

Weed Control in Pastures

Lesson 4

Introduction

Weed control in pastures can be a very difficult challenge. This is especially true in certain cases where animal species select against specific weed species (example: horses –tansy, cows – goldenrod, thistles and milkweed). This is a common occurrence in all livestock grazing systems.

Plant species are unique in livestock grazing systems as compared to row crops. It is important to remember there are several plant species that are considered weeds in a row crop operation, but possess characteristics that are beneficial in a grazing system. Some of these include quackgrass, lambsquarter, and others. These plants, if properly managed can take abuse, yet still produce high quality, palatable forage. Therefore, we should focus on the plants that animals avoid eating and those containing low nutritional value such as thistles and goldenrod.

It is important to begin by scouting pastures to identify all pre-existing problems. References such “Weeds of the Northeast”(Appendix A) can help you identify noxious and poisonous plants. Problem areas, “hot spots,” tend to be found where animals congregate (under trees and around water tanks, etc.) or where animals tend not to graze (rock piles, steep slopes, along fence lines, etc.). This will then, in turn, help you in developing a plan to eliminate weed problems and keep from developing new ones. Your local Extension Educator can help with this process.

Table 1. Maine Problem Weed List

Common Name	Genus and species
Bracken Fern	Pteridium aquilinum
Burdock, Common	Arctium minus
Buttercup	Ranunculus bulbosus L.
Cherry, Common Chokecherry	Prunus virginiana
Dogbane	Apocynum cannabinum
Ivy, poison	Toxicodendron radicans
Loosestrife, purple	Lythrum salicaria, virgatum, or any combination
Milkweed	Asclepias syriaca
Spurge, leafy	Euphorbia esula
Bedstraw, smooth	Galium mullugo L.
Sowthistle, perennial	Sonchus arvensis
Thistle, bull	Cirsium vulgare (biennial)
Thistle, Canada	Cirsium arvense (perennial)

Weed Control Options for Pasture

Good weed control takes dedication and utilization of several methods, especially with certain weeds. Specific options include: 1) grazing management, 2) mechanical control, and 3) chemical control.

1. Grazing management

Proper grazing management has proven to be a very useful weed control mechanism. **Good fertility goes hand in hand with good weed control.** Controlled grazing allows beneficial plants to become strong, productive plants and out-compete the weeds. Rotational grazing helps in this process because it gives beneficial plants the opportunity to rest after grazing, and then grow undisturbed before being grazed again. High stocking rates in small paddocks can also be used to “force” animals to consume forage that might normally be considered a “weed”.

Soil pH management is critical in the Northeast where soils are naturally acidic. Regular soil testing should be considered. If soil pH levels are below 6.0, conditions favor weed growth as opposed to desirable grasses and legumes. A soil program that includes lime applications when indicated is essential. For most applications, soil tests will indicate the use of high Magnesium limestone or Dolomitic limestone to improve the magnesium status in the soil and the resulting forage. This is important for both plant health and for the prevention of metabolic diseases in livestock such as grass tetany.

Grazing management alone, however, will not normally correct serious pre-existing weed problems without causing losses in animal performance. Plants such as thistles, brush, and poisonous plants may continue to be a problem even after you have intensified your system, since they are seldom eaten even at high stocking rates.

2. Mechanical Control

Mechanical weed control is also a very good option in situations where equipment can be utilized or fairly small infestations of weeds are present. This method takes time and dedication, but has been successfully used in overtaking extensive weed control problems.

Repeated mowing, clippings, and hand weeding can diminish weed infestations. When the weeds are in the early bud to early bloom stage, cut them 3 to 4 inches above the ground. This weakens the weed by depleting the root reserves and prevents the further spread of seed. Timing of the mowing is critical because you **must eliminate the seed production, which will prevent future re-infestations. This is true of all weed control options.**

Plants such as Canadian thistles are difficult to control due to their ability to produce a second seed head during the same growing season. This forces a follow-up clipping. In addition to re-growing, they commonly produce the second seed head close to the ground, making clipping very difficult. Caution must also be observed when mowing woody plants, as some plant material such as cherry tree leaves can become toxic to livestock after they have been artificially desiccated.

