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Weed Control in Forage Legumes

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Vigorous forage plants are good weed competitors. Good seed, proper seedbed, and good planting techniques will reduce weed problems in new legume seedings. Herbicides are an aid to recommended grazing or haying practices.

Herbicide Suggestions

Information in this publication is based on research conducted by the South Dakota Agricultural Experiment Station and other research or observations. Herbicides are included only after the chemical is registered by the Environmental Protection Agency (EPA) as to residue tolerances in crops used for food or feed.

This information provides a summary of herbicide uses and does not imply a guarantee or responsibility for results. Tradenames are for reader convenience and do not imply product endorsement. Users are responsible for following label directions and precautions.

Most herbicides are listed by tradename except where the active ingredient is available in several products. The common name (in parentheses) follows the first listing of the tradename. Product labels for the same active ingredient may vary. Users should consult the label of the product.

Rates for each treatment and each formulation are stated as the amount of product per acre. Weed control is rated poor, fair, good, very good, or excellent for each weed problem in each crop.

Herbicide Cost

The cost per acre for herbicide treatments is given using suggested retail prices for the low and high rates. Consult your local dealer for actual prices.

Abbreviations Used

pt	=	pint
qt	=	quart
lb	=	pound
gal	=	gallon
lb/gal	=	pound per gallon active ingredient or acid equivalent
L	=	liquid
G	=	granule
DF	=	dry flowable (spray)
act	=	active ingredient or acid equivalent
gpa	=	gallons per acre
AMS	=	ammonium sulfate
COC	=	crop oil concentrate
MSO	=	methylated seed oil
NIS	=	non-ionic surfactant

Table of Contents

Herbicides for Established Legumes

Herbicides for Establishment without Companion Crop

SOUTH DAKOTA STATE UNIVERSITY
College of Agriculture & Biological Sciences • Cooperative Extension Service • U.S. Department of Agriculture

HERBICIDES for ESTABLISHED LEGUMES

Established legumes usually compete effectively with most annual weeds. Weeds take over thin, weak legume stands. Winter annuals such as pennycress or downy brome become a problem when fall conditions are favorable for their establishment. Perennials such as dandelion or perennial grasses often persist in spite of legume competition.

Controlling weeds does not improve the legume stand and frequently does not increase total forage production. However, weed control usually improves protein percentage and palatability of harvested forage. Drying time may be reduced.

Weed control has greatest value if there is a premium for high quality, pure legume forage. Weed control in seed fields reduces cleaning problems and yields higher quality seed.

SENCOR (metribuzin) ($14.40-29.00)

.66-1.33 lb Sencor 75DF (.38-1 lb act)

Alfalfa and sanfoin only. Use on stands established at least one year. May be used on mixed alfalfa and grass stands; however injury to grasses should be expected. Higher rates may cause severe damage to forage grasses. Metribuzin gives good to excellent control of many annual and some biennial or perennial weeds including kochia, shepherdspurse, tansy mustard, blue mustard, and downy brome ("cheatgrass"). Excellent downy brome and very good kochia and mustard control in SDSU tests. Dandelion control has been fair, but variable. Seedling dandelion control is very good.

Crop tolerance is good. There is some risk of injury with high rates on light soil. There are no pH limitations; however, there is increased risk of injury on very high pH soils.

Rates of .66 to 1.33 lb/A of 75DF are suggested for annual broadleaved weeds on most soils. The .66 lb/A rate is adequate for downy brome. Use 1.33 lb/A for bluegrass, barnyardgrass, or dandelion.

Sencor rates vary according to weed species. Use low rates for sandy soil with 1 to 2% organic matter; higher rates for clay and clay-loam soils with over 2% organic matter.

Minimum carrier is 20 gpa for ground and 2 gpa for air. Alfalfa, corn, forage grasses, and soybeans may be planted 4 months after application. Other crops may be planted 18 months after application.

FALL or ***SPRING:*** Apply in late fall after cutting when fall growth has ceased or in early spring before growth begins. Fall application strongly preferred; however, early spring applications have provided excellent downy brome control. Active legume growth at the time of application will be damaged. Do not graze for 28 days after treatment.

POAST or POAST PLUS (sethoxydim) ($8.30-20.75)

1-2.5 pt Poast 1.5L (.2-.5 lb act)
1.5-2.25 pt Poast Plus 1L (.2-.3 lb act)

Established pure stands of alfalfa. Poast may also be used in birdsfoot trefoil and sanfoin. Grasses in a mixture will be killed or damaged. Used primarily in established stands to control perennial grasses or special annual grasses such as sandbur. Applications are not effective on annual brome.

