



# Identification & Control of thistles and grasses on rangelands

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# Thistles of concern in the foothills



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Californi  
tural Resou

# yellow starthistle



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Photo by Joe DiTomaso



UGA1459671



*Italian thistle*



***Bull thistle***



***Bull thistle***



***milk thistle***



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*Skeleton weed*



A woman in a white short-sleeved shirt and black pants stands on the right side of the image, looking towards a large patch of Skeleton weed. The weed is a dense, bushy plant with many small, light-colored flowers and green stems. The ground is a mix of dirt and gravel. In the background, there are some wooden posts and a dark, possibly paved or asphalt area. The overall scene is outdoors in a field or garden.

***Skeleton weed***



*stinkwort*



*Smooth distaff thistle*



**Groundsel**



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# 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

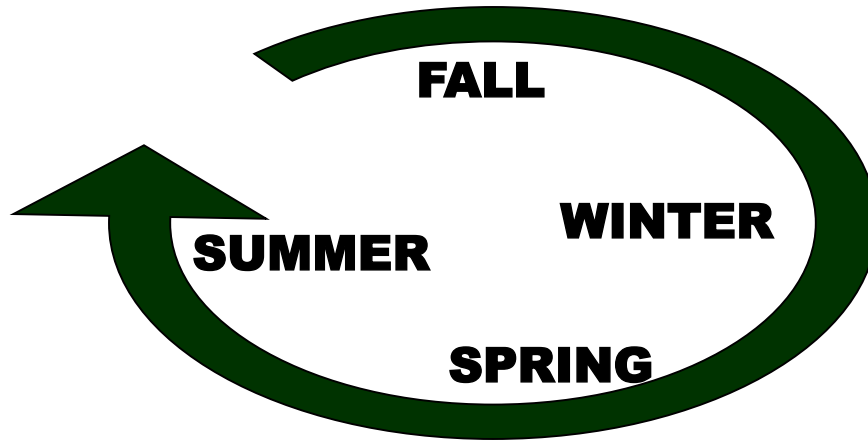




**Seedling**



**Flowering**



**Rosette**



**Bolting**

# Thistle Control

## Cultural Control

- Grazing
- Burning

## Mechanical Control

- Mowing
- Hand pulling and hoeing

## Biological Control

- Insects
- Diseases

## Chemical Control

- Herbicides





# Grazing

- DON'T graze yellow starthistle or other *Centaurea* with horses!!!!
- 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



# 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 season control & early maturing thistles, use hand flamer



# Mowing

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



# Chemical Control

- Herbicides used for thistle control
  - Glyphosate
  - 2,4-D\*
  - 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 (Broadleaf and grasses)
- 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)
- No soil activity – must be applied to actively growing plants
  
- 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
  - Crossbow



# Glyphosate and Triclopyr: Timing

- Anytime the plant is growing
  - For annuals spot treatments should be made after the last spring rain
  - If applied in winter or early spring, multiple applications may be needed to kill subsequent weed flushes
  - For biennials and perennials anytime, before flowering

# Selective Herbicides with soil activity

- **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
  - 3-5 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



# Important Forage and Manure Management: Transline, Milestone, Capstone

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|--|--|
| <p style="text-align: center;"><b>IMPORTANT USE<br/>PRECAUTIONS AND<br/>RESTRICTIONS TO PREVENT<br/>INJURY TO DESIRABLE PLANTS</b></p> <ul style="list-style-type: none"><li>• Carefully read the section "<b>Restrictions in Hay or Manure Use .</b>"</li><li>• It is mandatory to follow the "<b>Use Precautions and Restrictions</b>" section of this label.</li><li>• Manure and urine from animals consuming grass or hay treated with this product may contain enough aminopyralid to cause injury to sensitive broadleaf plants.</li><li>• Hay can only be used on the farm or ranch where product is applied unless allowed by supplemental labeling.</li><li>• Consult with a Dow AgroSciences representative if you do not understand the "Use Precautions and Restrictions". <b>Call [1-(800) 263-1196] Customer Information Group.</b></li></ul> | <p style="text-align: center;"><b>Forage and Manure Management</b></p> <p style="text-align: center;">©Copyright 2011 Dow AgroSciences LLC</p> |
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# Identification & Control of Weedy Grasses on California Rangelands





wild oat  
(*Avena* spp)



