

AGR-148

WEED CONTROL IN ALFALFA AND OTHER FORAGE LEGUME CROPS

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Introduction

The importance of weed control in forage production should not be overlooked, especially when you consider the high investment associated with alfalfa and other legume forages. Weeds reduce forage yield by competing for water, sunlight and nutrients. For example, yield obtained from the first cutting of alfalfa can be significantly reduced by a heavy infestation of common chickweed. In addition to yield losses, weeds can also lower forage quality, increase the incidence of disease and insect problems, cause premature stand loss, and create harvesting problems. Some weeds are unpalatable to livestock or in some cases may be poisonous.

Weed management strategies in forage legumes should focus first on cultural practices and then on chemical weed control practices. Vigorous, dense growing forage legume stands have fewer weed problems. Thus, cultural and management practices that promote a highly competitive forage stand prevent many weed problems. These practices include: 1) liming and fertilizing fields based on soil test recommendations; 2) seeding well-adapted, vigorous, long-lived varieties; 3) buying weed-free seed; 4) cutting forage at proper growth stage; 5) timely control of insect and disease problems; and 6) rotating crops to interrupt the buildup of certain weeds.

Because of the aggressive nature of some weed species, they can become established despite preventive efforts. Therefore, herbicide treatment may be necessary to combat some weed problems. The specific herbicides and control strategies available for use will depend on the type of forage you grow (alfalfa, alfalfa/grass mixture, clovers, or other legumes), whether your stand is a new seeding or an established stand, and the crop growth stage (dormant, non-dormant, between cutting, etc.). Table 1 is a guide to herbicides labeled for use in various forage legumes. Before using a herbicide always read and follow label directions. A guide to the relative response of weeds to these herbicides can be found in Table 2.

New Seedings

Weed control is more critical during the first year than any other period of forage production. Forage seedlings grow slowly and are easily overcome by rapidly growing weeds. Research has shown that some broadleaf weed seedlings are capable of growing five times more rapidly than certain legume seedlings. Because alfalfa stands gradually decline with age it is important to start with a good stand. A uniform, dense stand is more likely to survive longer and have fewer weed problems than a thin stand.

Site Selection: Consider the field history when you select a field for legume forage production. It may be difficult to establish and maintain a weed-free forage stand in fields known to be infested with weeds such as musk thistle, curly dock or yellow nutsedge. In addition, some herbicides which are applied in previously-grown crops have the potential to carryover and cause injury to newly-seeded forages. Alfalfa and other forage crops are sensitive to low concentrations of herbicides that contain atrazine (i.e. AAtrex, Bicep, Bullet, Extrazine II, Guardsman, Harness Xtra, Surpass 100, Sutazine), clomazone (i.e. Command, Commence), chlorimuron ethyl (i.e.

Canopy, Classic, Lorox Plus), and imazaquin (i.e. Scepter, Squadron, Tri-Scept). More information on herbicides that have a potential to injure alfalfa and other forages can be obtained from your local county Extension office and on the label of herbicide products used in a previous crop.

Time of Seeding: Weed control is one of many factors that will determine whether you seed your fields in the spring or fall. As a general rule, the summer complex of weeds tend to overcome spring seedings; whereas, the winter weed complex tend to outcompete forages seeded in the fall. Therefore, for optimum establishment of most forage crops, you should consider fall seedings in fields that have a history with such weeds as large crabgrass, foxtails, or lambsquarters; consider spring seedings in fields that are potentially infested with common chickweed, henbit, and yellow rocket.

Weed-Free Seed: Using weed-free seed is the first step to prevent the introduction of weeds. You should check the seed tag to determine the purity of the seed. Noxious weeds such as dodder or johnsongrass are required by law to be listed on the label if seed analysis has determined that they are a contaminant in the seed lot.

Liming and fertilization: Adjusting soil pH and nutrient levels according to soil test recommendations is important during the establishment phase and throughout the life of the forage stand. The objective is to achieve a competitive alfalfa stand which is capable of suppressing weed emergence and growth. Proper liming and fertility are not effective for eliminating weeds that have already become established, especially in areas where the forage stand is poor. Likewise, some weeds such as chickweed, curly dock, and crabgrass respond favorably to fertilization. Thus, other weed control methods are often needed in addition to proper fertility.

Clipping new seedings: Clipping or mowing can be an effective option for controlling some weeds such as common cocklebur or jimsonweed in legume forage stands. This method controls weeds by removing the leaves and lateral buds that develop new growth. Annual broadleaf weeds have buds that develop above the soil surface, they are more easily controlled with clipping or mowing than grasses, which have crown buds near the soil surface. Mow as low as possible to be effective. Because alfalfa plants and other legumes have crown buds they can tolerate low clipping. When you clip new seedings, be careful not to smother forage legumes with heavy residues; remove clipped vegetation when weed infestations are heavy.

Herbicides for new seedings: Herbicides used for new seedings are designed to eliminate or reduce competition from rapidly-growing weeds during the establishment phase. In some instances herbicides that aid alfalfa establishment have also contributed to higher yields in subsequent years and greater longevity of stands. During seedling development forage grasses usually are susceptible to injury from herbicides used in legume establishment. Subsequently, no herbicides are registered for new seedings of legume-grass mixtures.

