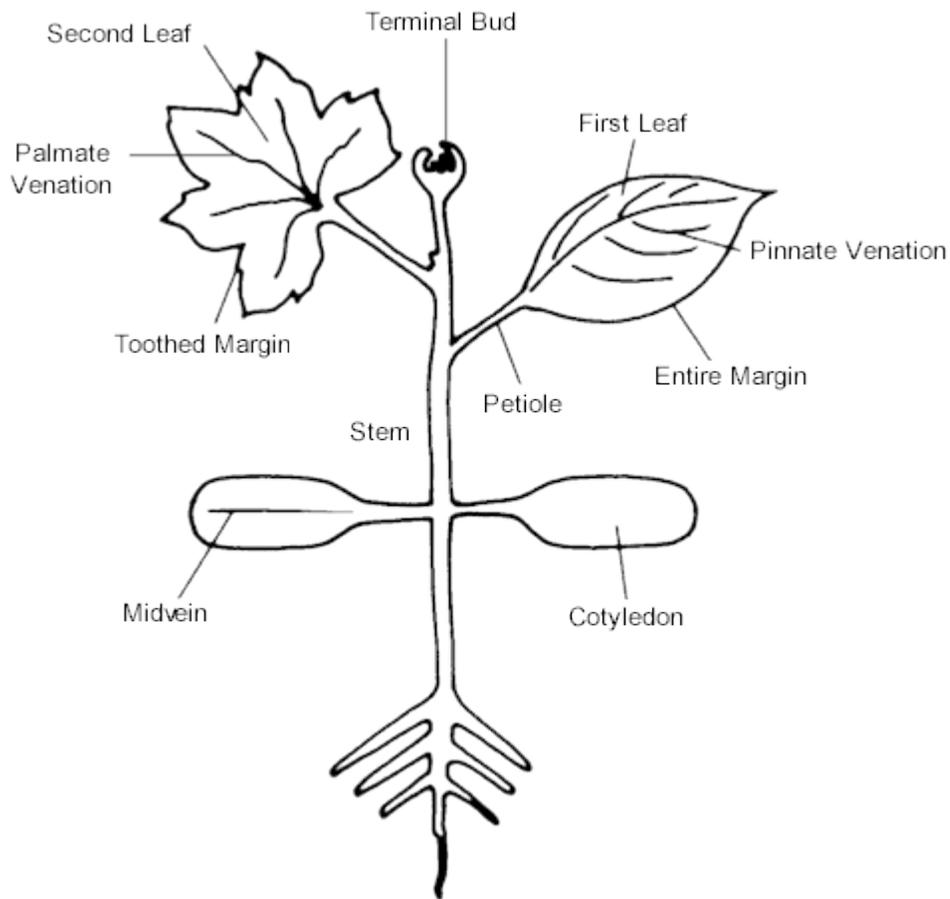
Terminology

- Alternate Leaves** One leaf attached per node. Newest leaf is of smaller size.
- Cotyledon** Seed leaves; the first pair of leaflike structures, usually paired, appearing above ground in most dicotyledonous plants.
- Entire leaf margin** Leaf margins that are smooth without sawtoothed or irregularly notched edges.
- Lobe** A division or segment of a leaf.
- Margin** The border or edge of any plant part.
- Mealy** Covered with a small, white bran-like bloom.
- Midvein** The central vein of a leaf
- Node** The part of the stem from which leaves or branches arise.
- Opposite leaves** Leaves attached at the same node on opposite sides of the stem. Newest leaf pair are of similar size.
- Palmate** Three or more lobes or veins arising from one point.
- Petiole** The stalk of the leaf.
- Pinnate** Lobes or veins arranged on two sides of the midvein.
- Rosette** A basal cluster of leaves in a circular form without discernable upright stem.
- Toothed Leaf Margins** Sawtoothed or irregularly notched leaf edges.
- Whorled** Three or more leaves attached at the same node, often arranged in a whorl around the stem.

