



Control of thistles and grasses on rangelands

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Thistles of concern in the foothills



yellow starthistle



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Photo by Joe DiTomaso



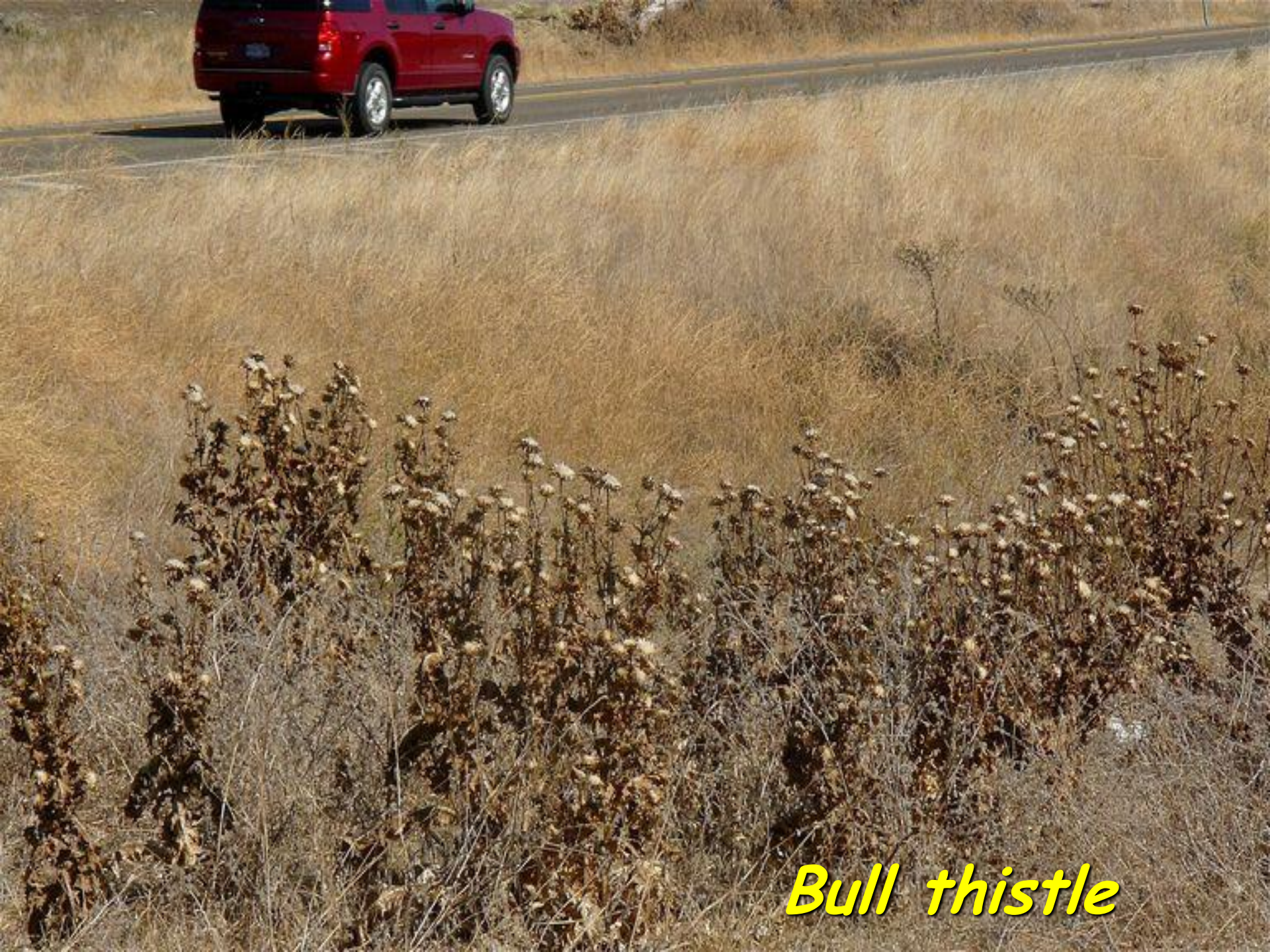
UGA1459671



Italian thistle



Bull thistle



Bull thistle



milk thistle





Skeleton weed





Skeleton weed



stinkwort



Smooth distaff thistle

Life Cycle

- Most are winter annuals
 - Exceptions
 - Bull thistle –biennial
 - Milk thistle – annual or biennial
 - skeletonweed-perennial
- Germinate with first fall rain and can continue to germinate with each subsequent rain through June

