*Tristate SARE Workshop* –Sustainable Livestock Production Practices
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# Managing Weeds in Pasture

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THE UNIVERSITY OF VERMONT EXTENSION

## Managing Weeds in Pasture

- Know and understand your weeds
- Prevention Management
- Control Strategies
- Wrap up

## Managing Weeds in Pasture

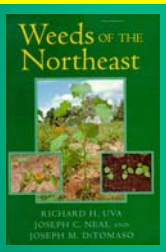

## Know Your Weeds

**What do you need to know about your weeds when it comes to management:**

- **Life cycle** (annual, biennial, perennial)
- **Propagation** (seed, rhizomes, stolons)
- **Competitiveness/spread capacity**
- **Tolerance to mowing**
- **Forage Nutritional Value**
- **Palatability**
- **Toxicity**

## Know Your Weeds

**Weeds of the Northeast**

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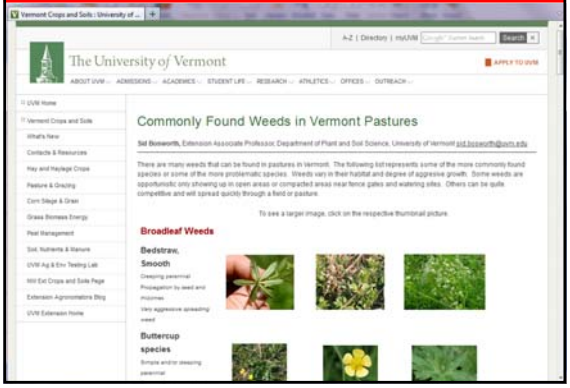


# Pasture Weed Manageemnt

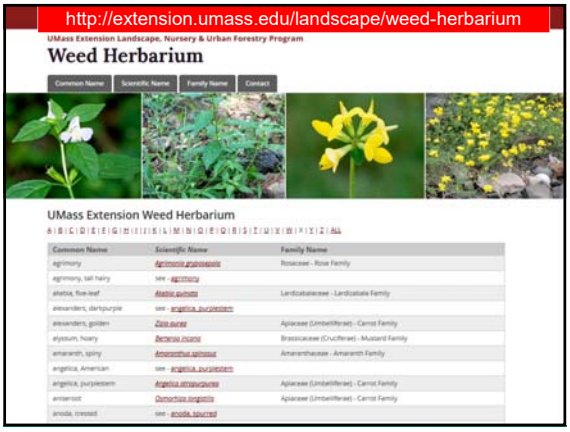




Table 1. The most problem weeds in Vermont based on a 2010 survey of 49 farms.

| Weed Species | Weeds Ranked As A Farm's Top Five Weeds | | | | | Overall Ranking | Weighted Ranking |
|---|---|---|---|---|---|---|---|
| | 1st | 2nd | 3rd | 4th | 5th | | |
| | Number of Responses | | | | | | % |
| Bedstraw, smooth | 16 | 5 | 6 | 2 | 2 | 1 | 19.2% |
| Milkweed, common | 5 | 7 | 9 | 4 | 5 | 2 | 14.4% |
| Canada thistle | 3 | 8 | 2 | 3 | 2 | 3 | 9.4% |
| Goldenrod | 3 | 3 | 4 | 7 | 1 | 4 | 8.4% |
| Bull thistle | 5 | 0 | 7 | 1 | 0 | 5 | 7.4% |
| Burdock | 3 | 3 | 2 | 2 | 3 | 6 | 6.2% |
| Buttercup | 1 | 6 | 1 | 3 | 2 | 7 | 6.2% |
| Horsenettle | 3 | 3 | 1 | 1 | 1 | 8 | 5.1% |
| Curly dock | 1 | 4 | 0 | 2 | 0 | 9 | 3.9% |
| Wild carrot | 2 | 1 | 2 | 1 | 0 | 10 | 3.4% |
| Knappweed, spotted | 3 | 1 | 1 | 0 | 0 | 11 | 3.4% |
| Plantains | 1 | 1 | 1 | 1 | 2 | 12 | 2.5% |
| Wild chervil | 1 | 1 | 1 | 0 | 2 | 13 | 2.2% |
| Dandelion | 1 | 1 | 0 | 0 | 1 | 14 | 1.5% |
| Pokeweed | 0 | 1 | 0 | 1 | 2 | 15 | 1.2% |
| Cinqefoil species | 0 | 0 | 1 | 2 | 1 | 16 | 1.2% |
| Spurge, leafy | 1 | 0 | 0 | 1 | 0 | 17 | 1.1% |
| Wild parsnip | 0 | 0 | 1 | 1 | 0 | 18 | 0.8% |
| Nightshade, eastern black | 0 | 0 | 0 | 1 | 3 | 19 | 0.8% |
| Dogbane, hemp | 0 | 1 | 0 | 0 | 0 | 20 | 0.6% |
| Chicory | 0 | 0 | 1 | 0 | 0 | 21 | 0.5% |
| White campion | 0 | 0 | 0 | 1 | 0 | 22 | 0.3% |
| Yellow rattle | 0 | 0 | 0 | 1 | 0 | 23 | 0.3% |