Poast rates are 1 pt for foxtail, 1.5 pt for sandbur and 2.5 pt/A for quackgrass. Repeat application required for improved quackgrass control. Poast Plus rates are 1.5 pt for foxtail, 2.25 pt for sandbur and 2.25 pt/A for quackgrass. Retreat with 1.5 pt/A for improved quackgrass control.

Add COC at 2 pt/A. The addition of .5 to 1 gal 28% or 2.5 lb AMS per acre improves control of some grasses. Minimum carrier is 5 gpa for air or ground; increasing carrier to 10 gpa may improve results if growth is dense.

POSTEMERGENCE. Apply to actively growing weeds. Refer to section for new seedings for additional information. Do not harvest wet forage or graze for 7 days or cut for dry hay for 14 days after treatment.

SELECT/PRISM (clethodim) ($12.05)

8 oz Select 2L or 17 oz Prism .94L (.125 lb act)

Established pure stands of alfalfa, sanfoin, and birdsfoot trefoil. Grasses in a mixture will be damaged. Select controls several annual grassy weeds. Use in established stands is primarily for special problems such as sandbur or downy brome. It is effective for downy brome (2-6 in). Labeling also includes foxtail barley.

Rate is 8 oz Select or 17 oz Prism per acre for annual grasses in established alfalfa. Use 16 oz Select or 34 oz Prism per acre to control or suppress perennial grasses. Rate for Select is lower for new seedings where weeds are more uniform. Suggested size for most annual grasses is 2 to 6 inches. Minimum carrier is 10 gpa. Always add COC at 1 gal/100 gallons. Select or Prism may be tank-mixed with 2,4-DB or Pursuit.

POSTEMERGENCE. Apply to actively growing weeds. Crop may be grown for seed, hay, silage, or direct grazing. Do not apply within 15 days of harvest or grazing.

PURSUIT (imazethapyr) ($12.30-24.55)

3-6 oz Pursuit 2L or 1.08-2.16 oz Pursuit 70DF (.047-.094 lb act)

Alfalfa only. Established grass will be damaged. Pursuit gives excellent control of pennycress, pigweed, Russian thistle, and nightshade. It also controls non-ALS kochia, cocklebur, and sunflower. Established dandelion, cheatgrass, sandbur, quackgrass, Canada thistle, and field bindweed are not satisfactorily controlled; however considerable early-season growth suppression of established dandelion plants has been noted in SDSU tests. Flower development is prevented.

Crop tolerance is very good. There are no soil pH or soil texture restrictions. Pursuit rates are 1.1 to 2.16 oz/A of 70DF or 3-6 oz of 2L. The 1.1 oz rate has been satisfactory for mustards and other susceptible weeds.

Minimum carrier is 10 gpa; use 20 gpa for high weed pressure or if residue is heavy. Add NIS at 1 qt/100 gal or COC at 2 pt/A or MSO at 1.5 to 2 pt/A plus liquid fertilizer at 1 to 2 qt/A or AMS at 2.5 lb/A.

Pursuit may be tank-mixed with other labeled herbicides including Buctril, 2-4-DB, or Poast Plus. When tank-mixing, follow additive guidelines according to the product label. Pursuit 70DF Eco-Pak is formulated in soluble packs. Follow rotational crop guidelines for succeeding crops. If a stand is lost after application, allow a 4 month interval before planting alfalfa.

DORMANT. ***FALL*** or ***SPRING***. Apply in late fall after the last cutting and crop is dormant or in the spring before alfalfa has 3 inches growth.

POSTEMERGENCE. Apply after alfalfa cutting but before there is excessive regrowth to interfere with weed coverage. Do not graze or harvest alfalfa for 30 days after application.

RAPTOR (imazamox) ($16.55-24.80)

4-6 oz Raptor 1L (.031-.047 lb act)

Alfalfa only. Established grass will be damaged. Raptor controls several annual broadleaf weeds including non-ALS kochia as well as annual grasses and suppresses certain perennial grasses. Rates are based on weed height and species. Weeds should be actively growing and not exceed 3 inches. Minimum carrier is 10 gpa; use 20 gpa for high weed pressure. Use COC or NIS and 28% N or AMS.

Raptor may be tank-mixed with 2,4-DB, Poast, Poast Plus, or Select/Prism. Check tank-mix partners for additives.

DORMANT. ***FALL*** or ***SPRING***. Apply in late fall after last cutting and when crop is dormant or in the spring before alfalfa has 3 in growth.

