

Weeds

(For Plumas Master Gardeners)

UCCE: Tom Getts



What's a Weed?

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



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



Identification!

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



Image courtesy of: www.wildernessaware.org

ID Various Life Stages



ID Various Life Stages



ID Various Life Stages



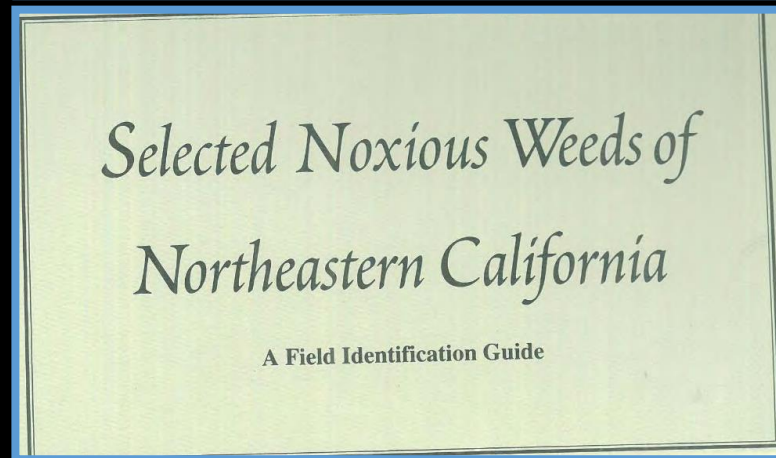
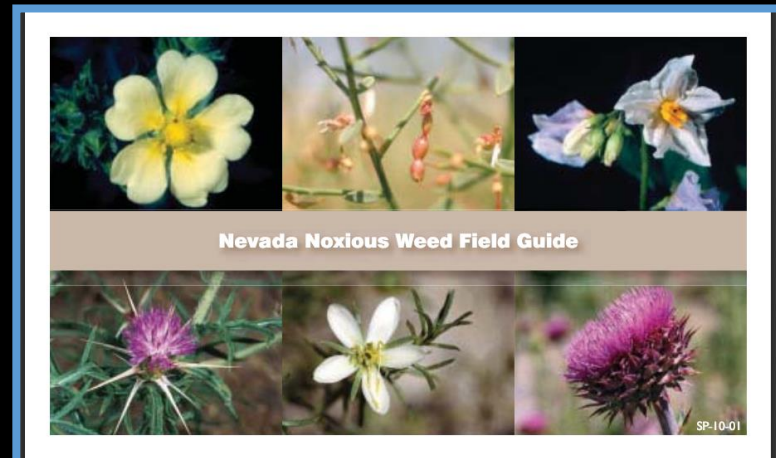
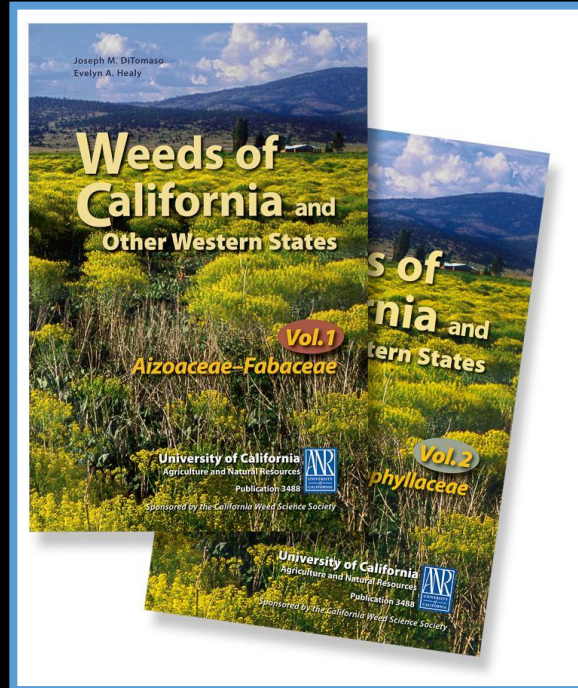
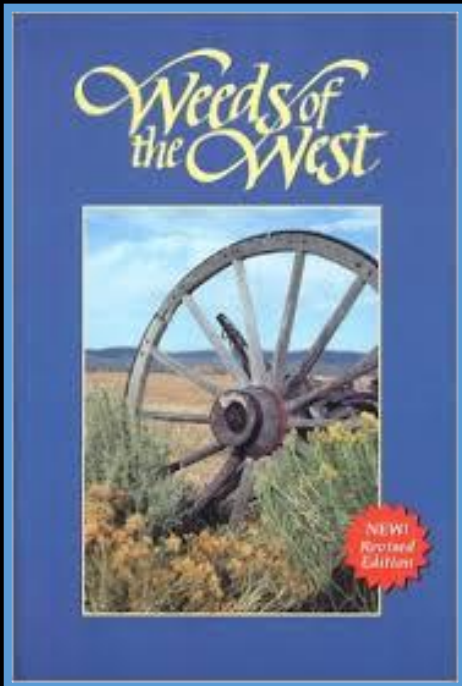
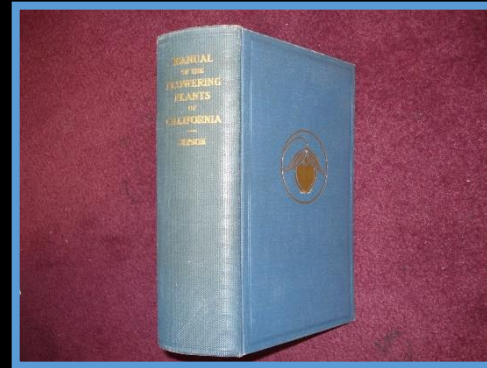
Tools

- Books

- Weeds of the West
- Weeds of California and other Western States
- By Plant Family

- Field Guides

- Dichotomous Keys (haha)



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](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.msueextension.org/publications/AgandNaturalResources/EB0215.pdf>

