Targeted Grazing for Weed Control and Wildlife Management

Presented by
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University of California
Agriculture and Natural Resources
Making a Difference for California

To Graze Or Not To Graze?

- Many years of debate, polarized views and management decisions based on dogma.
- Both sides want the same outcome from their management philosophy.
    - Healthy ecosystem
    - Sustainable provision of ecosystem services

Society for Range Management

CALIFORNIA-PACIFIC SECTION

PROCEEDINGS
California-Pacific Section Society for Range Management Symposium

Grazing for Biological Conservation

Lessons Learned from Grazing Studies

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Selected References from Symposium

- Marty, J. 2005. Effects of cattle grazing on diversity in ephemeral wetlands. Conservation Biology 19:1626-1632
  - **Removal of grazing decreased native vegetation and invertebrate species in vernal pools.**
- Germano, D.J., G.B. Rathbun, and L.R. Saslaw. 2001. Managing exotic grasses and conserving declining species. Wildlife Society Bulletin 29(2):551-559.
  - **Although livestock may have contributed originally to habitat destruction and introduction of exotic plants, we believe that in some years, moderate to heavy grazing by livestock is the best way to decrease the dense cover created by exotics.**
- Russell W. H., and J.R. McBride. 2003. Landscape scale vegetation-type conversion and fire hazard in the San Francisco bay area open spaces. Landscape and Urban Planning. 64: 201-208.
  - **Successional pressures resulting from fire suppression and reduced grazing have resulted in vegetation-type conversion in the open spaces surrounding the urbanized areas of the San Francisco bay area.**
- Hayes, G.F. and K.D. Holl. 2003. Cattle grazing impacts on annual forbs and vegetation composition of Mesic Grasslands in California. Conservation Biology. 17(6):1694-1702.
  - **The results of this and other studies highlight the importance of considering the adaptation of vegetation communities to disturbance in making grazing management recommendations.**
- DiDonato, J. 2006. Endangered Amphibian Research within Grazed Grasslands. Symposium presentation: Grazing for Biological Conservation. San Jose, CA.
  - **Amphibians evolved with disturbances associated with large herbivores and such animals continue to play an important role in these ecosystems.**

Grazing?

- “Grazing” and “No Grazing”

- Grazing parameters are used to describe and define the type of grazing

Grazing?

Low Density
Long Duration
Extensive

Grazing?

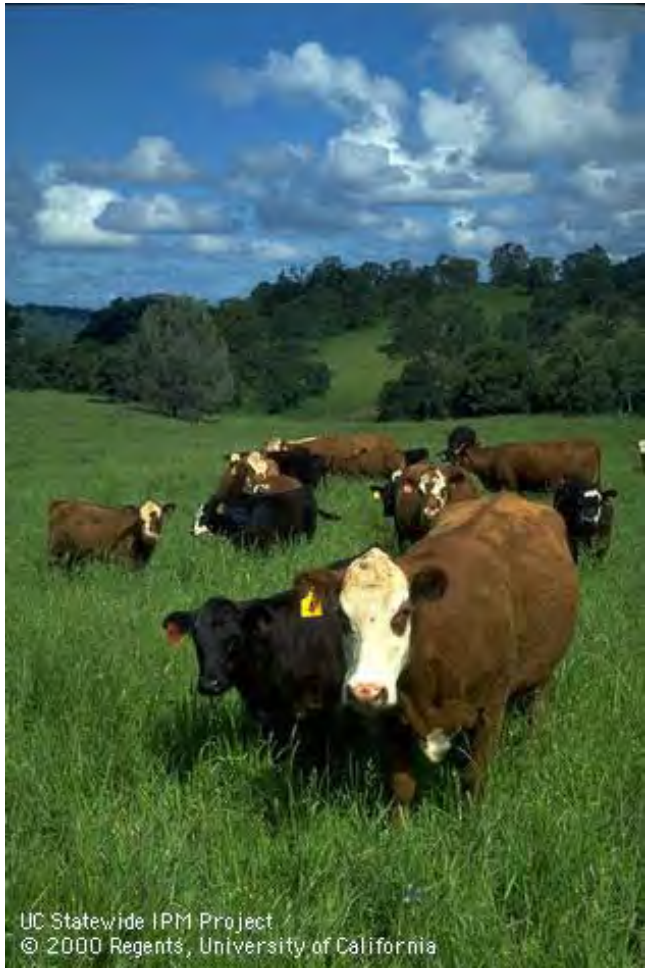
Low Density
Long Duration
Extensive

High Density
Short Duration
Intensive

Grazing?

