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EC98-130-D A 1998 Guide for...Herbicide Use in Nebraska

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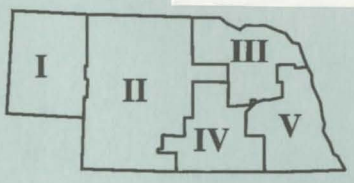

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This circular deals principally with herbicides as an aid for crop production. The suggestions for use are based on results at Nebraska research centers and elsewhere. Consult product label for additional information. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Cooperative Extension is implied.

RESTRICTED USE HERBICIDES. Amizol, Atrazine, AAtrex, Basis Gold, Bicep, Bicep II, Bicep II Magnum, Bicep Lite, Bicep Lite II Magnum, Bladex, Buctril/Atrazine, Bugle, Bullet, Contour, Cynex, Doubleplay, Extrazine II, Freedom, Fultime, Gramoxone Extra, Grazon, Guardsman, Harness, Harness Xtra, Hoelon, Kerb, Laddok, Lariat, Lasso, Magnacide, Marksman, Micro-Tech, Paraquat, Partner, Ramrod/Atrazine, Shotgun, Surpass, Surpass 100, Topnotch, and Tordon are restricted use herbicides. Other herbicides may be classified as restricted use at some future date. The label will indicate if a product is restricted use. Only certified applicators should apply or supervise the application of restricted use herbicides. See your Extension educator if you need to be certified.

PROTECT

"Use Crop Production Chemicals Wisely"

- **READ THE LABEL BEFORE EACH USE.**
- **FOLLOW WORKER PROTECTION STANDARDS.**
- **STORE IN ORIGINAL LABELED CONTAINERS.**
- **ELIMINATE HAZARDS FROM CONTAINERS BY RINSING AND PROPER DISPOSAL.**
- **DO NOT USE 2,4-D ESTER, ALLY, AMBER, BANVEL (DICAMBA), COMMAND (3ME), AND SIMILAR HERBICIDES NEAR VEGETABLES, ORNAMENTALS, TREES, SHRUBS, AND BROADLEAF CROPS.**

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Kenneth R. Bolen, Director of Cooperative Extension, University of Nebraska, Institute of Agriculture and Natural Resources.

University of Nebraska Cooperative Extension educational programs abide with the non-discrimination policies of the University of Nebraska-Lincoln and the United States Department of Agriculture.

Contents

	Page
Abbreviations	76
Additives for Postemergence Corn Herbicides	11
Additives for Postemergence Soybean Herbicides	12
Additives for Postemergence Sorghum Herbicides	12
Alfalfa	53
Application Pointers	3
Aquatic Weeds	64
Barley	45
Bean Bar/Wiper Application	43
Burndown Tables for No-Till	14, 31
Cleaning the Sprayer	10
Combination Herbicides	77
Conservation Tillage Discussion	4
Conversion Tables	75
Corn, Popcorn, Sweet Corn	19
CRP Acres	56
CRP Burndown, Sod Burndown	13
Ecofarming-Ecofallow	48
Fieldbean	60
Footnotes	74
Grazing Restrictions for Pasture Herbicides	55
Groundwater Contamination	9
Herbicide Carryover Discussion	5
Herbicide Classification	7
Herbicide Dictionary	78
Herbicide Resistance	6
Interpreting Herbicide Residue	5
Melons and Cucurbits	62
Mixing Herbicides	9
Moss in Stock and Nurse Tanks	65
Non-Crop Acres	57
Oat	45
Onion	62
Pasture and Range	54
Potato	59
Preharvest Intervals	76
Prices of Selected Herbicides	87
Proso Millet	47
Rainfast Table	75
Reduced Soybean Rates	42
Ridge-Till	4, 21, 29, 38
Sorghum, Forage Sorghum	28
Soybean	36
Spot Treatments	75
Sugarbeet	61
Sunflower	47
Terminology	3
Trees and Shrubs, Christmas and Fruit Trees	64
Troublesome Weeds and Woody Plants	65
Weed Competition	6
Weed Science Publications	88
Weed Response Charts	13-18, 26-27, 31-35, 44, 48, 53, 58
Wheat, Spring,	45
Wheat, Winter	46

Herbicide Applications

Soil Applied

Early preplant (EPP) treatments are made 10-30 days before planting. **Preplant surface applied** (PPSA) treatments are made 0-10 days before planting. Soil disturbance by some planters may allow weed growth in rows where herbicides are applied PPSA or EPP. **Preplant incorporated** (PPI) treatments are made before planting the crop. Thoroughly incorporate with rototiller or two angled passes of a tandem disk, field cultivator or similar equipment. **Preemergence** (PRE) treatments are applied from planting time to just before crop emergence or weed seed germination. **Surface mix** (SM) is the shallow mixing of a PRE herbicide into the top 1" to 2" of soil using a rototiller, mulch treader, field cultivator or similar implement.

Weed control with PRE treatments may be poor if there is no rain to move the herbicide into the top inch of soil. Rainfall required for activation is generally 1/4 to 1/2 inch on coarse textured soils and 1/2 to 1 inch on fine textured soils. To overcome dependence on rainfall and to increase dependability, some PRE herbicides may be incorporated into the surface soil with a rotary hoe. Excessive rainfall may leach some of the more soluble herbicides into the subsoil, especially on sandy soils. Weed control with preplant herbicides is more satisfactory on surface-planted crops. Some weed species are resistant to particular herbicides. Herbicides and crops should be rotated to control a wider spectrum of weeds and to reduce the risk of herbicide carryover.

Postemergence

Early post refers to herbicide applications made soon after the crop has emerged; control of late emerging weeds may be reduced. **Postemergence** (POST) treatments are applied after emergence of weeds or crop. **Directed** POST treatments are made to the lower portion of the crop plant.

Layby treatments are applied at last cultivation to provide an extended period of weed control.

Harvest aid treatments are applied late in the growing season to reduce weed seed production and make harvest easier.

Desiccants are applied after crop maturity to hasten drying and permit earlier harvest.

Excellent growing conditions make weeds more susceptible to POST herbicides. Likewise, crops may be more subject to herbicide damage when growing rapidly. **Adjust herbicide and additive dosages downward** when excellent conditions for growth are present the week before application and **upward** when ideal growth is limited by one or more factors. Rate of carrier should be in accordance with label recommendations.

Application Pointers

One of the components of good herbicide performance is proper application of the correct amount. Equipment must be calibrated properly before spraying. For new sprayers, flush entire system with water before installing screens and tips.

The amount of solution applied per acre depends on the forward speed, the spacing of the tips, and the output of the tip which is dependent upon the size of the tip and the pressure. A change in any one of these will change the rate of application. To calibrate a sprayer refer to NebGuide G88-865, *Fine Tuning a Sprayer With the Ounce Calibration Method.* Also, remember if spraying with any material other than water as the carrier, the output will be affected. This NebGuide also contains information on using fertilizers as carriers.

The selection of tips is an important criteria in herbicide application. The tip type, orifice size, boom height, pressure, ground or air speed, and wind all greatly affect drift potential and damage to nearby crops. These same criteria affect the coverage of the herbicide on the plants or soil surface. In general, flat fan tips have given the most satisfactory results. Nozzles placed on 30-inch spacing with the height and angle adjusted for 100% overlap gives uniform coverage. Do not angle any tip greater than 30° from vertical as the drift potential greatly increases.

For floaters and sprayers with booms greater than 36 inches in height, 80° flat fan tips are recommended. For lower boom heights, 110° tips usually are recommended. The 110° tips are needed with the lower boom height to maintain 100% overlap. Also the 110° tips yield smaller particle size allowing lower pressures while maintaining good plant coverage and reducing the drift prone fines that occur with higher pressures. For farmer application with the lower boom heights and 110° tips, the low pressure (LP) or extended range (XR) tips are recommended. The XR and LP tips give good patterns at pressures from 15 to 40 psi, and allow for reduced pressures without the pattern distortion that may occur with other tips. These tips, which maintain patterns over a wide range of pressure, work well with monitors with rate controllers. On the higher booms the 80° tips are recommended because of the difficulty in maintaining a good pattern with the 110° tips on the higher boom heights. To get the particle sizes needed for good coverage with POST herbicides the pressure needs to be 35 to 40 psi with the 80° tips and, therefore, the extended range or low pressure tips, are probably not as useful.

For banding PRE herbicides, even-flow flat fan tips are recommended.

For banding POST herbicides a three-tip setup over the row with cone tips gives the best pattern. The next best selection probably would be the even flat fan tip. When the crop is taller than 4" the center tip should be removed to minimize crop injury. Higher pressures are normally needed for the POST herbicides, especially where good coverage is important. For additional information on tips see NebGuide G89-955, *Nozzle Selection and Sizing.*

A few pointers on herbicide application are listed below:

1. It is not recommended to use any tip that requires smaller than a 50 mesh screen in order to reduce tip plugging.
2. Buy quality tips. Stainless steel, stainless steel inserts in nylon tips, polyacetal and ceramic tips in the long run are the most economical.
3. Use a special tip cleaning brush. Keep pocket knives, paper clips, and wire away from the tips as they will distort the pattern and also change the flow rate of the tip. Also check the sprayer with water to make sure that the tips are not plugged and fittings and hoses do not leak before adding any herbicide.
4. Use strainers before the pump, and before the flow control system along with tip screens.
5. Use diaphragm check valve or other sprayer items to give instant on and instant off control to eliminate drip and delay when the boom is turned on and off.

Reducing Drift

It is estimated that 2/3 of the drift problems involve mistakes which could have been avoided. Drift is of concern because it takes the pesticide from the intended target, making it less effective, and deposits it where it is not needed and not wanted. The pesticide then becomes an environmental pollutant in the off-target areas where it can injure susceptible vegetation, contaminate water or damage wildlife. Drift cannot be completely eliminated but the use of proper equipment and application procedures will maintain the drift deposits within acceptable limits.

The two kinds of drift are:

Particle drift is off-target movement of the spray particles.

Vapor drift is the volatilization of the pesticide molecules and their movement off target.

Dave Smith, a Mississippi State University ag engineer, analyzed data from more than 100 studies involving drift from ground sprayers. Of the 16 variables he considered, three were the most important.

1. Wind speed. When the wind speed was doubled, there was almost a 700% increase in drift when the readings were taken 90 feet downwind from the sprayer. Hence the recommendations of spraying in 10 mph wind or less.

2. Boom height. When the boom height was increased from 18 to 36 inches the amount of drift increased 350% at 90 feet downwind.

3. Distance downwind. If the distance downwind is doubled, the amount of drift decreases five-fold. Therefore, if the distance downwind goes from 100 to 200 feet, you have only 20% as much drift at 200 feet as at 100 feet and if the distance goes to 400 feet, you only have 4% of the drift you had at 100 feet. Check wind direction and speed when starting to spray a field. You may want to start spraying one side of the field when the wind is lower. Also it may be necessary to only spray part of a field because of wind speed, wind direction and distance to susceptible vegetation. The rest of the field can be sprayed when conditions change.

New tip types are available which reduce drift. Also spray pressure is important. Higher spray pressures produce smaller droplets which are more susceptible to drift. If using a rate controller, be careful of increased speed. Since most rate controllers increase the pressure to maintain the same gpa, when the speed increases, try to maintain the speed within ±10%. For example, if applying 20 gpa at 8 mph at 40 psi and you increase the speed to 11 mph, the pressure will now be 75.5 psi which will produce a lot of small particles prone to drift and also the pressure will be above the operating range of most tips. Drift reduction agents are helpful.

Monsanto has published a guide and a video on on-target herbicide application. Included is information on spray particle sizes, tip selection, spray pressure, factors affecting drift and how to control it.

Conservation Tillage Systems

No-Till

Early preplant treatments generally provide the most satisfactory weed control. This involves applying residue herbicides 10 to 30 days prior to planting. The objective is to apply the herbicide prior to the germination of summer annual weeds, especially grasses. This may eliminate the need for a nonselective herbicide like Gramoxone Extra or Roundup Ultra. It is important to use treatments with adequate residual control. A split herbicide application with a portion applied early preplant and a second increment at planting can be used. This could be helpful with short residue materials or where heavy rains or delayed planting occurs following the first treatment. Early preplant treatments, properly designed, can often provide consistent weed control at lower cost than planting time treatments. Soil disturbance by planter following a preplant treatment may allow weed growth in the row.

Planting time treatments of a PRE herbicide are made at or immediately after planting. When established weeds are present, a POST herbicide is combined with the PRE herbicide. Atrazine, Bladex, Extrazine II, Canopy, Preview, Pursuit, Gramoxone Extra, or Roundup Ultra will control established broadleaf weeds, grasses or volunteer wheat depending on plant height. If grasses are less than 2" tall, Atrazine, Bladex, and Extrazine II will provide acceptable control. Control is improved when crop oil concentrate or 28% UAN is added. In corn or soybean, 2,4-D ester may also be added for improved weed control. Gramoxone Extra can be applied to grasses less than 4" tall. If grasses are taller than 4" and are growing vigorously, apply Roundup Ultra at 1 pt/A. Kill volunteer wheat and annual bromes in April to prevent soil moisture loss.

Ridge-Till

With the ridge plant system, the row has fewer weeds because the weed seed produced the preceding year is not worked into the soil when the seedbed is prepared. During planting, the ridge clearing device, sweeps or disks, move soil containing corn kernels and ears, sorghum seed and/or heads, and most weed seed from the ridge. A banded herbicide treatment should be used at planting time in the row. If timely cultivation is not possible, weed density is heavy, or the field contains many hard to control weeds like velvetleaf, a broadcast herbicide treatment at planting time may be necessary.

Select the herbicide treatment from the PRE treatments of soil applied herbicides. Early preplant treatments can be applied in early April prior to planting to keep early summer annual weeds under control. The rate of atrazine to use depends on future crops that will be planted.

The early herbicide treatment should eliminate planting through 4-inch or taller weed growth. Weeds like kochia and Russian thistle are troublesome if not killed. The trouble arises along the cutting edge of the planter ridge clearing device, where larger broadleaf weeds may not be uprooted or covered. Most early germinating broadleaf weeds can be controlled effectively and economically with 2,4-D. If 2,4-D is to be used at planting it is better to apply from a spray boom on the front end or underbelly of the tractor rather than after planting. If considerable grass weed growth is present before planting, Gramoxone Extra or Roundup Ultra should be used. Another option would be to preplant cultivate for row-middle tillage, leaving ridge top weed removal to the planter ridge clearing device. This works extremely well on fields where corn was ensiled. Preplant cultivation also allows for rebuilding ridges, which may be desirable if they have been damaged by harvest equipment or livestock tramping. However, preplant cultivation mixes weed seeds into the ridge.

Ecofarming

Ecofarming is a system which controls weeds after wheat harvest and throughout the fallow period by using herbicides and/or tillage with minimum disturbance of crop residues and soils. For a more detailed discussion, see page 48.

Herbicide Carryover

Certain herbicides can persist in the soil to the extent that rotational crops may be injured. The potential for herbicide carryover increases as one goes westward in Nebraska. Lower rainfall and low soil organic matter increases carryover potential. Herbicide carryover potential is greater on eroded soils and may be influenced by pH. Carryover is also a function of application accuracy. Carryover will be more apparent in headlands and other areas where sprayer overlap is common. Herbicide applications made late in the season have greater carryover potential compared to earlier applications.

Carryover can restrict crop rotation options as well as limit replant options if a crop is lost due to hail or other disasters. Care should be taken when choosing herbicides to fit your rotation sequence. Consult the weed response charts for carryover restrictions.

Consult herbicide labels for rotation intervals and restrictions. Conducting a plant bioassay can be helpful in determining whether carryover will be a problem in your fields. Additional information on conducting a bioassay can be obtained in the NebGuide G74-113, *A Quick Test for Atrazine Carryover.*

Interpreting Soil Herbicide Residue Analysis

What does a herbicide residue level of 0.3 ppm (parts per million) in the soil mean? Herbicide concentrations may be more easily visualized as lb/A rather than ppm. The tilled layer (6-7" deep) of an acre of loam soil weighs approximately two million pounds. Two pounds of herbicide per acre mixed in the tilled layer of soil would result in a concentration of 1 ppm (two parts herbicide per two million parts soil). Multiplying the concentration in ppm by 2 will give the quantity of lb/Acre active ingredient contained in the tilled layer of soil.

What herbicide residue levels are safe to sensitive crops? This varies with the herbicide and the soil properties. The following information is provided as a guide. Consult herbicide manufacturer for more specific information.

Crop Tolerance to Herbicide Residue in the Soil (Injury Threshold)

Crop	Soil	
	Silt Loam/Clay Loam* 2.5% O.M., pH < 7.0	Sandy Loam/Loamy Sand < 2.0 % O.M., pH > 7.0
	Atrazine ppm*[1]	
Soybean	0.25 ppm*[1]	____
Oats	0.15 ppm*[1]	____
Alfalfa	0.10 ppm*[1]	____
Sugarbeet	0.005	< 0.005
	Scepter	
Corn	10-15 ppb[2]	____
	Pursuit	
Corn	30-40 ppb[2]	____
Sorghum	4-15 ppb[2]	____

*Tolerance level would be less on soils lower in organic matter and clay, and for atrazine higher in pH.
[1]ppm—parts per million
[2]ppb—parts per billion

Herbicide Resistance

Herbicide resistant weeds can develop as a result of repeatedly using the same herbicide or herbicides with the same mode of action. Herbicide resistant plants are naturally present in extremely low numbers. Repeatedly using the same herbicide allows the resistant weeds to multiply while the susceptible weeds are controlled. Over a period of time the weed population shifts to primarily herbicide-resistant weeds and weed control failures are observed. Resistant weeds cannot be controlled by increasing the herbicide rate.

Triazine-resistant kochia is common across western Nebraska. Isolated cases of triazine-resistant pigweed also have been recorded. Resistance to sulfonylurea herbicides (Glean, Ally and Amber are examples) has been confirmed in Nebraska. Additional cases of herbicide resistance are likely to develop unless steps are taken to prevent this. An integrated weed management program is suggested to minimize the development of herbicide resistant weeds.

Suggestions to minimize the development of herbicide resistant weeds include the following:

1. Rotate crops to keep any one weed species from dominating. Rotations including row crops, small grains and perennial forage crops are the most effective.
2. Include tillage as a component of the weed management program. Crop rotation permits a variation in tillage timing.
3. Utilize cultural practices that enhance crop growth thereby maximizing competitiveness with weeds. Planting sorghum and soybean in narrow rows improves their weed competitiveness.
4. Utilize herbicides with different sites of action in successive years and, where possible, within a year. This approach will slow the increase of a weed resistant to one site of action. See the discussion on Classification of Herbicides.
5. Use short residual rather than persistent herbicides. Most cases of resistant weeds involve persistent herbicides. Where long residual herbicides are used, other control measures should also be employed.

Weed Competition

Weeds compete with crops for water, mineral nutrients, sunlight, and infrequently for carbon dioxide and oxygen. Weed species differ in competitiveness based largely on their growth rate, size, canopy shape, and emergence date. Competitive index (CI) is a term used to describe the relative competitiveness of weed species, and is expressed as a range of 1-10. A plant with a CI of 1.0 is 1/10 as competitive as a plant with a CI of 10.0. **The CI of common weeds is listed in the weed response tables in this publication.** Competitive load is a term used to describe the total competitive effect of a weed population (community) and is a summation of the number of individual weeds multiplied by the CI of each. If there are 5 individuals of species A (CI 2.0) and 2 individuals of species B (CI 5.0) per 100 sq ft, the competitive load is 5 (species A) X 2.0 (CI of A) + 2 (species B) X 5.0 (CI of B) = 20. Crop yield reductions due to weed competition are directly related to the competitive load. Crops vary in their competitiveness with weeds based on their growth characteristics. Therefore, a specific competitive load may cause a larger yield reduction in one crop than another.

Competitive load required for a 5% yield reduction

Crop	Competitive Load per 100 ft^2
Corn	36
Soybean	10
Sorghum	10
Sugarbeet	5
Wheat	50

Classification of Herbicides by Mode and Site of Action and Chemical Family

Herbicides can be classified into families based on their chemical similarity or grouped by how they kill plants (mode and site of action). In some cases, herbicides from different chemical families have a similar site of action. Combinations of herbicides having the same site of action can lead to problems. For example, repeated use of ALS inhibitors can result in the selection for ALS-resistant weeds. Using sulfonylurea and imidazolinone herbicides (Classic, Pursuit, etc.) in the same growing season can result in increased carryover problems or possible crop injury. These problems can be lessened by rotating or combining herbicides with different action sites. This table lists herbicides by their broad mode of action (Roman numeral), specific action site (letter), and chemical family (number). Those herbicides with a common action site pose the highest risk of an additive effect which can lead to resistant weed development, additional carryover, or more crop injury. Refer to Weed Technology 11: 384-393 (1997) for additional information on herbicide classification.

Common Name—Trade Name—Site of Uptake

I. Lipid Synthesis Inhibitors

A. ACC ase inhibitors

1. Aryloxyphenoxypropionates
   - diclofop—Hoelon—F
   - fenoxaprop—Option II—F
   - fluazifop-P—Fusilade DX—F
   - quizalofop-P—Assure II—F
2. Cyclohexanediones
   - clethodim—Select—F
   - sethoxydim—Poast Plus—F
   - tralkoxydim—Achieve—F

II. Amino Acid Synthesis Inhibitors

A. ALS-AHAS inhibitors

1. Imidazolinones
   - imazamox—Raptor (F/R)
   - imazamethabenz—Assert—R/F
   - imazameth—Plateau—R/F
   - imazapyr—Arsenal—R/F
   - imazaquin—Scepter—R/F
   - imazethapyr—Pursuit—R/F
2. Sulfonylureas
   - bensulfuron—Londax—F/R
   - chlorimuron—Classic—F/R
   - chlorsulfuron—Glean—F/R
   - ethametsulfuron—Muster—F
   - halosulfuron—Permit/Battalion—F/R
   - metsulfuron—Ally/Escort—F/R
   - nicosulfuron—Accent—F
   - oxasulfuron—Expert—F/R
   - primisulfuron—Beacon—F/R
   - prosulfuron—Peak—F/R
   - rimsulfuron—Matrix—F/R
   - sulfometuron—Oust—F/R
   - triasulfuron—Amber—F/R
   - thifensulfuron—Harmony/Pinnacle—F/R
   - tribenuron—Express—F/R
   - triflusulfuron—Upbeet—F
3. Triazolopyrimidines
   - choransulam methyl—First Rate—F/R
   - flumetsulam—Broadstrike—R/F

B. EPSP synthetase inhibitors
   - glyphosate—Roundup Ultra/Rodeo—F
   - sulfosate—Touchdown—F

C. Glutamine synthetase Inhibitor
   - glufosinate—Liberty—F

III. Seedling Growth Inhibitors

A. Microtubule assembly inhibitors

1. Dinitroanilines
   - benefin—Balan—S/R
   - ethalfluralin—Curbit/Sonalan—S
   - oryzalin—Surflan—S
   - pendimethalin—Prowl—S
   - trifluralin—Treflan—S
2. Pyridazines
   - dithiopyr—Dimension—R/F
3. Carbamates
   - asulam—Asulox—F/R
4. Unclassified
   - DCPA—Dacthal—R

B. Shoot inhibitors

1. Chloroacetamides
   - acetochlor—Harness/Surpass—S/R
   - alachlor—Lasso—S/R
   - dimethenamid—Frontier—S/R
   - fluthiamide—Axiom component—S/R
   - metolachlor—Dual—S/R
   - pronamide—Kerb—S/R
   - propachlor—Ramrod—S/R
2. Nitriles
   - dichlobenil—Casoron—R/F

C. Lipid synthesis inhibitors (not ACC ase)

1. Thiocarbamates
   - butylate—Sutan +—S/R
   - cycloate—Ro-Neet—S/R
   - EPTC—Eptam/Eradicane—S/R
   - triallate—Far-Go—S/R

D. IAA inhibitors

1. Phthalamates
   - naptalam—Alanap—R/F

IV. Growth Regulators

A. Synthetic auxins

1. Phenoxyacetic Acids
   - 2,4-D—Many—F/R
   - 2,4-DB—Butyrac—F
   - dichlorprop—Many—F
   - MCPA—Many—F/R
   - mecoprop—Many—F
2. Benzoic Acids
   - dicamba—Banvel/Clarity—F/R/S
3. Carboxylic Acids
   - clopyralid—Stinger—F/R
   - picloram—Tordon—F/R
   - triclopyr—Garlon—F/R
4. Quinolines
   - quinclorac—Facet

V. Photosynthesis Inhibitors (Photosystem II) - Classes differ in binding behavior

A. C_1 class

1. Triazines
   - ametryn—Evik—R/F
   - atrazine—AAtrex—R/F
   - cyanazine—Bladex—R/F
   - prometon—Pramitol—R/F
   - simazine—Princep—R
2. Triazinones
   - hexazinone—Velpar—R/F
   - metribuzin—Lexone/Sencor—R/F
3. Phenylcarbamates
   - desmedipham—Betanex—F
   - phenmedipham—Betanal—F
4. Uracils
   - bromacil—Hyvar—R
   - terbacil—Sinbar—R

B. C_2 class

1. Phenylureas
   - diuron—Karmex—R
   - linuron—Lorox—R/F
   - tebuthiuron—Spike—R
   - siduron—Tupersan—R

C. C_3 class

1. Benzothiadiazoles
   - bentazon—Basagran—F
2. Nitriles
   - bromoxynil—Buctril—F
3. Phenylpyridazine
   - pyridate—Tough—F

VI. Cell Membrane Disrupters

A. PPO inhibitor

1. Diphenylethers
   - acifluorfen—Blazer—F
   - fomesafen—Reflex/Flexstar—R/F
   - lactofen—Cobra—F
   - oxyflurofen—Goal—R/S
2. N-phenylphthalimides
   - flumiclorac—Resource—F
   - fluthiacet methyl—Action—F
3. Triazolinone
   - sulfentrazone—Authority/Cover—R

B. Photosystem I election diversion

1. Bipyridyliums
   - diquat—Reward—F
   - paraquat—Gramoxone Extra—F

VII. Pigment Inhibitors

A. Carotenoid biosysthesis inhibitors

1. Isoxazole
   - isoxaflutole—Balance—R
2. Isoxazolidinone
   - clomazone—Command—R/S
3. Pyridazinone
   - norflurazon—Zorial—S
   - pyrazone—Pyramin—R/F

VIII. Unknown

- endothall—Endothal/Aquathol—R/F
- difenzoquat—Avenge—F
- ethofumesate—Nortron SC—SR
- fosamine—Krenite—F
- MSMA—Many—F
- DSMA—Many—F
- bensulide—Prefar—R/S

SITE OF HERBICIDE UPTAKE

R=Root Uptake
S=Shoot Uptake
F=Foliage Uptake

Letter sequence indicates primary order of herbicide uptake

Minimizing Water Contamination

Pesticide contamination of groundwater and surface water is a public concern. Contamination results from two types of sources — point and non-point.

Point Source Contamination

Point source contamination results from localized spills or accidents, i.e., the contamination can be traced back to an identifiable area. Point source contamination accounts for large doses being introduced into groundwater and poses a high risk of rendering the water unfit for drinking.

Spills and other mishaps which occur during the handling and mixing of pesticides are a major contributing factor. There are several steps we can take to minimize contamination.

Wells are a direct conduit to the groundwater and extra care should be taken at these sites when handling pesticides. In addition, many wells are not adequately sealed which increases the risk of contamination in the event of a spill. Mix pesticides at least 200 ft. from a well. Using a nurse-tank as a water source helps avoid these problems. Prevent back-siphoning into the well. Keep the end of the filler hose above the water level of the tank at all times. **Anti-backflow devices for hoses can be purchased from irrigation and spray equipment suppliers.** Clean up spills, especially near wells and other water supplies.

Because of the risk of a major mishap and groundwater contamination from chemigation, we do not suggest herbigation. If you need information, contact the specific chemical company.

Additional practices which help prevent point source contamination include triple-rinsing and the proper disposal of pesticide containers and excess pesticides.

For help in any emergency involving spills, leaks, fires, or exposure, phone 1-800-424-9300.

Non-point Source Contamination

Contamination which occurs from non-point sources cannot be traced back to a specific location or event. Examples of non-point source contamination would include the leaching of pesticides through the normal course of pesticide use, or pesticides carried into streams by surface runoff. The extent of non-point source contamination is dependent upon herbicide, soil, geology, topography, management practices, and weather.

There are several practices which minimize non-point source contamination. Apply the proper amount of herbicide for the crop, weed and site. Read the label to determine what the correct use rate is. Proper sprayer calibration assures application uniformity and more effective control. The amount of product can also be reduced by using band applications instead of broadcast treatments. These practices not only reduce the potential for groundwater contamination but also decrease the chance of crop injury, carryover problems, and make weed control more economical.

In choosing a herbicide, less mobile, short residual products are less likely to leach to the water table. Crop and herbicide rotation also reduces risk as a result of using different herbicides each year.

Identify high risk areas. The greatest risk for groundwater contamination exists where the water table is close to the soil surface. In addition, herbicides are more likely to contaminate groundwater when applications are made to coarse textured soils low in organic matter. High pH soils also present concerns because some herbicides leach more readily under these conditions. Extra care should be taken when any of these situations exist.

The greatest risk for surface water contamination is on steeply sloping land that drains directly into a stream/lake. Management practices such as terraces and conservation tillage to reduce water runoff will help. Reducing herbicide rates by banding or using combinations will reduce the loading potential of that product. Untreated buffer zones next to streams/lakes and grass waterways to encourage water infiltration may also be helpful.

Mixing Herbicides

Most herbicide labels give mixing sequences for tank mix combinations. If directions are not given, follow these steps:

1. Add approximately one-half of the needed water to the tank with agitation on.
2. Add water soluble packets, begin agitation.
3. If called for, add compatibility agents, anti-foaming agents, wetting agents, fertilizer, or other additives except crop oil.
4. Add flowables, dry flowables, or wettable powders.
5. If needed, add emulsifiable concentrates, crop oils and/or surfactants.
6. Finish filling tank with water while continuing agitation.
7. Apply as soon as possible after mixing. Avoid holding overnight whenever possible.
8. Sprayers should provide good agitation of spray solution and be equipped with appropriate strainers and screens to avoid tip clogging. **Do not mix herbicides near water sources. Herbicides may not always mix readily. Conduct a compatibility test if in doubt.**

Cleaning the Sprayer

First rinse the sprayer with a material which acts as a solvent for the herbicide. **Apply rinsate on registered crop or site.** Oils dissolve oil-soluble herbicides such as 2,4-D ester. Chemicals which form emulsions when mixed with water are oil-soluble. After the oil rinse, a rinse with water containing detergent will help remove the oil. Oil-soluble herbicides are the most difficult to remove. For most water-soluble herbicides, repeated rinsing with water is usually enough. Hormone type compounds require extra precautions. 2,4-D amine salts are water-soluble.

Cleanup Procedures

2,4-D, Banvel, Clarity, Curtail, Landmaster BW, Marksman, Tordon

If Banvel or 2,4-D were used, fill the tank with water and ammonia. Add one quart of household ammonia to 25 gallons of water. Approved tank cleaner can be used instead of ammonia as specified on product label. Pump enough solution through the hose and tips to fill these parts completely. Then fill the tank, close and leave for 24 hours before rinsing thoroughly with water.

Activated charcoal can be used after the preliminary rinsing to decontaminate the sprayer. A 3% suspension absorbs the 2,4-D. Agitate the suspension for two to three minutes and drain, then rinse thoroughly with clear water.

Atrazine, Bicep, Bladex, Extrazine II, Lariat, Laddok, Lexone, Sencor

See that none of the powder remains in the tank or spraying system. Thoroughly clean all equipment immediately after use.

Accent, Ally, Amber, Basis, Basis Gold, Battalion, Beacon, Canopy, Classic, Gemini, Glean, Harmony, Oust, Peak, Permit, Pinnacle, Preview

1. Drain tank, then flush tank, boom and hoses with clean water for a minimum of 10 minutes.
2. Fill the tank with clean water, then add one quart ammonia per 25 gallons of water. Flush through boom and hoses, allow to sit for 15 minutes with agitation, then drain.
3. Repeat Step 2.
4. Nozzles and screens should be removed and cleaned separately. To remove traces of ammonia, rinse the tank thoroughly with clean water and flush through hoses and boom.

Spray Additives

Additives are commonly used with POST herbicides to improve performance. Improved performance results from increased herbicide penetration of the treated plant surface. Additive response varies with the herbicide, weed species, and environmental conditions. Therefore, it is important that additives not be indiscriminately added to the spray mixture.

POST herbicide activity is strongly influenced by the additives included in the spray mixture. The most commonly used spray additives (adjuvants) include oils, surfactants (surface active agents) and fertilizers. The degree of weed control and the potential for crop injury are both influenced by additives. Additive effectiveness varies with herbicide and weed species. The response to an additive will vary with environment, weed species, and herbicide. Often additives that increase weed control also increase crop injury. There is a "fine line" between increased weed control and increased crop injury.

Oil concentrates include both petroleum and seed derived oils and are usually composed of at least 17% emulsifiers and 83% oil. Combining an emulsifier with the oil results in a unit, one portion of which is highly oil soluble, the other portion water soluble. Without the emulsifier the oil would not mix with water. Methylation improves the effectiveness of seed oils as spray additives. Oil concentrates are generally used at 1% v/v of spray solution or 1 to 2 pt/A depending upon the herbicide, oil, and spray volume.

A material is called a surfactant if it tends to concentrate on the surface of a liquid in which it is mixed. Compounds that function in this way generally consist of two components. One portion of the molecule is hydrophilic (water soluble) and the other portion is lipophilic (oil soluble). Surfactants concentrate at the interface of two surfaces binding them together.

Surfactants are classified by the hydrophilic portion of the molecule. There are three important classes of surfactants: (1) anionic, (2) cationic, and (3) nonionic. *Anionic* surfactants ionize in water to form a negative ion. *Cationic* surfactants ionize in water to form a positively charged ion. *Nonionic* contain no ionizable groups and therefore carry no charge. They are by far the most commonly used surfactant type.

Organosilicone surfactants are a class of nonionic surfactants that are especially effective in reducing surface tension of water mixtures. This results in efficient wetting of very waxy surfaces. Most other nonionic surfactants interfere with the function of organosilicones and should not be used with them. Organosilicones are most stable and most effective in solutions of pH 6 to 8. In more alkaline or acidic solutions, these compounds hydrolyze with a loss in activity.

Ammonium containing fertilizers are effective spray additives with UAN solutions, ammonium sulfate and 10-34-0 being the most commonly used. The ammonium in these fertilizers enhances the uptake of certain herbicides, especially weak acids by a mechanism not well understood. While oils and surfactants function primarily at the waxy leaf surface, the ammonium ion functions inside the cell wall. This enhanced activity due to the ammonium ion is pronounced with several POST herbicides. Fertilizers are not surfactants and do not replace the need for surfactants in the spray mixture.

Surfactants exert their effect on the leaf cuticle or spray droplet to enhance penetration of foliar-applied herbicides. This results from a reduction in surface tension of the spray droplets causing them to spread out and "wet" the sprayed surface. Surface tension causes water to "bead" on a waxy surface as a result of an energy imbalance, "skin effect", at the surface. Plant surfaces are composed of waxes while the spray mixture is primarily water. The surfactant with the hydrophilic end associated with the spray mixture and the lipophilic portion oriented to the lipid containing plant surface functions as a bond between the two. The result is the spray droplets spread out more completely over the surface. This improved wetting generally results in increased herbicide uptake by the plant hence increased herbicide activity.

Additives for Post Corn Herbicides

Check the label for specific additive rates and use conditions. Weather conditions, crop and weed growth stages and herbicide rate will determine the proper additive and use rate.

Herbicide	Nonionic Surfactant	Nonionic Surfactant + UAN	Crop Oil Concentrate	Crop Oil Concentrate + UAN	28% UAN
Accent	1-2 qt/A	1-2 qt/A + 1-2 qt/A	1 gal/100	1 gal/100 + 1-2 qt/A	—
Accent + Atrazine	—	—	1 gal/100	1 gal/100 + 2-4 qt/A	—
Accent + Banvel	1 qt/100 gal	1 qt/A + 2-4 qt/A	—	—	—
Accent + Buctril	1 qt/100 gal	1 qt/A + 2-4 qt/A	—	—	—
Accent + Buctril + Atrazine	1 qt/100 gal	1 qt/100 + 2-4 qt/A	—	—	—
Atrazine	—	—	1 qt/A	—	—
Banvel	—	—	—	—	2-4 qt
Basis	—	1-2 qt/100 + 1-2 qt/A	—	1-2 gal/100 + 1-2 qt/100	—
Basis Gold	—	—	1-2 gal/100	1-2 gal/100 + 2 qt/A[2]	—
Beacon	1 qt/100 gal	1 qt/A + 2-4 qt/A[2]	1 qt/A	1 qt/A + 2-4 qt/A	—
Beacon + 2,4-D	1 qt/A	—	—	—	—
Beacon + Banvel	1 qt/A	—	—	—	—
Beacon + Buctril	1 qt/A	—	—	—	—
Bladex 90DF	1 qt/A dry[3]	—	vegetable oil-dry	—	—
Buctril	—[1]	—	—[1]	—	—[1]
Buctril + Atrazine	1 qt/100[1]	—	—	—	—
Buctril + Banvel	—	—	—	—	—
Clarity	1 qt/100 gal	—	1 qt/A dry	—	2-4 qt/A
Contour	—	1 qt + 1-2 qt/A[2]	—	1.5-2 pt + 1-2 qt/A[2]	—
Exceed	1 qt/100 gal	1 qt/A + 2-4 qt/A	1 qt/A	yes	—
Extrazine II 4L	—	—	—	—	—
Extrazine II DF	1 qt/A dry	—	vegetable oil-dry	—	—
Laddok S-12	—	—	1 qt/A	1 qt + 2-4 qt/A	2-4 qt/A
Liberty	—	—	—	—	—
Lightning	—	1 qt/A + 1-2 t/A	—	—	—
Marksman	1 qt/100 gal	—	1 qt/A[1]	—	2-4 qt/A
Pursuit	—	1 qt/100 + 1-2 qt/A	—	1.5-2 pt/A + 1-2 qt/A	—
Permit	1 qt/100 gal	1 qt/100 + 2-4 qt/A	1 gal/100	1 gal/100 + 2-4 qt/A	—
Permit + Banvel	1 qt/100 gal	—	—	—	—
Permit + Buctril	1 qt/100 gal	—	—	—	—
Permit + Accent or Beacon	1 qt/100 gal	—	—	—	—
Poast HC	—	—	1 qt/A	1 qt/A + 2-4 qt/A	—
Resolve (IMI Corn)	—	1 qt/100 — 1-2 qt/A	—	—	—
Resource	—	—	1 qt/A	1 qt/A + 2 qt/A	—
Roundup Ultra	—	—	—	—	—
Scorpion III	1 qt/A	1 qt/A + 1-2 qt/A	—	—	—
Sencor + Basagran	—	—	—	—	2-4 qt/A
Shotgun	—	—	—	—	—
2,4-D	—	—	—	—	—

[1]Labeled but not normally used due to crop injury.
[2]Ammonium Sulfate (Spray Grade) can be substituted for UAN.
[3]Use only under moisture stress conditions.

Additives for Post Soybean Herbicides

Herbicide	Nonionic Surfactant	Nonionic Surfactant + UAN	Crop Oil Concentrate (COC)	Crop Oil + UAN	Dash	UAN	Dash UAN
Assure II	1 qt/100	1 qt/100 + 2-4 qt/A[2]	1 qt/A	1 qt/A + 2-4 qt/A[2]	—	—	—
Basagran	—	—	1 qt/A	yes[2]	—	2-4 qt/A[2]	—
Basagran + Blazer	—	—	1 qt/A[1]	—	—	2-4 qt/A[2]	—
Basagran + Poast Plus	—	—	1 qt/A	1 qt/A + 1-2 qt/A[1,2]	—	2-4 qt/A[2]	1 qt/A + 2-4 qt/A[2]
Basagran + Blazer + Poast Plus	—	—	1 qt/A	—	—	—	—
Basagran + Scepter	1 qt/100	—	—	—	—	—	—
Blazer	1 qt/100	—	1 qt/A	—	—	2-4 qt/A	—
Blazer + Poast Plus	—	—	1 qt/A[1]	—	—	—	—
Classic + Assure	1 qt/100	1 qt/100 + 1-2 qt/A[1,2]	1 qt/A	1 qt/A + 1-2 qt/A[2]	—	—	—
Classic + Pinnacle + Assure	1 qt/100	1 qt/100 + 1-2 qt/A[1,2]	—	—	—	—	—
Classic	1 qt/100	1 qt/100 + 2-4 qt/A[2]	1 qt/100[1]	1 qt/A + 2-4 qt/A[1,2]	—	—	—
Cobra	1 qt/100	1 qt/100 + 2-4 qt/A[2]	1 qt/100[1]	1 qt/A + 2-4 qt/A[1]	—	2-4 qt/A[2]	—
Concert	—	1 qt/100 + 1-2 qt/A[2]	—	1 qt/A + 1-2 qt/A	—	—	—
Flexstar	1 qt/100	—	—	1 qt/A + 2-4 qt/A	—	—	—
Fusilade + Basagran	1 qt/100	—	1 qt/A	—	—	—	—
Fusilade or Fusion	1 qt/100	—	1 qt/A	—	—	—	—
Galaxy	—	—	1 qt/A[1]	1 qt/A + 2-4 qt/A	—	2-4 qt/A[2]	—
Matador	1 qt/100	1 qt/100 + 2-4 qt/A[2]	1 qt/A	1 qt/A + 2-4 qt/A	—	—	—
Option	1 qt/100	—	1 qt/A	1 qt/A + 1-2 qt/A	—	—	—
Option + Basagran	—	—	1 qt/A	—	—	2-4 qt/A	—
Pinnacle	—	1 qt/100 + 2-4 qt/A[2]	—	—	—	—	—
Pinnacle + Basagran	—	1 qt/100 + 2-4 qt/A	—	1 qt/A + 2-4 qt/A[1,2]	—	—	—
Pinnacle + Classic	1 qt/100	—	1 qt/A	—	—	—	—
Poast Plus	—	—	1 qt/A	1 qt/A + 2-4 qt/A[2]	1 qt/A	—	1 qt/A + 2-4 qt/A[2]
Prestige	—	—	1 qt/A	1 qt/A + 2-4 qt/A[2]	1 qt/A	—	—
Pursuit	—	1 qt/100 + 1-2 qt/A	—	1 qt/A + 1-2 qt/A[1,2]	—	—	—
Raptor	—	1 qt/100 + 2-4 qt/A	—	1 qt/100 + 1-2 qt/A[1,2]	—	—	—
Reliance Synchrony (STS Beans)	—	—	1 qt/A	1 qt/A + 1-2 qt/A[2]	—	—	—
Reflex	1 qt/100	—	—	1 qt/A + 1-2 qt/A	—	—	—
Resource	—	—	1 qt/A	1 qt/A + 1-2 qt/A[2]	—	—	—
Rezult	—	—	—	—	—	2-4 qt/A[2]	—
Roundup Ultra	—	—	—	—	—	—	—
Scepter	1 qt/100	—	1 qt/A	—	—	—	—
Scepter OT	1 qt/100	—	—	—	—	—	—
Select	—	—	1 qt/A	1 qt/A + 2 qt/A	—	—	—
Skirmish	1 qt/100	1 qt/100 + 2-4 qt/A[2]	1 qt/2[1]	1 qt/A + 2-4 qt/qt/A[1,2]	—	—	—
Status	1 qt/100	—	1 qt/A[2]	—	—	2-4 qt/A	—
Stellar	1 qt/100	1 qt/100 + 2-4 qt/A[2]	1 qt/A[2]	1 qt/A + 2-4 qt/A[1,2]	—	—	—

[1]Crop injury potential is enhanced with COC. Use only for labeled conditions.
[2]Ammonium Sulfate (Spray Grade) can be substituted for UAN.