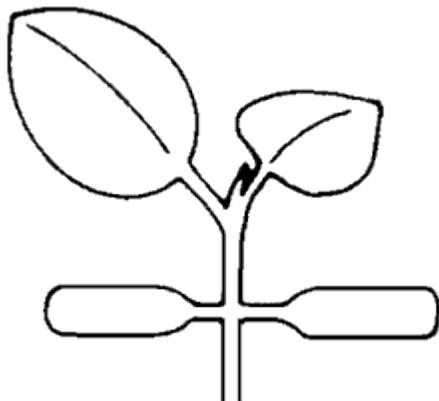


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Plant Parts

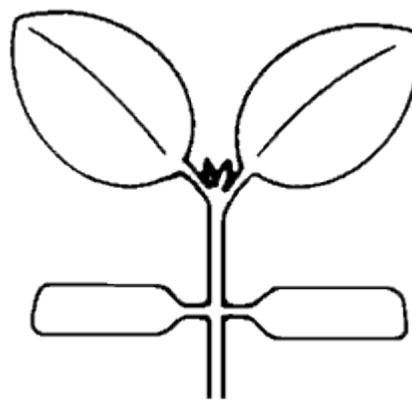


Leaf Arrangement on Stem



Alternate Leaves

One leaf per node. New leaf is smaller.



Opposite Leaves

Attached at the same node on opposite sides of the stem. Leaves at the same node are of similar size.

Cotyledon and Leaf Shape



Linear



Oblong



Lanceolate



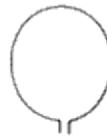
Ovate



Spatulate



Oval



Round



Kidney



Palmately Lobed



Pinnately Lobed

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What to Do About Weeds

Losses and Damage Caused by Weeds Information Sheet

- Weeds take water, nutrients, and sunshine away from crop plants and reduce the yield of the crop. Sometimes crops have to be cut before they mature because of weeds.
- Weeds add work and expense to harvesting crops. It may be difficult to hire someone to hay your fields if they are infested with weeds.
- Weeds reduce the value of products on the market. Hay and other feeds containing noxious weeds should not be sold off the farm and should not be permitted to spread onto clean land. Other states may refuse shipments of hay from your state if it is infested with noxious weeds.
- Poisonous weeds may kill livestock or leave them in a sickly, unprofitable condition.
- Unpalatable weeds may replace valuable grass plants and reduce the grazing value of pastures.
- Weeds growing on ditch banks interfere with delivery of irrigation water and contaminate water with weed seeds. Their removal and control may be costly.
- Weeds that affect human health cause loss of labor and time, adding to medical costs.
- Weeds may be hosts for plant diseases and insects that spread to crop plants.
- Many farmers spend hundreds of dollars yearly trying to control or eradicate weeds.
- Property values decrease when invasive weeds are present.
- Some landscape ornamentals have become serious invasive weeds of wildlands, affecting wildlife, native plant communities, and watersheds.



What to Do About Weeds

Preventing the Spread of Weeds Information Sheet

- Plant clean, weed-free crop seed.
- Avoid spreading weed seeds with manure. Wait at least five days after grazing in a weed infested area before moving livestock into areas that are currently weed-free.
- Sanitize tillage and harvesting equipment before moving from one field to another.
- Plant and maintain desirable plant species to discourage weed establishment. Avoid disturbing the land without revegetating the area, as weeds will invade.
- Consider crop rotation to slow weed spread.
- Minimize soil disturbance by vehicles, machinery, wildlife, stream flow, and livestock to lessen the advantage noxious weeds have developed for success in these sites.
- Avoid driving in noxious weed infested areas. Seeds can become stuck in tire treads or mud on the vehicle and be carried to unaffected areas. Check and clean tires and undercarriage of vehicles and machinery for contamination after driving in a weed-infested area.
- Likewise, request that campers, hikers and sportsmen take care to brush and clean not only their vehicles, but also their clothing when coming from weed-infested areas. Post warnings near infested areas to exclude users when possible.
- Don't transport flowering plants that you cannot identify, or noxious weeds, many of which are beautiful.
- If you find a small number of isolated noxious weeds that have no flowers or seeds, pull the weeds and leave them where you found them to dry out. If possible, burn or bag the weeds and dispose of them in a sanitary landfill.
- If you find noxious weeds and they have flowers or seeds, pull them, place them in a plastic bag or container to avoid spreading seeds, and either burn them or dispose of them in a sanitary landfill.
- Report newly found noxious weeds to your Division of Agriculture or Cooperative Extension office.



