Pasture Weed & Brush Control

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Are weeds taking over your farm?

The same field showing the result of sporadic mowing and after switching to timely herbicide sprays

Taney Co. Missouri

When Do Weeds Need to be Controlled?
Keep Weeds from Going to Seed

<table>
<thead>
<tr>
<th>Weed</th>
<th>Approximate Seeds Produced Per Plant</th>
<th>Longevity of Weed Seeds in the Soil (Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Redroot Pigweed</td>
<td>117,000</td>
<td>10</td>
</tr>
<tr>
<td>Curly Dock</td>
<td>40,000</td>
<td>40</td>
</tr>
<tr>
<td>Common Ragweed</td>
<td>15,000</td>
<td>40</td>
</tr>
<tr>
<td>Foxtail</td>
<td>6,400</td>
<td>20</td>
</tr>
<tr>
<td>Mullein</td>
<td>223,200</td>
<td>40</td>
</tr>
<tr>
<td>Musk Thistle</td>
<td>10,000</td>
<td>7</td>
</tr>
<tr>
<td>Sericea Lespedeza</td>
<td>1,000 / stem</td>
<td>20+</td>
</tr>
<tr>
<td>Spotted Knapweed</td>
<td>1,000</td>
<td>8+</td>
</tr>
<tr>
<td>Johnsongrass</td>
<td>80,000</td>
<td>10</td>
</tr>
</tbody>
</table>

Nebraska Study: The number of seeds in the soil can range from 2 to 140 seeds per pound of surface soil.
**Overgrazing**

**Density of Weed Seedlings Over Three Years of Intensive Grazing**

- Grazed
- Ungrazed

<table>
<thead>
<tr>
<th>Year</th>
<th>Grazed</th>
<th>Ungrazed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>50</td>
<td>30</td>
</tr>
<tr>
<td>2nd</td>
<td>40</td>
<td>20</td>
</tr>
<tr>
<td>3rd</td>
<td>30</td>
<td>10</td>
</tr>
</tbody>
</table>


**Nutrient Removal Rates**
(lbs removed per crop per acre)

<table>
<thead>
<tr>
<th>Hay Type</th>
<th>N</th>
<th>P₂O₅</th>
<th>K₂O</th>
</tr>
</thead>
<tbody>
<tr>
<td>N. Warm Season Hay (3.5 Ton)</td>
<td>60</td>
<td>7</td>
<td>53</td>
</tr>
<tr>
<td>Fescue Hay (2.5 Ton)</td>
<td>100</td>
<td>30</td>
<td>117</td>
</tr>
<tr>
<td>Fescue/Clover Hay (2.5 Ton)</td>
<td>100</td>
<td>32</td>
<td>142</td>
</tr>
<tr>
<td>Bermuda Hay (4 Ton)</td>
<td>200</td>
<td>44</td>
<td>160</td>
</tr>
<tr>
<td>Alfalfa/Grass Hay (4 Ton)</td>
<td>208</td>
<td>44</td>
<td>212</td>
</tr>
</tbody>
</table>

Hay can remove 80% of nutrients added to the field.

**Chemical Weed Control Disclaimer**

- Non-chemical weed control trumps chemical weed control in the long-term...managed grazing systems; weedy hay management, fertility, goat browse, etc.
- Remember....Some weeds are nutritious
- Weeds can make a difference in endophyte management
- Chemical weed control can be a useful tool to reign in a weed population out of control

**Using Goats for Brush Control**

- Dietary differences occur between breeds, time of year and plant species.
  - Preferred – Blackberry, Elm, Greenbriar, Multiflora Rose, Locust, Walnut, Hickory, Oak, Persimmon, Sassafras, Cedar
  - Moderately Preferred – Grasses, Sumac
  - Poorly Utilized – Clover, Blackjack and Post Oak, Buckbrush
- May take 2-3 years to control brush
- 8-10 goats / acre without cattle
- 2-4 goats / acre with cattle (compliments cattle grazing)
- Guard against predators – Dogs, Donkeys, Llamas
Do Herbicides Pay?

- Oklahoma rangeland studies have found no correlation of herbicide use to increased gain/acre or average daily gain on stocker cattle
- Common economic thresholds for pastures
  - It depends... Data is limited due to variables in a pasture
  - 1 lb of weeds = 1 lb of forage lost – Varies with the weed in question and forage species
  - Commonly quoted - 25% domination for most weeds
  - But... just a few thistles can justify control
- Management-Intensive Grazing Systems can not tolerate as much weed pressure as continuous systems

Do Herbicides Pay?

- Having a pest present, doesn’t mean spraying is necessary
- Spot treatment is most economical but comes at the cost of labor and potentially lower overall control
- What is the goal?
  - Attractive pasture
  - Reigning in a problem that has potential to get out of control
  - Increased carrying capacity
  - Remove toxic weeds that could harm cattle
  - Keep weeds from going to seed

Check label recommendations regarding wipers. Note that most pasture sprays do not mention wiper use.