Additives for Post Sorghum Herbicides

Check the label for specific additive rates and use conditions. Weather conditions, crop and weed growth stages and herbicide rate will determine the proper additive and use rate.

Herbicide	Nonionic Surfactant	Nonionic Surfactant + UAN	Crop Oil Concentrate	Crop Oil Concentrate + UAN	UAN
Atrazine	—	—	1 qt/A	—	—
Banvel	—	—	—	—	—
Buctril + Atrazine	1 qt/100[1]	—	—	—	—
Laddok S-12	—	—	1 qt/A	—	—
Marksman	—	—	—	—	—
Peak	1 qt/100	1 qt/100 + 2-4 qt/A	1 qt/A	1 qt/A + 2-4 qt/A	—
Permit	1 qt/100	1 qt/100 + 2-4 qt/A	1 gal/100	1 gal/100 + 2-4 qt/A	—
2,4-D	—	—	—	—	—
Shotgun	—	—	—	—	—

[1]Labeled but not normally used due to crop injury.

CRP/Sod Response to Selected Herbicides

Herbicide	Treatment Time*	Rate	Alfalfa	Bluegrass	Red Clover	Smooth Brome	Sweet Clover	Tall Fescue
2,4-D + Banvel	Spring	1.0 qt + 0.5 pt	9	1	10	2	10	2
2,4-D + Banvel	Fall	1.0 qt + 0.5 pt	10	1	10	2	10	2
Gramoxone Extra	Spring	1.5 pt	2	5	5	3	3	5
Gramoxone Extra	Spring	3.0 pt	3	6	6	4	4	7
Gramoxone Extra	Fall	1.5 pt	3	6	6	4	4	6
Gramoxone Extra	Fall	3.0 pt	5	6	6	5	4	7
Roundup Ultra/Touchdown*	Spring	1.0 qt	5	8	5	4	5	5
Roundup Ultra/Touchdown*	Spring	2.0 qt	6	9	7	6	7	7
Roundup Ultra/Touchdown*	Fall	1.0 qt	6	9	7	6	7	7
Roundup Ultra/Touchdown*	Fall	2.0 qt	7	10	9	8	9	9
Roundup Ultra/Touchdown* + 2,4-D	Spring	1 qt + 1 pt	7	8	8	4	8	5
Roundup Ultra/Touchdown* + 2,4-D	Spring	2 qt + 1 qt	8	9	9	6	9	7
Roundup Ultra/Touchdown* + 2,4-D	Fall	1 qt + 1 pt	8	9	9	6	9	7
Roundup Ultra/Touchdown* + 2,4-D	Fall	2 qt + 1 qt	9	10	10	8	10	8
Roundup Ultra/Touchdown* + Banvel	Spring	1 qt + 0.5 pt	8	8	9	4	9	5
Roundup Ultra/Touchdown* + Banvel	Spring	2 qt + 1 pt	9	9	10	6	10	7
Roundup Ultra/Touchdown* + Banvel	Fall	1 qt + 0.5 pt	9	9	10	6	10	7
Roundup Ultra/Touchdown* + Banvel	Fall	2 qt + 1 pt	10	10	10	8	10	9
Gramoxone Extra + Atrazine	Spring	1.5 pt + 2 lb	5	9	7	7	7	7
Gramoxone Extra + Extrazine	Spring	1.5 pt + 3 lb	5	9	9	7	7	7

Herbicide	Treatment Time	Rate	Warm Season Grasses	Wheatgrass
Gramoxone Extra	Spring	1.5 pt	3	3
Gramoxone Extra	Spring	3.0 pt	4	4
Gramoxone Extra	Fall	1.5 pt	4	4
Gramoxone Extra	Fall	3.0 pt	5	5
Roundup Ultra/Touchdown*	Spring	1.0 qt	4	4
Roundup Ultra/Touchdown*	Spring	2.0 qt	7	6
Roundup Ultra/Touchdown*	Fall	1.0 qt	7	6
Roundup Ultra/Touchdown*	Fall	2.0 qt	9	8
Roundup Ultra/Touchdown* + 2,4-D	Spring	1 qt + 1 pt	4	4
Roundup Ultra/Touchdown* + 2,4-D	Spring	2 qt + 1 qt	7	6
Roundup Ultra/Touchdown* + 2,4-D	Fall	1 qt + 1 pt	7	6
Roundup Ultra/Touchdown* + 2,4-D	Fall	2 qt + 1 qt	9	8
Roundup Ultra/Touchdown* + Banvel	Spring	1 qt + 0.5 pt	4	4
Roundup Ultra/Touchdown* + Banvel	Spring	2 qt + 1 pt	7	6
Roundup Ultra/Touchdown* + Banvel	Fall	1 qt + 0.5 pt	7	6
Roundup Ultra/Touchdown* + Banvel	Fall	2 qt + 1 pt	9	8
Gramoxone + Atrazine	Spring	1.5 pt + 2 lb	3	7
Gramozone + Extrazine	Spring	1.5 pt + 3 lb	3	7

Rating	Percent Control
10 —	(96-100%)
9 —	(90-95%)
8 —	(85-90%)
7 —	(80-84%)
6 —	(70-79%)
5 —	(60-69%)
4-2 —	less than 60%
1 —	0

Ratings reflect favorable growing conditions.

* Response ratings assume that old growth is removed before application and 6-12" of new growth is present. Soil moisture affects the response. Soil moisture is usually limiting in the fall in western Nebraska. Response ratings assume the additions of AMS. Fall applications to warm-season grasses must be made prior to dormance, usually before September 15 to October 5. Control of warm-season grasses will decrease after a light frost. Fall applications to cool-season grasses may be made through November 1. Use Touchdown at 2/3 the Roundup Ultra rate.

Weed Response to Burndown Herbicides*

No-till Corn and Grain Sorghum

Herbicide	Annual Bluegrass	Chickweed	Downy Brome	Dandelion	Foxtail Barley	Evening Primrose	Henbit	Horseweed (Marestail)	Pennycress	Prickly Lettuce	Shepherdspurse	Purslane Speedwell	Virginia Pepperweed	Tall Knotweed	Foxtail	Barnyardgrass	Lambsquarters	Field Sandbur	Kochia	Kochia-Triazine-resistant	Russian Thistle	Smartweed—Annual	Velvetleaf	Sunflower	Rye	Winter Wheat	Alfalfa	Sweet Clover	Hairy Vetch	Grain Sorghum***
2,4-D Ester (1.0 pt)**	1	7	1	5	1	7	5	7	10	9	10	7	8	6	1	1	9	1	7	4	7	7	8	10	1	1	5	7	9	Y
2,4-D Ester (0.5 pt) + Banvel (0.5 pt)	1	10	1	9	1	8	9	8	10	9	10	7	9	9	1	1	9	2	9	9	9	9	8	10	1	1	9	8	10	N
Atrazine (2.0 qt)	9	10	7	4	9	9	10	8	10	9	10	10	9	10	7	6	10	6	10	1	9	10	10	10	6	6	4	3	6	Y
Atrazine + Banvel (2.0 qt + 0.5 pt)	10	10	8	8	10	10	10	10	10	10	10	10	10	10	9	7	10	7	10	10	9	10	9	10	5	5	7	9	10	N
Atrazine + 2,4-D (2.0 qt + 1.0 pt)	10	10	8	6	10	10	10	10	10	10	10	10	10	10	8	7	10	7	10	6	9	10	10	10	5	7	5	8	10	Y
Banvel (0.5 pt)**	1	10	1	8	1	7	9	7	9	9	7	4	7	9	1	1	7	2	9	9	9	8	7	10	1	1	9	8	10	N
Bladex (2.0 qt)	10	10	7	4	10	10	10	10	10	7	10	10	10	10	8	7	10	7	10	1	9	9	9	10	4	5	3	6	7	N
Bladex + 2,4-D (2.0 qt + 1.0 pt)	10	10	7	6	10	9	10	10	10	10	10	10	10	10	8	7	10	7	9	4	9	10	9	10	4	6	6	8	10	N
Extrazine II (4.0 qt)	9	10	7	5	9	9	10	9	10	10	10	10	9	10	8	7	10	7	10	2	9	10	9	10	6	7	3	4	8	N
Extrazine II + 2,4-D (4.0 qt + 1.0 pt)	10	10	8	7	9	10	10	10	10	10	10	10	10	10	8	8	10	8	10	4	9	10	9	10	6	6	5	8	10	N
Gramoxone + Atrazine (1.5 pt + 2.0 qt)	10	10	10	5	10	10	10	9	10	10	10	10	10	10	9	10	10	10	10	9	9	9	10	10	10	10	5	7	7	Y
Gramoxone + Bladex (1.5 pt + 2.0 qt)	10	10	10	5	8	10	10	9	10	10	10	10	10	10	10	10	10	10	9	9	9	8	9	10	9	10	3	8	8	N
Gramoxone Extra (1.5 pt)	9	10	7	5	7	7	9	7	10	8	9	6	9	8	6	6	7	9	9	9	6	6	8	10	6	6	4	6	8	Y
Gramoxone + Extrazine (1.5 pt + 4.0 qt)	10	10	10	6	10	10	10	10	10	10	10	10	10	10	10	9	10	10	10	9	9	10	10	10	10	10	4	6	7	N
Roundup Ultra/Touchdown**** (1.0 pt)	10	10	10	5	9	7	7	6	10	6	10	10	7	9	9	10	7	10	7	7	9	7	7	9	10	10	4	3	5	Y
Roundup Ultra/Touchdown**** (1.5 pt)	10	10	10	7	9	8	9	8	10	7	10	10	8	9	10	10	9	10	8	8	9	8	9	9	10	10	5	4	6	Y
Roundup Ultra/Touchdown**** + 2,4-D (1.0 pt + 1.0 pt)	10	10	8	9	9	9	9	9	10	9	10	10	9	9	9	10	9	10	9	9	9	9	10	10	10	10	6	5	7	Y
Roundup Ultra/Touchdown**** + Atrazine (1.0 pt + 1.5 pt)	10	10	10	6	8	10	10	10	10	10	10	10	10	10	9	10	10	10	10	8	10	10	10	10	10	10	4	3	6	Y

Rating	Percent Control
10 —	(96-100%)
9 —	(90-95%)
8 —	(85-90%)
7 —	(80-84%)
6 —	(70-79%)
5 —	(60-69%)
4-2 —	less than 60%
1 —	0

* This guide presents burndown information only. It *does not* reflect residual weed control.

** Preplant interval— 2,4-D—5 days for corn, 7 days for soybean, 10 days for sorghum, 7 days for 2,4-D + Banvel at 1 qt and 0.5 pt—10 days for corn on sandy soil. Banvel—6 months for soybean, 15 days for sorghum.
Postplant interval—2,4-D—5 days for corn.

*** Treatment labeled for use in no-till grain sorghum, Y = Yes, N = No.

**** Use Touchdown at 2/3 the rate listed for Roundup Ultra.

Broadleaf Weed Response To Selected Herbicides

Field Corn, Popcorn*, Sweet Corn**, and Silage***

Plant response may be altered by growing conditions, genetic variation in crops and weeds, soil type, pH, organic matter and application rates. Ratings may vary from season to season and geographical areas within the state. Ratings apply when herbicides are used as suggested in this publication. See pages 65-74 for additional problem weeds and their control.

Weed Response Ratings: Ratings are for light to moderate weed populations, favorable conditions and weed growth stage as specified on the product label. High weed populations, adverse conditions, or large weeds will reduce control. 10—(96-100%), 9—(90-95%), 8—(85-89%), 7—(80-84%), 6—(70-79%), 5—(60-69%), 4-2—less than 60%, 1—0%

	B. Nightshade (3.5)§	Cocklebur (5.5)	Kochia (2.5)	Kochia, ALS-resistant (2.5)	Kochia, Triazine-resistant (2.5)	Lambsquarters (1.5)	Pigweed (2.5)	Pigweed, Triazine-resistant (2.5)	Ragweed (4.5)	R. Thistle (2.3)	Smartweed (1.5)	Sunflower (10)	Velvetleaf (4.2)	Waterhemp(2.5)	Waterhemp, ALS-resistant (2.5)	Waterhemp, Triazine-resistant (2.5)	Crop Safety[a]	Recrop Interval, in Months[b]
Soil Applied Herbicides																		
AAtrex/Atrazine*,**,***	9	8	10	10	1	10	10	1	9	9	9	7	7	10	10	1	1	6-24
Axiom	7	5	5	5	2	8	9	8	7	5	7	7	7	9	9	8	2	—
Balance	8	5	8	8	8	8	8	8	8	—	8	6	9	8	8	8	2	—
Bicep II*,**,***	9	7	9	9	2	9	9	8	8	8	8	6	6	9	9	8	2	6-24
Bladex/Cypro*,**,***	8	7	8	8	1	9	4	1	9	9	9	6	6	3	3	1	3	2-4
Broadstrike + Dual	7	6	9	2	9	9	9	9	7	8	8	7	7	9	7	8	2	6-24
Contour[d]	9	8	5	2	2	8	9	8	9	9	9	8	7	9	5	6	2	4-26
DoublePlay*,***	8	2	5	5	5	8	8	8	6	3	1	3	3	8	8	7	2	6-24
Dual/Dual II *,**	7	2	2	2	2	8	8	8	5	3	2	2	2	8	8	8	2	4-12
Dual II + AAtrex*,**,***	9	7	9	9	2	9	9	8	8	8	8	6	6	9	9	8	2	6-24
Dual II + Bladex	8	6	9	9	3	8	8	8	8	8	8	6	5	7	7	8	2	4-18
Eradicane*,**,***	6	3	5	5	5	7	7	7	5	3	3	2	2	7	7	7	2	1-2
Eradicane + Atrazine*,**,***	9	6	9	9	5	9	9	7	7	7	8	7	7	9	9	7	2	6-24
Eradicane + Bladex*	7	5	7	7	5	9	7	6	7	7	8	5	5	7	7	7	2	2-4
Extrazine II/Cypro AT*,**,***	9	7	8	8	1	9	8	1	9	9	9	7	7	7	7	1	2	6-24
Frontier***	7	2	2	2	2	7	7	7	5	3	2	2	2	7	7	7	2	4-18
Fultime	9	7	9	9	2	9	9	7	8	8	8	6	6	9	9	7	2	6-24
Guardsman***	9	7	9	9	2	9	9	7	8	8	8	6	6	9	9	7	2	6-24
Harness*,***	7	2	2	2	2	8	8	8	5	3	2	2	2	8	8	8	2	6-24
Harness Xtra*,***	9	7	9	9	2	9	9	7	8	8	8	6	6	9	9	7	2	6-24
Hornet	7	8	9	4	9	9	9	9	7	8	8	7	7	9	5	8	2	4-18
Lariat/Bullet or Lasso + Atrazine*,**,***	9	7	9	9	2	9	9	9	8	8	8	6	6	9	9	8	2	6-24
Lasso/Micro Tech*,**,***	7	2	2	2	2	8	8	8	5	3	2	2	2	8	8	8	2	2-4
Lasso or Dual + (Atrazine+ Bladex) or Extrazine II*.**,***	9	7	9	9	2	9	9	7	9	7	7	7	7	9	9	8	2	6-24
Lasso + Bladex*	8	6	9	9	2	8	8	7	8	8	8	6	5	7	7	8	2	2-4
Prowl + Atrazine*,**,***	9	4	9	9	5	9	9	7	7	7	8	6	7	9	9	6	3	6-24
Prowl + Bladex*	8	4	9	9	5	9	7	7	7	7	8	5	6	7	7	6	3	4-12
Surpass*,***	7	2	2	2	2	8	8	8	5	3	2	2	2	8	8	8	2	2-18
Surpass 100*,***	9	7	9	9	2	9	9	7	8	8	8	6	6	9	9	7	2	6-24
Topnotch*,***	8	3	2	2	2	8	8	8	6	5	3	2	3	8	8	8	2	6-24

[a]Crop varieties vary in their response to herbicides. Crop safety ratings less than 3 indicate that crop yield should not be affected by any direct injury.
[b]The recrop interval varies with herbicide rate, soil texture, pH, organic matter, rainfall or irrigation, and rotational crop.
[c]Ratings include a PRE grass herbicide.
[d]For use in a resistant/tolerant hybrid only.
*Registered for Popcorn, **Registered for sweet corn, ***Registered for silage.
§Weed Competitive Index—See page 6.

Grass Weed Response To Selected Herbicides

Field Corn, Popcorn*, Sweet Corn**, and Silage***

Plant response may be altered by growing conditions, genetic variation in crops and weeds, soil type, pH, organic matter and application rates. Ratings may vary from season to season and geographical areas within the state. Ratings apply when herbicides are used as suggested in this publication. See pages 65-74 for additional problem weeds and their control.

Weed Response Ratings: Ratings are for light to moderate weed populations, favorable conditions and weed growth stage as specified on the product label. High weed populations, adverse conditions, or large weeds will reduce control. 10—(96-100%), 9—(90-95%), 8—(85-89%), 7—(80-84%), 6—(70-79%), 5—(60-69%), 4-2—less than 60%, 1—0%

Soil Applied Herbicides

	Barnyardgrass (0.3)[§]	Crabgrass (0.5)	Fall Panicum (0.4)	Foxtail (1.0)	Sandbur (0.4)	Shattercane/Sorghum (3.5)	Shattercane, ALS-resistant (3.5)	Crop Safety[a]	Recrop Interval, in Months[b]
Axiom	9	9	9	9	7	6	6	2	—
AAtrex/Atrazine*,**,***	6	4	2	7	5	1	1	1	6-24
Balance	7	7	7	8	5	5	5	2	—
Bicep II*,**,***	9	9	9	9	6	4	4	2	6-24
Bladex/Cypro*,**,***	7	7	6	8	5	4	4	3	2-4
Broadstrike + Dual	9	9	9	9	6	4	4	2	6-24
Contour[d]	6	3	9	9	6	8	1	2	4-26
DoublePlay*,***	9	9	9	9	7	8	8	2	6-24
Dual/Dual II *,**	9	9	9	9	5	4	4	2	4-12
Dual II + AAtrex*,**,***	9	9	9	9	6	4	4	2	6-24
Dual II + Bladex	8	9	9	9	5	4	4	2	4-18
Eradicane*,**,***	9	9	9	9	7	8	8	2	1-2
Eradicane + Atrazine*,**,***	9	9	9	9	7	8	8	2	6-24
Eradicane + Bladex*	9	9	9	9	7	8	8	2	2-4
Extrazine II/Cypro AT*,**,***	6	7	5	8	5	4	4	2	6-24
Frontier***	9	9	9	9	4	3	3	2	4-18
Fultime	9	9	9	9	6	4	4	2	6-24
Guardsman***	9	9	9	9	4	3	3	2	6-24
Harness*,***	9	9	9	9	6	4	4	2	6-24
Harness Xtra*,***	9	9	9	9	6	4	4	2	6-24
Hornet	9	9	8	8	5	4	4	2	4-18
Lariat/Bullet or Lasso + Atrazine*,**,***	9	9	9	9	6	4	4	2	6-24
Lasso/Micro Tech*,**,***	9	9	9	9	6	4	4	2	2-4
Lasso or Dual + (Atrazine+ Bladex) or Extrazine II*.**,***	9	9	9	8	4	3	3	2	6-24
Lasso + Bladex*	8	9	9	9	5	4	4	2	2-4
Prowl + Atrazine*,**,***	8	9	9	9	7	3	3	3	6-24
Prowl + Bladex*	8	9	9	9	7	3	3	3	4-12
Surpass*,***	9	9	9	9	6	4	4	2	2-18
Surpass 100*,***	9	9	9	9	6	4	4	2	6-24
Sutan + *,**,***	9	9	9	9	8	7	7	2	1-2
Sutan+ + Atrazine*,***	9	9	9	9	7	7	7	2	6-24
Sutazine+*,**,***	9	9	9	9	7	7	7	2	6-24
Sutan+ + (Atrazine + Bladex) or Extrazine II*	9	9	9	9	7	7	7	2	6-24
Sutan+ + Bladex*	9	9	9	9	7	7	7	2	2-4
Topnotch*,***	9	9	9	9	6	4	4	2	6-24

[a]Crop varieties vary in their response to herbicides. Crop safety ratings less than 3 indicate that crop yield should not be affected by any direct injury.
[b]The recrop interval varies with herbicide rate, soil texture, pH, organic matter, rainfall or irrigation, and rotational crop.
[c]Ratings include a PRE grass herbicide.
[d]For use in a resistant/tolerant hybrid only.
*Registered for Popcorn, **Registered for sweet corn, ***Registered for silage.
[§]Weed Competitive Index—See page 6.

Broadleaf Weed Response To Selected Herbicides

Field Corn, Popcorn*, Sweet Corn**, and Silage***

Plant response may be altered by growing conditions, genetic variation in crops and weeds, soil type, pH, organic matter and application rates. Ratings may vary from season to season and geographical areas within the state. Ratings apply when herbicides are used as suggested in this publication. See pages 65-74 for additional problem weeds and their control.

Weed Response Ratings: Ratings are for light to moderate weed populations, favorable conditions and weed growth stage as specified on the product label. High weed populations, adverse conditions, or large weeds will reduce control. 10—(96-100%), 9—(90-95%), 8—(85-89%), 7—(80-84%), 6—(70-79%), 5—(60-69%), 4-2—less than 60%, 1—0%

Postemergence Herbicides

Weed size influences performance—see label

	B. Nightshade (3.5)[§]	Cocklebur (5.5)	Kochia (2.5)	Kochia, ALS-resistant (2.5)	Kochia, Triazine-resistant (2.5)	Lambsquarters (1.5)	Pigweed (2.5)	Pigweed, Triazine-resistant (2.5)	Ragweed (4.5)	R. Thistle (2.3)	Smartweed (1.5)	Sunflower (10)	Velvetleaf (4.2)	Waterhemp (2.5)	Waterhemp, ALS-resistant (2.5)[e]	Waterhemp, Triazine-resistant (2.5)	Crop Safety[a]	Recrop Interval, in Months[b]
AAtrex/Atrazine or Bicep II*,**,***	9	9	9	9	2	9	9	1	9	4	9	8	8	9	9	1	2	6-24
Accent*	4	5	6	1	6	2	7	7	1	3	7	2	4	7	1	7	2	1-18
Accent + Atrazine	9	9	9	9	6	9	9	7	9	4	9	9	8	9	7	7	2	6-24
Accent + Banvel	7	9	8	8	8	7	7	7	9	9	9	7	8	7	8	7	3	1-2
Accent + Beacon	8	9	8	1	8	4	8	8	9	7	8	9	8	8	1	8	2	1-18
Accent + Buctril	9	9	8	8	8	7	8	8	8	9	9	8	7	8	6	8	2	1-2
Action	5	5	3	3	3	7	5	5	7	3	4	4	10	5	5	5	2	0
Banvel/Clarity	7	9	8	8	8	7	8	8	8	9	9	7	4	7	7	7	2	1-2
Basis	3	9	3	1	3	7	9	9	5	4	8	7	8	8	1	8	3	0-18
Basis Gold	9	9	9	3	8	9	9	9	9	9	8	8	9	8	8	8	3	1-18
Beacon*,***	8	9	8	1	8	4	8	8	9	4	8	9	7	8	1	1	2	1-18
Bladex*,**,***	9	7	9	9	2	9	6	1	9	4	9	7	7	6	6	6	3	2-4
Buctril*	9	9	8	8	8	7	6	6	9	7	9	9	7	6	6	6	2	0
Buctril + Atrazine*	9	9	9	9	8	9	9	6	9	8	9	9	8	9	9	8	2	6-24
Buctril + Banvel	9	9	9	9	9	7	8	8	7	9	9	9	8	8	8	8	2	1-2
Contour[d]	8	9	8	5	8	6	9	9	8	5	8	7	8	8	7	8	1	4-26
Exceed*,***	8	9	8	1	8	7	9	9	9	4	8	9	8	8	1	8	1	0-24
Extrazine II*,**	9	9	9	9	2	9	6	1	9	4	9	7	7	6	6	1	2	6-24
Hornet	7	9	6	6	6	7	7	7	8	5	8	9	8	6	5	6	2	4-26
Laddok S-12*,**	7	9	8	8	7	7	8	2	9	2	9	9	9	8	8	1	1	6-24
Liberty	8	9	7	7	7	7	7	7	9	8	9	9	8	7	7	7	1	0
Liberty + Atrazine	9	9	9	9	7	9	9	7	9	9	9	9	9	9	9	7	1	0
Lightning[d]	8	9	8	1	8	7	9	9	7	5	8	8	8	6	1	6	1	4-26
Marksman	9	9	8	8	7	9	9	8	9	7	9	9	8	9	9	7	2	6-24
Peak	3	9	6	1	6	5	9	9	9	-	6	9	9	8	1	8	2	0-18
Permit	3	9	6	1	6	5	9	9	9	-	7	9	9	8	1	8	2	0-10
Poast[d]	1	1	1	1	1	1	1	1	1	-	1	1	1	1	1	1	1	0
Pursuit[d]	8	9	8	1	8	4	9	9	7	5	8	7	8	6	1	6[e]	1	4-26
Resolve[d]	10	9	9	8	9	8	9	9	8	8	9	8	8	9	6	8	2	0-40
Resource	3	5	3	3	3	7	5	5	7	3	4	4	10	5	5	5	2	0
Roundup Ultra	10	10	9	9	9	10	10	10	10	-	10	10	9	10	10	10	1	0
Scorpion III	9	10	8	5	8	7	9	9	8	-	9	9	8	9	6	9	3	4-18
Sencor + 2,4-D	7	10	8	8	5	7	7	7	8	2	7	8	8	7	7	8	3	6-24
Sencor + Banvel	8	9	8	8	8	7	8	8	8	9	9	8	7	8	8	7	2	6-24
Sencor + Basagran	7	9	8	8	7	7	7	2	9	2	9	9	9	6	6	3	2	6-24
Tough + Atrazine	9	9	9	9	8	9	9	9	9	4	9	9	8	9	9	4	2	6-24
2,4-D**,***	6	10	5	5	5	7	7	7	7	4	4	7	8	8	8	8	3	1

[a]Crop varieties vary in their response to herbicides. Crop ratings less than 3 result in no yield loss.
[b]Values will vary with soil texture, pH, organic matter and rainfall or irrigation, rotational crop and herbicide rate.
[c]Ratings include a PRE grass herbicide.
[d]For use in a resistant/tolerant field corn hybrid only.
[e]Pursuit not labeled for control of waterhemp.
*Registered for Popcorn, **Registered for sweet corn, ***Registered for silage.
[§]Weed Competitive Index—See page 6.

Grass Weed Response To Selected Herbicides

Field Corn, Popcorn*, Sweet Corn**, and Silage***

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10—(96—100%), 9—(90-95%),
8—(85-89%), 7—(80-84%),
6—(70-79%), 5—(60-69%),
4-2—less than 60%, 1—0%

Postemergence Herbicides

Weed size influences performance—see label

	Barnyardgrass (0.3)[§]	Crabgrass (0.5)	Fall Panicum (0.4)	Foxtail (1.0)	Sandbur (0.4)	Shattercane/Sorghum (3.5)	Shattercane, ALS-resistant (3.5)	Crop Safety[a]	Recrop Interval, in Months[b]
AAtrex/Atrazine or Bicep II*,**,***	5	4	2	6	4	2	1	2	6-24
Accent*	8	2	8	8	8	10	1	2	1-18
Accent + Atrazine	8	2	8	8	8	10	1	2	6-24
Accent + Banvel	8	2	8	8	8	10	1	3	1-2
Accent + Beacon	4	3	7	7	8	10	1	2	1-18
Accent + Buctril	8	2	8	8	8	10	1	2	1-2
Action	1	1	1	1	1	1	1	2	0
Banvel/Clarity	2	2	2	2	2	2	1	2	1-2
Basis	7	7	7	8	7	10	1	2	0-18
Basis Gold	8	7	8	8	7	10	1	2	1-18
Beacon*,***	2	2	7	4	4	10	1	2	1-18
Bladex*,**,***	4	7	4	7	4	4	4	3	2-4
Buctril*	2	2	2	2	2	2	2	2	0
Buctril + Atrazine*	2	2	2	2	2	2	2	2	6-24
Buctril + Banvel	2	2	2	2	2	2	2	2	1-2
Contour	8	7	8	8	6	9	1	1	4-26
Exceed*,***	2	2	3	3	2	9	1	1	0-24
Extrazine II*,**	4	7	4	7	4	4	4	2	6-24
Hornet	1	1	1	1	1	1	1	2	4-26
Laddok S-12*,**	2	2	2	2	2	2	2	1	6-24
Liberty	7	8	7	9	7	7	7	1	0
Liberty + atrazine	6	7	7	9	8	7	7	1	0
Lightning	8	7	8	8	6	9	1	1	4-26
Marksman	2	2	2	2	2	2	2	2	6-24
Peak	1	1	1	1	1	1	1	2	0-18
Permit	1	1	1	1	1	1	1	2	0-10
Poast[d]	9	9	9	9	9	10	10	1	0
Pursuit[d]	8	7	8	8	6	9	1	1	4-26
Resolve[d]	7	6	7	8	6	9	2	2	0-40
Resource	1	1	1	1	1	1	1	2	0
Roundup Ultra	10	10	10	10	10	10	10	1	0
Scorpion III	2	2	2	2	2	1	1	3	4-18
Sencor + 2,4-D	2	2	2	2	2	2	2	3	6-24
Sencor + Banvel	2	2	2	2	2	2	2	2	6-24
Sencor + Basagran	2	2	2	2	2	2	2	2	6-24
Tough + Atrazine	4	4	2	7	4	2	2	2	6-24
2,4-D**,***	2	2	2	2	2	2	2	3	1

[a]Crop varieties vary in their response to herbicides
[b]Values will vary with soil texture, pH, organic matter and rainfall or irrigation, rotational crop and herbicide rate.
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[d]For use in a resistant/tolerant field corn hybrid only.
[e]Pursuit not labeled for control of ALS-resistant waterhemp.
*Registered for Popcorn, **Registered for sweet corn, ***Registered for silage.
[§]Weed Competitive Index—See page 6.

Corn

No-Till

Herbicide	Commercial Product per Acre: Sandy Loam < 1% OM	Silt Loam 1-2% OM	Silty-Clay Loam > 2% OM	Application Time	Remarks and Approximate Cost/A Broadcast
Cool-Season Grass Sod (including bromegrass and bluegrass)					
AATREX 4L[3]*,**,*** + GRAMOXONE EXTRA[1]	Do not use	2 qt 1.5-2.5 pt	2 qt. 1.5-2.5 pt	Apply when grass is 4-6" and before corn emerges	Cost: AAtrex 4L + Gramoxone Extra $12.07-$15.92.
TOUCHDOWN	1-1.3 qt	1-1.3 qt	1-1.3 qt		Use appropriate herbicide at planting. Cost: Roundup Ultra $11.54-$17.32; Touchdown $23.08.
ROUNDUP ULTRA[1]*,**,***	1.5-2.0 qt	1.5-2.0 qt	1.5-2.0 qt	Fall new growth	
Alfalfa/Clover Sod					
2,4-D LV Ester (4L) + BANVEL followed by appropriate herbicide at planting or early preplant	1 qt 0.5 pt	1 qt 0.5 pt	1 qt 0.5 pt	Apply in fall or Apr.-May to alfalfa with 4" new growth and at least 7 days before planting	2,4-D + Banvel used to kill alfalfa. Don't apply with 28% UAN or a triazine herbicide. If bromegrass or bluegrass is present add Round Ultra. On sandy soils don't plant corn for 10 days. Cost: $8.02
Rye or Winter Wheat					
AATREX 4L*,**,***	1.2 qt	1.4 qt	1.6 qt		On dryland, moisture may be inadequate for corn. Cost: AAtrex $3.78-$5.04; AAtrex + Gramoxone Extra $9.55-$10.81; AAtrex + Bladex + Gramoxone Extra $15.59-$30.00.
ATRAZINE 4L*,**,*** + BLADEX 4L + GRAMOXONE EXTRA[1]	0.5 qt 1.25 qt 1.5-2.5 pt	0.75 qt 1.75 qt 1.5-2.5 pt	1-1.25 qt 2.5-2.75 qt 1.5-2.5 pt	Apply when rye and wheat are 4-10" and before corn emerges	
AATREX 4L[3]*,**,*** + GRAMOXONE EXTRA	1.2 qt 1.5 pt	1.4 qt 1.5 pt	1.6 qt 1.5 pt		
ROUNDUP ULTRA	12-16 oz	12-16 oz	12-16 oz	Apply when rye and wheat are 4-10" and before corn emerges	Use appropriate herbicide at planting. Cost: Roundup Ultra $4.33-$5.77; Touchdown $4.00-$6.00.
TOUCHDOWN	8-12 oz	8-12 oz	8-12 oz		

[a]Rate required poses risk of groundwater contamination.
[b]Do not use on sandy soil if water table is shallower than 30 feet.

See page 74 for additional footnotes.

Corn No-Till (Continued)

Herbicide	Commercial Product per Acre: Sandy Loam < 1% OM	Silt Loam 1-2% OM	Silty-Clay Loam > 2% OM	Application Time	Remarks and Approximate Cost/A Broadcast
Continuous Row Crop[4]					
AATREX/ATRAZINE 4L[3]*,**,***	Do not use[a]	2.0 qt	2.0 qt	0-15 days preplant; for 16-30 days preplant increase rates 20%	Add 0.5-1 pt of 2,4-D LV ester or 0.5 pt Banvel to control broadleaf weeds. For triazine-resistant kochia add Banvel. Emerged grass weeds under 1.5 inches are normally controlled with full rates of atrazine or Bladex. Add 1.5-2.5 pt Gramoxone Extra to control larger emerged grass. For volunteer corn use Roundup Ultra[1] at 0.75-1 pt/A in 5 gpa water before crop emergence. Cost: AAtrex/Atrazine $6.31; Bicep $14.63-$19.51; Bicep + Atrazine $15.52-$25.28; Bullet + Atrazine $22.98-$26.67; Dual + Atrazine $16.35-$34.53; Bladex + Atrazine $7.56-$15.12; Bullet $17.31-$21.03; Contour $16.10; Extrazine alone $6.77-$18.06; Extrazine II + Dual $18.70-$46.91; Atrazine + Bladex + Dual $19.49-$38.98; Bladex $11.68-$21.24; Atrazine + Partner\Micro Tech $18.31-$22.91; Micro-Tech + Bladex $22.14-$29.89; Guardsman $11.55-$20.80; Harness $10.16-$18.28.
AATREX/ATRAZINE 4L[3]*,**,***	1.4 qt	1.6 qt	1.8 qt		
+					
DUAL/DUAL II	1.5-2.0 pt	1.5-2.5 pt	2-3 pt		
AATREX/ATRAZINE 4L[3]*,**,***	1.2 qt	1.6 qt	2 qt		
+					
MICRO-TECH	2.25 qt	2.25 qt	2.75 qt		
or					
PARTNER	3.5 lb	3.5 lb	4.0 lb		
BICEP II/BICEP LITE II*,**,***	1.8-2.4 qt	2.4 qt	2.4 qt		
BULLET*,**,***	3.5 qt	3.75 qt	4.25 qt		
AATREX 4L[3]*,**,***	0.5 qt	0.75 qt	1 qt	0-30 days preplant; on sand use at least 14 days preplant.	
+					
BLADEX 4L	1.0 qt	1.5 qt	2 qt		
+					
DUAL/DUAL II	1.5-2.0 pt	1.5-2.5 pt	2-3 pt		
BLADEX 90DF*,**,***	Do not use	2.2-2.7 lb	3.3-4.0 lb		
BLADEX 4L*,**,***	1.2 qt	1.75 qt	2.0 qt		
+					
MICRO-TECH	2.25 qt	2.25 qt	2.75 qt		
CONTOUR **[Herbicide Tolerant Crop Required (IMI)]**	1.30 pt	1.30 pt	1.30 pt		
EXTRAZINE II*,**,***	1.5 qt	2.75 qt	4.0 qt		
with or without					
DUAL/DUAL II	1.5-2.0 pt	1.5-2.5 pt	2-3 pt		
GUARDSMAN	3.0 pt	3.0-4.0 pt	4-4.5 pt		
HARNESS Xtra*,***,***b	1.8 qt	2.3 qt	2.3 qt		
SURPASS 100	1.6-2.2 qt	2.2-2.6 qt	2.6-3.3 qt	0-30 days preplant; use the highest rate for the soil if applied more than 15 days before planting.	Do not apply more than 14 days early preplant. Apply burndown treatments as necessary. Cost: $13.48-$27.81.
TOPNOTCH*,**,***	2.0-2.5 qt	2.0-2.5 qt	2.5-3.0 qt	0-30 days preplant; use the higher rate when applied alone or for applications made more than 10 days prior to planting.	Add burndown herbicide such as Gramoxone Extra as necessary. Cost: $20.47-$30.22.
+					
ATRAZINE	1.1 qt	1.5 qt	1.5 qt		

[a]Rate required poses risk of groundwater contamination.
[b]Do not use on sandy soil if water table is shallower than 30 feet.

See page 74 for additional footnotes.

Ridge-Till

Herbicide (See *Weed Response Chart* on page 14 before selecting herbicides)	Commercial Product per Acre: Sandy Loam <1% OM	Silt Loam 1-2% OM	Silty-Clay Loam > 2% OM	Application Time, Remarks and Approximate Cost/A Broadcast	
ROUNDUP ULTRA	1 pt	1 pt	1 pt	Apply 1-2 weeks preplant.	Roundup Ultra provides good control on annual grasses less than 6" tall and good to excellent control on broadleaves 6" or less. Follow with appropriate herbicide at planting. Cost: Roundup Ultra + Banvel $10.42; 2,4-D + Banvel $6.34; Gramoxone Extra + Atrazine $9.25; Touchdown + Banvel $9.95.
OR					
TOUCHDOWN	.66 pt	.66 pt	.66 pt		
+					
BANVEL	0.5 pt	0.5 pt	0.5 pt		
2,4-D LV Ester (4L)	1 pt	1 pt	1 pt		
+					
BANVEL	0.5 pt	0.5 pt	0.5 pt		
GRAMOXONE EXTRA	1.5 pt	1.5 pt	1.5 pt		
+					
ATRAZINE	1.0 qt	1.0 qt	1.0 qt		

Field Corn, Popcorn*, Sweet Corn**, and Silage***

Tilled Seedbed — Soil Applied

Herbicide (See *Weed Response Chart* on page 15 before selecting herbicides)	Commercial Product per Acre: Sandy Loam <1% OM	Silt Loam 1-2% OM	Silty-Clay Loam > 2% OM	Application Time, Remarks and Approximate Cost/A Broadcast
AATREX/ATRAZINE DF*,**,***[3]	Do not use[a]	2.2 lb	2.2 lb	EPP, PPSA, PPI, PRE, SURFACE MIX or EARLY POST— May affect sensitive crops the following year especially on high pH soils. Cost: $6.64.
BICEP II/BICEP LITE II*,**,***	1.5-1.8 qt	1.8-2.4 qt	1.8-2.4 qt	EPP, PPSA, PRE, SURFACE MIX, or EARLY POST — Cost: Bicep $12.19-$19.51.
BLADEX DF**	Do not use	2.7 lb	3.6 lb	PPSA, PRE, SURFACE MIX, or EARLY POST — Injury may occur on soils that are calcareous, sandy or below 1% organic matter. Cost: $14.33-$19.11.
BLADEX DF**	1.30 lb	2.20 lb	3.10 lb	PPSA, PRE, SURFACE MIX, or EARLY POST — Injury may occur on soils that are calcareous, sandy or below 1% organic matter. Carryover could affect some crops. Cost: $8.11-$20.39.
+				
ATRAZINE DF**	0.40 lb	0.90 lb	1.30 lb	
BROADSTRIKE + DUAL	1.75-2.0 pt	2.0-2.25 pt	2.25-2.50 pt	PPSA, PRE, SURFACE MIX, or EARLY POST. Cost: $17.06-$24.38.
BULLET*,**	3.0 qt	3.2 qt	3.5 qt	PPSA, PRE, or SURFACE MIX. Cost: $14.84-$17.31.
CONTOUR (Herbicide Resistant (IMI) Crop Required)	1.30 pt	1.30 pt	1.30 pt	PPSA, PRE, SURFACE MIX, or POST. Cost: $16.50.
DOUBLEPLAY[b]*,**,***	4.5 pt	5.0 pt	6.0 pt	PPI—Apply treatments to dry surface soil and immediately incorporate by cross tandem disking or field cultivating. Continuous use of Doubleplay can lead to reduced weed control. Treated fields should be rotated to another crop or herbicide class. Cost: Doubleplay $18.70-$24.90; Doubleplay + Atrazine DF $22.00-$29.43.
DOUBLEPLAY*,**,***	4.5 pt	5.0 pt	6.0 pt	
+				
ATRAZINE DF*,**,***	1.1 lb	1.3 lb	1.5 lb	
DUAL/DUAL II*,**,***	1.5 pt	2.0 pt	2.5 pt	EPP, PPSA, PRE, SURFACE MIX, or LAYBY— Dual and Dual + AAtrex may be applied early post. Dual II may be applied layby. Injury may occur with Dual + Bladex on soils that are calcareous, sandy or below 1% organic matter. Cost: Dual II $11.92-$19.87; Dual + AAtrex $12.00-$19.50; Dual + Bladex $13.26-$21.95.
or				
DUAL 25G*,**,***	6 lb	8 lb	10 lb	
DUAL/DUAL II*,**,***	1.3 pt	1.5 pt	1.75 pt	
+				
AATREX DF*,**,***[3]	1.10 lb	1.38 lb	1.85 lb	
or				
BLADEX DF	0.83-1.1 lb	1.94 lb	2.2-2.4 lb	

[a]Rate required poses risk of groundwater contamination.
[b]Do not use on sandy soil if water table is shallower than 30 feet.

See page 74 for additional footnotes.

