

Medusahead: The state of the weed

An overview put together by
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University of California

Agriculture and Natural Resources

■ *A Celebration of Science and Service*

Overview

Medusahead background

Invasion dynamics

Control

Current Research



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What's in a name?

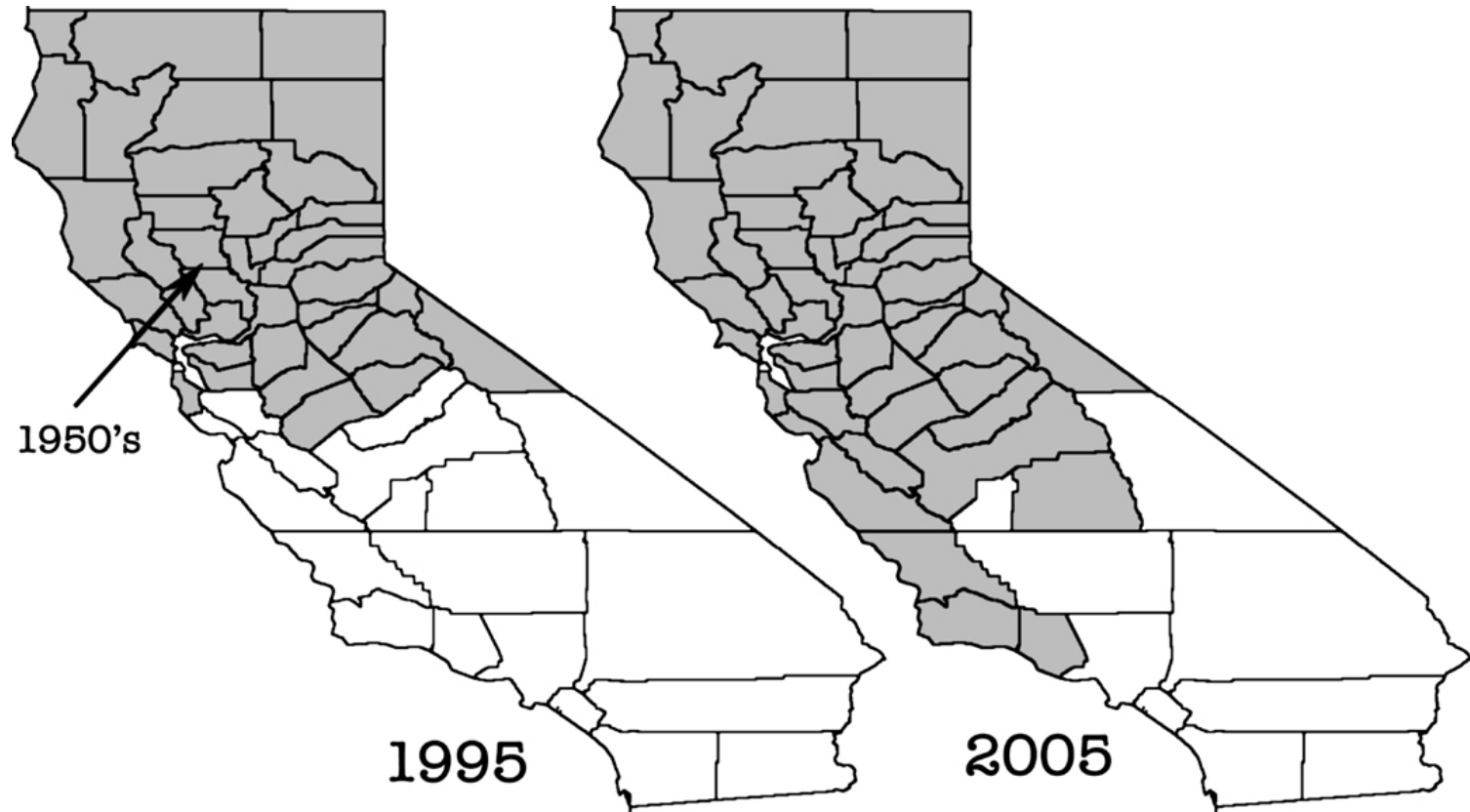




History



History



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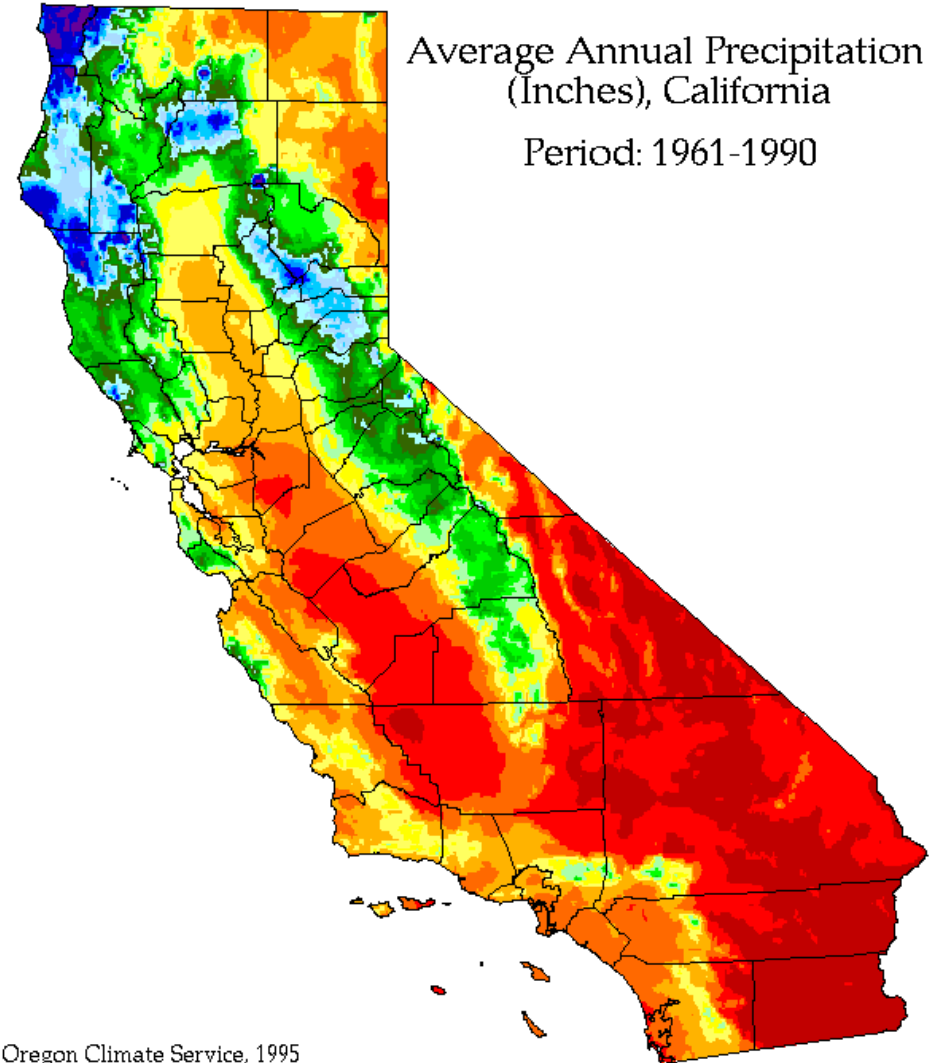
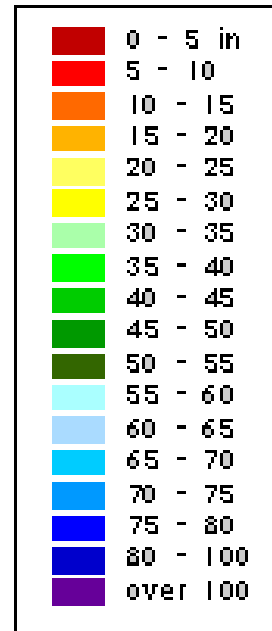
Control

Current Research



Factors for Invasion

Precipitation



Factors for Invasion

Soils



Factors for Invasion

Thatch



Factors for Invasion

Seed
Dispersal



Impacts of Invasion

Decreased
Habitat



Impacts of Invasion

Thatch



Impacts of Invasion

Fire



Impacts of Invasion

Competition



Impacts of Invasion

Decreased
Grazing



How to combat?

Understand
medusahead
growth



Medusahead Growth Stages



V2



V3

Medusahead Growth Stages



R4, beginning



R4

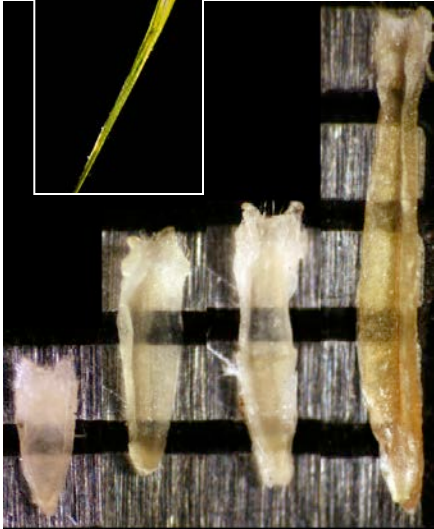


R5

Medusahead Growth Stages



Seed kernel development.



R7



R8

R9



M10

Phenology

- Most seeds rapidly germinate in the fall
 - Practices that limit a single year of seed production can drastically reduce plant numbers
- Matures and stays green later than most annual grasses
 - Often doesn't mature until May

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How to control medusahead

- Burning
- Herbicide
- Competition (seeding)
- Grazing
- Mowing



