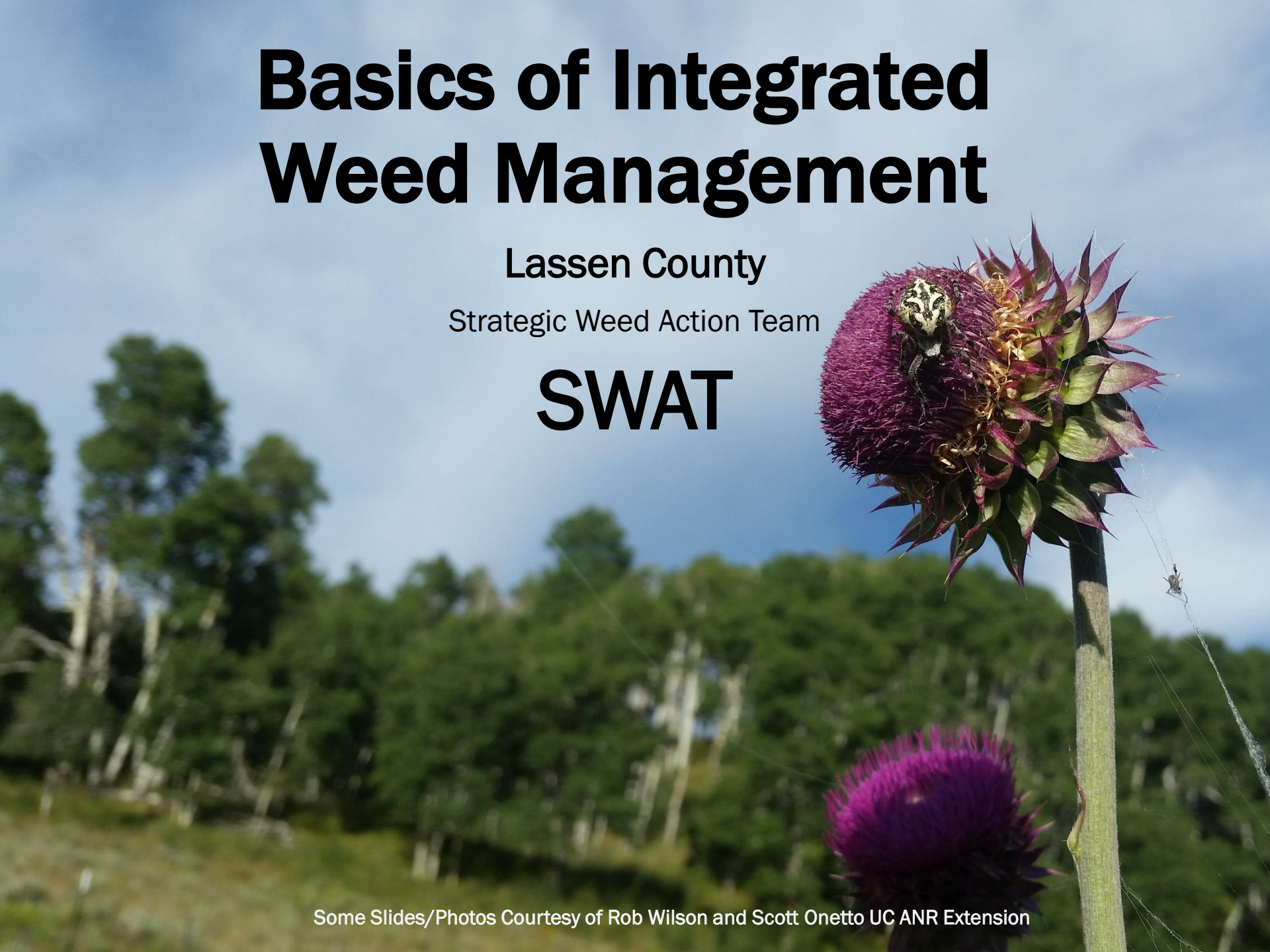
# Basics of Integrated Weed Management

## Lassen County

Strategic Weed Action Team

## SWAT



Some Slides/Photos Courtesy of Rob Wilson and Scott Onetto UC ANR Extension

# Lassen County-SWAT

- Weed Management Area
  - Headed by the Honey Lake Valley Resource Conservation District

East Lake Resource Conservation District
Big Valley Pest Abatement District
Bureau of Land Management, Alturas Field Office
Bureau of Land Management, Eagle Lake Field Office
Bureau of Land Management, Surprise Field Office
California Correctional Center
California Department of Fish and Game
California Department of Food and Agriculture
California Department of Forestry
California Department of Transportation District 2
City of Susanville Parks Department
Ducks Unlimited
Honey Lake Conservation team
Honey Lake Valley Resource Conservation District
Lassen Community College
Lassen County Agricultural Commissioner's Office
Lassen County Cattlemens and Cattlewomens Associations
Lassen County Farm Advisor's Office
Lassen County Farm Bureau
Lassen County Office of Education
Lassen County Public Works Road Department
Lassen County University of California Cooperative Extension Office
Lassen Land and Trail Trust
National Park Service, Lassen Volcanic National Park
Natural Resources Conservation Service/Honey Lake RCD
Pheasants Forever
Pyramid Lake Paiute Tribe
Sierra Army Depot
Sierra Pacific Industries
Surprise Valley Resource Conservation District
Susanville Indian Rancheria
US Forest Service, Lassen National Forest
USDA Farm Services Agency

# Outline

- Definitions
- Identification
- Biology
- Integrated Weed Management
  - Physical
  - Cultural
  - Chemical
- Common Noxious Weeds


Photo Courtesy of: www.nwcb.wa.gov

# What's a Weed?

- A plant out of place
- One you don’t want!

Photo Courtesy of: Dr. Westra CSU

# Why does it matter?

- Poisonous to livestock
- Reduced forage quality
- Reduced Yields
- Ascetics
- Fire safety
- Thorns
- Ecosystem damage
- ALL IN THE EYE OF THE BEHOLDER

Image Courtesy of: http://www.outsidepride.com/seed/flower-seed/adonis.html

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Image Courtesy of: Phil Westra

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Images Courtesy of: Scott Onetto

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Images Courtesy of: http://www.napafirewise.org/DS%20Download/defensable-space-live/02_defensiblespace.html

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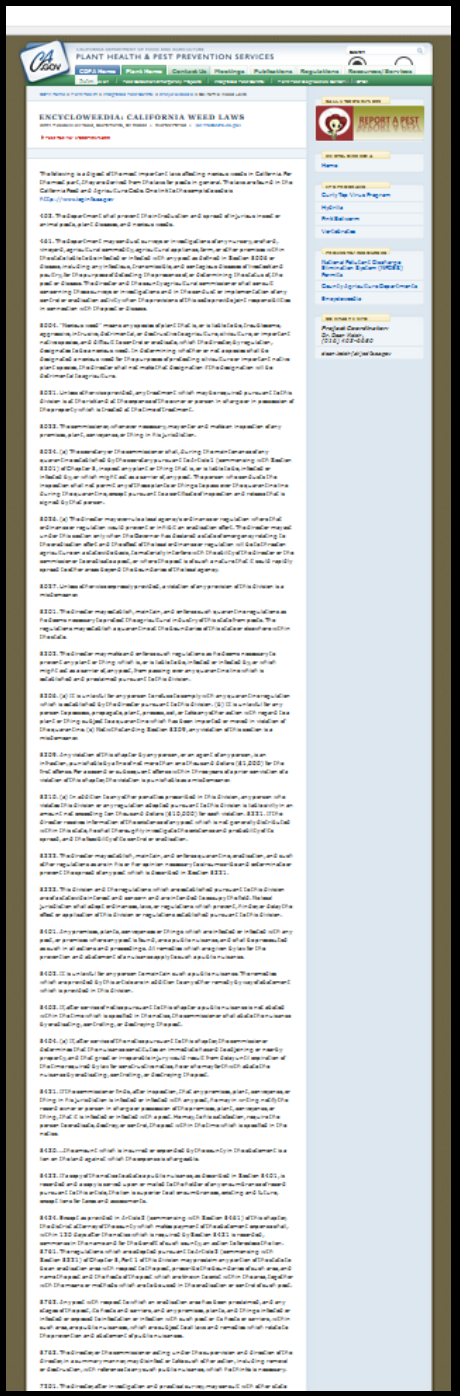
Images Courtesy of: www.co.stevens.wa.us

# What is a Noxious Weed?

- Legal Designation!
- Federal Noxious Weeds
- State Noxious weeds

Image Courtesy of: Colorado State

# California Weed Laws



# Invasive Weeds

- Plants that disrupt ecosystems
- Defined by CaI Invasive plant council
- Some overlap with noxious weeds


Image courtesy of: http://www.piercecountyweedboard.org/images/pierce/ppepperweed/pPepperweed_3.jpg

- Integrated Weed Management- Utilizing a combination of information and practices to control weed species

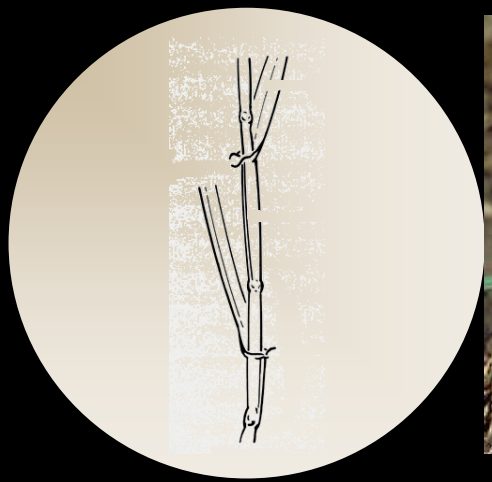
# So what is the first step?

# Identification!

- Bad?
- Poisonous?
- Noxious?
- Good?
- Endangered?

