

Weed Management for Master Gardeners

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3/24/14



What is a weed?

- A plant without a positive role
- A plant out of place
- A plant that interferes with management objectives
- Usually a non-native plant



What is an invasive weed?

- A plant that adversely affect the habitats they invade economically, environmentally, and/or ecologically

What is a noxious weed?

- An invasive weed that has been designated by law or regulation because of above listed factors



Overview of Weed Management

- Life Cycles
- Identification
- Non-Chemical Weed Management
- Herbicides
- Weed IPM Examples



Life Cycles

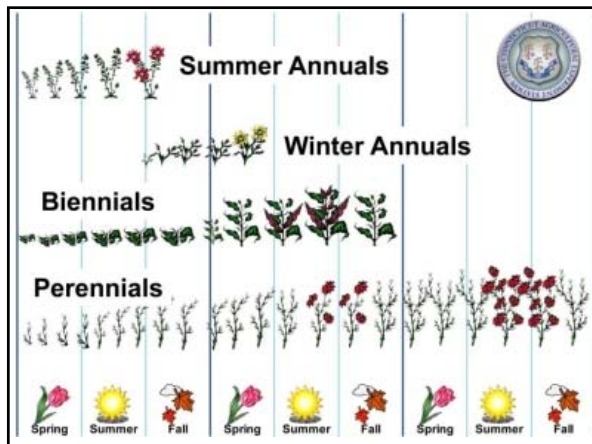
- **Annuals weeds** complete their life cycle (seed to seed) within one growing season or one calendar year
- **Biennial weeds** complete their life cycle over two growing seasons
- **Perennial weeds** continue to regrow over a few seasons to many seasons
- **Creeping perennial** have vegetative structures (stolons or rhizomes) that permit them to reproduce asexually



Life Cycles (cont.)

- **Woody perennials** are perennial weeds that grow into a tree or shrub
- **Cool Season** weeds germinate/grow in the fall through early spring (October to March), when soil temperature and moisture are favorable (may be annual, biennial, or perennial)
- **Warm Season** weeds germinate as temperatures rise in the spring (April to May) through summer, whenever soil moisture is adequate





Purslane, (*Portulaca oleracea*), annual, warm.



Filaree, (*Erodium cicutarium*), annual, cool.



London rocket, (*Sisymbrium irio*), annual, cool.



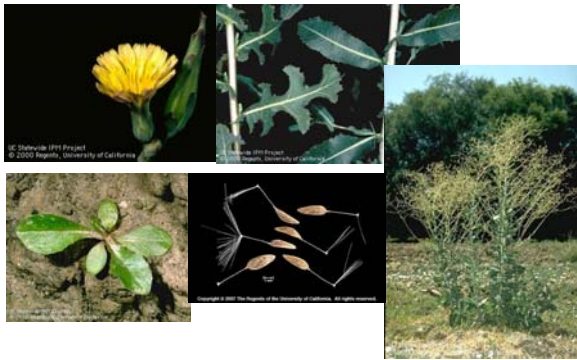
**Sowthistle, (*Sonchus oleraceus*),
annual, warm.**



**Common Weeds: Annual brome
grasses, (*Bromus sp.*), annual, cool.**



**Prickly lettuce, (*Lactuca serriola*),
annual, cool.**



Hare barley, (*Hordeum murinum* ssp. *leporinum*), annual, cool.



Puncturevine, (*Tribulus terrestris*), annual, warm.



Field sandbur, (*Cenchrus echinatus*), annual, warm.



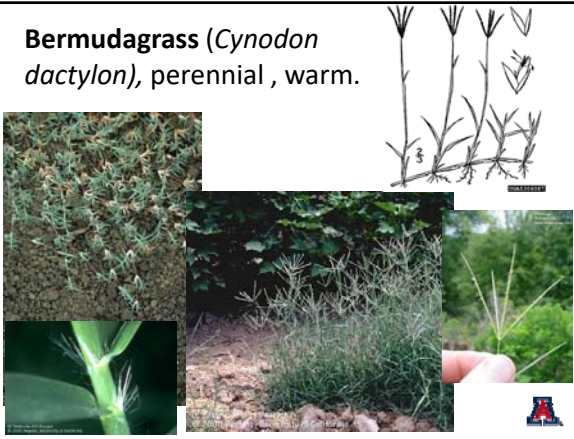
Scotch thistle (*Onopordum acanthium*),
biennial, cool.



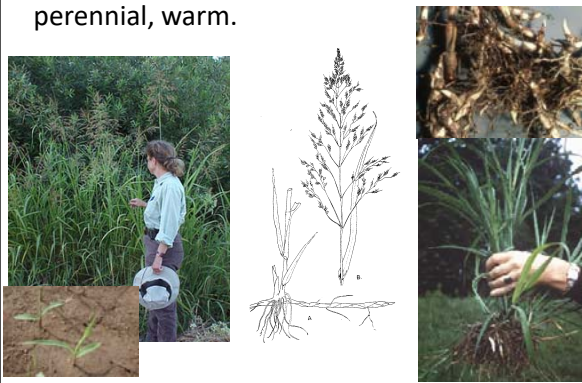
Diffuse knapweed (*Centaurea diffusa*),
biennial/perennial, cool.