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What to Do About Weeds

Ten Steps to Effective Weed Control Information Sheet

1. Attend this class (good job you're on your way!).
2. Identify your problem weed. Whenever possible, bring a fresh sample stored in a paper or Ziploc bag to your local Cooperative Extension office. Don't spread seeds while transporting.
3. Gather information on your weed. Ask for available publications or other materials.
4. Learn the life cycle of the weed. Is it an annual, perennial, or biennial?
5. Evaluate the reproduction method and likely means of spreading the weed.
6. Determine whether the weed is a broadleaf or grass plant.
7. Create a plan for the eventual rehabilitation of the land once the problem weeds have been eradicated. Weeds take advantage of site conditions including soil disturbance, uneven soil moisture, and compaction. You'll need to inspect your property often, to catch the presence of weeds as early as possible.
8. List and assess the treatment options: mechanical, cultural, biological, and chemical. Determine the most effective time of year to control your weed.
9. Complete your weed management plan and monitor and evaluate its success.
10. Check next year and every year to see if your weed management continues to keep weeds out.



Weed Management Plan Checklist Activity Sheet

Have I identified the locations, species, life cycles and methods of reproduction of my problem weeds? Yes No

Have I identified the extent of the problem, e.g. is there one plant, a few plants, an acre with about 50 percent coverage? Yes No

Will my proposed control method work efficiently on a problem of this size? Yes No

What do I hope to do with the site? _____

Does it require frequent tilling, which may favor the increase of rhizomatous perennials?
 Yes No

Is my application of water and fertilizer uniform and appropriate? Yes No

Which site conditions cannot be changed? _____

Have I incorporated methods of prevention to keep from reintroducing weeds? Yes No

Do I know what the most effective control methods are? Yes No

Have I considered which control methods from my toolbox are appropriate to use?
 Yes No

Which tools will I use? _____

Can I afford what it will cost to follow all the elements of my weed control plan?
 Yes No

If I am going to use herbicides, have I read the pesticide safety information so that I will not endanger myself, others, the local water supply, or habitat when using herbicides? Yes No



Herbicide Safety Tips Information Sheet

Herbicides are poisons and must be used with caution at all times. Follow the herbicide safety tips below:

- 1. Read the label carefully and take notice of personal safety and environmental precautions.**
The label information isn't advertising – it's based on solid science *and the law*. It includes the proper rate of herbicide use for various conditions, the relative toxicity of the product, directions for safe mixing and application, and any environmental precautions. It lists the product manufacturer's name and address, required protective clothing, and warnings about groundwater contamination, hazards to wildlife, and the re-entry interval – how long one must wait before entering the treated area.
- 2. Wear appropriate personal safety equipment when handling herbicides.** Start by wearing a wide-brim hat, long-sleeved shirt, long pants and chemical-resistant gloves. You should also wear sturdy work shoes or rubber boots, not sneakers or sandals. Depending on the product you are using, it may be necessary for you to wear goggles, a face shield, and a respirator.
- 3. When mixing and loading chemicals, prevent spills that might contaminate water supplies.**
One key spill-prevention step: prevent tank overflow by never leaving a sprayer unattended during filling.
- 4. While filling sprayers, avoid back siphoning by keeping the discharge end of the fill hose above the tank's water level.** If you put the end of the hose down into the herbicide liquid in the tank, you run the very real risk that the hose will suck water and chemicals back into the hose, and possibly into your well or home, when you turn off the water.
- 5. Never exceed labeled chemical rates. Always calibrate your sprayer before application.**
After you've read the label and chosen the right product to apply at the prescribed rates, it's important to make sure your sprayer is delivering the appropriate amount of product. Carefully follow the directions on the sprayer.
- 6. Prevent herbicide leftovers by mixing only needed quantities.** If you follow label instructions for rates and mix carefully, your tank should be empty as you complete application.
- 7. Never rinse equipment near wellheads, ditches, streams or other water sources.** If needed, install a longer rinse water hose to move the cleaning operations a safe distance from a well or other water source. Spray the rinse water in the spray tank out over the target area, following label directions.
- 8. Always triple rinse or pressure rinse chemical containers before disposal or recycling.** If it's been properly rinsed and label instructions have been followed, the herbicide container is ordinary trash, but the best place for it is a pesticide container collection and recycling facility.