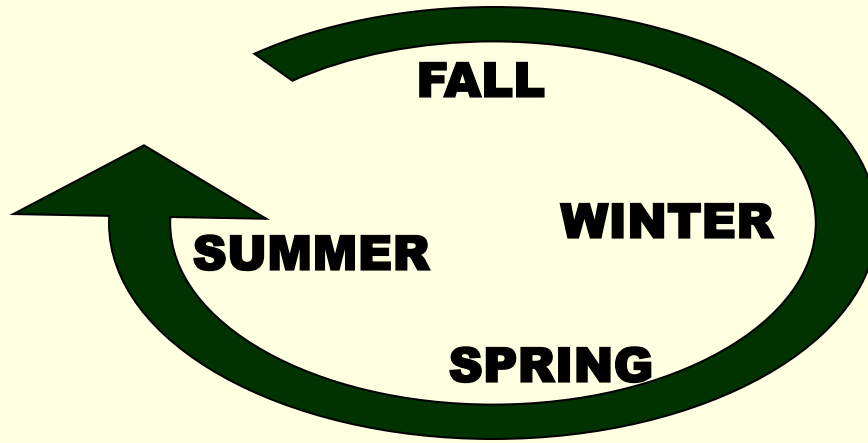




Seedling



Rosette



Flowering



Bolting

Thistle Control

Cultural Control

- Grazing
- Burning

Mechanical Control

- Mowing
- Hand pulling and hoeing

Biological Control

- Insects
- Diseases

Chemical Control

- Herbicides



Grazing



- Grazing can be effective against some thistles, mostly yellow starthistle
- Graze intensively during the bolting stage
- Often 2-3 grazing treatments are required to prevent flowering
- Grazing too early will increase Yellow Starthistle population
- DON'T graze yellow starthistle or other *Centaurea* with horses!!!!

Burning

- Not often an option on large scale due to timing and threat of wildfires
- Burn before plants flower and set seed
- For late maturing thistles like yellow starthistle this is often in May and early June after other desirable forages have died
- For early maturing thistles, use hand flamer



Mowing

- Can be effective on many annual thistles.
- Must have the right architecture!
- TIMING: just as plants have begun to flower.
- Mowing too early or the wrong architecture will result in a carpet of flowers.



Chemical Control

- Herbicides used for thistle control
 - 2,4-D*
 - Glyphosate
 - Triclopyr
 - Clopyralid
 - Aminopyralid



***2,4-D is a restricted material**

****Clopyralid and Aminopyralid are not registered for use in agricultural crops**

Glyphosate

- Trade Name: Roundup, Honcho, glystar, and many others
- Non-selective herbicide
- Can kill or injure most plants
- Post emergent herbicide
 - Only kills plants actively growing
 - No soil activity, does not prevent seeds from germinating



Triclopyr



- Post emergent
 - Only kills emergent plants
- Selective (Broadleaf)

- Products Available Over-the-Counter
 - Ortho Brush B Gon Poison Ivy Killer Concentrate
 - EasyGone Brush Killer
 - Roundup Poison Ivy & Tough Brush Killer Plus (glyphosate and triclopyr)
- Products Available by Permit (Operator Identification Number) Available through Ag Dept
 - Garlon 3A, 4 Ultra
 - Remedy



Glyphosate and Triclopyr: Timing

- Anytime the plant is growing
 - For annuals spot treatments should be made after the last spring rain
 - For biennials and perennials anytime, preferably before flowering

Selective Herbicides

- **Clopyralid**
- Trade Name: Transline
- Effective against many thistles
- Can cause injury to legumes

- **Aminopyralid**
- Trade Name: Milestone
- Effective against thistles
- Can cause injury to legumes
- Can control some grasses
- Controls other problematic weeds including; tarweed, fiddleneck

- **Aminopyralid + Triclopyr**
- Trade Name: Capstone
- Properties of both Milestone and Garlon 4



Clopyralid & Aminopyralid

- Broadleaf herbicides
 - At low rates they become even more selective.
 - Thistles are very sensitive at low rates
- Kills thistles actively growing
- Also kills new plants as they germinate
- Products are active in the soil for 3-6 months
- Timing is critical to success
- Apply January – April when plants are in the seedling to rosette stage