**Forage quality of several weeds/forages**
**(ranges = vegetative to flowering)**

| Plant | % Crude protein | % IVDMD* |
|---|---|---|
| Curly dock | 30 - 16 | 73 - 51 |
| Redroot pigweed | 24 - 11 | 73 - 64 |
| VA Pepperweed | 32 – 17 | 86 - 63 |
| Yellow foxtail | 17 - 14 | 73 - 57 |
| Large crabgrass | 14 - 6 | 79 - 63 |
| White clover | 27 - 23 | 81 - 83 |
| Tall fescue | 22 - 12 | 78 - 67 |

*In vitro dry matter digestibility

Adapted from Bosworth et. al, 1980, 1985 (Auburn University)



## Info on Poisonous Plants

- Numerous books, fact sheets, and websites on toxic plants
  - Trust university or science-based publications
- *Consult with veterinary scientist if you have concerns*

Penn Veterinary Medicine Computer Aided Learning

http://research.vet.upenn.edu/poisonousplants/Home/tabid/5034/Default.aspx


www.extension.purdue.edu/extmedia/WS/WS_37_ToxicPlants08.pdf

## Managing Weeds in Pasture

**Methods of Weed Management**

- Prevention verses Control
- Cultural Weed Management
- Mechanical Control/Management
- Biological Control/Management
- Chemical Opportunities

## Weed Prevention Practices

Be on the look out for newly introduced weeds at the field, farm or regional level.

This Canada thistle was introduced to this field via a purchased round bale

## Weed Prevention Practices

By the next year…

## Weed Prevention Practices

Develop a "Hit List" of those weeds you do not want and diligently look for them.

Eradication is possible for small patches

## Weed Prevention Practices

Develop an isolation protocol for newly introduced animals

May want to isolate animals for five to six days

## Weed Prevention Practices

**Cultural Management of Weeds**

- Preventative approach
  - Grazing management
  - Soil pH and fertility
  - Species/variety selection and overseeding

## Cultural Weed Management

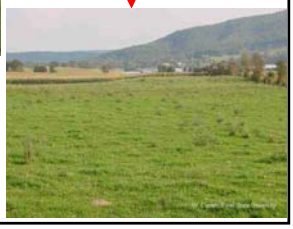
The best weed control in pasture is from competition by a strong stand of forage

## Cultural Weed Management

Graze to the Optimum Residual Height

## Pasture Crop Competition

Well managed
Verses
Poorly managed



Overgrazed pasture became infested with biennial thistles which were rejected the cattle

Source: Bill Curran, Penn State

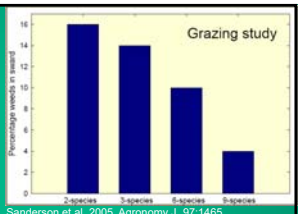
## Cultural Weed Management

**Soil pH and Fertility**

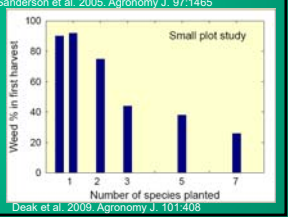
- The addition of lime and fertilizer may help prevent weeds by improving pasture growth, density and competitiveness.
- Adding fertilizer to poor, weedy pastures without first controlling the weeds can often "feed" the weeds.
- It pays to soil test

Weed Prevention

**Pasture Plant Species Diversity Can Help Reduce Weeds**




Sanderson et al. 2005. Agronomy J. 97:1465




Deak et al. 2009. Agronomy J. 101:408

## Animal Diversity And Weed Management

**Multi-Livestock Species Grazing**

As a general principle, using only one animal specie under the same continuous management can eventually result in undesirable plant species in the system.