Burning

- Must be dry enough to carry fire
- Must be early enough that seeds have not dropped from the head
 - Fire is not great at controlling seeds on the soil surface



Burning

- Advantage
 - Nearly eliminates medusahead plants
 - Does not harm clover, filaree, or perennial grasses
- Disadvantage
 - Grazing is very limited the next year due to very low forage production
 - May be three years before normal production returns
 - Most desirable annual grasses are also lost
 - Slender/wild oat is the exception
 - Often by the time forage production returns to normal, so does the medusahead cover

Herbicide overview

- Aminopyralid (milestone) before germination
- Aminopyralid in the spring
- Grass selective herbicides
- Glyphosate



Aminopyralid before germination

- Effective, but expensive - \$2.85/ounce @ 14 oz/acre
- Use 5 oz product/acre (product = 2 oz amino + 0.8oz chlorosulfuron)
- A study at Red Bluff suggests that this approach lasts about 4 yrs
- The second year after use, hard seeded clover and filaree returned

Aminopyralid in the spring

- Still being tested
- Low rates are acceptable
 - 2-4 oz/acre possibly
- Does not kill plants, but prevents seed production



Grass selective herbicides

Clethodim
Arrow 2EC

Rate: 4 to 8 fluid oz product/acre (1 to 2 oz a.e./acre)

Cost (2013)¹: \$120/gal (~\$4 to \$8/acre)

Timing: Early postemergence

Safety on established perennial grasses: May vary by species and growth stage. Older, established bunchgrasses should be safe but may show injury. Annual grasses will be severely injured or killed.