Alternative Weed and Brush Control Techniques

- Cut Stumps / Spaced Cuts
- Basal Bark Spray
- Soil Treatment
“I would have sprayed but it would have killed my clover!”

Future product development may fix this

Essentials for Effective Chemical Control

Active Growth
Proper Stage Of Growth
Calibrated Equipment
Right Chemical For The Right Plant

Common Pasture Herbicides
Single-Ingredient Products
Remedy Ultra / Relegate / Clear Pasture (triclopyr)
Tordon 22K / Trooper22K / Picloram22K / Outpost (picloram)
Cimarron / Purestand (metsulfuron)
2,4-D / Shredder / HiDep / etc. (2,4-D)
Banvel / Clarity (dicamba)
Milestone (aminopyralid)
Pastora (nicosulfuron)
Stinger (clopyralid)
Outrider (sulfosulfuron)
Facet
Permit
Prowl H2O

Common Pasture Herbicides
Multi-Ingredient Products
Crossbow / Everett / Candor (2,4-D+Remedy)
GrazonNext HL (Milestone+2,4-D)
Grazon P+D / Trooper P+D / Picloram+D / Graslan (Tordon+2,4-D)
Chaparral (Milestone+Cimarron)
Surmount (Tordon+Starane)
PastureGard HL (Remedy+Starane)
Cimarron Max (Cimarron+Banvel+2,4-D)
Brash / Rangestar / Weedmaster (2,4-D+Banvel)

$15 – Any MU Extension Center Weed ID and Herbicide Ratings
Pre-emergence Control in Pastures

- **Prowl H₂O (BASF)**
  - Pendimethalin
  - Refer to supplemental labels (expires 4/30/19) regarding established cool and warm season grass hay and pasture
  - Apply before weed germination
  - Controls germination of foxtails, cheat, barnyardgrass, chickweed, henbit, etc

- Residual of post-emergence products

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Follow Label Restrictions

Interval Before Grazing Cattle (Days)*

<table>
<thead>
<tr>
<th>Pesticide</th>
<th>Beef</th>
<th>L. Dairy</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,4-D</td>
<td>0</td>
<td>7-14*</td>
</tr>
<tr>
<td>Grazon P + D / Graslan</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Tordon 22K</td>
<td>0</td>
<td>14</td>
</tr>
<tr>
<td>Banvel / Clarity</td>
<td>0</td>
<td>7-40*</td>
</tr>
<tr>
<td>Remedy Ultra</td>
<td>0-14*</td>
<td>0</td>
</tr>
<tr>
<td>GrazonNext HL</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Chaparral</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Roundup spot treatment</td>
<td>0-14*</td>
<td></td>
</tr>
<tr>
<td>Crossbow</td>
<td>0-14*</td>
<td>Next Season</td>
</tr>
</tbody>
</table>

* The label has the final say.

---

Caution

Herbicides Used Before or After Establishment

- **Before Establishment** – Beware of pasture herbicide residual
  - **Burndown herbicide options** – Glyphosate, Gramoxone, 2,4-D
  - Residual of Grazon P+D, GrazonNext, 2,4-D can kill new stands of grass and legumes

- **After Establishment** – Grasses should be well tillered and established before using several pasture herbicides

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GrazonNext Restrictions

- Hay from areas treated with GrazonNext HL in the preceding 18 months cannot be distributed or made available for sale off the farm or ranch where harvested...
- Hay from areas treated with GrazonNext HL in the preceding 18 months cannot be used for silage, haylage, baleage and green chop...
- Do not use hay or straw from areas treated with GrazonNext HL within the preceding 18 months or manure from animals feeding on hay treated with GrazonNext HL in compost.
- Do not use grasses treated with GrazonNext HL in the preceding 18 months for seed production.

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Herbicide Impregnated onto Fertilizer

- Available for GrazonNext HL and Chaparral
- Convenient way to apply a herbicide and in “difficult-to-spray” areas
- Mostly kills using residual action instead of foliar
- Typically a slow kill
- Hearing positive results
Spray Most Biennial Weeds in the Rosette Stage

- Spotted Knapweed
- Poison Hemlock
- Thistles

Late Fall and Early Spring Spraying

- Best control of biennial weeds such as thistles, poison hemlock and spotted knapweed is achieved in the rosette stage.
- Spraying can be done late winter or early spring.
- Make sure spraying occurs on sunny days when the high temperature is a minimum of 55 degrees F and there is limited nighttime hard freezing.

