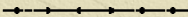


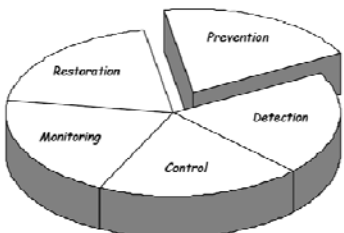
*Managing weeds to  
conserve diversity and  
productivity*

Joe DiTomaso  
University of California, Davis



### Prevention

Our first line of defense

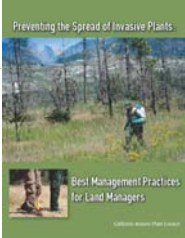


### Prevention BMPs

Goal: To prevent accidental introduction and spread of invasive plants

Two Prevention BMP Manuals:

1. for Land Managers
2. for Transportation and Utility Corridors



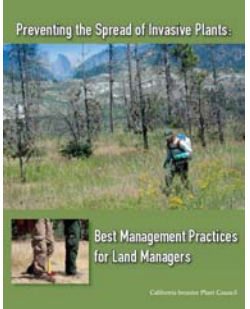
### Prevention BMPs

**Manual Chapters: Pathways of Invasion**

1. Planning & Inventory
2. Project Materials
3. Travel
4. Tool, Equipment & Vehicle Cleaning
5. Clothing, Gear & Boots Cleaning
6. Waste Disposal

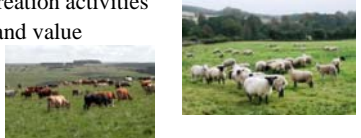
### Land Manager Prevention BMPs

Available at:  
[www.cal-ipc.org](http://www.cal-ipc.org)

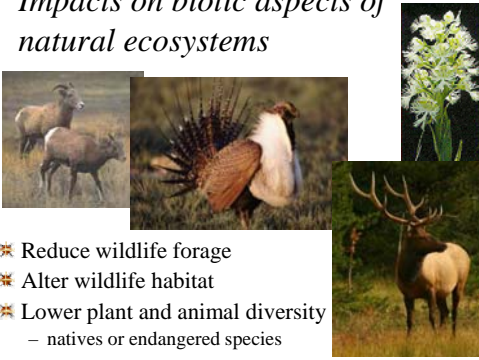


### *Impacts on human activities*

- ⊙ Lower livestock forage quality and quantity
- ⊙ Physically interfere with grazing
- ⊙ Compromise livestock, horse or human health
- ⊙ Increase cost of managing and producing livestock
  - slow animal weight gain
  - reducing the quality of meat, milk, wool, and hides
- ⊙ Impede recreation activities
- ⊙ Reducing land value



### Impacts on biotic aspects of natural ecosystems



- ✦ Reduce wildlife forage
- ✦ Alter wildlife habitat
- ✦ Lower plant and animal diversity
  - natives or endangered species

### Control options in rangelands

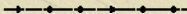
- ✦ Mechanical
  - Hand pulling, hoeing, weed whips
  - Tillage
  - Mowing
- ✦ Cultural
  - Grazing
  - Prescribed burning
  - Flaming
- ✦ Biological
  - Pathogens
  - Insects
- ✦ Chemical
- ✦ Integrated approaches
  - Combination of techniques
  - Revegetation + other technique

### Consideration of primary long-term land-use objective

- ✦ Forage production for livestock
- ✦ Timber production
- ✦ Preservation of native or endangered plant species
- ✦ Wildlife habitat development
- ✦ Water management
- ✦ Recreational land maintenance

### Mechanical Control Strategies

- Tillage or cultivation
- Mowing



### Mowing


Will select for

- low growing annuals
- perennials
- species that have just started their life cycle at the mowing timing
- species that have just completed their life cycle at the mowing timing



### Tillage

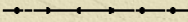
Will select for ruderal annual species




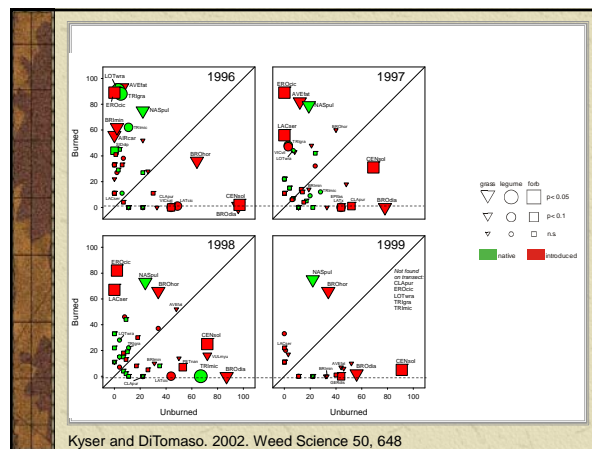
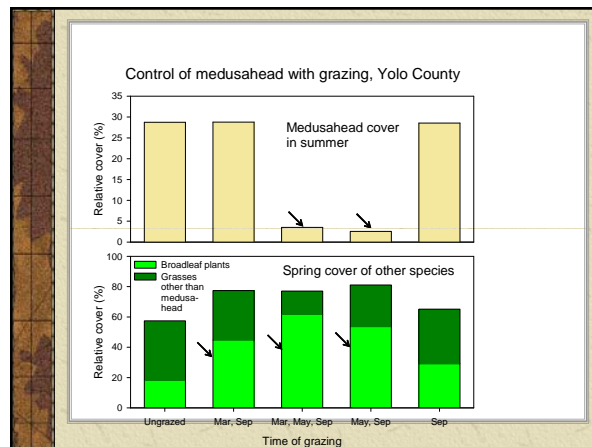
When tillage is conducted too early it can select for other annuals that germinate over a long period