Tillage and reseeding can be used to suppress weeds as part of a pasture renovation, but is seldom used to manage weeds in an existing pasture as it is costly and time consuming.

3. Chemical Control

Chemical control of weeds is often looked at as the first option of control, but consideration should go into developing a plan. Chemical weed control can be a challenge because of its selective or nonselective means of controlling specific plant species. For example, you can use 2-4,D to control thistles in some cases. The problem is that 2-4,D will also kill desirable legumes that naturally persist or that were planted. It is essential to read chemical labels and also use resource people such as your local County Extension Educator.

Weed control in grass pastures is therefore limited to controlling broadleaf weeds and is generally accomplished with post-emergence, translocated herbicides. These herbicides are absorbed by the foliage and move within the plant. As a result, they may produce a toxic effect a considerable distance from the point of entry. Post-emergence applications are greatly affected by the age of the weeds and the growing conditions. Applications should be made when the weeds are young and actively growing. Weather conditions are also important consideration as the herbicide may need time to be absorbed.

For control of summer annual weeds such as lambsquarters, translocated herbicides should be applied to the foliage of seedling plants in the spring or early summer. The rosettes of winter annuals such as shepherdspurse should be treated in the fall or early spring.

Most of the problem weeds in grass pastures are either biennial or perennial broadleaf weeds. Post-emergence treatments for biennial weeds such as common burdock or simple perennials such as dandelion, should be applied to the rosettes, or other fall growth, in the fall or early spring before these plants bolt (send up a flower stalk).

Foliar treatments for creeping perennials such as common milkweed must be made when they are actively growing and have a large leaf area. The ideal time for treating them is after they have reached the bud stage in mid to late summer. During this period they have their maximum leaf area and are storing food reserves for the winter.

Because the herbicides recommended for broadleaf weed control in pastures will also kill legumes, they should not be used as broadcast treatments if legumes are present in the pasture. Spot treatments would be required, or there will be a lot of bare ground after the treatment, inviting more weed species to appear, and diminishing the value of the pasture. This is especially true if you choose to use non-selective vegetation control products such as Touchdown® or Roundup®. Annual retreatment may be necessary for several years to obtain long-term control. Spot treatments can be accomplished with a wick applicator, which looks like a hollow hockey stick with either rope or roller applicator on the end.

Another challenge that exists with chemical weed control is that after existing weed(s) are killed, the weed seeds existing in the soil still have an opportunity to germinate and grow. In this situation you would need to be sure to seed the bare area following chemical application so the desired species has a chance to grow.

Producers should also be aware of grazing restrictions associated with herbicides. The label of every product will list restrictions such as how long before animals can go back and graze, harvest restrictions, animal withdrawal times before slaughter and time of year products should be applied for effective control. Product restrictions for milk and meat must also be followed to maintain a safe food supply.

Identification of the weeds is the essential first step to good chemical weed control. One of the best resources is “Weeds of the Northeast” from Cornell University Press. Also included in this lesson is a glossary of terms commonly used in identification of weeds. Your local Extension Educator can also assist you in this activity.

Life Cycle of Plants

It is also important to determine the life cycle of the weed. This will help determine when the plants will be most susceptible to control with chemicals. These life cycles include:

Annuals - Entire life cycle from seed germination to seed production occurs in one growing season and then the plant dies. Annuals can be controlled throughout the season but are usually most susceptible during seedling stage and seed head development. It is important to remember that the key to annual weed control is to eliminate seed production.