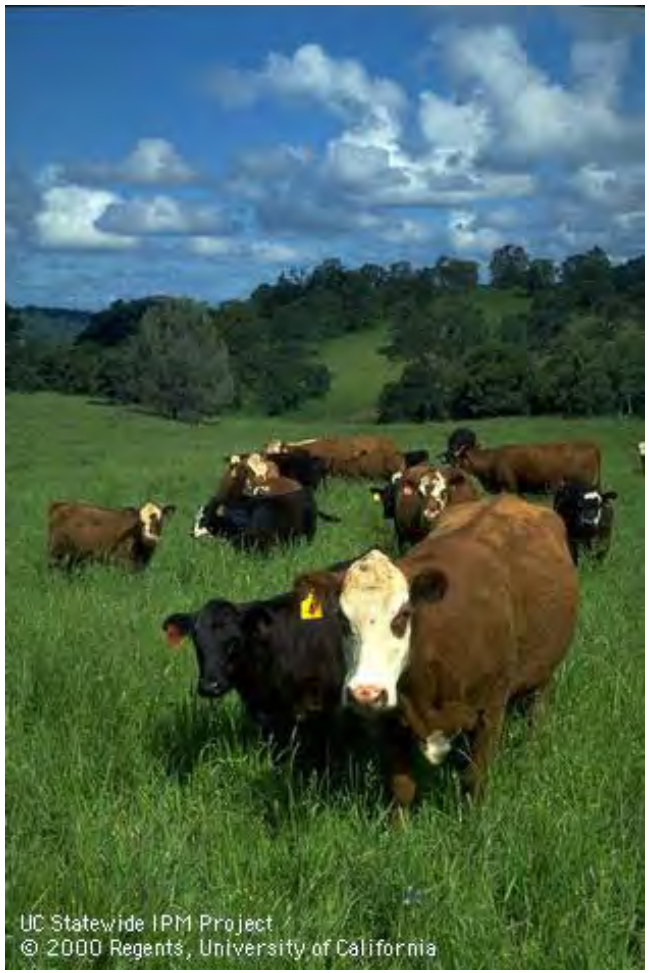
- Grazing Parameters
  - **Livestock Density**
    - Number of animals per acre
    - Animal Units (AU)/acre
    - 1 AU = 1 cow that weighs 1,000 lbs. and consumes about 26 lbs. of dry matter per day
    - 1 AU = 5 mature sheep
  - **Grazing Duration**
    - Number of days or months
    - Animal Unit Day (AUD), Animal Unit Month (AUM)

Grazing?



Winter and Spring Grazing

Grazing?



Winter and Spring Grazing

Summer Grazing

Grazing?

- Grazing Parameters
  - **Timing of Grazing**
    - Season
    - Plant's phenological stage
      - Bolting stage
      - Boot stage

Grazing?

Type of Animal

Grazing?

- Grazing Parameters
  - **Livestock Density**
  - **Grazing Duration**
  - **Timing of Grazing**
  - **Type of Animal**

Manipulated to achieve desired results.

A Closer Look At…

- **<u>Livestock Density</u>**
  - Low Density results in:
    - High selectivity
    - Uneven grazing/utilization
  - High Density results in:
    - Low selectivity
    - Even grazing/utilization

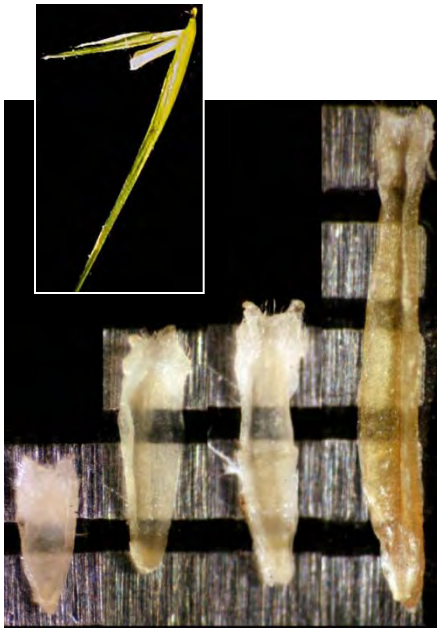
A Closer Look At…

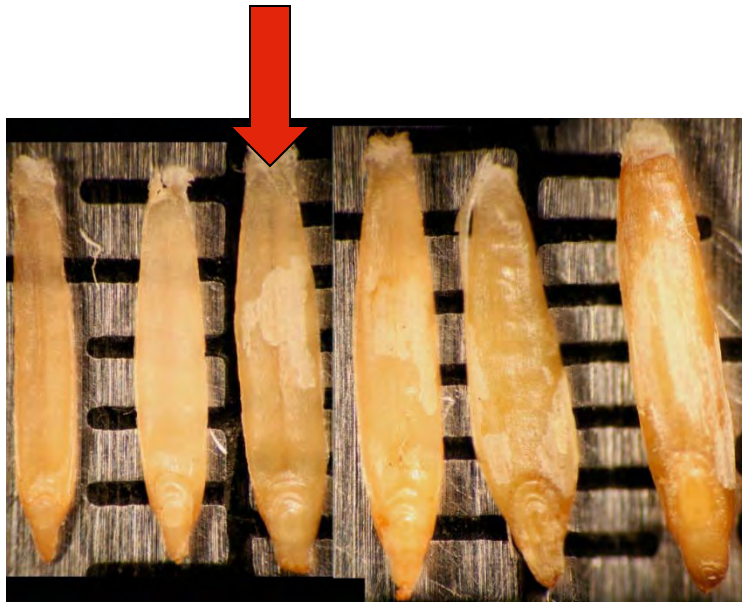
- **<u>Grazing Duration</u>**
  - Will depend on:
    - Amount of vegetation
    - Livestock density
    - Window of opportunity