Maintaining Established Stands

Established forage legumes are capable of growing fairly rapidly and competing against many weed seedlings during the growing season. However, weeds gradually invade fields where forage stands decline with age. Timely mowing and the use of herbicides may aid in weed control and prolong the life of the stand.

If you have a weed problem that occurs in field borders, along fence rows or in adjacent fields you should mow or spray to prevent production and spread of weed seed from these areas into alfalfa and other hay fields. This is particularly important for such weeds as musk thistle, which is capable of producing a large number of seed that are easily spread to new areas.

Clipping established stands: The routine mowing of legumes for hay is sometimes effective in controlling some perennial weeds by reducing food reserves and plant vigor. However, in grazed forages, livestock often selectively graze and may leave such weeds as chicory or musk thistle. Mowing soon after livestock have been removed from the field can help control these weeds and prevent seed production and further spread of infestations.

Herbicides for established stands: Several herbicide options are available for established alfalfa stands. You can use many of the same herbicides available for new seedings. Furthermore, the deep root system of established plants such as alfalfa enables them to tolerate certain herbicides that are not suitable for new seedings. When you select herbicides for forage legumes, consider such factors as whether the herbicide can be applied as a dormant season, non- dormant, or between cutting treatment (Table 2), effectiveness on weeds species to be controlled (Table 3), feeding and grazing limitations (Table 4), rotational crop restrictions, and cost of treatment.

Scouting Methods for Forage Crops

Scouting for weed problems early is an effective tool for finding and effectively controlling weed problems before they develop into situations which can not be managed easily. This requires a trained eye and the ability to identify weeds in their early growth stages. Winter annual weeds, such as common chickweed and henbit, usually germinate in the late fall or winter and are present in early spring. Whereas the summer weed complex, such as crabgrass and common ragweed, will be present after the first harvest through a killing frost in the fall.

Weed infestation levels, or weed density, should be determined by estimating the percent ground cover occupied by weeds. This can be accomplished by randomly selecting one site within the field for every 10 acres. A minimum of three sites should be selected in fields with less than 20 acres. At each field site an area of approximately 30 feet by 30 feet should be used to determine the percentage of weeds present. Keep in mind that fields which appear almost weed free could have a 5% weed density. Only in extremely poor alfalfa stands will weed infestations in excess of 50% occur. At each site record the predominant species and its size at the time of sampling. Refer to the "Kentucky Integrated Crop Management Manual for Alfalfa" for additional information on field scouting.

Table 1. Herbicide Products, Active Ingredients, REI's, and Manufacturers.

Herbicide	Active Ingredient	EPA Reg. No.	REI's (hrs) ^a	Manufacturer
Balan 60DF	benefin (60% w/w)	34704-746	12	Platte Chemical
Buctril 2EC	bromoxynil (2 lb ai/gal)	264-437	12	Rhone-Poulenc
Buctril GEL	bromoxynil	264-531	12	Rhone-Poulenc

	(4 lb ai/gal)			
Butyrac 200	2,4-DB (2 lb ai/gal)	264-105	48	Rhone-Poulenc
Etam 7-E	EPTC (7 lb ai/gal)	10182-220	12	Zeneca
Gramoxone Extra #	paraquat (2.5 lb ai/gal)	10182-280	12 ^b	Zeneca
Kerb 50-W #	pronamide (50% w/w)	707-159	12	Rohm and Haas
Lexone DF or [Lexone SP]	metribuzin (75% w/w)	352-390 [352-550]	12	DuPont
Poast	sethoxydim (1.5 lb ai/gal)	7969-58	12	BASF
Poast Plus	sethoxydim (1 lb ai/gal)	7969-88	12	BASF
Pursuit 2S	imazethapyr (2 lb ai/gal)	241-310	12	American Cyanamid
Pursuit DG	imazethapyr (70% w/w)	241-350	12	American Cyanamid
Roundup	glyphosate (4 lb ai/gal)	524-445	12	Monsanto
Sencor 4	metribuzin (4 lb ai/gal)	3125-314	12	Bayer
Sencor DF or [Solupak]	metribuzin (75% w/w)	3125-325 [3125-402]	12	Bayer
Sinbar	terbacil (80% w/w)	352-317	12	DuPont
Velpar L	hexazinone (2 lb ai/gal)	352-392	24	DuPont
Velpar WSP	hexazinone (90% w/w)	352-378	24	DuPont

^a Label guidelines for Restricted-Entry Interval (REI) into fields following treatment. Consult label for other Worker Protection Standards and Personal Protective Equipment (PPE) required when handling and applying these herbicide products.

^b Worker Protection Standards require both an oral warning and posting.

