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Weed Management in Grass Pastures, Hayfields, and Fencerows

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Introduction

Weeds can reduce the quantity and the stand life of desirable forage plants in pastures and hayfields. These unwanted plants are often more aggressive than existing or desired forage species and compete for light, water, and nutrients. In some cases, weeds can also diminish the quality and palatability of the forage available for livestock grazing, and certain weed species are potentially poisonous to grazing animals. The aesthetic value of a pasture is also affected by weeds.

Therefore, it may be desirable to initiate weed management strategies that reduce the effect of weeds on forage production. However, not all weedy plants are detrimental to pastures or hayfields. In fact, some weedy plants provide nutritional value to grazing animals; thus, prudent management decisions are often required to determine when or if weed control should be initiated in a pasture or hayfield.

Effect of Weeds on Pasture Yield and Animal Performance

In general, weedy plants are usually not high yielding and are considered to be low in quality. However, many weeds are eaten along with the desired forage grasses and legumes. In fact, the dry matter digestibility of several weed species is generally high and comparable to seeded forage species during their early vegetative stage of growth. Crude protein levels are also adequate for consumption by cattle. But, like many cultivated forage grasses, digestibility and crude protein decline as weeds mature. Thus, the greatest benefits in digestibility and crude protein are obtained from weeds and desirable forage species that are grazed during their early stages of growth.

On the other hand, some weedy plants are unpalatable compared with the desirable forage species; thus, they are not normally consumed by animals. For example, weeds such as curly dock and tall ironweed are selectively grazed to a greater extent compared with more palatable species, such as crabgrass.

Weed Control Methods

The way a pasture is managed can have a major impact on the presence of weedy plants. Production practices that result in overgrazing and low fertility levels favor emergence, propagation, and growth of weeds. The ideal approach is to incorporate practices that are more adaptable to the growth of the desirable forage species and less favorable for unwanted plants.

Although there are exceptions, most weeds do not compete well with a dense stand of desirable forage species. Further, to minimize the effects of weedy plants, pastures and hayfields should be managed to favor the vigorous growth of the desired forage species. Effective pasture management programs include these practices:

- maintain proper soil pH and fertility levels,
- use controlled grazing practices,
- mow at proper timing and stage of maturity,
- allow new seedings to become well established before use, and
- renovate pastures when needed.

Herbicides should be used only when appropriate and cost effective.

A program that integrates several different control strategies is generally more successful than relying on only one method. Weeds present at the time of herbicide application may be controlled, but if the forage stand is not vigorous and actively growing, new weed seedlings will soon emerge and occupy the bare soil areas that remain. Thus, without proper cultural practices, herbicide use will not be beneficial.

Cultural Practices

Seeding Forages or Renovation

Sometimes pastures and hayfields must be re-seeded or renovated to maintain proper stands. The time of year forage seeding occurs can determine the weed species that will be most troublesome during the establishment phase. Seeding in late summer or early fall will enable the crop to become established and compete with weeds, such as large crabgrass and yellow foxtail, that emerge the following spring, whereas a spring seeding is vulnerable to these weeds. Common chickweed and other cool-season weeds that begin to emerge in late fall and early winter can compete with forages seeded in the fall.

When establishing grass-legume forage mixtures, it may be desirable to seed the grass component in late summer or fall and interseed the legume species the following spring. This would allow flexibility for use of a broadleaf herbicide, if needed, prior to seeding a legume.

Weed-free Seed

It is also important to use weed-free seed to prevent the introduction of weedy plants. The seed tag should be examined to determine the purity of the seed and the potential presence of weed seed contaminants. The state regulations

of the Kentucky Seed Law classify certain plants, such as Canada thistle, johnsongrass, and quackgrass, as noxious weeds, and prohibit their presence in commercial seed sold in Kentucky.

Fertility

Adjusting the soil pH and nutrient levels according to soil test recommendations helps increase the stand density of desirable forage species. However, such practices as the addition of lime and/or proper fertilization alone are usually not effective in eliminating established weeds. In fact, some weeds, such as common chickweed, crabgrass, and curly dock, can respond favorably to fertilization and grow well on fertile soils.

Grazing Practices

Grazing can be an effective and economical weed management tool. The greatest benefits are obtained when weeds are small. In the early vegetative stage of growth, many weeds can provide a good source of animal nutrition that would be comparable to desired forages. However, the forage quality of weeds declines rapidly as the plant matures.

Animals tend to selectively graze certain plant species because of differences in the plant's palatability; therefore, weeds, such as horsenettle or tall ironweed, become more prominent over time in grazed pastures because they are less palatable to the animal.

As grazing pressure increases, animal selectivity decreases; thus, more weeds are consumed by animals regardless of forage quality. Flash grazing (putting a lot of cattle on a small area for a short time period) is one method whereby weedy-type plants could be consumed by the animal. Animals should be rotated off these areas to allow desirable plants to recover. A potential drawback of flash grazing is that the forage stand density may be reduced, allowing the germination and growth of other undesirable plants.