POSTEMERGENCE. Apply after alfalfa cutting but before significant alfalfa regrowth to allow herbicide to reach target weeds. Apply before bud formation on seed crop. Do not apply more than 6 oz/A per season. Do not hay or graze for 20 days after application. Do not harvest for seed for 70 days after application.

BUTYRAC 200 (2,4-DB) ($7.35-22.05)

2-6 pt Butyrac 200 2L (.5-1.5 lb act)

Alfalfa, birdsfoot trefoil, red or white clover. For pure legume stands. Primarily for treating patches of problem weeds. Annual broadleaves such as lambsquarters, cocklebur, wild mustard, pigweed, and pennycress are most susceptible. Ragweed, smartweed, shepherdspurse, and tansy mustard usually require the higher rates. High rates will suppress topgrowth of perennials such as Canada thistle. Not effective on established dandelion or kochia.

Some crop effects can be expected. Stem twisting and leaf malformation are usually noted. Use only the low rate on red clover. Do not treat when crop is under stress or if expected high temperature exceeds 90° F.

Minimum carrier is 10 gpa for ground and 5 gpa for air.

FALL or ***SPRING POSTEMERGENCE***. Apply when weeds have emerged and are actively growing. Weeds should be less than 1 to 2 inches tall for best results. Do not graze or harvest forage from treated areas for 30 days after applying.

TREFLAN (trifluralin) ($3.35-17.45)

1.5-2 pt Treflan 4L or 20 lb Treflan 10G (.75-2 lb act)

Alfalfa only. Use on pure stands established at least one year. Provides good to excellent control of foxtail, barnyardgrass, and sandbur. Established annual brome will be destroyed if mechanical incorporation is used in spring.

Excellent crop tolerance. Use is primarily in seed fields. Major concern is injury to crowns during incorporation. Liquid must be mechanically incorporated within 24 hours or may be applied via chemigation. Granules are activated by ½ inch of rain or overhead irrigation within 3 days of application or by mechanical means. A disk or field cultivator may be used. The program works well where alfalfa is planted in rows and row cultivation is used to incorporate.

Rates are 1.5 to 2 pt 4L or 20 lb/A of 10G. Rate of 2 qt/A may be used for application through irrigation systems. Minimum carrier is 5 gpa for ground or air.

SPRING APPLICATION: Apply before alfalfa growth begins and before weeds emerge.

FALL APPLICATION: Apply after cutting between August 1 and October 1. Primarily to control winter annual bromes that have not germinated.

KERB (pronamide) ($51.35-136.95)

1.5-4 lb Kerb 50W (.75-2 lb act)

Alfalfa, clover, birdsfoot trefoil, crown vetch, and sanfoin. Perennial grasses will be killed. Effective as a preemergence or early postemergence treatment for annual grass. Control of annual grasses such as downy brome and perennial grasses such as bluegrass has been very good. Quackgrass control is fair to good. Competition from dense alfalfa stand is helpful for perennials. Broadleaved weeds such as kochia or dandelion are not controlled. Crop tolerance is excellent. No soil texture or pH limitations. High soil temperature (over 65° F.) may reduce effectiveness.

Use 1.5 to 2 lb Kerb 50W for downy brome and other annual grasses, 2 to 3 lb for perennial bluegrass, or 3 to 4 lb/A for more tolerant perennial grasses such as quackgrass or bromegrass. The high rate may control broadleaves such as mustard. Weed control is dependent on rainfall or irrigation after application. Use the low rate if overhead irrigation is used to activate the herbicide.

Minimum carrier is 20 gpa for ground and 5 gpa for air. Small grain should not be planted in the spring after a fall application if the alfalfa stand is lost.

FALL: Apply in late fall before freezeup, usually in early to mid-October. Excessive residue should be removed or dispersed. Emerged downy brome and other annual grasses will usually be controlled.

SPRING: Kerb may be applied in the spring for downy brome control. Apply 1.5 to 2 lb/A Kerb 50W in early spring at the time weed seeds germinate. Fall application usually preferred. Treated alfalfa should not be grazed or harvested for forage for 25 days if less than 3 lb or 45 days if more than 3 lb/A is used.

SINBAR (terbacil) ($15.60-46.80)

.5-1.5 lb Sinbar 80W (.4-1.2 lb act)

Alfalfa only. Use on pure stands established at least one year. Perennial grasses may be injured or killed. Good to excellent control of many annual weeds including lambsquarters, tansy mustard, pennycress, peppergrass, downy brome and foxtail. Fair suppression of dandelion has been noted in SDSU tests. Perennnial or established annual weeds are not controlled. Grasses will be damaged.