**Plant Preference**

| | |
|---|---|
| Cattle | Grasses |
| Sheep | Forbs |
| Goats | Browse |

## Managing Weeds in Pasture

- Know and understand your weeds
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- Wrap up

## Controlling Existing Pasture Weeds

Cost/Benefit Analysis

- Costs can be high
  - Mechanical, chemical, extra fencing
  - Reduction in animal gain/sacrifice animals
- Benefits are hard to measure
  - Depends on weed density and forage use
  - Weed intake and nutritional value

Weed Control

## Mowing/Clipping Weeds

Control:

- Preventing seed production
- Stressing perennial and biennial plants

Image: http://pineplainstractor.com/index.php?main_page=popup_image&pID=70

## Mowing and Hand Removal

- Repeated mowing (2 to 4 times/year) reduces weed competition, helps deplete root/vegetative reserves, prevents seed production

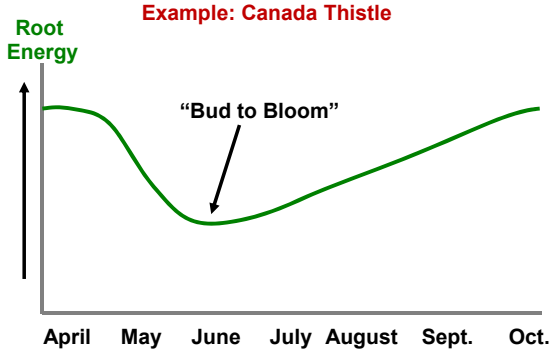
- Particularly important during establishment year – mow when weeds are 8 to 10 inches tall
- For new or scattered weeds, dig, pull, or remove seedheads to prevent spread

## Clipping or Mowing

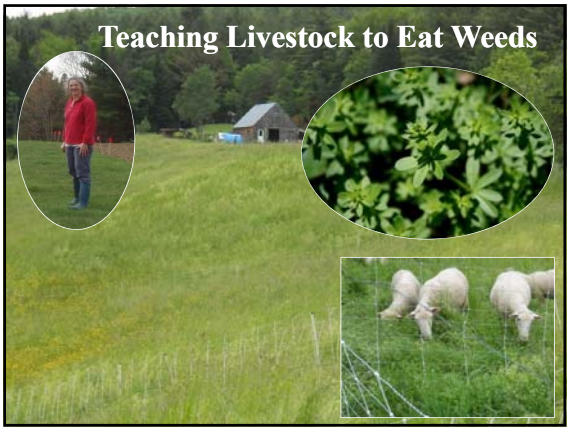
- May be sufficient for annual weed control
  - Mow after stem elongation
  - Mow before seed set to reduce seed production
- Helps deplete root carbohydrates of perennials
  - Frequent mowing necessary for complete control

## Perennial Broadleaf Root Reserves

Example: Canada Thistle





## Teaching Livestock to Eat Weeds


http://www.livestockforlandscapes.com/

## Teaching Livestock to Eat Weeds

## Teaching Livestock to Eat Weeds

**Concerns**

- Poisonous Plants
- Weed Spread

## Controlling Existing Pasture Weeds

Complete Renovation and Crop Rotation

For arable land, periodically rotating pastures with annual forage crops may be a viable economic option.

## Controlling Existing Pasture Weeds

Chemical Weed Control

**Herbicide Considerations**

- Efficacy
- Cost
- Grazing/haying restrictions
- Legume impact?
- Safety
- Environmental Impact

https://www.youtube.com/watch?v=RiOaJfznZa4 John Deere

**Effect of Herbicides on Selected Pasture Weeds**

| Weed | 2,4-D | Clarity (dicamba) | 2,4-D + Clarity | Cimarron Plus | Crossbow | ForeFront | Roundup (spot) |
|---|---|---|---|---|---|---|---|
| Milkweed | 6 | 8 | **8+** | N | 7+ | 6 | 7+ |
| Poison hemlock | 7 | 8 | **9** | N | **9** | 7 | **9** |
| Pokeweed | 7 | 7 | 7 | | **9** | 8 | 8 |
| E. Black nightshade | 7+ | **8+** | 8 | 8 | **8+** | **9** | **9** |
| Horsenettle | 7 | 8 | **8+** | 6 | **8+** | **9** | 8 |
| Jimsonweed | 8 | **9+** | **9+** | **9+** | **9** | 8 | **9** |
| Buttercup | **8+** | 8 | **9** | **9+** | **9** | **9** | **9** |
| Lambsquarters | **9** | **9+** | **9+** | **9+** | **9+** | **9** | **9** |
| Pigweed | **9** | **9** | **9+** | **9+** | **9** | 8 | **9** |
| Ragweed | **9** | **9** | **9+** | 7 | **9+** | **9** | **9+** |
| White snakeroot | 8 | **9** | **9** | N | **9** | 8 | 8 |
| Plantain species | **9** | 8 | **9+** | **9** | **9** | 7+ | **9** |
| Smooth bedstraw | 7 | N | 7 | N | **8+** | **9** | **9** |
| Canada thistle | 8 | 8 | **8+** | **8+** | 8 | **9+** | 8 |
| Multiflora rose | 6 | 6 | 7+ | **8+** | **8+** | 7+ | 8 |