Another consideration before allowing livestock to graze fields heavily infested with weeds is the potential for exposure to poisonous plants. The potential for livestock poisonings depends on the availability and quantity of the poisonous plant available, the stage of plant growth, the time of year, and the kind of animal. Several plants that can be found in Kentucky are potentially toxic (Table 1). More information about poisonous plants can be found in the University of Kentucky Extension publication, *Some Plants of Kentucky Poisonous to Livestock* (ID-2).

Table 1. Plants potentially poisonous to livestock found in Kentucky

Buttercup	Hemlock, Poison
Butterfly Weed	Larkspur
Cherry, Wild	Snakeroot, White
Cocklebur	Sneezeweed
Elderberry	Star-of-Bethlehem

Mowing

Timely mowing or clipping of pastures can be beneficial for control of many erect broadleaf weeds. A primary benefit of mowing is to prevent or reduce seed production and spread of undesirable plants; therefore, mowing should begin when weeds are in the stem elongation stage, but before flowers are produced.

Some weeds, such as common cocklebur, that are mowed when they are small or when clipped high may develop new growth from lateral buds. Ideally, mowing should be done when most weeds reach 12 to 18 inches in height. Although some plants when mowed will produce new shoots and seedheads, the number of flowers and amount of seed produced will be notably less than if the field had not been mowed. Best results are obtained if the vegetation is clipped as close to the soil as possible.

Frequent mowing, repeated over a three- to five-year time span, can deplete root reserves of some perennial weeds, such as horsenettle or johnsongrass. This practice will help suppress their growth and reproduction.

Not all weeds are inhibited by mowing. Low-growing plants, such as dandelions, crabgrass, and nimblewill, tend to be more prevalent in pastures that are frequently mowed.

It is important to mow or clip pastures that have been selectively grazed by animals. This helps to prevent or reduce seed production of weedy plants left by the animals. Timely mowing can also promote regrowth of desirable forage species. In fact, mowing can stimulate the production of tender new forage for livestock to graze.

The benefits of clipping pastures may not be as evident if mowing is not part of a complete pasture management system, particularly if mowing has been delayed until after new weed seed are produced or perennial weeds have been able to build up their root reserves.

Herbicides

It is sometimes necessary to consider the use of a herbicide for control of problem weeds. Herbicide selection is based on the type of forage and weed species present, but the decision to use a herbicide treatment will also depend on a variety of other factors. Some of these factors may include stage and severity of weed growth, the time of year, environmental conditions such as temperature and rainfall, potential damage to nearby sensitive crops or plants, waiting period after treatment to use forage, and cost of treatment. Always consult the label before using a herbicide product.

The *type of forage* grown and whether the desirable forage is a new seeding or an established stand can greatly limit the herbicide options available for use in grazed pastures and hayfields. Herbicides currently available for use in **established** grass pastures are listed in Table 2.

Table 2. Herbicides labeled for use in permanent grass pastures and approximate cost for treatment

Treatment (rate)	Estimated Cost*	Type of Weeds Controlled
Ally (0.1-0.3 oz/A)	$3.15 - 9.45	Selected broadleaf weeds and certain woody plants
Banvel (0.5-4 pt/A)	$5.20 - 41.60	Broadleaf weeds and woody brush
Crossbow (2-4 qt/A)	$20.55 - 41.10	Broadleaf weeds and woody brush
2,4-D (1-2 qt/A)	$4.90 - 9.80	Herbaceous broadleaf weeds
Stinger (0.67-1.33 pt/A)	$11.25 - 22.50	Canada thistle and other selected broadleaf weeds
Weedmaster (1-4 pt/A)	$3.25 - 13.00	Broadleaf weeds and woody brush
MOWING	$9.00	Grasses and broadleaf weeds and small brush

*The estimated cost ($/A) does not represent the use of spray additives or the application costs.

In grass pastures interseeded with clover or other forage legumes, herbicide options are not available for use as broadcast treatments. Lack of herbicide options in mixed stands is largely due to the potential injury to the legume species. Another factor is that the maximum allowable residue levels of these herbicides have not been established for these forage species.

The *type of weeds* to be controlled is a major consideration when selecting a herbicide product (see Table 4). The control option can often depend on the life cycle of the plant (whether it is an annual, biennial, or herbaceous perennial), or whether it is a woody plant, such as multiflora rose (see Table 5). The age and size of the plant can also determine the herbicide rate and its potential effectiveness. Herbicide treatments are most often used for weeds such as musk thistle, multiflora rose, and other broadleaf-type plants in which herbicides are known to be effective. Herbicides that will selectively control broomsedge, purpletop, and other weedy-type grasses in grass pastures are not available.

Proper *timing of a herbicide application* should be based on stage of weed growth, potential risk to nearby sensitive crops, and environmental conditions, such as air temperatures and humidity. Newly seeded forage grasses or legumes can be injured if herbicides are applied before or soon after a new seeding or pasture renovation. In general, annual broadleaf weeds are easier to control when herbicides are applied to plants that are small and actively growing. Perennial broadleaf weeds tend to be most susceptible when plants have reached the early bloom stage of growth.