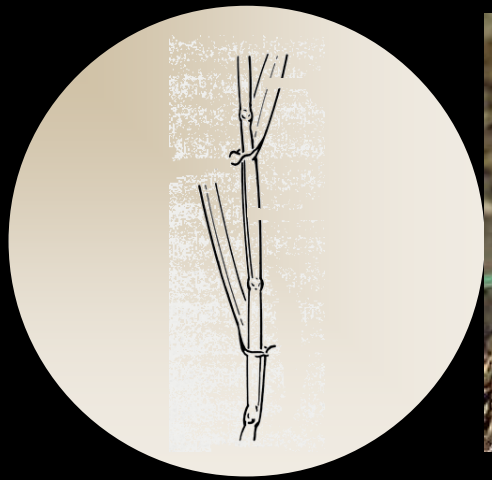
Image courtesy of: www.wildernessaware.org

# Narrow it down



# Narrow it down

- Veins
- Leafs
- Flowers
- Roots
- Growth Style
- Habitat
- Seeds



# Broadleaf Plants

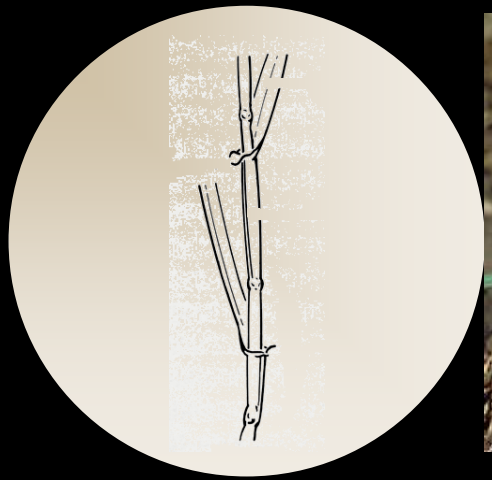
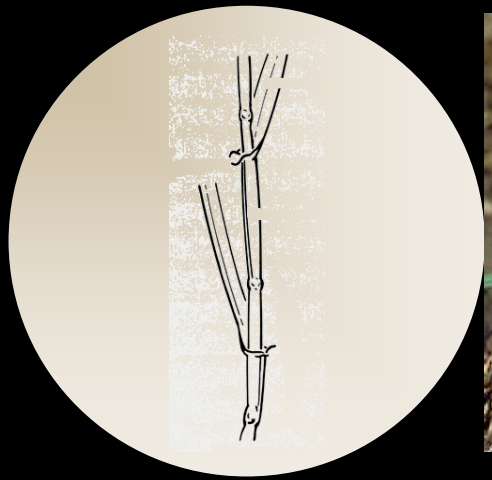



Photo Courtesy of extention.Missouri.edu

# Sedges

# Grasses

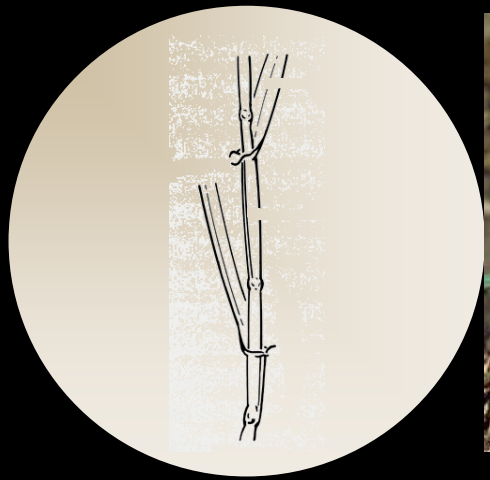


# Broadleaf Plants

Kidney

Simple Leafs

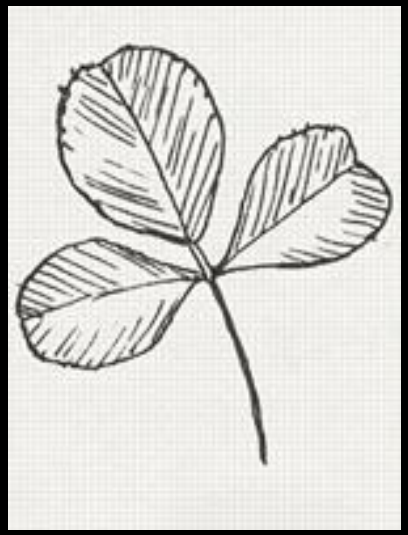
Palmate Lobed



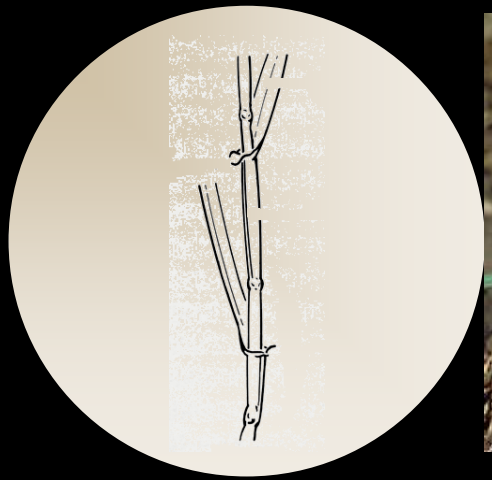
# Broadleaf Plants

Compound Pinnate

Compound Leafs

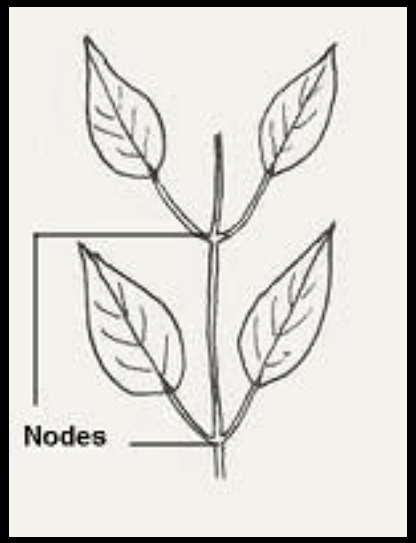


Compound Palmate

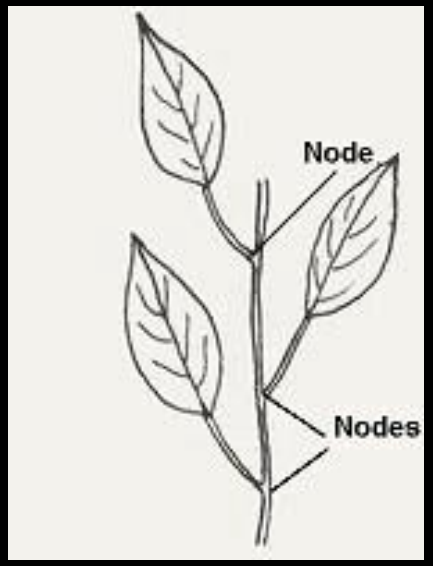


# Broadleaf Plants

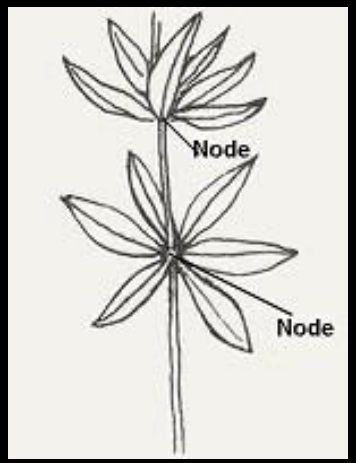
Leaf arrangement



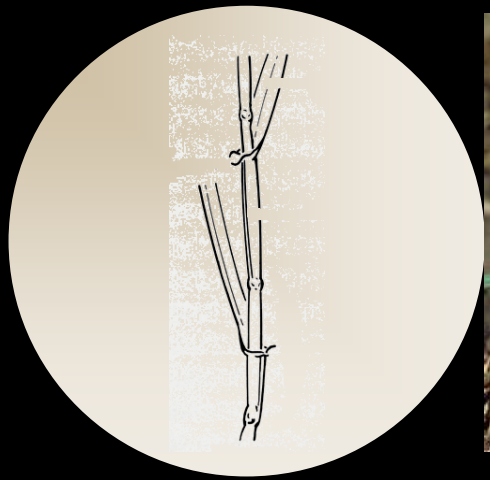

Opposite




Alternate




Whorled



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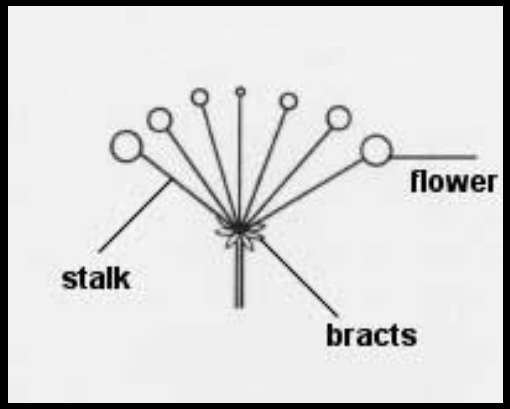
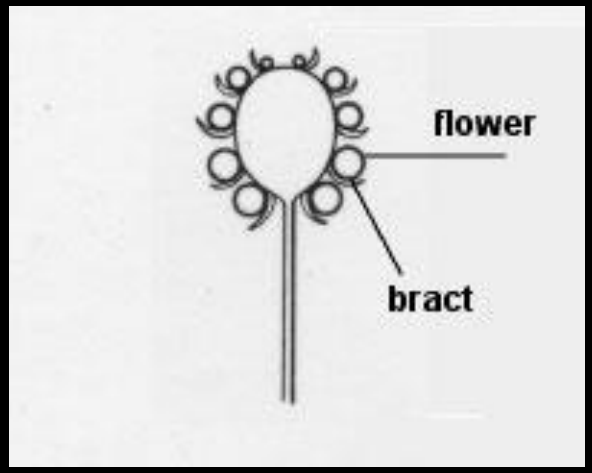
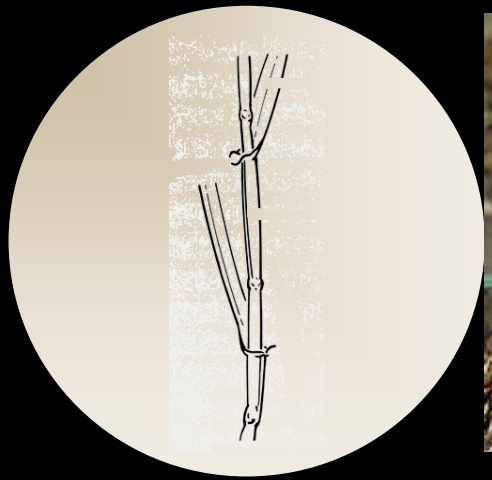