A Closer Look At…

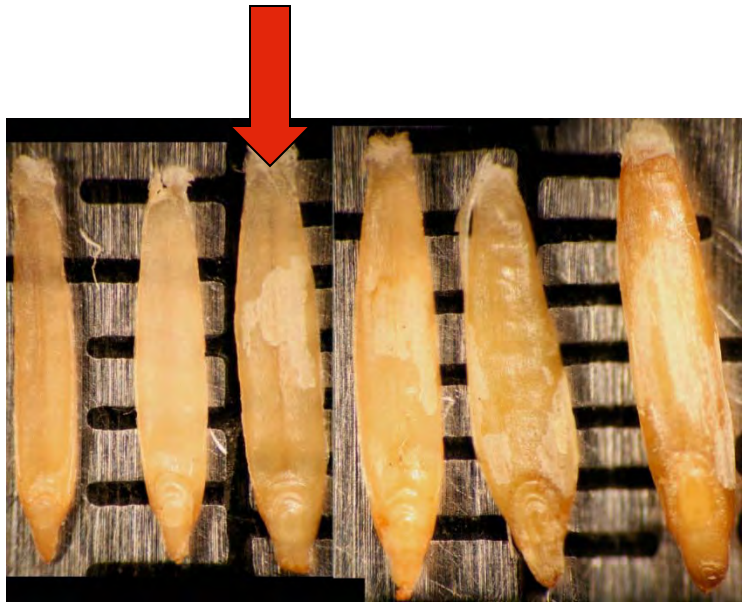
- **<u>Timing of Grazing</u>**
  - For weed control grazing must occur when:
    - The target plant is vulnerable to grazing
    - The target plant is palatable to livestock
  - Medusahead example

Medusahead Phenology





Medusahead Phenology



A Closer Look At…

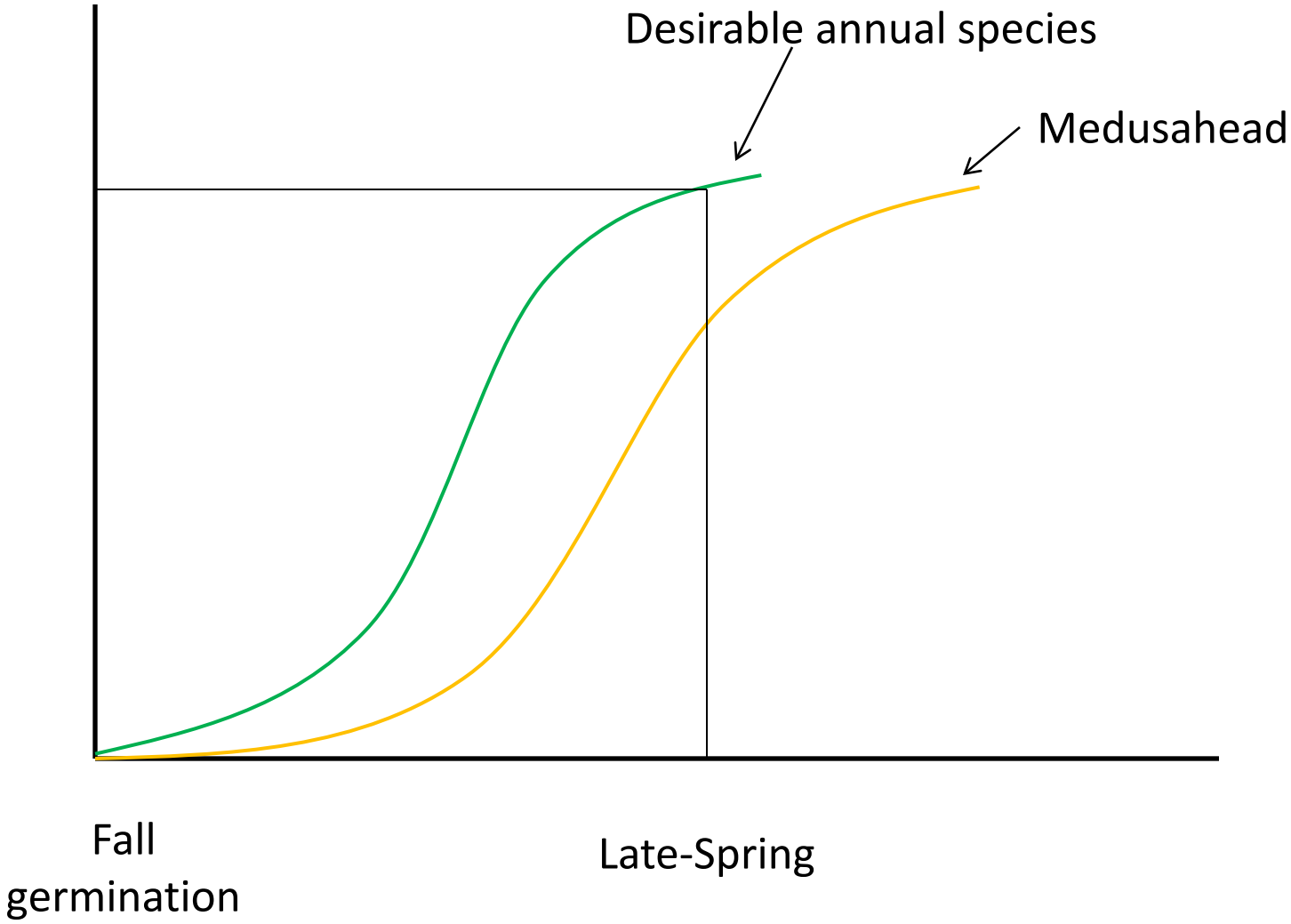
- **<u>Type of Livestock</u>**
  - Cattle
    - Low selectivity
    - Grazer
  - Sheep
    - Moderate selectivity
    - Grazer
  - Goat
    - High selectivity
    - Browser