- Botany

- <https://ag.arizona.edu/pubs/garden/mg/botany/plantparts.html>

Life Cycle

- Annual, Biennial, Perennial
- Prevent Reproduction!
 - Seeds
 - Roots

Annuals

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

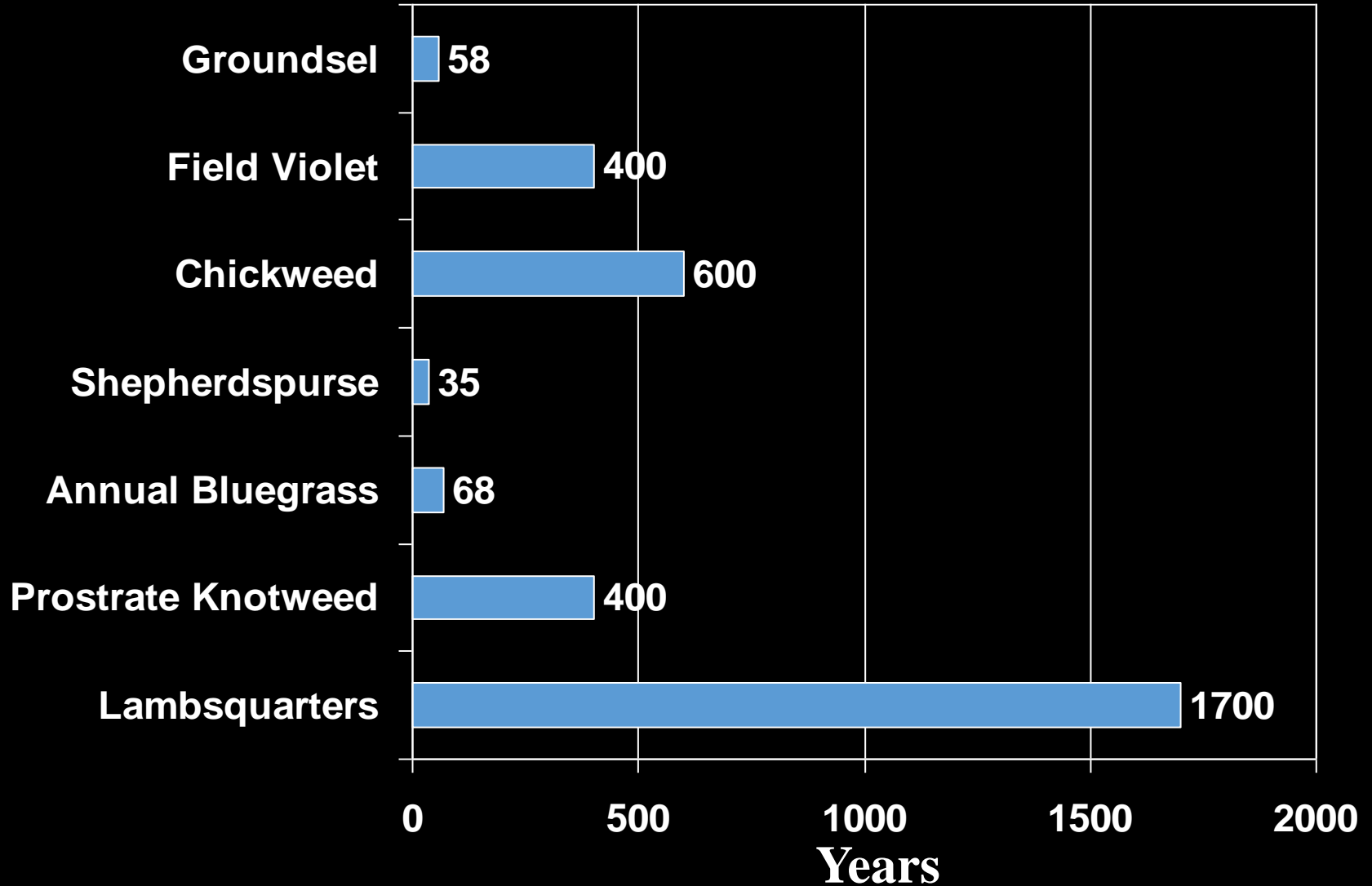


Image courtesy of: <http://www.co.stevens.wa.us/weedboard/other%20weeds/htm%20pages/shepherd's%20purse.htm>

Weed Seed Production

	<u>Seed / Plant</u>
Pigweed	>200,000
Lambsquarters	>70,000
Crabgrass	53,000
Annual Bluegrass	2,000

Longevity of Weed Seeds in Soil



Biennial Weeds

- Two seasons before reproduction
- Easier to kill first 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)





Dispersal



Photo Courtesy of : cdfnews.wordpress.com



#1 Goal in Successful Weed Management?

Prevent Reproduction!

+

Prevent Dispersal

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

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



Flaming/burning (in ag)