Crop tolerance is good on most soils. Avoid use in very sandy, gravelly, low organic matter (under 1%) soil. Rates of 1 to 1.5 lb/A Sinbar 80W have been used in most SDSU tests. Minimum carrier is 40 gpa for ground. Sinbar persists in the soil. Do not plant treated areas to other crops for 2 years after application.

FALL or ***SPRING:*** Fall applications strongly preferred; however, early spring applications have provided excellent downy brome control if rainfall is received soon after application.

VELPAR (hexazinone) ($15.10-29.95)

.67 or 1.33 lb Velpar 75DF (.5-1 lb act)

Alfalfa established for at least one year (13 mo.). Perennial grasses will be severely damaged. The lower rates control pennycress, sheperdspurse, foxtail and cheatgrass. The high rate is required for perennial grass and established dandelion. Annual broadleaf control has been excellent in SDSU tests; it has been effective for dandelion in several tests. Crop tolerance has been adequate.

Rates are adjusted for soil texture. Use .66 to 1 lb for coarse soil and 1 to 1.33 lb/A of 75DF for medium and heavy soil. Forage may be harvested 30 days after application. Minimum carrier is 20 gpa for ground or 5 to 15 gpa for air but use at least 10 gal for each 1 lb product.

SPRING: Apply to dormant alfalfa in spring. Late fall application has also been successful in SDSU tests. Rainfall required. Special label for South Dakota.

GRAMOXONE (paraquat) ($6.95-10.70)

1.3-2 pt Gramoxone Max 3L (.25-.7 lb act)
2-3 pt Gramoxone Inteon 2L (.5-.75 lb act)

Alfalfa only. Used in established stands as a between cutting or dormant season treatment. Non-residual, non-selective.

DORMANT SEASON. Well established stands. Apply in late fall after crop is dormant or in early spring before one inch of new growth. Stunting expected if treated late. Do not apply if fall regrowth exceeds 6 inches. Controls emerged broadleaf seedlings and downy brome and suppresses perennial grass such as bluegrass. Some potential for late fall use in situations where early winter annual growth has been heavy. Use 1.75 pt of 3L per acre for most situations. Add 1 to 2 pt NIS per 100 gal of solution. Minimum carrier is 10 gpa for ground or 5 gpa for air. Use high rates for perennial grass suppression. Do not use within 42 days of harvest.

.7 pt Gramoxone Max 3L (.12 lb act) ($3.75)
1 pt Gramoxone Inteon 2L (.5-.75 lb act)

BETWEEN CUTTING: Established stands. Controls emerged annual weeds and suppresses perennial grass. Must be applied within 5 days of cutting. Some potential to control annual seedlings emerged at time of first cutting. Do not harvest for 30 days after application. Add 1 to 2 pt NIS per 100 gal of solution. Minimum carrier is 10 gpa for ground.

ROUNDUP or GLYPHOSATE PRODUCTS (glyphosate) ($6.15-27.60)

1 pt-4 qt Roundup 3L ae or .8 pt-3.6 pt Roundup Ultra Max 3.75L ae (.38-3 lb act)

Glyphosate is available in several formulations and is marketed as several brands. Application rates are based on acid equivalent per acre. Refer to the table below to determine the amount of product required for the rate of acid equivalent required. For example, Roundup UltraMax II contains 5.5 lb active ingredient (glyphosate acid + salt) and 4.5 lb acid equivalent (ae) per gal.

Formulation		*Amount of Product for lb ae*			
		.38 ae	*.75 ae*	*1.5 ae*	*3 ae*
3 lb ae (4 lb ai)	L	16 oz	32 oz	64 oz	128 oz
3.75 lb ae (5 lb ai)	L	13 oz	26 oz	52 oz	104 oz
4 lb ae (5 or 5.4 lb ai)	L	12 oz	24 oz	48 oz	96 oz
4.17 lb ae (-----)	L	12 oz	23 oz	46 oz	93 oz
4.5 lb ae (5.5 lb ai)	L	11 oz	21 oz	43 oz	86 oz
5 lb ae (-----)	L	10 oz	20 oz	39 oz	77 oz

Forage legumes. Used only as a spot treatment in emerged legumes. Primarily for perennials.

SPOT TREATMENT: Rates are 1 to 2 qt for quackgrass, 2 to 3 qt for Canada thistle and 4 qt of 3L ae/A for field bindweed. Do not graze treated areas for 8 weeks or harvest forage for 14 days after treatment.