Field Corn, Popcorn*, Sweet Corn**, and Silage***

Tilled Seedbed (Continued)

Herbicide (See *Weed Response Chart* on pages 15-16 before selecting herbicides)	Commercial Product per Acre: Sandy Loam <1% OM	Silt Loam 1-2% OM	Silty-Clay Loam > 2% OM	Application Time, Remarks and Approximate Cost/A Broadcast
DUAL/DUAL II	1.3 pt	1.5 pt	1.75 pt	PPSA or PRE — Injury may occur on soils that are calcareous, sandy, or below 1% organic matter. Cost: $14.92-$23.33.
+				
ATRAZINE DF	0.55 lb	0.55 lb	0.69 lb	
+				
BLADEX DF	0.55 lb	1.1 lb	1.38 lb	
ERADICANE*,**,***	4.75 pt	5 pt	5 pt	PPI — Apply treatments to dry surface soil and immediately incorporate by cross tandem disking or similar soil mixing. Injury may occur with Bladex on soils that are calcareous, sandy or below 1% organic matter. See page 72 for shattercane control. Repeated use of Eradicane will lead to reduced weed control. Consider rotating herbicides or crops. Cost: Eradicane $14.00; Eradicane + Atrazine $18.79; Eradicane + Bladex $21.31.
ERADICANE*,**,***	4.75 pt	5 pt	5 pt	
+				
ATRAZINE DF*,**,***	1.1 lb	1.33 lb	1.77 lb	
or				
BLADEX DF	1.1 lb	1.77 lb	2.2 lb	
EXTRAZINE II DF*,**,***	1.66 lb	3.05 lb	4.16 lb	PPSA, PRE, or EARLY POST — Injury may occur on soils that are calcareous, sandy or below 1% organic matter. Cost: Extrazine $6.23-$15.61; Extrazine + Dual or Lasso $19.08-$25.20; Frontier (6.0) + Extrazine $17.15-$34.29.
EXTRAZINE II DF	1.38 lb	1.94 lb	2.50 lb	
+				
DUAL/DUAL II	1.3 pt	1.75 pt	1.75 pt	
or				
LASSO 4EC	2 qt	2 qt	2 qt	
or				
FRONTIER (6.0)	13-16 oz	16-20 oz	18-22 oz	
FRONTIER***	20 oz	25 oz	30 oz	PPSA, PRE, or PPI. Cost: $16.25-$24.37.
FULTIME	2.5-2.7 qt	2.7-3.0 qt	2.7-3.5 qt	EPP, PPSA, PRE, or surface mix. Cost: $11.00-$15.40.
GUARDSMAN	2.5-3.0 pt	3.0-4.0 pt	4.0-4.5 pt	PPSA, PRE, or PPI. Cost: $11.50-$20.80.
HARNESS[b]*,**,***	1.25-1.75 pt	1.75-2.25 pt	1.75-2.25 pt	PPSA, PRE, SURFACE MIX, EARLY POST. Cost: $10.16-$18.28.
HARNESS XTRA[b]*,***	1.8 qt	2.3 qt	2.3 qt	
HORNET	3.2-4.0 oz	3.2-4.0 oz	3.2-4.0 oz	PPSA, PRE, SURFACE MIX, or EARLY POST. Controls broadleaf weeds only. Cost: $10.44-$13.05.
LASSO (4EC)*,**,***	Do not use[a]	2.5 qt	3 qt	PPSA, PRE, or SURFACE MIX. Cost: $16.07-$19.80.
or				
LASSO II*,**,***		17 lb	20 lb	
LASSO (4EC)	2 qt	2 qt	2 qt	PPSA, or PRE — Injury may occur on soils that are calcareous, sandy or below 1% organic matter. Cost: $18.69-$24.13.
+				
BLADEX DF	1.1 lb	1.88 lb	2.2 lb	
LASSO (4EC)	2 qt	2 qt	2 qt	PPSA or PRE — Three-way mix. Injury may occur on soils that are calcareous, sandy or below 1% organic matter. Cost: $17.43-$22.26
+				
ATRAZINE DF	0.55 lb	0.55 lb	0.69 lb	
+				
BLADEX DF	0.55 lb	1.1 lb	1.38 lb	
PROWL 3.3EC	Do not use	1.8 qt	1.8 qt	PRE — Corn injury may occur if replanting is necessary. Rainfall shortly after planting required for performance. See page 74 for wild proso millet. Cost: Prowl + Bladex $23.47-$25.07; Prowl + Atrazine $17.40-$18.73.
+				
ATRAZINE DF		1.33 lb	1.77 lb	
or				
BLADEX DF		1.88 lb	2.2 lb	
SURPASS*,**,***[b]	1.5-2.0 pt	2.0-2.5 pt	2.0-2.5 pt	PPSA, PRE, SURFACE MIX, or EARLY POST. Cost: Surpass $10.75-$19.60; Surpass 100 $13.48-$27.81.
SURPASS 100[b]*,**,***	1.6-2.2 qt	2.2-2.6 qt	2.6-3.3 qt	
TOPNOTCH*,**,***	2.0 qt	2.0-2.5 qt	2.0-3.0 qt	EPP, PPSA, PRE, or SURFACE MIX. Cost: $17.00-$25.50.

See page 74 for additional footnotes.

Field Corn, Popcorn*, Sweet Corn**, and Silage***

Tilled Seedbed (Continued)

Herbicide	Rate Per Acre		Application Time	Remarks and Approximate Cost/A Broadcast
TOPNOTCH*,**,***	2.0 qt	2.0-2.5 qt	2.0-3.0 qt	EPP, PPSA, PRE, or SURFACE MIX. Cost: Topnotch + atrazine $20.47-$30.22.
+				
ATRAZINE DF*,**,***	1.1 lb	1.3 lb	1.5 lb	

Postemergence (see page 11 for additives)

Herbicide	Rate Per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
AATREX*,**,***[2]	1.4-2.2 lb	Corn <12"	Lower atrazine rate controls broadleaf weeds. Cost: $5.26-$7.68.
ATRAZINE DF		Broadleaf weeds 2-6"; grass weeds 1" or less	
BASIS	0.33 oz	Foxtail 1-2" Corn spike to 2- collar/4-leaf	Do not use if Counter was applied to the crop. Do not apply Basis 3 days before or 7 days after foliar applied organophosphate insecticides. Tank mix with 0.25-0.50 pt/A Banvel/Clarity for additional broadleaf control. Tank mix with Marksman or Atrazine for broader spectrum. Cost: $12.00.
BASIS GOLD	14 oz	Weeds 1-3" Corn up to 12" or V6 stage	Can tank mix with Banvel, Clarity, Hornet, or Tough. Cost: $16.00.
ACCENT*	0.67 oz		
ACCENT*	0.67 oz	Corn 4-20" broadcast, >20" use post directed Shattercane <4"-12" Broadleaf weeds <4" Grasses <3"	Do not use if Counter was applied to the crop. Do not use Beacon within 20 days of a planting or cultivation application of any organophosphate insecticide. Do not apply Accent 3 days before or 7 days after a foliar POST organophosphate insecticide. Do not apply Beacon within 10 days of a foliar POST organophosphate insecticide. Beacon may be applied at 0.38 oz followed by a second 0.38 oz treatment if required. Corn hybrids vary in tolerance. See *Herbicide Resistance*, page 6. Cost: Accent $17.89; Accent + Atrazine $24.49-$26.86; with Banvel $26.71-$31.57; with Buctril $28.82-$32.09; Beacon $9.52-$17.54.
+			
ATRAZINE 4L[2]	0.75-1.5 qt		
or			
BANVEL	0.5-1.0 pt		
or			
BUCTRIL 2E/Moxy	1.0-1.5 pt		
or			
BUCTRIL GEL	0.5-0.75 pt		
BEACON*	0.38-0.76 oz		
BEACON	0.38 oz	Corn 4-20", if >20"-Post direct Grasses 1-3", Broadleaves <4"	Use only if grass herbicide has been used preplant or PRE. Cost: $18.61.
+			
ACCENT	0.34 oz		
BANVEL*	0.5-1.0 pt	Corn spike to 5", Corn 8-24", direct	Use higher rate only on corn at spike to 5" and on silty clay loam soil containing more than 2.5% organic matter. Observe precautions regarding use near sensitive crops. Cost: Banvel $4.65-$9.30; Clarity $5.32-$10.64.
or			
CLARITY***	0.5-1.0 pt		
BLADEX 90DF**	2.2 lb	Grass weeds 1" or less; corn before 5-leaf stage	Do not use on sand or loamy sand. Decrease rate if Bladex was used earlier. Cost: $11.68.
BUCTRIL* 2E/Moxy or	1.0-1.5 pt or	Broadleaf weeds 2-6" tall; corn 3-leaf to 12".	Contact herbicide. Thorough coverage, correct tips, pressure, spray volume, rate and weed size important. Cost alone: $6.56-$9.83; with atrazine $8.13-$11.40; Buctril + Atrazine $8.67-$11.40; Buctril Gel $6.78-$10.17.
BUCTRIL GEL with or without	0.5-0.75 pt		
ATRAZINE DF[2]	1,1 lb		
BUCTRIL/ATRAZINE[2]	2.0-3.0 pt		
BUCTRIL 2E/Moxy or BUCTRIL GEL	1.0 pt or 0.5 pt	Spike to 36", weeds 2-6 leaf	Later applications may cause brittleness and stalk breakage. Use lower rate when good growing conditions exist to reduce corn injury. Do not use Banvel within 1/2 mile of sugarbeet, fieldbean, alfalfa, soybean, gardens and ornamentals unless drop tips are used on corn over 8". Do not apply between June 20 and Sept. 1 if sensitive crops are nearby. Cost: 2,4-D $0.84-$2.69; 2,4-D + Banvel $5.07; Banvel + Buctril $11.43; Buctril Gel $6.78.
+			
BANVEL	0.5 pt		
2,4-D AMINE (4L)**,***	1.0-2.0 pt	When corn is small, over 8" use drop tips	
or			
2,4-D LV ESTER (4L)**,***	0.5-1.0 pt		
2,4-D AMINE (4L)	0.25 pt		
or ESTER (4L)	0.25 pt		
+			
BANVEL	0.5 pt		

See page 74 for additional footnotes.

Field Corn, Popcorn*, Sweet Corn**, and Silage***

Postemergence (Continued)

Herbicide	Rate Per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
CONTOUR **[Herbicide (IMI) Tolerant Crop Required]**	1.33 pt	Weeds to 3" Corn to 12"	Do not apply other products containing Beacon or Pursuit in the same year as Contour. Cost: $16.10.
EXCEED	1.0 oz	Corn 4-20" broadcast. 20"-tassel post- direct 2-12" broadleaves	Banvel/Clarity may be added for resistance management. On soil above pH 7.5 carryover may injure soybeans and other sensitive crops. Cost: $11.00.
EXTRAZINE II DF[2***]	1.8-2.2 lb	Grass weeds 1" or less, corn before 5-leaf stage	Use with water only. Do not use on sand or loamy sand. Decrease rate if Bladex was used earlier. Cost: $6.75-$8.25.
HORNET	1.6-4.0 oz	Broadleaf weeds <8" Corn at spike to 24"	Cost: $6.10-$15.20.
LADDOK S-12*,**,***[2]	1.3-2.3 pt	Broadleaf weeds 2-4" high; corn less than 12".	Use 20 gal water and 40 psi. Increase rate according to the label on weeds 3-8" tall. Cost: $6.25-$11.06.
LIBERTY **(Liberty Link tolerance required)**	20-28 oz	Weeds 1-4"	Liberty is a contact herbicide without soil residual. Apply at 15-20 GPA and 35-40 psi. Use higher rate on bigger weeds. Liberty may be tank-mixed with other post corn herbicides except for metribuzin and Basis. Cost: Liberty $19.00-$26.60; Liberty + Atrazine DF $21.40-$23.00.
LIBERTY **(Liberty Link tolerance required)** + ATRAZINE DF	20 oz .85-1.3 lb	Corn up to 24" or V7 Weeds 1-4" Corn up to 12"	
LIGHTNING **[Herbicide (IMI) Tolerant Crop Required]**	1.28 oz	Weeds to 4" Corn to 12"	Banvel, Clarity, Buctril, or 2,4-D may be added for ALS-resistant weed management. Cost: $18.00.
MARKSMAN*[2]	2.0-3.5 pt	Before corn exceeds 5-leaf stage	Observe precautions regarding Banvel use near sensitive crops specified above. Use 3 pt only on silty clay loam soil containing more than 2.5% organic matter. Cost: $6.38-$11.17.
PERMIT	0.66-1.33 oz	Broadleaf weeds 2-6". Corn spike-20" Broadcast direct >20"	Banvel/Clarity may be added for resistance management. Cost: $8.59-$17.31.
POAST **(Herbicide Tolerant (SR) Crop Required)**	1.0 pt	Grasses less than 8"	Consult label for suitable broadleaf tank mix. Cost: $11.80.
RESOLVE SG **(Herbicide Resistant (IMI) Crop Required)**	5.3 oz	Weeds 1-3"	Observe precautions regarding Banvel as listed previously. Cost: $18.02.
RESOURCE	4.0-6.0 oz	Corn 2-10 leaf, Broadleaf weeds <4"	Especially good on velvetleaf. Rate may be increased to 8 oz when using drop tips. Cost: $6.40-$9.60.
SCORPION III	4.0 oz	Corn <8" Broadleaves 2-4 leaf	If corn is taller than 8", use post-directed spray. Do not apply if corn was previously treated wtih Broadstrike. Consult label. Cost: $8.90.
SENCOR 75DF + BASAGRAN or 2,4-D LV ESTER (4L) or BANVEL	1.5-2.0 oz 0.5-1.0 pt 0.33-0.50 pt 0.50-1.0 pt	When corn is small, up to 8". Broadleaf weeds 2-4"	Cost: Sencor + 2,4-D $2.20-$4.10; Sencor + Banvel $6.30-$12.50; Sencor + Basagran $7.08-$12.55.

See page 74 for additional footnotes.

Field Corn, Popcorn*, Sweet Corn**, and Silage***

Postemergence (Continued)

Herbicide	Rate Per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
TOUGH + ATRAZINE DF	1.0-2.0 pt 1.25-2.0 lb	Broadleaf weeds 2-6"; grass weeds 1" or less. Corn <12"	Cost: $14.60-$16.85.
DUAL II*,**	1.5-3 pt	Layby	Apply after furrowing or final cultivation. Cost: $11.93-23.85.
PROWL 3.3EC	1.8-3.6 pt	Corn spike to layby. Weeds unemerged	Cover brace roots by cultivation before application. Incorporate by tillage, irrigation, or rain within a week. Cost: $6.60-$13.39.
TREFLAN 4EC	1.5-2.0 pt	Corn 2-leaf to layby. Weeds unemerged	Incorporate with rainfall, sprinkler irrigation water or cultivate within 24 hours. Cost: Treflan 4EC $6.21-$8.27; Treflan + atrazine $9.36-$13.02.
TREFLAN 4EC + ATRAZINE 4L[2]	1.5-2.0 pt 1-1.5 qt	Corn 2-leaf to 12". Weeds unemerged	

Harvest Aid

2,4-D LV ESTER (4L)	1 qt	After hard dough stage (dent)	For control of sunflower, cocklebur, velvetleaf and other late broadleaf weeds. Only certain brands labeled for this use. Brittleness and kernel fill not affected if silks are dry. Cost: $3.38.

See page 74 for additional footnotes.

Broadleaf Weed Response To Selected Herbicides

Sorghum-Grain and Forage*

Plant response may be altered by growing conditions, genetic variation in crops and weeds, soil type, pH, organic matter and f application rates. Ratings may vary from season to season and geographical areas within the state. Ratings apply when herbicides are used as suggested in this publication. See pages 65-74 for additional problem weeds and their control.

Weed Response Ratings: Ratings are for light to moderate weed populations, favorable conditions and weed growth stage as specified on the product label. High weed populations, adverse conditions, or large weeds will reduce control. 10—(96-100%), 9—(90-95%), 8—(85-89%), 7—(80-84%), 6—(70-79%), 5—(60-69%), 4-2—less than 60%, 1—0%

	B. Nightshade (3.5)§	Cocklebur (5.5)	Kochia (2.5)	Kochia, ALS-resistant	Kochia, Triazine-resistant (2.5)	Lambsquarters (1.5)	Pigweed (2.5)	Pigweed, Triazine-resistant (2.5)	Ragweed (4.0)	R. Thistle (2.3)	Smartweed (1.5)	Sunflower (10)	Velvetleaf (4.2)	Waterhemp (2.5)	Waterhemp, ALS-resistant (2.5)	Waterhemp, Triazine-resistant	Crop Safety[a]	Recrop Interva, in Monthsl[b]
Soil Applied Herbicides																		
AAtrex*/Atrazine	9	7	9	9	2	9	9	1	9	9	9	7	7	9	9	1	2	6-24
Bicep II	9	4	9	9	2	9	9	7	8	9	7	7	6	9	9	7	2	6-24
Bullet	9	5	9	9	2	9	9	7	9	7	7	6	5	9	9	7	2	6-24
Dual* or Lasso	6	2	2	2	2	7	7	7	4	2	2	2	2	7	7	7	2	2-18
Dual* + Lasso + Atrazine	9	5	9	9	2	9	9	7	9	7	7	6	5	9	9	7	2	6-24
Lariat	9	5	9	9	2	9	9	7	9	7	7	6	5	9	9	7	2	6-24
Ramrod	2	2	2	2	2	4	7	7	2	2	4	2	2	7	7	7	1	1-2
Ramrod + Atrazine	8	4	9	9	2	9	9	7	7	7	8	6	6	9	9	7	2	6-24
Postemergence Herbicides (Weed size influences performance—see label)																		
AAtrex/Atrazine + COC	9	9	9	9	1	9	9	1	9	4	9	9	9	9	9	1	2	6-24
Banvel	7	9	8	8	8	7	8	8	7	9	9	8	5	8	8	8	4	1-2
Buctril	9	9	8	8	8	7	6	6	9	7	9	9	8	6	6	6	2	0
Buctril + Atrazine*	9	9	9	9	8	9	9	6	9	8	8	9	9	9	9	6	2	6-24
Laddok S-12*	7	9	8	8	7	7	8	2	9	2	9	8	9	8	8	4	1	6-24
Marksman	9	9	8	8	7	9	9	9	9	8	9	9	8	9	9	8	2	6-24
Peak	3	9	6	6	1	5	8	9	9	-	7	9	8	9	1	8	2	0-18
Permit	3	9	6	6	6	5	8	9	9	-	7	9	8	8	1	8	2	0-10
Roundup Ultra-ropewicks, wipers,etc.[c]	-	8	6	6	6	4	5	5	7	4	7	7	4	5	5	5	1	0
2,4-D	4	10	4	4	4	7	8	8	7	9	3	7	7	8	8	8	4	1

[a]Crop ratings less than 3 result in no yield loss
[b]Values will vary with soil texture, pH, organic matter, rainfall or irrigation, rotational crop, and herbicide rate.
[c]Ratings for weeds tall enough for selective treatment.
*Registered for forage sorghum, sorghum-grain and forage.
§Weed Competitive Index—See page 6.

Grass Weed Response To Selected Herbicides

Sorghum-Grain and Forage*

Plant response may be altered by growing conditions, genetic variation in crops and weeds, soil type, pH, organic matter and application rates. Ratings may vary from season to season and geographical areas within the state. Ratings apply when herbicides are used as suggested in this publication. See pages 65-74 for additional problem weeds and their control.

Weed Response Ratings: Ratings are for light to moderate weed populations, favorable conditions and weed growth stage as specified on the product label. High weed populations, adverse conditions, or large weeds will reduce control. 10—(96-100%), 9—(90-95%), 8—(85-89%), 7—(80-84%), 6—(70-79%), 5—(60-69%), 4-2—less than 60%, 1—0%

	Barnyardgrass (0.3)§	Crabgrass (0.5)	Fall Panicum (0.4)	Foxtail (1.0)	Sandbur (0.4)	Shattercane/Sorghum (3.5)	Shattercane, ALS-resistant	Crop Safety[a]	Recrop Interval, in Months[b]
Soil-applied Herbicides									
AAtrex*/Atrazine	4	4	2	7	4	2	2	2	6-24
Bicep II	9	7	7	9	4	2	2	2	6-24
Bullet	9	7	7	9	4	2	2	2	6-24
Dual* or Lasso	9	9	9	9	4	2	2	2	2-18
Dual* + Lasso + Atrazine	9	7	7	9	4	2	2	2	6-24
Lariat	9	7	7	9	4	2	2	2	6-24
Ramrod	7	7	7	9	2	2	2	1	1-2
Ramrod + Atrazine	7	7	4	9	2	2	2	2	6-24
Postemergence Herbicides									
Weed size influences performance—see label									
AAtrex/Atrazine + COC	2	2	2	4	2	2	2	2	6-24
Banvel	2	2	2	2	2	2	2	4	1-2
Buctril	2	2	2	2	2	2	2	2	0
Buctril + Atrazine*	2	2	2	2	2	2	2	2	6-24
Laddok S-12*	2	2	2	2	2	2	2	1	6-24
Marksman	2	2	2	2	2	2	2	2	6-24
Peak	1	1	1	1	1	1	1	2	0-18
Permit	1	1	1	1	1	1	1	2	0-10
Roundup Ultra-ropewicks, wipers,etc.[c]	-	-	-	-	-	8	8	1	0
2,4-D	2	2	2	2	2	3	2	4	1

[a]Crop ratings less than 3 result in no yield loss
[b]Values will vary with soil texture, pH, organic matter, rainfall or irrigation, rotational crop, and herbicide rate.
[c]Ratings for weeds tall enough for selective treatment.
*Registered for forage sorghum, sorghum-grain and forage.
§Weed Competitive Index—See page 6.

Sorghum
No-Till

When the interval between herbicide application and planting is expected to be 28 days or more, split applications will generally give better control. If a split application was not made and planting is delayed, a PRE treatment may be needed. If treatments are not applied until 14 days or less before planting, weeds will likely be emerged. Grasses should be 1.5 inches or less for control with atrazine. Adding crop oil concentrate, nitrogen fertilizer or nonionic surfactant will increase control. If grasses are more than 2 inches tall, use Gramoxone Extra at 1.5 to 2.5 pt/A or Roundup Ultra at 1.0 to 1.5 pt/A plus X-77 at 1 qt/100 gal for Gramoxone Extra and 2 qt/100 gal for Roundup Ultra. Add 1.0 pt/A 2,4-D LV ester 4 lb/gal if broadleaf weeds are present and apply 7 days before planting.

Herbicide	Commercial Product per Acre: Sandy Loam < 1% OM	Silt Loam 1-2% OM	Silty-Clay Loam >2% OM	Application Time	Remarks and Approximate Cost/A Broadcast
Cool-Season Grass Sod (including bromegrass and bluegrass)					
ROUNDUP ULTRA[1]	1-2 qt	1-2 qt	1-2 qt	Fall or new growth	Use appropriate herbicide at planting. Cost: $11.54-23.09.
Alfalfa Clover Sod					
2,4-D LV Ester (4L)	1 qt	1 qt	1 qt	Apply in fall or April to alfalfa with 4" new growth	On dryland, moisture often not adequate for sorghum. 2,4-D + Banvel used to kill alfalfa. Don't plant sorghum for 30 days. If bromegrass or bluegrass is present add Roundup Ultra. Don't apply with UAN or atrazine. Cost: $8.02.
+ BANVEL	0.5 pt	0.5 pt	0.5 pt		
followed by appropriate herbicide at planting or early preplant					
Rye or Winter Wheat					
ATRAZINE 4L[3]	Do not use	2.0 qt	2.0 qt	Apply when rye and wheat are 4-10" tall and before sorghum emerges	On dryland, moisture is often not adequate for sorghum. Use safened seed with Lasso or Dual. Cost: Atrazine + Gramoxone $12.08-$15.92; AAtrex + Roundup Ultra + Dual $21.48-$25.63; Atrazine + Roundup Ultra + Lasso $24.34-$28.49.
+ GRAMOXONE EXTRA[1]		1.5-2.5 pt	1.5-2.5 pt		
AATREX 4L[3]	1.2 qt	1.4 qt	1.6 qt		
+ ROUNDUP ULTRA	1.0-1.5 pt	1.0-1.5 pt	1.0-1.5 pt		
+ LASSO	2.3 qt	2.3 qt	2.3 qt		
or DUAL/DUAL II	1.5 pt	1.5 pt	1.5 pt		
Continuous Row Crop[4]					
AATREX 4L*[3]	Do not use	2.0 qt	2.0 qt	April 1-15	Seed must be treated with Concep to protect from Dual and Bicep injury or Screen to protect from Bullet. Atrazine and Bicep will damage sorghum on sandy and low organic matter soils. If weedy, add Gramoxone Extra at 1.5-2.0 pt. Cost: Atrazine $6.31; Bicep $17.88-$19.51; Bullet $14.84-$19.79.
BICEP/BICEP II/BICEP LITE II	Do not use	2.2 qt	2.4 qt	Increase rate 20% for 20 + days preplant	
BULLET (Neb. State Label)	Do not use	3.0 qt	3-4 qt	0-7 days preplant	
GUARDSMAN	3.0 pt	3.5-4.0 pt	4.0-4.5 pt	0-30 days preplant	Add 0.5 pt for heavy residues. Do not exceed 5.0 pt/A. Cost: $13.85-$20.77.
ROUNDUP ULTRA	1-2 pt	1-2 pt	1-2 pt	Prior to crop emergence	Add appropriate residual herbicide. If only broadleaf weeds are present, add 2,4-D LV (4L) ester at 1 pt/A and delay planting 10 days. Can be used preplant. Cost: $5.77-$11.54.

[c]21 days preplant on sandy loam

See page 74 for additional footnotes.

Sorghum

Ridge Plant

In crops planted after mid-May, weeds can be expected to grow vigorously before planting. In a ridge plant system these weeds may become too large to uproot and smother unless control efforts are applied in late April or early May. Two approaches can be used to control these weeds. The first would be to select an early preplant treatment from the no-till section and apply by mid to late April. Since the planting operation will destroy this herbicide barrier, a second herbicide application over the row is required at planting. A split application of 2/3 rate applied preplant + 1/3 rate banded over the row at planting should be effective. Another strategy is to apply a POST herbicide such as Roundup Ultra or Gramoxone Extra to destroy weeds before growth exceeds 3 to 4 inches in height. Application is needed in late April to early May. Apply a PRE herbicide at planting. In most cases the time interval from application of the preplant knockdown herbicide to planting should not exceed three to four weeks. Weeds such as kochia, horseweed, smartweed, and winter annuals will warrant early treatment. Lambsquarters, velvetleaf, and grasses will emerge early in some years. The key to successful weed control is timely herbicide application. Appropriate herbicides can be selected from the no-till and tilled seedbed sections for this crop.

	Commercial Product per Acre				
Herbicide	Sandy Loam < 1% OM	Silt Loam 1-2% OM	Silty-Clay Loam >2% OM	Application Time	Remarks and Approximate Cost/A Broadcast
ROUNDUP ULTRA	1.5-2.0 pt	1.5-2.0 pt	1.5-2.0 pt	1-3 weeks preplant	Roundup Ultra is excellent on annual grasses less than 6" tall. Both are good to excellent on broadleaves 6" or less. Follow with appropriate PRE treatment. Cost: Roundup Ultra $8.66-$11.55; Gramoxone $5.76-$9.61.
GRAMOXONE EXTRA	1.5-2.5 pt	1.5-2.5 pt	1.5-2.5 pt		

Tilled Seedbed

	Commercial Product per Acre			
Herbicide	Sandy Loam < 1% OM	Silt Loam 1-2% OM	Silty-Clay Loam >2% OM	Remarks and Approximate Cost/A Broadcast
AATREX/ATRAZINE DF*[3]	Do not use	2.2 lb	2.2 lb	EPP, PPSA, PP, PRE, or SURFACE MIX — Preplant applications should be made only on fine textured soils. Cost: $6.65.
BICEP*/BICEP II/BICEP LITE II	Do not use	1.8 qt	2.2 qt	EPP, PPSA, PRE, or SURFACE MIX — Seed must be Concep treated for Bicep and Dual, Screen treated for Bullet. Do not use atrazine on sandy, high pH or calcareous soils. Rain may leach herbicides and cause sorghum injury. Cost: Atrazine $6.30; Bicep $14.60-$18.00; Dual $11.90 -$15.90; Bullet $14.80-$19.80.
DUAL*/DUAL II	1.5 pt	2 pt	2.5 pt	
or DUAL 25G	6 lb	8 lb	10 lb	
BULLET (Neb. State Label)	Do not use	3.0 qt	3.5 qt	
FRONTIER	20 oz	25 oz	30 oz	0-30 days. Add 2-5 fluid oz for heavy residues. Do not exceed 32 fluid oz/A. Cost $16.90-$25.30.
GUARDSMAN	3.0 pt	3.5-4.0 pt	4.0-4.5 pt	0-30 days preplant. Add 0.5 pt for heavy residues. Do not exceed 5 pt/A on any soil in any crop year. Cost: $13.85-$20.77.
LASSO	Do not use	2.5 qt	3 qt	PPSA, PRE, or SURFACE MIX — Seed must be Screen treated. Cost: Lariat $12.80-$16.80; Lasso $16.00-$19.30.
LARIAT	Do not use	3 qt	3.5 qt	
RAMROD FLOWABLE	4 qt	4 qt	4 qt	PRE —May cause skin irritation to applicator. Do not feed treated forage to dairy animals. Leaches on sandy soil. Cost: $16.30.
or RAMROD 20G	20 lb	20 lb	20 lb	
RAMROD FLOWABLE	Do not use	3 qt	3 qt	PRE —In southwest Nebraska hold AAtrex rate to 0.83 lb/A. Rain may leach herbicides and cause sorghum injury or poor weed control. Do not feed treated forage to lactating dairy animals. Cost: Ramrod + atrazine $16.20; Ramrod & atrazine Flowable $14.90.
+ AATREX DF		0.83 -1.1 lb	1.4 lb	
RAMROD + ATRAZINE	Do not use	4 qt	4 qt	

See page 74 for additional footnotes.

Sorghum

Postemergence (See page 12 for additives)

Herbicide	Rate Per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
AATREX/ATRAZINE DF*[2]	1.33 lb	Broadleaf weeds < 6" Sorghum < 12"	Atrazine may give partial control of grass weeds under 1". Do not use atrazine on sand or loamy sand. Increase Laddok rate according to label on weeds 3-8" tall. Do not exceed 5 pints of atrazine 4L or 2.8 pounds of Atrazine DF per calendar year. Cost: Atrazine $4.00; Laddok $5.00-$12.00.
LADDOK S-12[2]	1.3-2.3 pt		
MARKSMAN[2]	2 pt	Sorghum 2-5 leaf. Broadleaf weeds 2-4"	Cost: $6.38.
BANVEL/CLARITY*	0.5 pt	Sorghum 3-5 leaves	Observe label precautions when sensitive crops are nearby. Cost: $4.65.
2,4-D AMINE* (4L) or	1 pt	After sorghum is 5" tall. If over 10" use drop tips	Spraying 2,4-D before 5" stage may inhibit root development. Spraying 2,4-D without drop tips after 8" through early boot may inhibit head development; use drop tips after 8" for all Banvel treatments. Do not use 2,4-D from early boot through soft dough stage. Cost: 2,4-D $0.84-$1.34; Buctril alone $6.55-$9.83; with Atrazine $8.12-$11.40, with Banvel $7.67-$14.48; Buctril Gel $6.78-$10.17.
2,4-D LV ESTER* (4L)	0.5 pt		
BUCTRIL or	1 -1.5 pt or	Broadleaf weeds 2-6"; sorghum 3-leaf to 12"	
BUCTRIL GEL alone or with	0.5-0.75 pt		
ATRAZINE[2]	0.55 lb		
or with BANVEL	0.12-0.5 pt		
BUCTRIL/ATRAZINE[2]	2-3 pt	Sorghum 3-leaf to 12"	
BUCTRIL/ATRAZINE[2] + BANVEL	1.5-2.0 pt 0.12-0.25 pt	Sorghum 3-leaf to 12"	
PEAK	0.50-1 oz	Sorghum 5-30"	May be tank mixed with AAtrex, Buctril, Buctril + Atrazine, Marksman, 2,4-D, or Banvel. On soil above pH 7.5, carryover may injure soybeans and other sensitive crops. Cost: $5.00-$10.00.
PERMIT	0.66 oz	Sorghum 2-leaf to layby (before head emergence)	May be tank mixed with AAtrex, Buctril, Banvel, or 2,4-D. Cost: $8.59.

Harvest Aid

CHLORATE 3 or	1.5-2 gal	7-10 days before harvest	Desiccant. Products are sodium chlorate with a fire retardant. Good coverage required. Do not graze or harvest forage for 14 days after treatment. Cost: $5.25-$7.00.
LEAFEX-3	1.5-2 gal		

See page 74 for additional footnotes.

Weed Response to Burndown Herbicides

No-Till Soybean

Herbicide	Annual Bluegrass	Chickweed	Dandelion	Downy Brome	Foxtail Barley	Evening Primrose	Henbit	Horseweed (Marestail)	Pennycress	Prickly Lettuce	Shepherdspurse	Purslane Speedwell	Virginia Pepperweed	Tall Knotweed	Foxtail	Barnyardgrass	Lambsquarters	Sandbur	Kochia	Kochia, Triazine-resistant	Russian Thistle	Smartweed—Annual	Velvetleaf	Sunflower	Rye	Winter Wheat	Alfalfa	Sweet Clover	Hairy Vetch
2,4-D Ester** (1.0 pt)	1	4	7	1	1	7	4	7	10	9	10	7	9	6	1	1	9	1	6	4	9	7	8	10	1	1	5	6	7
Canopy/Preview (6/7 oz)	10	10	7	3	7	6	8	8	10	9	10	4	6	9	4	4	9	4	7	4	9	9	8	8	3	3	4	0	6
Command (3ME) (1.5 pt)	1	1	3	5	4	7	1	2	6	6	6	5	6	6	6	6	6	6	8	8	6	7	9	5	6	6	4	3	3
Command (3ME) + Prowl (1.5 pt + 3.0 pt)	2	1	3	7	4	7	1	2	6	6	6	6	6	7	7	6	6	6	9	9	7	7	9	6	6	6	4	3	3
Gramoxone Extra (1.5 pt)	8	10	5	7	8	7	9	7	10	8	9	6	9	9	7	7	8	7	9	9	9	6	8	10	6	6	4	4	7
Gramoxone + Canopy /Preview (1.5 pt + 6 to 7 oz)	9	10	6	8	8	8	9	9	10	10	10	7	9	10	9	10	10	9	9	9	9	9	9	10	6	6	4	4	8
Gramoxone + Pursuit (1.5 pt + 4 oz)	9	10	6	8	9	8	9	8	10	9	10	7	9	10	9	9	9	9	9	9	9	9	9	10	8	6	4	4	8
Gramoxone + Scepter (1.5 pt + 4 oz)	9	10	6	7	9	8	9	7	10	9	10	6	9	10	9	9	10	9	9	9	9	8	9	10	7	6	4	4	8
Gramoxone + Sencor/ Lexone DF (1.5 pt + 12 oz)	10	10	6	7	9	8	9	8	10	10	10	8	9	10	9	9	10	9	10	9	10	8	10	10	7	7	4	4	8
Pursuit (4 oz)	5	8	4	2	7	5	7	4	8	7	8	3	3	3	8	7	5	7	6	6	6	8	9	8	1	1	1	2	2
Pursuit Plus (2.5 pt)	5	8	4	2	7	5	7	4	8	7	8	3	3	3	8	7	5	7	6	6	6	8	9	8	1	1	1	2	2
Roundup Ultra/ Touchdown*** (1.0 pt)	10	10	5	10	9	7	9	6	10	6	10	10	9	9	9	10	7	10	6	6	9	7	7	9	10	10	4	3	6
Roundup Ultra/ Touchdown*** (1.5 pt)	10	10	7	10	9	8	9	8	10	7	10	10	9	9	10	10	9	10	8	8	9	8	9	9	10	10	5	4	6
Roundup Ultra/ Touchdown*** + 2,4-D (1.0 pt + 1.0 pt)	10	10	8	7	9	9	9	9	10	8	10	10	9	9	9	10	9	10	9	9	9	9	10	10	10	10	6	5	7
Roundup Ultra/Touchdown + Canopy/Preview (1.0 pt + 6/7 oz)	10	10	8	10	10	7	9	10	10	10	10	10	9	10	10	10	10	10	10	10	10	9	9	10	8	10	3	3	7
Roundup Ultra/ Touchdown*** + Scepter (1.0 pt + 4 oz)	10	10	7	10	9	7	9	8	10	8	10	9	9	10	10	10	9	10	9	9	10	9	9	10	10	9	4	3	7
Roundup Ultra/ Touchdown*** + Pursuit (1.0 pt + 4 oz)	10	10	8	10	9	8	9	9	10	9	10	9	9	10	10	10	9	10	9	9	10	10	10	10	9	9	4	3	7
Roundup Ultra/ Touchdown*** + Sencor/Lexone DF (1.0 pt + 2-4 oz)	10	10	7	10	8	7	9	8	10	9	10	10	9	10	9	10	8	10	8	7	10	8	8	10	10	10	4	4	7
Scepter (0.66 pt)	5	9	4	1	5	5	7	4	9	6	9	3	1	3	3	3	5	5	7	7	5	7	7	8	1	1	1	1	3
Sencor/Lexone DF (12 oz)	2	10	5	7	8	6	8	5	10	7	9	2	6	8	5	5	5	6	9	1	7	7	8	8	5	5	5	5	6

Rating	Percent Control
10 —	(96-100%)
9 —	(90-95%)
8 —	(85-90%)
7 —	(80-84%)
6 —	(70-79%)
5 —	(60-69%)
4-2 —	less than 60%
1 —	0

* This guide presents burndown information only. It *does not* reflect residual weed control.
** Preplant interval— 2,4-D—7 days for soybean.
*** See no-till corn.

Broadleaf Weed Response to Selected Herbicides

Soybean

Plant response may be altered by growing conditions, genetic variation in crops and weeds, soil type, pH, organic matter and application rates. Ratings may vary from season to season and geographical areas within the state. Ratings apply when herbicides are used as suggested in this publication. See pages 65-74 for additional problem weeds and their control.

Weed Response Ratings: Ratings are for light to moderate weed populations, favorable conditions and weed growth stage as specified on the product label. High weed populations, adverse conditions, or large weeds will reduce control. 10—(96-100%), 9—(90-95%), 8—(85-89%), 7—(80-84%), 6—(70-79%), 5—(60-69%), 4-2—less than 60%, 1—0%

	B. Nightshade (3.5)[§]	Cocklebur (5.5)	Kochia (2.5)	Kochia, ALS-resistant (2.5)	Kochia, Triazine-resistant (2.5)	Lambsquarters (1.5)	Pigweed (2.5)	Pigweed, Triazine-resistant (2.5)	Ragweed (3)	R. Thistle (2.3)	Smartweed (1.5)	Sunflower (10)	Velvetleaf (4.2)	Waterhemp (2.5)[c]	Waterhemp, ALS-resistant (2.5)[c]	Waterhemp, Triazine-resistant	Crop Safety[a]	Recrop Inteval, in Months[b]
Soil Applied Herbicides																		
Authority Broadleaf/Canopy XL	9	8	9	9	9	9	9	9	8	-	9	5	7	9	8	9	2	4-18
Broadstrike + Dual	8	6	9	2	9	9	9	9	7	8	8	7	7	9	7	9	2	4-26
Broadstrike + Treflan	6	6	9	7	9	9	9	9	7	8	9	8	8	9	7	9	1	4-26
Canopy + Dual or Lasso	7	8	7	7	4	9	9	8	9	7	4	3	8	9	8	9	2	4-18
Canopy	4	8	7	7	4	9	9	8	9	7	2	3	8	9	6	9	2	4-18
Canopy + Treflan or Sonalan or Prowl	2	8	9	7	7	9	9	8	9	8	8	7	9	9	8	9	2	4-18
Command (3ME)	2	2	9	9	9	7	2	2	4	-	8	8	10	2	2	2	1	6-12
Command (3ME) + Canopy	4	9	9	9	9	9	9	8	9	7	8	8	10	9	7	9	2	4-18
Command (3ME) + Treflan or Sonalan or Prowl	3	3	9	9	9	9	7	7	7	7	9	4	9	7	7	7	1	9-18
Detail	9	9	7	2	7	9	9	9	9	9	9	9	8	9	7	9	2	0-26
Dual/Dual II	7	2	2	2	3	8	8	8	5	3	2	2	2	7	7	7	1	4-18
Dual + Lexone/Sencor	7	4	4	4	2	9	9	8	9	7	8	4	6	9	9	7	3	4-18
Frontier (6.0)	6	2	2	2	2	7	8	8	5	3	2	2	2	7	7	7	1	2-4
Lasso/Micro Tech/Partner	7	2	2	2	2	7	8	8	4	2	2	2	2	7	7	7	1	2-4
Lasso + Lexone/Sencor	7	4	4	4	2	9	9	8	9	7	8	4	6	9	9	7	3	4-18
Prowl	2	2	7	7	7	7	7	7	2	7	2	2	4	7	7	7	2	4-18
Prowl + Lexone/Sencor	2	4	7	8	7	9	9	7	9	9	7	4	7	9	9	7	3	4-18
Pursuit	8	6	8	1	9	7	9	9	9	-	9	8	8	9	3	9[c]	2	4-26
Pursuit + Dual	8	6	8	2	9	9	9	9	9	-	9	8	8	9	7	9[c]	2	4-26
Pursuit Plus	8	6	9	7	9	9	9	9	9	-	9	8	8	9	7	9[c]	2	4-26
Scepter + Dual or Lasso	7	9	4	2	4	9	9	9	9	-	9	8	7	9	7	9	2	4-26
Squadron or Scepter + Sonalan or Treflan	8	9	7	7	7	9	9	9	9	-	9	8	7	9	7	9	2	4-26
Steel	9	9	8	5	8	9	9	9	8	-	9	9	7	9	3	7	1	4-26
Treflan	2	2	7	8	7	7	7	7	2	7	2	2	9	7	7	9	2	5-18
Treflan/Trifluralin + Sencor/Lexone	2	4	7	8	7	9	9	7	9	9	7	4	7	9	9	7	3	4-18
Treflan + Lexone/Sencor + Command (3ME)	5	5	9	9	9	9	9	7	9	9	7	5	10	9	9	7	2	9-16

[a]Crop ratings less than 3 result in no yield loss.
[b]Values will vary with soil texture, pH, organic matter and rainfall or irrigation, rotational crop, and herbicide rate.
[c]Pursuit — Not labeled for control of waterhemp.
[§]Weed Competitive Index—see page 6.

Grass Weed Response To Selected Herbicides

Soybean

Plant response may be altered by growing conditions, genetic variation in crops and weeds, soil type, pH, organic matter and rates application rates. Ratings may vary from season to season and geographical areas within the state. Ratings apply when herbicides are used as suggested in this publication. See pages 65-74 for additional problem weeds and their control.

Weed Response Ratings: Ratings are for light to moderate weed populations, favorable conditions and weed growth stage as specified on the product label. High weed populations, adverse conditions, or large weeds will reduce control.
10—(96-100%), 9—(90-95%), 8—(85-89%), 7—(80-84%), 6—(70-79%), 5—(60-69%), 4-2—less than 60%, 1—0%

	Barnyardgrass (0.3)[§]	Crabgrass (0.5)	Fall Panicum (0.4)	Foxtail (1)	Sandbur (0.4)	Shattercane/Sorghum (3.5)	Shattercane, ALS-resistant	Crop Safety[a]	Recrop Inteval, in Months[b]
Soil Applied Herbicides									
Authority Broadleaf/Canopy XL	3	6	3	3	3	3	3	2	4-18
Broadstrike + Dual	9	9	9	9	6	4	4	2	4-26
Broadstrike + Treflan	9	9	9	9	9	8	8	1	4-26
Canopy + Dual or Lasso	9	9	9	9	4	3	3	2	4-18
Canopy	2	2	2	2	2	3	3	2	4-18
Canopy + Treflan or Sonalan or Prowl	9	9	9	9	8	7	7	2	4-18
Command (3ME)	8	8	8	8	8	8	8	1	6-12
Command (3ME) + Canopy	8	8	8	8	8	8	8	2	4-18
Command (3ME) + Treflan or Sonalan or Prowl	9	9	9	9	9	8	8	1	9-18
Detail	9	9	8	9	4	5	4	2	0-26
Dual/Dual II	9	9	9	9	5	4	2	1	4-18
Dual + Lexone/Sencor	9	9	9	9	4	4	4	3	4-18
Frontier (6.0)	9	9	9	9	4	3	3	1	2-4
Lasso/Micro Tech/Partner	9	9	9	9	4	3	3	1	2-4
Lasso + Lexone/Sencor	9	9	9	9	4	4	4	3	4-18
Prowl	9	9	9	9	8	6	7	2	4-18
Prowl + Lexone/Sencor	9	9	9	9	8	7	7	3	4-18
Pursuit	6	2	6	6	2	8	1	2	4-26
Pursuit + Dual	9	9	9	9	7	8	4	2	4-26
Pursuit Plus	9	9	9	9	7	8	6	2	4-26
Scepter + Dual or Lasso	9	9	9	9	4	4	4	2	4-26
Squadron or Scepter + Sonalan or Treflan	9	9	9	9	7	8	6	2	4-26
Steel	9	9	9	9	1	9	6	1	4-26
Treflan	9	9	9	9	8	6	1	2	5-18
Treflan/Trifluralin + Sencor/Lexone	9	9	9	9	8	7	7	3	4-18
Treflan + Lexone/Sencor + Command (3ME)	9	9	9	9	8	8	8	2	9-16

[a]Crop ratings less than 3 result in no yield loss.
[b]Values will vary with soil texture, pH, organic matter and rainfall or irrigation, rotational crop, and herbicide rate.
[§]Weed Competitive Index—see page 6.