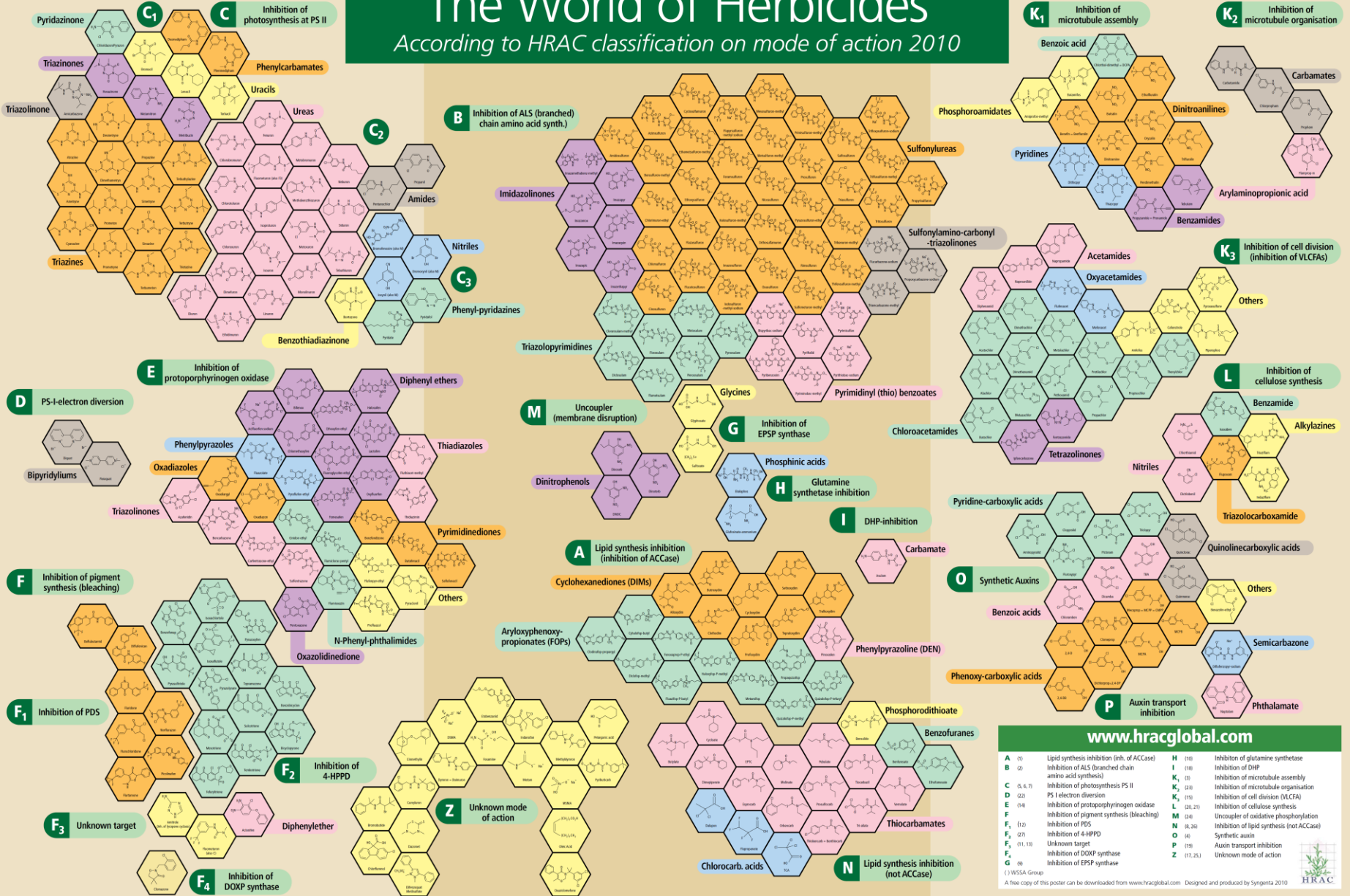


Soil steamers



The World of Herbicides

According to HRAC classification on mode of action 2010



www.hracglobal.com

A (1)	Lipid synthesis inhibition (inhibition of ACCase)	H (19)	Inhibition of glutamine synthetase
B (2)	Inhibition of ALS (branched chain amino acid synthase)	I (18)	Inhibition of DHP
C (5, 6, 7)	Inhibition of photosynthesis PS II	K1 (3)	Inhibition of microtubule assembly
D (22)	PS I electron diversion	K2 (23)	Inhibition of microtubule organisation
E (14)	Inhibition of protoporphyrin oxidase	K3 (19)	Inhibition of cell division (VLFAs)
F (18)	Inhibition of pigment synthesis (bleaching)	L (24, 21)	Inhibition of cellulose synthesis
F1 (12)	Inhibition of PDS	M (24)	Uncoupler of oxidative phosphorylation
F2 (27)	Inhibition of 4-HPPD	N (8, 26)	Inhibition of lipid synthesis (not ACCase)
F3 (11, 13)	Unknown target	O (4)	Synthetic auxin
F4 (1)	Inhibition of DOXP synthase	P (19)	Auxin transport inhibition
G (9)	Inhibition of EPSP synthase	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

HERBICIDES AFFECTING: Light Processes

Cell Metabolism

Growth/Cell Division

The Label is the LAW!!!