Italian  
ryegrass  
(*Lolium  
multiflorum*)



soft brome  
(*Bromus  
hordeaceus*)



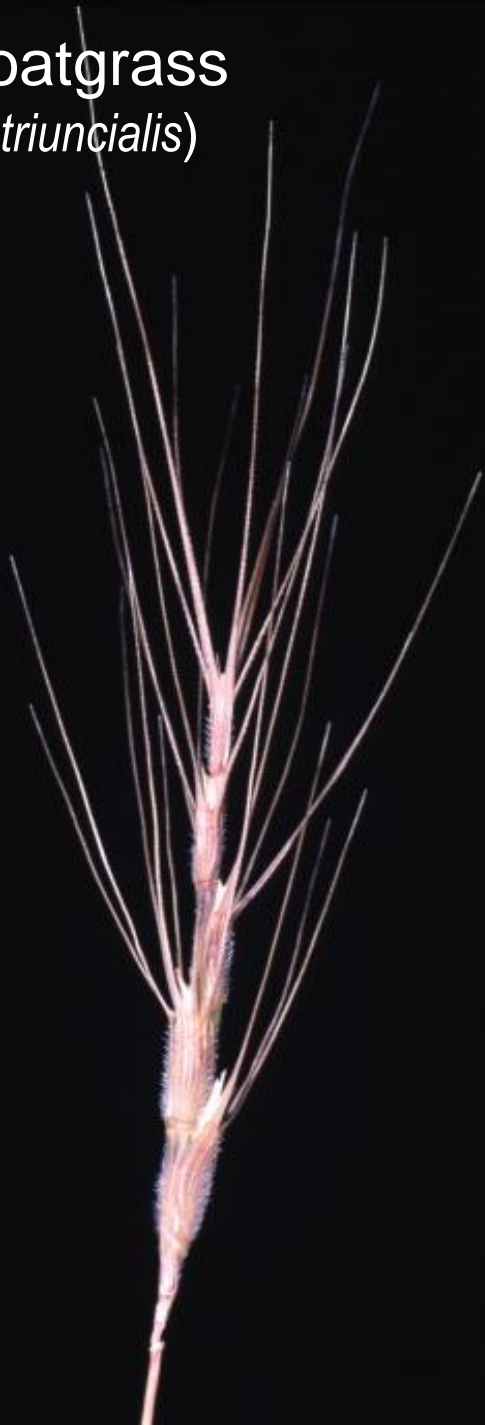
# medusahead

(*Taeniatherum caput-medusae*)





barb goatgrass  
(*Aegilops triuncialis*)



jointed goatgrass  
(*Aegilops cylindrica*)