Flower type

Umbel

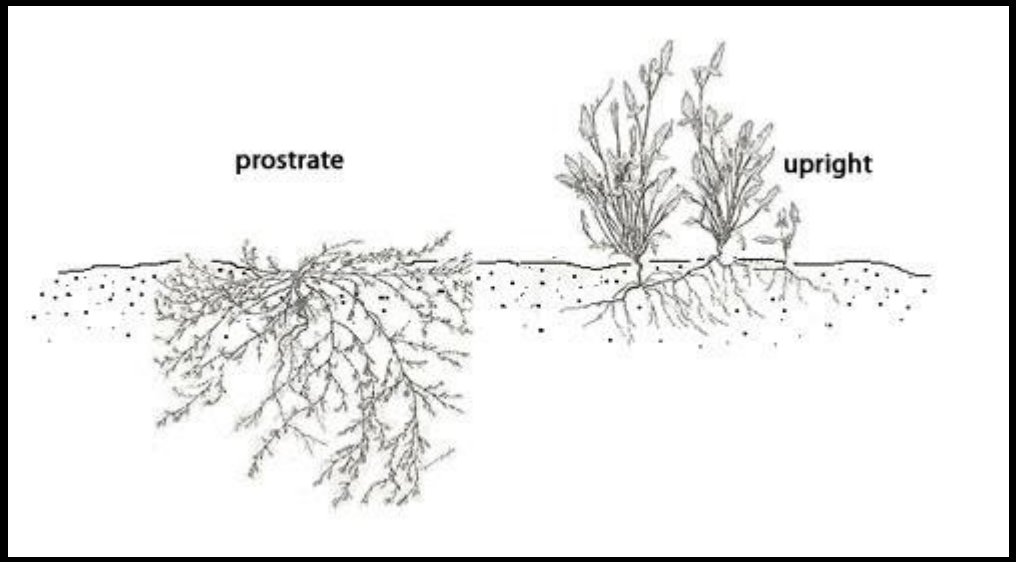


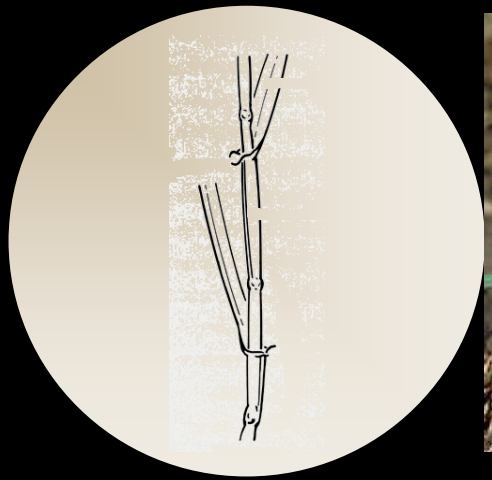

Composite



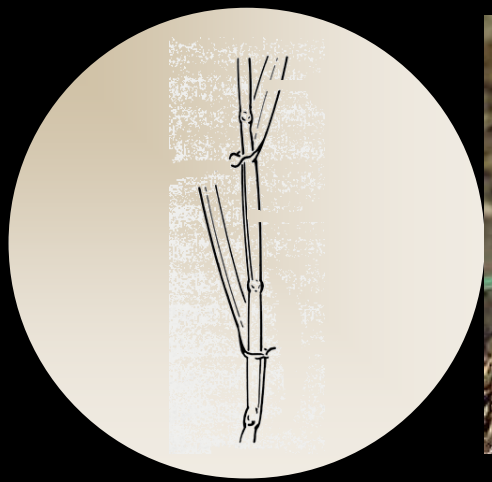
# Broadleaf Plants

Growth type



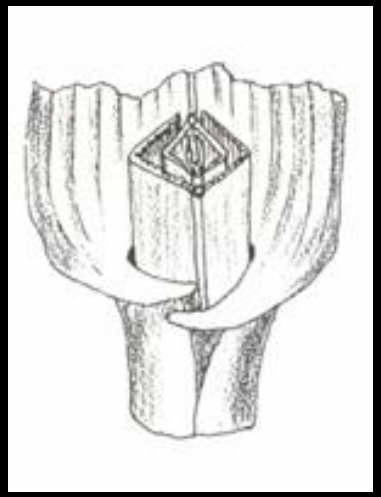



# Grasses



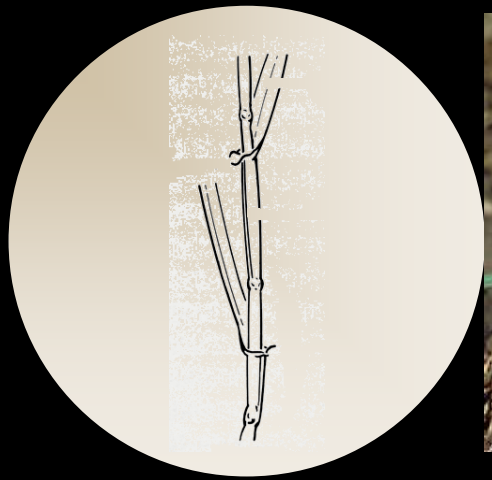
Rolled

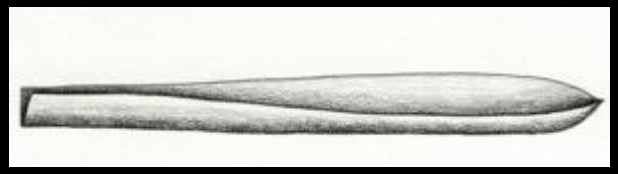
Leaf Morphology

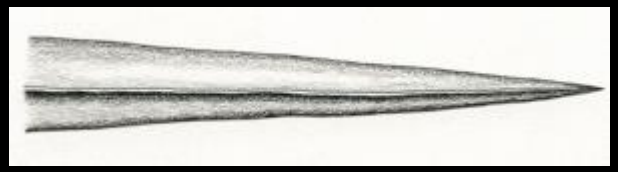


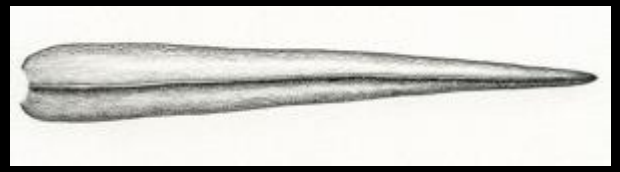
Folded

# Grasses

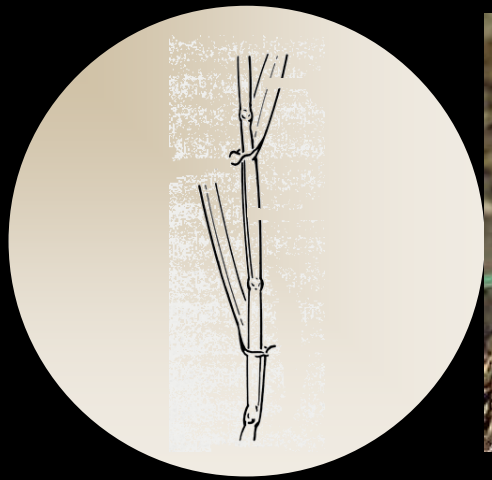






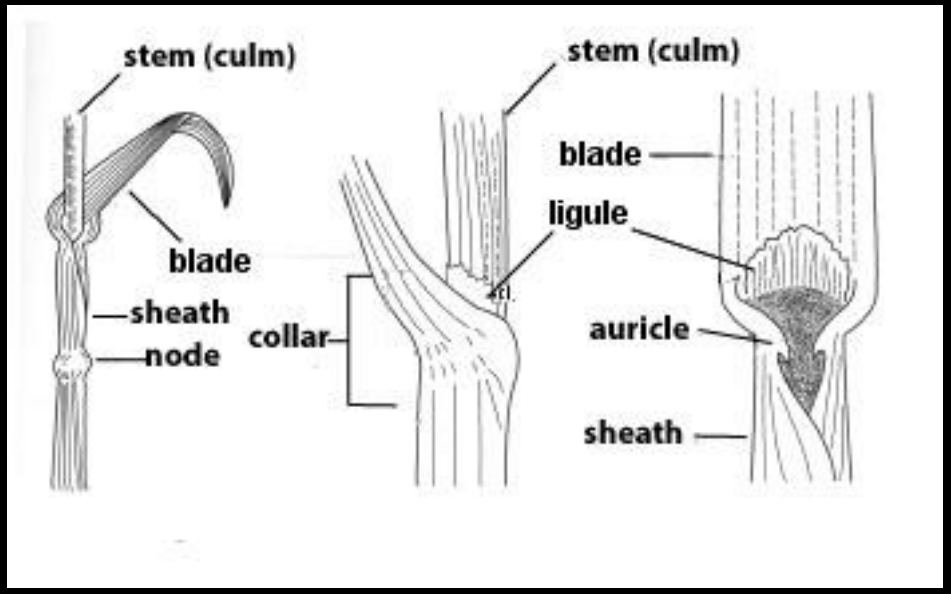


Leaf Shape



# Grasses

Collar Region

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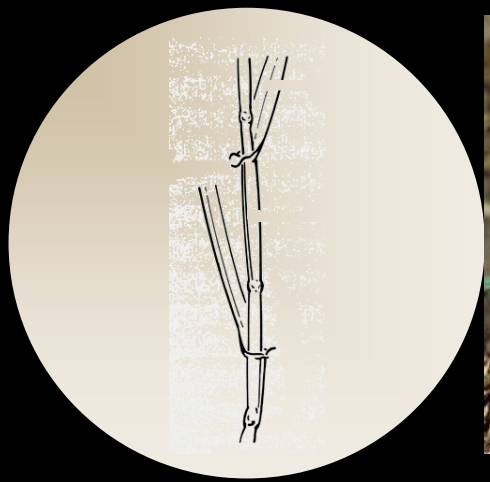
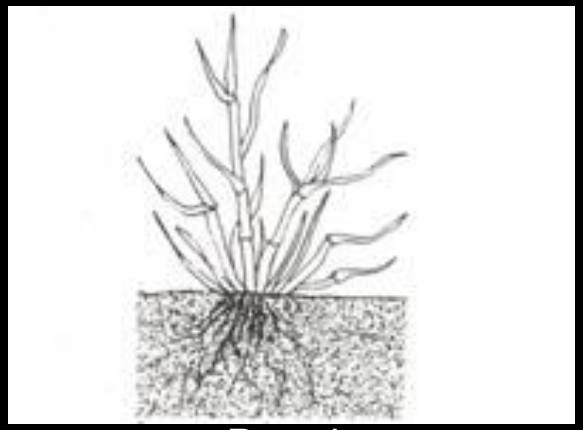
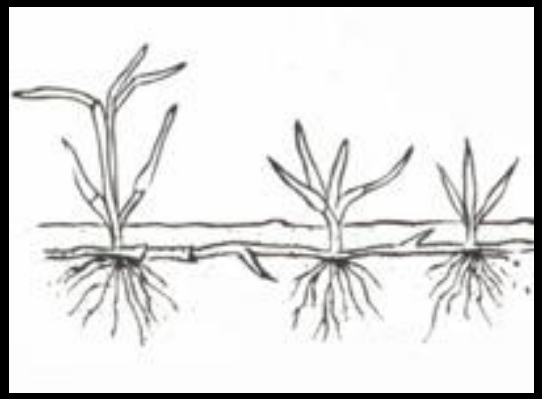