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

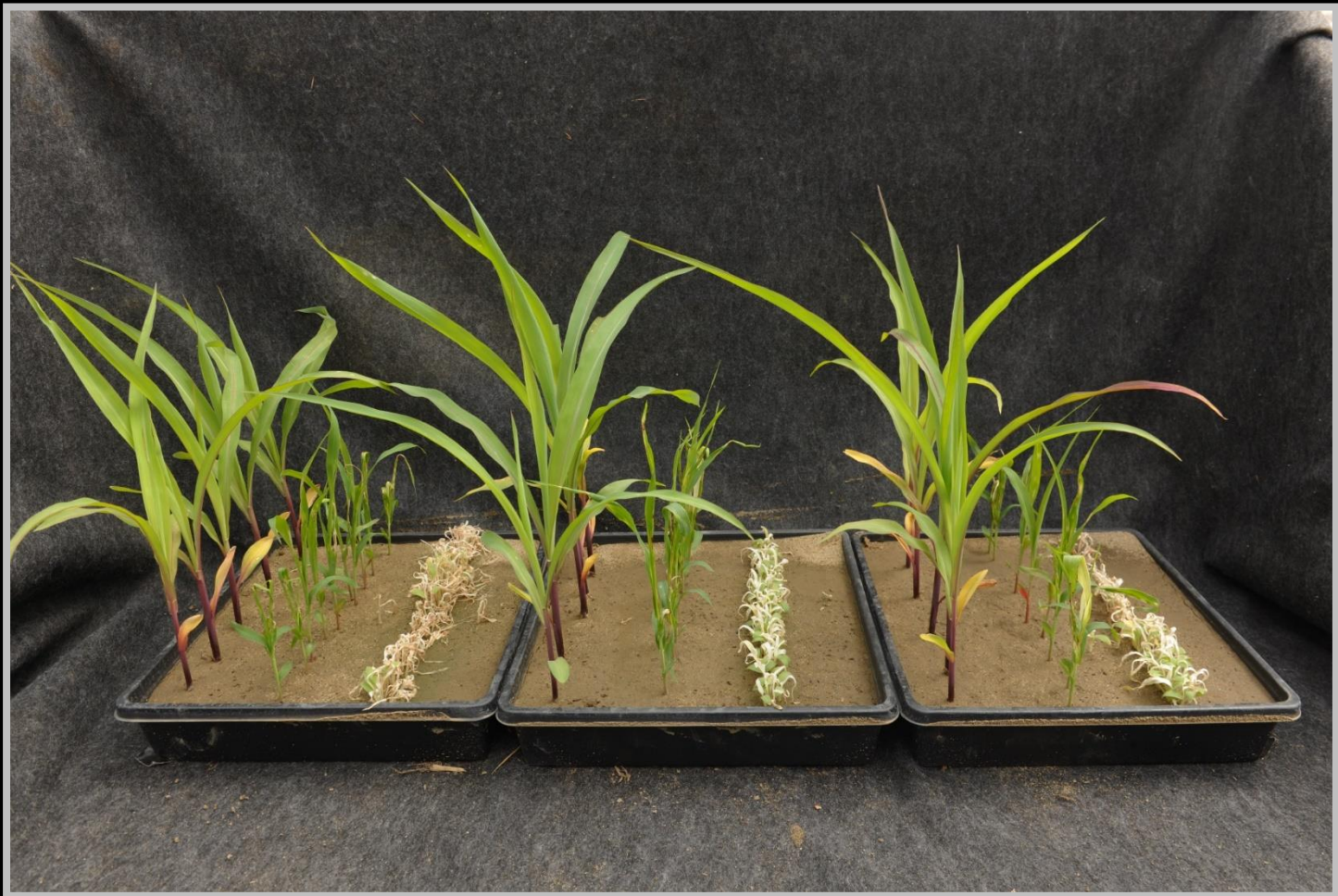
<http://www.cdms.net/Label-Database>



Image courtesy of: www.chemicaloutfitters.com

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!

- Climate, season, species, etc.





Contact vs. Systemic

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



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Contact vs. Systemic

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



Soil residual activity

- Plant back restrictions
- Breakdown in soil
- Light, water, time, microbial
- Short vs long time