64 oz Glyphosate Product 3L ae (1.5 lb ae)
52 oz Glyphosate Product 3.75L ae (1.5 lb ae)
44 oz Glyphosate Product 4.5L ae (1.5 lb ae)

PREHARVEST: Alfalfa. Intended for use in declining stands where crop destruction is required prior to planting. May be applied at any time during the season. Treated crop and weeds can be harvested and fed to livestock using a 36 hour application to harvest interval. Maximum rates vary with product formulation. Control of perennial grass and alfalfa will be best if there are several inches of new active growth; follow up control may be required for alfalfa or perennial weed regrowth; especially from early spring application.

HERBICIDES for LEGUME ESTABLISHMENT without COMPANION CROP

Seeding without a companion crop and using an herbicide to control weeds is an option if the small grain crop, weeds, or limited rain make it difficult to establish a new seeding. Two cuttings the seeding year are possible with irrigation.

Weaken perennials before seeding. Alfalfa works well to reduce perennial weeds like Canada thistle. However, the weeds should be weakened with tillage or herbicides such as glyphosate in the fall before seeding. Perennial grasses should be eliminated prior to establishment.

Annual grasses are very competitive. Grasses can reduce the stand, especially in dry seasons. Use herbicides.

Clip or treat for annual broadleaves. Annual broadleaves can also be competitive, especially in dry seasons. Kochia, wild buckwheat, Russian thistle, or sunflower are common and can be controlled with herbicides. Clipping is effective for light or moderate infestations, especially if they are several inches tall.

Interseeded oats. Low rates of oat seeded at the time alfalfa is planted will compete with early weeds and provide early cover to reduce effects of rain or high wind. Oat should be eliminated at early stages with postemergence herbicides. This system has been promising in field tests.

No-till alfalfa seeding. No-till seeding has been very successful. Weed competition can be reduced dramatically in no-till systems if they are properly planned. Be sure to use a fall burndown herbicide. Apply a spring herbicide to control emerged weeds or volunteer crops at planting. Be certain soil is firmed over the seed. Use postemergence herbicides or clip weeds if necessary.

EPTAM (EPTC) ($9.70-19.35)

2.25-4.5 pt Eptam 7L (2-4 lb act)

Alfalfa, birdsfoot trefoil, and clovers. Do not use on white clover. Do not use if grass is seeded with legume. Gives excellent control of several annual grasses and fair control of certain annual broadleaves. Foxtail control is consistent. Fair on wild oats, weak on smartweed, kochia, and Russian thistle. Established perennials are not controlled.

Crop tolerance is fair to good. Temporary stunting and searing of the first leaves is frequently noted. Does not cause stand reduction.

Rates vary according to soil type. Rate of 3.5 pt/A has been satisfactory in most SDSU tests. The 2.25 pt/A rate is for annual grass control on lighter, low organic matter soils. No soil pH limitations.

Minimum carrier is 10 gpa for ground equipment. May be applied with liquid fertilizer carrier.

PREPLANT INCORPORATED: Apply before planting to a smooth, dry seedbed and incorporate immediately with a tandem disk set to cut 4 to 6 inches deep or a field cultivator equipped with sweeps. A second incorporation insures thorough mixing, especially under wet, lumpy, or trashy conditions. Follow with a harrow or mulcher to smooth and firm seedbed.

PURSUIT (imazethapyr) ($4.40-8.85)

1.08-2.16 oz Pursuit 70DF (.047-.094 lb act)

Alfalfa only. Grasses will be damaged. Pursuit controls a wide spectrum of annual broadleaves and certain annual grasses. Control of pigweed, Russian thistle, mustard and nightshade is excellent; it is also consistent on non ALS kochia, cocklebur, sunflower, and green foxtail. Results on lambsquarters, wild oat, and common ragweed are not consistent; it is not effective on Canada thistle and bindweed.

Crop tolerance has been good in SDSU tests. Soil pH is not a factor and there are no soil texture restrictions. Some stunting is possible if applied before recommended crop stage when early spring conditions are cold and wet.

Pursuit rates are 1.08 to 2.16 oz/A of 70DF. Rates equivalent to 1.1 to 1.5 oz/A are suggested for most situations. Pigweed, Russian thistle, mustard, and nightshade are controlled with the low rates. Several other weeds including kochia, foxtail, cocklebur, and sunflower are more consistently controlled with 1.5 oz/A.

Minimum carrier is 10 gpa; use 20 gpa for high weed pressure or if residue is heavy. Add NIS at 1 qt/100 gal or COC at 2 pt/A or metholated seed oil at 1.5 to 2 pt/A plus liquid fertilizer at 1 to 2 qt/A or AMS at 2.5 lb/A.