Since many herbicides are applied to the foliage, the ideal temperature for most applications is when the daytime air temperature remains above 60°F for several days before and following application. However, applying herbicide products containing 2,4-D, dicamba (Banvel, Weedmaster), and triclopyr (Crossbow) when temperature exceeds 80°F may result in offsite movement of spray particles that can injure tobacco fields, vegetable gardens, and other nearby sensitive crops.

Another major consideration in herbicide choice is the *waiting period* after application before livestock are allowed to graze (Table 3). Use of the area as a hayfield can lengthen the waiting period for some products. Also, the kind of animals present, whether beef or lactating dairy animals, can be a factor in determining the waiting period. Since there are no specific guidelines for horses grazing herbicide-treated areas, the waiting period for beef animals should be applicable. Although some herbicide labels indicate a zero day waiting period, a general prac-

Table 3. Waiting interval following herbicide application before grazing livestock or harvesting for hay

	Waiting Interval (days)		
	Grazing		Hay
Herbicide	Beef	Lactating Dairy	
Ally	0	0	-
Banvel			
(1 pt/A)	0	7	37
(2 pt/A)	0	21	51
(4 pt/A)	0	40	70
Crossbow			
(1 gal/A or less)	0	14	7*
(2 to 4 gal/A)	14	365	14*
2,4-D [Several Products]	7-14**	7-14**	30
Roundup Ultra	14	14	14
Spike 20P			
(< 20 lb/A)	0	0	365
(> 20 lb/A)	365	365	365
Stinger	0	0	0
Weedmaster	0	7	37

*365 days for dairy animals
**Varies with 2,4-D formulation

tice is to remove animals from the treated area for at least 7 to 14 days following application.

One final consideration before selecting a herbicide is the *cost of treatment.* The estimated cost associated with weed management by herbicides can range from approximately $5.00 to nearly $50.00 per treated acre (Table 2). Treatment costs are determined by the herbicide used, the rate of application, and the cost of application. Some herbicide treatments may be cost prohibitive or provide fewer benefits compared with other control options or management strategies.

Pasture Renovation

It is sometimes necessary to renovate pastures and hayfields to improve the overall quality of the forage or to replace an endophyte-infected tall fescue stand. Renovation practices generally involve either: 1) rotating the pasture to corn or other crops, or 2) killing the existing vegetation with herbicides and then re-seeding a forage crop with a no-tillage drill.

In a crop rotation approach, a grain crop is often grown for one or two years before reseeding with another forage. Depending on the field situation, corn or other crops can be grown in a conventional seedbed by plowing or by no-tillage methods into the old sod. In a crop rotation system, select herbicides that do not have the potential to persist in the soil and injure fescue or other forages that will be seeded. Crop replanting and rotation guidelines for corn and soybean herbicide applications are listed in University of Kentucky Extension publication, *Chemical Control of Weeds in Kentucky Farm Crops* (AGR-6).

Replacement of endophyte-infected tall fescue stands or other forages without the benefit of tillage depends entirely on herbicides for control. Complete control of the undesirable vegetation may not be obtained under conditions of environmental stress or poor application; therefore, proper timing, herbicide application, and good management are essential to achieve optimum control.

The preferred time of year to use a herbicide for controlling tall fescue and certain other perennials is in **late summer** or **early fall.** Apply when forage grasses are small and actively growing. Herbicides labeled for use in pasture renovations include Roundup Ultra and Gramoxone Extra.

Roundup Ultra

Roundup Ultra (glyphosate 4 lb ai/gal) should be applied to tall fescue in the fall before reseeding. Apply 1 qt/A (2 pt/A) using a spray volume of 10 gal or less of water per acre. This spray volume may require changing to a smaller nozzle size and using fine mesh screens. Apply Roundup Ultra when tall fescue has 6 to 12 inches of new growth and is actively growing. Forage grasses should be mowed or grazed to obtain the recommended height. Before reseeding the desired forage grass, a second application of 1 pt/A Roundup Ultra will improve long-term control and control seedlings germinating after the initial treatment.

Renovating fields containing orchardgrass can be more difficult. For partial control or suppression of orchardgrass in pastures and hayfields, apply Roundup Ultra at 1 to 1.5 qt/A using a spray volume of 10 gal or less of water per acre. Apply to actively growing orchardgrass when most plants are 4 to 12 inches tall.

Remove domestic livestock before application of Roundup Ultra and keep them out of the field for at least 8 weeks after application before grazing or harvesting the newly established forage.

Gramoxone Extra

Gramoxone Extra (paraquat 2.5 lb ai/gal) should be applied as two separate treatments. Make the first application at a rate of 24 oz/A when tall fescue is actively growing and no more than 4 inches tall. A second application of Gramoxone Extra at 13 to 24 oz/A should be timed to spray regrowth, which usually occurs 10 to 21 days after the first application. Add a nonionic spreader surfactant to the spray mixture at 0.25% v/v (2 pt surfactant/ 100 gal of water) or a nonphytotoxic Crop Oil Concentrate (COC) at a 1% v/v (1 gal COC/100 gal of water). Broadcast the spray mixture at a minimum of 20 gal of water per acre.