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

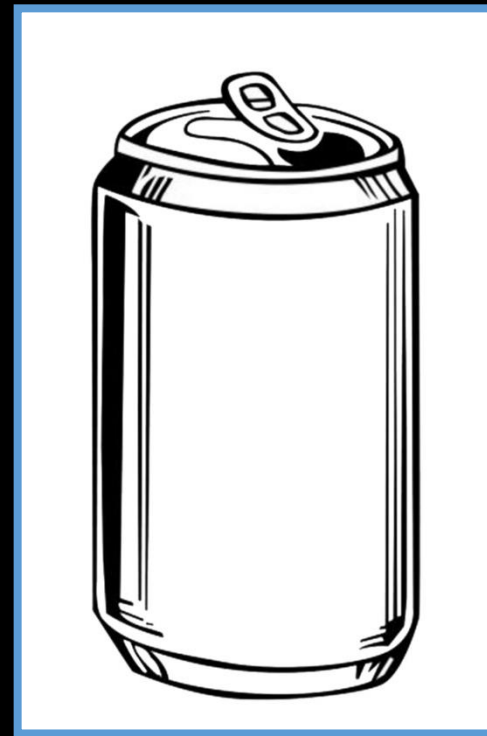


Image courtesy of : www.Clipartbest.com

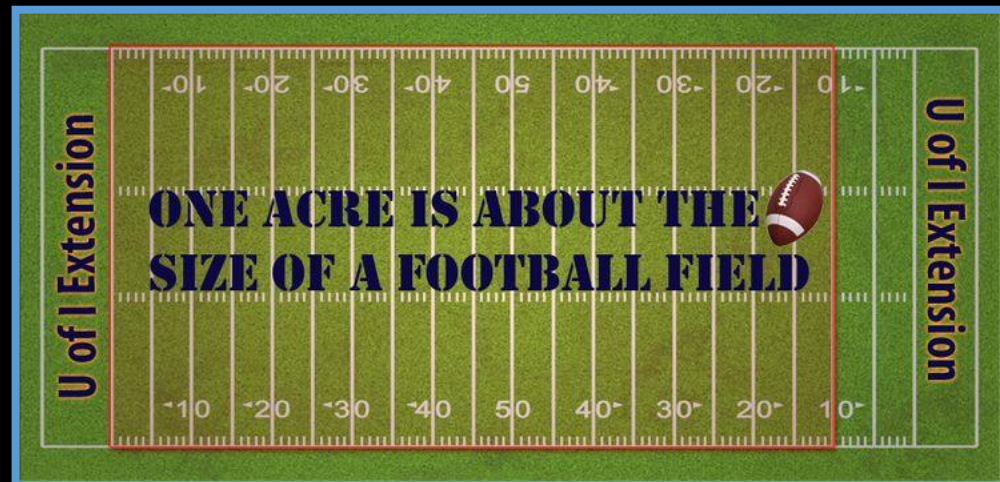


Image Courtesy of: Illinois Extension

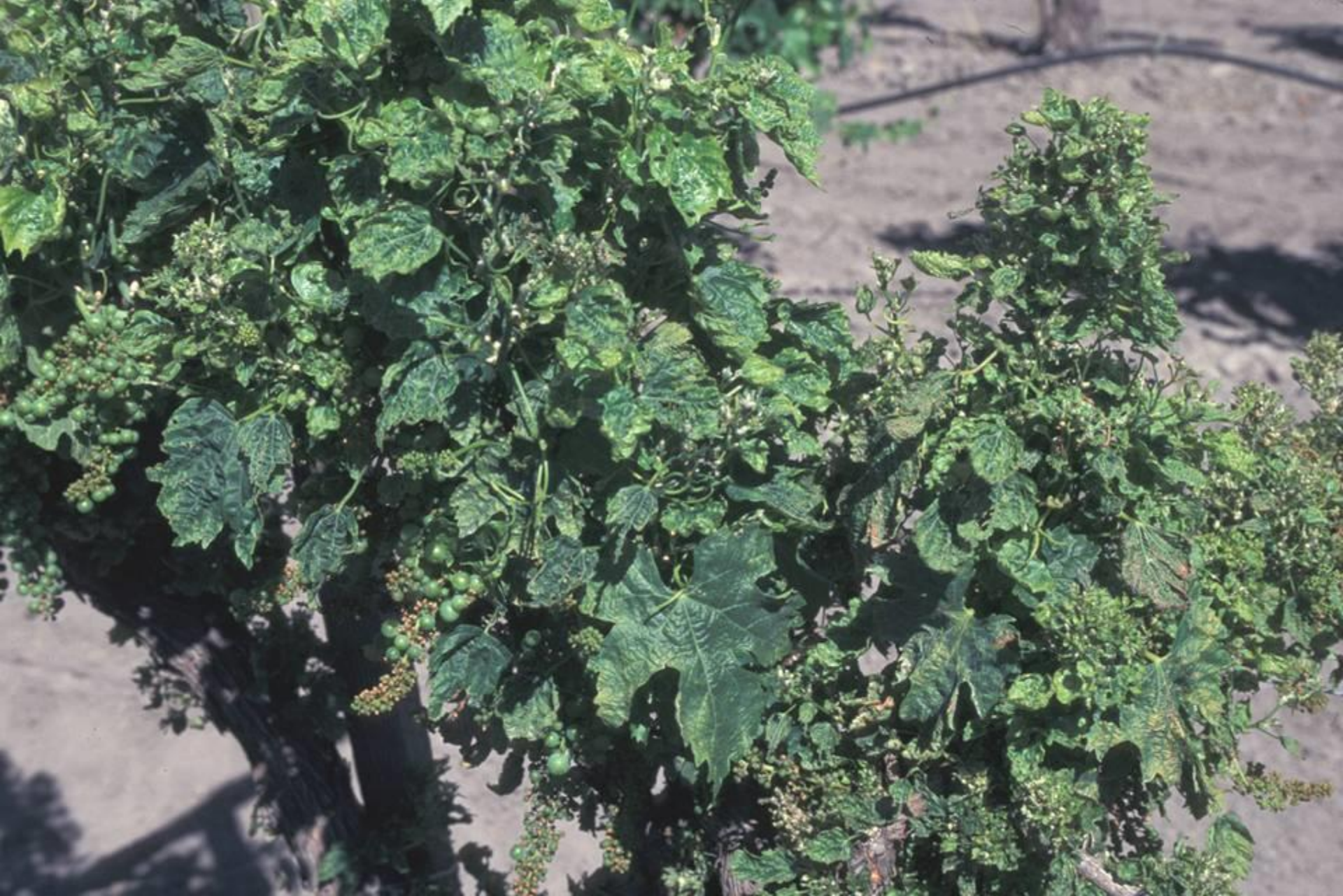
Herbicides

- 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





Glyphosate drift on to grapes



Triclopyr injury
on grape



©A.F. Sherf

Dicamba injury on tomato



©A.F. Sherf

Management Information

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

Common Problem Weeds

Filaree

- Winter annual
- Fern like leaves
- Cool Seeds!
- Physical
 - Pulling
 - Hoeing
 - Tillage
- Burning
 - Promotes following year



Image Courtesy of : blog.growingwithscience.com



Image Courtesy of : www.naturesongs.com

Filaree

- Chemical
 - Foliar
 - 2,4-D
 - Dicamba
 - Glyphosate
 - Pre
 - Oryzalin
 - Indaziflam
 - Both
 - Imazapyr



Image Courtesy of : www.southwestcoloradowildflowers.com

Cheatgrass

- “Scourge of the West”
- Winter annual
 - Long germination window
- Physical
 - Pulling
 - Grubbing
 - Hoeing
 - Tillage
- burning



Cheatgrass

- Chemical
 - Fluazifop
 - (grass only)
 - Trifluralin
 - Imazapyr
 - Glyphosate



Image Courtesy of : mtweed.org

Yellow Star Thistle

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

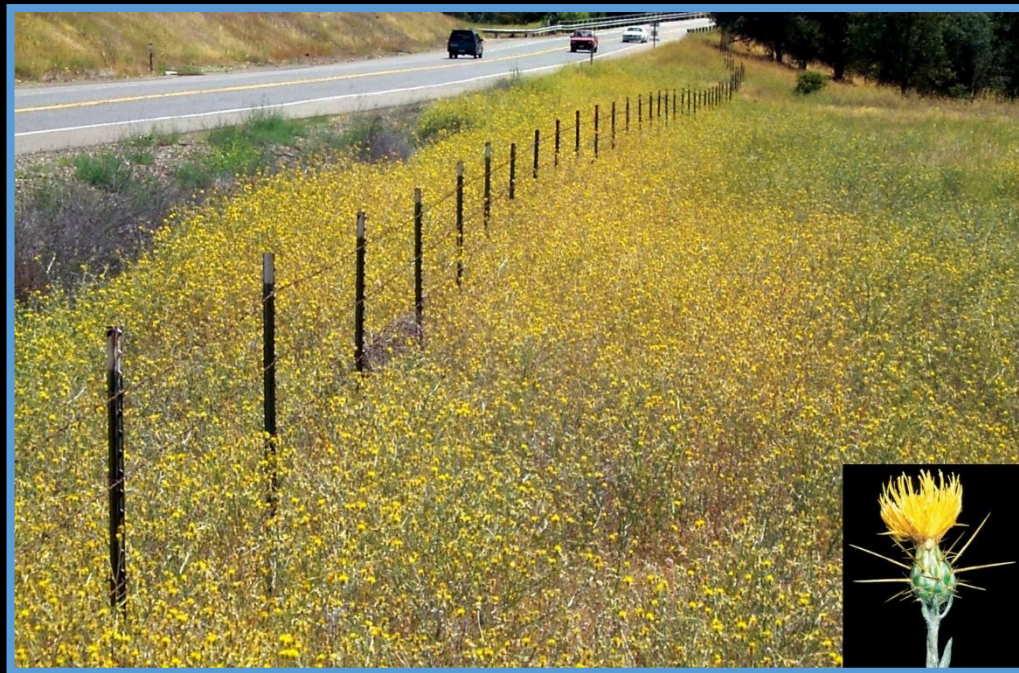


Photo Courtesy of : www.reddit.com



UGA1459655

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

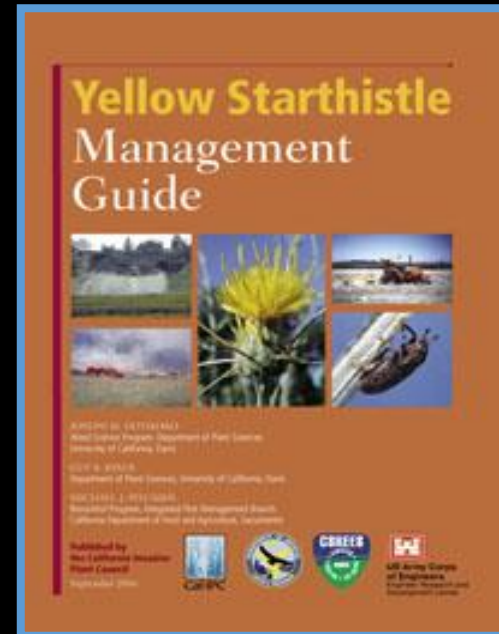


Photo Courtesy of : www.cal-IPC.org

Puncture vine

- List C
- Summer Annual
 - Multiple flushes
- Prostrate
- 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