Broadleaf Weed Response To Selected Herbicides

Soybean

Plant response may be altered by growing conditions, genetic variation in crops and weeds, soil type, pH, organic matter and application rates. Ratings may vary from season to season and geographical areas within the state. Ratings apply when herbicides are used as suggested in this publication. See pages 65-74 for additional problem weeds and their control.

Weed Response Ratings: Ratings are for light to moderate weed populations, favorable conditions and weed growth stage as specified on the product label. High weed populations, adverse conditions, or large weeds will reduce control.
10—(96-100%), 9—(90-95%),
8—(85-89%), 7—(80-84%),
6—(70-79%), 5—(60-69%),
4-2—less than 60%, 1—0%

	B. Nightshade (3.5)[§]	Cocklebur (5.5)	Kochia (2.5)	Kochia, ALS-resistant	Kochia, Triazine-resistant (2.5)	Lambsquarters (1.5)	Pigweed (2.5)	Pigweed, Triazine-resistant (2.5)	Ragweed (3)	R. Thistle (2.3)	Smartweed (1.5)	Sunflower (10)	Velvetleaf (4.2)	Waterhemp (2.5)	Waterhemp, ALS-resistant (2.5)	Waterhemp, Triazine-resistant	Crop Safety[a]	Recrop Inteval, in Months[b]
Postemergence Herbicides																		
Weed size influences performance—see label																		
Assure II/Matador	2	2	2	2	2	2	2	2	2	2	0	2	2	2	2	2	1	4
Basagran	2	9	7	7	7	7	2	2	7	7	9	8	9	2	2	2	1	0
Basagran + Blazer or Galaxy	7	9	7	7	7	7	8	8	9	7	9	8	9	8	8	8	2	0
Basagran + Cobra	7	8	4	4	4	4	9	9	9	7	9	8	8	9	9	9	3	0
Basagran + Scepter	2	10	7	7	7	7	9	9	7	7	9	9	9	8	3	3	1	4-26
Blazer/Status	7	4	4	4	4	4	9	9	9	5	9	2	4	9	9	9	3	0
Classic/Skirmish	2	10	4	1	5	4	8	8	9	-	9	9	8	8[e]	3[e]	3[e]	3	3-15
Cobra	7	7	4	4	4	4	9	9	9	5	9	7	7	9	9	9	3	0
Fusilade	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2
Fusion	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
Pinnacle + Classic	2	9	4	1	4	9	9	9	9	7	9	9	9	9[e]	3	3	3	3-9
Poast Plus/Prestige	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	0
Poast Plus/Prestige + Basagran	2	9	7	7	2	2	2	2	7	2	9	8	9	2	2	2	1	0
Pursuit	8	9	7	1	8	4	9	9	7	-	8	8	8	9[e]	3[e]	3[e]	1	4-26
Pursuit + Blazer or Cobra, or Reflex	7	9	8	4	5	4	9	9	9	5	9	7	7	9	8	8	3	4-26
Raptor	9	9	8	1	8	8	9	9	7	-	6	9	9	9[e]	1[e]	9[e]	1	2-18
Reflex/Flexstar	7	7	4	4	4	4	9	9	9	5	9	7	7	9	9	9	2	3-13
Reliance STS[d]	2	10	4	3	4	7	9	9	9	5	9	10	9	9[e]	3[e]	6[e]	1	3-30
Resource	2	7	3	3	7	7	7	7	-	1	3	3	10	6	6	6	2	0
Roundup Ultra (1.0 qt)[d]	9	8	8	8	9	8	9	9	7	7	7	8	8	9	9	9	1	0
Roundup Ultra/Touchdown-ropewicks, wipers, etc.[c]	-	7	2	2	2	7	7	7	7	4	7	4	4	7	7	7	1	0
Select	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	4
Stellar	7	7	4	1	4	7	9	9	9	5	9	7	10	9	9	9	3	0
Synchrony	2	9	4	1	4	9	9	9	9	7	9	9	9	9[e]	3[e]	3[e]	1	3-30

[a]Crop ratings less than 3 result in no yield loss.
[b]Values will vary with soil texture, pH, organic matter and rainfall or irrigation, rotational crop, and herbicide rate.
[c]Ratings for weeds tall enough for selective treatment
[d]For use in herbicide tolerant soybean varieties.
[e]Not labeled for control.
[§]Weed Competitive Index—see page 6.

Grass Weed Response To Selected Herbicides

Soybean

Plant response may be altered by growing conditions, genetic variation in crops and weeds, soil type, pH, organic matter and application rates. Ratings may vary from season to season and geographical areas within the state. Ratings apply when herbicides are used as suggested in this publication. See pages 65-74 for additional problem weeds and their control.

Weed Response Ratings: Ratings are for light to moderate weed populations, favorable conditions and weed growth stage as specified on the product label. High weed populations, adverse conditions, or large weeds will reduce control.
10—(96-100%), 9—(90-95%),
8—(85-89%), 7—(80-84%),
6—(70-79%), 5—(60-69%),
4-2—less than 60%, 1—0%

	Barnyardgrass (0.3)[§]	Crabgrass (0.5)	Fall Panicum (0.4)	Foxtail (1)	Sandbur (0.4)	Shattercane/Sorghum (3.5)	Shattercane, ALS-resistant	Crop Safety[a]	Recrop Inteval, in Months[b]
Postemergence Herbicides									
Weed size influences performance—see label									
Assure II/Matador	9	9	9	8	9	10	10	1	4
Basagran	2	2	2	2	2	2	2	1	0
Basagran + Blazer or Galaxy	2	2	2	2	8	2	2	2	0
Basagran + Cobra	2	4	4	4	4	4	4	3	0
Basagran + Scepter	2	2	2	2	2	2	2	1	4-26
Blazer/Status	2	4	4	4	4	4	4	3	0
Classic/Skirmish	2	2	2	2	2	2	2	3	3-15
Cobra	2	4	4	4	4	4	4	3	0
Fusilade	9	9	9	8	8	10	10	1	2
Fusion	9	9	9	8	8	10	10	2	1
Pinnacle + Classic	2	2	2	2	2	2	2	3	3-9
Poast Plus/Prestige	9	9	9	8	9	10	10	1	0
Poast Plus/Prestige + Basagran	8	8	8	7	8	9	9	1	0
Pursuit	7	7	7	8	6	9	1	1	4-26
Pursuit + Blazer or Cobra, or Reflex	7	7	4	7	4	9	4	3	4-26
Raptor	8	7	9	9	7	9	1	1	2-18
Reflex/Flexstar	2	4	4	4	4	4	4	2	3-13
Reliance STS[d]	2	2	2	2	2	2	1	1	3-30
Resource	1	1	1	1	1	1	1	2	0
Roundup Ultra (1.0 qt)[d]	9	10	10	10	10	10	10	1	0
Roundup Ultra/Touchdown—ropewicks, wipers, etc.[c]	-	-	-	-	-	10	10	1	0
Select	9	9	9	8	8	10	10	1	4
Stellar	2	4	4	4	4	4	4	3	0
Synchrony	2	2	2	2	2	2	2	1	3-30

[a]Crop ratings less than 3 result in no yield loss.
[b]Values will vary with soil texture, pH, organic matter and rainfall or irrigation, rotational crop, and herbicide rate.
[c]Ratings for weeds tall enough for selective treatment
[d]For use in herbicide tolerant soybean varieties.
[§]Weed Competitive Index—see page 6.

Soybean

No-Till

GENERAL REMARKS

EPP treatments provide excellent early weed control. However, when the interval between herbicide application and planting is 28 days or more, split applications will generally give better control. If planting is delayed longer than planned after an EPP treatment, a PRE treatment may be needed.

Herbicide (See *Weed Response Chart* on page 31 before selecting herbicides)	Commercial Product per Acre: Sandy Loam <1% OM	Silt Loam 1-2% OM	Silty-Clay Loam >2% OM	Application Time	Remarks and Approximate Cost/A Broadcast
No-Till in Alfalfa or Clover Sod					
2,4-D Ester LV(4L) + BANVEL	1 qt 0.5 pt	1 qt 0.5 pt	1 qt 0.5 pt	Apply in **FALL** to alfalfa with 4" new growth	Use appropriate residual herbicide at planting. 2,4-D + Banvel used to kill alfalfa. Cost: $8.02.
Soybean, No-Till in Cool-Season Grass Sod					
ROUNDUP ULTRA OR TOUCHDOWN	1.5-2.0 qt 1-1.33 qt	1.5-2.0 qt 1-1.33 qt	1.5-2.0 qt 1-1.33 qt	Apply in **FALL** to 6-12" of new growth	Cost: Roundup Ultra $17.32-$23.10; Touchdown $16.00-$20.80.
Soybean, No-Till in Warm-Season Grass Sod					
ROUNDUP ULTRA OR TOUCHDOWN	2.0 qt 1.3 qt	2.0 1.3 qt	2.0 qt 1.3 qt	Apply in August to early September	Cost: Roundup Ultra $23.10; Touchdown $20.80.
Soybean, No-Till in Rye or Winter Wheat					
ROUNDUP ULTRA OR TOUCHDOWN	0.75-1 pt 0.50-.66 pt	0.75-1 pt .50-.66 pt	0.75-1 pt .50-.66 pt	Apply when rye and wheat are 4-10" and before soybeans emerge	Follow with appropriate EPP treatment. Cost without EPP treatment: Roundup Ultra $4.33-$5.77; Touchdown $4.00-$5.30.
Soybean, No-Till Continuous Row Crops					
ROUNDUP ULTRA OR TOUCHDOWN	1.5-2.0 pt 0.66-1.33 pt	1.5-2.0 pt .66-1.3 pt	1.5-2.0 pt .66-1.3 pt	15-30 days EPP	Cost: Roundup Ultra $8.66-$11.55; Touchdown $5.30-$10.40.
ROUNDUP ULTRA OR TOUCHDOWN + 2,4-D LV Ester (4L)	1-2 pt 0.66-1.3 pt 1-2 pt	1-2 pt .66-1.3 pt 1-2 pt	1-2 pt .66-1.3 pt 1-2 pt	7-30 days EPP	Use appropriate herbicide at planting. 2,4-D at 1 pt, 7day/planting; at 2 pt, 30 days/planting. Cost: Roundup Ultra + 2,4-D $7.75-$14.92; Touchdown $5.30-$10.40.
BROADSTRIKE + DUAL	2.0-2.25 pt	2.25-2.5 pt	2.5-2.75 pt	0-30 days EPP	If emerged weeds are present, add Roundup Ultra or Gramoxone Extra. Do not apply to soils with pH greater than 7.8. Cost: Broadstrike + Dual $19.50-$26.81.
PURSUIT (DG) + DUAL/DUAL II	1.44 oz 1.5 pt	1.44 oz 2.0 pt	1.44 oz 2.5 pt	15-30 days EPP	If emerged weeds are present, add Roundup Ultra. Do not plant sorghum the following year. EPP treatments may be less effective if rainfall does not occur within 7 days of application. Cost: Pursuit + Dual $34.49-$38.46; Pursuit + Micro-Tech $31.63-$38.15; Pursuit + Partner $33.11-$35.19; Pursuit Plus $23.76; Pursuit + Frontier $36.20-$46.50.
or MICRO-TECH	2 qt	2.5 qt	3 qt		
or PARTNER	3.5 lb	3.5 lb	4.0 lb		
or FRONTIER	18 oz	25 oz	30 oz		
PURSUIT PLUS	2.5 pt	2.5 pt	2.5 pt		
COMMAND (3ME)	2-2.67 pt	2-2.67 pt	2-2.67 pt	0-30 days EPP	Do not use on soils with less than 0.5% OM. If emerged weeds are taller than 2", add Roundup Ultra. Cost: Command (3ME) + Canopy $26.38-$35.96.
CANOPY	5 oz	6 oz	7 oz		

See page 74 for additional footnotes.

Soybean

No-Till (Continued)

Herbicide (See *Weed Response Chart* on page 32 before selecting herbicides)	Commercial Product per Acre: Sandy Loam <1% OM	Silt Loam 1-2% OM	Silty-Clay Loam >2% OM	Application Time	Remarks and Approximate Cost/A Broadcast
LEXONE/SENCOR 75DF	0.33 lb	0.67 lb	0.83 lb	0-14 days EPP	Add 0.25% surfactant or 1 qt/A crop oil concentrate for better burndown of small weeds up to 1.5-2". If emerged weeds are more than 2", add Gramoxone Extra or Roundup Ultra as discussed in the preemergence section. Split application is not necessary except if planter causes excessive soil disturbance. Do not apply on soils with less than 0.5% OM. Reduce Sencor/Lexone rate by 1/3 on calcareous soils. Do not apply Canopy on soils with pH greater than 7.0; corn or grain sorghum should not be planted within 10 months of application. Cost: Lexone/Sencor with Dual $24.96 -$41.53; Lexone/Sencor + Frontier $19.56-$40.12; Lexone/Sencor with Lasso $26.08-$41.21; Canopy with Dual $23.38-$35.19; Canopy + Frontier $22.47-$34.65.
or					
CANOPY	5 oz	6 oz	7 oz		
+					
DUAL/DUAL II	1.5 pt	2 pt	2.5 pt		
or					
MICRO-TECH	2.0 qt	2.5 qt	3 qt		
or					
FRONTIER	16 oz	20 oz	25 oz		

See page 74 for additional footnotes.

Ridge-Till

In crops planted after mid-May, weeds can be expected to grow vigorously before planting. In a ridge plant system these weeds may become too large to uproot and smother unless control efforts are applied in late April or early May. Two approaches can be used to control these weeds. The first would be to select an early preplant treatment from the no-till section and apply by mid to late April. Since the planting operation will destroy this herbicide barrier, a second herbicide application over the row is required at planting. A split application of 2/3 rate applied preplant and 1/3 banded over the row at planting should be effective. Another strategy is to apply a POST herbicide such as Roundup Ultra to destroy weeds before growth exceeds 3 to 4 inches in height. Application is needed in late April to early May. Apply a PRE herbicide at planting. In most cases the time interval from application of the preplant knockdown herbicide to planting should not exceed three to four weeks. Weeds such as kochia, horseweed, smartweed, and winter annuals will warrant early treatment. Lambsquarters, velvetleaf, and grasses will emerge early in some years. The key to successful weed control is timely application of the herbicides. Appropriate herbicides can be selected from the no-till and tilled seedbed sections for this crop. Apply Roundup Ultra at 1.0 to 2.0 pt/A, 1-3 weeks preplant. Cost: $5.77-$11.54

Tilled Seedbed

Herbicide (See *Weed Response Chart* on pages 32-33 before selecting herbicides)	Commercial Product per Acre: Sandy Loam <1% OM	Silt Loam 1-2% OM	Silty-Clay Loam >2% OM	Remarks and Approximate Cost/A Broadcast
For cocklebur, sunflower and velvetleaf, see *Troublesome Weeds and Woody Plants,* pages 65-74.				
BROADSTRIKE + DUAL	1.75-2.0 pt	2.0-2.25 pt	2.25-2.50 pt	PPI with Treflan into the upper 2 inches of soil within 24 hours after application. Do not apply to soils with a pH greater than 7.8. Cost: Broadstrike + Dual $17.06-$24.37; Broadstrike + Treflan $13.50-$20.25.
BROADSTRIKE + TREFLAN	1.5-2.0 pt	2.0 pt	2.25 pt	
COMMAND (3ME)	2.0-2.67 pt	2.0-2.67 pt	2.0-2.67 pt	PPI with Treflan and Sonalan. PPI or SURFACE MIX with Prowl. SURFACE MIX or PRE with Dual or Lasso. To reduce injury on calcareous soil, reduce Sencor/Lexone rate by one-third. Command (3ME) vapor or droplet drift may damage green vegetation. Treflan and Sonalan may be applied to untilled residue prior to incorporation. Cost: Command (3ME) alone $14.85; Combinations: $12.70-$42.50.
or				
AUTHORITY BROADLEAF/				
or				
CANOPY XL	5.1 oz	6.4 oz	7.9 oz	
or				
CANOPY	5 oz	6 oz	7 oz	
or				
SENCOR 75 DF	0.33 lb	0.40 lb	0.5 lb	
with				
TREFLAN	1 pt	1.5 pt	2 pt	
or				
SONALAN	2 pt	2.5 pt	3 pt	
or				
PROWL (3.3EC)	1.8 pt	2.4 pt	2.4 pt	
or				
DUAL/DUAL II	1.5 pt	1.5 pt	2 pt	
or				
LASSO	2 qt	2.5 qt	2.5 qt	
or				
FRONTIER	16 oz	20 oz	25 oz	
COMMAND (3ME)	1.0 pt	1.6 pt	2.0 pt	30 days PPI with Treflan, Sonalan and Commence. Surface mix or PRE with Lasso. Use 2.5 qt rate of Lasso for heavy infestation of pigweed and lambsquarters. Command (3ME) vapor drift may damage green vegetation. Carryover may damage wheat seeded the same fall or sugarbeet and fieldbean the next year. Treflan and Sonalan may be applied to untilled residue. Cost: Command (3ME) + Treflan $11.56-$23.13; Command (3ME) + Sonalan $15.50-$26.96; Command (3ME) + Lasso $22.75; Command (3ME) + Prowl $14.12-$23.79; Commence $14.06-$21.38; Command (3ME) + Canopy $26.38-$35.95; Command + Authority Broadleaf/Canopy XL $28.70-$36.25.
+				
TREFLAN	1 pt	1.5 pt	2 pt	
or				
PROWL	1.8 pt	2.4 pt	2.4 pt	
or				
SONALAN	2 pt	2.5 pt	3 pt	
COMMAND (3ME)	1.33 pt	1.33 pt	1.33 pt	
+				
LASSO 4EC	2 qt	2 qt	2 qt	
COMMAND (3ME)	2.0-2.67 pt	2.0-2.67 pt	2.0-2.67 pt	
+				
CANOPY	5 oz	6 oz	7 oz	
or				
AUTHORITY BROADLEAF/				
CANOPY XL	5.1 oz	6.4 oz	7.9 oz	
COMMENCE	1.75-2 pt	2-2.25 pt	2.66 pt	
DETAIL	Do not use	1.0 qt	1.0 qt	PRE, SURFACE MIX. Consult label for area use and rotational crop restrictions. Cost: $30.00

See page 74 for additional footnotes.

Soybean

Tilled Seedbed (Continued)

Herbicide (See *Weed Response Chart* on pages 32-33 before selecting herbicides)	Commercial Product per Acre: Sandy Loam <1% OM	Silt Loam 1-2% OM	Silty-Clay Loam >2% OM	Remarks and Approximate Cost/A Broadcast
DUAL/DUAL II	2 pt	2 pt	2.5 pt	EPP, PRE, or SURFACE MIX. Cost: $15.90-$19.88.
or DUAL 25G	8 lb	8 lb	10 lb	
FRONTIER	16-20 oz	20-25 oz	25-30 oz	EPP, PRE, or SURFACE MIX. Cost: $10.92-$18.48.
LASSO 4EC/ MICROTECH	2.5 qt	2.5 qt	2.5 qt	PRE or SURFACE MIX — To reduce injury on calcareous soil decrease Sencor/Lexone rates by one-third . Cost: Lasso $16.07; Lasso + Sencor/Lexone $25.83-$28.42; Partner $14.52.
or LASSO II 15G	17 lb	17 lb	17 lb	
PARTNER	3.5 lb	3.5 lb	3.5 lb	
LASSO	Do not use	2 qt	2 qt	
+ SENCOR/LEXONE DF[6]		0.5 lb	0.6 lb	
PROWL (3.3EC)	1.8 pt	2.4 pt	3.0 pt	PPI or SURFACE MIX — Cost: Prowl $6.70-$10.78.
PURSUIT PLUS	2.5 pt	2.5 pt	2.5 pt	SURFACE MIX—Do not plant sorghum the following year. Do not graze or feed treated soybean forage, hay, or straw to livestock. Cost: $23.76.
SONALAN	2 pt	2.5 pt	3 pt	PPI — Incorporate within 48 hours. Increase Sonalan rate by 1/2-1 pt for black nightshade control. Sonalan may be applied to untilled residue. Cost: Sonalan $8.07-$ 12.11
SONALAN	Do not use	2.5 pt	3 pt	
+ SENCOR/LEXONE DF[6]	Do not use	0.5 lb	0.6 lb	
STEEL	3.0 pt	3.0 pt	3.0 pt	PPI or PRE—Applications can be made up to 45 days before, during or after planting. Incorporation by tillage or rainfall needed within seven days after application to insure weed control. Labeled east of Highway 81. Do not plant corn the year following treatment north of Highway 34 unless IR/IT corn is used. Cost: $23.20.
TREFLAN	1.0 pt	1.5 pt	2.0 pt	PPI — For best results immediately incorporate. Treflan and Sonalan may be applied to untilled residue. Costs: Treflan/Trifluralin $4.14-$8.28.
TURBO	1.5 pt	2.25 pt	2.75 pt	PRE or SURFACE MIX prior to planting. Do not use on soils with less than 2% organic matter. Cost: $16.85-$30.90.

See page 74 for additional footnotes.

Soybean

Postemergence (See page 12 for additives)

Herbicide (See *Weed Response Chart* on pages 34-35 before selecting herbicides)	Rates Per Acre	Application Time	Remarks and Approximate Cost Per Acre
ASSURE II	7-8 oz	Grasses 4" Shattercane and corn 12-18"	Cost: $7.84-$8.96.
BASAGRAN	1-2 pt	Broadleaf weeds less than 4" tall	Split applications of Basagran at 1 pt/A may improve control of several weeds. See label for specific weed size. Cost: Basagran $8.75 - $16.82; Basagran + Blazer $12.35 -$24.07; Basagran + Cobra $18.64-$32.22; Basagran + Pinnacle $16.36-$24.43; Basagran + Reflex $20.67-$29.22; Basagran + Scepter $17.96-$26.03.
BASAGRAN with BLAZER or REFLEX or PINNACLE or SCEPTER	1-2 pt 0.5-1 pt 1 pt 0.25 oz 0.33 pt		
BASAGRAN + POAST PLUS	1.5-2 pt 18-24 oz	Use Basagran and Poast Plus guidelines	See label for rates and weed size. Cost: $18.88-$25.77.
BLAZER	1-1.5 pt	Apply when most broadleaf weeds are less than 4" tall	See label for rates and specific weed size. Cost: $7.90-$11.51.
CLASSIC	0.5-0.75 oz	Apply when most broadleaf weeds are less than 4" tall	Do not use Classic on soils above pH 7.2. May be tank-mixed with 4-6 oz Cobra or with labeled rate of Blazer or Reflex where eastern black nightshade or common waterhemp are present. Use COC only during drought conditions. Add 1 gal. of 28% UAN for velvetleaf. Cost: Classic $6.25-$8.75; Classic/Pinnacle $13.50.
CLASSIC + PINNACLE	0.25 oz 0.25 oz		
COBRA	10-12.5 oz	Apply when most broadleaf weeds are 2-4" tall	Do not use during periods of stress or weed control will be poor. See label for specific weed size. Cost: $11.63-$15.29.
FUSION	6 oz	Grasses 4" Shattercane and corn 12-18"	Cost: $6.71.
GALAXY	2 pt 1 gal	Apply when most broadleaf weeds are less than 4" tall	See label for specific weeds. Cost: $14.91.
POAST PLUS/PRESTIGE	18-24 oz 2 pt	Grasses 4" Shattercane and corn 12-18"	COC needed for effective control. Cost: $7.86-$10.13.
PURSUIT DG + COBRA or BLAZER/STATUS or REFLEX	1.44 oz 4 oz 0.5-1 pt 0.75-1 pt	Weeds less than 4"	Do not plant sorghum the following year. Do not use during periods of stress or weed control will be poor. Cost: Pursuit + Blazer $23.18-$26.78 Pursuit + Cobra $23.25 Pursuit + Reflex $23.04-$24.22
PURSUIT DG	1.44 oz	Weeds 1-3" Shattercane up to 6"	Do not plant sorghum the following year. Add Select to improve control of volunteer corn. Do not graze or feed treated soybean forage, hay or straw to livestock. Cost: $23.32.

Soybean

Postemergence (Continued) (See page 12 for additives)

Herbicide (See *Weed Response Chart* on pages 34-35 before selecting herbicides)	Rates Per Acre	Application Time	Remarks and Approximate Cost Per Acre
RAPTOR	5 oz	Weeds 1-3" Shattercane up to 6"	Do not graze or feed treated forage. Cost: $26.25.
REFLEX/FLEXSTAR	1 pt	Apply when most broadleaf weeds are less than 4" tall	Do not plant sorghum the following year. Do not use west of Highway 81. Do not apply Reflex to any field more than once every two years. Cost: $16.86.
RELIANCE STS **(Herbicide Tolerant Crop Required)**	0.50 oz	Apply when most broadleaf weeds are less than 6" tall	For use only on soybean varieties designated as "STS". May be tank-mixed with 4-6 oz Cobra or labeled rates of Blazer or Reflex. Can be tank mixed with post grass herbicides under certain conditions. Reliance STS may reduce post grass heribicide activity. Cost: $4.85.
RESOURCE	4.0-8.0 oz	Broadleaf weeds less than 4"	Especially effective on velvetleaf. Cost: $6.40-$12.80.
ROUNDUP ULTRA **(Herbicide Tolerant (Roundup Ultra Ready) Crop Required)**	1.0 qt	Weeds less than 12" tall	Cost: $11.54.
SYNCHRONY STS **(Herbicide Tolerant (STS) Crop Required)**	0.50 oz		For use only on soybean varieties designated as "STS". May be tank-mixed with 4-6 oz Cobra or labeled rates of Blazer or Reflex. Can be tank mixed with POST grass herbicides under certain conditions. Reliance STS may reduce POST grass herbicide activity, where eastern black nightshade or common waterhemp are present. Cost: $12.00.
SELECT	6 oz	Grasses 4", Shattercane 6-18" Corn 12-24"	Cost: $9.57.

Soybean

REDUCED RATES FOR BROADLEAF WEED CONTROL
READ THIS SECTION BEFORE PROCEEDING

This information is based on research conducted at the University of Nebraska and is provided for growers interested in a **management intensive** system. This system does **not** consist of simply "reducing rates" and proceeding as normal. A reduced rate treatment is **not** a stand alone strategy—it is part of a program. Our program included a single cultivation.

Reduced rates may have a fit for you if you are willing to learn about the system and manage accordingly. To evaluate a reduced rate program, we suggest trying it on a limited area until you are comfortable with it. **The herbicide manufacturer has no product performance responsibility for below labeled rate treatments.** Our work with reduced rates has focused on broadleaf weed management in conventional till soybean with grasses being managed with a conventional soil applied or POST program. Antagonism problems have resulted in reduced grass control when we have attempted reduced rate programs combining grass and broadleaf herbicides in a single treatment.

The approach with the reduced rate program is to apply herbicides when weeds are small and therefore controllable with low rates. Treatment timing is the key to success. Growth stage of the weed is a more reliable indication for treatment timing than days after planting (DAP) or days after emergence. Broadleaf weeds often reach the 1-2 leaf stage 10-12 days after planting and 2-3 leaf stage by 17-20 days after planting. This of course can vary with conditions. Our experience is that 1/4x rates are appropriate when weeds are in the 1-2 leaf stage and 1/2x rates for weeds in the 2-3 leaf stage. After the 3-leaf stage labelled rates should be used. Cultivation is an important part of this system and should be carried out approximately 15 days after herbicide application. Delaying cultivation beyond this point allows weeds that were stunted to recover and grow. Most growers prefer to wait 5 weeks after planting to cultivate in order to 1) travel faster and 2) minimize weed establishment after cultivation.

The best opportunity for success with a single application reduced rate treatment is provided by the 1/2x rate applied at 17-20 days after planting. This program followed by cultivation has provided weed control comparable to standard treatments. Utilizing the 1/4x rate 10-12 days after planting has required a second treatment 20-24 days after planting 2 out of 3 years to provide weed control comparable to standard treatments.

Success with a reduced rate program is dependent on 1) match of herbicide treatment with target weeds, 2) correct timing, and 3) high quality application. A mismatch of herbicide treatment and weed species can result in serious problems when using reduced rates.

An advantage of the reduced rate program is a widening of the "treatment window" for POST treatments with application rates adjusted accordingly. The risk of adverse weather can be readily managed utilizing the reduced rate early application program. If circumstances prevent a planned early application, simply revert to a standard application.

Herbicide	Rate Per Acre	Application Time*	Remarks and Approximate Cost Per Acre (See page 12 for additives)
GALAXY	0.5 pt	1-2 leaf weeds. 10-12 DAP	Repeat treatment 20-24 DAP usually required. Cultivate 35 DAP. Cost: $4.20.
GALAXY	1 pt	2-3 leaf weeds. 17-20 DAP	Cultivate 35 DAP. Cost: $7.70.
CLASSIC + PINNACLE	1/16 oz 1/16 oz	1-2 leaf weeds. 10-12 DAP	Repeat treatment 20-24 DAP usually required. Cultivate 35 DAP. Cost: $4.40.
CLASSIC + PINNACLE	1/8 oz 1/8 oz	2-3 leaf weeds. 17-20 DAP	Cultivate 35 DAP. Cost: $8.75.
PURSUIT	0.36 oz	1-2 leaf weeds. 10-12 DAP	Repeat treatment 20-24 DAP usually required. Cultivate 35 DAP. Cost: $5.25.
PURSUIT	.72 oz	2-3 leaf weeds. 17-20 DAP	Cultivate 35 DAP. Cost: $11.50.
Harvest Aid			
GRAMOXONE EXTRA	12.8 oz	When 65% of pods are brown	Desiccant. Follow label directions on water volume and X-77 additive. Be careful of drift. Do not graze for 15 days. Cost: $3.07.
ROUNDUP ULTRA	1 qt	Pods no longer green	Allow 7 days interval from application to harvest. Do not graze for 25 days. Cost: $11.55.

*DAP = days after planting.

See page 74 for additional footnotes.

Bean Bar/Wiper Applications

Crop	Applicator	Herbicide:Water Ratio	Remarks*
Soybean and Sorghum	1. Ropewicks	ROUNDUP ULTRA 1:2 (33.3% concentration) TOUCHDOWN (25% concentration)	No surfactant needed. Works best on volunteer corn and shattercane. Weeds should be 10-12" taller than soybean. Travel both directions in heavy stands. In sorghum, too wet or dripping ropes will cause droplet splash and crop injury.
Soybean	2. Bean Bar—straight stream tip	ROUNDUP ULTRA 1:19 (5% concentration) TOUCHDOWN (3% concentration)	A marking dye can be added to the spray solution so it is easier to see treated plants. Add a surfactant at 0.5% v/v.
Soybean	3. Bean Bar—spreading tip	BASAGRAN 1:100 (1% concentration)	Complete coverage essential. Add 1 gal UAN to each 25 gal spray. Add Poast and COC for shattercane and volunteer corn.
		CLASSIC + PINNACLE 0.5 oz + 0.5 oz per 25 gal water	Add 1 qt COC + 1 gal 28-0-0 per 25 gal.
		POAST, FUSILADE or ASSURE 1:100 (1% concentration)	Add 1 qt crop oil conc. or 1/2 pt adjuvant per 25 gal mix. Pre-harvest, intervals: Poast, 90 days; Fusilade, pre-bloom; Assure, 80 days. Fusion, Prebloom, Select, 50 days.
		SELECT 1:100 (0.25% concentration)	
		FUSION 1:160 (0.62% concentration)	

*Herbicide costs per acre vary from $1.00 with light weed infestations to $15.00 in heavy infestations.

See page 74 for additional footnotes.

Weed Response to Postemergence Herbicides

Small grain

Response ratings:
Ratings are for light to moderate weed populations, favorable conditions and weed growth stage as specified on product label. High weed populations, adverse conditions, or large weeds will reduce control.
10 — (96-100%) 6 — (70-79%)
9 — (90-95%) 5 — (60-69%)
8 — (85-90%) 4-2 —less than 60%
7 — (80-84%) 1 — 0

Herbicide	Blue Mustard (10)§	Knotweed (3)	Field Pennycress (10)	Horseweed (5)	Kochia (5)	Kochia, ALS-resistant (5)	Lambsquarters (5)	P. Smartweed (3)	Prostrate Pigweed (1)	Redroot Pigweed (2)	R. Thistle (5)	Shepherdspurse (10)	Sunflower (5)	Tansy Mustard (10)	Wild Buckwheat (4)	Prickly Lettuce (10)	Wild Vetch (8)	Crop Safety[a]	Recrop Interval in Months, When Changing to Nonlabeled Crop[b]
Ally	9	4	9	7	6	1	7	4	8	8	6	9	7	9	5	8	1	1	4-34
Ally + 2,4-D	10	7	10	6	9	6	10	6	10	10	8	10	10	10	6	10	6	2	4-34
Ally + Banvel	9	7	10	6	10	7	10	9	10	10	9	10	9	10	7	10	8	4	4-34
Amber	9	4	9	7	7	1	6	5	8	8	6	9	8	9	8	8	1	1	4-36
Amber + 2,4-D	10	6	10	6	9	6	10	6	10	10	8	10	9	10	8	10	6	2	4-36
Amber + Banvel	9	7	10	6	10	7	10	9	10	10	9	10	10	10	9	10	8	3	4-36
Banvel + 2,4-D	6	8	10	6	10	10	9	10	10	10	9	10	10	10	7	8	8	5	1-2
Buctril	7	9	9	8	9	9	8	8	7	8	8	9	9	9	8	7	5	1	1
Buctril + 2,4-D	8	9	10	7	10	10	9	9	9	9	9	9	9	9	8	9	7	2	1
Curtail	9	9	10	9	8	8	10	10	9	10	8	9	10	9	9	10	9	2	1-18
Finesse	9	4	9	7	5	1	8	5	8	8	5	9	6	9	6	8	1	1	14-36
Finesse + 2,4-D	9	7	10	6	9	6	10	6	10	10	8	10	9	10	7	10	6	2	14-36
Finesse + Banvel	9	7	10	6	10	7	10	9	10	10	9	10	9	10	8	10	8	3	14-36
Harmony Extra	9	6	10	7	7	1	9	8	9	9	8	10	8	10	8	9	5	1	2
MCPA	5	4	7	4	5	5	7	6	6	6	6	8	6	8	4	6	5	1	1
Peak	8	6	9	7	5	1	6	8	8	8	6	9	8	9	6	8	1	1	0-18
Peak + 2,4-D	10	7	10	7	9	6	10	8	10	10	8	10	10	10	6	10	6	2	1-24
Peak + Banvel	9	7	10	7	10	7	10	9	10	10	9	10	9	10	9	10	8	4	1-24
Tordon + 2,4-D	8	6	10	5	6	6	10	8	10	10	8	10	9	10	9	9	8	3	Bioassay
2,4-D	9	6	9	5	6	6	9	8	9	9	8	9	9	9	4	9	7	2	1

[a]Crop ratings of 3 or less result in no yield loss; adding liquid nitrogen may considerably reduce crop safety, for some herbicide combinations.
[b]Values will vary with soil texture, pH, organic matter, rainfall or irrigation, rotational crop and herbicide rate.
§—Weed Competitive Index—see page 6.

Preplant and Preemergence Herbicides for Winter Annual Grasses in Winter Wheat

(See Downy Brome in *Troublesome Weeds Section*, pages 65-74, for more information.)

Herbicide(s)	Downy Brome	Jointed Goatgrass	Crop Safety[a]	Recrop Interval in months Changing to Nonlabeled Crop[b]
Preplant				
Amber	3	-	1	4-36
Far-Go	5	-	3	0-12
Hoelon	5	-	2	-
Treflan	5	3	-	5-18
Preemergence				
Amber	3	-	1	4-36
Finesse	4	-	2	14-36

See page 74 for additional footnotes.

BARLEY AND SPRING WHEAT

Herbicide	Rate Per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
ALLY or AMBER or FINESSE or PEAK + 2,4-D LV ESTER (4L)	0.10 oz 0.28 oz 0.2-0.3 oz 0.25-0.50 oz 0.25-0.50 pt	Spring 5-leaf to joint stage	Follow with small grain on Curtail and Amber treated fields. For wild buckwheat use Buctril as listed for winter wheat. For Ally, Amber, Finesse, or Peak + 2,4-D, add surfactant 1 qt/100 gallons of spray solution. Cost: Ally + 2,4-D $2.55-$2.97; Amber + 2,4-D $2.60-$3.02; Curtail $8.48; Finesse + 2,4-D $2.67-$4.21; Peak + 2,4-D $2.92-$5.84.
CURTAIL	2 pt		
2,4-D AMINE (4L) or 2,4-D LV ESTER (4L)	1-1.5 pt 0.5-0.75 pt		

Harvest Aid

2,4-D LV ESTER (4L)	1 qt	Hard dough, 7 or more days before harvest	Helps desiccate large broadleaf weeds. Only certain brands labeled for this use. Cost: $3.38.
ALLY + 2,4-D LV Ester (4L)	0.1 oz 4-8 oz	After dough stage	Preharvest interval of 10 days. Add surfactant at 1 qt/100 gallons of spray solution. Cost: $2.55-$2.97.

OAT

MCPA BUCTRIL + 2,4-D AMINE (4L)	0.5-1 pt 0.5-1.0 pt 0.5 pt	Fully tillered to joint	Cost: Buctril alone $6.56-$9.83; MCPA $0.86-$1.73; Buctril + 2,4-D or MCPA $7.23-$10.50.
BUCTRIL + MCPA	0.5-1.0 pt 0.5 pt	Oat 4-leaf to joint	Cost: $7.23-$10.50.
CURTAIL M	1.75-2.3 pt	Oat 3-leaf to joint, weeds <3"	Cost: $7.42-$9.95.
PEAK + BUCTRIL or MCPA	0.25-0.5 oz 0.75-1.5 pt 0.5-0.75 pt	Oat 3-leaf to 2nd node	Add surfactant at 1 qt/100 gallons of spray solution. Cost: $8.00-$14.83.
2,4-D AMINE (4L)	0.5-1.0 pt	3-4 leaf	Some injury from 2,4-D may be expected at any stage. Cost: $0.67-$1.34.

Harvest Aid

Herbicide	Rate Per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
2,4-D LV ESTER (4L)	1 qt	Hard dough 7 or more days before harvest	Helps desiccate large broadleaf weeds. Only certain brands labeled for use. Cost: $3.38.

See page 74 for additional footnotes.

WINTER WHEAT

Herbicide	Rate Per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
AMBER or ALLY or FINESSE or PEAK	0.28-0.35 oz 0.10 oz 0.2-0.4 oz 0.25-0.5 oz	In fall after 2-leaf stage	Effective control on mustards and pennycress. Add surfactant. Cost: Amber $2.18-$2.73; Ally $2.13; Finesse $2.25-$4.50; Peak $2.50-$5.00.
AMBER or ALLY or FINESSE or PEAK + 2,4-D ESTER (4L) or BANVEL	0.28-0.56 oz 0.10 oz 0.2-0.3 oz 0.25-0.5 oz 0.25-0.5 pt 2-3 oz	Early spring from 4 tillers to joint stage	Add surfactant if weeds are present. Use only with small grains or a proso millet rotation. Add surfactant at 1-2 qt/100 gal. Cost: Ally + 2,4-D $2.55-$2.97; Ally + Banvel $3.29-$3.87; Amber + 2,4-D $2.60-$5.21; Amber + Banvel $3.34-$6.11; Finesse + 2,4-D $2.67-$4.21; Finesse + Banvel $3.41-$5.11; Peak + 2,4-D $2.92-$5.84; Peak + Banvel $3.70-$6.80.
2,4-D AMINE (4L) or 2,4-D LV ESTER (4L)	1-1.5 pt 0.5-0.75 pt	Early spring, from 4 tillers to joint stage	Do not spray winter wheat until well tillered. Spray broadleaf weeds as soon as good growing conditions occur. Cost: $0.84-$2.01.
BUCTRIL Moxy + 2,4-D AMINE (4L)	1-1.5 pt 0.5 pt	Wheat from 4 tillers to before canopy covers weeds	Most broadleaf weeds should be in 2-4 leaf stage or mustards in early rosette stage. Cost: $6.82-$10.42.
BANVEL + 2,4-D AMINE (4L)	2-3 oz 0.5-0.75 pt	Spring, 4 tillers to joint stage	Controls most troublesome broadleaf weeds. Cost: $1.85-$2.75. Do not apply with fertilizer solutions.
CURTAIL	2.0 pt	Before boot stage	Use Curtail only in small grain rotations. Cost: Curtail $8.48.
2,4-D LV ESTER (4L) + TORDON 22K	0.5-0.75 pt 1-1.5 oz	Spring 4 tillers to before joint stage	Use only on land to be planted the following year to grass, barley, wheat, oat or fallowed. Cost: $1.55-$2.33.
HARMONY EXTRA + 2,4-D LV ESTER (4L)	0.3-0.46 oz 0.25-0.5 pt	Wheat 2-leaf to joint stage; weeds less than 4" tall	Add a nonionic surfactant at 2 pt/100 gallons. Any crop can be planted 60 days after application. Cost: $4.17.-$6.59

Harvest Aid

ALLY + 2,4-D AMINE (4L)	0.1 oz 0.25-0.50 pt	After dough stage.	Preharvest interval of 10 days. Add surfactant at 1 qt/100 gallons of spray solution. Cost: $2.55-$2.97.
2,4-D LV ESTER (4L)	1 qt	Hard dough 7 or more days before harvest	Rescue treatment for control of late broadleaf weeds. To reduce breakage with 2,4-D and Landmaster BW all green color should be gone from joints. Only certain brands of 2,4-D labeled for this use. Cost: 2,4-D $3.38; Landmaster BW $8.08; Roundup Ultra RT $7.65-$8.75; Roundup Ultra RT + 2,4-D $6.06-$12.15.
ROUNDUP ULTRA RT	28-32 oz		
ROUNDUP ULTRA RT + 2,4-D LV ESTER (4L)	1.0-2.0 pt 1.0-2.0 pt		
LANDMASTER BW	54 oz		

See page 74 for additional footnotes.

PROSO MILLET

Herbicide	Rate Per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
2,4-D AMINE (4L) Formula 40 only	0.5-1.0 pt	Proso in 2-5 leaf stage	Broadleaf weeds should be small. Observe all Banvel precautions when susceptible crops are within 1/2 mile of application site. Cost: 2,4-D amine $0.67-$1.34; 2,4-D + Banvel $2.75.
2,4-D AMINE (4L) + BANVEL (NE Label)	0.75 pt 3 oz		
PEAK + 2,4-D AMINE (formula 40 only)	0.38-0.5 oz 0.5 pt	Proso in 2-5 leaf stage	Add surfactant at 1-2 qt/100 gal. Cost: $4.95-$6.60.

SUNFLOWER (See Ecofarming for No-Till Sunflower Recommendations)

Herbicide	Commercial Product per Acre: Sandy Loam < 1% OM	Silt Loam 1-2% OM	Silty-Clay Loam >2% OM	Remarks and Approximate Cost/A Broadcast
EPTAM 7E or EPTAM 20G PPI	2.5 pt 10 lb	3.5 pt 15 lb	3.5 pt 15 lb	Apply and incorporate just before planting. Cost: $8.50-$12.75.
PROWL (3.3EC) PPI or PRE	1.8-2.4 pt 2.4 pt	2.4-3.0 pt 3.0 pt	3.0-3.6 pt 3.6 pt	PPI up to 30 days prior to planting. Prowl PRE is most effective in controlling weeds when adequate rainfall or irrigation is received within 7 days after application. Otherwise, a registered POST grass herbicide may be required. Cost: $6.69-$13.39 .
SONALAN or SONALAN 10G PPI	1.5-2.0 pt 5.5-7.5 lb	2.0-2.5 pt 7.5-9.5 lb	2.5-3.0 pt 9.5-11.5 lb	PPI...For best results immediately incorporate. Shallow incorporation prior to planting with field cultivators or narrow blade plows with or without mulch treaders are recommended. Read label for carryover precautions. Use the lower rates under 20" rainfall. Sensitive crops may be injured the following year. Cost: Sonalan/Treflan $4.13-$12.10; Sonalan 10G $8.50-$12.75; Treflan TR-10 $8.25-$11.00.
TREFLAN OR TREFLAN TR-10 PPI	1 pt 5 lb	1.25-1.5 pt 6.25-7.5 lb	1.5-2 pt 7.5-10 lb	

Postemergence

POAST + DASH HC or METHYLATED SEED OIL	1-1.5 pt 1 pt 2 pt	Good coverage essential. Shattercane and corn 12-18"; other annual grasses less than 4". Cost: $11.70-$16.15.