Do not seed tall fescue or other forage crops into treated areas with green vegetation. Remove domestic livestock before the first application and keep them out of the field until new forage growth is at least 6 inches tall.

Table 4. Guide to the relative response of herbaceous broadleaf weeds to herbicides[1]

	Preferred Time to Treat [2]	Ally	Banvel	Crossbow	2,4-D	Stinger	WeedMaster	Banvel + 2,4-D	Roundup (spot treatment)
Annuals									
chickweed, common	Oct - Dec	G	G	F	F	*	G	G	F
cocklebur, common	May - July	P	G	G	G	G	G	G	G
jimsonweed	May - July	*	G	G	F	G	*	G	F
marestail	Mar - Apr	F	G	G	G	F	G	G	G
pennycress, field	Oct - Nov	F	G	G	G	*	G	G	F
pigweeds / spiny amaranth	May - July	G	G	G	G	*	G	G	G
ragweed, common	May - July	P	G	G	G	G	G	G	G
ragweed, lanceleaf	May - July	P	G	F	F	*	G	G	F
ragweed, giant (horseweed)	May - July	P	G	G	G	G	G	G	G
sumpweed (marshelder)	May - July	G	*	G	G	*	*	*	*
Biennial									
burdock, common	Feb - Mar	*	G	G	G	G	G	G	G
hemlock, poison	Mar - Apr	*	G	G	G	P	*	G	G
thistle, bull	Mar or Oct	F	G	G	G	*	G	G	F
thistle, musk (nodding)	Feb - Mar or Oct - Nov	F	G	G	G	G	G	G	F
Perennial [3]									
aster spp.	Aug - Oct	*	G	G	G	*	G	G	G
buttercup spp.	Feb - Mar	G	G	G	F	*	G	G	F
chicory	Sept - Nov	*	G	F	F	*	G	G	*
dandelion	Mar or Oct - Nov	G	G	G	G	G	G	G	G
curly dock	Feb - Apr	G	G	G	F	F	G	G	F
goldenrod spp.	June - Aug	P	G	G	F	P	G	G	F
horsenettle	May - June	*	G	F	F	*	G	G	G
ironweed, tall	June - Aug	*	F	G	F	P	F	F	G
lespedeza, sericea	June - July	F	*	F	*	*	*	*	F
milkweed, common	Oct - Nov	P	F	F	P	*	F	F	F
red sorrel / sheep sorrel	Oct - Nov	G	G	G	P	F	G	G	F
sowthistle, perennial	Oct - Nov	F	G	G	F	F	F	F	F
thistle, Canada	Oct - Nov	G	F	G	F	G	F	F	G
wild garlic	Apr - Mar	G	F	F	F	*	F	F	*

* = No Information
G= Good
F = Fair[4]
P = Poor
N = None

[1] This table should be used only as guide for comparing the relative effectiveness of herbicides to a particular weed. Depending on the weed size, time of application, and/or whether applied under extreme weather conditions, a herbicide may perform better or worse than indicated in the table.

[2] The preferred time to treat will vary, depending on environmental conditions and other factors. Observe herbicide label for recommended plant height or stage of growth.

[3] For complete control of perennial weeds, repeated herbicide applications may be necessary over several years.

[4] Fair = Partial control or suppression

Herbicides for Use in Grazed Pastures and Hayfields

Ally

Ally 60DF contains 0.6 lb ai metsulfuron methyl per lb product. For use on grass pastures.

Use Rate: Broadcast at 1/10 to 3/10 oz/A. For spot treatments use 1 oz per 100 gal of water.

Additives: Add nonionic surfactant at 2 to 4 pt per 100 gal of spray solution (0.25 to 0.5% v/v). For fescue use 0.5 to 1 pt surfactant per 100 gal water; for timothy use 0.5 pt surfactant per 100 gal.

Weeds: Control or suppress growth of certain broadleaf weeds such as buttercup, curly dock, Canada thistle, musk thistle, and wild garlic; and certain woody plants such as buckbrush and multiflora rose.

General Comments: For best results apply as a broadcast application or spot treatment when weeds are young and actively growing in the spring, summer, or fall. Some pasture grass species such as fescue and timothy are sensitive to Ally (see label for details); thus, treated fescue pastures may be temporarily stunted and the first cutting of fescue may be lost. The minimum time from grass establishment until Ally application is 2 months for bermudagrass; 6 months for bluegrass, bromegrass, and orchardgrass; 12 months for timothy; and 24 months for fescue. The minimum waiting period before overseeding or renovating fields treated with Ally is 4 months when seeding alfalfa, clover (red, white, or sweet), bluegrass, bromegrass, fescue, orchardgrass, ryegrass, or timothy; 1 month before planting wheat; 10 months before planting barley or oats; and 34 months for other crops.

Precautions: Do not apply to pastures seeded with forage legumes, such as alfalfa or clover, as severe injury to the forage can result. Ally should not be used on soils having a pH above 7.9. Immediately following application of Ally, thoroughly clean all mixing and spraying equipment to avoid subsequent injury of desirable crops.

