Weed Management in Pastures

Sarah Kenyon
University of Missouri Extension
Agronomy Specialist
417-967-4545
KenyonS@missouri.edu
Identify Pest

- **Resources**
  - Extension Office
  - Weed ID App
  - Internet
    - USDA Plants Database
      - [http://plants.usda.gov](http://plants.usda.gov)
    - University Weed Websites
      - Missouri
        - [http://weedid.missouri.edu/](http://weedid.missouri.edu/)
      - Arkansas
        - [http://www.aragriculture.org/forage_pasture/plant_id/weeds/](http://www.aragriculture.org/forage_pasture/plant_id/weeds/)
      - Virginia Tech
        - [http://www.ppws.vt.edu/weedindex.htm](http://www.ppws.vt.edu/weedindex.htm)
  - Literature
    - Dichotomous Keys
    - Regional Books
• Three types of weeds to control in pastures
  1. Take up space and resources but livestock will eat
  2. Livestock will not graze due to grazing deterrents
  3. Plants that are poisonous to livestock
Density of Weed Seedlings Over 3 Years of Intensive Grazing

Mechanical Control
## Herbicide Application Timing

<table>
<thead>
<tr>
<th>Life Cycle</th>
<th>Application Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer Annual</td>
<td>• Young and Actively Growing</td>
</tr>
<tr>
<td></td>
<td>• April to July</td>
</tr>
<tr>
<td>Winter Annual</td>
<td>• Young and Actively Growing</td>
</tr>
<tr>
<td></td>
<td>• November to March</td>
</tr>
<tr>
<td>Biennial</td>
<td>• Rosette Stage</td>
</tr>
<tr>
<td></td>
<td>• November to March</td>
</tr>
<tr>
<td>Perennial</td>
<td>• Growth stage dependent</td>
</tr>
<tr>
<td></td>
<td>• Young and Actively Growing</td>
</tr>
</tbody>
</table>
Chemical Control

- Removal of legumes
  - White Clover
  - Red Clover
  - Alfalfa
  - Birdsfoot Trefoil

- Some herbicides have longer legume replant intervals which needs to be considered before you spray for weeds.
Herbicide Application Methods

• Surfactants – allow better herbicide coverage by reducing surface tension of the water

Without a surfactant  
With a surfactant
• Many herbicides have grazing, haying, and replanting restriction

• ALWAYS READ THE LABEL!
Weed Control

Broomsedge Bluestem
Thistles
Brambles
Red Sorrel
Maypop Passionflower
Horsenettle / Bullnettle
Spotted Knapweed
Sericea Lespedeza
Black Locust
Broomsgedge Bluestem
(*Andropogon virginicus* L.)

- Grazed in early spring becomes unpalatable with maturity
- Used for wildlife feed and erosion control
- Indicator of poor fertility
Cultural Control

Low Bray-1 P

30 lb P/acre Bray-1 P

Source: Dr. Dale Blevins and Dr. Kevin Bradley, MU
Cultural Control

• Fertilizer and/or lime application
• Allows pasture to ‘Out Compete’ many annuals
• Allows pasture to shade out many low growing annuals
• Prevents germination of weeds that favor low or high pH
Thistles

• Biennial
• Rosette
  – 90% of life span
• Spines deter grazing
  – Reduced pasture yield by 23% if left uncontrolled
Thistle Chemical Control

- Best results during the rosette stage (fall or early spring)
  - Weedmaster/ Rangestar (a.i. 2,4-D + Dicamba)
  - Grazon P+D (Picloram + 2,4-D)
  - Milestone (Aminopyralid)
  - GrazonNext (Aminopyralid + 2,4-D)
  - PastureGard (Triclopyr + Fluoxypyr)
  - Surmount (Picloram + Fluoxypyr)
  - Tordon 22K (Picloram)
Musk Thistle Biological Control

• Flower head weevil *(Rhinocyllus conicus Forelich)*
  – Introduced from Europe in 1975

• Rosette weevil *(Trichosirocalus horridus Panzar)*
  – Introduced from Italy in 1979
Introduction of flower head weevil
Biological Control of Musk Thistle

- Scout for weevil eggs on outside of flower bracts
- 3 weevils per bloom will eat 100% of the seed
- Black, drooping flowers also indicates weevil feeding
An Integrated Approach

- Spray in the fall or early spring
- Mow in late summer
- Let weevils do the rest!
Bull Thistle... an increasing problem

- 2 Different growth forms
  - 2nd year growth forms vertical ridges along the stem, called wings
- Same mechanical control strategy
- Same chemical control strategy
- Does not have biological control
Thistle Chemical Control

- Best results during the rosette stage (fall or early spring)
  - Weedmaster/ Rangestar (a.i. 2,4-D + Dicamba)
  - Grazon P+D (Picloram + 2,4-D)
  - Milestone (Aminopyralid)
  - GrazonNext (Aminopyralid + 2,4-D)
  - PastureGard (Triclopyr + Fluoxypyr)
  - Surmount (Picloram + Fluoxypyr)
  - Tordon 22K (Picloram)
Thistle Chemical Control

Too late to spray

Treat at this stage
Blackberries
(*Rubus spp.*)

- Fertility
- Mowing
- Spray in Fall before the leaves fall off (October)
  - Metsulfuron, Surmount, Cimarron Max, Remedy, or Grazon P+D mixed with Remedy
### Influence of Herbicides & Application Timings on Dewberry Control 1 Year After Treatment