One application will often provide one year of control

***Clopyralid and Aminopyralid are not registered for use in agricultural crops**

Transline & Milestone

- Very low use rates
- Transline
 - 4-6 oz product / acre for yellow starthistle
- Milestone
 - 3 oz product / acre for yellow starthistle

- Agricultural chemical
 - Requires Operator Identification Number from Department of Agriculture (purchase, storage and use of chemical)
 - Use is documented and submitted to County
 - Permit must be renewed annually
 - Typically sold in larger containers

Clopyralid

- Trade Name: Star Thistle Killer
- Same active ingredient as Transline
- Ranchette-use label
 - No permit required
 - Available over the counter
- Sold in ½ pint container
 - Enough to treat 2 acres



Control of Weedy Grasses on California Rangelands





wild oat
(*Avena* spp)



Italian
ryegrass
(*Lolium
multiflorum*)



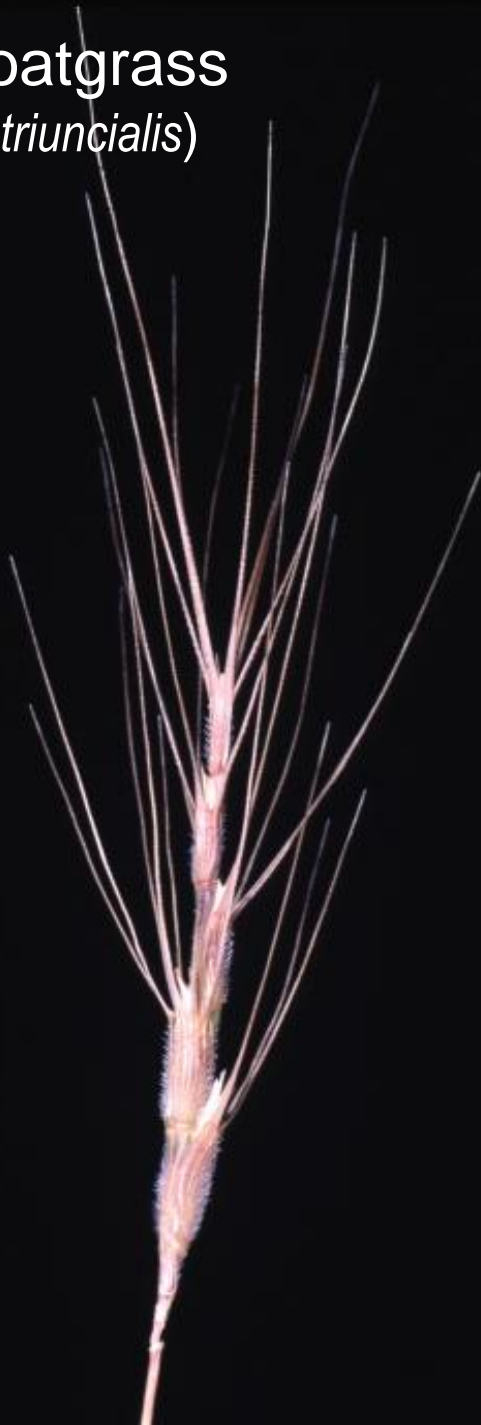
soft brome
(*Bromus
hordeaceus*)



medusahead
(*Taeniatherum caput-medusae*)



barb goatgrass
(*Aegilops triuncialis*)



jointed goatgrass
(*Aegilops cylindrica*)



Medusahead Biology



- Winter annual
 - Majority germinates with first fall rains
 - Can also germinate through spring
- Initial growth is focused on root development
 - More competitive than other annuals
 - Stays green longer

Medusahead Impacts



- High silica content
 - Slows decay
 - Thatch buildup 2–5 inches
- Litter prevents other plant seeds from contacting soil surface
- Thatch ties up nutrients
- Adapted to germinate and survive in thatch
- Poor forage for grazing

Controlling medusahead



To manage annuals...