Grazing and Hay Restrictions: None indicated on the Ally label.

Tank Mixtures: 2,4-D; Banvel; Weedmaster.

Banvel

Banvel contains 4 lb ai dicamba (dimethylamine salt) per gallon. For use on established grass pastures, hayfields, and general farmstead (non-cropland) sites.

Use Rate: Broadcast at 0.5 to 1.5 pt/A for annuals, 0.5 to 3 pt/A for biennials, and 2 to 4 pt/A for perennials depending on weed species and stage of growth.

Additives: Not required, but may be added.

Weeds: Control or suppress growth of several broadleaf weeds, such as bull thistle, curly dock, musk thistle, and ragweed; and certain woody brush, such as multiflora rose.

General Comments: Apply as a broadcast treatment on annual, biennial, and perennial broadleaf weeds when plants are actively growing. Spot treatments may be used on individual plants or small areas of undesirable vegetation. For multiflora rose, Banvel can be applied when plants are dormant using an undiluted spot-concentrate or lo-oil basal bark treatment. For control of susceptible trees and prevention of sprouts of cut trees, Banvel may be applied as a cut surface treatment. Consult label for specific rates to use depending on vegetation to be controlled.

Precautions: Do not apply to pastures seeded with forage legumes such as alfalfa, clover, or lespedeza as severe injury to the forage can result. Avoid applications of Banvel when sensitive crops such as tobacco, vegetable crops, or other desirable plants and trees are growing nearby. Do not apply near sensitive crop areas if conditions on day of treatment are favorable for off-site spray drift, such as when wind speed exceeds 5 mph, air temperature is expected to exceed 85°F, and/or temperature inversions exist.

Grazing and Hay Restrictions: For non-lactating animals there is no waiting period between treatment and grazing, whereas the waiting period for lactating dairy animals depends on the amount of Banvel applied. The waiting interval ranges from 7 to 40 days for grazing and 37 to 70 days for hay harvest. Animals cannot be removed from treated areas for slaughter prior to 30 days after last application.

Tank Mixtures: Ally; 2,4-D; Roundup Ultra.

Crossbow

Crossbow is a premixture product containing trichlopyr (1 lb ai/gal) and 2,4-D (2 lb ai/gal). For use on permanent grass pastures, hayfields, fencerows, and other farmstead (non-cropland) sites.

Use Rate: Broadcast at 1 to 2 qt/A for annuals and biennials and 2 to 4 qt/A for perennials and woody brush depending on weed species and stage of growth. As a spot treatment, use a 1 to 1.5% v/v solution.

Additives: Not required.

Weeds: Control or suppress growth of many broadleaf weeds, such as bull thistle, curly dock, musk thistle, and ironweed; and certain woody brush, such as blackberry and multiflora rose.

General Comments: Apply as a broadcast treatment on annual, biennial, and perennial broadleaf weeds when plants are actively growing. Spot treatments may be used on individual plants or small areas of undesirable vegetation. For multiflora rose, Crossbow can be applied when plants are dormant or breaking dormancy using an undiluted thinline basal application or lo-oil dormant stem treatment. For control of susceptible trees and prevention of sprouts of cut trees, Crossbow may be applied to freshly cut surfaces as a stump treatment. Consult label for specific rates to use depending on vegetation to be controlled.

Precautions: Do not apply to pastures seeded with forage legumes, such as clover, as severe injury to the forage can result. Avoid applications of Crossbow when sensitive crops, such as tobacco, vegetable crops, or other desirable plants and trees, are growing nearby. Do not apply near

sensitive crop areas if conditions on day of treatment are favorable for off site spray drift, such as when wind speed exceeds 5 mph, air temperature is expected to exceed 85°F, and/or temperature inversions exist. Do not reseed pastures within a minimum of 3 weeks after treatment.

Grazing and Hay Restrictions: If two gallons per acre or less is applied, wait 14 days after treatment before grazing lactating dairy animals. No waiting period exists between treatment and grazing for other livestock. Hay harvested as dried forage requires a 7-day waiting period after treatment before cutting if hay is fed to non-lactating animals; wait until the next growing season if harvested hay will be fed to lactating dairy animals. If more than two gallons per acre of Crossbow is applied, consult label for additional grazing and haying restrictions. Animals for slaughter should be withdrawn from treated grass or consumption of treated hay at least 3 days before slaughter.

2,4-D *(Various Products)*

Most products contain either 4 or 6 lb ai/gal of 2,4-D. For use on grass pastures, fencerows, and other farmstead (non-cropland) sites.

Use Rate: Consult label rates for specific product used. In general, for products containing 4 lb ai/gal of 2,4-D, use 2 pt/A for annuals and 2 to 4 pt/A for biennial and perennial broadleaf weeds.

Additives: Not required.

Weeds: Control or suppress growth of broadleaf weeds, such as bull thistle, dandelions, musk thistle, mustards, and pigweeds.