Restricted Use Pesticide

Table 2. Guide to Herbicide Products Labeled for Legume Forage Crops

Herbicide	Crops Labeled for Use	Time of Application
Before Seeding		
Balan	Alfalfa, Clovers (alsike, ladino, red), Birdsfoot Trefoil	Before Planting [Preplant Incorporate]
Eptam	Alfalfa, Clover, Lespedeza, Birdsfoot Trefoil	Before Planting [Preplant Incorporate]
Gramoxone Extra	Alfalfa, Clover, Lespedeza, Birdsfoot Trefoil	Before Planting
Roundup	Alfalfa, Clover	Before Planting
New Seedings¹		
Buctril	Alfalfa	Non-Dormant
Butyrac 200 [2,4-DB]	Alfalfa, Clovers (alsike, ladino, red), Birdsfoot Trefoil	Non-Dormant
Gramoxone Extra	Alfalfa, Clover, Lespedeza, Birdsfoot Trefoil, Crown Vetch	Dormant Season
	Alfalfa	Between Cutting
Kerb	Alfalfa, Clover, Birdsfoot Trefoil, Crown Vetch	Dormant Season or Non-Dormant
Poast Plus or Poast	Alfalfa	Non-Dormant
Pursuit	Alfalfa	Non-Dormant
Roundup	Alfalfa, Alfalfa-Grass Mixtures, Clover	Spot Treatment
Established Stands²		
Butyrac 200 [2,4-DB]	Alfalfa	Non-Dormant
Gramoxone Extra	Alfalfa, Clover, Lespedeza, Birdsfoot Trefoil, Crown Vetch	Dormant Season
	Alfalfa	Between Cutting
Kerb	Alfalfa, Clover, Birdsfoot Trefoil, Crown Vetch	Dormant Season
Lexone	Alfalfa, Alfalfa-Grass Mixtures	Dormant Season
Poast Plus or Poast	Alfalfa	Non-Dormant

Pursuit	Alfalfa	Dormant, Post Dormant, or Between Cutting
Roundup	Alfalfa, Alfalfa-Grass Mixtures, Clover	Spot Treatment
Sencor	Alfalfa, Alfalfa-Grass Mixtures	Dormant Season or Post Dormant
Sinbar	Alfalfa	Dormant Season
Velpar	Alfalfa	Dormant, Post Dormant, or Between Cutting

1 Emerged stands less than 1 year old

2 Established stands 1 year old or older

Table 3. Guide to the Relative Response of Weeds to Herbicides

	Before Seeding		Non-Dormant				Dormant Season			Dormant or Between Cutting			Spot Treat
	Balan	Eptam	Bucril	Butyrac 200	Poast Plus/Poast	Pursuit	Kerb	Lexone/Sencor	Sinbar	Pursuit	Velpar	Gramoxone Extra	Roundup
Cool Season Annuals													
Common Chickweed	F	F	F	P	N	G	G	G	G	G	G	G	G
Henbit	P	F	F	P	N	F	F	G	G	F	F	F	G
Mustard, Wild	P	P	G	F	N	G	G	G	G	G	G	G	G
Field Pennycress	P	P	G	F	N	G	P	G	G	G	G	F	G
Shepherdspurse	P	P	F	F	N	G	G	G	G	G	G	G	G
Yellow Rocket ¹	P	F	F	G	N	F	F	G	G	F	G	F	G
Musk Thistle ¹	N	N	P	F	N	P	P	P	P	P	F	P	F
Warm Season Annual Grasses													
Crabgrass	G	G	N	N	G	F	F	F	F	F	G	F	G

Fall Panicum	G	G	N	N	G	F	F	F	F	F	F	F	G
Foxtails	G	G	N	N	G	G	F	F	F	G	G	G	G
Johnsongrass (seedling)	F	F	N	N	G	G	P	P	F	G	*	F	G
Warm Season Annual Broadleaves													
Cocklebur	N	P	G	G	N	G	P	F	*	G	F	F	G
Jimsonweed	N	P	G	F	N	F	*	F	*	F	G	G	G
Lambsquarters	F	F	G	G	N	P	F	G	G	P	G	F	G
Pigweeds	G	F	F	G	N	G	P	G	F	G	G	G	G
Ragweed, Common	P	P	G	G	N	F	P	F	F	F	F	G	G
Ragweed, Giant	P	P	F	F	N	G	P	F	P	G	P	F	G
Smartweed	P	P	G	F	N	G	P	F	F	G	F	F	G
Perennials													
Dandelion	N	N	P	F	N	*	N	G	P	*	G	F	G
Dock, Curly	N	N	P	F	N	F	P	F	P	F	P	P	G
Orchardgrass	F	F	N	N	F	*	G	F	F	*	F	F	G
Plantain	N	N	P	F	N	*	P	F	F	*	G	F	G
Quackgrass	N	P	N	N	F	*	G	P	P	*	F	P	G
Red Sorrel	N	N	P	P	N	*	G	P	F	*	P	P	F
Tall Fescue	F	F	N	N	F	*	P	P	P	*	*	F	G

Yellow Nutsedge	N	F	N	N	N	P	N	P	P	P	P	F	F
Johnsongrass (rhizome)	P	P	N	N	F	P	N	N	*	P	*	N	G

*1*Biennial plant which emerges in late fall or early spring.

G = Good F = Fair P = Poor N = None

* = Data Not Available

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

Table 4. Minimum Waiting Period Following Herbicide Application Before Cutting for Feed or Grazing Treated Forage

Herbicide	Waiting Period ¹
BALAN	**
BUCTRIL	
- Spring Treated	30 days
- Fall or Winter treated	60 days
BUTYRAC 200	
- Alfalfa (established)	30 days
- Alfalfa, Clover, Birdsfoot Trefoil (new seedings)	60 days
EPTAM	**
GRAMOXONE EXTRA	
- Alfalfa	
(Before Seeding)	**
(Dormant Season)	60 days
(Between Cutting)	30 days
- Clovers, Lespedeza, Trefoil, Crown Vetch	60 days
KERB	120 days
LEXONE	28 days
POAST PLUS or POAST	

- Dry forage (hay)	14 days
- Green-chop forage	7 days
- Grazing	7 days
PURSUIT	30 days
ROUNDUP	
- Before seeding	8 weeks
- Spot treatment	14 days
SENCOR	
- Dormant Season	28 days
- Post Dormant	60 days
SINBAR	**
VELPAR	30 days

¹This table should be used only as a guide for herbicide treated forage crops. Always refer to the herbicide label for specific information. A "***" indicates no waiting period listed on the product label.