PURSUIT (Continued . . .)

Pursuit may be tank-mixed with other labeled herbicides including Buctril, 2,4-DB, or Poast Plus. When tank-mixing, follow additive guidelines according to the product label. Pursuit 70DF Eco-Pak is formulated in soluble packs. Follow rotational crop guidelines for succeeding crops. If a stand is lost after application, allow a 4-month interval before planting alfalfa.

POSTEMERGENCE. Apply after alfalfa has 2 fully expanded trifoliate leaves. Weeds should be small for best results. Do not graze or harvest alfalfa for 30 days after application.

TREFLAN (trifluralin) ($2.25-6.55)

1-1.5 pt Treflan 4L or 5-7.5 lb Treflan 10G (.5-.75 lb act)

Alfalfa. Labeling has been expanded to include use in alfalfa establishment for forage use in the seeding year. Treflan provides very good to excellent control of annual grasses and controls some small-seeded annual broadleaves. Crop tolerance is adequate; some early stunting may occur in prolonged cold, wet conditions. The lower rate is for coarse, sandy soil. Not for grass/legume mixtures.

RAPTOR (imazamox) ($16.55-24.80)

4-6 oz Raptor 1L (.031-.047 lb act)

Alfalfa only. Grasses will be damaged. Raptor controls a wide spectrum of annual broadleaf and certain annual grassy weeds. Weeds should be actively growing and not exceed 3 inches. Rate is based on weed size and species. Minimum carrier is 10 gpa; use 20 gpa for high weed pressure or for minimum or no-till. Use COC or NIS and 28% N or AMS.

Raptor may be tank-mixed with Buctril, 2,4-DB, Poast, Poast Plus, or Prism/Select.

POSTEMERGENCE. Apply Raptor when seedling alfalfa is in the second trifoliate stage or larger and when the majority of the weeds are 1 to 3 inches. Seedling alfalfa may show a temporary stunting. Do not graze or harvest for 20 days following application.

POAST or POAST PLUS (sethoxydim) ($6.25-20.80)

.75-2.5 pt Poast 1.5L (.15-.5 lb act)
1.12-2.25 pt Poast Plus 1L (.15-.3 lb act)

Poast and Poast Plus may be used in new pure alfalfa seedings. Poast may also be used in birdsfoot trefoil and sanfoin. Grasses or cereal companion crops will be killed or damaged. They are used to kill interseeded oats planted with alfalfa to suppress grassy weeds and provide cover during initial emergence. There is no residual activity and no control of broadleaved weeds.

Poast contains 1.5 lb/gal active ingredient; Poast Plus contains 1 lb/gal active plus surfactant. Product rates and labeling for specific weeds vary. Additives are similar for both products.

Poast or Poast Plus give very good to excellent control of green and yellow foxtail, seedling volunteer small grain, wild oat and other annual grasses. Partial to fair quackgrass control can be expected. Other perennial grasses may be less sensitive. Weeds must be growing actively. Drought stress reduces effectiveness. Crop tolerance is excellent.

Poast rates include special early application of .75 pt for foxtail (1-4 in). Rates for other situations are .75 pt for interseeded oat (2-8 in); 1 pt for wild oat (2-4 in); foxtails, barnyardgrass, witchgrass (3-8 in) and volunteer corn (6-20 in); 1.5 pt for sandbur (1-3 in) and volunteer cereals (2-4 in) per acre. For quackgrass (6-8 in) use 2.5 pt/A and repeat to improve control.

Poast plus rates include early application of 1.12 pt for foxtail and barnyardgrass (1-4 in). Rates for other situations are 1.5 pt for wild oats (2-4 in); barnyardgrass, foxtail, witchgrass (3-8 in); interseeded oat (4-10 in); sandbur (1-3 in) and volunteer corn (6-20 in). Rate of 2.38 pt if used for volunteer cereals (2-4 in) and quackgrass (6-8 in) per acre. Retreat with 1.5 pt/A to improve quackgrass control.

Add COC at 2 pt/A. The addition of .5 to 1 gal 28% N or 2.5 lb AMS per acre improves control of certain grasses such as wild oat and volunteer cereal. Thorough coverage is important. Minimum carrier is 5 gpa for ground or air. Poast and Poast Plus may be tank-mixed with 2,4-DB; however do not use liquid fertilizer or AMS additives in the mix.

POSTEMERGENCE: Apply rates specified for each weed. Do not graze or harvest wet foliage for 7 days or cut for dry hay for 14 days after treatment.