General Comments: Apply as a broadcast treatment on annual, biennial, and perennial broadleaf weeds when plants are small and actively growing. Spray musk thistle or other biennial weeds when plants are in the seedling to rosette stage, and before flower stalks are initiated. Consult label for specific rates to use depending on vegetation to be controlled.

Precautions: Do not apply to pastures seeded with forage legumes, such as clover, as severe injury to the forage can result. Do not apply to newly seeded areas until grass becomes well established. Avoid applications of 2,4-D when sensitive crops, such as tobacco, vegetable crops, or other desirable plants and trees, are growing nearby. Do not apply near sensitive crop areas if conditions on day of treatment are favorable for off site spray drift, such as when wind speed exceeds 5 mph, air temperature is expected to exceed 85°F, and/or temperature inversions exist. Do not reseed pastures or rotate to other crops for 3 months after treatment or until chemical has dissipated from the soil.

Grazing and Hay Restrictions: Consult product used for specific guidelines. In general, with 2,4-D ester formulations do not graze livestock on treated areas within 7 days after treatment; for 2,4-D amine formulations do not graze dairy cattle in treated areas for 7 days after application. Do not permit dairy animals or meat animals being finished for slaughter to forage treated fields within 3 days of slaughter. Do not cut grass for hay within 30 days after application.

Roundup Ultra

Roundup Ultra contains 4 lb ai glyphosate per gallon. For use in pastures, fencerows, and other farmstead (non-cropland) sites.

Use Rate: Apply as a 1 to 2% solution as a spot treatment.

Additives: Not required.

Weeds: For non-selective control of grasses, broadleaf weeds, and certain woody species.

General Comments: Apply as a spot treatment or wiper application for control of many annual, biennial, and perennial weeds in grass and legume pastures containing bermudagrass, bluegrass, fescue, orchardgrass, timothy, alfalfa, and/or clover. Apply in areas where the movement of livestock can be controlled. Treat no more than one-tenth of any acre at one time. Applications can be made in the same area at 30-day intervals.

Precautions: This herbicide treatment will kill all desirable grasses and plants in area treated, except when used with rope or sponge wick applicators. Do not apply near sensitive crop areas if conditions on day of treatment are favorable for off-site spray drift, such as when wind speed exceeds 5 mph.

Grazing and Hay Restrictions: Remove livestock before application and wait 14 days after application before grazing livestock or harvesting.

Stinger

Stinger contains 3 lb ai clopyralid per gallon. For use on established grass pastures, fencerows, and general farmstead (non-cropland) sites.

Use Rate: Broadcast at 0.33 to 1.33 pt/A depending on weed species and stage of growth.

Additives: Not required.

Weeds: Control or suppress growth of selected broadleaf weeds, such as Canada thistle, curly dock, musk thistle, and ragweeds.

General Comments: Apply as a broadcast treatment on annual, biennial, and perennial broadleaf weeds when plants are young and actively growing. Consult label for specific rates to use depending on vegetation to be controlled.

Precautions: Do not apply to pastures seeded with forage legumes, such as alfalfa, clover, or lespedeza, as severe injury to the forage can result. Avoid applications of Stinger when sensitive crops, such as tobacco, vegetable crops, or other desirable broadleaf plants, are growing nearby. Do not apply near sensitive crop areas if conditions on day of treatment are favorable for off-site spray drift, such as when wind speed exceeds 5 mph. The minimum waiting period before overseeding or planting fields treated with Stinger to other crops is any time for field corn, grasses, wheat, barley, and oats; 10.5 months for alfalfa, sorghum, popcorn, and soybeans; and 18 months for other crops.

Grazing and Hay Restrictions: There are no grazing restrictions when Stinger is applied at label use rates. Do not transfer livestock from treated grazing areas onto sensitive broadleaf crop areas, such as clover, without first allowing 7 days of grazing on an untreated pasture.

Weedmaster

Weedmaster is a premixture product containing dicamba (1 lb ai/gal) and 2,4-D (2.87 lb ai/gal). For use on established grass pastures, fencerows, and general farmstead (non-cropland) sites.

Use Rate: Broadcast at 1 to 4 pt/A depending on weed species and stage of growth. For spot treatment mix 1 oz product per 1 gallon of water.

Additives: Not required, but may be added.

Weeds: Control or suppress growth of several broadleaf weeds, such as bull thistle, buttercup, cocklebur, curly dock, musk thistle, and certain woody brush, such as multiflora rose.

General Comments: Apply as a broadcast treatment on annual, biennial, and perennial broadleaf weeds when plants are young and actively growing. Spot treatments may be used on individual plants or small areas of undesirable vegetation.

Precautions: Do not apply to pastures seeded with forage legumes, such as alfalfa, clover, or lespedeza, as severe injury to the forage can result. Avoid applications of Weedmaster when sensitive crops, such as tobacco, vegetable crops, or other desirable plants and trees, are growing nearby. Do not apply near sensitive crop areas if conditions on day of treatment are favorable for off site spray drift, such as when wind speed exceeds 5 mph, air temperature is expected to exceed 85°F, and/or temperature inversions exist.