Plantback interval: None

Grazing restriction: Depending on the type of application, label restrictions vary all the way from no restriction to “Do not graze.” Check with your county before use.

Remarks: Registered for use on noncrop, fallow ground, and native prairie restoration projects. Check with your county to make sure your intended use is permitted.

Fluazifop
Fusilade DX

Rate: 24 fluid oz product/acre (6 oz a.e./acre)

Cost (2014)²: \$170/gal (~\$32/acre)

Timing: Early postemergence

Safety on established perennial grasses: May vary by species and growth stage. Older, established bunchgrasses should be safe but may show injury. Annual grasses will be severely injured or killed.

Plantback interval: None

Grazing restriction: do not graze for 12 months after application

Remarks: Registered for use on noncrop and fallow ground; 24(c) registration for wildland in California and Oregon. Check with your county to make sure your intended use is permitted.

Glyphosate

Glyphosate
Roundup Pro,
Accord XRT, and
others

Rate: 0.75 to 1 pt product (41% glyphosate)/acre (4.5 to 6 oz a.e./acre) for early-season selective control in shrubland or other perennial systems; 1 to 2 qt product/acre (0.75 to 1.5 lb a.e./acre) for late-season, non-selective control.

Cost (2014)¹: \$16/gal (~\$2/acre for early-season treatment, ~\$4 to \$8/acre for late-season treatment)

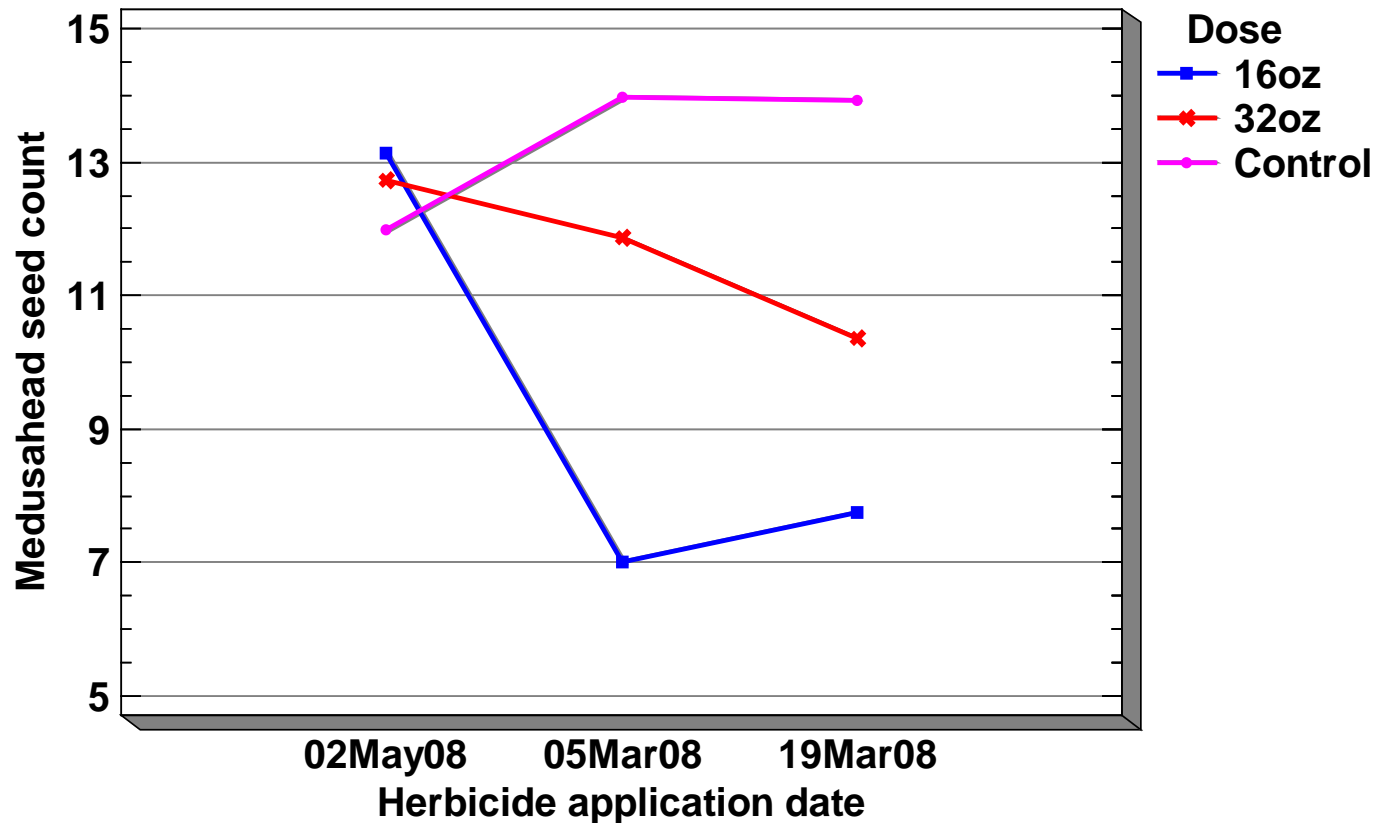
Timing: For selective control in shrubland, apply postemergence in spring after all seedlings are up and before heading; the tillering stage is ideal. For late-season, non-selective control, apply to rapidly growing plants before seeds are produced.