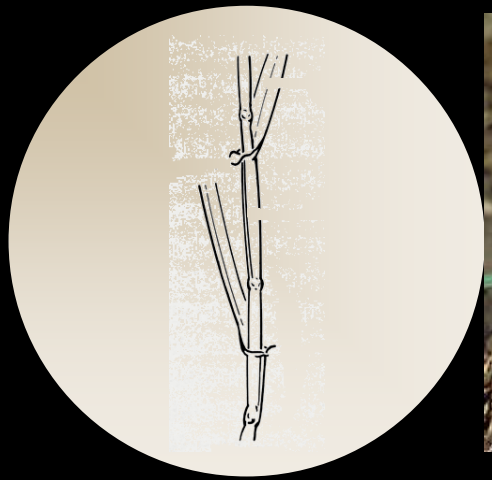
Bunch

Growth type

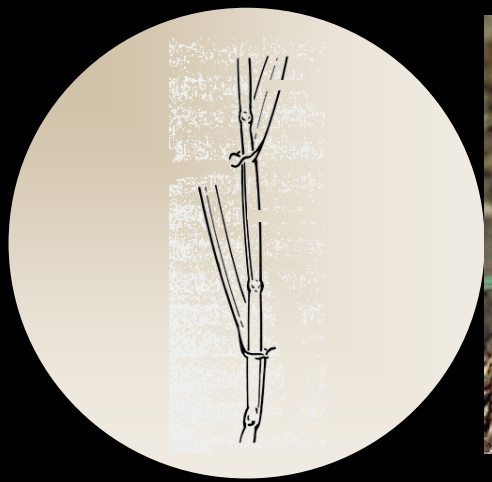


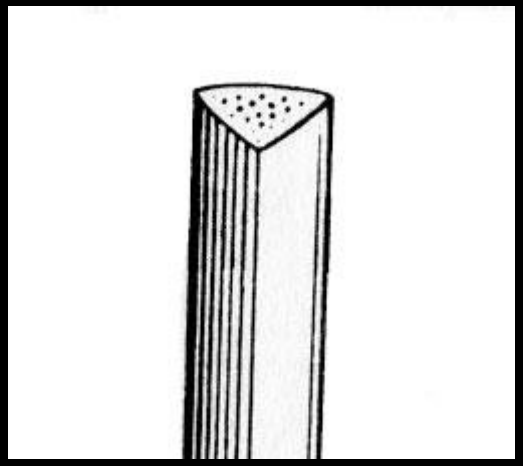
Spreading

# Grasses



# Sedges





# Sedges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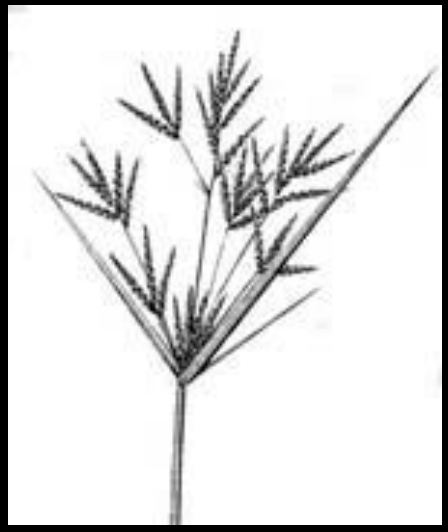
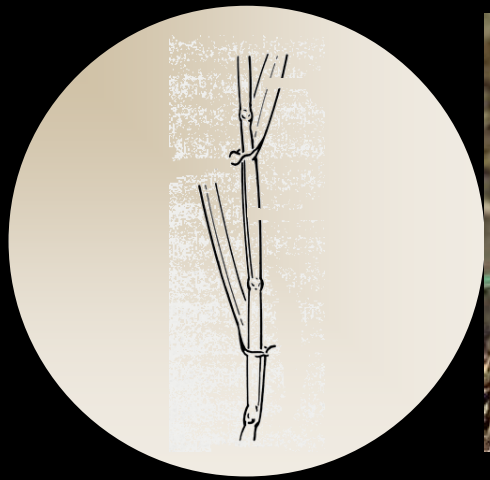
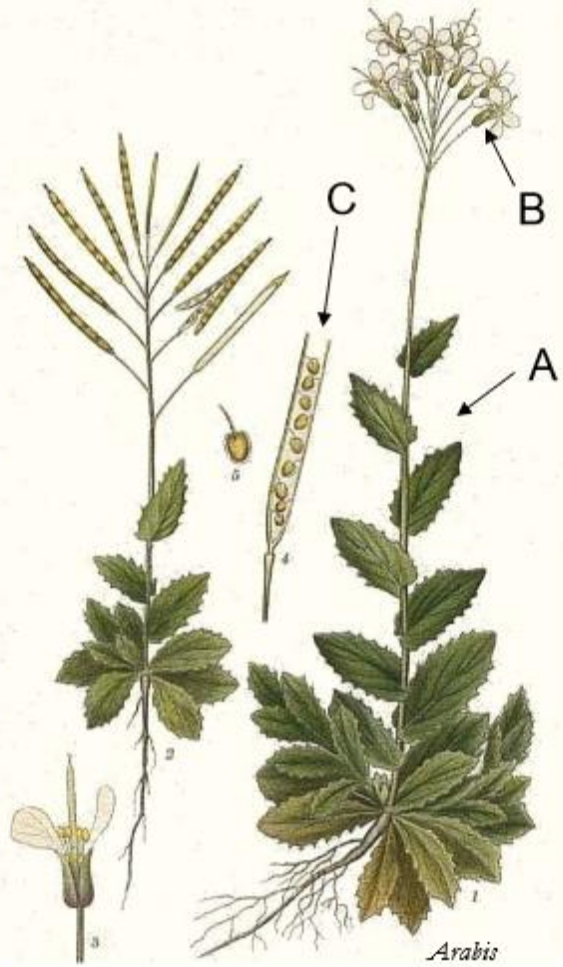




# Plant Family's

## Brassicaceae s. str. MUSTARD FAMILY

- Herbaceous
- With mustard oils
- Leaves simple, alternate (**A**), often lobed, with pinnate venation
- Leaf edge often dentate (**A**) or lobed
- Inflorescence a raceme
- Petals 4, not fused, forming a cross + from above (**B**), white, yellow, or pink
- Stamens 6
- Fruit a dry capsule with inner wall (silique; **C**)




Note: This family circumscription refers to Brassicaceae s. str. and does not include Capparaceae (capers) and Cleomaceae.

Photo courtesy of : http://www.sci.sdsu.edu

# ID Various Life Stages

http://courses.missouristate.edu/pbtrewatha/russian_thistle.htm

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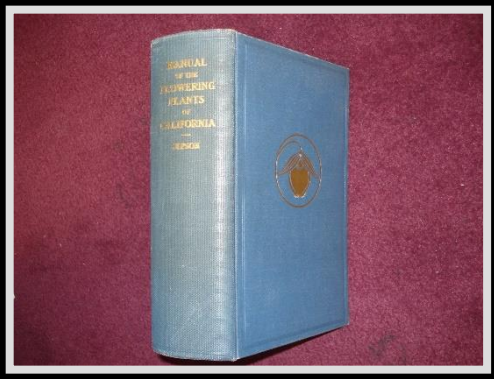
http://courses.missouristate.edu/pbtrewatha/russian_thistle.htm

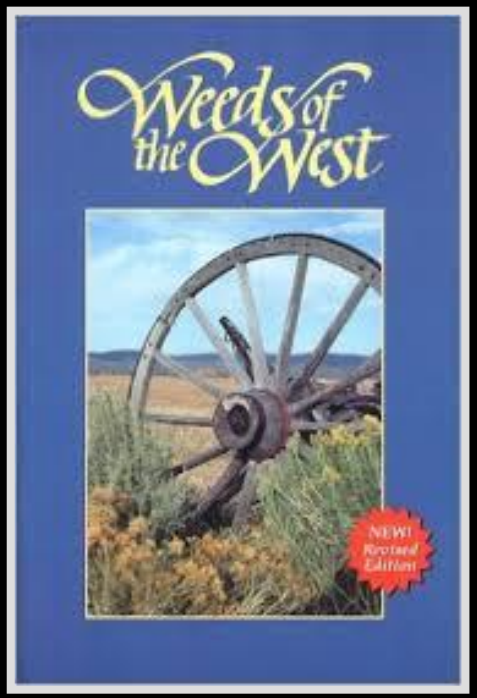
# ID Various Life Stages

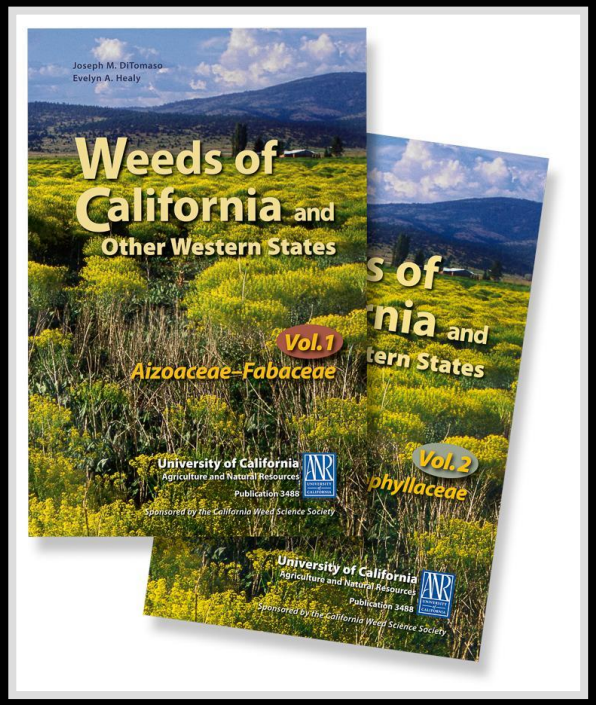
http://saunteringoregon.com/blog/?cat=15&paged=2

# Tools

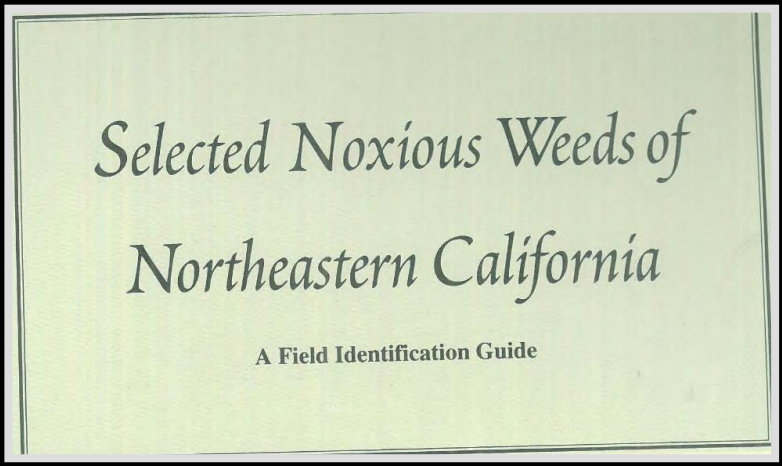
- Books
  - Weeds of the West
  - Weeds of California and other Western States
  - By Plant Family
- Field Guides
- Dichotomous Keys (haha)










Images courtesy of: google images

# Tools

Field Guide Links

http://nvwma.org/pdfs/publications/nevada_noxious_weed_field_guide.pdf

http://www.blm.gov/style/medialib/blm/ca/pdf/eaglelake/weeds.Par.92400.File.dat/Selected_Noxious_Weeds_of_Northeastern_California.pdf

# Tools

- People
  - Neighbors
  - Extension
  - Botanists
  - County Ag
  - NRCS
  - Plant Pest Diagnostic Center
    - CDFA
  - UC Davis Center for Plant Diversity
    - 5 free Identifications/year!
    - (then hourly)

Image courtesy of : www.rbg.vic.gov.au

# Preparing a sample

- In person
  - Alive, or Dry (all parts)
- By mail
  - Flat/folded newspaper
  - Taped down between cardboard
  - Padded envelope
- Location
  - Elevation
  - Wet/dry
  - Ecotype
  - Ect.
- Contact info!


Image courtesy of : gobotany.newenglandwild.org

# Tools

- Internet
  - UC Resources
    - http://www.ipm.ucdavis.edu/PMG/weeds_intro.html
  - Weed Id tool
    - http://weedid.wisc.edu/ca/weedid.php
  - Other Useful websites
    - http://www.calflora.org/ (not always a weed)
    - http://plants.usda.gov/java/
  - Plant Family Publication
    - http://www.sci.sdsu.edu/plants/plantsystematics/Identifying_50_major_plant_families.pdf
  - Google
  - Seedling ID
    - http://store.msuextension.org/publications/AgandNaturalResources/EB0215.pdf
  - Botany
    - https://ag.arizona.edu/pubs/garden/mg/botany/plantparts.html

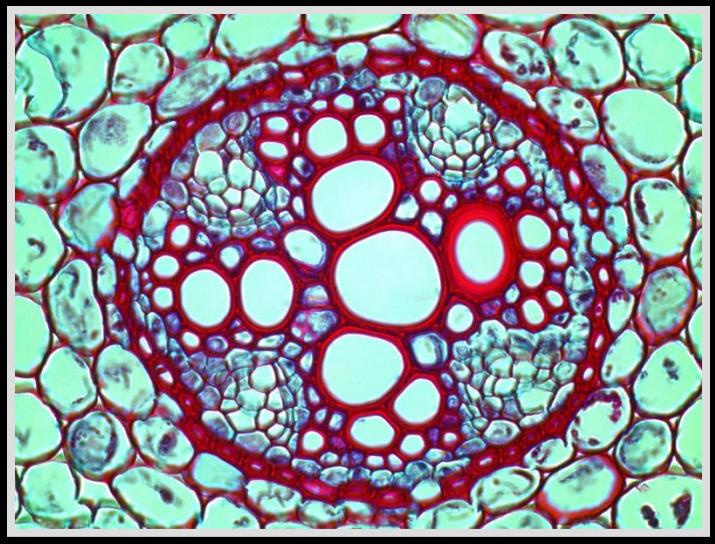
# #1 Goal in Successful Weed Management?