NEW ALFALFA SEEDINGS

Pure Stands Less Than 1 Year Old

Before Seeding-Preplant Foliar

ROUNDUP 1 to 3 qt/A

Weeds Controlled: Annual and perennial grasses and broadleaf plants. Consult label for specific weeds control, application rates and stages of weed growth.

Remarks: Apply no later than prior to seeding. Remove domestic livestock before application and wait 8 weeks after application before grazing or harvesting treated vegetation.

GRAMOXONE EXTRA 2.5S 2 to 3 pt/A + SURFACTANT (80% NONIONIC) 1 pt/100 gal water

Weeds Controlled: Annual grasses and broadleaf weeds and certain perennials. Consult label for specific weeds controlled, application rates and stages of weed growth.

Remarks: Apply postemergence to undesirable vegetation either before or after seeding but before crop emerges. Do not use around home gardens, schools, recreational parks, golf courses, or playgrounds.

Before Seeding-Preplant Incorporated

BALAN 60DF 2 to 2.5 lb/A

Weeds Controlled: Crabgrass, fall panicum, foxtails, and pigweeds.

Remarks: Apply and incorporate just before seeding. See incorporation directions on label. Do

not use if a grass or small grain nurse crop is to be planted with the legume. Temporary stunting of legumes may result if conditions are not favorable for germination or growth.

EPTAM 7E 3.5 pt/A

Weeds Controlled: Crabgrass, fall panicum, and foxtails.

Remarks: Apply and incorporate just before seeding. See incorporation directions on label. Do not use if a grass or small grain nurse crop is to be planted with the legume. Temporary stunting of legumes may result if conditions are not favorable for germination or growth.

New Seedings-After Crop Emergence

BUTYRAC 200 [2,4-DB] 1 to 3 qt/A

Weeds Controlled: Cocklebur, lambsquarters, pigweeds, common ragweed, and yellow rocket.

Non-Dormant: Apply in the fall or spring after the crop is in the 2- to 4-trifoliolate leaf stage and before weeds exceed the 4-leaf stage or rosettes exceed 1.5 inches across. Do not apply if temperature is expected to be less than 40°F or greater than 90°F. New alfalfa seedings should not be grazed or used for feed within 60 days after application. Do not apply BUTYRAC 200 (2,4-DB) with a spray adjuvant (crop oil or surfactant) unless specified by the label or tank mixture combination. Consult BUTYRAC 200 label for rates and additional comments before tank mixing with BUCTRIL or POAST.

BUCTRIL 2EC 1 to 1.5 pt/A or BUCTRIL GEL 0.5 to 0.75 pt/A

Weeds Controlled: Cocklebur, common ragweed, jimsonweed, lambsquarters, smartweed, wild mustard, field pennycress, and certain other broadleaf weeds.

Non-Dormant: Do not add a surfactant or crop oil because increased alfalfa injury can occur. Follow label directions for herbicide rate and specific weeds controlled. Apply in the fall or spring to seedling alfalfa with a minimum of 4 trifoliolate leaves and apply before weeds exceed the 4 leaf stage, 2 inches tall, or 1 inch in diameter. Unacceptable crop injury may occur if temperatures are expected to be low (less than 50°F) or exceed 70°F for 3 days following application. Do not cut for feed or graze spring treated alfalfa within 30 days after application; if fall or winter treated, wait until spring or 60 days following application. Consult BUCTRIL for application rates and additional comments when tank mixing with BUTYRAC 200.

POAST PLUS 1E 1.5 to 3.75 pt/A or POAST 1.5E 1 to 2.5 pt/A + DASH or OIL
CONCENTRATE 2 pt/A

Weeds Controlled: Crabgrass, fall panicum, foxtails, johnsongrass, shattercane and certain other grasses.

Non-Dormant: Apply to grasses that are actively growing and within their optimum plant heights for best results. For rhizome johnsongrass, more than one application may be required. The first application should be applied when johnsongrass plants are 15-25" tall; if regrowth occurs or new plants emerge, make the second application to plants 6-12" tall. Avoid applications when grasses are stressed by lack of moisture, mechanical injury, or other factors. Apply a minimum of one hour before expected rainfall. Wait 14 days following application before harvesting for [dry] hay. Treated fields can be grazed or fed as a green-chop [undried] forage within 7 days after

application. Do not apply more than a total of 9.75 pt/A of POAST PLUS or 6.5 pt/A of POAST in one season. Consult the labels of POAST PLUS or POAST before tank mixing with BUTYRAC 200 (2,4-DB).