Remarks: Glyphosate is a non-selective herbicide with no soil activity.

Spray when individuals are in the R5-R7 stage.



Roundup herbicide treatments



Competition/seeding



Seed desired grasses

- Weeds must be controlled the year before planting (herbicide is best)
- Retreat weeds the fall of planting with grazing or burning
- The more ground prep, the better it works
- Skipping a step = total failure



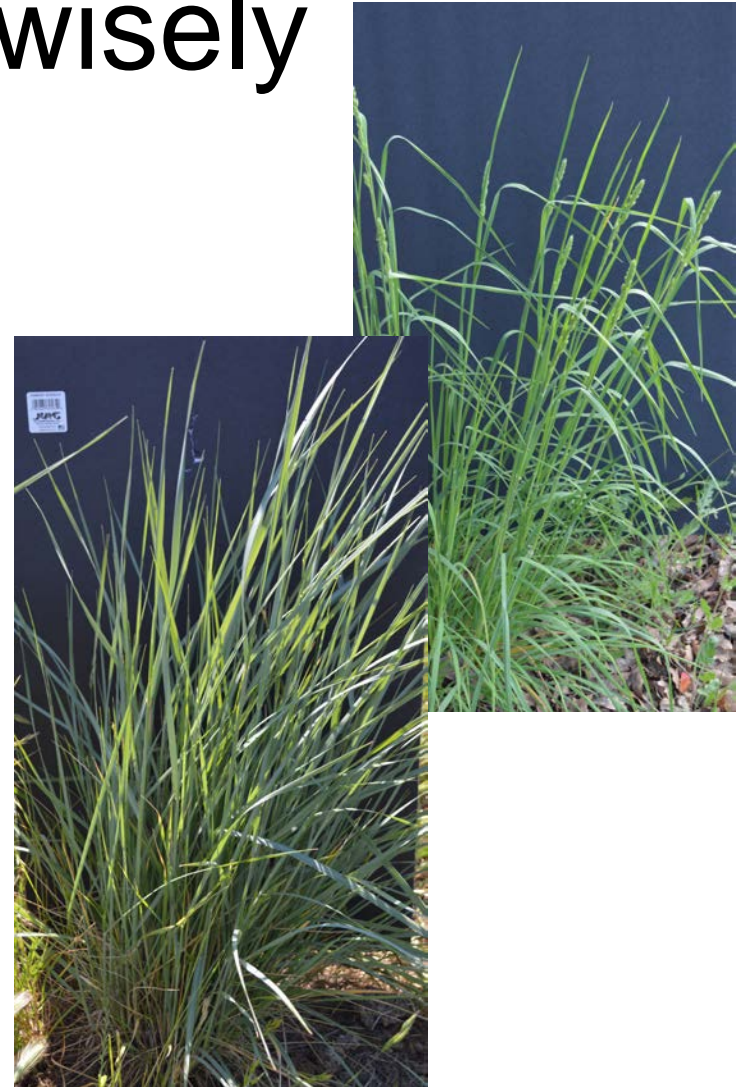
Seed desired grasses

- Tilling and drill seeding show best success to increase seed to soil interface



Pick seeded species wisely

- Match the plant to soils
 - E.g. Don't plant Harding grass in shallow soil, plant Berber orchardgrass
- Match the plant to climate
 - E.G. Wheatgrass does not do well in the valley, except for tall wheatgrass



Using Ryegrass

- Advantages
 - Superior quality and production
 - A long term solution
- Disadvantages
 - Cost is ~ \$45 an acre (\$0.40/lb.)
 - Chance of failure
 - This can be minimized on perennials
 - Risk can be eliminated with annuals (e.g. soft chess), but may not last as long



Grazing

Phenology work for proper timing

- Use the plants late maturity against it
- Defoliate late to reduce ability to make seed
- Timing is critical
- Weather, soil, etc cause variations in maturity



Grazing attraction - molasses



Effectiveness: Still questionable, but if tubs are moved around to medusahead patches, better grazing of the weed could be achieved