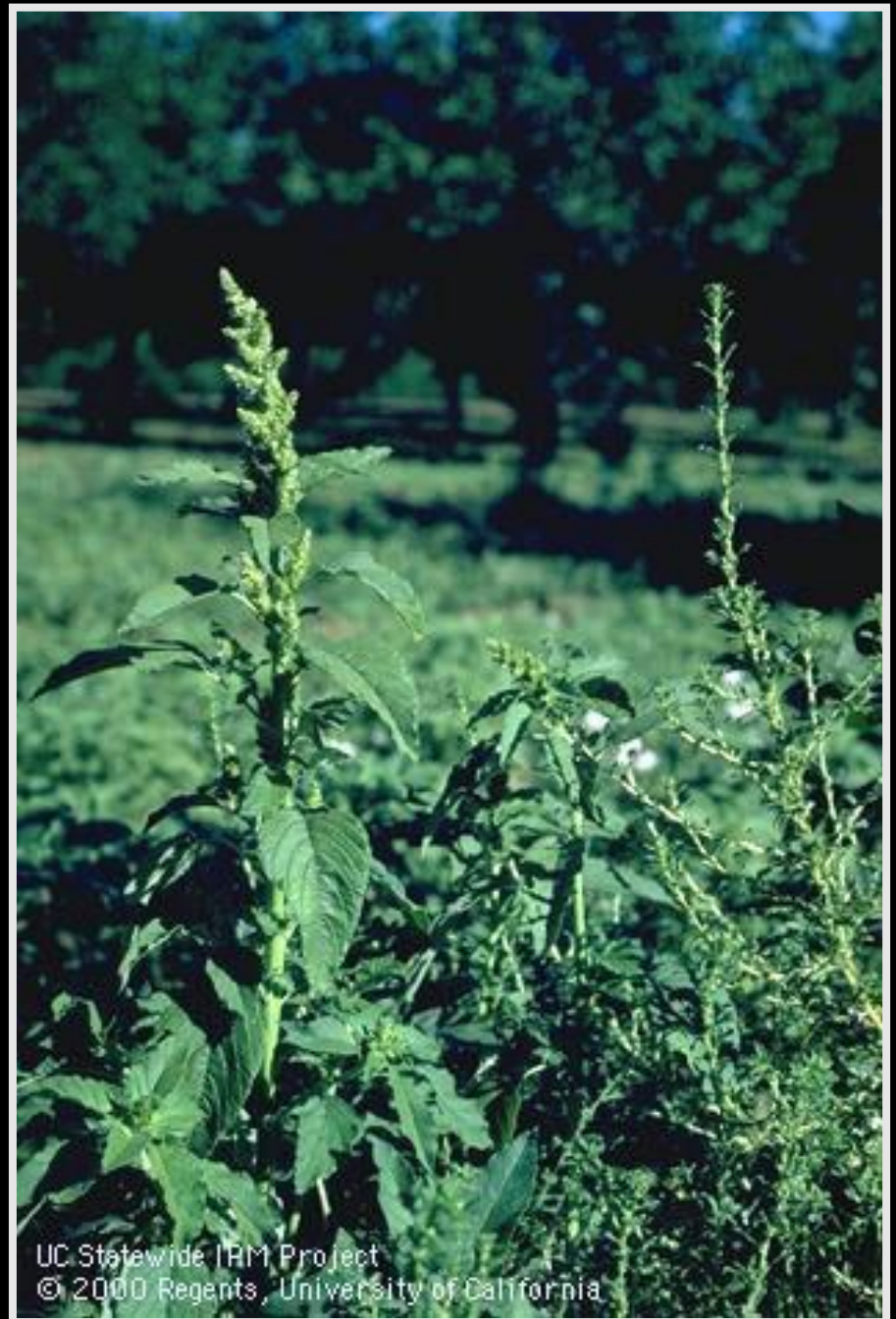
Pigweed

- Summer annual
- Prolific seed producer
- Long seed life
- Long germination window
- Physical
 - Hand pulling
 - Tilling
 - Burning (seedling)
 - Mowing (suppress)
 - Mulching



Pigweed

- Grazing
 - Nitrate Accumulation
- Chemical
 - 2,4-D
 - Dicamba
 - Glyphosate
 - Benefin
 - Oryzalin



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Teasel

- Biennial
- Only reproduce from seed
- Used for fleecing
- Physical
 - Hand pulling
 - Digging
 - Mowing ineffective
 - Tillage
- Repeat annually for 4-6 years



Image Courtesy of : [commons.Wikimedia.org](https://commons.wikimedia.org)



Image Courtesy of : pinterest.com

Teasel

- Fire- promotes teasel
- No biocontrol
- Chemical
 - 2,4-D
 - Aminopyralid
 - Dicamba
 - Clopyralid
 - Fluroxypyr
 - Glyphosate
- Rosette to bolting stage



Image Courtesy of : njaes.Rutgers.edu



Image Courtesy of : oregonstate.edu

Scotch Thistle

- List A weed
- Biennial
- Cottony Leaves
 - 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