# #1 Goal in Weed Management

- Prevent Reproduction!
  - Seeds
  - Tubers
  - Roots
- Basic understanding of biology

# Step Two-Biology

- Biology
  - Exposes weed's strengths
  - Exposes weed's weaknesses
- Life cycle
  - Reproduction method
  - Timing
- Preferred conditions



# Weed Life Cycle

**Annual:** **Completes growth cycle in a single growing season (warm and cool season plants)**

**Biennial:** **A plant that normally requires two growing seasons to complete its life cycle, flowering and fruiting in its second year**

**Perennial:** **A plant that can persist more than two years, and reproduces through roots or seeds**

# Annual Weeds

- Winter Annuals
  - Germinate in fall
- Summer annuals
  - Germinate
    - Early spring to fall

Image courtesy of: http://mint.ippc.orst.edu/puncturevine.htm

# Annuals

- Challenges
  - Long germination window
  - Multiple control efforts
  - Lots of seed quickly
- Advantages
  - Can prevent seed
  - Physical methods often effective

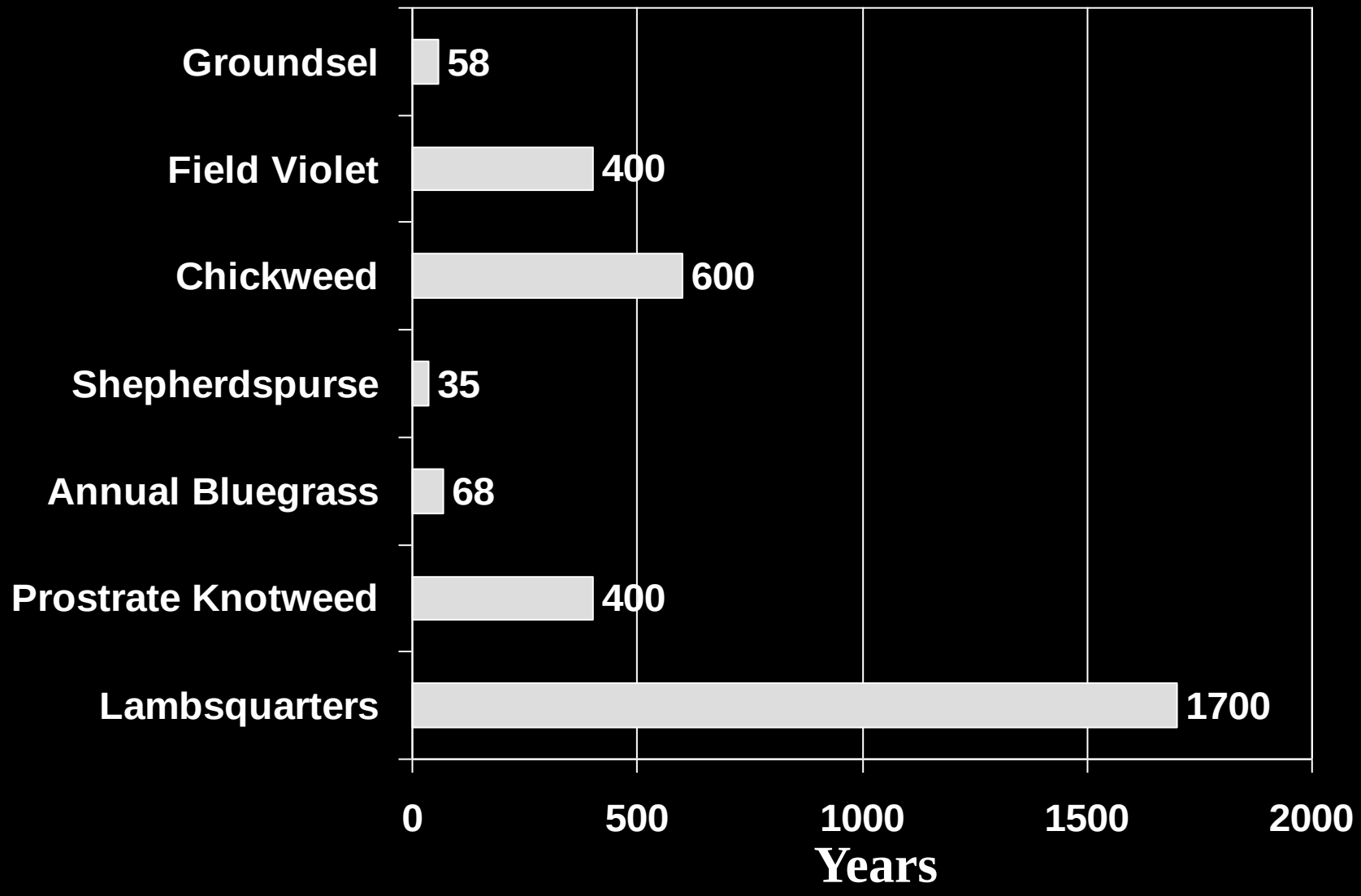
Image courtesy of: http://www.co.stevens.wa.us/weedboard/other%20weeds/htm%20pages/shepherd's%20purse.htm

Image courtesy of: http://pnwhandbooks.org/weed/punctureVine-seeds-and-seedlings

# Weed Seed Production

| | Seed / Plant |
|---|---|
| Pigweed | >200,000 |
| Lambsquarters | >70,000 |
| Crabgrass | 53,000 |
| Annual Bluegrass | 2,000 |

# Longevity of Weed Seeds in Soil

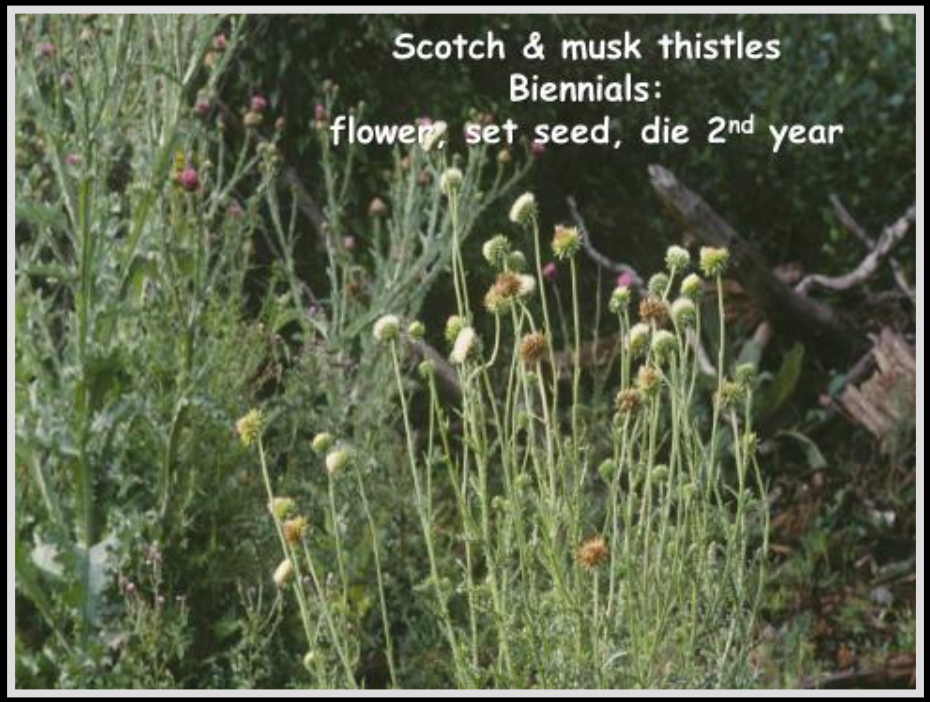


# Biennial Weeds

- Year one
  - Germinate
  - Grow
  - Often basal rosette

# Biennial Weeds

- Year one
  - Germinate
  - Grow
  - Often basal rosette
- Year two
  - Bolt (typically)
  - Flower
  - Set seed
  - Die

# Biennial Weeds

- Two seasons before reproduction
- Easier to kill fist year
- Easier to spot/find 2nd year
- Short control window second year

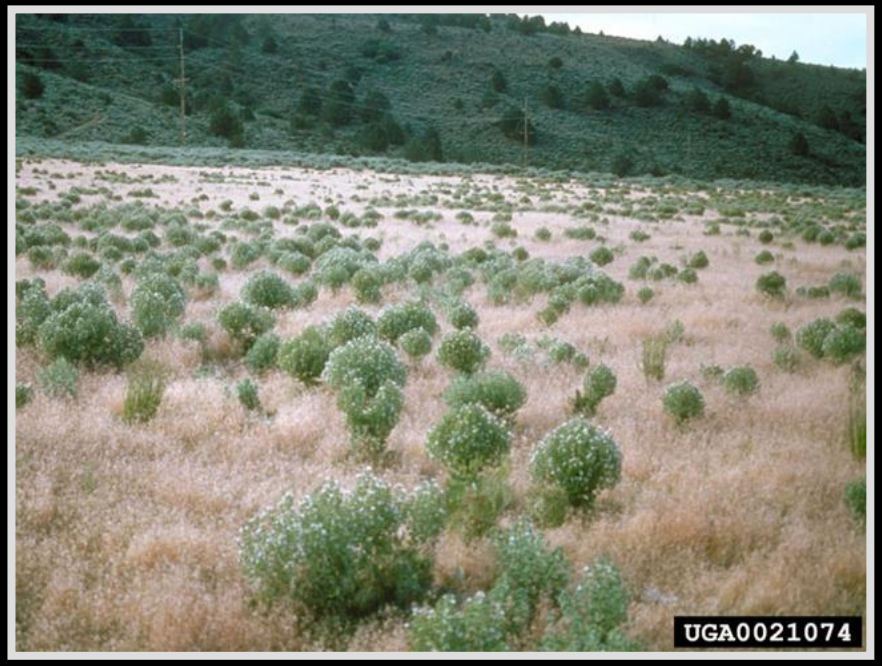



Photo courtesy of : www.streamwebs.org


Photo courtesy of : www.invasive.org

# Perennial weeds

- Year one
  - Best time to control
  - Seedling=annual


Photo courtesy of : www.forestryImages.org

# Perennial weeds

- Year one
  - Best time to control
  - Seedling=annual

- After
  - Reproductive tissue ☹
    - Roots
    - Tubers
    - Nutlets

  - Much more difficult to control!


Photo courtesy of : www.forestryImages.org

Photo Courtesy of : www.Techline News.com

# Whitetop (Perennial Peeperweed)

# Perennial weeds

- Need to control underground biomass+seeds
- Very difficult
- Often Herbicides
- Necessary multiple years

# Seed dispersal

Photo Courtesy of : cdfnews.wordpress.com

# #1 Goal in Successful Weed Management?

## Prevent Reproduction!

# #1 Goal in Successful Weed Management?

Prevent Reproduction!