Harvest Aid

GRAMOXONE EXTRA	1.0-1.5 pt	For oilseed varieties only. Use nonionic surfactant. Apply when sunflower seeds reach physiological maturity (when seed moisture is 35% or lower). For many varieties, this corresponds to the time when the back of the heads are yellow and the bracts are turning brown. Do not graze treated areas or feed treated forage to livestock. Use the higher rate when crop stands or weed infestations are heavy. Apply at least 7 days before harvest. Cost: Gramoxone Extra $3.85-$5.78.
DEFOL 6	1.0 gal	Apply 7 or more days before harvest when seed heads are fully mature. Do not allow grazing of treated fields or feed treated forage. Cost: Defol $5.30.

See page 74 for additional footnotes.

Ecofarming

Ecofarming (Ecofallow) is a system based on quality winter wheat stubble. Good quality stubble is the result of growing a winter wheat variety competitive with weeds along with good disease and insect resistance. Proper planting date, fertilization according to needs, weed control in the growing wheat, harvest with minimum grain loss and good chaff and long straw distribution all contribute to the success of this program. Also required is excellent herbicide application. If non-selective herbicides are being applied, weather and weed conditions need to be correct for good results. Atrazine, Gramoxone Extra, Roundup Ultra, Roundup Ultra RT, or Landmaster BW will control established broadleaf weeds, grasses or volunteer wheat depending on plant height. If grasses are less than 1" tall, Atrazine, Bladex, or Extrazine II will provide acceptable control. Control is improved when crop oil concentrate or 28% nitrogen is added. When planting corn, 2,4-D ester may also be added for improved weed control. Gramoxone Extra should be applied with a nonionic surfactant to grasses less than 4" tall. If grasses are taller than 4" and are growing vigorously, apply Roundup Ultra[1] or Landmaster BW[1]. Mixing some herbicides can create antagonism and decrease performance. Kill volunteer wheat and annual bromes in April to prevent soil moisture loss. Consider banding over the row in weedy fields at planting to compensate for disturbing the soil with the planter.

Volunteer winter wheat and/or downy brome or jointed goatgrass are not usually controlled with July and early August atrazine treatments. A split after harvest treatment with the early application atrazine rate reduced so 1 lb/A of atrazine can be applied in September can be an effective control measure. If maximum rates of atrazine have been applied the previous fall do not add additional atrazine in the spring. Lower rates of atrazine (or none at all) need to be used on eroded areas, on soils with less than 1.2% organic matter, on soils with a pH of 7.0 or greater, some terraces, Canyon and Rosebud soils, and caliche outcroppings. High atrazine rates may carryover and destroy wheat on these areas. Total atrazine applied last year after wheat harvest plus this year's treatment should not exceed 3.25 lb 90DF or 3 qt 4L/A for land to be planted to corn or sorghum. To receive the maximum benefits from ecofarming, which includes moisture conservation and prevention of weed seed production, treatments applied soon after harvest are usually the most successful. This is on the condition the weeds are not under drought stress and the straw has settled. At that time the weeds are smaller and easier to control with the nonselective translocating herbicide (Roundup Ultra, Roundup Ultra RT and Landmaster BW). The non-selective, non-translocating herbicides (Gramoxone Extra) are usually more effective in controlling small weeds and as they approach maturity.

If grasses recover from initial after harvest herbicide applications, use Roundup Ultra to kill escapes. Where Gramoxone Extra was used, use 12 oz/A of Roundup Ultra and where Landmaster BW, Roundup Ultra or Roundup Ultra RT was used, use 9 to 12 oz/A of Roundup Ultra.

Fields not treated after harvest with herbicides are not ecofallow. Therefore, herbicides might not be as effective and grain yields may be poorer than fields treated in fall. If moisture was present after harvest and weeds produced seed, weed density may be great enough that weed control with herbicides at rates that do not cause crop injury may be difficult. Also the moisture lost after harvest may be critical to the crop if the moisture during the winter and spring is limited. With these considerations and if one wishes to try the spring-only treatment, the following is suggested: Add or increase the AAtrex/Atrazine to the lower of the maximum labeled rate or the amount the crop can tolerate and still not cause damage to the succeeding crop. Be sure to add a grass herbicide. Add Gramoxone Extra at 1.5 to 2.0 pt/A after April 15 depending upon size of weeds. Rates suggested depend on soil type, pH, organic matter, time of application, and weed size. For corn use 1.5 to 2.0 qt/A AAtrex/atrazine, for grain sorghum use 1.25 to 2.0 qt/A AAtrex/atrazine. An early spring treatment of Roundup Ultra or Landmaster BW with atrazine as soon as good growing conditions exist in the spring is an effective treatment for volunteer wheat and downy brome. Dual or Bicep, Micro-Tech or Bullet should be applied 20 to 30 days before corn or sorghum planting. For sorghum, use the appropriate seed treatment for Dual, Bicep, Bullet or Micro-Tech.

PLANTING ROW CROPS NO-TILL INTO LAST YEAR'S SPRING SMALL GRAIN STUBBLE (Oat, Spring Wheat, and Spring Barley)

The spring small grains are not as competitive with weeds as winter wheat. This is because the winter wheat is established in the fall and starts growth early in the spring before most weeds germinate. With good stands of winter wheat, most weeds except for winter annual weeds, are not a problem.

The quality and quantity of winter wheat stubble and straw is also superior and longer lasting than that of the spring grain crops. The winter wheat stubble and straw is more effective in suppressing weeds. Therefore, planting crops no-till into last year's small grain, while it can be successful, can also be a disaster if the herbicide treatments are not timely, properly selected, applied properly, and results are not evaluated to determine if retreatment or other weed control measures are necessary.

The most important part of this program is weed control after spring small grain harvest. Keeping the weeds from producing seed and using stored soil moisture is done with a timely herbicide treatment after harvest. The herbicide treatments listed for winter wheat after harvest can be used in small grain stubble in most situations (check the label to be sure and for the recropping intervals for the crops in your rotation). The higher labeled rates of herbicides are usually required. Roundup Ultra, Roundup Ultra RT and Landmaster BW are usually the choice nonselective herbicides for control of emerged summer annual grass weeds that are growing rapidly. As weeds approach maturity, Gramoxone Extra has given good results if combined with atrazine. If atrazine is used in the fall treatment, the next crop must be tolerant to it at the rate used (check label).

The spring herbicide treatment is necessary. Again, check the rates, etc. for the crop in the ecofarming section. Check labels and be sure to control volunteer crops. Also, do not disturb the herbicide treatment if a residue herbicide was applied last fall. Read all the general remarks under ecofarming and see footnotes on page 74.

For additional information on ecofarming, see the *1996 Proceedings of the Ecofarming and Winter Wheat Conferences.*

Weed Response to Herbicides Applied After Winter Wheat Harvest

Response Ratings:

Ratings are for light to moderate weed populations, favorable conditions and weed growth stage as specified on product label. High weed populations, adverse conditions, or large weeds will reduce control.

10 — (96-100%) 5 — (60-69%)
9 — (90-95%) 4-2—less than 60%
8 — (85-90%)
7 — (80-84%) 1 — 0
6 — (70-79%)

Herbicides[a]	Broadleaf Weeds												Summer Annual Grasses								Winter Annual Grasses		
	Buckwheat, Wild	Buffalobur	Horseweed	Knotweed, Tall	Kochia	Lambsquarters	Lettuce, P	Pigweed	Smartweed, P.	Spurge, Tooth	Sunflower	Thistle, R.	Barnyardgrass	Crabgrass	Foxtail, Gr.	Foxtail, Ye.	Sandbur	Shattercane	Stinkgrass	Witchgrass	Downy Brome	Jointed Goatgrass	Volunteer Wheat
	6 inches tall or less												4 inches tall								4 inches tall		
Gramoxone Extra	10	10	10	10	10	10	10	10	5	10	10	9	4	2	7	4	5	5	8	8	10	10	10
Gramoxone Extra + atrazine	10	10	10	10	10	10	10	10	10	10	10	10	9	7	10	9	9	10	10	10	10	10	10
Landmaster BW	10	10	10	10	8	10	8	10	10	9	10	10	10	10	10	10	10	10	10	10	10	10	10
Landmaster BW + atrazine	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Round Ultra RT	7	10	8	8	7	9	6	10	10	5	10	8	10	10	10	10	10	10	10	10	10	10	10
Roundup Ultra + atrazine	10	10	10	10	8	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	12 inches tall												Tillered to boot								Tillered to boot		
Gramoxone Extra	9	7	7	7	7	7	7	7	4	7	7	7	3	1	4	4	3	3	5	4	6	6	6
Cyclone CF + atrazine + 2,4-D[b]	9	10	10	10	10	10	10	10	8	10	10	10	3	2	4	4	3	3	7	6	9	9	9
Landmaster BW	8	10	8	9	8	10	8	8	10	7	10	8	8	8	10	8	8	10	10	8	10	10	10
Landmaster BW + atrazine	10	10	10	10	8	10	8	10	10	8	10	9	5	6	10	7	8	10	10	8	10	10	10
Round Ultra RT	5	9	6	8	5	8	5	8	9	3	10	7	8	8	10	8	8	10	10	8	10	10	10
Roundup Ultra + atrazine + 2,4-D	10	10	10	10	8	10	8	10	10	8	10	10	5	6	10	9	8	10	10	8	10	10	10
	24 inches tall												Headed								Headed (in spring)		
Gramoxone Extra	8	8	9	7	8	8	8	8	4	6	7	7	6	6	7	8	7	4	8	8	9	9	9
Gramoxone Extra + atrazine + 2,4-D[b]	10	10	10	8	10	9	10	10	7	9	10	10	8	9	10	10	10	6	10	10	10	10	10
Landmaster BW	6	8	8	7	5	7	8	8	8	5	7	8	8	9	10	8	10	10	10	8	10	10	10
Landmaster BW + atrazine	10	10	8	8	7	9	10	10	9	6	10	8	7	8	10	9	9	10	10	8	10	10	10
Roundup Ultra RT	3	7	6	6	4	5	3	6	7	2	7	7	8	9	10	8	10	10	10	8	10	10	10
Roundup Ultra + atrazine + 2,4-D	10	10	8	8	7	9	10	10	9	6	10	8	7	8	10	9	9	10	10	8	10	10	10

[a]Rate is 1.5 pt/A for Gramoxone Extra, 54 oz/A for Landmaster BW, and 16 oz/A for Roundup Ultra or Roundup Ultra RT. Atrazine rate is 2.0 qt/A. Consult label to improve weed control with some herbicides. Example, tillered barnyardgrass needs 86 oz/A of Landmaster BW.
[b]Add 2,4-D ester (4L) at 1.5 pt/A.

Ecofarming

Herbicides to use after winter wheat harvest, with winter wheat planted in 2 to 3 months (continuous winter wheat), in 12 to 14 months (fall treatment in winter wheat-fallow), or in 4-5 months (spring treatment in winter wheat-fallow).

Herbicide	Commercial Product per Acre: Sandy Loam <1% OM	Silt Loam 1-2% OM	Silty-Clay Loam >2% OM	Application Time	Remarks and Approximate Cost/A Broadcast
Winter Wheat Stubble to be Seeded 2-3 Months Later to Winter Wheat (Continuous Wheat)					
ROUNDUP ULTRA[1] or ROUNDUP ULTRA RT[1]	12-32 oz	12-32 oz	12-32 oz	POST; two or more applications required. Wait 15 days before planting wheat with Landmaster BW	If volunteer wheat develops close to planting, treat with Roundup Ultra or Roundup Ultra RT. To facilitate drilling stubble should be no taller than 12" with good straw and chaff distribution. Cost: Roundup Ultra $4.33-$11.54; Roundup Ultra RT $3.00-$8.00; Landmaster BW $5.98-$9.57.
LANDMASTER BW[1]	40-64 oz	40-64 oz	40-64 oz		

See page 74 for additional footnotes.

Ecofarming (Continued)

Herbicide	Commercial Product per Acre: Sandy Loam <1% OM	Silty Loam 1-2% OM	Silty-Clay Loam >2% OM	Application Time	Remarks and Approximate Cost/A Broadcast
Winter Wheat Stubble to be Seeded 12-14 Months Later (Fallow Aid)					
AATREX 4L	1 pt	2 pt	2 pt	Aug 10-Sept 10 (12 months or more before seeding)	Spray before weeds produce seed and not under drought stress. Volunteer wheat and downy brome control are better with late Aug. and early Sept. application. The addition of 1 pt 2,4-D ester to AAtrex + Gramoxone Extra to improve control broadleaf weeds may decrease control of grasses. Roundup Ultra RT + 2,4-D may be substituted for Landmaster BW. Cost: AAtrex + Cyclone CF $8.15-$11.37; Bladex + Atrazine + Gramoxone Extra + 2,4-D $14.00-$15.63; AAtrex + Landmaster BW $9.64-$16.02.
+					
GRAMOXONE EXTRA[1]	1.5-2 pt	1.5-2 pt	1.5-2 pt		
ATRAZINE 4L	1 pt	1.5 pt	1.5 pt		
+					
GRAMOXONE EXTRA[1]	1.5-2 pt	1.5-2 pt	1.5-2 pt		
+					
2,4-D LV ESTER (4L)	1 pt	1 pt	1 pt		
AATREX 4L	1 pt	2 pt	2 pt		
+					
LANDMASTER BW[1]	64-86 oz	64-86 oz	64-86 oz		
LANDMASTER BW[1]	54 oz	54 oz	54 oz	Apply Landmaster BW at harvest. Apply atrazine Aug. 20 - Sept. 10	Good for weeds that are present early. Use Gramoxone Extra or Roundup Ultra RT with AAtrex on weeds present in late August to early September. Cost $9.66-$11.23.
followed by					
AATREX	1-2 pt	2 pt	2 pt		
Winter Wheat Stubble to be Seeded to Winter Wheat 4-5 Months Later (Fallow Aid)					
ROUNDUP ULTRA[1]				April or before boot stage of grass, weeds	Roundup Ultra $5.77-$11.54; Roundup Ultra RT $3.28-$8.75; Landmaster BW $5.98-$9.60.
or					
ROUNDUP ULTRA RT[1]	16-32 oz	16-32 oz	16-32 oz		
LANDMASTER BW[1]	40-54 oz	40-54 oz	40-54 oz		
TORDON	1.5 oz	1.5 oz	1.5 oz		Helps control Wild Buckwheat. Cost: Tordon + 2,4-D $3.08.
+					
2,4-D	0.75 pt	0.75 pt	0.75 pt		
Winter Wheat Stubble to be Planted to Corn or Sorghum the Next Spring "Check Remarks Under Ecofarming"					
Herbicides to use after winter wheat harvest					
GRAMOXONE EXTRA[1]	1.5-2 pt	1.5-2 pt	1.5-2 pt	July-Aug. or Sept.-Oct.	Spray after wheat harvest and before weeds produce seed. If grasses such as barnyardgrass recover, kill weeds before they develop seed. Use 1-1.2 qt Atrazine in Panhandle. Volunteer wheat and downy brome control is better with late Aug.-Oct. applications. Minimum rates for Landmaster BW with Atrazine are: 64 oz/A to 3 lb/A or less atrazine Barnyardgrass control requires 86 oz/A of Landmaster BW. Cost: Atrazine + Gramoxone Extra $11.21-$16.00; AAtrex + Landmaster BW $14.39-$19.04.
+					
AATREX/ATRAZINE 4L	2 qt or 1.5 qt	2.25 qt or 2 qt	2.5 qt or 2.5 qt		
LANDMASTER BW[1]	64-86 oz	64-86 oz	64-86 oz		
+					
AATREX/ATRAZINE 4L	2 qt or 1.5 qt	2.5 qt or 2.0 qt	3 qt or 2.5 qt		
—Split Treatments—					
ROUNDUP ULTRA or ROUNDUP ULTRA RT[1]	1.5-2 pt	1.5-2 pt	1.5-2 pt	July to Early Aug.	Spray after wheat harvest as soon as good growing conditions for the weeds occur and the crop residue does not protect the weeds from spray coverage.
followed by					
GRAMOXONE EXTRA	1.5-2 pt	1.5-2 pt	1.5-2 pt	Early Sept.	Use 1-1.2 qt Atrazine in Panhandle. Cost: Roundup Ultra + Gramoxone Extra + Atrazine $17.50-$23.80; RoundUltra RT + Gramoxone Extra + Atrazine $15.15-$20.50.
+					
AATREX/ATRAZINE XL	1.5 qt	2 qt	2.5 qt		

See page 74 for additional footnotes.

Herbicide	Commercial Product per Acre: Sandy Loam <1% OM	Silty Loam 1-2% OM	Silty-Clay Loam >2% OM	Application Time	Remarks and Approximate Cost/A Broadcast
Herbicides to be used after winter wheat harvest.					
Winter Wheat Stubble to be Planted to Soybean or Sunflower the Following Spring					
(Consider Soybean in Areas With Over 20" Rainfall]					
LANDMASTER BW[1]	54-86 oz	54-86 oz	54-86 oz	2 applications	Volunteer wheat may emerge in fall or spring. Control with Roundup Ultra. See spring treatments for soybean, page 36, or sunflower on page 47. Cost: Landmaster BW $8.08-$12.87; Roundup Ultra $5.77-$11.55; Roundup Ultra RT $4.38-$8.75.
or					
ROUNDUP ULTRA[1]					
or					
ROUNDUP ULTRA[1] RT	16-32 oz	16-32 oz	16-32 oz		
Corn to be Planted In Winter Wheat Stubble Treated with AAtrex/atrazine After Harvest[4]					
Herbicides to be used for ecofallow corn in the spring.					
If volunteer wheat and/or downy brome were not controlled in the fall, spray in April or control earlier with Round Ultra, Roundup Ultra RT, or Landmaster BW. Low rates (less than 2 lb active) of atrazine and/or Bladex usually do not give satisfactory volunteer wheat and downy brome control when applied in July or early August of the previous summer. If triazine-resistant kochia is a problem see *Troublesome Weeds and Woody Plants,* page 69.					
BLADEX 4L	1.75 qt	2 qt	2.5 qt	15-30 days preplant	Do not use on sands and loamy sands with less than 1% organic matter. Cost: Bladex $11.97-$14.96; Bladex + Atrazine $9.85-$13.63; Bladex + Dual $14.93-$23.89; Extrazine $25.28-$72.24.
BLADEX 4L	1.25 qt	1.5 qt	1.75 qt	0-15 days preplant	
+					
AATREX/ATRAZINE 4L	0.75 qt	1 qt	1 qt		
EXTRAZINE II	1.4 lb	2.2-3.1 lb	3.6-4.0 lb		
BLADEX 4L	1.5 qt	1.75 qt	2 qt		
+					
DUAL/DUAL II	0.75 qt	1 qt	1 qt		
DUAL/DUAL II	2 pt	2.5 pt	3 pt		If annual grasses produced seed in the wheat stubble or if areas of field have history of high grass population, use higher rates of Dual or Micro-Tech. Cost: Bicep $14.63-$19.51; Bullet $18.55-$19.79; Dual $11.93-$17.95; Dual + AAtrex $14.30-$21.11; Micro-Tech + AAtrex $15.40-$19.45; Micro-Tech + Bladex $20.52-$34.25.
BICEP II/BICEP LITE II	1.8 qt	2.4 qt	2.4 qt	0-20 days preplant	
DUAL/DUAL II	1.5 pt	2 pt	2 pt		
+					
AATREX 4L	0.75 qt	1 qt	1 qt		
BULLET	3.75 qt	4 qt	4 qt		
MICRO-TECH	2.0 qt	2.5 qt	2.5 qt		
+					
AATREX 4L	0.75 qt	1 qt	1 qt		
or					
BLADEX 4L	1.25 qt	1.5 qt	2 qt		
EXTRAZINE II	1.4 lb	2.2-3.1 lb	3.6-4.0 lb	0-15 days preplant; for 16-30 days preplant increase rates 20%	If annual grasses produced seed in the wheat stubble or if areas of field have history of high grass population use higher rates. Cost: Extrazine $25.28-$72.24; Frontier + atrazine $15.86-$22.05; Guardsman $13.86-$20.79; Surpass + atrazine $13.04-$24.51; Surpass + Bladex $15.16-$33.32; Surpass 100 $13.50-$27.50.
FRONTIER	1.0 pt	1.0-1.25 pt	1.25-1.4 pt		
or					
SURPASS	1.5-2.0 pt	2.0-2.5 pt	2.0-3.0 pt		
or					
HARNESS	1.5-2.0 pt	2.0-2.5 pt	2.0-3.0 pt		
+					
ATRAZINE	0.75 qt	1.0 qt	1.0 qt		
or					
BLADEX	0.75 qt	1.5 qt	2.0 qt		
SURPASS 100	1.6-2.2 qt	2.2-2.6 qt	2.6-3.3 qt		
GUARDSMAN	3.0 pt	3.0-4.0 pt	4.0-4.5 pt		

See page 74 for additional footnotes.

Herbicide	Commercial Product per Acre: Sandy Loam <1% OM	Silty Loam 1-2% OM	Silty-Clay Loam >2% OM	Application Time	Remarks and Approximate Cost/A Broadcast
Winter Wheat to be Planted in Fall (Fallow Aid)					
Herbicides to be used in spring on corn or sorghum stubble when followed with winter wheat.					
ROUNDUP ULTRA[1] or ROUNDUP ULTRA RT[1]	12-16 oz	12-16 oz	12-16 oz	Apr 16-May 1	Application time depends on year and weed species. If downy brome or volunteer wheat are present, they must be controlled before May 1. Early application is necessary to control winter annuals. Use Roundup Ultra for control of downy brome before heading. Do not plant wheat for 20 days after Landmaster BW. Follow-up weed control may be necessary if one wants to go to No-Till. Cost: Landmaster BW $5.98-$8.08; Roundup Ultra $4.33-$5.77; Roundup Ultra RT $3.83-$5.11; Amber + Roundup Ultra $8.86-$11.95; Glean + Roundup Ultra $11.79.
LANDMASTER BW	40-54 oz	40-54 oz	40-54 oz		
AMBER	0.28-0.56 oz	0.28-0.56 oz	0.28-0.56 oz	Before May 1	
+ ROUNDUP ULTRA OR ROUNDUP ULTRA RT	1 pt	1 pt	1 pt		
GLEAN	0.33 oz	0.33 oz	0.33 oz		
+ ROUNDUP ULTRA OR ROUNDUP ULTRA RT	1 pt	1 pt	1 pt		
Soybean to be Planted into Winter Wheat Stubble Treated With Landmaster BW, Roundup Ultra or Roundup Ultra RT After Harvest (For Areas With Over 20" Rainfall and Fields With Low Weed Density)					
PURSUIT*	4 oz	4 oz	4 oz		Add 1-1.5 pt/A of Round up Ultra[1] or Roundup Ultra RT[1] if there are emerged weeds. Control weeds when they are small to conserve moisture and improve performance. Check fields within 30 days after planting to determine if postemergence herbicides are needed. Cost without Roundup Ultra or Roundup Ultra RT: With Dual $34.49-$42.44; With Micro-Tech $31.63-$38.15; With Prowl $27.51-$31.98; Pursuit Plus $23.76.
+ DUAL/DUAL II	2 pt	2.5 pt	3 pt	0-30 days preplant	
or MICRO-TECH	2 qt	2.5 qt	3 qt		
or PROWL (3.3EC)	2.4 pt	3 pt	3.6 pt		
PURSUIT PLUS	2.5 pt	2.5 pt	2.5 pt		
Sunflower to be Planted into Winter Wheat Stubble Treated With Landmaster BW, Roundup Ultra or Roundup Ultra RT After Harvest (Both Treatments Required)					
LANDMASTER BW[1]	40 oz	40 oz	40 oz	Before May 1 and a minimum of 30 days prior to planting to control volunteer wheat and downy brome	Cost: Landmaster BW + Prowl $13.42; Roundup Ultra + Prowl $7.25-$11.72.
+ PROWL (3.3EC)	2.0 pt	2.0 pt	2.0 pt		
followed by ROUNDUP ULTRA1	16 oz	16 oz	16 oz		
+ PROWL (3.3EC)	0.4 pt	1.0 pt	1.6 pt		

*See rotational crop restrictions on the Pursuit label

Grain Sorghum to be Planted in Winter Wheat Stubble Treated With AAtrex/Atrazine After Harvest

If volunteer wheat and/or downy brome were not controlled in the fall, spray in April or control earlier with Roundup Ultra, Roundup Ultra RT, or Landmaster BW. Low rates (less than 2 lb active) of atrazine usually do not give satisfactory volunteer wheat and downy brome control when applied in July or early August of previous summer. If triazine-resistant kochia is a problem see *Troublesome Weeds and Woody Plants*, page 69.

BICEP, BICEP II, BICEP LITE II	Do not use	1.8 qt	2.1 qt	0-28 days preplant	Add 1.5-2 pt Gramoxone Extra[1] or 54 oz Landmaster BW for emerged weeds. When using Landmaster BW wait 20 days prior to planting. Seed must be treated with Concep for Dual or Bicep and Screen treated for Lasso, and Bullet treatments. Cost: Bicep $14.62-$17.06; Dual $15.90-$19.88; Dual + AAtrex $13.51-$19.05; Frontier $16.88-$25.32; Guardsman $13.85-$20.77; Micro-Tech+ AAtrex $11.15-$13.52.
BULLET	3.75 qt	3.75 qt	4.0 qt	0-28 days preplant	
DUAL/DUAL II	2.0 pt	2.25 pt	2.5 pt	0-28 days preplant	
DUAL/DUAL II	1.5 pt	2.0 pt	2.0 pt	0-28 days preplant	
+ AATREX 4L	0.5 qt	1.0 qt	1.0 qt		
FRONTIER	23 oz	28 oz	33 oz	0-28 days	
GUARDSMAN	3 pt	3.5-4.0 pt	4.0-4.5 pt	0-28 days preplant	
MICRO-TECH	2.25 qt	2.5 qt	2.75 qt		
+ AATREX 4L	0.5 qt	1.0 qt	1.0 qt	0-28 days preplant	

See page 74 for additional footnotes.

Weed Response to Selected Alfalfa Herbicides

Response Ratings:
Ratings are for light to moderate weed populations, favorable conditions and weed growth stage as specified on product label. High weed populations, adverse conditions, or large weeds will reduce control.

10 — (96-100%) 6 — (70-79%)
9 — (90-95%) 5 — (60-69%)
8 — (85-90%) 4-2 —less than 60
7 — (80-84%) 1 — 0

	Black Nightshade	Barnyardgrass	Common Sunflower	Dandelion	Downy Brome	Field Pennycress	Foxtail	Kochia	Kochia, Triazine-resistant	Lambsquarters	Pigweed	R. Thistle	Sandbur	Shepherdspurse	Tansy Mustard	Crop Tolerance[a]	Recrop Interval in Months When Changing to Nonlabeled Crop[b]
Preplant																	
Balan	4	9	5	2	9	2	10	8	8	9	6	10	8	2	2	2	12
Eptam	7	6	3	2	9	2	9	7	7	6	5	4	8	2	2	3	2
Seedling																	
Buctril (seedling only)	6	2	6	2	1	7	2	7	7	10	6	10	1	9	6	3	0
Butyrac	6	2	6	2	1	5	2	6	5	6	3	5	1	5	5	2	1
Poast	1	9	1	1	7	1	8	1	1	1	1	1	8	1	1	1	0
Established																	
Gramoxone Extra	4	5	8	2	8	4	6	6	6	8	8	6	5	4	4	3	0
Karmex	8	9	8	3	5	7	7	10	7	7	7	8	6	10	10	2	24
Kerb	4	6	4	2	8	5	5	6	6	5	5	5	5	2	4	1	9
Lexone/Sencor	5	8	8	8	9	9	2	9	3	8	8	7	3	10	10	3	4
Pursuit	7	5	7	2	2	8	5	9	9	5	9	7	4	7	8	2	0-40
Roundup Ultra RT	1	1	1	4	8	5	1	4	4	1	1	4	1	5	8	3	0
Sinbar	8	5	8	6	9	9	3	10	3	8	8	7	6	10	10	3	24
Velpar	6	5	6	6	10	8	3	8	3	7	7	8	6	10	10	3	12-24
Zorial Rapid 80	-	-	-	2	8	-	9	8	8	9	-	-	-	7	6	3	16

[a]Crop ratings of 3 or less result in no yield loss.
[b]Values will vary with soil texture, pH, organic matter, rainfall or irrigation, rotational crop, and herbicide rate.

Alfalfa

See NebGuide G95-1254, *Weed Control in Alfalfa* for more information.

Area or Use	Herbicide	Commercial Product per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
To Control Alfalfa, see Troublesome Weeds and Woody Plants, Page 65.				
ALFALFA (Establishing new stands)	BALAN EPTAM	3.0-4.0 qt 2.5-3.5 pt	Preplant	Apply to dry surface soil and immediately incorporate by cross tandem disking or equivalent soil mixing. Use lower rate on sandy soil. Early legume injury may occur. Controls primarily annual grasses. Cost: Balan $12.00-$16.00; Eptam $8.55-$11.97.
	BUCTRIL	1.0-1.5 pt	Weeds less than 2" tall. Alfalfa at least 4 trifoliate leaves	Apply when the majority of alfalfa has 4 trifoliate leaves. Temperatures above 80°F following Buctril application may result in crop injury. Do not cut spring treated alfalfa for feed within 30 days following treatment. Cost: Buctril $6.56-$9.83; Buctril + Pursuit $20.45.
	BUCTRIL + PURSUIT	1.0 pt 3 oz		
	POAST	1.0-2.0 pt	Grasses 4" or less	Good coverage necessary. Use higher rate for sandbur, volunteer cereals, or winter annual grasses. Poast will not control over-wintered downy brome. Add COC to spray solution. Do not graze or cut for forage for 7 days or 14 days before cutting for dry hay following a Poast combination. Cost: $11.93-$23.88.
ALFALFA (Seedling or established)	BUTYRAC 200,	1.0-3.0 qt	POST. Weeds less than 3" tall; alfalfa 2-4 trifoliate leaves	DO NOT use treated forage for 60 days after treatment on new stands and 30 days on established stands. Use when temperature is above 50°F. Cost: $8.92-$26.78.

See page 74 for additional footnotes.

Alfalfa

See NebGuide G95-1254 *Weed Control in Alfalfa* for more information.

Area or Use	Herbicide	Commercial Product per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
ALFALFA	KERB 50W	1.0-1.5 lb	Pre or post to winter annual grasses Oct.-Mar.	Controls downy brome and volunteer cereals. Do not graze or harvest for forage within 25 days following application. Cost: $26.75-$40.13.
Seedling or established for one year	PURSUIT DG	1.08-2.16 oz	Seedling alfalfa 2nd trifoliate stage.	Do not feed, graze, or harvest alfalfa for 30 days following treatment. Pursuit requires the addition of an adjuvant. Cost: $13.95-$27.90.
ALFALFA	GRAMOXONE EXTRA	1.5-2.0 pt	Dormant alfalfa	Do not cut or harvest within 60 days of application. Primarily for winter annual weeds such as pennycress and other mustards. Sinbar, Velpar, Gramoxone Extra and Lexone/Sencor also control downy brome. Do not use on sand; use lowest rates on soils with less than 1% organic matter. Spring application of Karmex controls annual warm season grasses such as foxtail and barnyardgrass. Cost: Karmex $6.45-$13.00; Sinbar $11.25-$22.50; Lexone Sencor $13.04 $26.08; Gramoxone Extra $5.77-$11.54.
	KARMEX 80W	1.5-3.0 lb	Late fall to early spring to dormant alfalfa	
(Established one year or more. For dodder control see *Troublesome Weeds Section,* page 67.)	LEXONE/SENCOR DF Harvest Interval (28 days)	0.5-1.0 lb		
	SINBAR 80W	0.5-1.0 lb		
	ROUNDUP ULTRA RT	8 to 12 oz	Apply in spring to alfalfa that is dormant	Roundup Ultra should not be applied after alfalfa has broken dormancy and initiated trifoliate leaf expansion. Do not use additional surfactant or ammonium sulfate. Allow 45 days after application before harvesting. Check label for local recommendations. Cost: $2.88-$4.33.
	VELPAR L Harvest Interval (30 days)	1.0-1.5 qt	Late fall to early spring to dormant alfalfa	The 1 qt/acre rate of Velpar is for low O.M. soils for downy brome control. Cost: $14.75-$22.15.
	ZORIAL RAPID 80	1.25-2.5 lb	Late fall to early spring to dormant alfalfa	Use lower rate on sand or sandy loam soils. Do not apply within 28 days of harvest. Will not control emerged weeds. Do not rotate to sensitive crops for 16 months following Zorial application. Cost: $TBA.

Pastures and Ranges

(See pages 65-74 for specific weed)

Area or Use	Herbicide	Commercial Product per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
CRP ONLY (Established grasses)	AATREX DF	0.6-1.1 lb	PRE, fall or early spring	Use on bluegrama, Indian grass, little bluestem, sand lovegrass, sideoats grama, western wheatgrass. Cost: $1.80-$3.32.
	AATREX DF[2]	1.1-2.2 lb	PRE, fall or early spring	Use on big bluestem and switchgrass. Cost: 3.34-$6.64.
GRASS SEEDLINGS (Cool and warm season grasses)	2,4-D LV Ester (4L)	1.0 pt	Grass 5-leaf stage or beyond	For broadleaf weeds. After grasses are well established, increase rate to 1 qt. Cost: $1.69-$3.38.
WARM SEASON GRASSES (Grown for seed production)	AATREX DF[2]	1.0-2.0 lb	Before weeds and crop emerge	Established grasses. Cost: AAtrex $3.04-$6.08; Bicep $8.00-$12.00.
	BICEP	1.0-1.5 qt		
SOD SEEDING (Legumes into grass)	GRAMOXONE EXTRA	1.5-3.0 pt	Before or immediately after legume seeding	Suppresses established sod. Seed legumes with a sod seeder. If grass is less than 3" use lower rate. During year of establishment, graze intensively for short periods only. Add X-77 surfactant. Cost: $5.76-$11.53.
SOD SEEDING (Native grass planted no-till)	ROUNDUP ULTRA	1.0-2.0 qt	Spring, on cool season grasses	Suppresses established sod. Seed grasses with a sod seeder. Do not graze seeded area until dormancy after second growing season. Apply in no more than 10 gallons water per acre and add 2 qt X-77 and 17 lb ammonium sulfate per 100 gallons. Cost: $5.77-$23.10.

See page 74 for additional footnotes.

Pastures and Ranges

(See pages 65-74 for specific weed)

Area or Use	Herbicide	Commercial Product per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
ANNUAL OR BIENNIAL BROADLEAF WEEDS IN PASTURES AND RANGES (For specific weeds see page 65-74.)	2,4-D LV Ester (4L)	1.0 qt	Rosette stage in fall or when weeds are small in spring	Withhold milk cows from grazing treated areas for 7 days.With Banvel mixture do not harvest hay for dairy animals within 37 days. Do not use Banvel within 1/2 mile of sensitive crops. Combination controls greater variety of weed species. Cost: 2,4-D $3.37; 2,4-D + Banvel $8.02; Ally $5.69-8.54; Amber $3.08-$6.17; Curtail $8.48-6.50; Escort $7.00-$14.00; Grazon $3.25-$6.50; Tordon 22K $11.49-$25.74.
	2,4-D LV Ester (4L) + BANVEL	1.0 qt 0.5 pt		
	ALLY	0.2-0.3 oz		
	AMBER	0.28-0.56 oz		
	CURTAIL	2 pt		
	ESCORT	0.2-0.4 oz		
	GRAZON P + D	1.0-2.0 pt		
	TORDON 22K	0.5-1.0 pt		
PERENNIAL BROADLEAF WEEDS IN PASTURE AND RANGES Includes: vervains, broom snakeweed, western ironweed, woolly loco, flodman thistle and wavy leaf thistle. For other weeds see pages 54-63.)	2,4-D LV Ester (4L)	1.5 qt	At bud stage of predominant weed. Oct. or April for dandelion and musk thistle	Annual treatment for 2-3 years may be necessary. Withhold milk cows from grazing for 7 days. With Banvel mixture do not harvest hay for dairy animals for 37 days. Do not use Banvel within 1/2 mile of sensitive crops. Cost: 2,4-D $5.06; 2,4-D + Banvel $12.67; Curtail $8.48-$16.96; Grazon $6.50-13.00.
	2,4-D LV Ester (4L) + BANVEL	1.0 qt 1.0 pt		
	CURTAIL	2.0-4.0 pt		
	GRAZON P + D	1.0-2.0 qt		
WINTER ANNUAL GRASS CONTROL in established warm season grass	ROUNDUP ULTRA	1.0 pt	Late winter prior to forage grass growth	Controls downy brome. Not on seed production fields. Do not harvest or graze for 8 weeks. Cost: $5.77.

Grazing Restrictions for Pasture Herbicides

		Lactating Dairy Animals		Beef and Non-Lactating Dairy Animals		
Herbicides	Product	Before Grazing	Before Hay Harvest	Before Grazing	Before Hay Harvest	Removal Before Slaughter
ALLY	0.10 to 0.30 oz	0	0	0	0	0
AMBER	0.28-0.56 oz	0	0	0	0	0
BANVEL 4S	Up to 1 pt	7 days	37 days	0	0	30 days
	Up to 2 pt	21 days	51 days	0	0	30 days
	Up to 4 pt	40 days	70 days	0	0	30 days
	Up to 16 pt	60 days	90 days	0	0	30 days
CROSSBOW 3S	1 to 6 qt	1 year	1 year	5 weeks[E]	1 year	3 days
CURTAIL	2.0 to 4.0 pt	14 days	30 days	0	30 days	7 days[G]
ESCORT	0.2-0.4 oz	0	0	0	0	0
GRAMOXONE EXTRA[B]	0.8 to 1.5 pt	1 month	1 month	1 month	1 month	0
GRAZON P + D[C]	3.0-4.0 pt	0 days	30 days	0 days	30 days	3 days
ROUNDUP ULTRA						
Spot or Wiper[A]	Any labeled rate	14 days	14 days	14 days	14 days	0
Broadcast	Any labeled rate	8 weeks	8 weeks	8 weeks	8 weeks	0
SPIKE 20P	1/2 oz per 45 sq. ft.	0 days[G]	1 year[F]	6 days[F]	1 year[F]	0 days[F]
STINGER 3E	0.66 to 1.31 pt	0	0	0	0	0
TORDON 22K[C]	0.5 to 2.0 pt	14 days	14 days	0	14 days (if < 1qt/A)	3 days
2,4-D/MCPA[D]		7-14 days	30 days	0-7 days	0-30 days	0

[A]Do not treat more than one-tenth of any given acre at one time with spot or wiper applications. Remove livestock before application.
[B]Restrictions based on the degree of new seedling establishment before grazing. Suggested at least 6 inches of grass or legume seedling growth which is approximately one month. Late fall seeding may require 3 to 5 months before the suggested 6-inch height is reached.
[C]Move livestock to untreated grass pasture for 7 days before transferring livestock to broadleaf crop or pasture areas. Removal before slaughter statement only applies to animals grazing treated forage for 2 weeks immediately after application. Do not exceed 1 qt/A broadcast. If > 1 qt/A; only spot treatments are allowed; total acres cannot exceed 25% of landowner's areas in any particular watershed.
[D]Be sure to check individual product labels for restrictions and use rates due to the large number of formulations available.
[E]One year if more than 1.5 gal/A rate used.
[F]If no more than 20 lb per acre used.
[G]Withdrawal not needed if 2 weeks or more time elapsed since application.

CRP Acres Establishment

PREPLANT OR PREEMERGENCE

See NebGuide G89-905, *Weed Control on CRP Acres* for more information.

Herbicide	Commercial[3] Product/A	Application Time	Remarks and Approximate Cost/A
AATREX 90 DF (NEB. STATE LABEL)	2.2 lb	PPI or PRE	Use only on loam or finer textured soils containing 1% or more organic matter. For use on big bluestem, eastern gamagrass and switchgrass. Cost: $6.64.
ROUNDUP ULTRA	1-2 pt	Before or at grass seeding	Will control most emerged seedling grass and broadleaf weeds. Apply Roundup Ultra 10 GPA carrier or less and include surfactant at 0.5% v/v. Ammonium sulfate added at 17 lb per 100 gal solution improve Roundup Ultra performance. Cost: Roundup Ultra $6.00-$12.00.
2,4-D AMINE (4L) or ESTER (4L)	1-2 pt	At least 30 days before grass seeding	Controls most broadleaf annual weeds. Both treatments may injure grass seedlings if applied less than 30 days before planting. Cost: 2,4-D $1.68-$3.38; Landmaster BW $5.98-$10.77.
LANDMASTER BW	40-72 oz		
PLATEAU	4 oz	At grass/ wildflower seeding	For use in big bluestem, little bluestem, indiangrass, buffalograss, sideoats grama, blue grama, selected wildflowers and legumes. Cost: $8.28.
PROWL (3.3EC)	1.2-2.4 pt	PPI or PRE	For use on legumes only. Incorporate immediately for best results. Cost: Prowl $4.46-$8.93; Treflan $4.13-$6.21.
TREFLAN	1-1.5 pt	PPI	

POSTEMERGENCE

For established grass, see *Pastures and Ranges,* page 54.
For specific weeds, see *Troublesome Weeds and Woody Plants,* page 65-74.

AMBER	0.28-0.56 oz	After 3-4 leaf stage of grass	Controls most broadleaf weeds. Use Escort on selected perennial grasses. Do not use on soils with pH greater than 8.0. Do not use on grass/legume mixtures. Add surfactant at 0.25% v/v. Cost: Amber $3.08-$6.17; Ally $2.85; Escort $3.40-$34.00.
ALLY*	0.1 oz		
ESCORT**	0.1-1.0 oz		
BANVEL + 2,4-D LV Ester (4L)	0.25-0.5 pt 0.5-1 pt	After 5-leaf stage of grass	Controls most broadleaf weeds. Use lower rates on warm-season grasses. Do not use on grass/legume mixtures. Established grasses may be treated with 0.5-1 pt Banvel + 0.5-2 pt 2,4-D for perennial weed control. Cost: $3.17-$12.68.
BUCTRIL	1.5-2 pt	After 3-leaf stage of grass	Controls many broadleaf weeds. Apply in minimum 10 GPA by air. May be used on grass/legume mixtures after third trifoliate leaf stage of alfalfa. May be tank mixed with 2,4-D or MCPA for improved control. Tank mix may injure or kill legumes. Cost: $9.83-$13.11.
CURTAIL	2-4 pt	Established grasses	Use only on grasses established one season or longer. Controls most broadleaf weeds including thistles. Do not use on grass/legume mixtures. Cost: $8.48-$16.96.
PLATEAU	4 oz	Spring	Apply when annual broadleaf and grass weeds are less than 6" tall. Cost: $8.28.
PURSUIT	4 oz	Legumes 3-trifoliate Grasses 4-leaf	Use on alfalfa, clover, crown vetch, birdsfoot trefoil, lespedeza, smooth brome, reed canarygrass, orchardgrass, big bluestem, little bluestem, switchgrass, Russian wildrye, wheatgrasses (intermediate, crested, tall). Cost: $18.58.
ROUNDUP ULTRA[1]	12-16 oz	Late fall or late winter	Apply when perennial grasses are dormant. Do not use ammonium sulfate. Cost: $4.33-$5.77.
2,4-D AMINE (4L) or 2,4-D ESTER (4L)	1 pt 0.5 pt	After 5-leaf stage of grass	Controls most broadleaf weeds. Reduce rate 25% if used on warm-season grasses. Will injure or kill legumes. Cost: $0.84-$1.34.