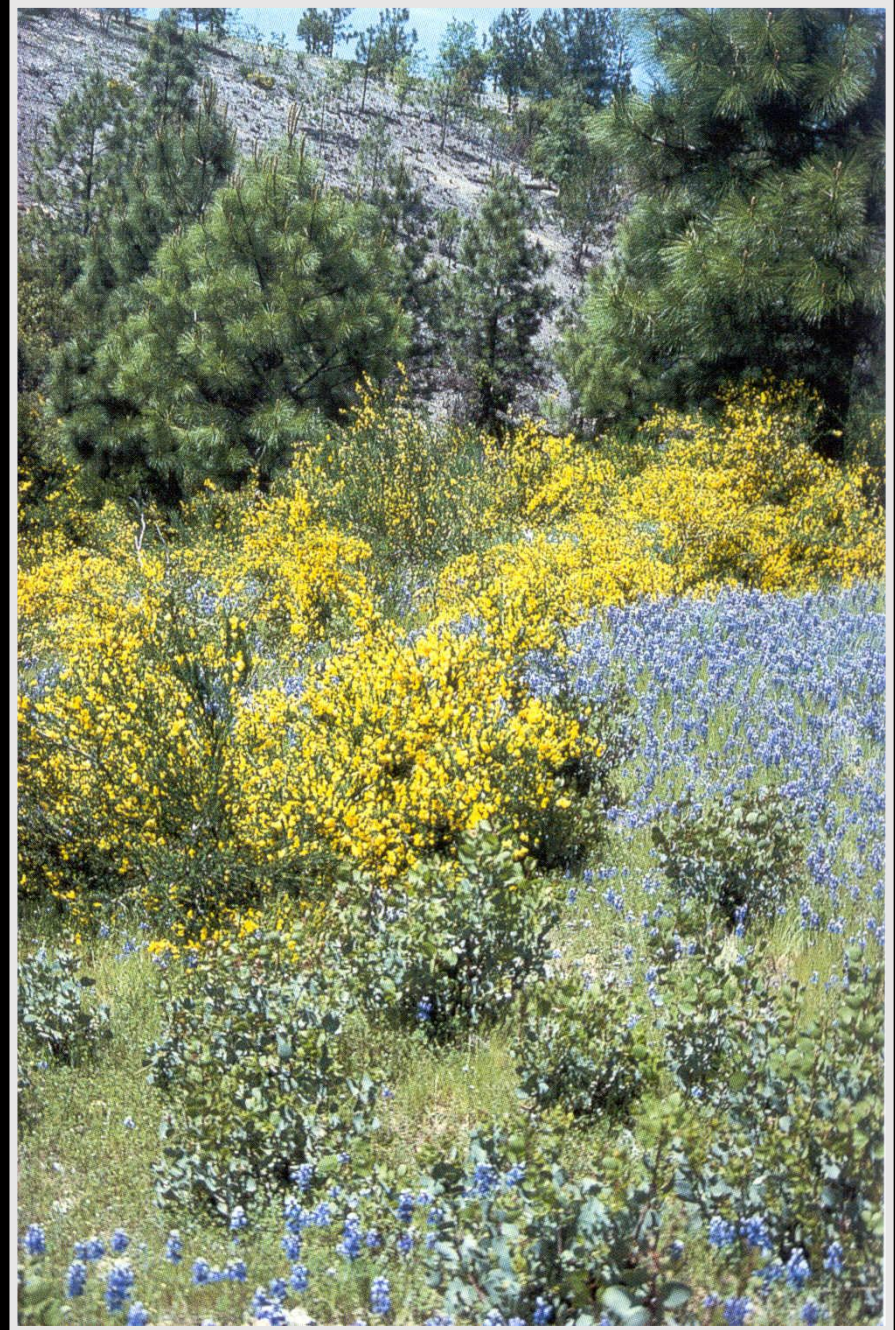
Photo Courtesy of : www.sites.google.com



Photo Courtesy of : www.texasinvasives.org

Scotch Broom

- Perennial
- Woody
- 5-10 ft. tall
- N fixer
- Mechanical
 - Hand pull
 - Weed wrench
 - Root
- Toxic flowers
 - Quinolizidine alkaloids



Scotch Broom

- Potential Biocontrol
 - Seed Beetle
 - Seed weevil
 - Twig miner moth
- Chemical
 - Triclopyr
 - Glyphosate
 - Imazapyr
- Foliar
- Basal Bark
- Cut Stump



© 2008, California Department of Food and Agriculture

Dandelion

- Potentially Circumpolar Species
- Perennial
- Windborne seed
- Prevention
- Grubbing/digging out
 - Multiple years
- Tarps/mulch



Image Courtesy of : www.e2ua.com



Image Courtesy of : www.fcps.edu

Dandelion

- Chemical
- Foliar
 - Glyphosate
 - 2,4-D
 - Triclopyr
 - MCPA
- Before germination
 - Isoxaben
 - Oxyfluorfen



Image Courtesy of : www.ranprieur.com

Field Bindweed

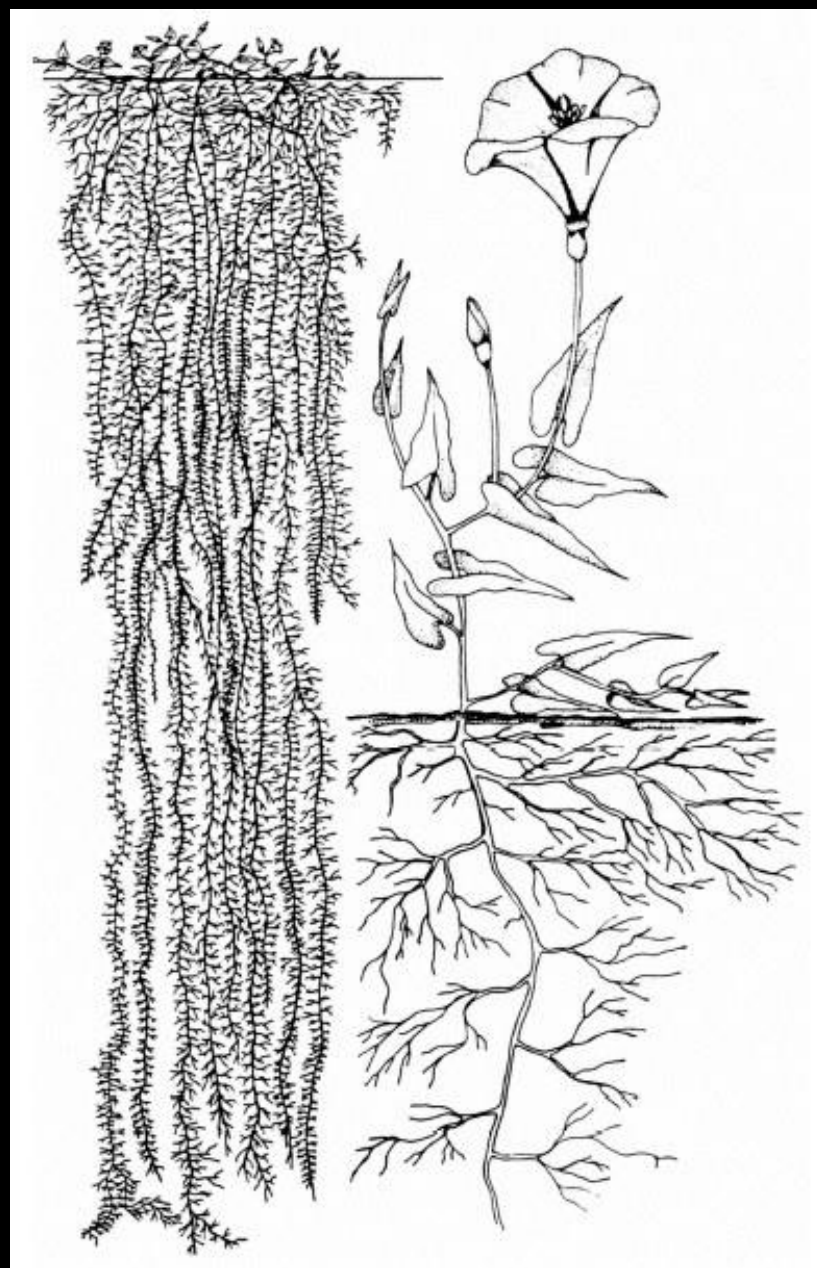
- Native to Europe
- Perennial
- Extensive root systems
 - 10ft taproots
 - Lateral roots
- Prostrate
- Mechanical
 - Pulling seedlings
- Tillage
 - Spreads roots