Grazing and Hay Restrictions: The waiting period before grazing lactating dairy animals is 7 days after treatment. No waiting period exists between treatment and grazing for non-lactating animals. However, meat animals cannot be removed from treated areas for slaughter prior to 30 days after last application. Wait 37 days before harvesting treated grasses for dry hay.

Tank Mixtures: Ally, Roundup Ultra.

Herbicides for Non-Grazed Fencerows, Buildings, and Other Farmstead Sites

Some herbicide products are not registered for use in grazed pastures and hayfields (e.g., BrushMaster, BrushKiller, Brush-No-More, Contain, etc.). These products are labeled for control of unwanted vegetation around buildings, farm structures, non-grazed fencerows, or other non-cropland areas. Since these products are designated for use only on non-cropland sites, they often do not indicate grazing restrictions for livestock. Fencerows surrounding a pasture or hayfield represent part of the pasture area; therefore, herbicide products labeled only for non-cropland sites generally should not be applied to fencerows adjacent to pastures, around buildings, or other areas accessible to domestic animals.

Brushmaster

Brushmaster is a mixture containing 2,4-D (1.05 lb ai/gal), 2,4-DP (1.05 lb ai/gal), and dicamba (0.25 lb ai/gal). For control of unwanted vegetation in fencerows, farmyards, and similar non-crop areas not grazed by domestic animals.

Use Rate: Broadcast Foliar: 1 to 2 gal per 100 gal of water or 4 to 8 oz per 3 gal of water (1 to 2% v/v). Basal or Cut Surface: Mix 10 oz product with 1 gal of oil (i.e., diesel oil, fuel oil, kerosene, etc.).

Weeds: Control or suppress growth of selected woody brush and other herbaceous broadleaf weeds.

General Comments: For use as a Broadcast Foliar application apply as a full cover spray wetting all leaves, stems, and root collars of woody plants. For Basal Bark apply a coarse spray as a drench treatment to the base of stems and trunks up to a height of 18 to 24 inches. For Cut Surface or Stump Treatment apply a coarse spray on newly cut surfaces.

Precautions: Avoid applications of Brushmaster when sensitive crops, such as tobacco, vegetables, fruit crops, or other desirable plants and trees, are growing nearby. Do not apply if conditions are favorable for off site spray drift such as when wind speed exceeds 5 mph, air temperature is expected to exceed 85°F, and/or temperature inversions exist.

Grazing and Hay Restrictions: Do not apply to areas that will be grazed by domestic animals.

Spike 20P

Spike 20P contains 0.2 lb ai tebuthiuron per lb product. For use in pastures, fencerows, and other farmstead (non-cropland) sites.

Use Rate: For individual plants, multistem clumps, or small stands of woody vegetation apply at a rate of 3/8 to 3/4 oz per 100 sq ft (equivalent to a broadcast rate of 10 to 20 lb/A).

Weeds: For control of woody plants and brush, such as multiflora rose.

General Comments: Spike 20P is a pellet formulation of a surface-applied, soil-active herbicide. Apply as a spot treatment around woody vegetation anytime throughout the year except when the soil is frozen or is saturated with moisture. For optimum results, apply prior to active seasonal growth in the spring or before expected seasonal rainfall.

Precautions: May cause injury to herbaceous vegetation in area treated. Avoid applications near desirable trees, shrubs, etc. Spike or treated soil may be moved from application areas by flowing water or mechanical means. Allow 2 years after application before reseeding.

Grazing and Hay Restrictions: Grazing is allowed in areas treated with 20 lb/A or less. Do not cut hay for livestock feed for one year after a Spike treatment.

Table 5. Guide to woody plant response to herbicides

		Foliar Surface Spray							Thin-Line Basal		Cut Stump or Surface		Soil Treatment	
	MECHANICAL	Ally	Banvel	Brushmaster	Crossbow	2,4-D	Roundup	Weedmaster	Banvel	Crossbow	Banvel	Crossbow	Spike 20P	Velpar
Labled Sites														
Pastures/Grazing Land		L	L	N	L	L	L	L	L	L	L	L	L	L
Hayfields		L	L	N	L	L	L	L	L	L	L	L	N	L
Fencerow/Pasture Fields		L	L	N	L	L	L	L	L	L	L	L	L	L
Fencerow (non-grazed)		L	L	L	L	L	L	L	L	L	L	L	L	L
Woody Plants														
Blackberry	M	R	F	F	R	N	R	R	F	R	N	N	R	R
Buckbrush (Coralberry)	M	R	N	F	F	R	N	R	N	N	N	N	R	F
Cherry, Wild Black	CT	N	R	R	F	N	R	N	N	N	R	N	F	*
Honeysuckle	*	*	F	R	R	N	R	F	N	N	N	N	R	N
Kudzu	*	F	R	R	F	N	R	R	N	N	N	N	F	N
Locust, Black	CT	N	F	R	R	N	F	F	N	N	R	R	R	*
Locust, Honey	CT	N	F	R	R	N	F	R	N	N	R	R	R	R
Mulberry	CT	N	N	N	N	N	N	N	N	N	N	N	F	F
Multiflora Rose	M	R	R	R	R	N	R	N	R	R	N	N	R	R
Osage Orange	CT	*	N	F	N	N	N	N	N	N	N	F	N	F
Poison Ivy	*	N	F	R	R	F	R	R	N	N	F	N	N	F
Redcedar, Eastern	C	N	N	F	N	N	N	*	N	N	N	N	N	F
Trumpetcreeper	M	N	R	*	F	N	R	N	N	N	R	N	F	N