## Cultural Control Strategies

- Grazing
- Prescribed burning



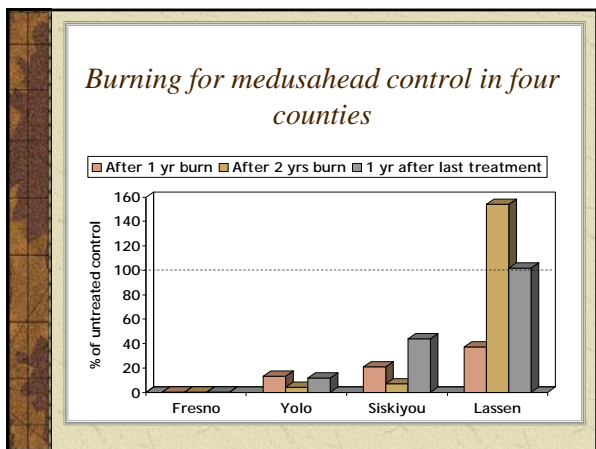
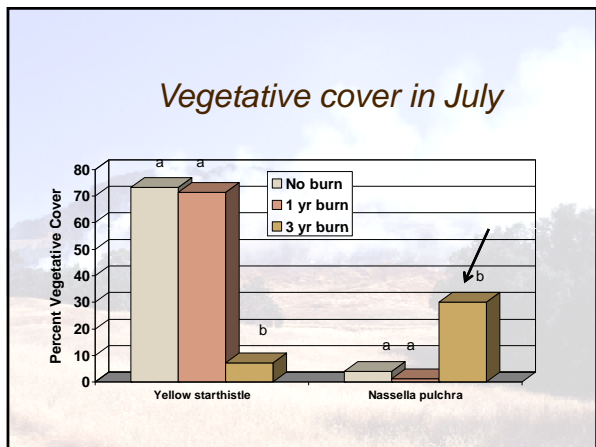
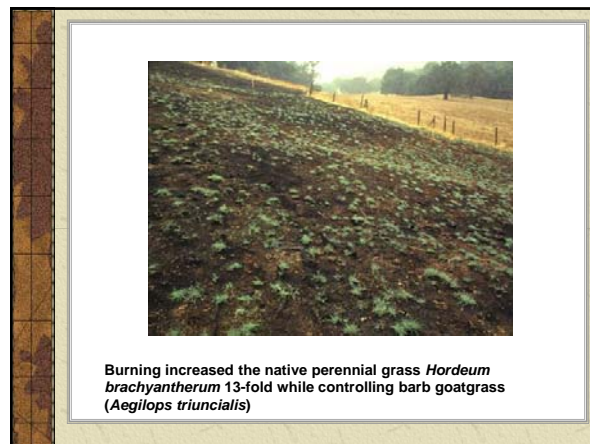
### Grazing

### Barb goatgrass control burn

Vegetation type	% Vegetative cover or index value					
	Unburned			burn		
	1997	1998	1999	1997	1998	1999
Pre-burn						
Grasses						
barb goatgrass	45	62	63	55	54	0
native perennials	0	0	1	1	9	10
total grasses	127	156	152	116	173	68

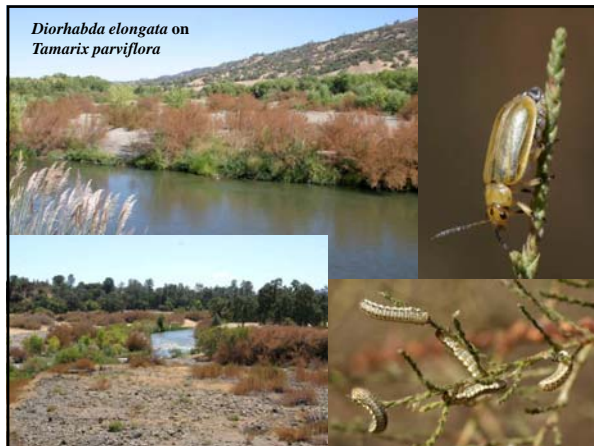
DiTomaso et al. 2001. Cal. Ag. 55, 47.