Taeniatherum caput-medusae - medusahead

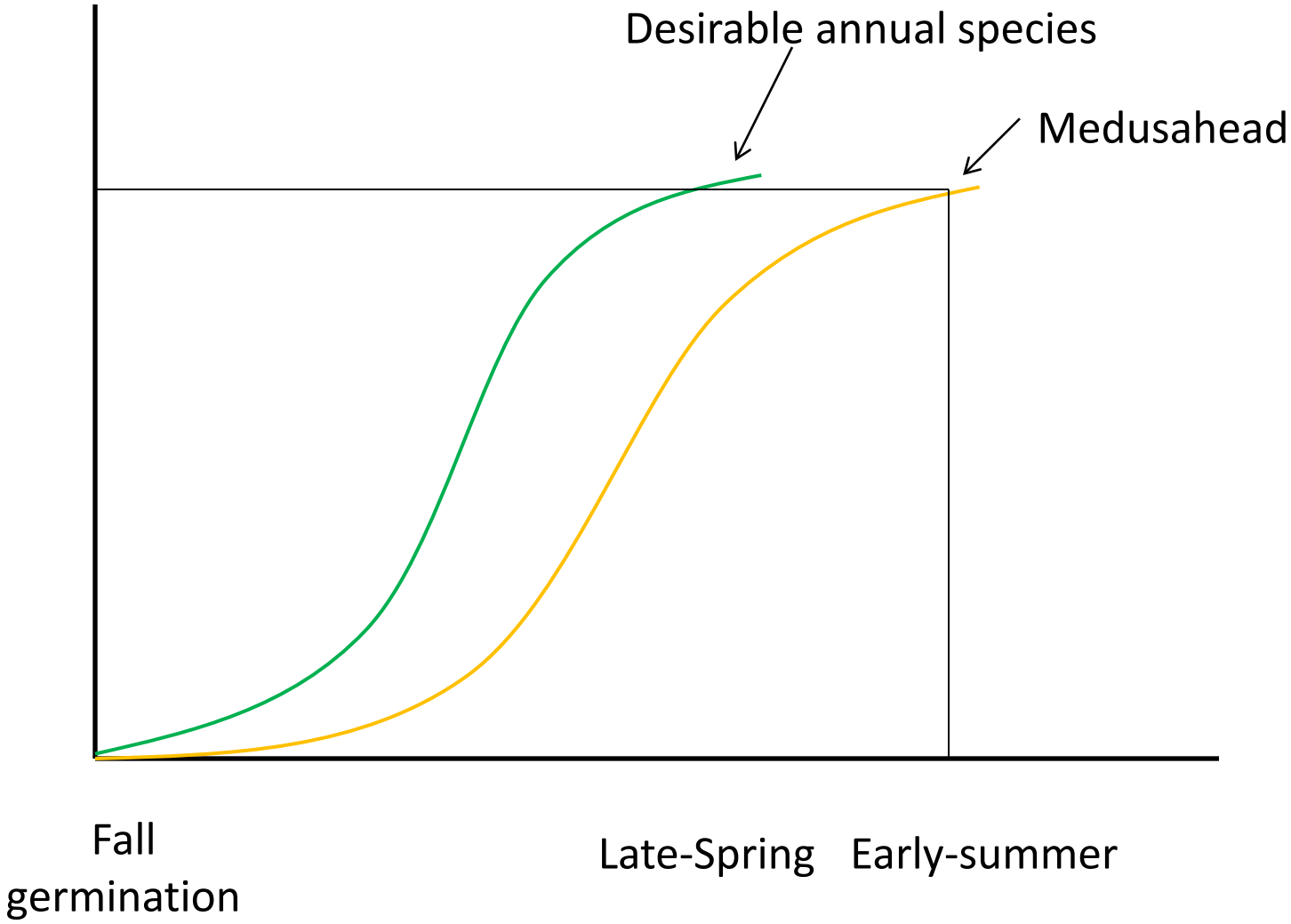
Key Characteristics of Medusahead

- Delayed phenology & seed shatter
- Very unpalatable to livestock after awns emerge (3x silica compared to other grass)
- Can accumulate dense thatch
- Little ability to grow back after late defoliation

Phenology of Medusahead relative to desirable annual species.