# Medusahead Biology



- Winter annual
  - 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

- Optimum time is just before flowering to 1 week after flowering







# Cultural control

- Grazing
- Prescribed burning



**Prior to March grazing**



**After March grazing**

**Start of May grazing**

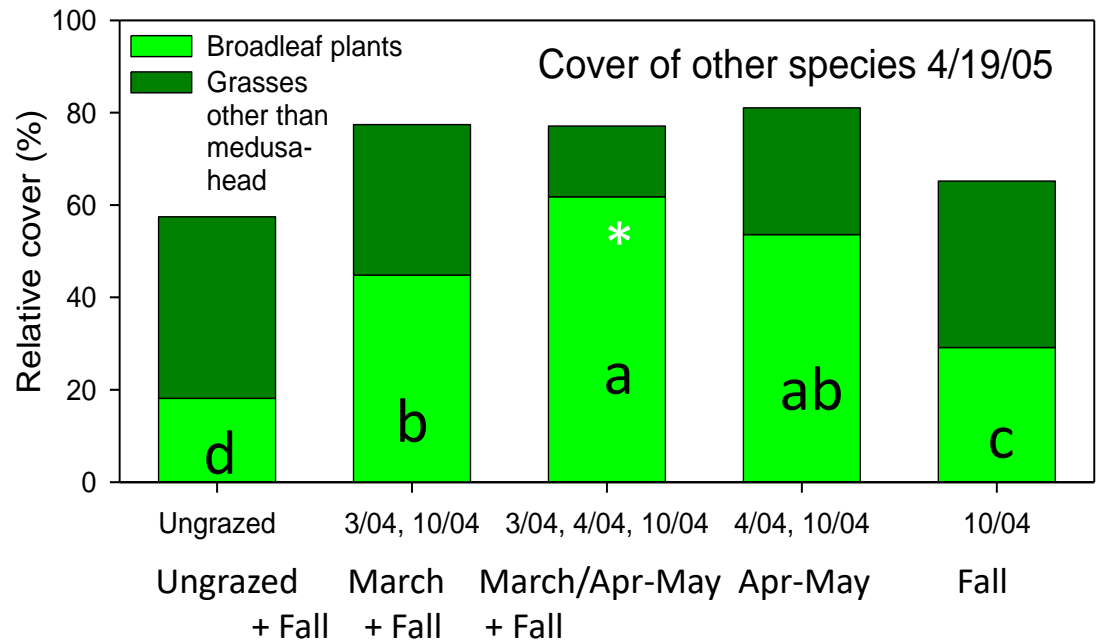
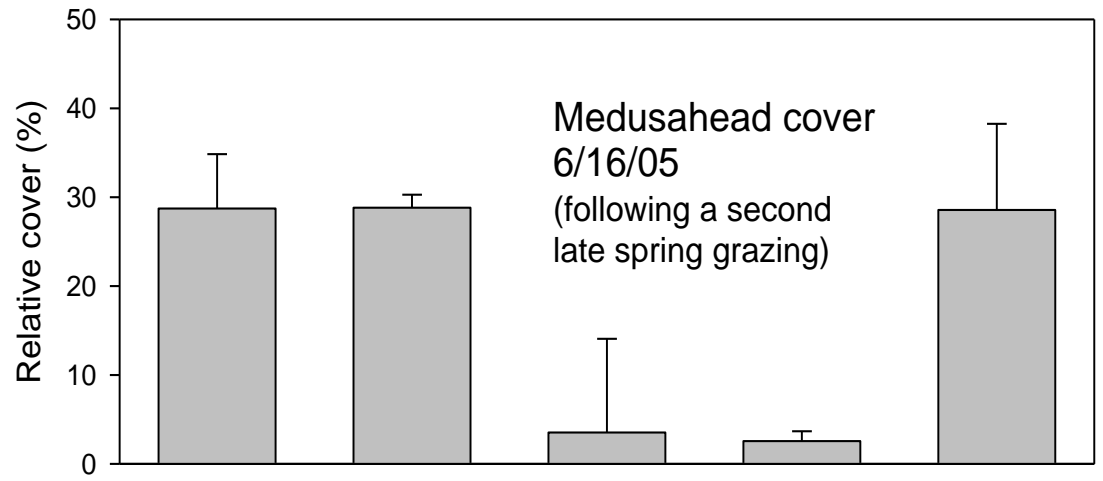




**End of May grazing**

# Control of medusahead with grazing, Yolo County

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



# Grazing for Mh and Bgg

- Both plants are non-palatable late season
- As season progresses, protein content drops
- Best done under high stocking rates for short durations during late spring/early summer just before flowering
- Application of nitrogen fertilizer can increase palatability