+

Dispersal

# Resources for biology

- Books
  - Weeds of California
  - Weeds of the West
  - Weed Control in Natural areas
- People
  - NRCS
  - RCD's
  - Extension
  - Neighbors
  - County Ag
- Google-add UC
  - UC IPM web site- good biology information
  - USDA plants
    - Forest Service- extensive literature reviews
    - Weed reports

# Helpful Websites

- Google! (add UC and poke around!)
- http://wric.ucdavis.edu/
- http://www.ipm.ucdavis.edu/PMG/weeds_intro.html
- http://www.ipm.ucdavis.edu/PMG/menu.weeds.html
- www.calflora.org/
- http://plants.usda.gov/core/profile?symbol=LELA2

# Step Three: Management

- Know what you have
  - Weed
  - Site Characteristics
    - Yard vs. Pasture vs Alfalfa vs. Driveway
  - Desirable species present
- How did you get here?
  - Previous landowner
  - Weeds neighbors
  - Overgrazing
  - Lack of water
  - New Weed species

# Step Three: Management

- Current Situation

- Managements
  - Weigh Pros vs Cons

- Desired outcome

# Step Three: Management

- Timing!
  - When to focus control efforts

Image Courtesy of www.kidcyber.com.au

# IPM

- Knowledge
- Management
  - Cultural
    - Prevention
    - Competition
  - Physical
    - Mechanical
    - Heat
  - Biological?
  - Chemical

# Cultural Control

- Kill weeds on edges
- Clean equipment
- Don’t move soil
- Plant clean seed
- Create competitive environment
  - Correct fertilizers
  - Species selection
  - Proper irrigation

Image courtesy of : weedsmart.org.au

# Physical Barriers

- Mulches
  - Rocks
  - Wood chips
    - At least 2 inches
- Synthetic mulches (colored tarps)
  - Brown and yellow if possible
    - Physically prevent weeds form growing

Image courtesy of : www.agriculturesolutions.com

# By Hand

http://www.ripplefarmorganics.co.uk/gallery.html

# Mowing

- Suppression weeds
- Reduce seed set/delay
- Stimulate growth of some species
  - Grasses typically more tolerant
  - Deplete roots of the sugars!
- Useful in certain situations

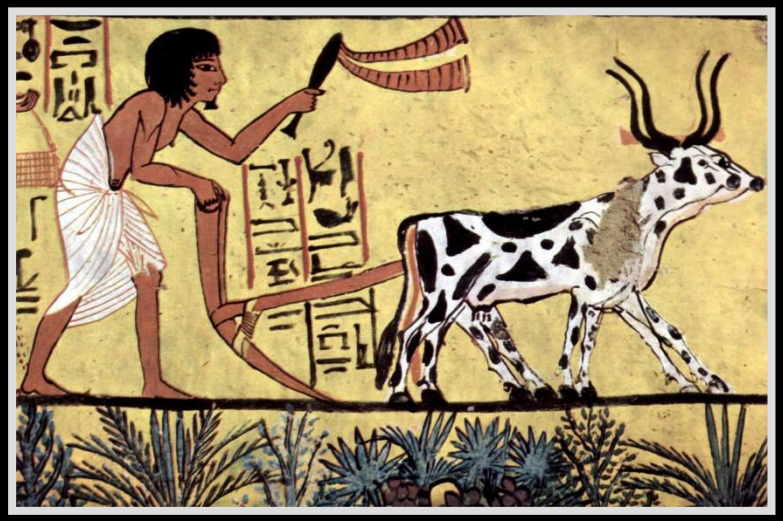

www.twentywheels.com

lavenderphoto.com

# Cultivation

- Great annual control
- SPREADS PERNNIALS!!
- Create good seed bed
- Can alter soil structure
- Moisture loss

Photo Courtesy: Google Images



"Maler der Grabkammer des Sennudem 001" by Painter of the burial chamber of Sennedjem - The Yorck Project: 10.000 Meisterwerke der Malerei. DVD-ROM, 2002. ISBN 3936122202. Distributed by DIRECTMEDIA Publishing GmbH.. Licensed under Public Domain via Commons - https://commons.wikimedia.org/wiki/File:Maler_der_Grabkammer_des_Sennudem_001.jpg#/media/File:Maler_der_Grabkammer_des_Sennudem_001.jpg

# Solarization

- Heats the top layers of soil, killing weeds, insects, pathogens, and nematodes
- Takes 4 to 8 weeks during the summer months when solar radiation is greatest

# Flaming/burning

- Typically not effective on perennial weeds
- Sprouting from roots
- *You are responsible for the fire!

# Flaming/burning

- Propane
- Home landscape
- Control top growth
- Good for annuals

http://www.gardenersedge.com/weed-dragon-100000-btu-backpack-torch-and-cart-combo/p/CT223/

# Flaming/burning (in ag)

https://www.flameengineering.com/agricultural-flamers-vegetable.php

# Burning

http://www.nature.org/cs/groups/webcontent/@web/@illinois/documents/media/il-vsn-nachusa-fire-1112x544.jpg

# Soil steamers

Invasive.org

# Weed Eaters Literally!

- Animals
  - Goats
  - Cows
  - Ducks
- Insects
- Humans

Photo Courtesy: Google Images

# Insects and Pathogens

- Long term control strategy
- Not a practical tool for individuals
- Encourage bio-control releases if new agents become available

# Chemical Control

- Herbicides
  - Chemicals that kill plants


Photo courtesy of: no-tillfamer.com

Herbicide trade names are only mentioned for example purposes only, and does not signify and endorsement of SWAT or UCCE.

# The Label is the LAW!!!

- Read the label
- Follow the label
- Labels
  - Protect you
  - Protect other species
  - Protect water
  - *Protects company
- Label Database

http://www.cdms.net/Label-Database


Image courtesy of: www.chemicaloutfiters.com

# The World of Herbicides

*According to HRAC classification on mode of action 2010*

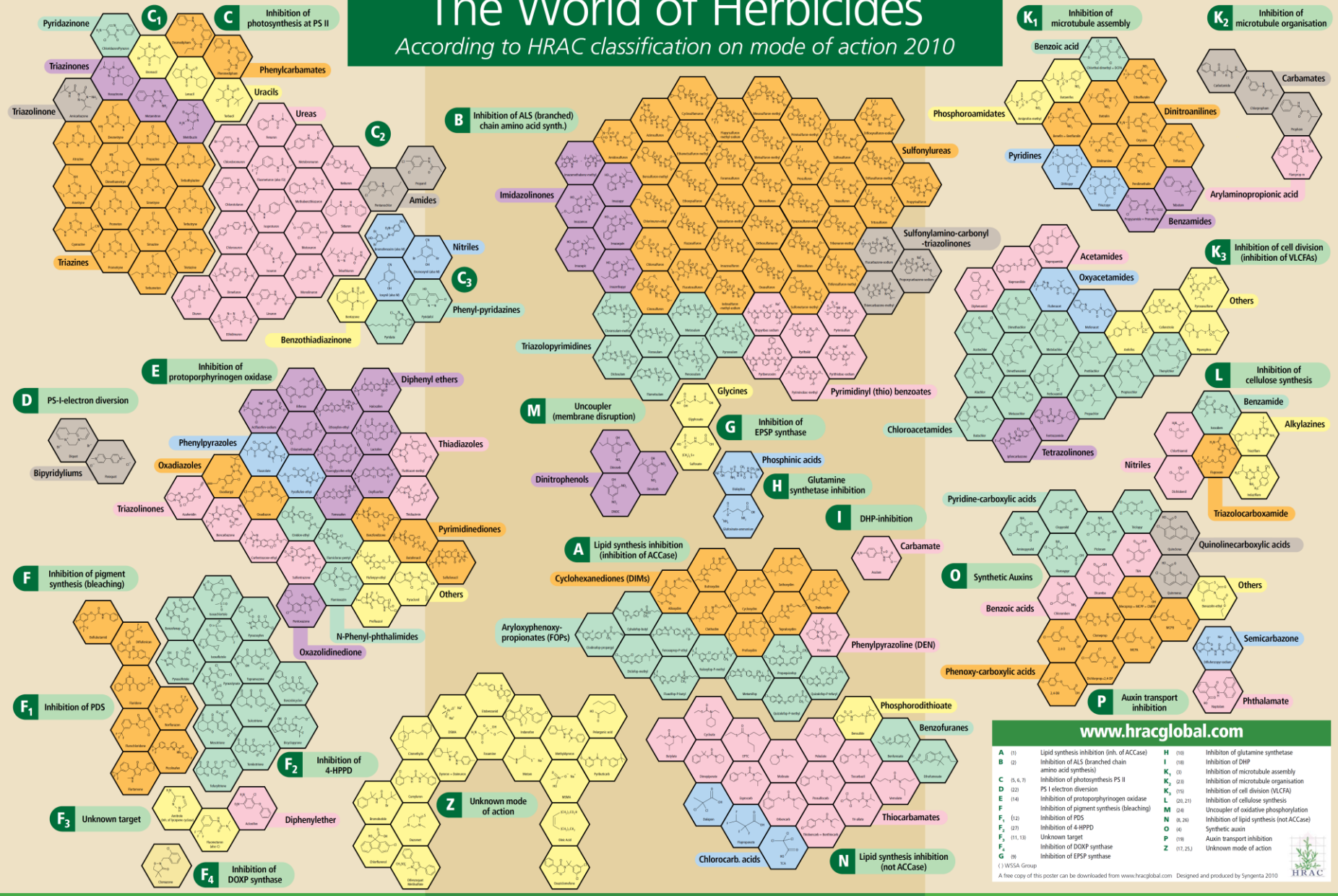



Image courtesy of the Herbicide Resistance Action Comity

# www.hracglobal.com

| | | |
|---|---|---|
| **A** | (1) | Lipid synthesis inhibition (inh. of ACCase) |
| **B** | (2) | Inhibition of ALS (branched chain amino acid synthesis) |
| **C** | (5, 6, 7) | Inhibition of photosynthesis PS II |
| **D** | (22) | PS I electron diversion |
| **E** | (14) | Inhibition of protoporphyrinogen oxidase |
| **F** | | Inhibition of pigment synthesis (bleaching) |
| **$F_1$** | (12) | Inhibition of PDS |
| **$F_2$** | (27) | Inhibition of 4-HPPD |
| **$F_3$** | (11, 13) | Unknown target |
| **$F_4$** | | Inhibition of DOXP synthase |
| **G** | (9) | Inhibition of EPSP synthase |
| **H** | (10) | Inhibiton of glutamine synthetase |
| **I** | (18) | Inhibition of DHP |
| **$K_1$** | (3) | Inhibition of microtubule assembly |
| **$K_2$** | (23) | Inhibition of microtubule organisation |
| **$K_3$** | (15) | Inhibition of cell division (VLCFA) |
| **L** | (20, 21) | Inhibition of cellulose synthesis |
| **M** | (24) | Uncoupler of oxidative phosphorylation |
| **N** | (8, 26) | Inhibition of lipid synthesis (not ACCase) |
| **O** | (4) | Synthetic auxin |
| **P** | (19) | Auxin transport inhibition |
| **Z** | (17, 25,) | Unknown mode of action |

