

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). 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 as *MN Noxious Weeds* AGFO-3560-GO (Table 1) and *Plants Poisonous to Livestock* AGFO 5655-D (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. Minnesota Noxious Weed List

Common Name	Genus and species
Bindweed, field	<i>Convolvulus arvensis</i>
Hemp	<i>Cannibis sativa</i>
Ivy, poison	<i>Toxicodendron radicans</i>
Loosestrife, purple	<i>Lythrum salicaria, virgatum, or any combination</i>
Spurge, leafy	<i>Euphorbia esula</i>
Sowthistle, perennial	<i>Sonchus arvensis</i>
Thistle, bull	<i>Cirsium vulgare</i>
Thistle, Canada	<i>Cirsium arvense</i>
Thistle, musk	<i>Carduus nutans</i>
Thistle, plumeless	<i>Carduus acanthoides</i>

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 when utilizing this weed control option. This control method 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.

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, Musk, and Plumeless 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.

Tillage can be used to suppress weeds as part of a pasture renovation, but is seldom used to manage weeds in an existing pasture.

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 2-4D to control thistles in some cases. The problem is that 2-4D will also kill desirable legumes that naturally persist or

that were planted. It is important to read chemical labels and also use resource people such as your local County Extension Educator.

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 area following chemical application so the desired species has a chance to grow.

Identification of the weeds is the essential first step to good chemical weed control. Some of the resource guides available include: *Noxious Weeds of Minnesota* AGFO-3560-GO, *Annual Broadleaf Weed Identification* MI-1350, *Annual Broadleaf Weed Seedling Identification* MI- 1349, *Annual Grass and Perennial Weed Seedling Identification* MI-1351, *Annual Grass and Perennial Weed Identification* MI-2384, *Weed Seedling Identification: Annual Broadleaves* MI-2228, *Weed Seedling Identification: Grasses* FO-0776, *Weeds of the North Central States* NCR 281, Bulletin 772 and *Selected North Dakota and Minnesota Range Plants* EB 69. 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.

Control of perennial weeds is greatest when applied to the plant at the early-bud growth stage (early summer), or in the fall to plants in the vegetative state. Annual retreatment will be necessary for several years to obtain long-term control.

Once you have the weeds identified, 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 tables 2 and 3 for some ideas on current recommended chemicals. You can also use the University of Minnesota Publication “*Cultural and Chemical Weed Control in Field Crops BU 3157 S*”, or consult your local Extension Educator.

It is also our advice to always carefully read the label before purchasing and using any herbicide!

Finally, after applying a herbicide there is generally a withholding, or grazing restriction period. This determines how long you must keep the animals from grazing the area where the chemical was applied. Table 4 lists the grazing restriction times for chemicals used on pastures, but information on the label supersedes information contained in this table.

Table 2. Effectiveness of herbicides on selected weeds in grass pastures (see text for best application timing)

	Biennial Plants			Perennial Plants					
	Bull thistle	Musk thistle	Plumeless thistle	Absinth wormwood	Canada thistle	Goldenrod spp.	Leafy spurge	Perennial sowthistle	Spotted knapweed
Clopyralid (Stinger)	G	G	G	-	G	-	N	F	G
Dicamba	G	G	G	G	G	G	P	G	G
Glyphosate (Roundup Ultra)	G	G	G	G	G	G	F	G	G
Metsulfuron methyl (Ally)	G	F/G	F/G	-	F	-	P	F	-
MCPA	G	F	F	P	F	F	N	F	G
Picloram (Tordon)	G	G	G	G	G	G	G	G	G
Tebuthiuron (Spike)	-	-	-	-	-	-	-	-	-
Triasulfuron (Amber)	-	-	-	-	-	-	-	-	-
Triclopyr + 2,4-D (Crossbow)	G	G	G	F	F	F	F	F	G
2,4-D	G	G	G	F/G	F	F	P/F	F	G

G = Good

F = Fair

P = Poor

- = insufficient information

Table 3. Susceptibility of trees and shrubs to foliage applications of herbicides

Plant	Herbicide (see text for best application time)					
	2,4-D	Dicamba <i>Banvel</i>	Glyphosate <i>Round Up Ultra</i>	Picloram plus 2,4-D <i>Tordon + 2,4-D</i>	Triclopyr + 2,4-D <i>Crossbow</i>	Metsulfuron <i>Ally</i>
Alder	G	G	G	G	G	
Ash	P	G	G	P	F	G
Aspen, quaking	F-P	F	G	G-P	G	G
Cherry	F	F	G	G-F	G-F	G
Chokecherry	G	F-P	G	G	G	
Cottonwood	F-P	G	G	F	G	G
Elm	F-P	F-P	G	G	G	G
Oak	G-F	G	G	G	G	G
Pine	G	G	P	G	G	
Russian-olive	G	G	G	F	G	
Snowberry	P	G	G-P	F	G	G
Sumac	G-F	G		G	G	
Willow	G-F	G-F	G-F	G-P	G	

G = Good control
 F = Fair control, likely to need retreatment
 P = Poor control

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 4. Grazing restrictions** for pasture herbicides

Herbicide	Rate	Lactating Dairy Animals		Beef & Nonlactating Dairy Animals		Removal before slaughter
		Before grazing	Before hay harvest	Before grazing	Before hay harvest	
Clopyralid (Stinger 3E)	.66 to 1.33 pt	0	0	0	0	0
Clopyralid + 2,4-D (Curtail 2.38S)	2 to 3 qt	14 day	30 day	14 day	30 day	7 day
Dicamba (Banvel 4S)	Up to 1 pt	7 day	37 day	0	0	30 day
	Up to 2 pt	21 day	51 day	0	0	30 day
	Up to 4 pt	40 day	70 day	0	0	30 day
	Up to 16 pt	60 day	90 day	0	0	30 day
Glyphosate (Rounup Ultra 3S) Spot or Wiper Broadcast	Varies	14 day	14 day	14 day	14 day	0
	varies	8 week	8 week	8 week	8 week	0
Metsulfuron methyl (Ally 60 DF)	.1 to .3 oz	0	0	0	0	0
Paraquat (Gramomone Extra)	.8 to 1.5 pt	1 month	1 month	1 month	1 month	0
Picloram (Tordon 22K)	1 to 3 qt	14 day	14 day	0	14 day	3 day
Tebuthiuron (spike 20P)	3.75 to 20 lb	0	0	0	0	0
Triasulfuron (Amber 75 WDG)	.28 or .56 oz	0	30 day	0	30 day	0
Triclopyr + 2,4-D (Crossbow 3S)	Less than 2 gal	14 day	Next season	0	7 day	3 day
	2 to 4 gal	next season	Next season	14 day	14 day	3 day
2,4-D/MCPA	.25 to 2 qt	7-14 day	30 day	0-7 day	0-30 day	0

** This listing of restrictions is not complete. Check herbicide labels for more complete listing of all restrictions for applications to pastures.

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.

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REFERENCES:

1999 Cultural and Chemical Weed Control in Field Crops BU-3157-S

Improve Your Pasture in Five Easy Steps. University of Minnesota Extension Service and Minnesota Department of Agriculture.

Minnesota Noxious Weed Law and Rules. Minnesota Department of Agriculture.

Pasture for Profits: A Guide to Rotational Grazing A3529, University of Minnesota and Wisconsin.

Pasture Weed Management For NW Minnesota. Carlyle Holen.

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.