SELECT (clethodim) ($9.05-12.05)

6-8 oz Select 2L (.09-.125 lb act)

Select may be used on new pure seedings of alfalfa, sanfoin or birdsfoot trefoil. Select controls emerged annual grasses; there is limited activity on perennial grasses. There is no residual activity or control of broadleaf weeds. Select controls volunteer barley or wheat, woolly cupgrass, wild oat, field sandbur, and downy brome at 2 to 6 in; barnyardgrass, green and yellow foxtail, volunteer oat, witchgrass, and fall panicum at 2 to 8 in. It also controls wild proso millet at 2 to 10 in. There is activity on foxtail barley at 2 to 6 in. Crop tolerance is excellent. Select may be tank-mixed with 2,4-DB.

Rate is 6 to 8 oz/A of 2L. The high rate is for heavy weed pressure or if weeds are at maximum size. Minimum carrier is 10 gpa. Always add COC at 1 gal/100 gallons.

POSTEMERGENCE. Apply to actively growing weeds. Crop may be grown for seed, hay, silage, or direct grazing. Do not apply within 15 days of harvest or grazing. Do not rotate to other crops for 30 days.

BUTYRAC 200 (2,4-DB) ($7.35-22.05)

2-6 pt Butyrac 200 2L (.5-1.5 lb act)

Alfalfa, birdsfoot trefoil, red or white clover. Do not use on sweetclover.

For early postemergence weed control in new, pure legume seedings. Most useful for weed seedlings such as Russian thistle, wild mustard, pennycress, cocklebur, lambsquarters, and pigweed. Higher rates give temporary topgrowth control of Canada thistle or perennial sowthistle. Not effective on grasses.

Best control if weed seedlings are less than 1 to 2 inches tall. Use high rate for larger weeds 2 to 5 inches tall. Use only low rates on red clover. Fair crop tolerance. Some twisting and leaf malformation noted on legume seedings.

Minimum carrier is 10 gpa for ground and 5 gpa for air.

POSTEMERGENCE. Apply when weed seedlings are small and legume seedlings have reached the 1- to 2-trifoliate leaf stage. Do not treat when crop is under stress or if expected high temperature exceeds 90° F. Do not graze treated areas for 60 days after application.

BUCTRIL (bromoxynil) ($7.90-11.85)

1-1.5 pt Buctril 2L or 5.75 pt Buctril 4L (.25-.38 lb act)

Alfalfa only. For new seedings of pure alfalfa. Controls emerged annual broadleaves. Gives temporary topgrowth suppression of perennials such as Canada thistle. No effect on grasses. Has no residual activity. Contact action.

Bromoxynil gives very good control of wild buckwheat, kochia, sunflower, cocklebur, and several other seedling broadleaves. Weeds should be small and actively growing. Apply before most weeds exceed the 4-leaf stage and when the alfalfa has at least 4-trifoliate leaves.

Use the lower rate for small, susceptible weeds and the higher rate for larger weeds. Temporary leaf burn can be noted in some situations. Application during hot, humid weather increases risk of leaf burn. It has not affected stands or reduced crop growth in SDSU tests. Labeling includes tank-mix with 2,4-DB for improved suppression of perennials.

Minimum carrier is 20 gpa for ground or 5 gpa for air. Do not use surfactant additives.

POSTEMERGENCE: Spring application. Do not apply if expected temperatures will exceed 70 or 80° F. for 3 days after application. Allow 30 day interval between treatment and harvest.

GRAMOXONE (paraquat) ($9.10-14.45)

1.7-2.7 pt Gramoxone Max 3L (.75-1 lb act)
2.5-4 pt Gramoxone Inteon 2L (.6-1 lb act)

Alfalfa only. Used preplant or preemergence to replace tillage prior to planting. Non-selective, non-residual action. Controls emerged annual grasses and broadleaves. Good coverage is important.

PREPLANT or ***PREEMERGENCE***. Prior to planting or after planting but before crop emergence. Useful to control emerged weeds and volunteer crop growth prior to no-till planting in standing grain stubble. Minimize soil disturbance during planting. Lower rates are adequate if weeds are small and growing actively. Use 2 to 2.5 pt/A for most situations. Add 1 to 2 pt NIS per 100 gallons. Minimum carrier is 10 gpa for ground or 5 gpa for air.