Phenology of Medusahead relative to desirable annual species.



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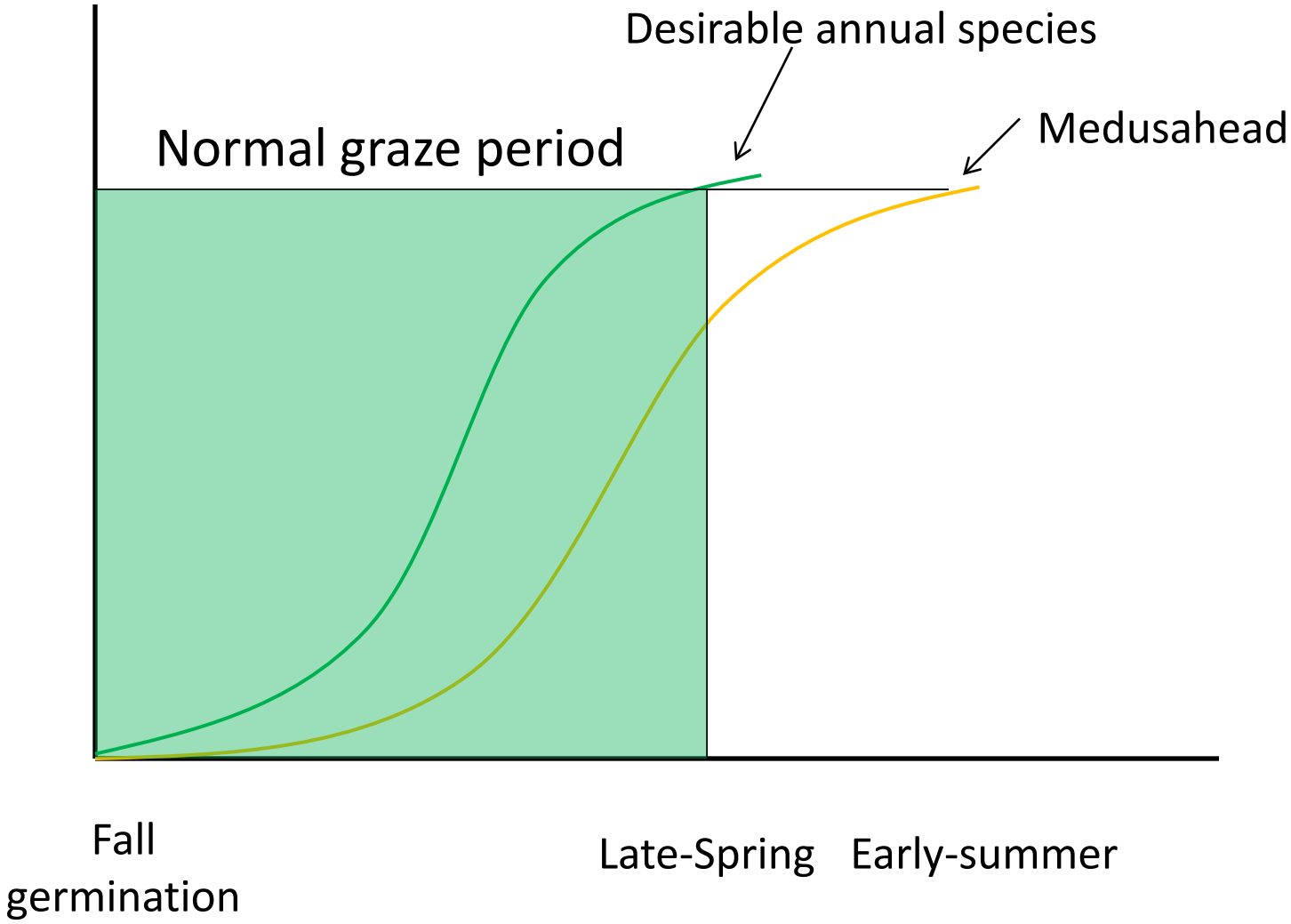
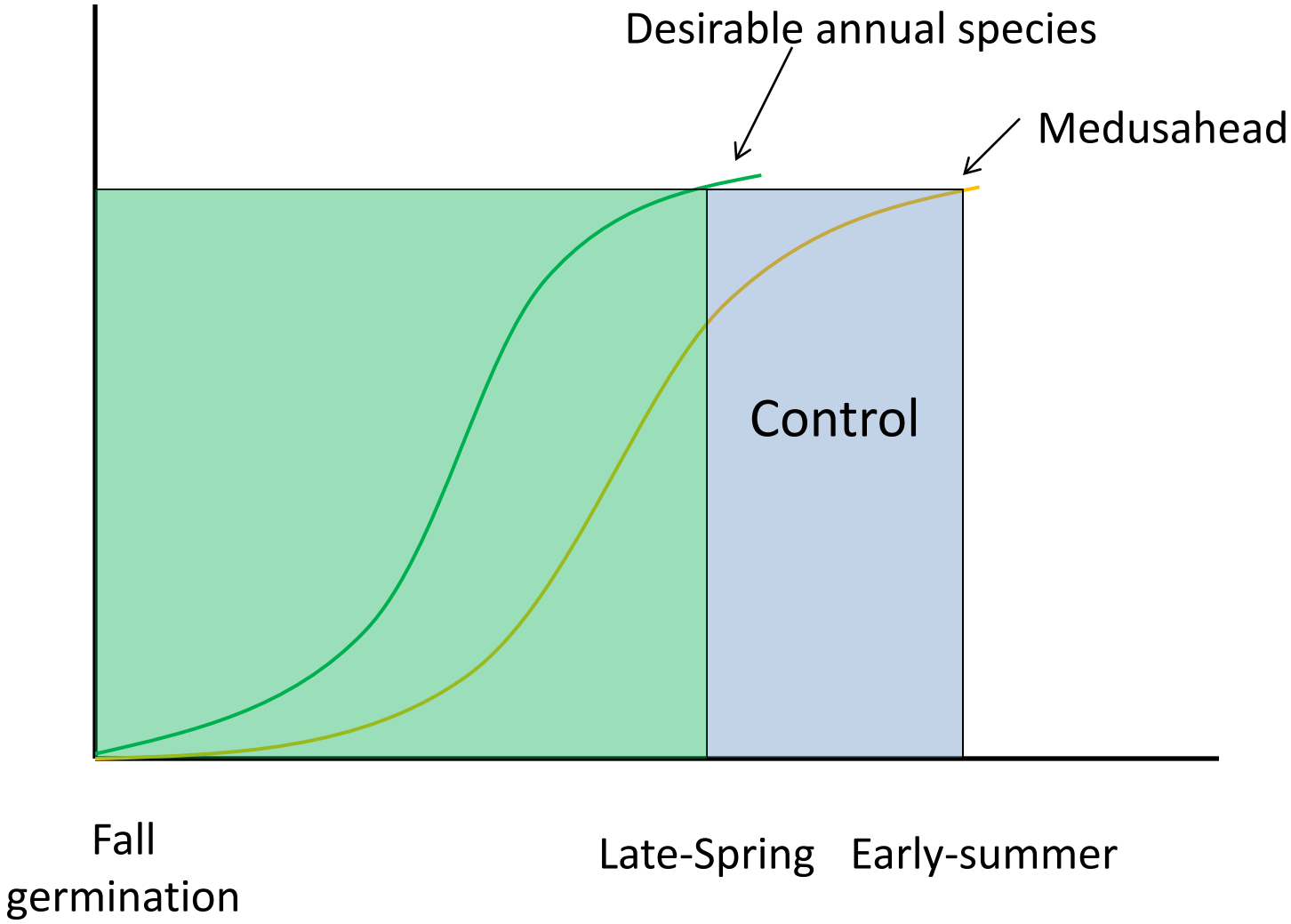
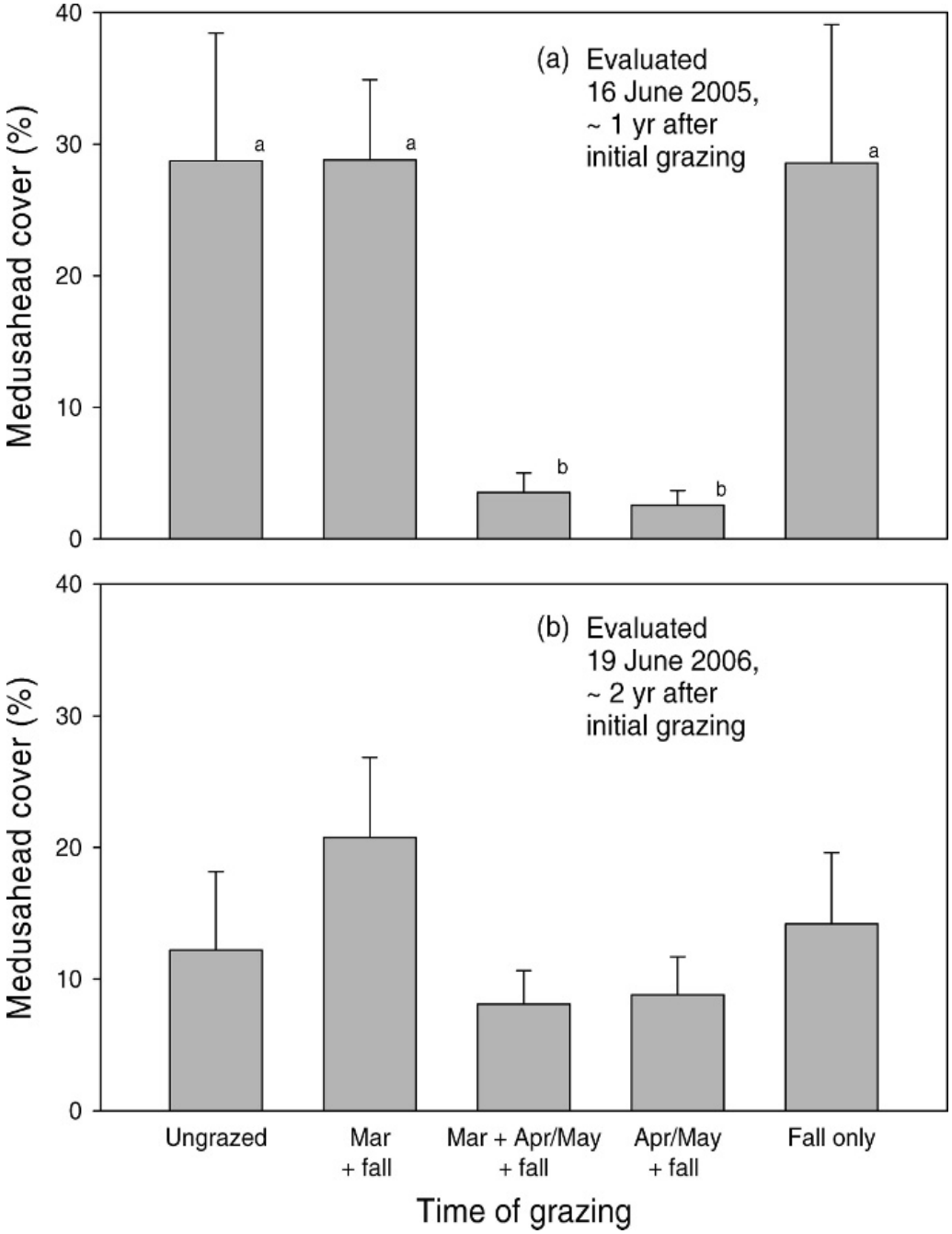