Common Thistles in SW MO

- Bull
- Musk
- Tall

Thistle

Fall (Rosette Stage) & Spring (Rosette/Prebud Stage) – 2,4-D ester (LV4); Brash/Rangestar, dicamba, Milestone, GrazonNext, Grazon P+D, Tordon 22K, Cimarron Max, Chaparral
Leaves highly divided (fern-like appearance)
- Stems smooth, hollow and purple-spotted
- Flowers white and umbrella-like
- All parts toxic (coniine)
- Biennial

Case Study: Flowering Poison Hemlock
Go to seed, spray or mow?

Spotted Knapweed
- perennial from a deep taproot
- initially develops as a rosette
- soil disturbance favors higher plant densities
- plants are allelopathic (catechin)
- produces an average of 1000 seed per plant
- > 50% of seed remained viable after burial in the soil for 5 years (Davis et al. 1993)
**Spotted Knapweed**
- Tordon 22K
- GrazonNext
- Milestone
- Chaparral
- Grazon P+D

**Foxtail**
- Giant, green and yellow foxtail
- **Facet L** (quinclorac) is now labeled for post-emergence application
- **Prowl H2O** (pendimethalin) labeled for pre-emergence application

**Broomsedge**
- Phosphorus
- Glyphosate through a wiper?
- Complete renovation

**Johnsongrass**
- Perennial that grows 6-8 ft tall
- Warm season grass
- Prolific rhizome producer
- Introduced as a forage from Turkey into S. Carolina about 1830
  - William Johnson – Farmer propagated it in Alabama about 1840

**Grass Invaders**
- Foxtails
- Broomsedge ("sagegrass")
- Purpletop ("greasegrass")
- Lindheimer’s Panic Grass
- Soft Brome Grass

<table>
<thead>
<tr>
<th>Forage</th>
<th>Yield Range Ton/Acre</th>
<th>Crude Protein %</th>
<th>TDN %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Johnsongrass</td>
<td>2-5</td>
<td>10-14</td>
<td>55-60</td>
</tr>
<tr>
<td>Pearl Millet</td>
<td>2-6</td>
<td>8-12</td>
<td>50-58</td>
</tr>
<tr>
<td>Tall Fescue</td>
<td>2-5</td>
<td>10-15</td>
<td>55-60</td>
</tr>
<tr>
<td>Hybrid Bermuda</td>
<td>5-8</td>
<td>10-14</td>
<td>55-60</td>
</tr>
</tbody>
</table>

Source: Ball et al., 2007 Southern Forages, 4th Edition
- Quality
- Tonnage
- Persistence
- Drought Tolerance

**The Good**
Palatability of Johnsongrass

Noble Foundation

- Palatability Study (1999-2001)
  - Averaged 11.6% Crude Protein; 58% TDN
  - Among 16 grasses studied, Johnsongrass ranked 1st for CP and 2nd for TDN, slightly lower than bermudagrass

- Grazing Preference During AM Grazing (2007)
  - Yearling steers had access to 14 species
  - 1st Place - 9,200 bites from Alamo Switchgrass

The Bad

Johnsongrass

- Reproduces from seed and rhizomes
- Rhizomes have been found 5 ft deep
- Rhizomes can develop within 19 days of seedling emergence
- 275 ft of rhizomes from one plant
- 80,000 seeds from one plant that can remain viable for 10 years.
- Robs desirable species of light, nutrients and water

Control Options in Forages

- Heavy Grazing / Low Mowing
  - Reduced seed production
  - Depletes carbohydrates in rootstocks; The growing point sits 4-8” above ground; Rhizome development reduced if plant height is kept below 12-15”
- Weed Wiper, Spot Treatment or Full Renovation using Glyphosate
  - Effective but will not eliminate it with one pass.
- Herbicide (expect stunting)
  - Outrider (sulfosulfuron)-Bermudagrass, Native Grass, Fescue
  - Pastora (nicosulfuron)-Bermudagrass
  - Plateau / Panoramic (imazapic)-Bermudagrass, Native Grass

The Ugly

- Prussic Acid
- Nitrate Toxicity
- Sorghum Cystitis

Outrider

- Sulfosulfuron (Valent)
- Controls johnsongrass, cheat and nutesedge in fescue and bermudagrass pastures
- Will yellow and stunt cool season grasses
- Follow the label closely

Sedges

- Permit
  - Halosulfuron-methyl
  - Now labeled for pastures from Gowan
  - Yukon – Permit + dicamba
- Outrider