# Burning



# Chemical Control



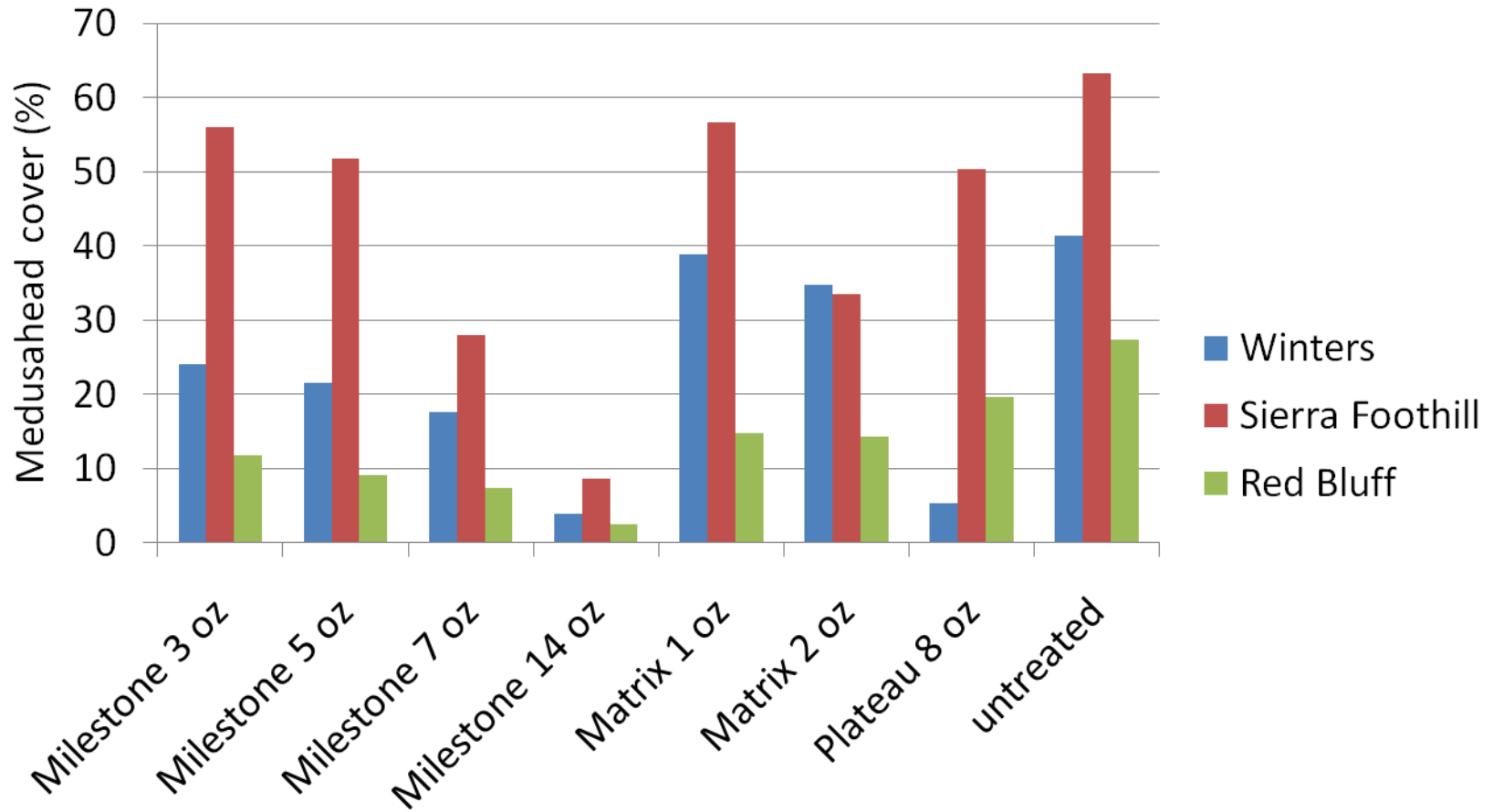
# Glyphosate (Roundup®)

- Non-selective
- Post emergent – must be applied to actively growing plants
- No soil activity
- Applications
  - Spot treatment (1-4% solution)
  - Broadcast treatment
    - High Concentration (late spring) (1 qt/acre)
    - Low concentration (early season) (2 – 18 oz/ac)
- Apply anytime before flowering

# Aminopyralid (Milestone®)

- “Selective” – Broadleaf herbicide
- Typically used as a selective herbicide for yellow starthistle and other thistles
- Pre/Post emergent
- Two opportunities for control:
  - Applied in fall – PRE emergent application on bare ground
    - High rates 10-14 oz product/acre
  - Applied in spring – post emergent application at boot stage
    - 5-7 oz/acre – causes plants to abort seed production

## 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



**Questions?**