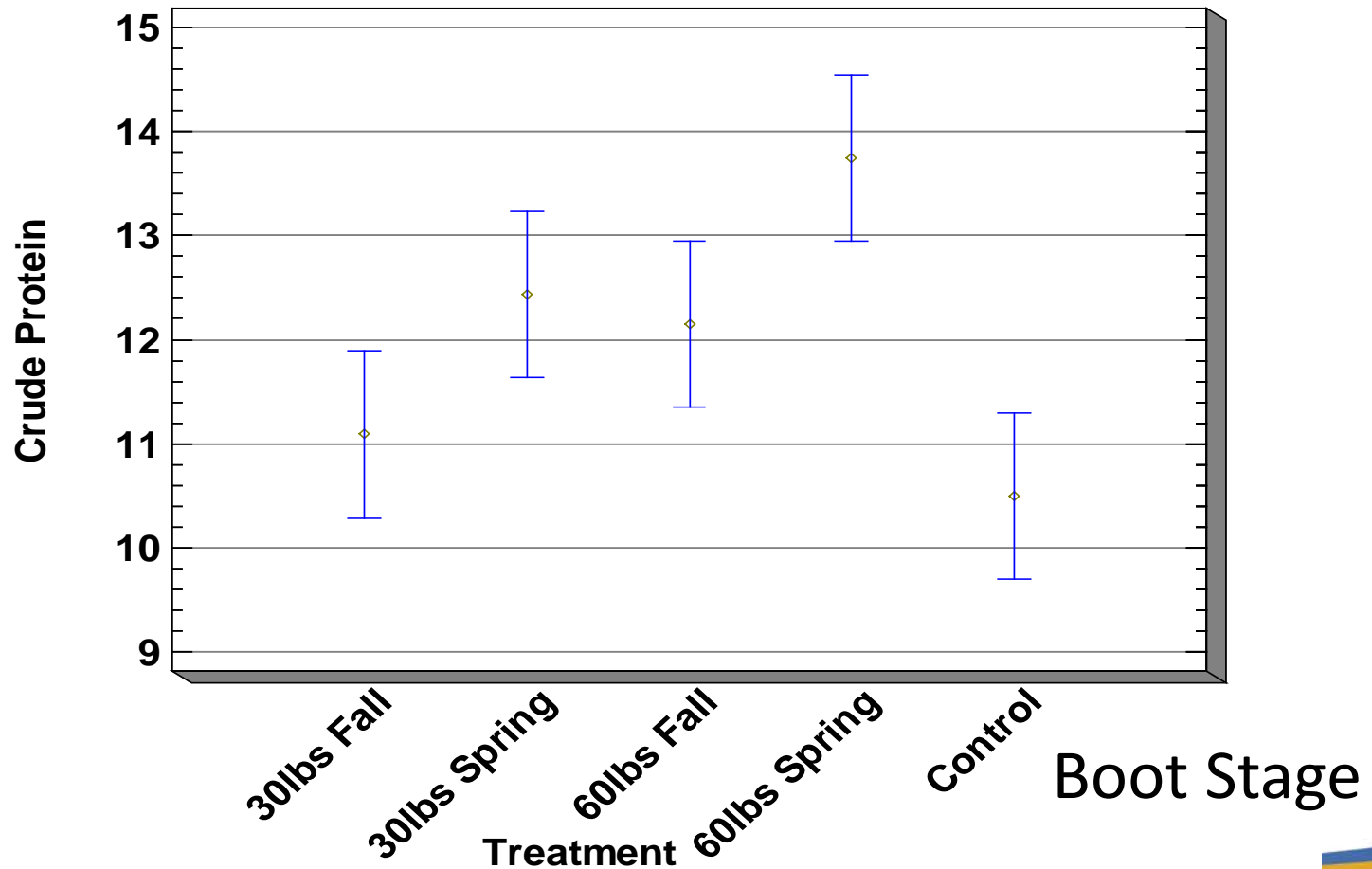
Grazing attraction - nitrogen

- Rates as low as 30 lbs/acre can attract cattle to graze medusahead during the spring
- Rates of 50+ lbs/acre should be done in the fall to enhance winter growth.