Bermudagrass (*Cynodon dactylon*),
perennial, warm.



Johnsongrass (*Sorghum halapense*),
perennial, warm.



Field Bindweed (*Convolvulus arvensis*),
perennial, warm.



**Silverleaf nightshade (*Solanum*
elaeagnifolium),** perennial, warm.



Salt cedar (*Tamarix parviflora*), woody perennial.



Russian olive (*Elaeagnus angustifolia*), woody perennial.



Tree of heaven (*Ailanthus altissima*), woody perennial.



Siberian elm (*Ulmus pumila*), woody perennial.



Giant Reed (*Arundo donax*), large perennial grass.



Non-Chemical Weed Management

- Prevention (be aware of weed propagules)
- Competition/restoration/planting density
- Solarization
- Mulching
- Mechanical control (pulling, mowing, etc.)
- Biological control (grazing/herbivory/fungi/bact)

"a year of seeds means a decade of weeds"



NCWM: Prevention

- Clean equipment before going to a site
- Be suspicious of horse manure, imported soil, other materials or objects
- Buy certified weed-free seed
- Minimize unnecessary disturbance
- Learn to recognize weed seedlings
- Early detection and removal



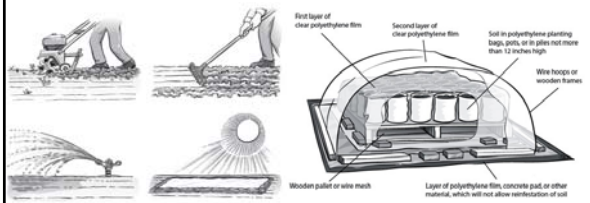
NCWM: Competition

- Mow lawns taller (deeper roots more canopy)
- Plant densely to crowd out weeds
- Restore disturbed areas with desirable plants
- Think about warm and cool season competitors



NCWM: Solarization

- Clear plastic placed above irrigated soil and sealed at edges
- Allow to solarize



NCWM: Mulching

Mulches work well for annual weeds

- Inorganic mulches (gravel, rubber, brick chips)
- Synthetic mulches (black plastic, geotextiles, landscape fabric)
- Organic mulches (bark, chips, straw) are preferable to inorganic and synthetic mulches



NCWM: Mechanical

- Hand pulling/cultivation (sparse populations)
 - “water, wait, then cultivate”
- Mowing (favors grasses)
- Burning (broadleaf annuals)
- Disking (don’t go deeper than necessary)
- String trimmer (best on annual broad leaves)



NCWM: Biological

- Usually most effective where weeds are well established
- Will never completely eradicate a weed
- Grazing, insects, fungi, bacteria, and other living organisms having an affinity for the weed



Herbicides

Should be used in combination with as many other appropriate weed management practices as possible

- Preemergent
- Postemergent
 - Systemic
 - Selective
 - Nonselective
 - Contact
- Soil Sterilants



Herbicides: Preemergent

Used to prevent annual weed seeds from germinating in established landscape areas

- Many types – some are selective
- Some sold in combinations
- Check the label to determine which ornamental species the material can safely be used around and which species of weeds are controlled



Herbicides: Postemergent

Postemergent herbicides can be used to control established weeds

- Systemic formulations
 - go into plant and translocate to roots
 - Nonselective – kills all plants
 - Selective
 - Broadleaf (Weed B Gon, 2,4-D)
 - Grass Killers (clethodim and fluzifop)
- Contact – for annuals only – kills leaves only
 - Glufosinate and diquat
 - Some are considered “least toxic” – pelargonic acid, clove oil, acetic acid (for small annuals)



Herbicides: Soil Sterilants

Used to prevent plant growth in industrial and commercial areas – not appropriate for home use

- When used in landscapes, these products often kill or injure desirable landscape plants



Herbicides: Killing Woody Plants

- Digging up root system
- Stump grinding
- Black plastic
- Cut Stump Treatment with glyphosate or triclopyr – see publication AZ1401 – *Cut Stump Application of Herbicides to Manage Woody Vegetation*, (<http://cals.arizona.edu/pubs/garden/az1401.pdf>)



Herbicides: Timing

Preemergent

- Late summer for cool season annual weeds
- Late winter for warm season annual weeds

Systemic

- Plant must be actively growing for glyphosate to be effective – summer

Cut Stump

- Fall is usually when woody plants are moving stored materials into the root system – this is a good time to treat unwanted woody plants



Recognizing Herbicide Injury

Herbicide injury symptoms vary according to plant species and the herbicide and can include the following:

- yellowing (chlorosis)
- bleaching
- root stunting
- distorted growth
- death of leaves

It takes time for herbicide residues to completely degrade.



Additional Resources

- University of California IPM Weeds (for home) (<http://www.ipm.ucdavis.edu/PMG/menu.weeds.html>)
- Utah State Extension Weed Control (for small farm) (<http://extension.usu.edu/smac/htm/weed/>)
- Montana State University Cropweed Management (for small farm) (<http://www.ipm.montana.edu/CropWeeds/Index.htm>)