Labeled Sites: L= Labeled; N=Not Labeled; * = No Information

Mechanical Controls: M=Mow, C=Cut below green growth, CT=Cut and treat cut surface

Herbicide Treatment:

R= Recommend, susceptible or recommended by product label
F= Fair to partial control or growth suppression
N= Not recommended, not listed on the label or poor performance expected

Foliar Surface Spray: *Foliage is usually sprayed when plants are in full leaf and foliage is tender. June tends to be the preferred time of year. Ideally trees and brush should be less than 6 feet in height.*

Thin-Line Basal: *A low volume of herbicide applied as a solid stream across the base of stems (6 to 12 inches above groundline). This type of method may not be effective when stem diameter exceeds 3 inches or when plants have thick, rough bark. Treat when stems are dry and rain is not anticipated.*

Cut Stump or Surface: *Method consists of treating the live tissue beneath the bark. This method includes such treatments as: 1) injecting with specialized tools, 2) spraying fresh cuts made in the trunk, or 3) treating the outer surface of fresh cut stumps. These types of treatments are often used for woody plants that are beyond the brush stage.*

Soil Treatment: *Method consists of treating soil beneath plant canopy. Herbicide must be leached into the root zone for plant uptake.*

Velpar

Velpar L contains 2 lb ai hexazinone per gal. Velpar DF contains 0.75 lb ai hexazinone per lb product. For control of brush in pastures, fencerows, and other farmstead (non-cropland) sites.

Use Rate: For basal soil applications apply Velpar L as an undiluted product or mix 2.67 lb Velpar DF with sufficient water to make one gallon of suspension liquid. Apply with a handgun applicator at a rate of 2 to 4 ml for each inch of stem diameter at chest height. Do not apply more than 1/3 gallon of Velpar L or Velpar DF suspension per acre per year.

Weeds: For control and suppression of woody plants and brush, such as multiflora rose and locust sprouts.

General Comments: Apply Velpar directly to the soil within 3 ft of the root collar of woody plants to be controlled. When treating large stems, make applications on opposite sides of the stem. For optimum results, apply from late winter through summer (prebud break until new growth hardens off). Following mechanical cutting or clearing, allow stumps and injured trees sufficient time to adequately resprout before applying. Brush control depends on sufficient moisture to activate Velpar.

Precautions: Avoid applications or flushing application equipment near desirable trees, shrubs, etc. Do not use Velpar on frozen soils.

Grazing and Hay Restrictions: When applied as a basal soil treatment, there is no restriction on grazing by domestic animals nor on cutting surrounding vegetation for forage or hay. For broadcast pasture applications wait 60 days before grazing or harvesting vegetation for forage or hay.

Table 6. Herbicides labeled for use in fencerows adjacent to grazed pastures

Application Method	Remarks
Dormant Stem Applications: [For Multiflora Rose]* Banvel (0.25 oz per bush 5 ft canopy diameter) (2.25 oz per bush 15 ft canopy diameter) Crossbow (0.67 oz [20 ml] per bush with stems <0.5 inch diameter) *Apply undiluted product before plants break dormancy	Apply undiluted product in late winter before plants break dormancy. Apply Banvel to soil near root crown. Apply Crossbow to lower portions of stems with <½ inch in diameter. Do not apply when snow or water prevent application to soil or groundline.
Basal Bark Applications: Banvel (1 pt) + Diesel Oil (2.5 pt) + Water (~1.5 gal) Crossbow (5 oz) + Diesel Oil or Kerosene per 1 gal mix	Apply in late winter before plants break dormancy. Thoroughly wet all of the basal bark area including crown (base of canes or stems) and sprouts. Do not apply when snow or water prevent application to crown or ground sprouts. Do not apply near root zone of desirable trees or where runoff may occur to surface water.
Foliar Applications: Ally (1 oz/100 gal) + Surfactant (1 pt/100 gal) Banvel [1 to 2 qt/A] or [1 to 2% solution] (1.25 - 2.5 oz/ gal mix) Crossbow [1 to 1.5% solution] (1.25 to 2 oz/gal mix) Roundup Ultra [1 to 2% solution] (1.25 to 2.5 oz/ gal mix)	Apply to foliage when plants are actively growing and leaves are fully developed, usually during spring and early summer months. Do not include diesel oil with foliar sprays.
Soil Sterilants: Spike 20P (1.25 to 11 oz / 1000 sq ft)	Do not apply when soil is frozen or saturated. Do not apply near desirable plants or in areas where overland flow of water may occur. Do not disturb brush for 2 years after application.

Disclaimer

Listing of products implies no endorsement by the University of Kentucky or its representatives. Criticism of products not listed is neither implied nor intended.

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