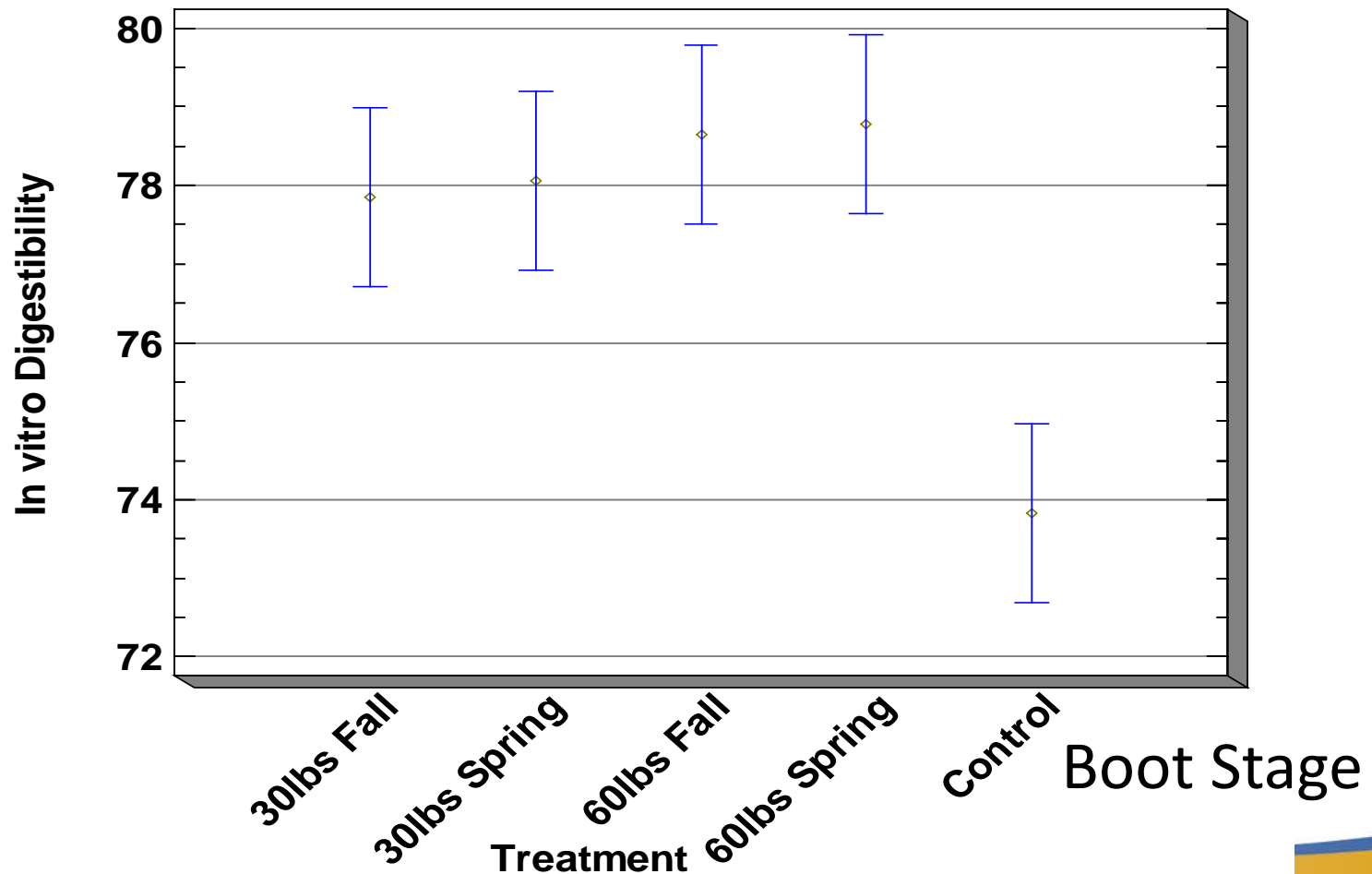
Crude protein from fertilization

Means and 95.0 Percent LSD Intervals



Digestibility increase from fertilization

Means and 95.0 Percent LSD Intervals



Plot boundary



Grazing



- It will not reduce medusahead every year
 - Particularly on years with late spring rain
 - Plants recover after grazing and make seed
 - Desirable forages are already dry and cattle need to be shipped to greener, higher quality forage
 - Reliable drinking water supply may be gone earlier in the season
 - It will not get worse on late spring rain years, it's just harder to make an impact so be patient
- On dry years, medusahead reductions can be seen

Mowing

- Mowing acts similar to grazing in eliminating seed production
 - The window for mowing is longer than grazing because the awns on the seed head decrease palatability
 - Late season fire is a concern with mowing
 - Relatively inexpensive, but often infeasible over large scales and on rocky landscapes

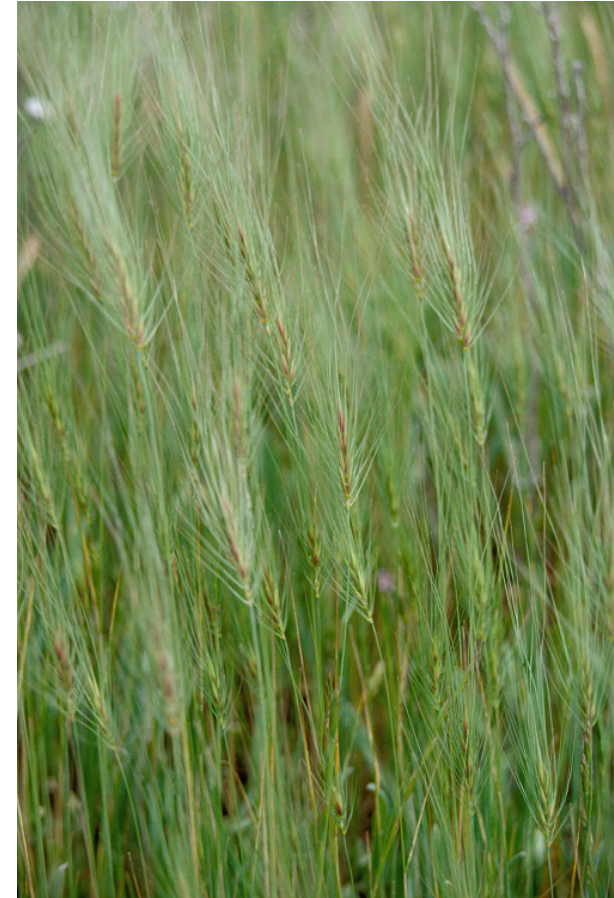
Mowing

- Should be done when medusahead is in the boot stage
- However, medusahead individuals that escape mowing will respond with an explosion of seed production, so two mowing events in a single season is ideal



Approximate costs per acre

- Fertilizer
 - 30 lbs/acre N: \$26.70
 - 60 lbs/acre N: \$53.40
- Roundup: \$15
- Mowing: \$18
- Supplement: \$10
- Forage Replacement: \$34
- Seeding: \$30-1000
- Burning: \$2



IPM approach

- IPM = Integrated pest management
- Best method of control is using different approaches within and across years
- This results in more complete medusahead control + often comes with benefits to desired species and natives
- Single treatment applications will fail for long-term control

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Whats new in medusahead research?