(Salem, MO 2009)

<table>
<thead>
<tr>
<th>Application Timing</th>
<th>Dewberry Control Across All Herbicide Treatments</th>
<th>---</th>
<th># Stems/Plot 1 YAT ---</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Bloom</td>
<td></td>
<td>76</td>
<td></td>
</tr>
<tr>
<td>Fall</td>
<td></td>
<td>27</td>
<td></td>
</tr>
</tbody>
</table>
Influence of Herbicides & Application Timings on Dewberry Control 1 Year After Treatment (Salem, MO 2009)

- Untreated: 96 Stems/Plot
- 0.4 ozs Cimarron/Acre Full Bloom Application Timing: 89 Stems/Plot
- 0.4 ozs Cimarron/Acre Fall Application Timing: 16 Stems/Plot

Source: Dr. Kevin Bradley, MU
Rubus spp.

- Do not mow during the year of herbicide application
- Plan on a follow up treatment the next year to control escape canes
• Red sorrel does not tolerate shade and is not very competitive
• Fertilizer, liming, and improved drainage allow other species to be more competitive and to crowd out red sorrel
Red Sorrel

• Spray in fall or early spring
  – Weedmaster/ Rangestar (a.i. 2,4-D + Dicamba)
  – Grazon P+D (Picloram + 2,4-D)
  – Milestone (Aminopyralid)
  – GrazonNext (Aminopyralid + 2,4-D)
Maypop Passionflower

• Fast growing perennial vine
• Sometimes sold as an ornamental
• Very little information is available on control
  – High rates of 2,4-D
  – Remedy
  – Grazon P+D
  – Grazon Next
  – Surmount
  – Dicamba
Horsenettle/Bullnettle
(Solanum carolinense L.)

- Perennial
- Resistant to grazing spines present
- Fertility
- Frequent mowing
- Herbicides
Horsenettle

- Grazon P+D, GrazonNext, Forefront, Milestone, Surmount, or Tordon 22K
- Apply at mid-bloom through fruiting
- Control will take multiple years due to prolific seed production.
- Spray for 3 consecutive years to achieve 90 – 100% control.
Sericea Lespedeza
(*Lespedeza cuneata* L.)

- Annual legume native to Asia
- Prolific seed producer
- Allelopathic

- 2 pts PastureGard has been the most consistent treatment across all years of research, regardless of application timing.

Source: Dr. Kevin Bradley, MU
Honey Locust
(Gleditsia triacanthos L.)

- Legume
- Many thorns
- Multiple mowings
- Small sprouts use Grazon P+D total coverage of the leaves is needed
- 0.25% Remedy + 1% Grazon P+D
- Large trees
  - Basal Bark treatment with Pathfinder II
  - Cut Stump treatment with Tordon RTU
Spotted Knapweed

- Biennial
- Allelopathic (Catechin)
- Prolific Seed Production
- An 63% reduction in cattle grazing (Butcher, 1984)
Replacement of Grass by Spotted Knapweed Over Time

Chemical Control

- 1 pt/A Tordon 22K
- 5 oz/A Milestone
- Apply at late bud or rosette stage

Chemicals will provide control for 2 -3 years but spotted knapweed will reinvade the area unless other control techniques are adopted.

Montana State University & Colorado State University
Cultural Control

- Irrigation to allow the forage to outcompete the knapweed
  - Not tolerant of flooding or shade
- Grazing
  - Colorado State University found that cattle grazing diffuse knapweed twice during the spring decreased seed production by 50%
- Mowing *alone* is not recommended. The plant can produce seed below the mowing height.
- For small areas hand pull/dig plant making sure to remove as much root stock as possible
Biological Control

- Knapweed Root Weevil
- Knapweed Flower Weevil
- UV Knapweed Seed Head Gall Fly
Biological Control

- Spotted knapweed weevils can be purchased online
  - Knapweed Root Weevil
    - $140/100 insects
    - July to mid September
  - Knapweed Flower Weevil
    - $80/200 insects
    - June to late July
Spotted Knapweed Control (1 & 2- YAT) Rosette/Bolting Growth Stage Application

**Percent control**

- 4 fl ozs/A
- 5 fl ozs/A
- 7 fl ozs/A
- 1 pt/A

**Milestone**

- Tordon 22K

*1 YAT Evaluations average of 5 locations: Montana (3), Idaho (1), Washington (1); 2 YAT, Montana (1)

No significant difference

LSD (P=0.05)
Weed Control

Cultural Control
- Soil Fertility
- Reseeding
- Crop Rotation
- Timed Planting & Harvesting
- Purchasing Certified Seed

Mechanical Control
- Mowing or Grazing
- Prevents Seed Production
- Depletes Carbohydrate Reserves of Perennials

Biological Control
- Organism found in nature
- Usually specific to target plant
- Some Commercially Available

Chemical Control
Keys to Pesticide Use

- Identify pest
- Select the right product
- Time the application correctly
- Apply accurately
- Follow grazing and haying restrictions
- ALWAYS READ THE LABEL
Restricted-Use Pesticides

- Toxic to people, animals, or other plants
- Oncogenicity - tumors in laboratory animals
- Ground water concerns
- Grazon P+D
- Surmount
- Tordon

PPAT Training – Gainesville
March 16, 6:00pm

http://www.kellysolutions.com/MO/searchbyRUP.asp
THANK YOU!

Sarah Kenyon
Agronomy Specialist
417-967-4545
KenyonS@missouri.edu