PURSUIT 70DG 1.08 to 2.16 oz/A or PURSUIT 2S 3 to 6 oz/A

[1 soluble bag treats 5 acres @ 1.44 oz/A + SURFACTANT (>80% Non-Ionic) 2 pt/100 gal or CROP OIL CONCENTRATE 1.5 to 2 pt/A + LIQUID FERTILIZER SOLUTION (28%N, 32%N, or 10-34-0) 1 to 2 qt/A

[Ammonium Sulfate 2.5 lb/A may be used instead of Liquid Fertilizer]

Weeds Controlled: Cocklebur, common chickweed, foxtails, johnsongrass (seedling), field pennycress, pigweeds, giant ragweed, shepherdspurse, smartweed, and wild mustards.

Non-Dormant: Apply when seedling alfalfa has 2 fully expanded trifoliolate leaves or larger and when the majority of weeds are 1 to 3 inches tall or before low growing weeds (rosettes) exceed 3 inches. Apply PURSUIT a minimum of one hour before expected rainfall. Temporary height reduction or slight leaf yellowing is occasionally observed soon after application of PURSUIT. Growth of perennial grasses present (such as orchardgrass, fescues, bromes, or timothy) may be suppressed. Do not feed, graze, or harvest alfalfa for 30 days following application. A maximum total of 2.16 oz/A of PURSUIT DG or 6 oz/A of PURSUIT 2S can be applied per year. Rotational crops that may be planted include soybeans anytime after application; alfalfa, rye, or wheat after 4 months; field corn after 8.5 months; barley or tobacco after 9.5 months; and oats, popcorn, sorghum, sunflowers, or sweet corn after 18 month. Other crops not listed on the label require a minimum 26 month waiting period. When PURSUIT is used in combination with a labeled tankmixed partner (i.e. BUCTRIL, BUTYRAC 200 [2,4-DB], POAST, or POAST PLUS) consult the labels of the products to be mixed.

KERB 50W 1 to 3 lb/A

Weeds Controlled: Common chickweed, wild mustard, orchardgrass, quackgrass, red sorrel (from seed), and shepherdspurse.

Dormant Season: Optimum results occur when applied in the fall or early winter under cool temperature conditions (55°F or less), but before soil freeze-up. Best if applied before weeds emerge. In fall seeded forage legumes, applications should be made after legumes have reached the trifoliolate leaf stage. In spring- seeded legumes, applications should be made the following fall or early winter. Do not graze or harvest for forage within 120 days after treatment.

GRAMOXONE EXTRA 2.5S [see below for rates] + SURFACTANT (>80% Non-Ionic) 1 pt/100 gal

Weeds Controlled: Annual grasses and broadleaf weeds. Established weeds and the stubble of weeds cut off during harvest will be less affected by this treatment compared with weed seedlings.

Dormant Season: GRAMOXONE EXTRA 13 to 24 fl.oz/A (0.8 to 1.5 pt/A). Apply during the late fall or winter months after last fall cutting and before spring regrowth is more than 2 inches. CAUTION: Applications to alfalfa that is not dormant, or has broken dormancy, may result in stand and/or yield reductions. Replanting may be necessary. Green alfalfa foliage present at the time of application will be burned. Do not apply more than once per season. Do not graze, cut or

harvest treated fields within 60 days after application.

Between Cutting: GRAMOXONE EXTRA 13 fl.oz/A (0.8 pt/A). Apply immediately after alfalfa has been removed for hay or silage. **Do not treat more than 5 days after cutting.** First year alfalfa stands and yields may be reduced if alfalfa is allowed to regrow more than 2 inches. Do not apply more than twice during the growing season. Do not graze, cut, or harvest within 30 days after application.

Remarks: Do not use GRAMOXONE EXTRA around home gardens, schools, recreational parks, golf courses, or playgrounds.

ROUNDUP 4S (Spot Treatment) 2 to 2.5 oz/gal

Weeds Controlled: Annual and perennial grasses and broadleaf weeds. Consult label for rates and stages of weed growth.

Non-Dormant: The crop receiving spray in treated area will be killed. No more than one-tenth of any acre should be treated at one time. Remove domestic livestock before application and allow 14 days following spot treatment before grazing livestock or harvesting treated forage.

ESTABLISHED ALFALFA STANDS

Pure Stands 1 Year Old or Longer

BUTYRAC 200 [2,4-DB] 1 to 3 qt/A

Weeds Controlled: Cocklebur, lambsquarters, pigweeds, common ragweed, and yellow rocket.

Non-Dormant: Apply in the fall or spring when weeds are small. Do not apply if temperature is expected to be less than 40°F or greater than 90°F. Established alfalfa stands should not be grazed or used for feed within 30 days after application. Do not apply BUTYRAC 200 (2,4-DB) with a spray adjuvant (crop oil or surfactant) unless specified by the label or tank mixture combination. Consult the BUTYRAC 200 label for rates and additional comments before tank mixing with POAST.

POAST PLUS 1E 1.5 to 3.75 pt/A or POAST 1.5E 1 to 2.5 pt/A + DASH or OIL
CONCENTRATE 2 pt/A

Weeds Controlled: Crabgrass, fall panicum, foxtails, johnsongrass, shattercane and certain other grasses.