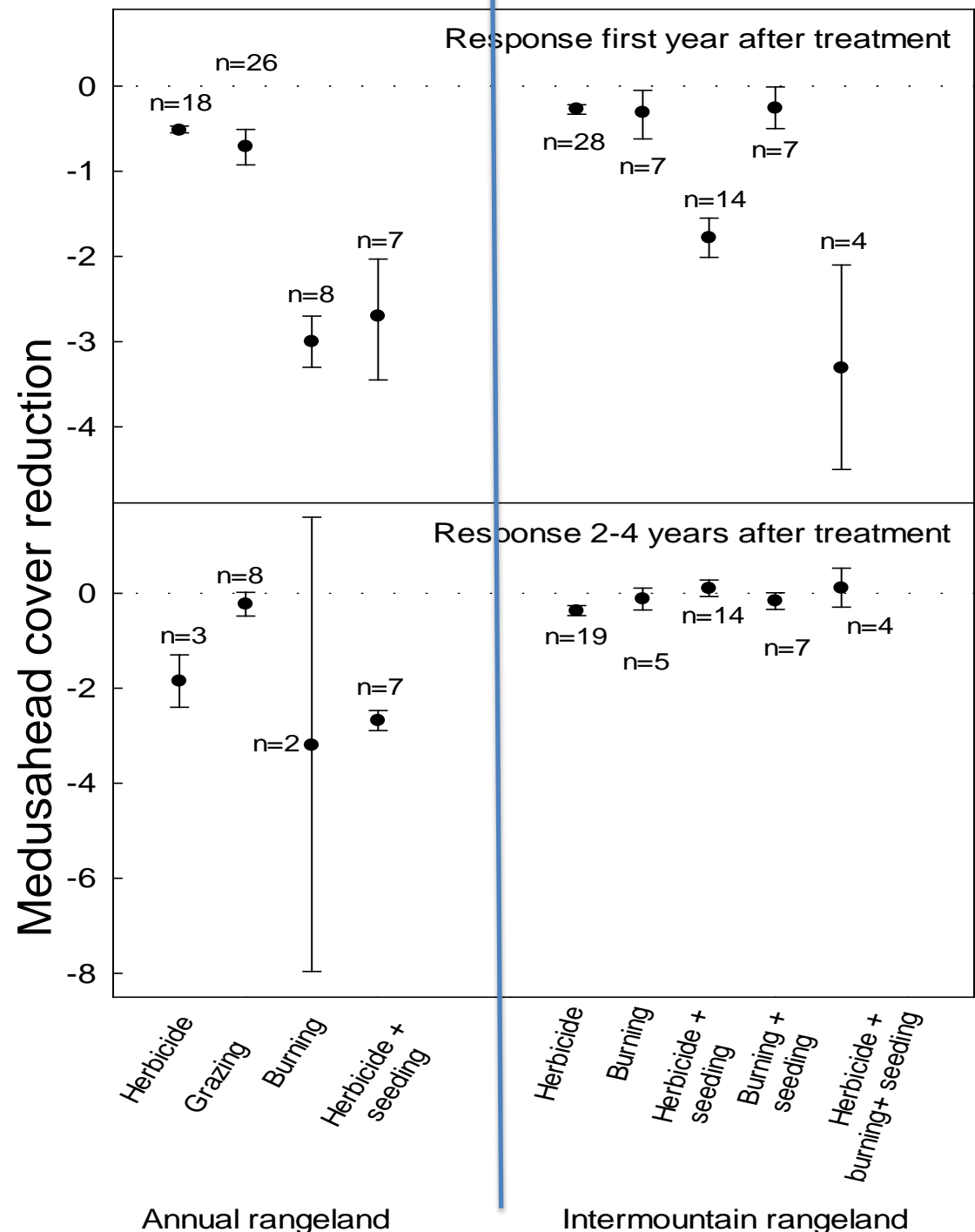
Lots of research is being conducted to investigate novel medusahead control and eradication. Much of it is occurring through the UC system and UCCE!