Robs desirable species of light, nutrients and water
**Maypop Passionflower**

- Surmount (4-6 pt)
- Cimarron
- Grazon P+D – Remedy
- 2,4-D – dicamba

**Influence of Selected Herbicide Treatments on Maypop Passionflower Control in Mixed Grass-Legume Forages**

<table>
<thead>
<tr>
<th>Treatments</th>
<th>0%</th>
<th>20%</th>
<th>40%</th>
<th>60%</th>
<th>80%</th>
<th>100%</th>
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</thead>
<tbody>
<tr>
<td>La Tuna</td>
<td>95</td>
<td>75</td>
<td>50</td>
<td>25</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>La Tuna</td>
<td>95</td>
<td>75</td>
<td>50</td>
<td>25</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>La Tuna</td>
<td>95</td>
<td>75</td>
<td>50</td>
<td>25</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>La Tuna</td>
<td>95</td>
<td>75</td>
<td>50</td>
<td>25</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>La Tuna</td>
<td>95</td>
<td>75</td>
<td>50</td>
<td>25</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

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**Buckhorn Plantain**

*Plantago lanceotata*

- Cool-Season Perennial
- Reproduces by seed and roots
- Can dominate pastures during drought periods (taproot)

**Buckhorn Plantain**

- 2,4-D (High Rates)
- Chaparral
- Grazon P+D (High Rates)
- GrazonNext HL

Fall may be the best time for control

**Blackberry**

- Do not mow the season of treatment; mowing stems the year before treatment is OK
- Early fall seems to be the better application timing; ~ 2-3 weeks before 1st frost
- Metsulfuron alone (0.5 oz/A) seems to provide best control; similar but slightly lower control achieved with Pasturegard or with mixes of Remedy (2,4-D + Remedy)
- Spot-spraying is likely to provide better results and is also more economical

Photo Sources: University of Missouri; University of Arkansas Extension
Influence of Herbicide Treatments and Application Timings on Himalayan Blackberry Control (Salem, MO 2011-12)

<table>
<thead>
<tr>
<th>Treatments</th>
<th>% Control</th>
<th>Bloom Stage Application (May 26)</th>
<th>Full Application (Sept 26)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.8 oz, 1 pt/L.D</td>
<td>Y</td>
<td>ab</td>
<td>ab</td>
</tr>
<tr>
<td>2.0 oz, 1 pt/L.D</td>
<td>Y</td>
<td>ab</td>
<td>ab</td>
</tr>
<tr>
<td>2.5 oz, 1 pt/L.D</td>
<td>Y</td>
<td>ab</td>
<td>ab</td>
</tr>
<tr>
<td>4.0 oz, 1 pt/L.D</td>
<td>ab</td>
<td>ab</td>
<td>ab</td>
</tr>
<tr>
<td>1 lb/gal, 1 pt/L.D</td>
<td>ab</td>
<td>ab</td>
<td>ab</td>
</tr>
<tr>
<td>2 lb/gal, 1 pt/L.D</td>
<td>ab</td>
<td>ab</td>
<td>ab</td>
</tr>
<tr>
<td>2 lb/gal, 1 pt/L.D</td>
<td>ab</td>
<td>ab</td>
<td>ab</td>
</tr>
<tr>
<td>3 lb/gal, 1 pt/L.D</td>
<td>ab</td>
<td>ab</td>
<td>ab</td>
</tr>
</tbody>
</table>

*Means followed by the same letter are not different, LSD (0.05).

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Perilla Mint

- 2,4-D
- Grazon P+D
- GrazonNext HL
- Brash/Rangestar
- Chaparral
- Metsulfuron

Sericea Lespedeza

- Deep-rooted perennial
- Introduced to US in 1890s for wildlife food source and erosion control; MO in 1930s
- Tolerates very acidic soils
- First recognized as a high-quality forage because of its protein levels; found to contain tannins, which bind proteins
- Cattle will eat 2-3" growth
- Some seed can be viable for 20-30 years

Sericea Lespedeza

- Pasturegard HL
- Remedy Ultra
- Cimarron

Apply when sericea is 12" or taller
Or, from bud to flowering

Buckbrush (Coralberry)
Buckbrush (Coralberry)
- 2,4-D early
- GrazonNext HL
- Grazon P+D
- Chaparral
- Cimarron
- Glyphosate

Common Ragweed
- 2,4-D
- GrazonNext HL
- Grazon P+D
- Chaparral
- Brash/Rangestar
- Cimarron Max
- Crossbow
- Remedy Ultra

Spiny Pigweed
- Grazon P+D
- Chaparral
- GrazonNext HL
- 2,4-D early

Horsenettle (Perennial)
- Chaparral
- GrazonNext
- Grazon P+D
- Tordon 22K
- Milestone
- Cimarron Max

Multiflora Rose
- Grazon P+D
- Tordon 22K
- PastureGard
- Remedy Ultra
- Spike pellets (full bloom)

Pennsylvania Smartweeed Swamp Smartweeed
- Brash
- Grazon P+D
- GrazonNext HL
- Chaparral
- Tordon 22K
What are Your Weed Issues?

Locust
- GrazonNext HL
- Grazon + Remedy
- Surmount
- Tordon 22K
- Tordon RTU

Sumac
- 2,4-D early
- Remedy Ultra
- Crossbow

Thank You

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