- Prevent seed production
- Deplete existing seed bank
- Prevent recruitment

Mechanical control

- Mowing
- Tillage



Prevent seed
production

- Timing – boot stage



Cultural control

- Grazing
- Prescribed burning



Prior to March grazing



After March grazing

Start of May grazing

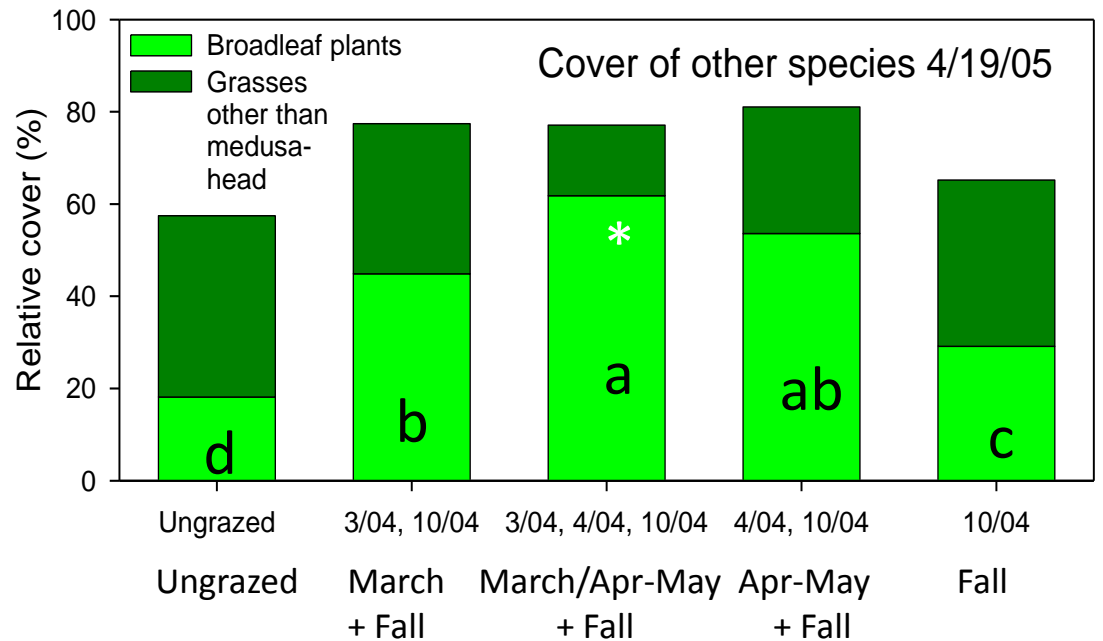
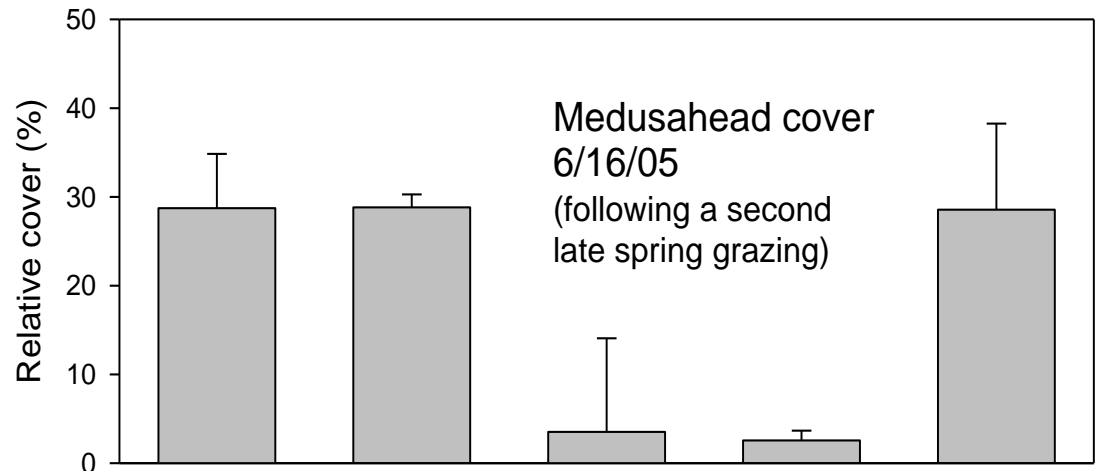