Biennials - Plants start from seeds, produce vegetative structures and food storage organs the first season. During the first winter a hardy evergreen rosette of basal leaves persists. During the second season, flowers, fruit and seeds develop to complete the life cycle. Then the plant dies. Herbicides should be applied as late as possible in the fall prior to a killing frost for best control of biennials. This allows for maximum seedling emergence and rosettes. Seedlings that emerge after spraying will remain vegetative until the following spring, and can be treated then. Long-term eradication of biennials is very difficult because of the large number of seeds each plant produces and the ease of seed transport by wind due to pappus (fuzzy material) attached to most biennial species seeds.

Perennials - Live for many years, and after reaching maturity produce flowers and seeds each year. Perennials are classified in many ways:

Herbaceous - top dries back to the ground each winter and new stems grow from the root each spring.

Woody - the top persists, as in shrubs or trees.

Deciduous - will shed leaves during a portion of the year.

Evergreen - leaves persist throughout the year.

Once you have the weeds identified and you want to use chemical control, you then need to select a herbicide to kill the weeds. Consider price, spot spraying vs. broadcast and remember that many can and do kill desirable legumes. See Table 1. Chemical Weed Control in Grass Pastures.

Carefully read the label before purchasing. It is mandatory to follow the label instructions when using all pesticides including herbicides. The label is the law!

SUMMARY

In summary, it is important to remember several steps to effective weed control in pastures.

- 1) Provide proper nutrients and management for desired forage species.
- 2) Identify weed problems and location.
- 3) Select which option or combination of options you plan to use for control; mechanical, chemical, or grazing management.
- 4) Perform the practice.
- 5) Evaluate outcome.

An effective weed control program is essential to establish and maintain highly productive pastures and animal performance.

Table 1. Chemical Weed Control in Grass Pastures

<i>Situation</i>	<i>Amount of Product(s) per Acre</i>	<i>Remarks and Limitations</i>
Summer annual broadleaf weeds: Lambsquarters, pigweed, etc.	2 pt. 3.8 lb./gal. 2,4-D formulation ¹ <i>or</i> ½ pt. Banvel/Clarity	Apply to small, actively growing plants in spring or early summer.
Winter annual and biennial broadleaf weeds: Shepherdspurse Common burdock Spotted knapweed Bull thistle	2-3 pt. 3.8 lb./gal. 2,4-D formulation ¹ <i>or</i> ½ pt. – 1 pt. Banvel/Clarity	Apply to rosettes or other fall growth in fall or early spring. Use low rate for winter annuals and high rate for biennials.
Simple perennial broadleaf weeds: Tall buttercup Chicory Dandelion Curly dock	3-4 pt. 3.8 lb./gal. 2,4-D formulation ¹ <i>or</i> 2 pt. Banvel/Clarity	Apply to rosettes or other fall growth in the fall or early spring.
Creeping perennial broadleaf weeds: Horsenettle Common milkweed Leafy spurge Canada thistle	4 pt. 3.8 lb./gal. 2,4-D formulation ¹ + 2 pt. Banvel/Clarity	Apply after weeds have reached the bud stage in mid- to late summer (before killing frost).
Bedstraw plus a wide variety of annual, biennial and perennial broadleaf weeds	2 qt. Crossbow	Apply to actively growing bedstraw in fall before killing frost. For lactating dairy animals, do not graze or harvest green forage from treated areas for 14 days after treatment or harvest hay until the next growing season. For all other livestock, do not harvest hay for 7 days after treatment. There is no grazing restriction for other livestock. Do not let livestock graze treated grass or consume treated hay at least 3 days before slaughter during the season following treatment.
Non-selective Herbicide for grass and broadleaf plants	Touchdown Roundup (per label directions)	Apply to actively growing plants. Following application, livestock must be removed for 8 weeks before grazing or harvest for forage or hay. If using spot applicator (wiper/wick), livestock must be removed for 14 days before grazing or harvesting for hay or forage.

¹For other 2,4-D formulations, use Table 2 to calculate the amount of herbicide needed per acre.