ROUNDUP or GLYPHOSATE PRODUCT (glyphosate) ($6.15-27.60)

1 pt-4 qt Glyphosate Product 3L ae (.38-3 lb ae)
.8 pt-3.25 qt Glyphosate Product 3.75L ae (.38-3 lb ae)
.7 pt-3 qt Glyphosate Product 4.5L ae (.38-3 lb ae)

Glyphosate is available in several formulations and is marketed as several brands. Application rates are based on acid equivalent per acre. Refer to the table below to determine the amount of product required for the rate of acid equivalent required. For example, Roundup UltraMax II contains 5.5 lb active ingredient (glyphosate acid + salt) and 4.5 lb acid equivalent (ae) per gal.

Formulation		*Amount of Product for lb ae*			
		.38 ae	*.75 ae*	*1.5 ae*	*3 ae*
3 lb ae (4 lb ai)	L	16 oz	32 oz	64 oz	128 oz
3.75 lb ae (5 lb ai)	L	13 oz	26 oz	52 oz	104 oz
4 lb ae (5 or 5.4 lb ai)	L	12 oz	24 oz	48 oz	96 oz
4.17 lb ae (-----)	L	12 oz	23 oz	46 oz	93 oz
4.5 lb ae (5.5 lb ai)	L	11 oz	21 oz	43 oz	86 oz
5 lb ae (-----)	L	10 oz	20 oz	39 oz	77 oz

Forage legumes. May be used prior to planting or after planting prior to legume emergence. Primarily for eliminating perennials before seeding or to replace tillage prior to planting in reduced or no-till systems. Useful to control emerged weeds and volunteer crop growth prior to no-till planting in standing grain stubble. Volunteer winter grain and annual bromes must be out of winter dormancy. Non-selective. No soil residual activity. Emerged grasses and broadleaves are controlled.

Glyphosate is available in several products. Use products labeled for burndown before alfalfa seeding. Minimum carrier is 3 gpa for air and ground. Add 17 lb AMS in each 100 gal solution. Weeds should be actively growing.

PREPLANT. Rates are for 3 lb ae (4 lb active) product. Use .75 to 1 pt/A of 3L ae for seedling annual grasses and volunteer cereals. Rates are 1 to 2 qt for quackgrass, 2 to 3 qt for Canada thistle, and 4 qt/A of 3L ae for field bindweed. Adjust rates for other concentrations.

PROWL (pendimethalin) ($3.20-7.90)

1.2-3 pt Prowl 3.3L (.5-1.25 lb act)

Forage legume cover crop. Labeling is limited to legumes planted as cover crop or set-aside or Conservation Reserve Program (CRP) acreages. Do not feed or graze legume cover crop. Not for grass/legume mixtures.

Provides very good control of several annual grasses. Higher rates are for heavy, clay soil. Crop tolerance has been adequate in SDSU tests. Not for use on crops intended for hay or forage for livestock.

PREPLANT INCORPORATED or ***PREEMERGENCE***. Preplant application provides more consistent control. Immediate incorporation preferred, but may be delayed in some situations. Minimum carrier is 10 gpa for ground or 5 gpa for air.

WEED RESPONSE TO HERBICIDES

Weed control percentages are a guide. Percentages are estimated based on favorable conditions. E = Excellent, 90-95%; G = Good, 80-90%; F = Fair, 65-80%; M = Marginal, 40-65%; P = Poor, under 40%.

HERBICIDE	"Cheatgrass"	Foxtail	Wild oat	Barnyardgrass	Kochia (non-ALS)	Wild mustard	Pennycress	Blue mustard	Lambsquarter	Pigweed	Dandelion	Seedling Dandelion	Canada thistle	Quackgrass
Eptam	E	E	G+	G+	F	P	P	P	G	G	P	P	P	M
Treflan	E	G	M	G	F	P	P	P	G	G	P	P	P	P
Sencor	G+	F	P	M	G+	E	E	G+	G+	G	F	G	P	P
Kerb	E	G	G	F	F	P	P	P	F	P	P	P	P	G
Sinbar	G+	G	F	F	G+	E	E	G+	G+	G+	M	F	P	P
Velpar	E	G	F	G	G+	E	E	E	G	G	G	E	P	G
Pursuit	P	G	P	M	G+	E	E	E	M	G+	G	G	P	P
Poast Plus	F	E	E	G+	N	N	N	N	N	N	N	N	N	G
Raptor	F	G+	P	F	G+	E	E	E	F	G+	M	F	P	P
Select	G	E	E	E	N	N	N	N	N	N	N	N	N	M
Buctril	N	N	N	N	E	G+	G+	E	G	F	P	M	M	N
Butyrac 200	N	N	N	N	M	E	G	G	G+	G	P	G	F	N
Gramoxone	F	G	F	F	M	G+	M	M	G	G	M	G	M	F

"Cheatgrass" = Winter annual bromes; control in spring difficult.

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