( ) WSSA Group

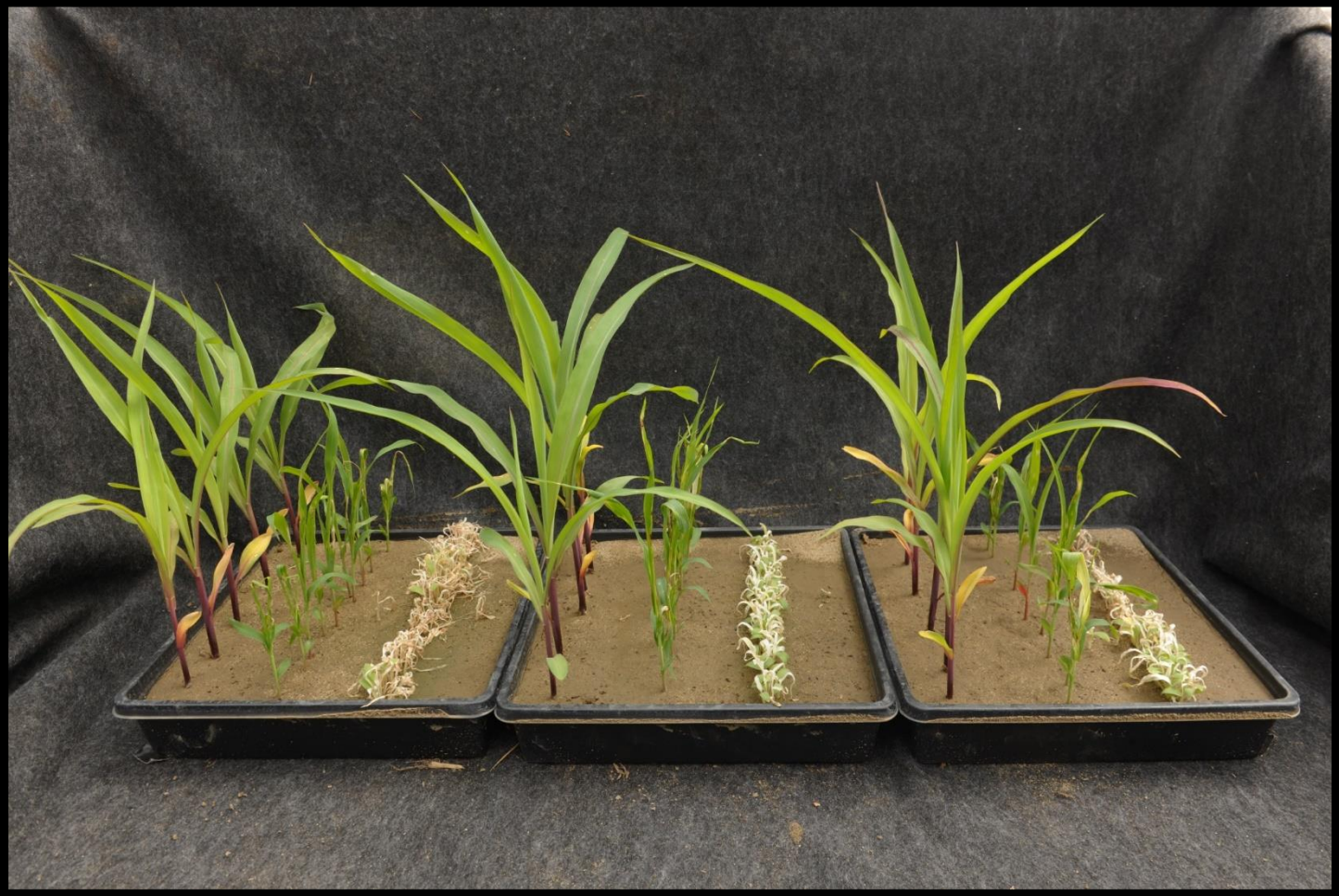
A free copy of this poster can be downloaded from www.hracglobal.com Designed and produced by Syngenta 2010

HRA

Image courtesy of the Herbicide Resistance Action Comity

# Herbicide selectivity

- What plants are effected by application
- Susceptible vs Tolerant



# Herbicide selectivity

- Some kill only grasses
- Some kill only broadleaves
- Some kill only seedlings
- Some kill only growing plants
- And all combinations!


# Herbicide selectivity

- Effected by
  - Plant species
  - Herbicide
  - Application timing
  - Growth stage (dormant applications)
  - Ect…

Image courtesy of : gmandchemicalindustry9.wordpress.com

# Contact vs. Systemic

- Contact- Does not move through plant (Ex -Acetic Acid, carfentrazone, paraquat)
- Coverage matters
- Only kills top growth


# Contact vs. Systemic

- Systemic- Can move through plant (Ex –glyphosate, chlorsulfuron, imazapyr, 2,4-D)
- Can kill roots


# Herbicides

- Timing
  - Species
  - Herbicides
- Annuals
  - Typically when small
    - Fall -winter annuals
    - Spring- summer annuals
  - Label will specify timing/growth stage
- Perennials
  - Dependent on species
  - Some in the fall
  - Some mid-growth

Image courtesy of : US Forest Service

# Calibration

- Most Important Factor!
- How much are you applying?
  - Herbicide effectiveness
  - Off target impacts
  - Residual activities
- Amount Product spread over Amount of area
- Spot
  - % v/v solution

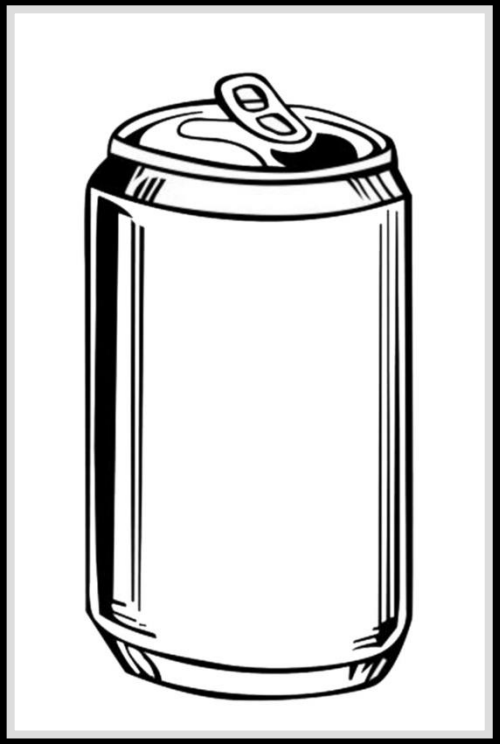


Image courtesy of : www.Clipartbest.com

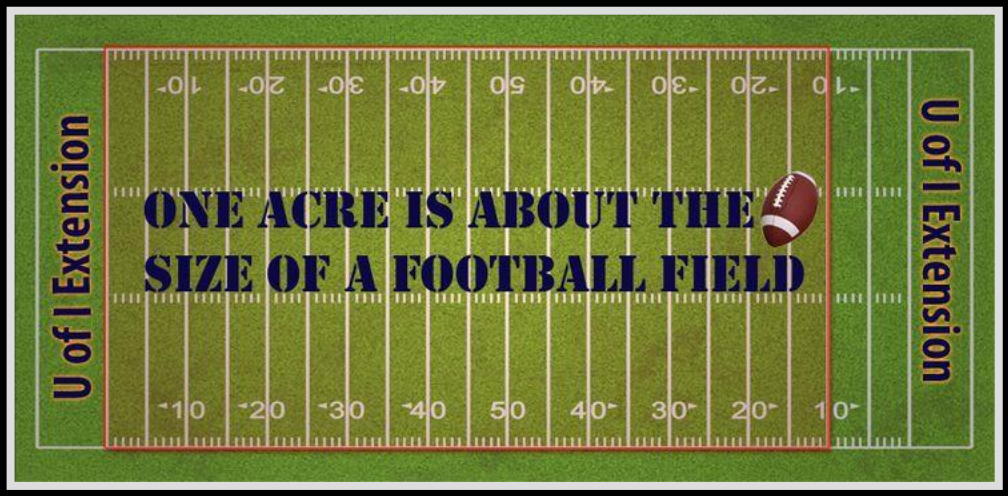
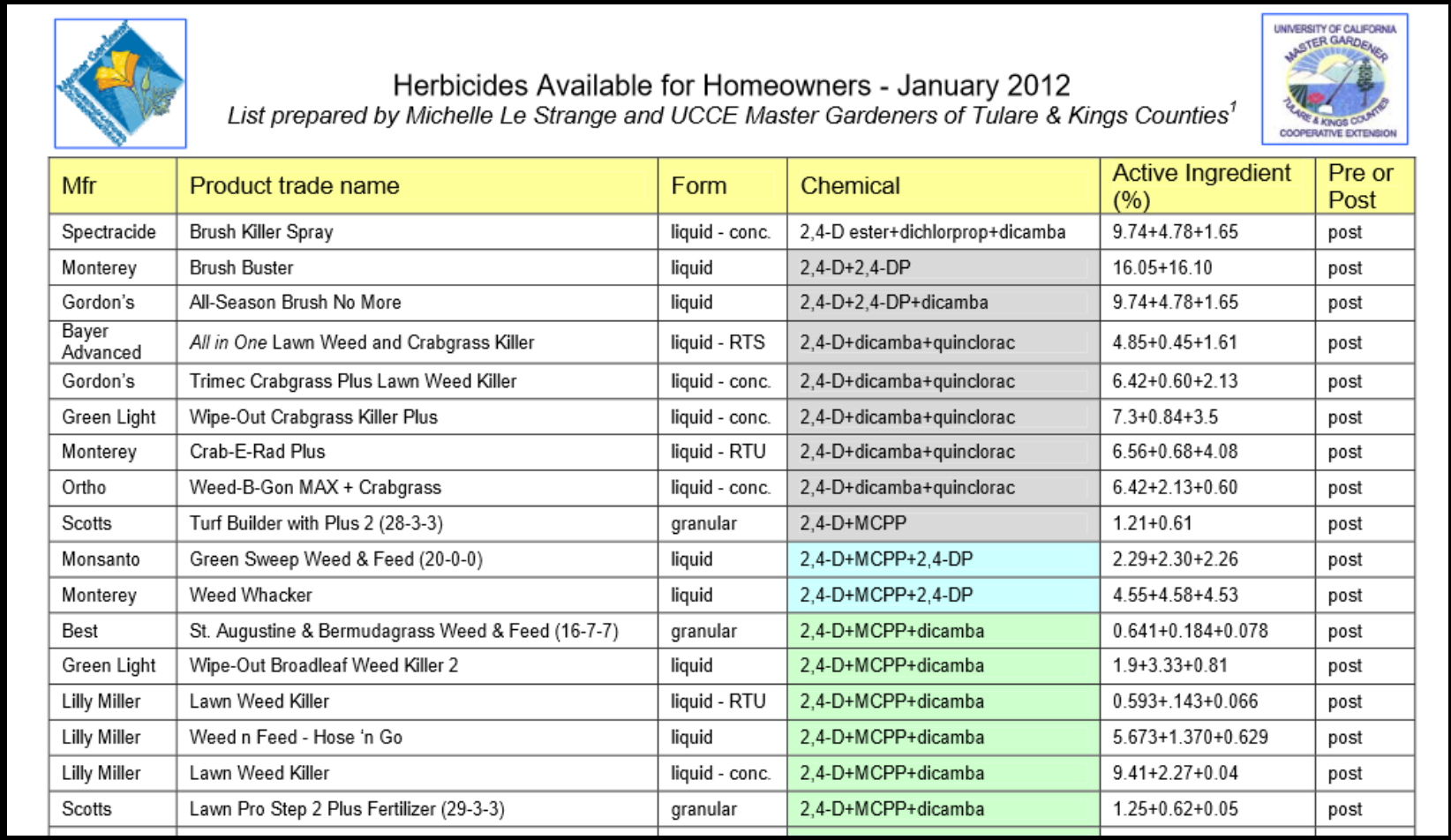