Image Courtesy of : www.natronacountyweeds.com

Field Bindweed

- Solarization
 - 3-5 years
- Biocontrol
 - Gall mite Colorado
 - Others not effective
- Chemical
 - (Repeat applications)
 - 2,4-D
 - Glyphosate
 - Triclopyr
 - Quinolac
 - (lawn product)



Common Tansy

- Perennial
- Seeds + roots
- Potential Dermatitis
- Physical
 - Hand pulling
 - Wet soil
 - Multiple times
 - Mowing will suppress
- Grazing
 - Sheep+ goats
 - No cattle



Common Tansy

- Biocontrol
 - None effective
- Chemical
 - 2,4-D
 - Glyphosate
 - Aminocyclopyrachlor + Chlorsulfuron
 - Chlorsulfuron
 - Wiper application shown to be effective



Oxeye Daisy

- Perennial
- 38 year soil seed life
- Creeping roots (shallow)
- Causes unpleasant flavor in milk
- Physical
 - Repeated pulling
 - Mowing (suppress)
 - Deep cultivation
- Grazing can suppress



Image Courtesy of :perennialco.com

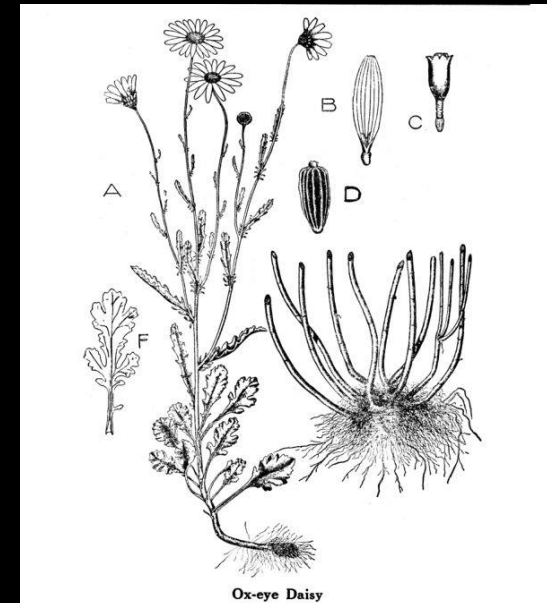


Image Courtesy of : mtwow.org

Oxeye Daisy

- No biocontrol
- Burning ineffective
- Chemical
 - Aminocyclopyrachlor
 - Aminopyralid
 - Clopyralid
 - Dicamba
 - Triclopyr
 - Glyphosate
- Apply to rapidly growing plants in spring



Image Courtesy of : www.NWCB.wa.gov



Image Courtesy of : www.123rf.com

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



Tall White Top

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



Canada Thistle

- Perennial
- Extensive roots
- Gardens
- Agriculture
- Natural areas
- Physical
 - Mowing
 - Every 3 weeks
 - Grazing goats suppress
 - Hand pulling (suppress)



Image courtesy of <https://www.btny.purdue.edu/Pubs/WS/CanadaThistle/CanadaThistle.html>

Canada Thistle

- Biocontrol
 - Rust
 - Gall
 - Weevil
 - None super effective
- Chemical
 - Aminopyralid
 - Clopyralid
 - Glyphosate
 - 2,4-D + Dicamba
 - Chlorsulfuron
 - Imazapyr
 - May need to treat multiple times
 - Spring or fall



Photo Courtesy of : oregonstate.edu

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

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

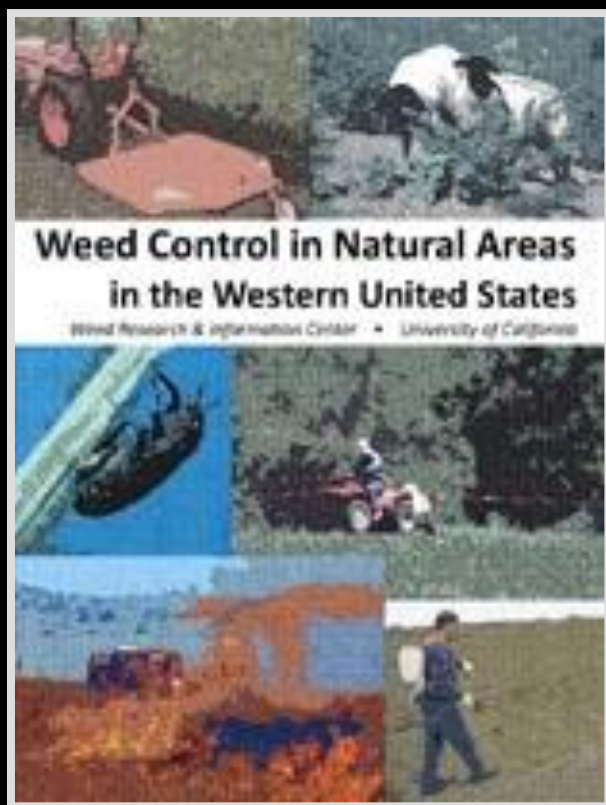


Image courtesy of : CALIPC



Image courtesy of www.ucanr.edu