*Weed control ratings: 10 = 95-100%, 9 = 85-95%, 8 = 75-85%, 7 = 65-75, 6 = 55-65%, N = no control

Source: Bill Curran, Penn State

## Follow Herbicide Grazing and Haying Restrictions

(taken from PSU Agronomy Guide)

**Table 2.6-9. Grazing and haying restrictions for grass forage and pasture herbicides.**

| Herbicide | Type of Animal | Interval Between Application and Grazing | Interval Between Application and Haying | Comments |
|---|---|---|---|---|
| 2,4-D amine | Lactating dairy | 7 days | 30 days | Remove meat animals from treated area 3 days before slaughter. 2,4-D labels vary. See specific label of product used. |
| 2,4-D LVE | Lactating dairy | 7 days | 30 days | Remove meat animals from treated area 3 days before slaughter. 2,4-D labels vary. See specific label of product used. |
| Cimarron Plus (metsulfuron + chlorsulfuron) | All | None | None | Be cautious of crop rotation restrictions. See label for details. |
| Clarity/Banvel (dicamba) | Lactating dairy | 7 days if < 1 pt<br>21 days if 1–2 pt<br>40 days if 2–4 pt | 37 days if < 1 pt<br>51 days if 1–2 pt<br>70 days if 2–4 pt | No waiting period between treatment and grazing for nonlactating animals. Remove meat animals from treated areas 30 days prior to slaughter. |
| Crossbow (2,4-D + triclopyr) | Lactating dairy<br>Other livestock | Do not graze until next season<br>None | 14 days<br>14 days | Remove meat animals from treated areas or dried hay 3 days prior to slaughter. |
| ForeFront (aminopyralid + 2,4-D) | All | None | 7 days | Do not transfer grazing animals for 3 days from treated areas to areas with Milestone sensitive-species. Do not spread manure to areas where sensitive-species are or will be grown. |
| Metsulfuron | All | None | None | Do not seed to other crops for 1 or more years. See label for restrictions. |
| Milestone (aminopyralid) | All | None | None | Do not transfer grazing animals for 3 days from treated areas to areas with Milestone-sensitive species. Do not spread manure to areas where sensitive-species are or will be grown. |
| Overdrive/Distinct (dicamba + diflufenzopyr) | All | None | None | Do not apply more than 8 oz/A per season. |
| Roundup/glyphosate | All | Spot—7 days<br>Renovate—56 days | Spot—7 days<br>Renovate—56 days | Use as spot treatment. Do not treat more than one-tenth of any acre. Leaves no soil residue. |

Source: Bill Curran, Penn State

## Common Herbicides for Grass Hay/Pastures

**Avg. herbicide cost/acre**

- 2,4-D <$5
- Banvel/Clarity (dicamba) <$10
- Cimarron Plus (metsulfuron + chlorsulfuron) $15
- Crossbow (triclopyr + 2,4-D) $20-30
- ForeFront HL (aminopyralid + 2,4-D) $15
- Roundup/glyphosate products $5-10
  - Spot treatments or renovation
- Facet (quinclorac) ≈$25(25 fl oz)

***The avg. cost does not represent the use of spray additives or application costs**
****Generic alternatives are available for some of these herbicides**

Source: Bill Curran, Penn State

## Selected Generic alternatives for grass hay/pasture

| Active ingredient(s) | Tradename | Manufacturer | Alternative to: |
|---|---|---|---|
| Clopyralid | Clopyr AG<br>Spur<br>Pyramid | UPI<br>Albaugh/Agri-Star<br>Albaugh/Agri-Star | Stinger |
| Metsulfuron-methyl | Accurate<br>Ciramet<br>Metsulfuron-methyl<br>Metsulfuron 60EG AG<br>Plotter | Cheminova<br>AgSurf<br>FarmSaver.com<br>Arysta LifeScience<br>Rotam North Amer. | Cimarron 60DF (DuPont no longer sells the single ai product for pastures) |
| Metsulfuron-methyl + chlorsulfuron | Chisum | Cheminova | Cimarron Plus |
| Triclopyr + 2,4-D | Candor<br>Crossroad | NuFarm<br>Albaugh/Agri-Star | Crossbow |

Source: Bill Curran, Penn State