Reading Herbicide Labels Activity Sheet, page 1 of 2

This exercise is designed to teach you how to read herbicide labels. Herbicide labels are quite long and contain extensive information. On first glance, they can be quite daunting. They are required by law to contain certain information: health and environmental hazards, weeds they control, mixing rates, etc. The daunting part is, there is no set order by which this information is supposed to be presented. **ALWAYS READ THE ENTIRE LABEL.** It is imperative that you understand that as a consumer, once you buy these products and use them, you are agreeing to the limit of liability and warranty on the label and you are agreeing to use them only in the manner specified on the label.

The following is a short exercise on herbicide labels. You will be answering the same seven questions for three different products. These products are common herbicides that can be purchased without special permits or licenses.

Product 1 _____

What are the active ingredients? _____

Can the product be used adjacent to or in surface water bodies? Yes No

How should you dispose of the container? _____

What should you do if you get some of the product on your skin? _____

Can the product be used to control Russian thistle? Yes No

Can the product be used to control Canada thistle? Yes No

Can the product be used to control musk thistle? Yes No

How much product would you use to mix up one gallon of spray at 1.5% of product? _____



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Reading Herbicide Labels Activity Sheet, page 2 of 2

Product 2 _____

What are the active ingredients? _____

Can the product be used adjacent to or in surface water bodies? Yes No

How should you dispose of the container? _____

What should you do if you get some of the product on your skin? _____

Can the product be used to control Russian thistle? Yes No

Can the product be used to control Canada thistle? Yes No

Can the product be used to control musk thistle? Yes No

How much product would you use to mix up one gallon of spray at 1.5 percent of product? _____

Product 3 _____

What are the active ingredients? _____

Can the product be used adjacent to or in surface water bodies? Yes No

How should you dispose of the container? _____

What should you do if you get some of the product on your skin? _____

Can the product be used to control Russian thistle? Yes No

Can the product be used to control Canada thistle? Yes No

Can the product be used to control musk thistle? Yes No

How much product would you use to mix up one gallon of spray at 1.5 percent of product? _____



Weed Management Plan Activity Sheet

Date: _____ Address: _____

Use your property map to map the location of your problem weeds. Which of the weeds **MUST** be controlled according to law?

Common Name (Note if weed is a legally noxious weed)	Scientific Name	Life Cycle (summer annual, winter annual, biennial or perennial)	Plant Type (broadleaf or grass)	Method of Reproduction (seed, underground roots or shoots, both)	Spread (vehicles, animals, wind, water, birds, foot traffic, fill dirt, contaminated hay, seed or manure, other)	Mechanical Control	Cultural/Biological Control	Chemical Control (Chemical applied)	Chemical Control (date applied)	Chemical Control (Application rate and success)
1.										
2.										
3.										
4.										
5.										
6.										
7.										
8.										
9.										
10.										
11.										
12.										

Remember:

Most annuals and biennials can be controlled by mechanical means. Check to determine which integrated pest management tools will be effective for the specific species and site conditions. When chemical control is needed, consult the Dept. of Agriculture for chemical recommendations. **Follow all label directions and safety precautions.** Develop a revegetation plan so weeds do not reinvade.



