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Why Control Pasture Weeds?

• 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

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

<table>
<thead>
<tr>
<th>Without a surfactant</th>
<th>With a surfactant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broomsedge Bluestem</td>
<td>Thistles</td>
</tr>
<tr>
<td>Brambles</td>
<td>Red Sorrel</td>
</tr>
<tr>
<td>Maypop Passionflower</td>
<td>Horsenettle / Bullnettle</td>
</tr>
<tr>
<td>Spotted Knapweed</td>
<td>Sericea Lespedeza</td>
</tr>
<tr>
<td>Black Locust</td>
<td></td>
</tr>
</tbody>
</table>

Restriction

- Many herbicides have grazing, haying, and replanting restriction
- ALWAYS READ THE LABEL!

Weed Control

Broomsedge 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

<table>
<thead>
<tr>
<th>Low Bray-1 P</th>
<th>30 lb P/acre Bray-1 P</th>
</tr>
</thead>
</table>

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 (Picolram + 2,4-D)
  - Milestone (Aminopyralid)
  - GrazonNext (Aminopyralid + 2,4-D)
  - PastureGard (Triclopyr + Fluoxypyr)
  - Surmount (Picolram + Fluoxypyr)
  - Tordon 22K (Picolram)

**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

**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 (Picolram + 2,4-D)
  - Milestone (Aminopyralid)
  - GrazonNext (Aminopyralid + 2,4-D)
  - PastureGard (Triclopyr + Fluoxypyr)
  - Surmount (Picolram + Fluoxypyr)
  - Tordon 22K (Picolram)

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 (Joliet, IL 2004)

<table>
<thead>
<tr>
<th>Application Timing</th>
<th>Dewberry Control Across All Herbicide Treatments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Bloom</td>
<td>76</td>
</tr>
<tr>
<td>Fall</td>
<td>27</td>
</tr>
</tbody>
</table>
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

- 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

- 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

- 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

MO Spotted Knapweed Infestation 2008

Spotted Knapweed Control (1 & 2- YAT) Rosette/Boiting Growth Stage Application
Forage and Livestock Conference - Gainesville, MO

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

Chemical Control
- Weed killer

Biological Control
- Organism found in nature
- Usually specific to target plant
- Some commercially available

Weed Control

Restrict-Use Pesticides
- Toxic to people, animals, or other plants
- Oncogenicity - tumors in laboratory animals
- Ground water concerns

- Grazon P+D
- Surmount
- Tordon

http://www.kellysolutions.com/MO/searchbyRUP.asp

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

PPAT Training – Gainesville
March 16, 6:00pm

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THANK YOU!