### Biological Control

- Pathogens
- Insects

→ → → → →



### Herbicide Application Methods

- ✦ Broadcast
- ✦ Directed
  - Backpack sprayer or wick applicator
  - Woody plant control
    - Cut stump
    - Stem injection (hack-n-squirt)
    - Basal bark

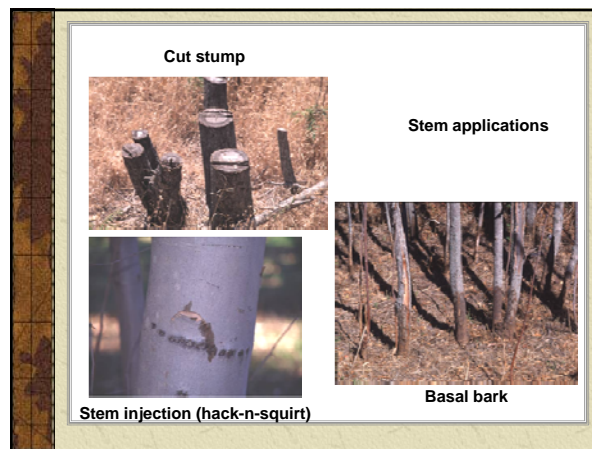
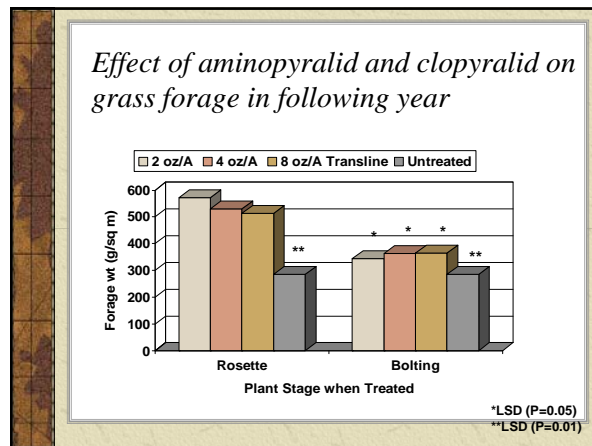
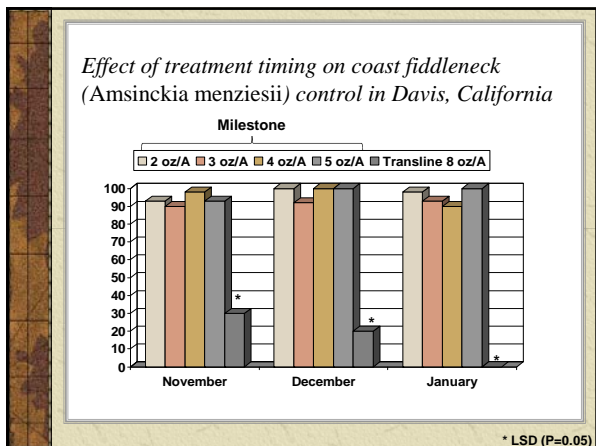
### Chemical

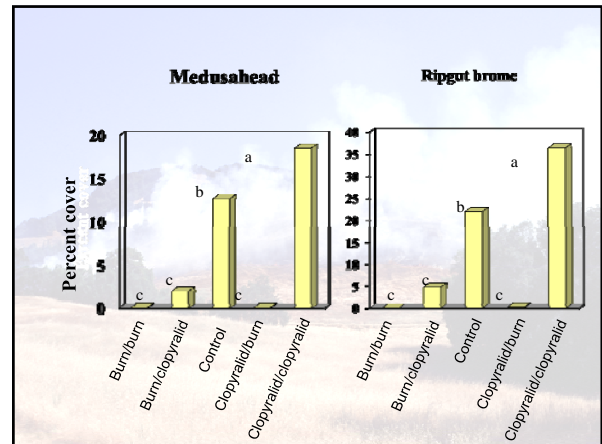
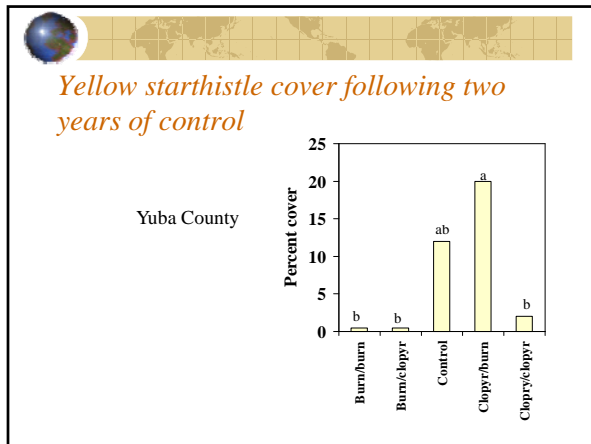
**Broadcast applications**

To achieve selectivity:  
 -use selective herbicide  
 -apply at specific timing

Transline (clopyralid) treated rangeland on right

Aminopyralid 3 oz/A      Untreated





*Thank you! Questions?*