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What to Do About Weeds

Web sites for further information

Clark County Vegetation Management, <http://www.clark.wa.gov/weed/>

Washington State Noxious Weed Control Board, <http://www.nwcb.wa.gov/default.asp>

Pacific Northwest Weed Management Handbook, <http://pnwhandbooks.org/weed/>

WSU Extension Weed Management, <http://extension.wsu.edu/agriculture/plants/weed/Pages/default.aspx>

WSU Urban IPM and Pesticide Safety Education Program, <http://pep.wsu.edu/>

California Weed Science Society, <http://www.cwss.org/>

Colorado Environmental Pesticide Education Program, <http://www.colostate.edu/Depts/SoilCrop/extension/CEPEP/>

Weed Management for Small Rural Acreages, Colorado State University, <http://www.ext.colostate.edu/pubs/natres/03106.html>

Colorado State University Cooperative Extension Small Acreage Management, <http://www.extension.colostate.edu/boulder/ag/agweeds.shtml>

Federal Interagency Committee for the Management of Noxious and Exotic Weeds, <http://www.fs.fed.us/ficmnew/index.shtml>

Idaho Noxious Weeds, <http://www.idahoweedawareness.net/vfg/weedlist/weedlist.html>

Invasive Species, <http://www.invasive.org/species/weeds.cfm>

Montana Pesticide Education Program, <http://www.pesticides.montana.edu/>

Pesticide Education Network, <http://www.gaipm.org/pen/>

The Nature Conservancy, Global Invasive Species Team, <http://tncinvasives.ucdavis.edu/>

University of California IPM Pesticide Information Resources, <http://www.ipm.ucdavis.edu/GENERAL/pesticides.html>

University of Montana Invaders Database System, <http://invader.dbs.umt.edu/>

US Army Corps of Engineers Invasive Plants Management, <http://www.usace.army.mil/Missions/Environmental/InvasiveSpeciesManagement.aspx>

USDA CSREES Pesticide Safety Education Program, <http://www.epa.gov/oig/catalog/programs/269.html>

USDA Plants Database, <http://plants.usda.gov/java/noxiousDriver>

Utah State University Extension Pesticide Use and Safety Information, <http://extension.usu.edu/htm/publications/by=category/category=53>

Western Society of Weed Science, <http://www.wsweedscience.org/>



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What to Do About Weeds Glossary, page 1 of 1

Annual: Plant that completes its life cycle, growing from a seed to producing seed, in one year.

Biennial: A plant that completes its life cycle in two years. First year growth consists of roots and low growing leaves; the second year growth includes flowers and seeds.

Dicot: Plant with two seed leaves, net-like veins, and coarse taproots; generally broad-leafed plants.

Eradication: Complete elimination of a pest. This is difficult to achieve except in very small, new infestations.

Herbicide: Pesticide (chemical) used to specifically control undesirable plants and vegetation.

Indigenous Plants: Native plants, plants that evolved or developed over time in this area.

Invasive weeds: Weeds that rapidly multiply to dominate a site, are difficult to control, and are damaging.

Integrated weed management (IWM): A weed control program that combines two or more control methods. Methods commonly considered include prevention, eradication, mechanical controls, cultural controls, biological controls, chemical controls.

Monocots: Plants with one seed leaf, parallel veins and fibrous roots; generally grasses.

Monocultures: Plant communities consisting on one plant species, generally an undesirable plant species.

Nonindigenous plants: Introduced, nonnative plant species.

Noxious weeds: Invasive weeds that meet the “3 D’s”: **D**amaging, **D**ifficult to control, and tend to **D**ominate a site.

Perennials: A plant that lives for three or more years, even though some perennials die down to the ground each year.

Pesticide: Chemical used to kill pests, generally formulated for a specific pest. The responsibility falls on the person doing the application to have correctly identified the pest and used the pesticide correctly – ALWAYS READ THE LABEL. A chemical used to kill or damage pests of any kind. An herbicide is a type of pesticide used to kill plants or weeds.

Rhizomes: Underground stems, usually horizontal, capable of producing new shoots and roots at the nodes.

Seed bank: Term used to describe the wealth of seeds present in the soil, awaiting optimum conditions to sprout and grow. Weed seeds are particularly adept at remaining viable for years or decades in the soil, waiting for the conditions necessary to germinate and grow.

Stolon: Trailing or lateral stem forming at or below the soil surface, capable of rooting and sending up new shoots at the nodes.

Weed: Any plant growing where it is not wanted.