Phenology of Medusahead relative to desirable annual species.

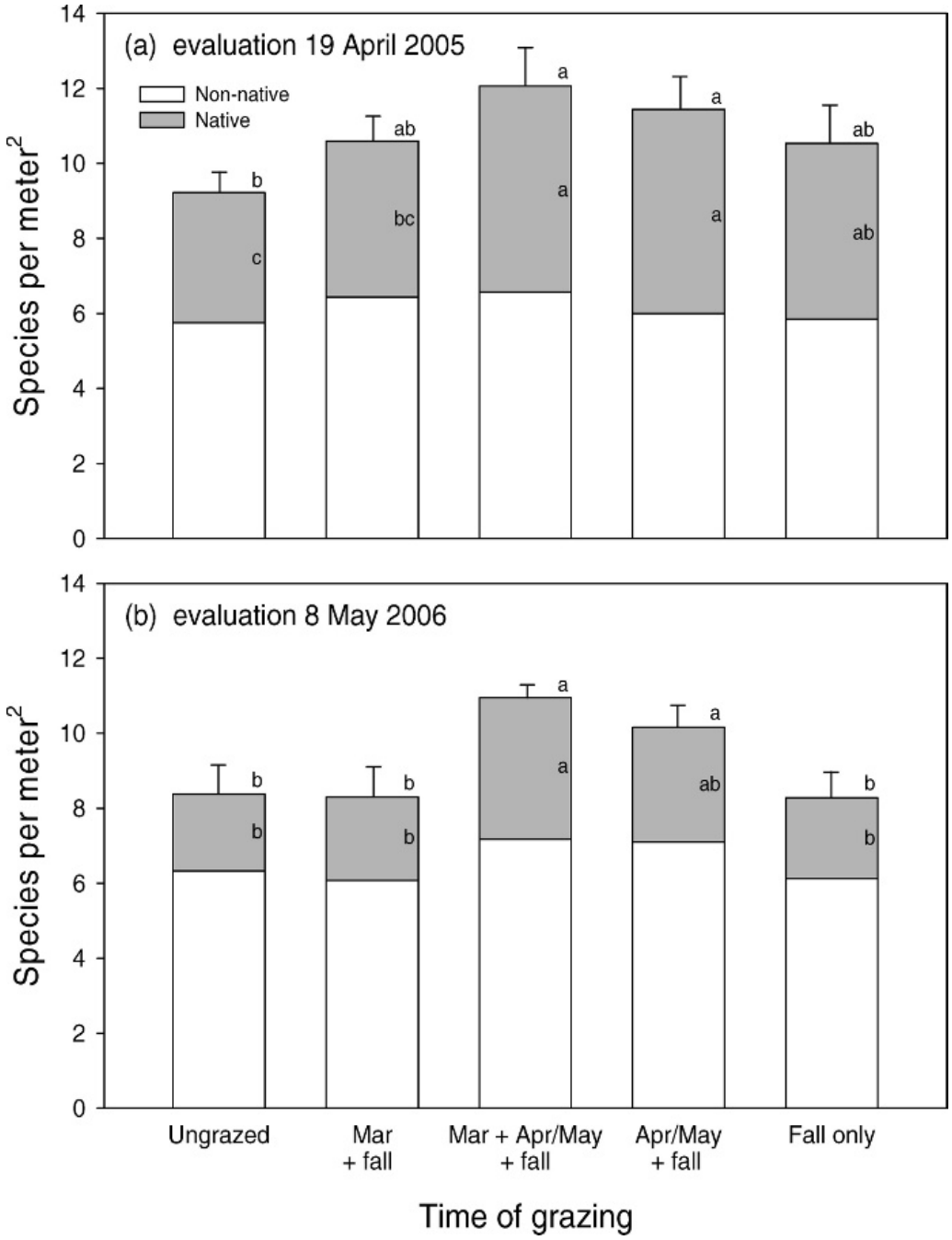


First grazing trial, 2004-2005


April 2004: post-grazing



DiTomaso et al., 2008. Invasive Plant Science and Management 1:241-247.



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Adjusting stocking density and duration with a static stocking rate.

# of Sheep (ewes)	# of Cattle (cows)	Area (acres)	Time (days)	Stocking rate (AUD/acre)
10	2	0.025	1	80
1000	200	1	1	80
250	50	1	4	80
125	25	1	8	80
100	20	1	10	80
71.4	14.3	1	14	80