*Ally can be applied POST only at 0.1 oz/A to the following grasses: blackwell switchgrass; blue grama; big, little, plains, sand, and ww spar bluestem; buffalo grass; green sprangletop; Indian grass; kleingrass; atherstone, sand, weeping, and wilmarn lovegrass; orchard grass, Russian wild-rye, sideoats grama; and crested, intermediate, western, tall, bluebunch, pubescent, slender Siberian, streambank, and thickspike wheatgrass.
**Escort can be applied to crested wheatgrass, and smooth brome at 0.25 to 1.0 oz/A. Fescue and bluegrass at 0.25 to 0.5 oz/A.

Non-Crop Acres

Area or Use	Herbicide[5]	Commercial Product[7,8]	Application Time	Remarks and Approximate Cost/A Broadcast
ROADSIDES (Broadleaf weed control)	2,4-D	1 qt/A	Broadleaf weeds 2-6"	Repeat treatments may be necessary. Do not use near susceptible plants/trees. Cost: 2,4-D $3.37; 2,4-D + Banvel $12.67.
	2,4-D + BANVEL	1 qt/A 1 pt/A		
	PLATEAU	4-12 oz	Dormant (fall) or growing season (spring-early summer)	Applications made in growing season may cause yellowing especially at higher rates. Use with surfactant: COC at 1.5-2.0 pt/acre and 28% UAN at 2.0 to 3.0 pt/acre. Cost: $8.30-$24.85.
	TELAR	0.25-0.5 oz/A	Weeds 0-2"	Use with surfactant 1 qt/100 gal. Cost: $3.00-$6.00.
GRASS SUPPRESSION	OUST	1 oz/A	Grass 6-12"	Do not apply to bare soil. May move if soil moves. Suppresses height and heading of bromegrass and other cool season grasses. Do not use year after year in order to avoid development of resistant weeds. Trace amounts can harm crops and gardens. Imperative that label directions are read and followed. Cost: $8.00-$16.00.
	PLATEAU	4-12 oz	Dormant (fall) or growing season (spring-early summer)	Applications made in growing season may cause yellowing especially at higher rates. Use with surfactant: COC at 1.5-2.0 pt/acre and 28% UAN at 2.0 to 3.0 pt/acre. Cost: $8.30-$24.85.
IRRIGATION DITCHBANKS	KARMEX 80W	5-10 lb/A	Soon after ditches are open. Treat before weeds appear or soon after	Use enough water to insure good coverage. Use 50 mesh or coarser screens. May injure nearby trees and shrubs. Cost: Karmex $21.50-$43.00; 2,4-D $3.37.
	2,4-D LV Ester (4L)	1 qt/A	Broadleaf weeds 2-6"	
	RODEO + X-77	4 qt in 10 gal or less water/A	POST when good growth is present	Nonselective. No residual control. Use the lower rate on annual weeds and perennial grasses, the higher rates on perennial broadleaf weeds. Add X-77 at 1/2% v/v. Cost: $110.45.
LONG-TERM VEGETATION CONTROL	ARSENAL	1 fluid oz/1000 sq ft	Treat before weeds appear or soon thereafter	Kochia has become resistant to triazines and ALS herbicides in some areas. Consult label for specific instructions on problem weeds and conditions. Do not use near root zones of trees or other desirable plants. Do not use on land subject to erosion unless erosion is controlled. Cost/1000 sq ft: Hyvar $4.74; Krovar $4.60; Karmex $1.25-$2.45; Spike $6.00-$12.00; Arsenal $0.55-$1.05.
	HYVAR 80W or HYVAR X-L	0.5 lb/1000 sq ft 0.75 pt/1000 sq ft		
	KROVAR I 80W	0.5 lb/1000 sq ft		
	KARMEX 80W	0.25-0.5 pt/1000 sq ft		
	SPIKE 80W or SPIKE 5G	0.12-0.25 lb/1000 sq ft 2-4 lb/1000 sq ft		
PERENNIAL GRASSES (including smooth brome and quack grass)	ROUNDUP ULTRA	2 qt/A in 10 gal or less water/A	Full foliage	Nonselective. Perennial grasses should have good top growth. Kills all annuals. Cost: $23.09.

See page 74 for additional footnotes.

Weed Response to Herbicides in Selected Crops

Plant response may be altered by growing conditions, genetic variation in crops and weeds, soil type, pH, organic matter and application rates. Ratings may vary from season to season and geographical areas within the state. Ratings apply when herbicides are used at rates suggested.

Response Ratings: Ratings are for light to moderate weed populations, favorable conditions and weed growth stage as specified on product label. High weed populations, adverse conditions, or large weeds will reduce control.
10—(96-100%) 6—(70-79%)
9—(90-95%) 5—(60-69%)
8—(85-90%) 4-2—less than 60%
7—(80-84%) 1—0

Herbicide and Application Site (PPI or PRE on soil or POST on foliage)	Annual Morningglory	Barnyardgrass	Cocklebur	Crabgrass	Fall Panicum	Foxtail	Jimsonweed	Kochia	Kochia, Triazine-resistant	Lambsquarters	Nightshade (Hairy)	Pigweed	Ragweed	R. Thistle	Sandbur	Shattercane/Sorghum	Smartweed	Sunflower	Velvetleaf	W. Buckwheat	Crop Safety[a]	Recrop Inteval in Months, When Changing to Nonlabeled Crop[b]
Potato																						
Eptam-PPI	7	9	4	9	9	9	4	6	6	7	9	7	6	4	9	9	4	2	4	7	2	1-2
Eptam + Sencor/Lexone-PPI	6	7	6	9	7	9	4	6	6	9	7	9	7	6	7	7	6	6	6	7	3	4-18
Eptam + Treflan or Prowl-PPI	6	9	4	9	9	9	4	9	9	7	7	7	4	6	9	9	4	2	4	6	2	6-12
Matrix	1	9	5	5	1	8	1	8	8	5	4	9	-	3	1	1	1	1	5	1	1	12
Poast-POST	1	8	1	9	9	9	1	1	1	1	1	1	1	1	9	9	1	1	1	1	1	0
Sencor/Lexone + Dual or Turbo-PRE	4	9	6	6	9	9	7	6	2	9	7	9	9	7	6	4	7	6	7	9	2	4-18
Sencor/Lexone-PRE	4	7	6	7	7	7	7	6	2	9	5	9	9	7	4	4	7	6	7	9	2	4-18
Sencor/Lexone-POST	4	4	7	6	4	6	4	7	2	4	4	9	7	9	6	4	7	7	6	4	3	4-18
Fieldbean																						
Assure II + COC	-	8	1	8	8	9	1	1	1	1	1	1	1	1	6	9	1	1	1	1	1	2-4
Basagran-POST*	5	3	7	1	1	3	8	9	4	6	6	5	5	4	1	1	8	8	7	6	2	0
Dual + Treflan-PPI	5	8	5	9	9	9	5	9	9	7	8	9	5	5	9	7	5	3	5	6	2	6-12
Eptam-PPI	6	6	5	9	9	9	5	8	8	7	7	7	6	4	9	9	5	3	5	6	1	1-2
Eptam + Dual-PPI	5	9	5	9	9	9	5	7	7	6	8	9	5	5	9	7	5	3	5	6	2	2-5
Eptam + Lasso-PPI	5	9	4	9	9	9	5	7	7	7	7	9	5	5	9	7	5	3	5	6	2	2-4
Eptam + Sonalan-PPI	5	9	5	9	9	9	5	9	9	9	10	9	5	5	9	9	5	3	5	6	1	6-12
Eptam + Treflan or Prowl-PPI	5	9	6	9	9	9	5	9	9	9	6	9	5	5	9	9	5	3	5	6	1	6-12
Frontier	-	8	2	8	8	9	1	2	2	7	6	7	5	3	6	3	3	2	2	1	1	2-4
Lasso or Dual-PPI	4	7	4	9	9	8	5	6	6	6	7	9	7	4	7	5	5	3	5	5	2	2-4
Lasso + Treflan-PPI	5	7	5	9	9	9	5	9	9	7	8	9	5	5	9	7	5	3	5	6	2	6-12
Partner-PPI	4	7	4	9	9	8	5	6	6	6	7	9	7	5	7	5	5	3	5	5	2	2-4
Partner + Eptam-PPI	5	9	4	9	9	9	5	7	7	7	7	9	5	5	9	7	5	3	5	6	2	2-4
Poast-POST	1	6	1	9	9	9	1	1	1	1	1	1	1	1	9	9	1	1	1	1	1	0
Pursuit-POST	7	5	8	7	1	7	7	8	8	4	7	8	7	7	4	9	7	7	7	4	4	0-40
Pursuit + Basagran-POST	7	5	8	7	1	7	8	8	8	7	8	8	7	7	4	8	8	8	7	6	2	0-40
Sugarbeet																						
Assure II + COC	-	9	-	9	9	9	-	-	-	-	-	-	-	-	9	10	-	-	-	-	1	4
Betamix-POST	1	4	2	1	1	6	3	4	4	9	9	9	3	5	6	1	3	1	2	5	3	1
Betamix Progress-POST	1	4	2	1	1	7	3	5	5	6	8	8	3	5	7	1	3	2	2	5	3	12
Betamix + Stinger-POST	5	5	9	1	1	6	7	5	5	9	9	9	8	5	6	1	7	9	3	9	3	12
Betamix + Upbeet	1	4	6	1	1	7	3	9	9	9	9	9	6	5	6	1	6	6	7	7	3	1
Betanal + Betanex-POST	1	4	2	1	1	6	3	4	4	9	9	9	3	5	6	1	3	1	2	5	3	1
Eptam-LAYBY	5	6	5	9	9	9	5	8	8	7	7	7	6	4	9	9	5	3	5	6	1	1-2
Nortron-PPI	-	5	5	7	7	8	-	6	6	6	6	8	-	6	6	-	7	4	-	7	2	12
Poast-POST	1	6	1	7	7	9	1	1	1	1	1	1	1	1	7	7	1	1	1	1	1	0
Ro-Neet-PPI	4	5	4	8	8	9	4	3	3	8	9	9	6	4	7	7	4	2	4	4	2	1-2
Select-POST	1	8	1	8	8	8	1	1	1	1	1	1	1	1	8	9	1	1	1	1	1	0
Stinger-POST	1	1	9	1	1	1	5	3	3	4	4	1	7	4	1	1	5	5	3	7	2	12
Onion																						
Buctril-POST	9	1	7	2	2	2	9	6	6	7	9	7	9	7	2	2	9	9	9	9	3	0
Dacthal 75W-PRE	4	7	4	9	4	9	4	4	4	9	6	9	4	4	7	4	4	4	4	4	2	3-8
Fusilade-POST	4	7	1	9	9	8	1	1	1	1	1	1	1	1	7	7	1	1	1	1	1	0
Goal-POST	4	4	7	2	4	4	-	6	6	7	6	7	-	6	4	2	-	6	-	7	3	10
Poast-POST	1	7	1	9	9	9	1	1	1	1	1	1	1	1	7	7	1	1	1	1	1	0
Prowl-PRE	-	6	2	-	-	7	9	9	9	8	5	7	-	-	6	7	-	4	-	-	2	6-12
Select-POST	1	8	1	8	8	8	1	1	1	1	1	1	1	1	8	9	1	1	1	1	1	0
Vine Crop																						
Curbit-PRE	4	9	4	9	9	9	4	7	7	7	6	7	4	7	7	7	4	2	2	4	2	4-13
Dacthal 75W-PRE	4	7	4	9	4	9	4	4	4	9	6	9	4	4	7	4	4	4	4	4	2	3-8
Poast-POST	1	6	1	9	9	9	1	1	1	1	1	1	1	1	9	9	1	1	1	1	1	0
Prefar 4E + Alanap-PRE	2	9	7	9	6	9	-	-	-	7	-	7	7	-	6	6	-	7	-	7	3	4-6
Ramrod-PRE	2	8	2	8	7	8	2	4	4	6	4	8	4	4	6	3	6	4	4	5	3	1-2
Treflan-PRE	4	9	4	9	9	9	4	7	7	7	4	7	4	7	7	7	4	2	2	4	2	6-12

[a]Crop ratings less than 3 result in no yield loss.
[b]Values will vary with soil texture, pH, organic matter, rainfall or irrigation, rotational crop and herbicide rate.
*Good control of hairy nightshade.

Potato

Herbicide	Commercial Product per Acre: Sandy Loam < 1% OM	Silt Loam 1-2% OM	Silty-Clay Loam > 2% OM	Application Time, Remarks and Approximate Cost/A Broadcast
Potato				
EPTAM 7E	3.5 pt	3.5 pt	7 pt	PPI, DRAG-OFF, or LAYBY — Apply and incorporate before planting or after potato plants have emerged. Minimum time from application to harvest is 45 days. The Superior variety is sensitive to EPTAM. Cost: $11.97-$15.40.
EPTAM 7E + TREFLAN 4EC	2.5 pt 1 pt	2.5 pt 1 pt	2.5 pt 1 pt	PRE UP TO and JUST BEFORE DRAG-OFF — Incorporate chemical immediately after application. Set incorporation equipment so that herbicide is not concentrated over the row. The Superior variety is sensitive to EPTAM and injury may occur. Cost: Eptam + Treflan $12.69; Eptam + Prowl $14.72-$16.96.
EPTAM 7E + PROWL (3.3EC)	3 pt 1.2 pt	3 pt 1.2 pt	3 pt 1.8 pt	
EPTAM 7E + SENCOR/LEXONE 4L	3.5 pt 0.5 pt	3.5 pt 0.5 pt	4.5 pt 1 pt	PPI, DRAG-OFF, or Early POST. Apply and incorporate mechanically or through an irrigation sprinkler system. The Superior variety is sensitive to Eptam. Cost: $20.90-$33.24.
DUAL/DUAL II	1.5 pt	2 pt	2.5 pt	PPI, PRE, or DRAG OFF—If cool, wet soil conditions occur after application, Dual may delay maturity or injure Superior or other early maturing potato varieties. Cost: $11.93-$19.88.
MATRIX	1-1.5 oz	1-1.5 oz	1-1.5 oz	Apply after hilling or drag-off but before potatoes or weeds emerge. For activation supply moisture by rainfall or sprinkle, is labeled for chemigation. Can be tank mixed with Eptam, Prowl, Dual, or Lexone; can also be applied POST after crop emergence but before the crop is 14". Maximum 2 oz/season; cannot be used on potatoes grown for seed; some varieties may show injury. Add a nonionic surfactant with post applications. Cost: $16.50-$24.75.
SENCOR/LEXONE 4L	1 pt	1.5 pt	2 pt	PRE, PPI, or DRAG-OFF AS PER LABEL—Do not plant treated area to sensitive crops such as onion or sugarbeet during the next growing season. Most thin-skinned varieties such as Atlantic and Shepody are sensitive to Sencor/Lexone. Cost: Dual + Sencor/Lexone $29.76-$36.93; Sencor/Lexone $17.05-$34.10; Prowl + Sencor/Lexone $21.52-$23.74; Turbo $24.82-$43.43.
SENCOR/LEXONE 4L with DUAL/DUAL II	1 pt 1.5 pt	1 pt 2.0 pt	1 pt 2.5 pt	
or with PROWL (3.3EC)	1.2 pt	1.2 pt	1.8 pt	
TURBO	2-2.5 pt	3-3.5 pt	3-3.5 pt	
Postemergence				
POAST	1-1.5 pt	1-1.5 pt	1-1.5 pt	POST before susceptible grasses are 4" tall. Potatoes tolerant at all growth stages. Add 2 pints of crop oil concentrate. Minimum time from application to harvest 30 days. Good coverage essential for effective control. Cost: $13.39-$20.08.
SENCOR/LEXONE 4L	0.5-1 pt	0.5-1 pt	0.5-1 pt	POST BEFORE WEEDS ARE 1" TALL—Highest rate for common sunflower and kochia. Do not use on red skinned or early maturing white varieties or within 60 days of harvest. Cost: $8.52-$17.04.
Harvest Aid				
DIQUAT	1-2 pt			Harvest Aid—Apply when potato leaves turn yellow. Use 2 pt if a quick kill is desired. Cost: $8.68-$17.36.

See page 74 for additional footnotes.

Fieldbean

Preplant

Herbicide	Commercial Product per Acre: Sandy Loam < 1% OM	Silt Loam 1-2% OM	Silty-Clay Loam > 2% OM	Application Time, Remarks and Approximate Cost/A Broadcast
DUAL/DUAL II	1.5 pt	2 pt	2.5 pt	PPI or PRE—Surface mixing will improve weed control and reduce crop injury. Cost: $15.90-$19.88.
EPTAM 10G	30 lb	30 lb		PPI—Apply to dry surface soil; immediately incorporate with disk or field cultivator. Apply layby at time of last cultivation as a directed spray or direct granules to the base of the plants before bean pods start to form. Do not feed or pasture vines within 45 days after application. Cost: $11.97.
or				
EPTAM 7E	2.5 pt	4.5 pt		
FRONTIER	16 oz	20 oz	22 oz	PRE or early POST (first to third trifoliate stage). Frontier can be tank mixed with Poast, Basagran or Pursuit. Cost: $13.50-$18.48.
EPTAM 7E	2.5 pt	2.5 pt		PPI—Apply to dry surface soil, immediately incorporate with a disk or field cultivator. Sonalan, Treflan, or Prowl may injure fall seeded small grains, or spring seeded sugarbeet or sorghum the following year. Cost: Eptam + Dual $20.48; Eptam + Lasso $18.11; Eptam + Sonalan $16.62; Lasso $19.28; Partner $18.67; Sonalan + Dual $20.00; Sonalan + Lasso $17.63; Eptam + Prowl $17.48; Eptam + Treflan $12.69.
with				
SONALAN	2 pt	2 pt		
or with				
PROWL (3.3EC)	2.4 pt	2.4 pt		
or with				
TREFLAN	1 pt	1 pt		
EPTAM 7E	2.5 pt	2.5 pt		
with				
DUAL/DUAL II	1.5 pt	1.5 pt		
or with				
LASSO	4 pt	4 pt		
LASSO	3 qt	3 qt		
PARTNER	4.5 lb	4.5 lb		
PARTNER	3.0 lb	3.0 lb		Apply to dry surface soil, immediately incorporate. Treflan at 1 pt may injure fall seeded small grain or spring seeded sugarbeet or sorghum the following year. Cost: Partner $18.67; with Eptam $21.00; Partner + Treflan $22.80; Treflan + Dual $16.05; Treflan + Lasso $16.98.
+				
EPTAM 7E	2.5 pt	2.5 pt		
or with				
TREFLAN	1 pt	1 pt		
TREFLAN 4EC	1 pt	1 pt		
with				
DUAL 8E	1.5 pt	1.5 pt		
or with				
LASSO	4 pt	4 pt		

Postemergence

ASSURE II	6-12 oz			POSTEMERGENCE— Susceptible grasses less than 4" tall. Fieldbean tolerant at all growth stages. Do not apply within 30 days of harvest. Cost: $6.48-$12.96.
+				
COC				
BASAGRAN	1-2 pt			POST—Unifoliate to first trifoliate leaf stage. Use 1 pt for fieldbean in the unifoliate leaf stage and 2 pt for beans in the first trifoliate leaf stage. Basagran may be reapplied at the 1 pt rate 5 to 7 days after the initial application. Broadleaf weeds 1" to 2" tall. Weeds showing moisture stress or over 6" tall are poorly controlled. Controls hairy but not eastern black nightshade. Cost: $8.06-$16.12.
+				
COC	1 qt			
PURSUIT DG	1.08 oz			POSTEMERGENCE—Fieldbean must have one trifoliate leaf. Pursuit and Pursuit + Basagran require the addition of an adjuvant. **Pursuit will carryover. Do not plant sugarbeet for 40 months.** Allow at least 60 days between Pursuit application and harvest. Cost: Pursuit $13.94; Pursuit + Basagran $22.00.
PURSUIT DG	1.08 oz			
+				
BASAGRAN	1 pt			
POAST	1-1.5 pt			POSTEMERGENCE—Susceptible weeds less than 4" tall. Fieldbean tolerant at all growth stages. Good coverage essential. Cost: $15.51-$22.20.
+				
COC	1 qt			

Harvest Aid

GRAMOXONE EXTRA	1-1.5 pt			Desiccant. Apply when at least 80% of pods are yellowing and no more than 30% of leaves still green. Do not harvest within 7 days of application. Add 1 qt nonionic surfactant/100 gal. Cost: $3.84-$5.77.

See page 74 for additional footnotes.

Sugarbeet

Herbicide	Commercial Product per Acre: Sandy Loam 1% OM, Broad-cast	Sandy Loam 1% OM, Product/7" Band 22" Row	Sandy Loam 1% OM, Product/7" Band 30" Row	Silt Loam 1-2% OM, Broad-cast	Silt Loam 1-2% OM, Product/7" Band 22" Row	Silt Loam 1-2% OM, Product/7" Band 30" Row	Application Time, Remarks, and Approximate Cost/A Broadcast
Sugarbeet, No-Till in Rye or Winter Wheat							
ROUNDUP ULTRA	1.5-2 pt	9 oz	6.5 oz	1.5-2 pt	9 oz	6.5 oz	Apply in spring when rye or wheat are 6" to 10" tall and before sugarbeet have emerged. Cost: $2.34-$11.55.
PPI or PRE							
NORTRON SC	2.2 pt	11 oz	8 oz	3.7 pt	19 oz	16 oz	PPI or PRE—Furrow irrigation, apply preplant and incorporate 1" to 2"; for sprinkler irrigation apply PRE at planting or shortly after and immediately irrigate with 0.5" water. Cost: $10.37-$45.60.
RO-NEET 6E	2.0 pt	10 oz	7.5 oz	3.3 pt	17 oz	12 oz	PPI—Immediately mix into dry soil with power incorporator 2" to 3". Crop injury may occur on sandy soils below 1% organic matter or with highly saline or alkaline soil conditions. Use lower rate if POST treatments are planned. Primarily annual grass control. Cost: $3.01-$21.54.
Layby							
EPTAM 7E	2.25 pt	11.5 oz	8 oz	3.5 pt	18 oz	13 oz	Apply Eptam after thinning and clean cultivation; incorporate immediately 2" deep with a cultivator. Cost: $1.71-$11.98.
or EPTAM 10G	20 lb	6 lb	4.5 lb	30 lb	9.5 lb	7 lb	
TREFLAN 4EC	1 pt	5 oz	3.5 oz	1.25 pt	6 oz	4.5 oz	Sugarbeet 2" to 6" tall. Cover exposed beet roots with soil before Treflan application to reduce root girdling. Cost: $0.91-$5.18.

Postemergence

Herbicide	Rate per acre: Brdcst	Ounces per 7" Band: 22" Row	Ounces per 7" Band: 30" Row	Application Time	Remarks and Approximate Cost/A Broadcast
ASSURE II + COC	7-8 oz	2.2-2.6 oz	1.6-1.8 oz	Grass 1-3"	POST — Susceptible grasses less than 4" tall. Good activity on volunteer cereals. Do not apply within 45 days of harvest. Do not mix with any herbicide or insecticide. Cost Broadcast: $7.60-$8.70.
BETAMIX	2-3 pt	10-15 oz	7.5-11 oz	Any stage of sugarbeet growth. Weeds cotyledon stage. Repeat in 5-7 days.	Use lower rates on small beets or when using a split application. On Nortron or Ro-Neet treated fields wait till 4-leaf stage if beets show signs of injury. Treat in late afternoon to reduce injury. Use highest rate as weed size increases. Cost: Broadcast Betamix $21.25-$31.89; Betamix + Stinger $35.83.
BETAMIX with STINGER	2 pt 0.25 pt	10 oz 1.3 oz	7.5 oz 1.0 oz	Sugarbeet 2-leaf stage. Repeat in 5-7 days	
BETAMIX PROGRESS	1.25-2.25 pt	6.4-11.4oz	4.7-8.4 oz	Sugarbeet cotlyedon to 2-leaf stage	Use the lower rate when sugarbeet are in the cotyledon stage of growth. Follow with the higher rate in 5 to 7 days when sugarbeet is in the 2-leaf stage. Cost: Broadcast $15.51- $22.40.
BETAMIX 1.3EC	4.5-6 pt	23-31 oz	17-22 oz	Sugarbeet 4-true-leaf stage	Cost: Broadcast $47.89-$63.79.
POAST	1-2 pt	5-10 oz	3-7 oz	Grass 1-3"	Use higher rate for larger grass or grass under drought stress. All herbicides require the addition of an adjuvant. See label. Cost Broadcast: Poast $8.50-$17.00; Select $9.55-$12.75.
SELECT 2 EC	6-8 oz	2-2.5 oz	1.4-1.8 oz	Grass 1-3"	

See page 74 for additional footnotes.

Sugarbeet (Continued)

Postemergence

Herbicide	Rate per Acre: Brdcst	Ounces per 7" Band: 22" Row	Ounces per 7" Band: 30" Row	Application Time	Remarks and Approximate Cost/A Broadcast
BETAMIX	2 pt	10 oz	7.5 oz	Sugarbeet 2-leaf stage	Do not add crop oil to Betamix plus Poast or Betamix plus Select combinations. Grasses should be less than 2 inches. Cost Broadcast: Betamix plus Poast $34.00; Betamix plus Select $34.00.
with POAST	1.5 pt	7.5 oz	5 oz		
or SELECT 2 EC	8 oz	2.5 oz	1.8 oz		
STINGER	0.25-0.66 pt	1.3-3.4 oz	1.0-2.5 oz	Sugarbeet, 2-8 true leaves; Canada thistle rosette to pre-bud.	Use lower rates for annual weeds and higher rates for Canada thistle. Do not plant or rotate for 1 year after treatment to any crop except small grains or corn. Cost: Broadcast $14.57-$38.46.
UPBEET	0.5 oz	0.17 oz	0.12 oz	Weeds less than 2" tall	For best weed control a minimum of 2 sequential applications should be applied. Should be tank mixed with Betamix or Betamix Progress. Cost broadcast: Upbeet $21.50; Betamix + Upbeet $42.75.
UPBEET +	0.5 oz	0.17 oz	0.12 oz		
BETAMIX	2 pt	10 oz	7.5 oz		

Vine Crops and Onion

Herbicide	Commercial Product per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
Melons and Cucurbits			
CURBIT	3-4.5 pt	PRE	Apply postplant to the soil surface prior to weed emergence. Apply to seeded crop prior to crop emergence or apply as a banded spray between rows after crop emergence or transplanting. Do not preplant incorporate or do not use under plastic mulch. Cost: $14.60-$21.95.
PREFAR + ALANAP-L	4-6 qt 4-8 qt	Preplant	Immediately incorporate to a depth of 1". Use lower rate on sandy soil. Controls many annual grasses and broadleaf weeds. Cost: $48.80-$80.00.
DACTHAL 75W	8-14 lb	Crop 4-5 true leaves	Crop should be weeded prior to application. Controls annual grasses. Use lower rate on sandy soil. Cost: $38.40-$67.20.
RAMROD FLOWABLE	4-5 qt	Apply immediately after planting and before crop and weed emergence.	Use lower rate on sandy soils. **For Processing Pumpkins Only.** Cost: $16.34-$20.43.
TREFLAN	1-1.5 pt	Crop 3-4 true leaves	Direct material to soil between the rows and mechanically incorporate. Controls germinating annual grasses and some broadleaves. Use the lower rate on sandy soils. Cost: $4.14-$6.21.
POAST	1-1.5 pt	Grasses most susceptible under 4"	Do not apply within 14 days of harvest. Crop oil concentrate and good coverage essential for effective control. Cost: $13.39-$20.08.
COMMAND (3ME) (Pumpkins only)	2.0 pt	Preplant	Immediately incorporate. Use on pumpkins only. Controls many annual grasses and broadleaf weeds. Cost: $19.81.

See page 74 for additional footnotes.

Onion

Herbicide	Commercial Product per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
DACTHAL 75W	8-14 lb	PRE at seeding or transplanting and/or at layby	Preplant incorporation not recommended. Use lower rate on soils with less than 1% organic matter. Cost: $38.40-$67.20.
BUCTRIL	1-1.5 pt	POST; onion should have 2-5 true leaves	Water volume is important. Use 50-70 gallons of water per acre. Do not add surfactants. Cost: $6.55-$9.83.
GOAL	0.6-1.25 pt	Onion, 2 fully developed true leaves; weeds, 2-4 leaves	Do not apply to onion under drought stress. Do not mix Goal with oil, surfactant or fertilizer. Cost: $5.76-$12.00.
FUSILADE DX	6 oz	Shattercane and corn 12-18". Other annual grasses less than 4"	Crop oil concentrate and good coverage essential for effective control. Don't tank mix with Buctril. Cost: $7.50.
POAST	1-1.5 pt		
PROWL	2-3 pt	PRE to weeds, onion must have 2 to 9 true leaves	Do not apply within 45 days of harvest. Cost: $7.44-$11.16.
SELECT 2 EC	6-8 oz	Grass 1-3"	Do not apply within 45 days of harvest. Crop oil concentrate and good coverage essential for effective control. Cost: $12.00-$15.00.

See page 74 for additional footnotes.

Trees and Shrubs Including Shelterbelts, Christmas and Fruit Trees*

Herbicide	Rate Per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
CASORON 50W* or CASORON 4G	8.0 lb 100 lb	PRE on trees at least 2 years old	Apply a 20" band on each side of tree row after trees are planted. Some injury to trees may result on low organic matter soil. Cost: $125.00.
DACTHAL 75W	14-16 lb	PRE	Application must be made before weed seed germination. Two applications may be necessary for season-long weed control. Cost: $67.20-$76.80.
2,4-D AMINE (4L)	1 qt	POST to weeds	Keep off new bark and foliage. Controls broadleaf weeds. Cost: $6.53.
FUSILADE DX* or POAST*	1 pt 2 pt	POST before grasses tiller	Use on fruit trees limited to nonbearing trees. Add 1 qt crop oil concentrate per acre. Thorough coverage required. On ornamentals use nonionic surfactant with Fusilade. Cost: Fusilade DX $15.00; Poast $26.77.
GOAL	2-4 qt	PRE- or POST-emergence to weeds	Conifers only. Grasses should be treated before they are beyond 2-leaf stage. Use before bud break or after new growth hardens. Cost: $38.40-$76.80.
KARMEX 80W*	2.5-5 lb	PRE on trees at least 2 years old	Karmex use limited to conifers, honey locust, green ash, apples, and peaches. Cost: $10.75-$21.50.
GRAMOXONE EXTRA*	1.5-3 pt	Directed post-emergence	Nonselective contact herbicide. Keep spray off tree foliage. Add X-77 surfactant. Cost: $5.76-$11.54.
PRINCEP 80W*	1-5 lb	PRE on trees at least 2 years old; use only on fruit trees planted 1 year or longer	Kochia may become resistant with repeated use. Use 1 lb on sandy, low organic matter, or high pH soils. Apply 20" band on each side of tree row after trees are planted. Some injury to trees may result on low organic matter soils. Gives poor control of Russian thistle and triazine-resistant Kochia. Cost: $5.25-$17.40.
ROUNDUP ULTRA*	1-4 qt in 10 gal water/A	Directed post-emergence	Do not spray green bark or foliage. Spray may contact brown bark. Use lower rate on annuals. Cost: $11.54-$46.19.
SOLICAM 80WP*	2.5-5.0 lb	PRE, late fall or early spring	Fruit trees only. May be combined with Karmex and Princep for improved broadleaf control. Cost: $27.00-$54.00.
SURFLAN A.S.*	2-4 qt	PRE	Fruit trees only. May be combined with Karmex and Princep for improved broadleaf control. Cost: $33.50-$67.00.
TREFLAN	1-2 pt	Preplant	Incorporate 2-3" deep prior to planting. If applied after planting adjust machine to throw treated soil towards trees in the row. Cost: $4.13-$8.27.

*Denotes products registered for use on fruit trees.

Aquatic Weed Control

Slow Moving and Still Water

Important: Before treating any body of water containing fish, contact the Game and Parks Commission local representative. Whenever possible, treat before aquatic weed growth becomes dense to avoid fish suffocation due to oxygen depletion from decaying vegetation. When dense weed growth is present in fish containing waters, treat no more than one-half of the area. After vegetation in the treated area disappears treat the remainder of the water.

Herbicide	Rate Per AF (Acre Foot) or SA (Surface Acre)	Weeds Controlled	Application Time	Remarks and Approximate Cost
COPPER SULFATE CRYSTALS	5.4 lb/SA	Algae (Moss) Chara	When growth first becomes visible	No restrictions on water usage at recommended rates except for use with sheep. Copper compounds can be corrosive to equipment. Use Chelated Copper in high pH water. Cost/SA: Copper Sulfate $3.90.
COPPER CHELATES (Cutrine plus, Algetol or Algecide)	0.67-1.25 gal/AF			

See page 74 for additional footnotes.

Aquatic Weed Control

Slow moving and still water (Continued)

Herbicide	Rate Per AF (Acre Foot) or SA (Surface Acre)	Weeds Controlled	Application Time	Remarks and Approximate Cost
AQUATHOL G or AQUATHOL K	13-135 lb/AF 0.3-3.2 gal/AF	Burreed Coontail Milfoil Pondweed Naiad	Water has warmed and growth is visible	Handle with caution, extremely irritating. Overdose can be harmful to fish. Do not use water within 14 days for irrigation or domestic uses. Cost/AF: $14.31-$148.50.
NOROSAC 10G	100-150 lb/SA	Coontail Duckweed Naiad Milfoil	Before weed growth occurs	Do not use for irrigation, livestock or humans. Do not use fish for 90 days. Cost: $125.00-$187.50.
2,4-D AMINE or ESTER (4L) or 2,4-D 20G	1.50-4 qt/SA 7.50-20 lb/SA	Water Hyacinth Water Lily Water Primrose Duckweed Arrowhead Pondweed Milfoil	Use sprays on emerged weeds when in full leaf stage. Apply granules when first growth appears	Do not use water for 14 days for livestock or irrigation. Cost: $5.06-$20.26.
REWARD	1-2 gal/SA	Arrowhead Cattail Bulrush Elodea Pondweed	Post on foliage or on surface for submerged species	Do not use for 10 days for swimming, livestock or irrigation. Not effective in water with suspended silt. Cost: $69.50-$139.10.
RODEO + ORTHO X-77	1 gal/SA 2.0 qt	Most annual and perennial weeds	Apply to well emerged vegetation	Can be applied to most water situations. No restrictions on use of water for irrigation, recreation and domestic purposes. $119.20.

Stock and Nurse Tanks

Dissolve 1 oz copper sulfate in 1 pt of water in a glass jar. Add 7.5 tablespoons of the prepared solution to each 1,000 gallons of water. Mix thoroughly. Water can be used for crop spraying and livestock watering. Increase rate if water is extra hard. An alternative practice is to paint the nurse tank black to prevent algae growth.

CUT STUMP TREATMENTS—TREES and WOODY PLANTS

Herbicide	Herbicide Concentration	Remarks and Cost
2,4-D LV ESTER (4L)	2 qt/10 gal diesel	Use to prevent resprouting of cut stumps. Apply to runoff to freshly cut surface. Delayed applications less effective. Cost/10 gal of solution: 2,4-D ester $6.75 + diesel, Crossbow $21.60 + diesel.
CROSSBOW	2 qt/10 gal diesel	
TORDON RTU	Use undiluted	

Troublesome Weeds and Woody Plants

(See pages 11 and 12 for additives)

Best control will be obtained if treatments are made when plants are actively growing. Treatment in following years may be required. An application just before flowering and a second application on fall regrowth will give best results on most perennials. Dust on leaves may interfere with herbicide activity.

Weed	Herbicide[5]	Product Per Acre or Per 100 Gallons[7,8]	Application Time	Remarks and Approximate Cost/A Broadcast
ALFALFA (for control of alfalfa in corn or sorghum)	2,4-D Amine (4L) + Banvel (corn only)	0.25 pt 0.5 pt	Alfalfa with 4-6" growth	Use drop tips on crop taller than 8". See no-till section of corn, sorghum or soybean to kill alfalfa prior to planting. Sorghum at 3-5 leaf stage. Cost: 2,4-D + Banvel $4.98; Banvel $4.65.
	Banvel	0.5 pt		
ALFALFA (for control before planting wheat, soybean, fieldbean, and potato)	2,4-D LV Ester (4L)	1 qt	Alfalfa with 4-6" new growth	Delay planting wheat 15 days and delay planting soybean, fieldbean, and potato 30 days after application. Ester formulations are less persistent than amine formulations. Cost: $10.10-$13.48.

See page 74 for additional footnotes.

Troublesome Weeds and Woody Plants (Continued)

Weed	Herbicide[5]	Product Per Acre or Per 100 Gallons[7,8]	Application Time	Remarks and Approximate Cost/A Broadcast
ARTICHOKE JERUSALEM	2,4-D Amine (4L) + Banvel	0.5 pt 0.5 pt	12-18" tall	For use in corn. Use drop tips on corn taller than 8". Cost: $5.32.
	Classic	0.75 oz	2-8" tall	For use in soybean. Cost: $7.50.
	Exceed	1.0 oz	1-6" tall	For use in corn. Cost: $11.00.
	Curtail	2.0 pt	12-18" tall	For use where no crop is present. Cost: 2,4-D $3.37; Curtail $8.48.
	2,4-D LV Ester (4L)	1 qt	18-24" tall	
BARNYARD SAGE	Command (3ME) + Canopy or Sencor/Lexone DF	1.5-2.0 pt 5-8 oz 0.33-0.5 lb	PPI to soybean	Do not use Canopy on soils above pH 6.8. Reduce Sencor/Lexone rate by 1/3 on calcareous soil. Cost: Command (3ME) + Canopy $16.30-$22.13; Command (3ME) + Sencor $23.43-$32.80; Pursuit $18.59.
	Pursuit	4 oz		
BLUE MUSTARD	2,4-D LV Ester (4L)	0.5 pt	Nov. 15-Mar. 15 before blue mustard stem elongation	Use only on fully tillered wheat. Cost: $0.85-$1.34. See NebGuide G74-92, *Blue Mustard Control.*
	2,4-D Amine (4L)	1 pt		
	Ally or Amber or Finesse or Peak + 2,4-D LV Ester (4L)	0.1 oz 0.28 oz 0.2 oz 4.0 oz	Nov. 15-Mar. 15 before blue mustard stem elongation In spring, broadleaf weeds 2-4"	Add surfactant. Use only on wheat with four or more tillers. Use only on continuous wheat or wheat fallow. Do not use on soils with pH of 7.9 or higher. Cost: Ally + 2,4-D $3.26; Amber + 2,4-D $3.50; Finesse + 2,4-D $4.00; Peak $5.00.
BUCKBRUSH (snowberry)	2,4-D LV Ester	1-2 qt	Full foliage (May 10-25)	Use sufficient water to insure good coverage. Cost: $3.37-$6.74.
BUFFALOBUR	Atrazine 4L[2]	2 qt	Preplant or PRE in corn	Reduced rates less effective. Cost: $6.31
	Buctril	1.5 pt	Weeds 3-5 leaf stage in corn or sorghum	Plants taller than 4" not controlled. Cost: $9.83.
	Blazer	1.5 qt	Weeds 3-4 leaf stage in soybean	Weeds must be small. Follow-up treatments necessary. Cost: $14.41.
	Cobra	12.5 oz	POST on soybean	Weeds need to have 4 true leaves. Cost: $11.47.
	Exceed	1.0 oz	POST on corn and weeds 1-5" tall	Cost: $11.00.
	2,4-D LV Ester (4L) + Banvel	0.5 pt 0.5 pt	POST on corn	Plants must be small. Cost: $5.50.
BURCUCUMBER and WILD CUCUMBER	Atrazine 4L[2]	2 qt	PRE in corn	Atrazine can also be used POST. Cost: Atrazine $6.31.
	Buctril 2 EC	1.5 pt	Weeds 3-5 leaf stage in corn	Thorough coverage required. Cost: $9.83.
	Exceed	1.0 oz	POST on corn and weeds 1-8" tall	Cost: $11.00.
	Princep 4L	3 qt	PRE in trees	Cost: Princep $12.60.
BURSAGE, (Skeletonleaf and Woollyleaf)	Tordon 22K	2 pt	Flower bud stage or when growing actively	Non-crop areas. Tordon may remain in soil for three or more years. Cost: $22.81.
	2,4-D LV Ester (4L) + Banvel	1 qt 1 qt	June or when growing actively	See remarks for field bindweed. If soil moisture conditions are poor, use oil-water emulsions as a carrier. Cost: $21.98.

See page 74 for additional footnotes.

Troublesome Weeds and Woody Plants (Continued)

Weed	Herbicide[5]	Product Per Acre or Per 100 Gallons[7,8]	Application Time	Remarks and Approximate Cost/A Broadcast
CANADA THISTLE	Tordon 22K	1 qt	Fall—actively growing or spring—early flower bud	For non-crop areas and spot treatment in pasture and range. Tordon may remain in the soil for three or more years. Cost: $22.81. See NebGuide G80-509, *Canada Thistle Control.*
	Tordon 22K + 2,4-D LV Ester (4L)	1 pt 1 qt	Fall; Spring during flower bud	Cost: $14.77
	Roundup Ultra	2-3 qt in 10 gal or less water	Flower bud stage or in fall when growing actively	Idle ground or spot treatment in cropland before head or pod fill of crop. Avoid tillage for three days. Cost: $23.09-$34.64.
	Banvel	1-2 qt	Fall—actively growing or spring early flower bud	Idle ground or grassland. Avoid tillage for five days. Injury to forage grasses may occur. Broadleaf crops may be injured for two years, after treatment. Cost: $18.61-$37.22.
	Curtail Stinger	2-4 pt 0.67 pt	Rosette to pre-bud or in fall when actively growing	Curtail—Use lower rate in wheat and barley, higher rate in fallow, pasture, or CRP. Stinger used in sugarbeet and corn. Cost: Curtail $8.48-$16.96; Stinger $29.14.
	Ally + Surfactant Telar + Surfactant or Escort + Surfactant	0.1 oz 1.0-3.0 oz 1.0 oz	4-6" or rosettte stage Prebloom to bloom or in the fall when actively growing	Escort or Telar for use in non crop land only. Use Ally in wheat, barley, or fallow to be planted to winter wheat. One application suppresses Canada thistle. Cost: Ally $2.85; Escort $34.50; Telar $21.50-$64.65.
CACTUS (Prickly Pear)	Tordon 22K	1-2 pt	Early summer	Spot treatment in pasture and grazingland. Include NIS in spray mixture. Cost: $11.41-$22.81.
CATTAILS	2,4-D LV Ester (4L)	1.5 gal + 5% diesel oil + 0.5% emulsifier	Boot to early flowering	Use the equivalent of 150 gal of water per acre. Retreat regrowth as necessary. Cost: 2,4-D $20.22.
	Rodeo Roundup Ultra	3 qt in 10 gal	At flowering	Use Rodeo, not Roundup Ultra in or near water Cost: Rodeo $82.84; Roundup Ultra $34.64.
CHEAT GRASS	See Downy Brome			
COCKLEBUR	See Velvetleaf — For additional treatments Beacon	0.38-0.76 oz		POST in corn use COC or nonionic surfactant. Cost: $9.52-$19.05.
COTTONWOOD, WILLOWS, SIBERIAN ELM, CHINESE ELM	2,4-D LV ester (4L)	2-3 qt	Full foliage (June-July); basal treatment anytime	2,4-D with aerial equipment at least 5 gal carrier, annual treatment for two to three years may be necessary. Basal or stump treatment: 2 qt of herbicide/10 gal of diesel; apply to point of runoff. Cost: 2,4-D $6.74-$10.11; Crossbow $43.00.
	Crossbow	1 gal		
	Krenite S	2-3 gal in 100 gal water + surfactant	Late July, Aug., and Sept.	Has little effect on grasses. Results show the following spring. Cost: $116.70-$175.05.
	Spike 20P	0.25 oz/1" dia	Spring or fall	Apply under drip line. Cost: $8.60/lb.
	Velpar L	4 ml/1" dia	Spring with spot gun to tree base	Cost: $0.08/tree inch.
DANDELION	See No-Till Burndown Tables for Corn and Soybean			
DEVILSCLAW	See Velvetleaf for control in corn & sorghum			
DIFFUSE KNAPWEED	SEE SPOTTED KNAPWEED			
DOCK (Curled & Pale)	2,4-D LV Ester (4L) + Banvel	1 qt 0.5 pt	Before flowering in spring or fall	For use on idle ground or grassland. Cost: $8.02.
DODDER (Control in alfalfa)	Kerb 50-W	3 lb	Apply before dodder germinates in the spring	Dodder seed will begin to germinate when soil temperatures reach 60F. Apply Kerb before soil temperatures reach 60F and incorporate the herbicide by irrigating with 1" of water. Cost: $80.25.