Image Courtesy of: Illinois Extension

# Herbicides for Homeowners



Herbicides Available for Homeowners - January 2012

*List prepared by Michelle Le Strange and UCCE Master Gardeners of Tulare & Kings Counties*[1]

| Mfr | Product trade name | Form | Chemical | Active Ingredient (%) | Pre or Post |
|---|---|---|---|---|---|
| Spectracide | Brush Killer Spray | liquid - conc. | 2,4-D ester+dichlorprop+dicamba | 9.74+4.78+1.65 | post |
| Monterey | Brush Buster | liquid | 2,4-D+2,4-DP | 16.05+16.10 | post |
| Gordon's | All-Season Brush No More | liquid | 2,4-D+2,4-DP+dicamba | 9.74+4.78+1.65 | post |
| Bayer Advanced | *All in One* Lawn Weed and Crabgrass Killer | liquid - RTS | 2,4-D+dicamba+quinclorac | 4.85+0.45+1.61 | post |
| Gordon's | Trimec Crabgrass Plus Lawn Weed Killer | liquid - conc. | 2,4-D+dicamba+quinclorac | 6.42+0.60+2.13 | post |
| Green Light | Wipe-Out Crabgrass Killer Plus | liquid - conc. | 2,4-D+dicamba+quinclorac | 7.3+0.84+3.5 | post |
| Monterey | Crab-E-Rad Plus | liquid - RTU | 2,4-D+dicamba+quinclorac | 6.56+0.68+4.08 | post |
| Ortho | Weed-B-Gon MAX + Crabgrass | liquid - conc. | 2,4-D+dicamba+quinclorac | 6.42+2.13+0.60 | post |
| Scotts | Turf Builder with Plus 2 (28-3-3) | granular | 2,4-D+MCPP | 1.21+0.61 | post |
| Monsanto | Green Sweep Weed & Feed (20-0-0) | liquid | 2,4-D+MCPP+2,4-DP | 2.29+2.30+2.26 | post |
| Monterey | Weed Whacker | liquid | 2,4-D+MCPP+2,4-DP | 4.55+4.58+4.53 | post |
| Best | St. Augustine & Bermudagrass Weed & Feed (16-7-7) | granular | 2,4-D+MCPP+dicamba | 0.641+0.184+0.078 | post |
| Green Light | Wipe-Out Broadleaf Weed Killer 2 | liquid | 2,4-D+MCPP+dicamba | 1.9+3.33+0.81 | post |
| Lilly Miller | Lawn Weed Killer | liquid - RTU | 2,4-D+MCPP+dicamba | 0.593+.143+0.066 | post |
| Lilly Miller | Weed n Feed - Hose 'n Go | liquid | 2,4-D+MCPP+dicamba | 5.673+1.370+0.629 | post |
| Lilly Miller | Lawn Weed Killer | liquid - conc. | 2,4-D+MCPP+dicamba | 9.41+2.27+0.04 | post |
| Scotts | Lawn Pro Step 2 Plus Fertilizer (29-3-3) | granular | 2,4-D+MCPP+dicamba | 1.25+0.62+0.05 | post |

http://wric.ucdavis.edu/PDFs/Weed%20control%20material%20available%20for%20homeowners%202012_TulareKings.pdf

# Some Common Herbicides

- Broad Spectrum
  - Glyphosate- Roundup, Touchdown, Maddog etc.
  - Imazapyr- Arsenal, Habitat, etc.

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  - Glyphosate- Roundup, Touchdown, Maddog etc.
  - Imazapyr- Arsenal, Habitat, etc
- Broadleaf Killers
  - Aminopyrlid- Milestone
  - Clyopyrlid- Stinger, Transline etc.
  - Dicambia- Banvel, Clarity etc.
  - 2,4-D

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- Grass killers
  - Fluazifop- Fusilade
  - Clethodim- Select, Arrow etc.
- Seedling Inhibitors
  - Pendimethalin- Prowl, Pendulum etc.
  - Trifluralin- Treflan, Bayonet, etc.

# IPM

- Cultural
  - Prevention
- Physical
- Mechanical
- Fire
- Biological
- Chemical
  - When you have to

# Management Information

- UC IPM Website
  - Crops
  - Homeowners
- Pacific Northwest Weed Control Handbook
- Weed control in Natural Area Western Untied States
- UC COOP Extension
- Nevada COOP Extension

# Local Resources

- County Ag Department
  - List A species
  - Help you help yourself!
- Large Acreage
  - The Pardner/Stannislaus Farm Supply
  - NRCS assistance
- Small Infestation
  - Susanville Pest Control
  - Susanville Weed Abatement
  - Hunters Services (Chico)
  - Etc.

# Common Problem Weeds

# Puncture vine

- List C
- Summer Annual
  - Multiple flushes
- Prostate
- Pinnate leafs
- Spikey seeds
- 2-5 seeds per nutlet
- Grows disturbed areas
- Management
  - Persistence!!


# Puncture vine

- Cultural
  - Prevent seeds
  - Clean tires
  - Check tires
- Physical
  - Pulling
  - Hoeing
  - Cultivation (new flushes)
  - Propane torch


# Puncture vine

- Chemical
  - Post Seedlings
    - Glyphosate
    - 2,4-D
    - Dicamba
  - Pre suppression
    - Pendimethalin
    - Trifluralin
  - Pre and post
    - Imazapyr
    - Chlorsulfuron

# Scotch Thistle

- List A weed
- Biennial
- Cottony Leafs
  - Large
- Spiny
- 4-6ft. Tall
- 7-39 year seed life

Photo Courtesy of : www.nwcb.wa

Photo Courtesy of : www.UCANR.edu

# Scotch Thistle

- Digging
  - Below soil surface
- Mowing
  - Reduce seeds
- Tillage
  - Flush of seed
- Goats
  - Eat seed heads


Photo Courtesy of : www.invasive.org

Photo Courtesy of : www.co.laplata.co.us

# Scotch Thistle

- Chemical
  - Post rosettes
    - 2,4-D
    - Aminopyrlid
    - Clopyralid
    - Dicambia
    - Chlorsulfuron

Photo Courtesy of : www.sites.google.com


Photo Courtesy of : www.texasinvasives.org

# Tall White Top

- List B
- Perennial
- Eurasia
- Reproduction
  - Seeds
  - Roots
- Salt tolerant
- White flowers

Photo Courtesy of : www.eddmaps.org

Photo Courtesy of : www.sierravalleyrcd.org

# Tall White Top

- Don’t Cultivate
- Don’t move seeds
- Mowing
  - Removes thatch
- Burning
  - Removes thatch
- Establish competitive grass

Photo Courtesy of : www.eddmaps.org

# Tall White Top

- Chemical
  - Bud Stage best
  - Chlorsulfuron
  - 2-4,D
  - Imazapyr
  - Glyphosate

Image courtesy of www.unioncountyweedcontorl.org

# Spotted Knapweed

- Biennial to Short lived perennial
- A list weed
- Basal rosettes first year
- Can propagate of later roots
- 8 year seed dormancy


Photo Courtesy of : www.Invasive.org


Photo Courtesy of : www.fairbanksweeds.org

# Spotted Knapweed

- Hand pulling
  - Before seed set
- Burning seedlings
- Mowing
  - Only suppression
- Chemical
  - Aminopyralid
  - Dicamba
  - 2,4D
  - Clopyralid
- Seedlings rosettes bud depending


Photo Courtesy of : www.Bentonswcd.org

Photo Courtesy of : www.mtwow.org

# Medusa Head

- List C
- Winter Annual
- Medertreanean region
- Clay soils
- Low moisture
- Dense litter

Photo Courtesy of : www.amazon.com


Photo Courtesy of : www.wiki.bugwood.org

# Medusa Head

- Burning Reduce litter (effective low elevation)
- Tillage
- Chemical
  - Pre
    - Aminopyralid
    - Rimsulfuron
    - Sulfometuron

Photo Courtesy of : www.fs.fed.us

Photo Courtesy of : www.ucanr.edu

# Yellow Star Thistle

- List C Weed
  - Rare here
  - Need to control
- Winter Annual (or biennial)
  - Flushes
- Blueish green foliage
- Deep root
  - 6ft

Photo Courtesy of : www.reddit.com


Photo Courtesy of :www.dnr.wi.gov

# Yellow Star Thistle

- Intensive Grazing
  - After bolting
- Flaming
- Manual removal
- Mowing
- 2-4 years
  - Deplete seeds in soil
- Weevils and rust

Photo Courtesy of : www.UCANR.edu

Photo Courtesy of : www.ndweeds.homestead.com

# Yellow Star Thistle

- Chemical
  - Post and Pre (seedling mid rosette Ideal)
    - Aminopyralid
    - Clopyralid
    - Aminocyclopyrachlor + Chlorsulfuron
  - Post
    - 2,4-D
  - Pre
    - Chlorsulfuron

Photo Courtesy of : www.californiaagriculture.ucanr.edu


Photo Courtesy of : www.cal-IPC.org

- All management suggestions and biology sourced from:
- UC IPM website
- Weed Control in Natural Areas of the Western Untied States

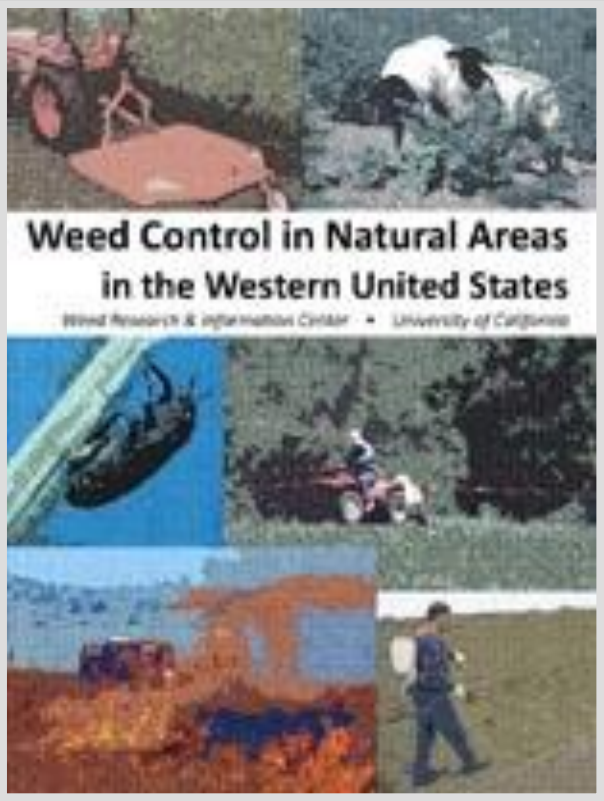


Image courtesy of : CALIPC


Image courtesy of www.ucanr.edu

# Discussion + Questions?

Presentation Will be Posted: http://celassen.ucanr.edu/Farm_Advisor/Weed_Science/

# SWAT

- Tim Keesey- Honey lake RCD
- info@honeylakevalleyrcd.us

- Tom Getts- UCCE
- tjgetts@ucanr.edu

- Lassen County Ag Dept.
- Susanville Rancheria
- Susanville NRCS