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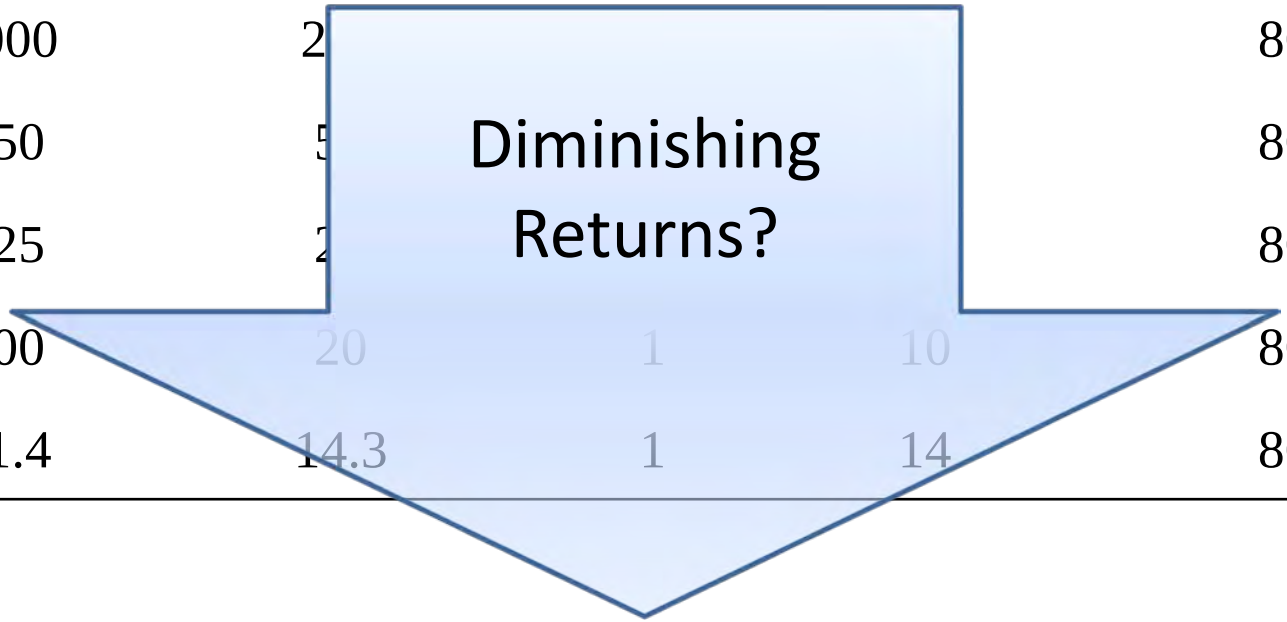

Conclusions

- Targeted livestock grazing can provide ecological benefits.
  - Weed control
  - Wildlife habitat
- Weed control depends on precise timing based on plant phenology.
- Effective control requires long term planning and incorporation of treatments into the regular management.
- Also requires a shift from traditional grazing practices (time, density, duration).
- We must accurately and precisely define grazing parameters to replicate successes and avoid problems.

QUESTIONS