Non-Dormant: Apply to grasses that are actively growing and within their optimum plant heights for best results. For rhizome johnsongrass, more than one application may be required. The first application should be applied when johnsongrass plants are 15-25" tall; if regrowth occurs or new plants emerge, make the second application to plants 6-12" tall. Avoid applications when grasses are stressed by lack of moisture, mechanical injury, or other factors. Apply a minimum of one hour before expected rainfall. Wait 14 days following application before harvesting for [dry] hay. Treated fields can be grazed or fed as a green-chop [undried] forage within 7 days after application. Do not apply more than a total of 9.75 pt/A of POAST PLUS or 6.5 pt/A of POAST in one season. Consult the labels of POAST PLUS or POAST before tank mixing with BUTYRAC 200 (2,4-DB).

KERB 50W 1 to 3 lb/A

Weeds Controlled: Common chickweed, wild mustard, orchardgrass, quackgrass, red sorrel (from seed), and shepherdspurse.

Dormant Season: Optimum results occur when applied in the fall or early winter under cool temperature conditions (55°F or less), but before soil freeze-up. For best results apply before weeds emerge. In fall-seeded forage legumes, applications should be made after legumes have reached the trifoliolate leaf stage. In spring-seeded legumes, applications should be made the following fall or early winter. Do not graze or harvest for forage within 120 days after treatment.

SINBAR 80W 1 to 1.5 lb/A

Weeds Controlled: Common chickweed, crabgrass, foxtails, henbit, lambsquarters, wild mustard, pepperweed, prickly lettuce, shepherdspurse, and yellow rocket.

Dormant Season: Apply in the fall after plants become dormant or in spring before new growth begins. Apply before or after emergence of weeds, but before weeds exceed 2" tall or across. Do not apply to frozen or snow-covered ground. Interval between time of application and use of treated alfalfa for grazing or hay harvest is not discussed on the label. Do not replant treated areas to other crops within 2 years after treatment.

LEXONE 75DF or LEXONE SP 0.67 to 0.75 lb/A

Weeds Controlled: Common chickweed, dandelion, henbit, lambsquarters, wild mustard, pepperweed, pigweeds, shepherdspurse, and yellow rocket.

Dormant Season: Apply when alfalfa growth ceases in late fall or in the spring before new growth begins. Crop injury may occur if crop is under stress caused by diseases, drought, winter injury, or other factors at time of application. For best results apply to weeds that are less than 2 inches tall or before weeds exceed 2 inches in diameter. Do not apply within the first growing season (12 months) after seeding. Do not graze or harvest within 28 days after treatment.

SENCOR (75DF or Solupak) 0.67 to 1.33 lb/A or SENCOR 4 1 to 2 pt/A

Weeds Controlled: Common chickweed, dandelion, henbit, lambsquarters, wild mustard, pepperweed, pigweeds, shepherdspurse, and yellow rocket.

Dormant Season: Apply when alfalfa growth ceases in late fall or in the spring before new growth begins. Crop injury may occur if crop is under stress caused by diseases, drought, winter injury, or other factors at time of application. For best results apply to weeds that are less than 2 inches tall or before weeds exceed 2 inches in diameter. Do not apply within the first growing season (12 months) after seeding. Do not graze or harvest within 28 days after treatment.

Post Dormant: SENCOR may be applied after dormancy has broken, but prior to 3 inches of new alfalfa shoot growth, only when impregnated on dry fertilizer. Apply when alfalfa foliage is dry or crop injury may occur. When using this method, do not harvest or graze treated alfalfa for 60 days after application.

PURSUIT 70DG 1.08 to 2.16 oz/A or PURSUIT 2S 3 to 6 oz/A

[1 soluble bag treats 5 acres @ 1.44 oz/A + SURFACTANT (>80% Non-Ionic) 2 pt/100 gal or

CROP OIL CONCENTRATE 1.5 to 2 pt/A + LIQUID FERTILIZER SOLUTION (28%N, 32%N, or 10-34-0) 1 to 2 qt/A

[Ammonium Sulfate 2.5 lb/A may be used instead of Liquid Fertilizer]

Weeds Controlled: Cocklebur, common chickweed, foxtails, johnsongrass (seedling), field pennycress, pigweeds, giant ragweed, shepherdspusre, smartweed, and wild mustards.

Dormant Season or Semi-Dormant: Apply to dormant alfalfa in the fall following last cutting or in the spring to dormant alfalfa. Spring treatments should be applied prior to excessive alfalfa growth (less than 3 inches of new growth) to reduce spray interference.

Between Cutting: For weed control during the season, PURSUIT can be applied following alfalfa hay cutting. Remove the hay from the field and apply prior to excessive alfalfa regrowth.

Remarks: Apply PURSUIT a minimum of one hour before expected rainfall. Temporary height reduction or slight leaf yellowing is occasionally observed soon after application of PURSUIT. Growth of perennial grasses present (such as orchardgrass, fescues, bromes, or timothy) may be suppressed. Do not feed, graze, or harvest alfalfa for 30 days following application. A maximum total of 2.16 oz/A of PURSUIT DG or 6 oz/A of PURSUIT 2S can be applied per year. Do not apply to alfalfa during the last year of the stand. Rotational crops that may be planted include soybeans anytime after application; alfalfa, rye, or wheat after 4 months; field corn after 8.5 months; barley or tobacco after 9.5 months; and oats, popcorn, sorghum, sunflowers, or sweet corn after 18 month. Other crops not listed on the label require a minimum 26 month waiting period. When PURSUIT is used in combination with a labeled tankmixed partner (i.e. BUTYRAC 200 [2,4-DB], POAST, or POAST PLUS) consult the labels of the products to be mixed.