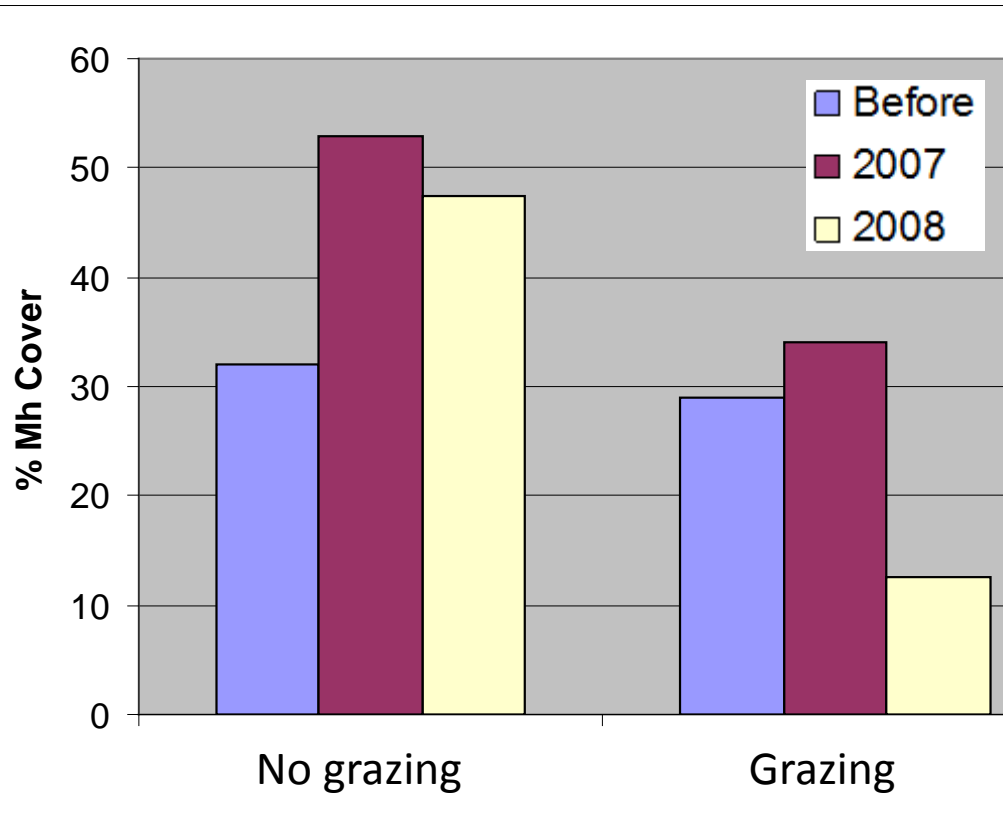
Control review

Overall conclusions

- Current methods are not adequate for long term medusahead control
- Seeding might be a particularly useful avenue for medusahead control



Patch grazing with low-moisture supplement



Medusahead cover increased less in grazed than in ungrazed areas.



Mowing – one project

Mowing two years in a row,
while medusahead is in the
boot stage.

Medusahead reduced from 50
to 5% cover

Medusahead seed
production reduced by
almost 90%



Mowing – another project

Mowing in the boot stage in oak and grassland plots

Medusahead cover reduced by 75% but seed production only reduced by 40%

Oak tree maintenance can help isolate medusahead patches and reduce overall cover



Best management approaches

- Burn in year 1 (to reduce seed production and get rid of thatch); till and seed with desired species in year 2; follow up as needed in year 3 and beyond
- Spray with roundup late in the season (~\$4/acre) and then seed in the fall of year 1; follow up as needed

Just a reminder....

- Cooperative extension's role is to help you get where you want to go, not where we think you should go
- One size does not fit all
- We test the tools
- IPM approach



Useful information

California invasive plant council: <http://www.cal-ipc.org/>

UC Integrated Pest Management Program:
<http://www.ipm.ucdavis.edu/index.html>

Invasive Plant News: <http://techlinenews.com/>

Research Gate: <https://www.researchgate.net>

USDA:

<http://www.invasivespeciesinfo.gov/plants/medusahead.shtml>

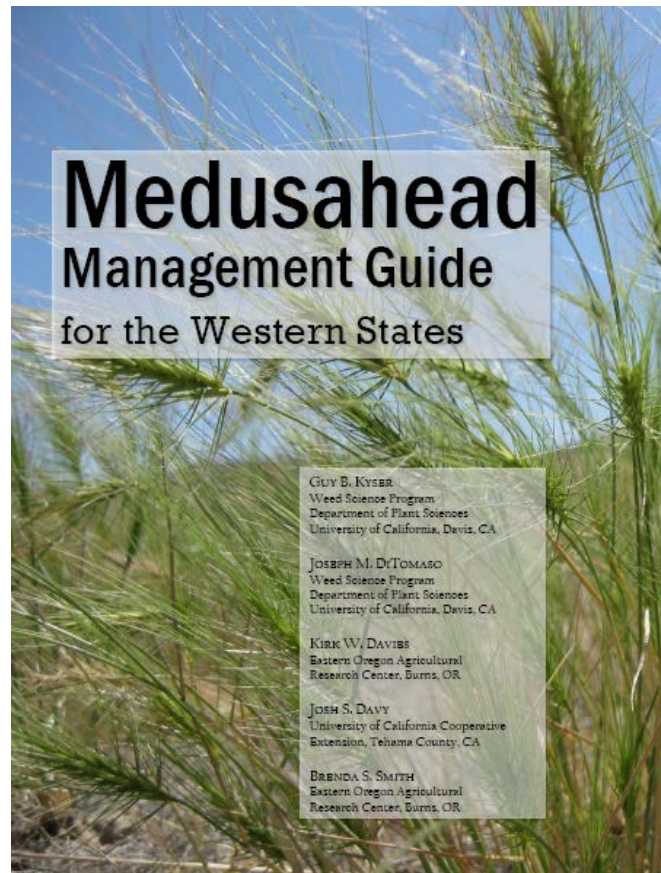


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More information is in this guide!

Download for free!!



<http://wric.ucdavis.edu>

Questions?

Contact your local farm or livestock advisor. Alternatively, you can contact the organizers of this presentation:

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