See page 74 for additional footnotes.

Troublesome Weeds and Woody Plants (Continued)

Weed	Herbicide[5]	Product Per Acre or Per 100 Gallons[7,8]	Application Time	Remarks and Approximate Cost/A Broadcast
DOGWOOD	Banvel	1-2 qt	Full foliage during June	Ground application only. Observe all drift precautions when using within 1/2 mile of sensitive crops. Cost: Banvel $18.61-$37.22; Crossbow $43.00-$64.50.
	Crossbow	1.0 to 1.5 gal		
	Spike 20P	0.25 oz/1" dia	Spring or fall	Apply under drip line. Cost: $8.60/lb.
DOWNY BROME	Roundup Ultra	12-16 oz	Fall or early spring when desirable grasses are dormant	Use Roundup Ultra before planting corn, sorghum, soybean and in fallow. Cost: Roundup Ultra $4.33-$5.77; Oust $8.00.
	Oust (non-cropland)	1-2 oz	Early spring	
	Treflan	1-1.5 pt	Preplant to winter wheat	Approximately 40%-70% control. Wheat must be planted with hoe drill. Will not control emerged downy brome. Cost: $4.13-$6.21.
	Amber	0.56 oz	Preplant or PRE to winter wheat	Approximately 30-50% control. Will not control emerged downy brome. Cost: $4.37.
	Finesse	0.5 oz	PRE to winter wheat	Approximately 40-60% control. Will not control emerged downy brome. Cost: $5.62.
	Alternate system			Crop rotation—include a late spring seeded crop in the rotation. See NebGuide G78-422, *Downy Brome Control.*
FIELD BINDWEED (when treating crops adjust rates)	2,4-D LV Ester (4L)	1 qt	Vigorous fall growth or flower bud stage in spring	Avoid tillage 5 weeks before and 1 week after application. Do not plant small grains for 15 days after 2,4-D and 45 days after Banvel. Plan to treat for several consecutive years. Cost: 2,4-D $3.37; 2,4-D + Banvel $8.02-$12.31.
	2,4-D LV Ester (4L) + Banvel	1 qt 0.5-1 pt		
	Banvel	1-2 pt	Late summer or late fall actively growing	Apply Roundup Ultra in 10 gal or less water/acre, add 2 qt X-77 or similar surfactant plus 17 lb ammonium sulfate per 100 gallons. Avoid tillage for 5 days. Do not plant small grains for 15 days with 2,4-D and 45 days per pint of Banvel. leaf crops may be injured 2 years after high rates of Banvel in western Nebraska. Cost: Roundup Ultra + 2,4-D $6.44; Roundup Ultra + Banvel $10.42; Banvel $9.31-$19.61; Landmaster BW $8.08.
	Landmaster BW	54 oz		
	Roundup Ultra + 2,4-D Amine (4L) or Banvel	0.5 qt 0.5 pt 0.5 pt		
	Tordon 22K + 2,4-D LV Ester (4L)	0.5-1 pt 1-2 pt	Fall after wheat harvest	Use in a wheat-fallow rotation. Retreat with 2,4-D or Landmaster BW in spring. Cost: $5.70-$22.88.
GUMWEED (Curlycup)	2,4-D LV Ester (4L)	1.5 qt	Pre-bud	Cost: $5.06.
HEMP (Marijuana)	2,4-D LV Ester (4L)	1 qt	2-12" tall	Cost: 2,4-D LV Ester (4L) $3.37; Grazon $6.50.
	Grazon P + D	2 pt		
HEMP DOGBANE	2,4-D LV Ester (4L)	0.5-1 qt	Flower bud stage, spring	Use lower rates in crops. Cost: $1.69-$3.37.
	2,4-D LV Ester (4L)	1 qt	After corn is in the dough stage. Apply to dogbane before leaves start to turn yellow	Dogbane roots should have pink swollen buds. Cost: 2,4-D $3.37. See NebGuide G83-665, *Hemp Dogbane.*
	Roundup Ultra	4 qt	Late summer or fall	Idle ground or spot treatment in cropland before head or pod fill of crop. Avoid tillage for at least 7 days after treatment. Cost: $46.19.
HOARY CRESS	2,4-D LV Ester (4L)	2 qt	Rosette stage in the fall or early bud in spring	Suppression only. Growth starts in early spring. Treat twice a year for 2 to 3 years. Cost: $6.74.
IRONWEED	2,4-D LV Ester (4L)	1.5 qt	Flower to bud stage	Cost: $5.05.
	Grazon P+D	1 qt	Prior to bud stage	Rangeland. Cost: $6.50.

See page 74 for additional footnotes.

Troublesome Weeds and Woody Plants (Continued)

Weed	Herbicide[5]	Product Per Acre or Per 100 Gallons[7,8]	Application Time	Remarks and Approximate Cost/A Broadcast
JOHNSONGRASS	Accent	0.67 oz	6-16"	See corn POST for application restrictions. Split-applications more effective. Cost: $18.79.
	Beacon	0.76 oz		
	Fusilade 2000	1.5 pt	12-18" new growth	Can be used in soybean. Add 1 qt/A crop oil concentrate. Cost: Fusilade $17.65.
(see shattercane for seedling control)	Poast Plus + Am sulfate	2.25 pt		Cost: Poast Plus $13.60.
	Roundup Ultra or Touchdown	2-3 pt	12" through boot stage	Idle ground or spot treatment in cropland before head or pod fill of crop. Avoid tillage for seven days. Cost: Roundup Ultra $11.54-$23.09; Touchdown $16.00.
JOINTED GOATGRASS	SEE DOWNY BROME		See NebGuide G95-1252 *Controlling Jointed Goatgrass*	
KNAPWEED—See specified knapweed—Russian, spotted or diffuse				
KOCHIA (triazine resistant). May have to spray twice or cultivate for row crops.				
	Banvel	0.5 pt	Preplant to corn or sorghum. Kochia less than 2" tall	Wait 20 days before planting sorghum if Banvel, Landmaster BW, or Fallow Master is used. Include appropriate PRE herbicides. Banvel resistant kochia has been confirmed. Cost: Landmaster BW $6.58; Banvel $3.40; Gramoxone Extra $4.90.
	Landmaster BW	54 oz	Preplant to corn sorghum or wheat Kochia less than 4" tall	
	Gramoxone Extra	1.5 pt		
	Banvel	0.5 pt	POST to corn, or sorghum Kochia less than 2" tall	Sorghum must have 3-5 leaves when using Banvel. Use higher Buctril rate for taller kochia. Buctril + Banvel on corn only. Use higher rates on dense stands of kochia. Cost: Banvel $4.65; Buctril $6.55-$9.93; Buctril + Banvel $11.20; Buctril/Atrazine + Banvel $13.16-$15.49; Marksman $6.12-$9.19; Tough + Atrazine $11.62.
	Buctril	1.0-1.5 pt		
	Buctril + Banvel	1.0 pt 0.5 pt		
	Buctril/Atrazine	2-3 pt	Kochia less than 4"	
	Buctril/Atrazine + Banvel	2.5 pt 0.25 to 0.5 pt	Corn or sorghum	
	Marksman	2 to 3 pt		
	Tough + Atrazine	1 pt 1 pt	Corn only	
	Command (3ME)	2.0 pt	Preplant incorporate in soybean, before kochia emerges	Do not rotate to small grains. Cost: $14.86.
	Command (3ME) + Roundup Ultra	2.0 pt 1 pt	Preplant to soybean for no-till	A POST herbicide or cultivation may be needed to control kochia escapes. Cost: $20.63.
	Pursuit Plus + Roundup Ultra	2.5 pt 1 pt	Preplant to soybean 15-30 days	A POST herbicide or cultivation may be needed to control kochia escapes. Cost: $29.53.
	Basagran	2 pt	Kochia <3"	Cost: Basagran $16.85; Classic + Pinnacle $14.70; Pursuit $23.35.
	Classic + Pinnacle	0.25 oz 0.25 oz	Post to soybean Kochia < 1"	
	Pursuit	1.44 oz	Post to soybean Kochia < 5"	

See page 74 for additional footnotes.

Troublesome Weeds and Woody Plants (Continued)

Weed	Herbicide[5]	Product Per Acre or Per 100 Gallons[7,8]	Application Time	Remarks and Approximate Cost/A Broadcast
LEAFY SPURGE	2,4-D LV Ester (4L)	2 qt	Bud stage in spring	Retreatment necessary. Annual applications gradually reduce infestation. Cost: 2,4-D LV $6.74; 2,4-D + Tordon $14.10. See NebGuide G87-834, *Leafy Spurge.*
	2,4-D Amine (4L) + Tordon 22K	1 qt 1 pt		
	Plateau	8-12 oz	In fall 2 weeks before first killing frost	An additional 4 oz/acre may need to be applied in the spring following a fall application of 8 oz/acre to control well-established stands of leafy spurge. Grass suppression will occur with spring application. Do not apply herbicide in spring over area treated the previous fall with 12 oz/acre. Use with surfactant: COC 1.5 to 2.0 pt/acre and 28% UAN 2 to 3 pt/acre. Cost: $16.56-$24.84.
	Tordon 22K	2-4 qt	Fall or spring Sept. to early Oct.	Tordon for non-crop areas and spot treatment in pasture and range. Roundup Ultra for use in trees or areas where grass stand is not a factor. Cost: Tordon $45.62-$91.24; Roundup Ultra + 2,4-D $14.24.
	Roundup Ultra + 2,4-D Amine (4L)	1 qt 1 qt		
LOCUST (Honey and Black)	Banvel	2 qt	Full foliage during June; cut stump or basal treatment anytime	Ground application only. Observe all drift precautions. See cottonwood for basal and cut stump treatment. Cost: Banvel $37.22; Crossbow $43.00-$64.50.
	Crossbow	1.0-1.5 gal		
	Spike 20P	0.25 oz/1" dia	Spring or fall	Apply under drip line. Cost: $8.60/lb.
	Velpar RP	4 ml/1" dia	Spot gun-spring	Cost: $0.08/tree inch.
MARESTAIL (Horseweed)	2,4-D LV Ester (4L)	1 qt	Prior to bolt	Cost $3.37
	Roundup Ultra	24 oz	Before 6" tall	Cost $8.66
MILKWEED, COMMON	2,4-D LV Ester (4L) + Banvel	1 qt 0.5 pt	Flower bud to bloom stage	Do not plant small grains for 15 days after 2,4-D Banvel treatment. 2,4-D + Banvel suppresses growth for 1 year. Cost: $8.02.
	Roundup Ultra or Touchdown	3 qt in 10 gal or less water/A	Flowering through maturity; ropewick application in soybean	Idle ground or spot treatment on cropland before head or pod fill of crop. Avoid tillage for 7 days. Cost: Roundup Ultra $34.64; Touchdown $32.00.
MILKWEED, HONEYVINE (climbing)	2,4-D Amine (4L)	1-2 pt	Before vines reach 3' in length	For use in corn or sorghum. Use lower rates in sorghum. Gives suppression only. Cost: $.85-$2.69. See NebGuide G77-384, *Common Milkweed.*
	2,4-D LV Ester (4L)	0.5-1 pt		
MULLEIN, COMMON	Ally	0.2 oz	Late fall on rosettes or spring before flowering stalks lengthen	Essential to apply in rosette stage. Add surfactant 2 pt/100 gal solution. Cost: Ally $5.69; Grazon $6.50-$13.00.
	Grazon P + D	2-4 pt		
MUSK AND PLUMELESS THISTLE	Ally	0.2-0.3 oz	Late fall or spring before bolting	Use in pastures, grasses for seed, fallow and CRP. Curtail may be used in wheat. Cost: Ally $8.54; Curtail $8.48.
	Curtail	2 pt		
	Escort	1 oz	Bolted plants in spring prior to flowering	Use in noncropland and roadsides. Add surfactant at 1 pint/100 gal. Cost: $34.50.
	2,4-D LV Ester (4L)	1.5-2 qt	Late fall treatment treatment of rosettes or spring before flowering stalks lengthen	Annual treatments necessary for control of new seedlings. Fall applications after trees drop leaves and before leafing out in the spring reduces damage. Do not apply after "soil freeze-up" in the fall. For use on ranges and permanent pastures only. Cost: 2,4-D $5.05-$6.74; 2,4-D + Banvel $8.02; Tordon $5.70.
	2,4-D LV Ester (4L) + Banvel	1 qt 0.5 pt		
	Tordon 22K (musk only)	8 oz	Oct. 1-Dec. 1	

See page 74 for additional footnotes.

Troublesome Weeds and Woody Plants (Continued)

Weed	Herbicide[5]	Product Per Acre or Per 100 Gallons[7,8]	Application Time	Remarks and Approximate Cost/A Broadcast
OAK	Banvel	2 qt	Full foliage June to July; cut stump or basal treatment anytime	Non-cropland only for Spike and Crossbow. Cost: Banvel $37.22; Crossbow $64.50; Spike $8.60/lb; Velpar RP $0.08/tree inch.
	Crossbow	1.5 gal		
	Spike 20P	0.25 oz/1" dia	Spring or fall	
	Velpar L	4 ml/1" dia	Spot gun-spring to tree base	
OSAGE ORANGE	Crossbow	1.0-1.5 gal	Full foliage June to July; basal treatment anytime	Non-crop areas only. See remarks for cottonwood. Cost: Crossbow $43.00-$64.50; Spike $8.60/lb; Velpar RP $.08/tree inch.
	Spike 20P	0.5 oz/1" dia	Spring or fall	
	Velpar L	4 ml/1" dia	Spring. Spot gun. Apply to tree base	
POISON HEMLOCK	2,4-D LV Ester (4L) + Banvel	1 qt 0.5 pt	Rosettes—fall or early spring	Cost: $8.02.
POISON IVY	Crossbow	1.0 - 1.5 gal		Thoroughly wet all vegetation. Do not apply to cropland. Cost: Crossbow $1.10/1000 sq ft; Roundup Ultra $34.52-$57.70.
	Roundup Ultra	3-5 qt		
POVERTYWEED — See Bursage				
PUNCTURE VINE	2,4-D LV Ester (4L)	1 qt	Pre-bloom stage most effective	Mature burs not affected by 2,4-D. Retreatment necessary on new plants. Cost: $3.37.
	Ally + 2,4-D LV Ester (4L)	0.3 oz 1 pt		Ally provides residual control in non-crop areas. Cost: $10.23.
	Exceed	1.0 oz	POST on corn	Cost: $11.00.
	Peak	0.75-1 oz		PRE or POST. Cost: $8.00-$10.50.
PURPLE LOOSESTRIFE	Rodeo Roundup Ultra	2 qt 2 qt	Apply to plants with active growth in bloom stage or later.	Use Rodeo in or near water sources. Add appropriate surfactant to Rodeo. Cost: Rodeo $55.23; Roundup Ultra $23.09.
PURSLANE (in fallow to be planted to winter wheat)	2,4-D LV Ester (4L)	1 qt	When growing actively	Till 5-7 days after treatment. Do not plant small grains for 15 days. Cost: 2,4-D $3.37.
	Ally or Amber or Finesse + 2,4-D LV Ester (4L)	0.1 oz 0.2-0.3 oz 0.4 oz 4.0 oz	Early POST	Add surfactant when used POST. Surfactant 1-2 qt/100 gal solution. Do not use on soils with pH of 7.9 or higher. Cost: Ally + 2,4-D $2.46; Amber + 2,4-D $2.71-$3.86; Finesse + 2,4-D $4.00.
RAGWEED, WESTERN (perennial)	2,4-D LV Ester (4L)	1 qt	Early summer	Follow-up treatments may be necessary. Cost: $3.37.
	Grazon P + D	2-3 pt	Lower rate when weeds are small	Cost: $6.50-$9.75.
RED CEDAR	Spike 20P	0.5 oz/1" dia	Spring or fall	Spike for use in non-crop areas only. Tordon and Velpar LP can be used on grazingland. Cost: Spike $8.60/lb; Tordon $91.24; Velpar RP $0.08/tree inch.
	Tordon 22K	4 qt/100 gal	Spring or fall	
	Velpar L	4 ml/1" dia	Spot gun in spring to tree base	
	Alternative Treatment — Prescribed Burn — See NebGuide G88-894, G96-1308, or EC90-121.			

See page 74 for additional footnotes.

Troublesome Weeds and Woody Plants (Continued)

Weed	Herbicide[5]	Product Per Acre or Per 100 Gallons[7,8]	Application Time	Remarks and Approximate Cost/A Broadcast
RUSSIAN KNAPWEED	Banvel 4WS	1-2 qt	Apply at bud stage early flower	Idle ground or grassland. Avoid tillage for 7 days. Injury to forage grasses may occur. Broadleaf crops may be injured for 2 years after treatment. Cost: Banvel $18.61-$37.22; Tordon $22.81-$45.62.
	Curtail	3-4 qt		
	Tordon 22K	1-2 qt		
RUSSIAN OLIVE	2,4-D LV Ester (4L) + Banvel	2 qt 1 qt	Full foliage (early June)	See remarks for cottonwood. Cost: $25.35.
	Spike 20P	0.5 oz/1" dia	Spring or fall	Use on non-cropland only. Cost: $8.60/lb.
RUSSIAN THISTLE	See Kochia for controls.			
RYE, VOLUNTEER	SEE DOWNY BROME	See NebGuide G94-1225 *Controlling Volunteer Rye in Winter Wheat*		
SAGEBRUSH (sand and fringed and green sagewort)	2,4-D LV Ester (4L)	1.5-2 qt	4"-8" new growth (June)	1.5 qt/A 2,4-D adequate on sand sagebrush. Cost: $5.05-$6.74. See NebGuide G80-510, *Sagebrush Control.*
SANDBUR (Corn treatments) (Rotate to Soybean)	Accent + COC	0.67 oz 1%	POST in Corn. Sandbur < 1" Corn < 12"	Cost: Accent $17.89; Atrazine $6.31; Basis Gold $16.00. See NebGuide G74-121, *Field Sandbur Control in Corn.*
	Atrazine 4L[2] + COC	2 qt 2 pt		
	Basis Gold	14 oz		
	Poast (SR Corn)	24 oz		Cost: $9.10.
	Treatments listed for shattercane also control or suppress sandbur.			
SHATTERCANE				
Corn treatments	Accent	0.67 oz	Corn 2-6 leaf Shattercane 4"-6"	Use with COC or surfactant. Do not use if Counter was applied to the corn or within 20 days of an application at planting or cultivation application of any organophosphate insecticide. Do not apply Accent 3 days before or 7 days after a foliar POST organophosphate treatment. Do not apply Beacon within 10 days of a foliar post emergence organophosphate treatment. Beacon may be applied at 0.38 oz followed by a second 0.38 oz treatment if required. Corn hybrids vary in tolerance to Beacon. Cost: Accent/Beacon $18.90; Eradicane $14.74.
	Beacon	0.75 oz	Corn 4"-20" Shattercane 4"-6"	
	Eradicane	5 pt	PPI	
	Poast Plus (SR Corn)	16-24 oz	<3"	Cost: $6.04-$9.10.
	Pursuit DG	1.44 oz	Shattercane < 6"	IMI Corn Only. Cost: $27.34.

An alternate system — Ridge-till.

See page 74 for additional footnotes.

Troublesome Weeds and Woody Plants (Continued)

Weed	Herbicide[5]	Product Per Acre or Per 100 Gallons[7,8]	Application Time	Remarks and Approximate Cost/A Broadcast
SHATTERCANE				
Soybean treatments	Prowl (3.3EC)	3.6 pt	Preplant to soybean	Incorporate by cross tandem disking or equivalent soil mixing. Cost: Prowl $13.39; Sonalan $12.11; Treflan $6.21-$10.35.
	Sonalan	3 pt		
	Treflan 4EC	1.5-2.5 pt		
	Assure II	7 oz	POST Cane 6-12"	Use with crop oil concentrate. Cost: Assure $9.75; Fusilade DX $5.70: Fusion $6.71; Poast Plus $6.04-$9.10.
	Fusilade DX	0.38 pt		
	Fusion	6 oz		
	Poast Plus/Prestige	16-24 oz		
	Pursuit DG	1.44 oz	POST Cane 4-8"	Add nonionic surfactant 1/4% v/v plus 2 qt/A UAN. Use Roundup Ultra with Roundup Ready Seed. Cost: Cost: Pursuit $18.94; Roundup Ultra $5.75-$11.50.
	Roundup Ultra	16 - 32 oz	POST	
	Select	6 oz	Cane 6-12"	Use with COC. Cost: $12.76.
An alternate system — Ridge-till.				
SOAPWEED (Yucca)	Velpar L	4 ml/plant		Apply with spot gun in whorl or base of plant.
	Tordon 22k	1 ml/plant		
SOW THISTLE (Perennial)	2,4-D LV Ester (4L)	1.5 qt	Fall rosette or spring bud stage	See remarks for field bindweed. Cost: $5.05.
SPOTTED KNAPWEED	2,4-D LV Ester (4L)	1 qt	Rosette stage	Cost: $3.37.
SUMAC	2,4-D LV Ester (4L)	1-2 qt	Full foliage	Use sufficient water for good coverage. Cost: $3.37-$6.74.
SWAMP SMARTWEED (tanweed, shoestring)	2,4-D LV Ester (4L) + Banvel	1 qt 1 pt	When growing vigorously	On crops use lower rates and amine formulations. Cost: $12.68.
	Roundup Ultra	3-4 qt in 10 gal or less water/A	Full foliage mid to late summer	Idle ground or spot treatment in cropland before head or pod fill of crop. Avoid tillage for 7 days. Cost: $34.64-$46.19.
VELVETLEAF				
Corn and Sorghum treatments (also controls cocklebur, devil's claw & common sunflower)	AAtrex/ Atrazine 4L[2]	1.2 qt	Velvetleaf less than 4"	Use crop oil concentrate with AAtrex/atrazine and Laddok. Cost: AAtrex/atrazine $3.78; Basagran $8.75-$16.81; Buctril + Atrazine $8.70-$11.40; 2,4-D $0.85-$1.69; Marksman $6.37-$11.40; Laddok $8.12-$12.17.
	Basagran + 28% N	1-2 pt 1 gal		
	Laddok S-12[2]	2.4 to 3.6 pt		
	Buctril 2EC + Atrazine 4L[2]	1-1.5 pt 1-2 pt		
	Exceed	0.80-1.0 oz	4-12"	Use on corn only. Use 1 gal of 28% UAN + 1 qt of COC for effective control with Exceed. Cost: Exceed $8.80-$11.00; 2,4-D $0.83-$1.69; Marksman $6.12-$10.70.
	2,4-D LV Ester (4L)	0.5-1 pt	Velvetleaf less than 6"	
	Marksman[2]	2-3.5 pt	Before 5-leaf stage of corn	
	Peak (Sorghum only)	0.75-1.0 oz	Velvetleaf 1-6"	Cost: $7.50-$10.00.
	Permit	0.66-1.33 oz	Velvetleaf 1-6"	Cost: $8.59-$17.31.
	Resource (Corn only)	4-8 oz	Velvetleaf 4-12"	Use 1 qt/A COC. Cost: $6.40-$12.80.

See page 74 for additional footnotes.

Troublesome Weeds and Woody Plants (Continued)

Weed	Herbicide[5]	Product Per Acre or Per 100 Gallons[7,8]	Application Time	Remarks and Approximate Cost/A Broadcast
VELVETLEAF **Soybean treatments**	Command	1.5-2.0 pt	PPI/PRE to soybean planting	Command drift may damage green vegetation. Command residue may damage wheat planted the same fall. Cost: Command $9.91-$14.82.
	Classic + Pinnacle + 28% UAN + Surfactant	0.25 oz 0.25 oz 1 gal 1/8% v/v		See NebGuide G83-681, *Velvetleaf.* Cost: Classic + Pinnacle $10.00
	Pursuit	1.44 oz	Velvetleaf less than 3"	Use with 1-2 qt of 28% UAN + NIS at 2 pt/100 gal. Cost: $18.94.
	Resource	4.0-8.0 oz	Velvetleaf 4-12"	Use 1 qt/A COC. Cost: $6.40-$12.80.
WILDOAT	In Nebraska probably weedy annual brome. See downy brome.			
WILD PROSO MILLET (See NebGuide G83-648)	Eptam	3.5 pt	Preplant to fieldbean	Apply to dry surface soil and incorporate immediately with a disk or field cultivator. Cost: $11.40.
	Eradicane 6.7E	5 pt	Preplant to corn	
	Prowl (3.3EC) + Bladex 90DF	1.2 qt 1.1 lb	Spike stage of corn. Wild proso millet less than 1"	Cost: $18.54.
	Prowl 3.3EC	1.5-1.8 qt	Layby to corn	Direct spray to cover the base of the corn plant and in between corn rows. Incorporate with irrigation water or with cultivation. Cost: $11.16.
	Accent	0.67 oz	Post in corn Wild proso millet 1-3 leaf stage.	Follow label directions. Cost: $17.89.
	Liberty (Liberty Link Corn)	28 oz	1"-4" wild proso millet	Cost: $26.60.
	Poast Plus	24 oz	POST on 4-8" wild proso millet	Post on sugarbeet, soybean, fieldbean and alfalfa and SR corn. Add 1 qt crop oil concentrate per acre. Cost: Poast Plus $4.53.
	Ro-Neet	3.3-4.0 pt	Preplant to sugarbeet	Cost: $21.24-$25.75.
YARROW	2,4-D LV Ester (4L) + Banvel	1.0 lb 0.5 pt	Fall or spring Pre-bloom	Cost: $8.02.

[1]Add X-77 spreader 2 pt (0.25% v/v) per 100 gal spray solution for Gramoxone Extra, 4 pt/100 gal. (0.5% v/v), for Roundup Ultra, Roundup Ultra RT, Touchdown, Landmaster BW, and Fallow Master application, apply 10 gal or less water per acre, and add 17 lb ammonium sulfate (spray grade) per 100 gal spray.
[2]If atrazine was applied at planting, the total amount of atrazine per calendar year cannot exceed 2.5 lb of active ingredient per year.
[3]Use no more than 1.6 qt on <30% crop residue on highly erodible land.
[4]The addition of 0.5 to 1 pt 2,4-D LV ester improves control of broadleaf weeds. Do not apply 2,4-D PRE after planting sorghum.
[5]Low volatile ester and salt formulations preferred over volatile esters such as isopropyl because of vapor hazards. 2,4-D and MCPA calculated on the basis of 4 lb/gal of acid equivalent (the chemicals responsible for herbicidal effects). For other formulations see Conversion Table on page 75.
[6]Do not use on soils with less than 1% organic matter. Increased injury risk on soils where triazine carryover exists.
[7]For spot treatment add 1 1/2 tablespoons of herbicide per gallon of water for each 1 qt per acre required broadcast, and apply to 1,000 sq ft.
[8]Rates per 100 gallons pertain to handgun on a power sprayer.

Conversion Tables

Rate Per Acre To 1,000 Square Feet

1. Known Facts and Assumptions:

   1 acre = 43,560 sq ft
   1 pt = 16 oz; 1 qt = 32 oz
   1 oz = 2 tablespoons = 6 teaspoons
   Herbicide rate per acre from bulletin or label
   Hand sprayers apply about 1 gal per 1,000 sq ft

2. Convert Herbicide Rate Per Acre to Ounces:

   For example, 2 qt per acre = 64 oz

3. Convert 64 oz per acre to oz per 1,000 sq ft

   64 /43 = 1.50 oz or 3 tablespoons per 1,000 sq ft

4. Add 3 tablespoons of the product to 1 gal of water and apply uniformly to 1,000 sq ft

Spot Treatment

For hand sprayers used for spot treatments, add 1 1/2 tablespoons of herbicide per gallon of water for each 1 qt per acre required broadcast. Apply to 1,000 sq ft. Application amounts are dependent upon spray pressure, walking speed during treatment, and tip size. For powered handgun applications, mix broadcast rate in 100 gallons of water.

NOTE: Wettable powder herbicide rates would be determined by the same procedure; however, since volume or density of wettable powder herbicides varies, the calculated rate per 1,000 sq ft should be carefully measured by weighing on a precision scale.

Equivalent Amounts of Different Formulations

1 qt AAtrex or atrazine = 4L = 1.25 lb AAtrex or AAtrex Nine-O
1 qt Bladex 4L = 1.25 lb Bladex 80W = 1.1 lb Bladex 90DF
1 qt Ramrod Flowable = 1.5 lb Ramrod 65W
0.5 pt Sencor/Lexone 4L = 0.5 lb Sencor/Lexone 50W = 0.33 lb Sencor/Lexone 75DF

Active Ingredient Per Gallon Conversions

Pounds of active material per gal of commercial product	*Pints of commercial product needed per acre to give the following pounds of herbicide per acre*		
	1/4 lb	*1/2 lb*	*1 lb*
2.00	1	2	4
2.64	3/4	1 1/2	3
3.00	2/3	1 1/3	2 2/3
3.34	3/5	1 1/5	2 2/5
4.00	1/2	1	2
5.00	2/5	4/5	1 2/3
6.00	1/3	2/3	1 1/3

Metric Conversions

Symbol	*When You Know*	*Multiply By*	*To Find*	*Symbol*
lb	pounds	0.45	kilograms	kg
pt	pints	0.47	liters	L.
qt	quarts	0.95	liters	L.
oz	ounces	30.00	milliliters	ml
A	acres	0.40	hectares	ha
ha	hectares	2.50	acres	A

Time until Herbicides are Rainfast

Herbicide	Hours Until Rainfast	Herbicide	Hours Until Rainfast
ACCENT	4	GRAMOXONE EXTRA	0.5
ALLY	4	GLEAN	4
AMBER	4	HARMONY EXTRA	4
ASSURE II	1	HOELON	1
ASSERT	3	LADDOK S-12	4
ATRAZINE	4	LANDMASTER BW	6
AVENGE	6	LIGHTNING	1
BANVEL	4	MARKSMAN	4
BASAGRAN	4	MATADOR	1
BASIS	4	MCPA	1
BASIS GOLD	4	PEAK	4
BEACON	4	PERMIT	4
BICEP/BICEP II	4	PINNACLE	1
BLADEX	4	POAST PLUS	1
BLAZER	6	PURSUIT	1
BRONCO	6	RAPTOR	1
BRONATE	1	REFLEX	4
BUCTRIL	1	RELIANCE	1
BUCTRIL/ATRAZINE	1	RESOLVE	4
BUTYRAC 200	6	RESOURCE	1
CLARITY	4	RESULT	4
CONTOUR	4	ROUNDUP ULTRA	6
CROSSBOW	6	SCEPTER	2
CURTAIL	8	SCORPION III	8
CURTAIL M	8	SELECT 2 EC	1
CLASSIC	1	SKIRMISH	1
COBRA	0.5	STELLAR	1
EXCEED	4	STINGER	8
EXPRESS	4	SYCHRONY	1
EXTRAZINE II	4	TOUCHDOWN	6
FINESSE	4	TOUGH	2
FLEXSTAR	4	2,4-D	1
FUSILADE DX	1	TORDON	2
FUSION	1	ULTIMA 60	1
FALLOW MASTER	6	UPBEET	6

Preharvest Interval/Crop Stage Limits for POST Herbicides in Corn

Herbicide	PreHarvest Internal or Crop Height Limit
Accent	24" broadcast, 36" directed
Atrazine	12"
Banvel	1 pt 8", 0.5 pt 36", coarse textured soils 0.5 pt
Basagran	none
Basis	2 collar
Basis Gold	12"
Beacon/Exceed	20" broadcast, pre-tassel directed
Bladex 90 DF	4th leaf
Buctril	pre-tassel
Buctril-Atrazine	12"
Clarity	8", coarse textured soils 0.5 pt
Extrazine II	4th leaf
Laddok S-12	12"
Lightning	45 days
Marksman	5th leaf
Permit	36" directed
Pursuit (IR, IT Corn)	45 days
Resource	10 leaf
Scorpion III	85 days
Sencor + Basagran	60 days
Tough	68 days
2,4-D	8" broadcast, pre-tassel directed

Preharvest Interval/Crop Stage Limits for POST Herbicides in Sorghum

Herbicide	PreHarvest Interval or Crop Height Limit
Atrazine	12"
Banvel	8", 15" with drops
Basagran	boot
Buctril	pre-boot
Buctril-Atrazine	12"
Laddok	12"
Marksman	8"
Peak	5-30"
Permit	pre-boot
2,4-D	8" broadcast, boot directed

Preharvest Interval/Crop Stage Limits for POST Herbicides in Soybean

Herbicide	PreHarvest Interval or Crop Height Limit
Assure II	80 days
Basagran	30 days for forage or hay
Blazer	50 days
Classic	60 days
Cobra	90 days
Fusilade	Bloom
Fusion	Bloom
Matador	80 days
Pinnacle	60 days
Poast Plus	90 days
Pursuit	85 days
Raptor	85 days
Reflex	Bloom
Reliance	60 days
Resource	80 days
Select	60 days
Scepter	90 days
Skirmish	60 days

ABBREVIATIONS

AF — acre foot
AMS — ammonium sulfate
DAP — days after planting
DF — dry flowable
EPOST — early postemergence
EPP — early preplant
G — granules
g/A — gallons per acre, gpa GPA
NIS — nonionic surfactant
OM — organic matter
POST — postemergence
PP — preplant
PPSA — preplant surface applied
PRE — preemergence
PSI — lb/sq inch
qt/A — quarts per acre, qpa
SA — surface acres
SM — surface mix
UAN — urea ammonium nitrogen
V/V — volume per volume
WP — wettable powder
WS — water soluble

COMBINATION HERBICIDES

Trade Name	Equivalent Amount of Each Component Contained in 1 gal or 1b of Product (a.i.)	Manufacturer
Authority Broadleaf	0.47 lb sulfentrazone + 0.09 lb chlorimuron ethyl	FMC
Basis	0.50 lb rimsulfuron + 0.25 lb thifensulfuron	DuPont
Basis Gold	0.013 lb nicosulfuron + 0.013 rimsulfuron + 0.82 lb atrazine	DuPont
Betamix	0.65 lb phenmedipham + 0.6 lb desmedipham	AgrEvo
Betamix Progress	0.6 lb phenmedipham + 0.6 lb desmedipham + 0.6 lb ethofumesate	AgrEvo
Bicep II	3.3 lb metolachlor + 2.67 lb atrazine	Novartis
Bicep Lite	3.3 lb metolachlor + 1.67 lb atrazine	Novartis
Broadstrike + Dual	0.2 lb flumetsulam + 7.47 lb metolachlor	Dow
Broadstrike + Treflan	0.25 lb flumetsulam + 3.4 lb trifluralin	Dow
Bronate	2 lb bromoxynil + 2 lb MCPA	Rhone-Poulenc
Bronco	2.6 lb alachlor + 1.4 lb glyphosate	Monsanto
Buctril + atrazine	1.0 lb bromoxynil + 2.0 lb atrazine 4L	Rhone-Poulenc
Bullet	2.5 lb alachlor + 1.5 lb atrazine	Monsanto
Cannon	2.5 lb alachlor + 0.5 lb trifluralin	Monsanto
Canopy 75 DF	0.64 lb metribuzin + 0.11 lb chlorimuron	DuPont
Canopy XL	0.471 lb sulfentrazone + 0.09 lb chlorimuron ethyl	DuPont
Commence 5.25 EC	3 lb trifluralin + 2.25 lb clomazone	Elanco/FMC
Concert	2 oz package equals 0.125 oz chlorimuron + 0.125 oz thifensulfuron	DuPont
Conclude	bentazon + sethoyxdim	BASF
Contour	atrazine + imazethapyr, co-pack	Am. Cyanamid
Crossbow	1 lb triclopyr + 2 lb 2,4-D	Dow
Curtail	2.0 lb 2,4-D amine + 0.38 clopyralid	Dow
Detail	3.6 lbs dimethenamid + 0.5 lb imazaquin	Am. Cyanamid
DoublePlay	5.6 lbs EPTC + 1.4 lb acetochlor	Zeneca
Exceed	0.285 prosulfuron + 0.285 primisulfuron	Novartis
Extrazine II 4-L	3 lb cyanazine + 1.0 lb atrazine	DuPont
Fallow Master	1.5 lb glyphosate + 0.6 lb dicamba	Monsanto
Finesse	0.625 chlorimuron + 0.125 metsulfuron	DuPont
Freedom	2.67 lb alachlor + 0.33 lb trifluralin	Monsanto
FulTime	2.40 lb acetochlor + 1.6 lb atrazine	Zeneca
Fusion 2.66E	2 lb fluazifop + 0.66 lb fenoxaprop	Zeneca
Galaxy	3 lb bentazon +0 .67 lb acifluorfen	BASF
Guardsman	2.33 lb dimethenamid + 2.67 lb atrazine	BASF
Harmony Extra	0.50 lb thifensulfuron + 0.25 lb tribenuron	DuPont
Hornet	0.23 lb flumetsulam + 0.62 lb clopyralid	Dow
Laddok S-12	2.5 lb bentazon+ 2.5 lb atrazine	BASF
Landmaster BW	1.2 lb glyphosate + 1.9 lb 2,4-D	Monsanto
Lariat 4 F	2.5 lb alachlor + 1.5 lb atrazine	Monsanto
Lasso + atrazine	2.5 lb alachlor + 1.5 lb atrazine	Monsanto
Lightning	0.084 imazethapyr + 0.028 lb imazapyr	Am. Cyanamid
Marksman	1.1 lb dicamba + 2.1 lb atrazine	BASF
Matrix 75 DF	0.67 lb thifensulfuron + 0.033 lb tribenuron	DuPont
Pursuit Plus	2.9 lb pendimethalin + 0.2 lb imazethapyr	Am. Cyanamid
Ramrod & atrazine	3 lb propachlor + 1 lb atrazine	Monsanto
Reliance	0.02 lb chorimuron + 0.01 lb thifensulfuorn	DuPont
Resolve	dicamba + imazethapyr, co-pack	Am. Cyanamid
Rezult	bentazon + sethoxydim	BASF
Scepter O.T.	0.5 lb imazaquin + 2 lb acifluorfen	Am. Cyanamid
Scorpion III	0.078 lb flumetsulam + 0.21 lb chlopyralid + 0.423 lb 2,4-D	Dow
Shotgun	2.5 lb atrazine + 1.5 lb 2,4-D	UAP
Squadron 2.33 EC	2.0 lb pendimethalin + 0.33 lb imazaquin	Am. Cyanamid
Steel	1.5 lb imazequin + .2 imazethapyr + 2.7 pendimethalin	Am. Cyanamid
Stellar	0.7 lb flumiclorac + 2.4 lb lactofen	Valent
Surpass 100	3 lb acetochlor + 2.0 lb atrazine	Zeneca
Synchrony	0.039 lb chlorimuron + 0.014 lb thifensulfuron	DuPont
Tornado	0.75 lb fluazifop + 1 lb fomesafen	Zeneca
Trimec Super Brush Killer	4 parts 2,4-D + 4 parts 2,4-D + 1 part dicamba	PBI-Gordon
Trimec Turf Herbicide	2,4-D, MCPP, dicamba in 9:3:1 ratio	PBI-Gordon
Tri-Scept 3 E	2.57 lb trifluralin + 0.43 lb imazaquin	Am. Cyanamid
Turbo 8 E	6.55 lb metolachlor + 1.45 lb metribuzin	Bayer
Turflon D	2.0 lb 2,4-D ester + 1 lb triclopyr	Dow

Herbicide Dictionary

This section gives the trade name, common name, formulation, company, EPA registration number, and classification for herbicide family, mode of action, and herbicide resistance group commonly used in Nebraska. Example: atrazine code is [VA1]; to determine family, mode of action, or herbicide resistance group see pages 7-8.

AAtrex (atrazine—4 lb/gal or 90%DF). Novartis. EPA Reg. No. 100-497 or 100-585. [VA1].

Accent SP (nicosulfuron—75%DF). POST grass control in corn. DuPont. EPA Reg. No. 352-560. [II A2].

Acetochlor An active ingredient in Double Play, Fultime, Harness, Harness Extra, Surpass, Surpass 100, and Topnotch. [IIIB1].

Achieve (tralkoxydim). Zeneca. [IA2].

Acifluorfen An active ingredient in Blazer, Conclude B, Galaxy, Scepter O.T., and Status. [VIA1].

Action (fluthiacet methyl). Under development for POST broadleaf weed control in corn and soybean. Novartis. [VIA2].

Affinity (carfentrazone ethyl proposed name). Under development for broadleaf weed control in winter wheat. FMC.

Alachlor Active ingredient in Arena, Confidence, Freedom, Judge, Lariat, Lasso, Lasso II, Micro-Tech, Partner, Saddle, and Stall. [IIIB1].

Alanap (naptalam—2 lb/gal). A PRE or POST broadleaf and grass herbicide for cucurbit and nursery stock. EPA Reg. No. 400-49. [IIID1].

Ally (metsulfuron—60%DF). Used PP, PRE, or POST in wheat, barley, pastures, rangeland, and fallow for broadleaf and certain grass weed control. 3-6 week residual. DuPont. EPA Reg. No. 352-435. [IIA2].

Amber (triasulfuron—75%DF). A PRE or POST herbicide for broadleaf weed control in wheat, barley, and fallow. Novartis. EPA Reg. No. 100-701. [IIA2].

Ametryn Active ingredient in Evik.

Amine 4 (2,4-D amine—3.74 lb/gal). Used for selective broadleaf weed control in corn, sorghum, small grains, and lawns. UAP. EPA Reg. No. 34704-120. [IVA1].

Ansar 8100 (DSMA—80%WP). Used post to control crabgrass in lawns. ISK Biosciences. EPA Reg. No. 50534-46. [VIII].

Aquathol (endothall—10%DF or 4.2 lb/gal). An aquatic herbicide for use in still water. Elf Atochem. EPA Reg. No. 4581-201 or 4581-204. [VIII].

Aquazine (simazine—80%WP). An aquatic herbicide for use in still water. Novartis. EPA Reg. No. 100-650. [VA1].

Arena Generic alachlor. Monsanto. [IIIB1].

Arsenal (imazapyr—2 or 4 lb/gal or 0.5%G). Provides total vegetation control for noncrop areas. Am. Cyanamid. EPA Reg. No. 241-273, 241-291, 241-295, or 241-346. [IIA1].

Assert (imazamethabenz). POST control of wild oat in spring wheat and barley. Am. Cyanamid. EPA Reg. No. 241-285. [IIA1}.

Assure II (quizalofop—0.8 lb/gal). A POST grass herbicide for use in soybean. DuPont. EPA Reg. No. 352-541. [IA1].

Asulam Active ingredient in Asulox. [IIIA3].

Asulox (asulam—3.34 lb/gal). For POST weed control in turf, ornamentals, Christmas trees, and noncrop areas. Rhone-Poulenc. EPA Reg. No. 264-447. [IIIA3].

Atrazine A PP, PRE, and POST s-triazine for broadleaf and certain grass weeds in corn, sorghum, ecofallow, and CRP. Active ingredient in Atrazine 4L, Basis Gold, Bicep II, Bicep II Magnum, Bicep Lite II, Buctril + Atrazine, Bullet, Contour, Cornbelt Atrazine, Cy-Pro AT, Extrazine, FulTime, Guardsman, Harness Xtra, Laddok S-12, Lariat, Marksman, Moxy + atrazine, Shotgun, and Surpass 100. [VA1].