GRAMOXONE EXTRA 2.5S [see below for rates] + SURFACTANT (>80% Non-Ionic) 1 pt/100 gal

Weeds Controlled: Annual grasses and broadleaf weeds. Established weeds and the stubble of weeds cut off during harvest will be less affected by this treatment compared with weed seedlings.

Dormant Season: GRAMOXONE EXTRA 1.5 to 2 pt/A. Apply during late fall or winter months after last fall cutting before spring regrowth is more than 2 inches. CAUTION: Applications to alfalfa that is not dormant, or has broken dormancy, may result in stand and/or yield reductions. Replanting may be necessary. Green alfalfa foliage present at the time of application will be burned. Do not apply more than once per season. Do not graze, cut or harvest treated fields within 60 days after application.

Between Cutting: GRAMOXONE EXTRA 13 fl.oz/A (0.8 pt/A). Apply immediately after alfalfa has been removed for hay or silage. **Do not treat more than 5 days after cutting.** First year alfalfa stands and yields may be reduced if alfalfa is allowed to regrow more than 2 inches. Do not make more than 3 applications during the growing season. Do not graze, cut, or harvest within 30 days after application.

Remarks: Do not use GRAMOXONE EXTRA around home gardens, schools, recreational parks, golf courses, or playgrounds.

VELPAR L 1 to 2 qt/A or VELPAR 90WSP 0.5 to 1.5 lb/A

Weeds Controlled: Common chickweed, crabgrass, foxtails, jimsonweed, lambsquarters, wild mustard, field pennycress, pigweeds, shepherdspurse, yellow rocket and downy brome depending on when treatment is applied.

Dormant Season: Make a single application in the late fall or winter months after plants become dormant.

Post Dormant: Apply in the spring before new alfalfa growth exceeds 2 inches in height.

Between Cutting: Apply to stubble following hay removal but before alfalfa regrowth exceeds 2 inches in height.

Remarks: Apply either as a dormant, post-dormant, or between cutting treatment. VELPAR L may be impregnated on dry bulk fertilizer (follow label guidelines for mixing, proper application, and precautions). For best results apply VELPAR when weeds have not germinated or are less than 2 inches tall or across. Treat only stands established for one year or well established after one growing season. Do not graze or feed treated forage to livestock within 30 days after treatment. Corn may be planted within 12 months after last treatment. Do not plant other crops within 2 years after application.

ROUNDUP 4S (Spot Treatment) 2 to 2.5 oz/gal

Weeds Controlled: Annual and perennial grasses and broadleaf weeds. Consult label for rates and stages of weed growth.

Non-Dormant: The crop receiving spray in treated area will be killed. No more than one-tenth of any acre should be treated at one time. Remove domestic livestock before application and allow 14 days following spot treatment before grazing livestock or harvesting treated forage.

ESTABLISHED ALFALFA-GRASS MIXTURES

LEXONE 75DF or LEXONE SP 0.67 to 0.75 lb/A

Weeds Controlled: Common chickweed, dandelion, henbit, lambsquarters, wild mustard, pepperweed, pigweeds, shepherdspurse, and yellow rocket.

Dormant Season: Apply when alfalfa growth ceases in late fall or in the spring before new growth begins. Crop injury may occur if crop is under stress caused by diseases, drought, winter injury, or other factors at time of application. For best results apply to weeds that are less than 2 inches tall or before weeds exceed 2 inches in diameter. Do not apply within the first growing season (12 months) after seeding. Do not graze or harvest within 28 days after treatment.

SENCOR (75DF or Solupak) 0.67 to 1.0 lb/A or SENCOR 4 1 to 1.5 pt/A

Weeds Controlled: Common chickweed, dandelion, henbit, lambsquarters, wild mustard, pepperweed, pigweeds, shepherdspurse, and yellow rocket.

Dormant Season: Apply when alfalfa growth ceases in late fall or in the spring before new growth begins. Crop injury may occur if crop is under stress caused by diseases, drought, winter injury, or other factors at time of application. For best results apply to weeds that are less than 2

inches tall or before weeds exceed 2 inches in diameter. Do not apply within the first growing season (12 months) after seeding. Do not graze or harvest within 28 days after treatment.

Post Dormant: SENCOR may be applied after dormancy has broken, but prior to 3 inches of new alfalfa shoot growth, only when impregnated on dry fertilizer. Apply when alfalfa foliage is dry or crop injury may occur. When using this method, do not harvest or graze treated alfalfa for 60 days after application.

ROUNDUP 4S (Spot Treatment) 2 to 2.5 oz/gal

Weeds Controlled: Annual and perennial grasses and broadleaf weeds. Consult label for rates and stages of weed growth.

Non-Dormant: The crop receiving spray in treated area will be killed. No more than one-tenth of any acre should be treated at one time. Remove domestic livestock before application and allow 14 days following spot treatment before grazing livestock or harvesting treated forage.

CLOVERS and OTHER LEGUME CROPS

Herbicides for Pure Stands

Before Seeding-Preplant Foliar

ROUNDUP 1 to 3 qt/A

Crops: Clovers

Weeds Controlled: Annual and perennial grasses and broadleaf plants. Consult label for specific weeds control, application rates and stages of weed growth.

Remarks: Apply no later than prior to seeding. Remove domestic livestock before application and wait 8 weeks after application before grazing or harvesting treated vegetation.