NOTE: In pastures treated with 2,4-D or Banvel/Clarity, the following must be followed: 2,4-D – Do not graze lactating dairy animals for 14 days after treatment. Remove meat animals from treated areas for 7 days before slaughter if less than 14 days have elapsed since treatment. Do not cut treated grass for hay within 30 days after application. *Banvel/Clarity* – Do not graze lactating animals for 7 days after treatment up to 1 pt./A, and 21 days after 2 pt./A of Banvel. Remove meat animals from treated areas 30 days before slaughter. There is no waiting period between treatment and grazing for nonlactating animals.

When Trade names are used, no endorsement or discrimination against similar products is intended.

Recommendations provided in this publication were current at the time of development, but herbicide labels change frequently. Obtain and read the product label, and follow the directions on that document for the conditions at the time of herbicide use. Work with your local County Extension Educator on any questions.

Table 2. Amounts of herbicide liquid formulation needed to equal various rates per acre

Concentration of Herbicide Formulation	Amounts of Commercial Product to Use per Acre Broadcast to Obtain an Active Ingredient Rate of:				
	1/8 lb.	1/4 lb.	1/2 lb.	1 lb.	2 lb.
Pound of active ingredient per gallon of product	Pints				
1	1.00	2.00	4.00	8.00	16.00
2	0.5	1.00	2.00	4.00	8.00
3	0.33	0.67	1.33	2.67	5.33
4	0.25	0.50	1.00	2.00	4.00
5	0.20	0.40	0.80	1.60	3.20
6	0.16	0.33	0.67	1.33	2.67
6.7	0.15	0.30	0.59	1.19	2.38
7	0.14	0.28	0.56	1.13	2.25
8	0.13	0.25	0.50	1.00	2.00

REFERENCES:

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Visit the UMCE Web Site at www.umext.maine.edu,
Maine Natural Resources Conservation Service Web Site at
www.me.nrcs.usda.gov,
And Northeast Grazing Guide www.umaine.edu/grazingguide

TERMS HELPFUL IN WEED

IDENTIFICATION

alternate leaves: leaves attached singly along a stem.

axil: point where a leaf or branch is attached to the stem.

bract: a modified leaf structure that surrounds the flower on some plants.

leaflet: a division of the leaf.

lobe: the leaf margin that is shallowly or deeply divided into sections or divisions.

opposite leaves: leaves attached in pairs along the stem.

pappus: a cluster of fine hairs attached to the seed in some plants, e.g., dandelion.

rhizome: an underground creeping stem which provides the means of production of some perennial plants.

rosette: a basal cluster of leaves. The first year's growth of biennial plants.

stolon: an above-ground prostrate stem which provides the means of reproduction of some perennial plants.

whorled leaves: three or more leaves attached at the same point along a stem.

winter annual: an annual plant that initiates growth in the fall and produces seed the following spring.

winged: any membranous extension or in some instance the extension of the leaf blade.

WEED and PEST TREATMENT RECORD

Pasture Name/#	Problem Weed or Pest	Percent Infestation	Treatment	Date	Cost	Effectiveness	Comments

Notes

Weed Control

Lesson 4 Quiz

1. Name three weed control methods.
 - A. _____
 - B. _____
 - C. _____
2. (T or F) Proper grazing management allows beneficial forage species to become stronger and out-compete weeds.
3. (T or F) The key to any weed control option is to prevent or eliminate seed production by the weeds.
4. Why is Canadian thistle difficult to control?
5. (T or F) A problem with chemical weed control is that chemicals may also kill desirable forage species.
6. Although annual weeds can be controlled throughout the season, they are most susceptible during which two stages of development?
7. (T or F) Biennials are easy to control because they do not produce many seeds.
8. The first step in an effective weed management program is to:
 - A. spray chemicals on the pasture
 - B. disk up the pasture
 - C. scout the pasture to identify weed species to be controlled.
9. (T or F) According to Table 1, Banvel®/Clarity® will control Bedstraw.
10. Control of creeping perennials is most effective when the treatment method is applied during which two stages of growth?

Name _____ Phone _____

Address _____

(Optional) Fax _____ E-mail _____