End of May grazing

Control of medusahead with grazing, Yolo County

Grazed early spring, late spring, and fall 2004 + late spring 2005



Burning



Chemical Control



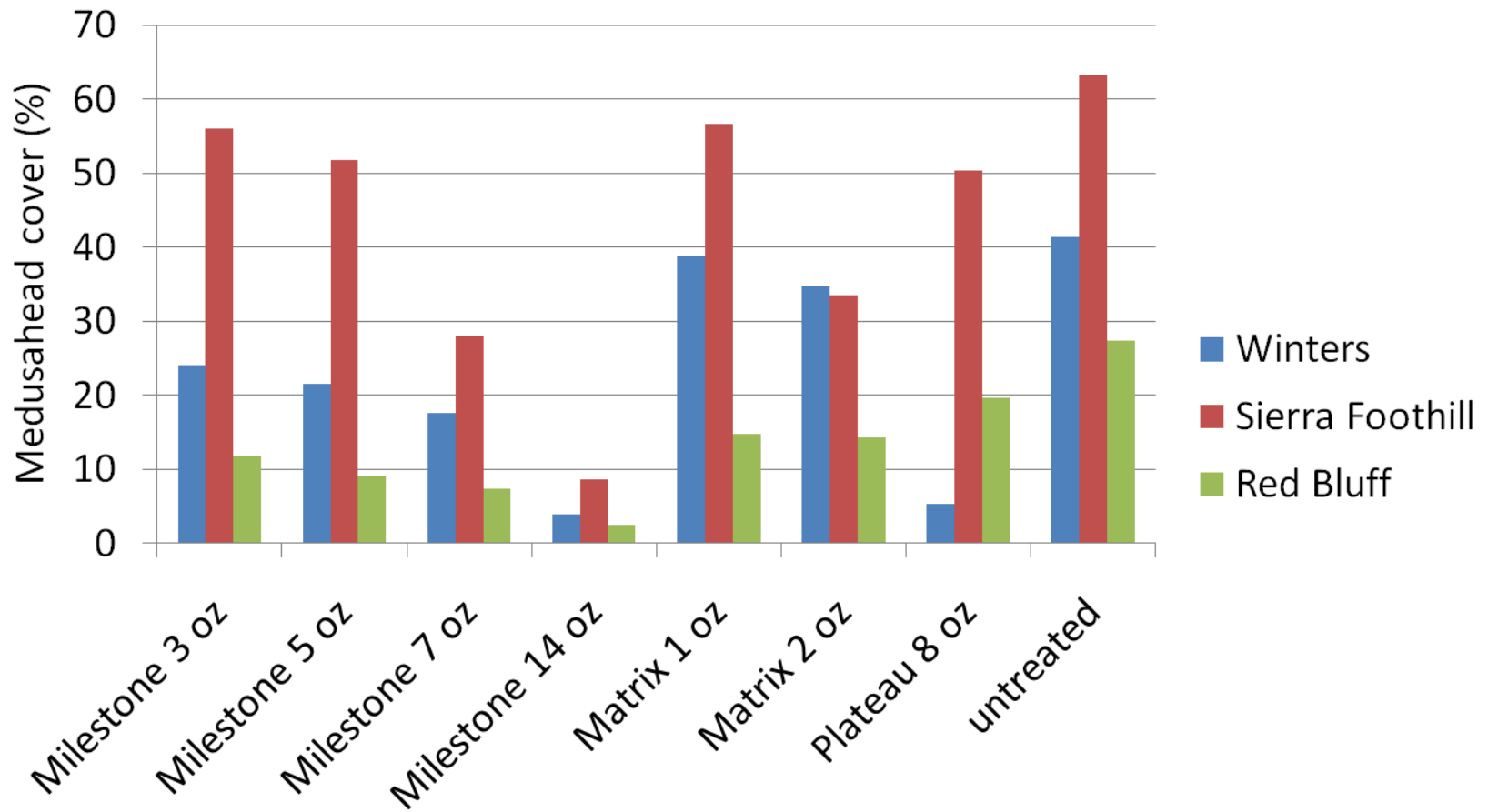
Glyphosate (Roundup[®])

- Post emergent
- Non-selective
- Applications
 - Spot treatment (1–4% solution)
 - Broadcast treatment
 - High Concentration (late spring) (1 qt/acre)
 - Low concentration (early season) (2 – 18 oz/ac)

Aminopyralid (Milestone®)

- Pre/Post emergent
- “Selective” – Broadleaf herbicide
- Typically used as a selective herbicide for yellow starthistle and other thistles
- Applications
 - Broadcast treatment

Treatments with *Milestone* (aminopyralid) at three sites



Winters, treated 10/9/2009, evaluated 5/21/2010

Sierra Foothill, treated 10/8/2009, evaluated 5/20/2010

Red Bluff, treated 9/28/2009, evaluated 5/28/2010



Safety

- Read and follow the label
- Wear personal protective equipment
- Avoid sensitive areas (water bodies, non-target plants)
- Avoid drift

More Information

- University of California Cooperative Extension
 - 209-223-6482
 - <http://cecentralsierra.ucanr.edu>