GRAMOXONE EXTRA 2.5S 1.5 pt/A + SURFACTANT (80% NONIONIC) 1 pt/100 gal water

Crops: Clovers and Other Forage Legumes

Weeds Controlled: Annual grasses and broadleaf weeds and for suppression of existing sod. Consult label for specific weeds controlled, application rates and stages of weed growth.

Remarks: Apply to undesirable vegetation either before or at time of seeding of forage. Apply to grazed or mowed pasture not more than 3 inches in height at time of treatment. Do not use around home gardens, schools, recreational parks, golf courses, or playgrounds.

Before Seeding-Preplant Incorporated

BALAN 60DF 2 lb/A

Crops: Clovers (alsike, ladino, red) and Birdsfoot Trefoil

Weeds Controlled: Crabgrass, fall panicum, foxtails, and pigweeds.

Remarks: Apply and incorporate just before seeding. See incorporation directions on label. Do not use if a grass or small grain nurse crop is to be planted with the legume. Temporary stunting of legumes may result if conditions are not favorable for germination or growth.

EPTAM 7E 3.5 pt/A

Crops: Clovers, Birdsfoot Trefoil and Lespedeza

Weeds Controlled: Crabgrass, fall panicum, and foxtails.

Remarks: Apply and incorporate just before seeding. See incorporation directions on label. Do not use if a grass or small grain nurse crop is to be planted with the legume. Temporary stunting of legumes may result if conditions are not favorable for germination or growth.

New Seedings-After Crop Emergence

BUTYRAC 200 [2,4-DB] 1 to 3 qt/A

Crops: Seedling Clovers (alsike, ladino, red) and Seedling Birdsfoot Trefoil

Weeds Controlled: Cocklebur, lambsquarters, pigweeds, common ragweed, and yellow rocket.

Non-Dormant: Apply postemergence to forage legumes that are emerged, healthy, and actively growing for greatest selectivity. Apply before weeds exceed 3 inches tall or rosettes exceed 1.5 inches across. Avoid applications if temperature is expected to be less than 40°F or greater than 90°F. Do not graze or feed seedling clover or seedling birdsfoot trefoil within 60 days after application. Do not apply BUTYRAC 200 (2,4-DB) with a spray adjuvant (crop oil or surfactant) unless specified by the label.

New Seedings and Established Stands

KERB 50W 1 to 3 lb/A

Crops: Clover, Birdsfoot Trefoil, and Crown Vetch

Weeds Controlled: Common chickweed, wild mustard, orchardgrass, quackgrass, red sorrel (from seed), and shepherdspurse.

Dormant Season: Apply before weeds emerge. Optimum results occur when applied in the fall or early winter under cool temperature conditions (55°F or less), but before soil freeze-up. In fall seeded forage legumes, applications should be made after legumes have reached the trifoliolate leaf stage. In spring-seeded legumes, applications should be made the following fall or early winter. Do not graze or harvest for forage within 120 days after treatment.

GRAMOXONE EXTRA 2.5S [see below for rates] + SURFACTANT (>80% Non-Ionic) 1 pt/100 gal

Crops: Clover, Lespedeza, Birdsfoot Trefoil, and Crown Vetch

New Seedings: GRAMOXONE EXTRA @ 0.8 to 1.5 pt/A (13 to 24 fl.oz/A).

Established Stands: GRAMOXONE EXTRA @ 1.5 to 2 pt/A.

Weeds Controlled: Annual grasses and broadleaf weeds. Larger weeds may not be effectively controlled.

Dormant Season: Apply during the late fall or winter months after last fall cutting and before

spring regrowth is more than 2 inches. **CAUTION:** Applications to forage legumes that are not dormant, or has broken dormancy, may result in stand and/or yield reductions. Green foliage present at the time of application will be burned. Do not apply more than once per season. Do not graze, cut or harvest treated fields within 60 days after application. Do not use GRAMOXONE EXTRA around home gardens, schools, recreational parks, golf courses, or playgrounds.

POAST 1.5E 1 to 1.5 pt/A + DASH HC or OIL CONCENTRATE 2 pt/A

Crops: Clover

Weeds Controlled: Crabgrass, fall panicum, foxtails, johnsongrass, shattercane and certain other grasses.

Non-Dormant: Apply to grasses that are actively growing and within their optimum plant heights for best results. For rhizome johnsongrass, more than one application may be required. The first application should be applied when johnsongrass plants are <<12" tall; if regrowth occurs or new plants emerge, make the second application to plants <<8" tall. Avoid applications when grasses are stressed by lack of moisture, mechanical injury, insect damage, or other factors. Apply a minimum of one hour before expected rainfall. Wait 20 days following application before harvesting for [dry] hay. Treated fields can be grazed or fed as a green-chop [undried] forage within 7 days after application. Do not apply more than a total of 6.5 pt/A of POAST in one season.

ROUNDUP 4S (Spot Treatment) 2 to 2.5 oz/gal

Crops: Clover

Weeds Controlled: Annual and perennial grasses and broadleaf weeds. Consult label for rates and stages of weed growth.

Non-Dormant: The crop receiving spray in treated area will be killed. No more than one-tenth of any acre should be treated at one time. Remove domestic livestock before application and allow 14 days following spot treatment before grazing livestock or harvesting treated forage.