Authority (sulfentrazone—75%DF). For selective PRE weed control in soybean. Increased control of black nightshade and pigweed. FMC. [VIA3].

Authority Broadleaf (sulfentrazone—46.9% + chlorimuron — 9.4%). For PRE broadleaf control in soybean. FMC. (VIA3 + IIA2].

Authority One-Pass (sulfentrazone + clomazone). Under development for weed control in soybean. FMC. [VIA3 + VIIA2].

Avenge (difenzoquat—2 lb/gal). Controls wild oat not annual bromes POST in spring small grains. Am. Cyanamid. EPA Reg. No. 241-266. [VIII].

Axiom (fluthiamide + metribuzin). Under development for selective PRE weed control in corn and soybean. Bayer. [IIIB1 + VA2].

Balan DF (benefin—60%DF). A PPI herbicide for annual grass control in alfalfa. UAP. EPA Reg. No. 34704-746. [IIIA1].

Balance (isoxazole). Under development for selective PRE or POST control of grass and broadleaf weeds in corn. Expect label in 1998. Rhone-Poulenc. [VIIA1].

Banvel (dicamba—4 lb/gal). A POST and PRE herbicide for selective broadleaf weed control in corn, sorghum, small grains, and perennial grass. BASF. EPA Reg. No. 55947-1. [IVA2].

Basagran (bentazon—4 lb/gal). A POST fieldbean, corn, sorghum, and soybean herbicide for velvetleaf, cocklebur, and other broadleaf weeds under 6". BASF. EPA Reg. No. 7969-45. [VC1].

Basis (50% rimsulfuron + 25% thifensulfuron—75%). A POST herbicide for selective grass control in corn. DuPont. EPA Reg. No. 352-571. [IIA2 + IIA2].

Basis Gold (1.34% rimsulfuron + 1.34% nicosulfuron + 11.5% atrazine) used POST for weed control in corn. EPA Reg. No. 352-585. DuPont. [IIA2 + IIA2 + VA1].

Battalion (halosulfuron + furilazole—15%DF). Under development for PRE and PPI use for broadleaf weed control in corn. Monsanto. EPA Reg. No. 524-466. [IIA2].

Beacon (primisulfuron—75%DF). POST grass and broadleaf control in corn. Novartis. EPA Reg. No. 100-705. [IIA2].

Benefin Active ingredient in Balan DF. [IIA1].

Benesulfuron Active ingredient in Londax. [IIA2].

Herbicide Dictionary (Continued)

Benoxacor Safner for corn and sorghum seed. Trade name Concep. Novartis

Bensulide Active ingredient in Prefar 4E. [VIII].

Bentazon An active ingredient in Basagran, Conclude B, Galaxy, and Laddok S-12. [VC1].

Betamix (0.65 lb phenmedipham + 0.65 desmedipham—1.3 lb/gal). For POST broadleaf weed control in sugarbeet. AgrEvo. EPA Reg. No. 45639-87. [VA3 + VA3].

Betamix Progress (0.6 lb phenmedipham + 0.6 lb desmedipham + 0.6 lb ethofumesate—1.8 lb/gal). For POST weed control in sugarbeet. AgrEvo. EPA Reg. No. 45639-159. [VA3 + VA3 + VIII].

Betanex (desmedipham—1.3 lb/gal). Used POST for redroot pigweed control in sugarbeet. AgrEvo. EPA Reg. No. 45637-86. [VA3].

Bicep II (3.23 lb metolachlor + 2.64 lb atrazine + benoxacor—5.87 lb/gal). For PRE use in corn and sorghum treated with Concep or Screen. Novartis. EPA Reg. No. 100-710. [IIIB1 + VA1].

Bicep Lite II (3.23 lb metolachlor + 1.67 lb atrazine—4.9 lb/gal). For PRE use in corn and sorghum safened with Concep or Screen. Norvatis. EPA Reg. No. 100-766. [IIIB1 + VA1].

Bicep II Magnum (metolachlor + atrazine). Limited availability in 1998. Novartis. EPA Reg. No. [IIIB1 + VA1].

Bladex (cyanazine—4 lb/gal or 90%DF). A short residual triazine for grass and broadleaf weed control in corn. DuPont. EPA Reg. No. 352-470 or 352-495. [VA1].

Blazer (acifluorfen—2 lb/gal). A POST herbicide for broadleaf weed control in soybean. BASF. EPA Reg. No. 7969-79. [VIA1].

Broadstrike + Dual (0.20 lb flumetsulam + 7.47 lb metolachlor—7.67 lb/gal). For PPI, PP, or PRE use in corn and soybean. Dow AgroSciences. EPA Reg. No. 62719-239. [IIA3 + IIIB1].

Broadstrike Plus (flumetsulam + clopyralid—0.856 lb/gal). Used PP, PPI, or PRE for controlling broadleaf weeds in corn. Dow AgroSciences. EPA Reg. No. 62719-253. [IIA3 + IVA3].

Broadstrike + Treflan (0.25 lb flumetsulam + 3.4 lb trifluralin—3.65 lb/gal). For PPI use in soybean. Dow AgroSciences. EPA Reg. No. 62719-222. [IIA3 + IIIA1].

Bromacil Active ingredient in Hyvar X. [VA4].

Bromoxynil Active ingredient in Bronate, Buctril, Buctril Gel, Buctril + atrazine, and Moxy 2E. [VC2].

Bronate (2 lb bromoxynil + 2 lb/gal MCPA—4 lb/gal). For use in small grain. Rhone-Poulenc. EPA Reg. No. 264-438. [VC2 + IVA1].

Buctril (bromoxynil—2 and 4lb/gal EC or 4 lb/gal GEL). A contact herbicide for broadleaf control in alfalfa, corn, sorghum, and small grains. Rhone-Poulenc. EPA Reg. No. 264-437, 264-540, or 264-531. [VC2].

Buctril + Atrazine (1 lb bromoxynil + 2 lb atrazine—3.0 lb/gal). For POST weed control in corn and grain sorghum. Rhone-Poulenc. EPA Reg. No. 264-477. [VC2 + VA1].

Bullet (2.5 lb alachlor + 1.5 lb atrazine—4 lb/gal). For PRE or PPI use in corn and grain sorghum. Monsanto. EPA Reg. No. 524-418. [IIIB1 + VA1].

Butylate Active ingredient in Sutan+. [IIIC1].

Butyrac 175 or 200 (2,4-DB—2.0 lb/gal). For selective control of cocklebur in soybean and small broadleaf weeds in alfalfa. Rhone-Poulenc. EPA Reg. No. 264-164. [IV1].

Canopy (10.7% chlorimuron + 64.3% metribuzin— 75%DF). For PRE use in soybean. DuPont. EPA Reg. No. 352-444. [IIA2 + VA2].

Canopy XL (46.9% sulfentrazone + chlorimuron 9.4%). For selective PRE and PPI weed control in soybean. DuPont. EPA Reg. No. 352-589. [VIA3 + VA2].

Casoron (dichlobenil—50%WP). Used for PRE weed control in woody plants and certain herbaceous perennials. Uniroyal. EPA Reg. No. 400-168. [IIIB2].

Canvas (31.5% thifensulfuron + 18.7% tribenuron + 15.0% metsulfuron—71%DF). Used for weed control in wheat, barley, and fallow. DuPont. EPA Reg. No. 352-586. [VA2 + IIA2 + IIA2].

Chart An experimental POST herbicide for broadleaf weed control in soybean. Novartis.

Chlorimuron An active ingredient in Classic, Canopy, Canopy XL, Concert SP, Lorox Plus, Reliance, and Synchron STS. [IIA2].

Chlorsulfuron An active ingredient in Finesse, Glean, and Telar. [IIA2].

Chloransulam methyl Active ingredient in First Rate [IIA3].

Chopper (imazapyr—2 lb/gal). mixed with water and/or diesel fuel to control regrowth from cut stumps of brush and trees. Am. Cyanamid. EPA Reg. No. 241-296. [IA1].

Chopper RTU (imazapyr —0.255 lb/gal). Ready to use product to control weedy brush and trees as a basal or cut stump treatment. Am. Cyanamid. EPA Reg. No. 241-330. [IA1].

Clarity (dicamba-glycolamine—5 lb/gal or 4 lb/gal dicamba). A low volatile formulation of dicamba to be used POST for broadleaf weed control in corn and sorghum. BASF. EPA Reg. No. 55947-46. [IVA2].

Classic (chlorimuron—25%DF). A POST herbicide for broadleaf weed control in soybean. DuPont. EPA Reg. No. 352-436. [IIA2].

Clethodim Active ingredient in Select and Prizm. [IA2].

Clomazone An active ingredient in Authority One-Pass, Command, and Commence. [VIIA2].

Clopyralid An active ingredient Broadstrike Plus, Curtail, Hornett, and Stinger [IVA3].

Cobra (lactofen—2.0 lb/gal). Used POST for broadleaf weed control in soybean. Valent. EPA Reg. No. 59639-34. [VIA1].

Command (clomazone—4 lb/gal). A PPI herbicide for grass and broadleaf weed control in soybean. FMC. EPA Reg. No. 279-3053. [VIIA2].

Herbicide Dictionary (Continued)

Command 3ME (clomazone—3 lb/gal). An encapsulated PRE herbicide for grass and broadleaf weed control in soybean. FMC. EPA Reg. No. 279-3158. [VIIA2].

Commence (3 lb trifluralin + 2.25 lb clomazone—5.25 lb/gal). Used to control weeds in soybean. FMC. EPA Reg. No. 279-3104. [IIIA1 + VIIA2].

Concep II (oxabatrinil—70%WP). A protectant for corn and sorghum seed to reduce metolachlor injury. Novartis. EPA Reg. No. 100-AL-1.

Concep III (fluxofenim—75%WP). A protection for corn and sorghum seed to reduce metolachlor injury. Novartis. EPA Reg. No. 100-NC-2.

Concert SP (12.5% chlorimuron + 12.5% thifensulfuron — 25%WP). For POST broadleaf control in soybean. DuPont. EPA Reg. No. 352-561. [IIA2 + IIA2].

Conclude B (2.67 lb bentazon + 1.33 lb acifluorfen). For POST grass and broadleaf control in soybean. Called Conclude when tank-mixed with Conclude G. BASF. EPA Reg. No. 7969-76. [VC1 + VIA1 + IA2].

Conclude G (sethoxydim—1.5 lb/gal). Control annual grasses in soybean. Called Conclude when tank mixed with Conclude B. BASF. EPA Reg. No. 7969-58. [IA2 + VC1 + VIA1].

Confidence Generic alachlor. Cenex Land O'Lakes. [IIIB1].

Contain (imazaphyr—1 lb/gal). Used for nonselective control of grass and broadleaves on industrial sites. Am. Cyanamid. [IIA1].

Contend (imazameth) Experimental herbicide by Am. Cyanamid.

Contour (0.38 lb imazethapyr + 3.0 lb atrazine—3.38 lb/gal). Used for weed control in corn. Am. Cyanamid. EPA Reg. No. 241-353. [IIA1 + VA1].

Copper Sulfate Available as crystals or in chelated form for algae control in moving and still water. Several band names.

Cover (75%DF sulfentrazone). For selective PRE weed control in soybean. Offers increased nightshade and pigweed control. DuPont. EPA Reg. No. 352-590 [VIA3].

Crossbow (2 lb 2,4-D + 1 lb trichlopyr—3 lb/gal). For broadleaf weeds and woody plant control in rangeland and noncrop areas. Dow AgroSciences. EPA Reg. No. 62719-260. [IIA1 + IVA3].

Curbit EC (ethalfluralin—3 lb/gal). Used PRE or PPI in melon and cucumber for grass control. UAP. EPA Reg. No. 34704-610. [IIIA1].

Curtail (0.38 lb clopyralid + 2 lb 2,4-D—2.38 lb/gal). For POST broadleaf control in wheat and barley, rangeland, and pastures. Dow AgroSciences. EPA Reg. No. 62719-48. [IVA1 + IVA3].

Curtail M (0.42 lb clopyralid + 2.35 lb MCPA—2.77 lb/gal). Used for POST broadleaf control in wheat and barley. Dow AgroSciences. EPA Reg. No. 62719-86. [IVA3 + IVA1].

Cyanazine An active ingredient in Bladex, Cy-Pro, Cy-Pro AT, and Extrazine II. [VA1].

Cycolate Active ingredient in Ro-Neet. [IIIC1].

Cy-Pro 4L or 90DF (cyanazine). See Bladex. Griffin Corp. EPA Reg. No., 1812-366 or 1812-365. [VA1].

Cy-Pro AT 4L or 90DF (cyanazine + atrazine). See Extrazine II. Griffin Corp. EPA Reg. No. 1812-367 or 1812-368. [VA1 + VA1].

Dacthal (DCPA—75%WP or 6 lb/gal). Used PRE for annual grass and certain broadleaf weeds in turf, ornamentals, and horticultural crops. ISK Bio Sci. EPA Reg. No. 50534-1 or 50534-10. [IIIA3].

Dash An anionic surfactant by BASF. EPA Reg. No. 34313-7x01.

DCPA Active ingredient in Dacthal. [IIIA3].

Desmedipham An active ingredient in Betamix, Betamix Progress, and Betanex. [VA3].

Detail (0.5 lb imazaquin + 3.6 lb dimethenamid—4.1 lb/gal). Used for PRE and EPOST weed control in soybean. Am. Cyanamid. EPA Reg. No. 241-361. [IIA1 + IIIB].

Dicamba An active ingredient in Banvel, Clariety, Fallow Master, Marksman, and Optill. [IVA2].

Dichlobenil Active ingredient in Casoron. [IIB2].

Dichlorprop Active ingredient in Weedone 2,4-DP. [IVA1].

Diclofop Active ingredient in Hoelon. [IA1].

Difenzoquat Active ingredient in Avenge. [VIII].

Dimension (dithiopyr). Lawn herbicide. Rohm and Haas. [IIIA3].

Dimethenamid An active ingredient in Detail, Frontier, Optill, Reward, Stature, and Weedtrine D. [IIIB1].

Diquat (diquat—2 lb/gal). Used for aquatic weed control and desiccation of legume, soybean, and grain sorghum seed crops. Zeneca. EPA Reg. No. 10182-353. [VIB1].

Direx 4L or 80DF (diuron—4 lb/gal or 80DF). Similar to Karmex. Griffin. EPA Reg. No. 1812-257 or 1812-362. [VB1].

Dithiopyr Proposed name for active ingredient in Dimension and Reward. [IIIB1].

Diuron An active ingredient in Direx, Diuron, Karmex, and Topside. [VB1].

DoublePlay (5.6 lb EPTC + 1.4 lb acetochlor—7.0 lb/gal). Used PPI for selective grass control in corn. Zeneca. EPA Reg. No. 10182-388. [IIIC1 + IIIB1].

DSMA Active ingredient in Ansar 8100 and DSMA. [VIII].

DSMA Liquid (DSMA—3.6 lb/gal). Used POST for controlling crabgrass in lawns. ISK BioSciences. EPA Reg. No. 50534-27. [VIII].

Dual or Dual 8E (metolachlor—8 lb/gal). Used PP, PPI, or PRE for annual grass and some broadleaf weeds in corn, sorghum, and soybean. Novartis. EPA Reg. No. 100-597 or 100-673. [IIIB1].

Dual II or Dual IIG (metolachlor—7.8 lb/gal or 25%G). Used PP, PPI, or PRE for weed control in corn, potato, sorghum, and soybean, Includes a safener but for sorghum use Concep or Screen-treated seed. Novartis. EPA Reg. No. 100-711 or 100-712. [IIIB1].

Herbicide Dictionary (Continued)

Dual II Magnum (metolachlor—7.65 lb/gal). Active isomer of metolachlor. Use rates are lower. Limited availability in 1998. Novartis. EPA Reg. No. [IIIB1].

Endothal (endothall). Used PRE and POST for annual grass and broadleaf weeds in sugarbeet and as a desiccant. ELF Atochem. EPA Reg. No. 4581-79. [VIII].

Endothall Active ingredient in Aquathol, Endothal, and Herbicide 273. [VIII].

Enthamefsulfuron Active ingredient in Muster. [IIA2].

Eptam (EPTC—7 lb/gal). Used PPI for control of grass and broadleaf weeds in corn, legumes, sugarbeet, and many horticultural crops. Zeneca. EPA Reg. No. 10182-220. [IIIC1].

EPTC An active ingredient in Double Play, Eptam, and Eradicane. [IIIC1].

Eradicane (EPTC + R-29148 antidote—6.7 lb/gal and 25%DF). Used PPI in corn. The antidote provides greater crop safety. Zeneca. EPA Reg. No. 10182-223 or 323. [IIIC1].

Escort (metsulfuron—60%DF). An industrial formulation of Ally. DuPont. EPA Reg. No. 352-439. [IIA2].

Ethalfluralin Active ingredient in Curbit and Sonalan. [IIIA1].

Ethofumesate An active ingredient in Betamix Progress and Norton SC. [VIII].

Expert (oxasulfuron). Under development for POST broadleaf weed control in soybean. Novartis. [IIA2].

Exceed (28.5% prosulfuron + 28.5% primsulfuron—57%DF). For POST broadleaf weeds and shattercane control in corn. Novartis. EPA Reg. No. 100-774. [IIA2].

Express (tribenuron—75%DF). A short residual POST herbicide for broadleaf weed control in wheat and barley. DuPont. EPA Reg. No. 352-509. [IIA2].

Extrazine II* (3 lb cyanazine + 1 lb atrazine—available in 4 lb/gal and 90%DF). For PP, PRE, or EPOST use in corn. DuPont. EPA Reg. No. 352-500. [VA1 + VA1].

Evik (ametryn—80%DF). Used as a directed POST directed spray for weeds in corn. Novartis. EPA Reg. No. 100-473. [VA1].

Facet (quinclorac—75%DF). A rice herbicide. BASF. EPA Reg. No. 7969-113. [IV4].

Fallow Master (1.5 lb glyphosate + 0.6 lb dicamba—2.1 lb/gal). For total weed control in fallow but not labeled in Nebraska. Monsanto. EPA Reg. No. 524-390. [IIB1 + IVA2].

Far-Go (triallate—10% DF or 4 lb/gal). For PRE control of downy brome and other grasses in winter wheat. Monsanto. EPA Reg. No. 524-292 or 524-145. [IIIC1].

Fenoxaprop Active ingredient in Option II. [IA1].

Finesse (62.5% chlorsulfuron + 12.5% metsulfuron—75%DF). For selective weed control in barley and wheat. DuPont. EPA Reg. No. 352-445. [IIA2 + IIA3].

First Rate (chloransulam methyl). Under development for POST broadleaf weed control in soybean. Dow AgroSciences. [IIA3].

Flexstar HL (fomesafen—1.88 lb/gal). POST broadleaf weed control in soybean. Zeneca. EPA Reg. No. 10182-418. [VIA1].

Fluazifop An active ingredient in Fusilade DX, Tornado, and Typhoon. [IA1].

Flumetsulam An active ingredient in Broadstrike, Broadstrike + Dual, Broadstrike Plus, Broadstrike + Treflan, and Hornet. [IIA3].

Flumiclorac An active ingredient in Resource and Stellar. [IIA3].

Fluroxypyr Active ingredient in Starane.

Fluthiamide An active ingredient in Axiom. [IIIB1].

Fluthiacet methyl Active ingredient in Action. [VIA2].

Fluxofenim Safener for sorghum seed. Called Concep III.

Fomesafen An active ingredient in Flexstar, Reflex, Tornado, and Typhoon. [VIA1].

Fosamine Active ingredient in Krenite S. [VIII].

Freedom (0.33 lb trifluralin + 2.67 lb alachlor—3 lb/gal). For PPI use in soybean. Monsanto. EPA Reg. No. 524-422. [IIIA1 + IIIB1].

Frontier (dimethenamid—6.0 lb/gal). PRE or PPI grass control in corn and soybean. BASF. EPA Reg. No. 55947-140. [IIIB1].

FulTime (2.4 lb of encapsulated acetochlor + 1.6 lb/gal of atrazine—4 lb/gal). Used for selective PRE weed control in corn. Zeneca. [IIIB1 + VA1].

Furilazole Reduces corn and sorghum seed injury from metolachlor. Novartis. EXP Reg. No.

Fusilade DX (fluazifop—2 lb/gal). A selective POST herbicide for control of shattercane, volunteer corn, and other grasses in soybean, nursery stock, and ornamentals. Zeneca. EPA Reg. No. 10182-367. [IA1].

Fusion (2 lb fluazifop + 0.66 lb fenoxaprop—2.66 lb/gal). For POST grass control in soybean. Zeneca. EPA Reg. No. 10182-343. [IA1 + IA1].

Galaxy (3 lb bentazon + 0.67 lb acifluorfen—3.67 lb/gal). For POST broadleaf weed control in soybean. BASF. EPA Reg. No. 7969-77. [VC1 + VIA1].

Glean (chlorosulfuron—75%DF). POST broadleaf herbicide for small grains. DuPont. EPA Reg. No. 352-522. [IIA2].

Glufosinate Active ingredient in Liberty [IIC1].

Glyphosate An active ingredient in Fallow Master, Landmaster BW, Rodeo, and Roundup Ultra. Monsanto. [IIB1].

Goal 2XL (oxyfluorfen—1.6 lb/gal). A PRE herbicide for soybean, onion, and nursery stock. Rohm and Haas. EPA Reg. No. 707-243. [VIA1].

Gramoxone Extra (paraquat—2.5 lb/gal). A nonselective herbicide used for no-till, ecofarming; soybean and sunflower desiccation; and on noncropland. Zeneca. EPA Reg. No. 10182-280. [VIB1].

Grazon P + D (0.54 lb picloram + 2.0 lb 2,4-D—2.5 lb/gal). For woody and perennial weed control in range and permanent grass pastures. Dow AgroSciences. EPA Reg. No. 62719-182. [IVA3 + IVA1].

Herbicide Dictionary (Continued)

Guardsman (2.33 lb dimethenamid + 2.67 atrazine—5 lb/gal). For selective PRE or EPOST weed control in corn. BASF. EPA Reg. No. 55947-150. [IIIB1 + VA1].

Halosulfuron Active ingredient in Battalion and Permit. [IIA2].

Harmony Extra (50% thifensulfuron + 25% tribenuron—75% DF). For weed control in small grains. DuPont. EPA Reg. No. 352-538. [IIA2 + IIA2].

Harness (acetochlor + safener—7 lb/gal). Used PP or PRE for selective weed control in corn. Monsanto. EPA Reg. No. 524-473. [IIIB1].

Harness Xtra (4.3 lb acetochlor + safener + 1.7 lb atrazine—6.0 lb/gal). Used PRE for selective weed control in corn. Monsanto. EPA Reg. No. 524-480. [IIIB1 + VA2].

Herbicide 273 (endothall). A POST sugarbeet herbicide especially effective against broadleaf weeds. Elf Atochem. EPA Reg. No. 4581-223. [VIII].

Hexazinone Active ingredient in Velpar. [VA2].

Hi-Dep Formulation of 2,4-D ester for low volume application. PBI-Gordon. EPA Reg. No. 2217-703. [IVA1].

Hoelon (diclofop—3 lb/gal). Used PPI or POST for certain annual grass on wheat. AgrEvo. EPA Reg. No. 45639-173. [IA1].

Hornet (0.23 lb flumetsulam + 0.62 lb clopyralid—0.856 lb/gal). For selective PRE broadleaf control in corn. Dow AgroSciences. EPA Reg. No. 62719-253. [IIA3 + VA3].

Hyvar X (bromacil—80%WP or 2 lb/gal). Used as a soil sterilant and for woody plant control. DuPont. EPA Reg. No. 352-287 or 352-346. [VA4].

Imazamax Active ingredient in Raptor. [IIA1].

Imazameth Proposed name for Plateau.

Imazamethabenz Active ingredient in Assert.

Imazapyr An active ingredient in Arsenal, Lightning, and Topside. [IIA1].

Imazaquin An active ingredient in Detail, Scepter, Scepter O.T., and Steel. [IIA1].

Imazethapyr An active ingredient in Lightning, Passport, Pursuit, Pursuit Plus, Stature, and Steel. [IIA1].

Isoxazole Active ingredient in Balance. [IIA1].

Judge Generic alachlor. Riverside/Terra. [IIIB1].

Karmex DF (diuron—80%WP). A substituted urea for selective annual weed control at low rates in established alfalfa and as a soil sterilant at higher rates. DuPont. EPA Reg. No. 352-508. [VB1].

Kerb (pronamide—50%WS). Use PRE or EPOST in alfalfa. Rohm and Haas. EPA Reg. No. 707-159. [IIIA3].

Krenite S (fosamine—4 lb/gal). A water soluble brush control agent that can be used on noncropland areas adjacent to water. DuPont. EPA Reg. No. 352-395. [VIII].

Lactofen An active ingredient in Cobra and Stellar. [VIA1].

Laddok S-12 (2.5 lb bentazon + 2.5 lb atrazine—5.0 lb/gal). For POST broadleaf weed control in corn and sorghum. BASF. EPA Reg. No. 7969-100. [VC1 + VA1].

Landmaster BW (1.2 lb glyphsoate + 1.9 lb 2,4-D—3.1 lb/gal). Used primarily for no-till. Monsanto. EPA Reg. No. 524-351. [IIB1 + IVA1].

Lariat (2.5 lb alachlor + 1.5 lb atrazine—4 lb/gal). Monsanto. EPA Reg. No. 524-329. [IIIB1 + VA1].

Lasso (alachlor—4 lb/gal and 67%DF). Used PP or PRE for annual grass and some broadleaf weeds in corn, sorghum, soybean, and fieldbean. Monsanto. EPA Reg. No. 524-314. [IIIB1].

Lasso II (alachlor—15%G). Granular formulation of Lasso. Monsanto. EPA Reg. No. 524-296. [IIIB1].

Leafex-3 (sodium chlorate). Used as a sorghum desiccant. Occidental. [XIII].

Lexone (metribuzin—available in 4 lb/gal and 75%DF).

Used to control weeds in corn, potato, soybean, and fallow. DuPont. EPA Reg. No. 352-390. [VA2].

Liberty (glufosinate—1.67 lb/gal). Registered for use in herbicide resistant Liberty Link hybrid crops. AgrEvo. [IIC1].

Lightning (imazethapyr + imazapyr). Under development for POST broadleaf and grass control in IMI corn. Am. Cyanamid. EPA Reg. No. 241-377. [IIA1 + IIA2].

Linex 4L or 50DF (linuron). Trade name for linuron. Griffin. EPA Reg. No. 1812-245 or 1812-320. [VB1].

Linuron An active ingredient in Linex, Linuron WP, Lorox, and Lorox Plus. Used primarily PRE for broadleaf weeds in corn, sorghum, and soybean. [VB1].

Linuron WP (linuron—50%). Drexel. [VB1].

Londax (bensulfuron). A rice herbicide. DuPont. EPA Reg. No. 352-506. [IIA2].

Lorox DF (linuron—50%DF). DuPont. See linuron. EPA Reg. No. 352-394. [VB1].

Lorox Plus (56.9% linuron + 3.1% chlorimuron—60%DF). For PRE use in corn, sorghum, and soybean. DuPont. EPA Reg. No. 352543. [VB1 + IIA2].

Marksman* (1.1 lb dicamba + 2.1 lb atrazine—3.2 lb/gal). For POST weed control in corn and sorghum. BASF. EPA Reg. No. 55947-39. [IVA2 + VA1].

Matador (quizalofop—0.8 lb/gal). POST grass control in soybean. FMC. [IA1].

Matrix (rimsulfuron—25%DF). Used PRE or POST for selective broadleaf and grass control in potato. DuPont. EPA Reg. No. 352-556. [IIA2].

MCPA A phenoxy similar to 2,4-D but safer on oat and legumes. Often used in combination. Many trade names. [IVA1].

MCPP mecoprop. [IVA1].

Mecoprop Active ingredient in MCPP. [IVA1].

Herbicide Dictionary (Continued)

Metolachlor An active ingredient in Bicep II, Bicep Lite II, Bicep II Magnum, Broadstrike + Dual, Dual, Dual II, Dual II Magnum, Pennant, and Turbo. [IIIB1].

Metribuzin Used PRE or POST for annual weeds in soybean, alfalfa, and potato; often used in combination. An active ingredient in Axiom, Canopy, Lexone, Salute, Sencor, and Turbo. [VA2].

Metsulfuron Active ingredient in Ally and Escort. [IIA2].

Micro-Tech (4 lb/gal). Mirco-encapsulated alachlor. Monsanto. EPA Reg. No. 524-344. [IIIB1].

MON 37500 (sulfosulfuron—proposed name). An experimental herbicide for downy brome control in winter wheat. Monsanto. [IIA2].

Moxy 2E (bromoxynil—2 lb/gal). Used for weed control in alfalfa, corn, small grains, and sorghum. Riverside/Terra. EPA Reg. No. 51036-256-9779. [VC2].

Moxy + atrazine (1 lb/gal bromoxynil + 2 lb/gal atrazine). Used for POST control of grass and broadleaf weeds in corn. EPA Reg. No. Riverside/Terra. [VC2 + VA1].

MSMA (monosodium methanearsonate). Used for selective crabgrass control in turf. Drexel, Helena. [VIII].

Muster (ethametsulfuron). DuPont. [IIA2].

Naptalam Active ingredient in Alanap. [IIID1].

Nicosulfuron An active ingredient in Accent and Basis Gold. [IIA2].

Norflurazon Active ingredient in Solicam and Zorial Rapid 80. [VIIA3].

Nortron SC (ethofumesate—4 lb/gal). A PPI, PRE, or POST herbicide for sugarbeet. AgroEvo. EPA Reg. No. 45639-8. [VIII].

Optill (5 lb dimethenamid + 1 lb of dicamba—6lb /gal). For PRE or PPI control of grass and broadleaf weeds in corn. BASF. [IIIB1 + IVA2].

Option II (fenoxaprop—0.67 lb/gal). A POST grass herbicide in soybean similar to Fusilade and Poast. AgrEvo. EPA Reg. No. 45639-185. [IA1].

Oryzalin Active ingredient in Surflan. [IIIA1].

Oust (sulfometuron—75%DF). A noncropland herbicide that also provides suppression of perennial grasses at lower rates. DuPont. EPA Reg. No. 352-401. [IIA2].

Oxabatrinil A seed protectant for reducing corn and sorghum injury from metolachlor. [IIA2].

Oxasulfuron Active ingredient in Expert. [IIIA1].

Oxyfluorfen Active ingredient in Goal. [VIA1].

Paraquat Active ingredient in Gramoxone Extra. Zeneca. [VIB1]

Partner (alachlor—65%WDG). Dry flowable formulation of Lasso. Monsanto. EXP Reg. No. 524-403. [IIIB1].

Passport (2.4 lb trifluralin + 0.2 lb imazethapyr—2.6 lb/gal). Used PPI for weed control in soybean. Am. Cyanamid. EPA Reg. No. 241-325. [IIIA1 + IIA1].

Peak (prosulfuron—57%DF). PRE and POST broadleaf control in sorghum, cereals, and proso millet. Novartis. EPA Reg. No. 100-763. [IIA2].

Pendimethalin Common name for Prowl. Also active ingredient in some PRE turf herbicides. Am. Cyanamid. [IIIA1].

Pennant (metolachlor—5 lb/gal). Industrial label for Dual. Novartis. [IIIB1].

Permit (halosulfuron—75%DF). Used POST for broadleaf weed control in corn and sorghum. Monsanto. EPA Reg. No. 524-465. [IIA2].

Phenmedipham An active ingredient in Betamix and Betamix Progress.

Picloram An active ingredient in Grazon P + D, Tordon 22K, and Tordon K. [IVA3].

Pinnacle (thifensulfuron—75%DF). Used POST for broadleaf control in soybean. DuPont. EPA Reg. No. 352-525. [IIA2].

Plateau (imazameth—2 lb/gal). Used for PRE or POST control of selective grass and broadleaf weeds in non-crop areas. Am. Cyanamid. EPA Reg. No. 241-365. [IIA1].

Poast (sethoxydim—1.50 lb/gal). A POST herbicide for shattercane, volunteer corn, and other grass weeds in soybean and other broadleaf crops. BASF. EPA Reg. No. 7969-58. [IA2].

Poast Plus (sethoxydim—1.0 lb/gal). A combination of sethoxydim + Dash. BASF. EPA Reg. No. 7969-88. [IA2].

Pramitol 25E (prometon—2 lb/gal). Used primarily for season long control of annual and perennial weeds in noncropped areas. Novartis. EPA Reg. No. 100-443. [VA1].

Pramitol 5PS (5% prometon, 0.75% simazine, 40% sodium chlorate, and 50% sodium metaborate). Soil sterilant. Novartis. EPA Reg. No. 100-479. [VA1, VA1, XIII, XIII].

Prefar 4E (bensulide—4 lb/gal). Used PRE for grass and broadleaf weeds in cantaloupe, cucumber, and watermelon. Gowan. EPA Reg. No. 10163-222. [VIII].

Prestige (sethoxydim—1.0 lb/gal). Used POST for control of small grass weeds in soybean. Am. Cyanamid. EPA Reg. No. 7969-79-241. [IA1].

Preview (68.5% metribuzin + 6.5% chlorimuron—75%DF). For use in soybean. DuPont. EPA Reg. No. 352-448. [VA2].

Primisulfuron Active ingredient in Beacon. [IIA1].

Princep 4L or Caliber 90 (simazine—4 lb/gal or 90%DF). A long lasting PRE for corn and shelterbelts. Novartis. EPA Reg. No. 100-526 or 100-603. [VA1].

Prism (clethodim—0.94 lb/gal). Used selective POST for control of grass in onion and sugarbeet. Valent. EPA Reg. No. 59639-78. [IA2].

Prometon An active ingredient in Pramitol 25E and Pramitol 5PS. [VA1].

Pronamide Active ingredient in Kerb. [IIIA1].

Propachlor Active ingredient in Ramrod. Used for grass weed control in corn and sorghum. [IIIB1].

Herbicide Dictionary (Continued)

Prosulfuron Active ingredient in Peak. [IIA2].

Prowl (pendimethalin—3.3 lb/gal). Used PRE or EPOST on corn and PP or PRE on soybean grown on soils with more than 1.5% organic matter. Am. Cyanamid. EPA Reg. No. 241-337. [IIIA1].

Pursuit (imazethapyr—2 lb/gal or 70%DG). Used PP, PRE, or POST for weed control in alfalfa, IMI-corn, and soybean. Am. Cyanamid. EPA Reg. No. 241-350. [IIA1].

Pursuit Plus (0.2 lb imazethapyr + 2.7 lb pendimethalin—2.9 lb/gal). For PPI use in IMI-corn and soybean. Am. Cyanamid. EPA Reg. No. 241-331. [IIA1 + IIIA1].

Pyramin DF or SC (pyrazon—4.5 lb/gal or 67.7% DF). Use for PRE for broadleaf weeds in sugarbeet. BASF. EPA Reg. No. 7969-108 or 7969-81. [VII3].

Pyrazon Active ingredient in Pyramin. [VIIA3].

Pyridate Active ingredient in Tough. [VC3].

Quinclorac Active ingredient in Facet. [IVA4].

Quizalofop Active ingredient in Assure II. [IA1].

Ramrod (propachlor—4 lb/gal and 20%DF). Used for grass control in grain sorghum. Monsanto. EPA Reg. No. 524-331. [IIIB1].

Raptor (imazamox). For selective POST weed control in soybean. Am. Cyanamid. EPA Reg. No. 241-379. [IIA1].

Reflex (fomesafen—2 lb/gal). Used POST for selective broadleaf control in soybean. Zeneca. EPA Reg. No. 10182-83. [VIA1].

Reliance STS (0.32 oz chlorimuron + 0.18 oz thifensulfuron). For selective POST broadleaf control in STS soybean only. DuPont. EPA Reg. No. 352-580. [IIA2 + IVA1].

Rescue (2 lb naptalam + 0.06 lb 2,4-DB—2.06 lb/gal). Used POST for broadleaf weeds in soybean. Uniroyal. EPA Reg. No. 400-166. [IIID1 + IVA1].

Resolve SG (18.7% imazethapyr + 56.3% dicamba— 70%). Used POST for weed control in IMI-corn hybrids. Am. Cyanamid. EPA Reg. No. 241-359. [IIA1 + IVA2].

Resource (flumiclorac—0.86 lb/gal). Used for selective POST broadleaf control in soybean and corn. Valent. EPA Reg. No. 59639-82. [VIA2].

Reward (diquat—2 lb/gal). Used for aquatic noncrop weed control and a desiccant. Zeneca. EPA Reg. No. 10182-353. [VIB1].

Rezult (bentazon—5 lb/gal + sexthoxydim—1 lb/gal). A twin pack of Rezult B (bentazon) and Rezult G (sethoxydim) for POST for weed control in soybean. BASF. EPA Reg. No. 7969-12, 7969-45, and 7969-88). [VC1 + IA1].

Rhomene (MCPA amine—4 lb/gal). Used for broadleaf weeds in small grain. Rhone-Poulenc. EPA Reg. No. 264-47AA. [VA1].

Rhonox (MCPA ester—3.7 lb/gal). Used to control broadleaf weeds in small grain, rangeland, and turf. Rhone-Poulenc. EPA Reg. No. 264-513. [IVA1].

Rimsulfuron An active ingredient in Matrix and Basis Gold. [IIIC1].

Ro-Neet (cycloate—6 lb/gal). Used PPI in sugarbeet for annual grass and some broadleaf weeds. Zeneca. EPA Reg. No. 10182-178. [IIIC1].

Rodeo (glyphosate—4 lb/gal). Special formulation of glyphosate for aquatic weed control. Monsanto. EPA Reg. No. 524-343. [IIB1].

Roundup Ultra (glyphosate—3 lb/gal + surfactant). A POST nonselective translocated herbicide for annual and perennial grass and broadleaf weed control. Round Ultra is labeled for weed control in Round Ultra Ready soybean varieties. Monsanto. EPA Reg. No. 524-475. [IIB1].

Roundup Ultra RT (glyphosate—3 lb/gal). Only available in a 100-gallon returnable shuttle. Can only be used in western 2/3 of Nebraska. Monsanto. EPA Reg. No. 524-475. [IIB1].

Saddle Generic alachlor. Van Deist. [IIIB1].

Salute 4EC (2.67 lb trifluralin + 1.33 lb metribuzin—4 lb/gal). For use in soybean. Bayer. EPA Reg. No. 3125-375. [IIIA1 + VA2].

Salvo (Isooctyl ester of 2,4-D—5 lb/gal). A low volatile ester. UAP. EPA Reg. No. 34704-605. [IVA1].

Savage (2,4-D—95%WP). UAP. EPA Reg. No. 34704-606. [IVA1].

Scepter (imazaquin in 1.5 lb/gal or 70%DF). A PPI, PRE, or POST grass and broadleaf weed control herbicide for soybean. Am. Cyanamid. EPA Reg. No. 241-289 or 306. [IIA1].

Scepter O.T. (0.5 lb imazaquin + 2 lb acifluorfen—2.5 lb/gal). For selective POST broadleaf control in soybean. Am. Cyanamid. EPA Reg. No. 241-321. [IIA1 + VIA1].

Scorpion III (9.3% flumetsulam + 25% clopyralid + 50% 2,4-D). Used POST for selective broadleaf control in corn. Dow AgroSciences. EPA Reg. No. 62719-264. [IIA3 + IVA3 + IVA1].

Screen (25%DF). A protectant for application to sorghum seed to reduce Lasso injury. Monsanto.

Select (clethodim—2 lb/gal). Used POST for annual and perennial grasses in soybean. Valent. EPA Reg. No. 59639-3. [IA2].

Sencor (metribuzin—4 lb/gal or 75%DF). Trade name for metribuzin. Bayer. EPA Reg. No. 3125-314 or 3125-325. [VA2].

Sethoxydim Active ingredient in Conclude G, Poast, Poast Plus, and Prestige. [IA2].

Shotgun (1.0 lb 2,4-D + 2.25 lb atrazine—3.75 lb/gal). For POST use in sorghum and corn. UAP. EPA Reg. No. 34704-728. [IVA1 + VA1].

Simazine Active ingredient in Aquazine and Princep. [VA1].

Sinbar (terbacil—80%WP). Used in dormant season for control of annual grass and broadleaf weeds in established alfalfa. DuPont. EPA Reg. No. 352-317. [VA4].

Skirmish (chlorimuron).

Sodium chlorate Active ingredient in Leafex-3.

Solicam DF (norflurazon—80%DF). Used PRE in fruit trees. BASF. EPA Reg. No. 55947-78. [VIIA3].

Herbicide Dictionary (Continued)

Sonalan HFP (ethalfluralin—3 lb/gal). Use PPI for annual grasses and certain broadleaf weeds in field bean, soybean, and sunflower. Dow AgroSciences. EPA Reg. No. 62719-188. [IIIA1].

Spike 20P (tebuthiuron—0.2 lb/gal). Used for total vegetation and selective brush control in grassland and noncrop areas. Dow AgroSciences. EPA Reg. No. 62719-121. [VB1].

Squadron (0.33 lb imazaquin + 2 lb pendimethalin—2.33 lb/gal). For PP, PPI, or PRE weed control in soybean. Am. Cyanamid. EPA Reg. No. 241-327. [IIA1 + IIIA1].

Stall Generic alachlor. UAP. [IIIB1].

Starane (fluroxypyr). Under development for kochia and other broadleaf weeds in small grain. Label by 1999. UAP and Dow AgroSciences.

Stature Under development combination of dimethenamid and imazethapyr for PRE weed control in corn. Am. Cyanamid. EPA Reg. No. [IIIB1 + IIA1].

Status (acifluorfen—2 lb/gal). For POST broadleaf weed control in soybean. Am. Cyanamid. EPA Reg. No. 7969-79-241. [VIA1].

Steel (0.17 lb imazaquin + 0.17 lb imazethapyr + 2.25 lb pendimethalin—3.4% lb/gal). For PP, PPI, or PRE control of grass and broadleaf weeds in soybean. Am. Cyanamid. EPA Reg. No. 241-376. [IIA2 + IIA2].

Stellar (0.7 lb flumiclorac + lactofen 2.4 lb —2.9 lb/gal). Used for POST broadleaf weed control in soybean. Valent. EPA Reg. No. 59639-92. [IIA3 + VIA1].

Stinger (clopyralid—3 lb/gal). For POST broadleaf weed control in sugarbeet and corn. Dow AgroSciences. EPA Reg. No. 62719-73. [IVA3].

Sulfentrazone An active ingredient in Authority, Authority Broadleaf, Authority One-Pass, Canopy XL, and Cover. [VIA3].

Sulfometuron Active ingredient in Oust. [IIA2].

Sulfosate Active ingredient in Touchdown. [IIB1].

Surflan A.S. (oryzalin—4 lb/gal). Used PRE for annual grasses in trees, turf, and ornamentals. Dow AgroSciences. EPA Reg. No. 62719-112. [IIA1].

Surpass EC (acetochlor + safener—6.4 lb/gal). Used PRE for control of annual grass in corn. Zeneca. EPA Reg. No. 10182-325. [IIIB1].

Surpass 100 (3 lb acetochlor + safener + 2 lb atrazine—5 lb/gal). For PRE control of annual grass and broadleaf weeds in corn. Zeneca. EPA Reg. No. 10182-363. [IIIB1 + VA1].

Sutan+ (butylate + R-25788—available in 10%DF and 6.7 lb/gal). A PPI herbicide for annual grasses in corn. Micro Flo. EPA Reg. No. 51036-248. [IIIC1].

Sword (MCPA—5.2 lb/gal). Used for broadleaf control in small grain and pastures. UAP. EPA Reg. No. 228-267-34704. [IVA1].

Synchrony STS (0.63 oz of chlorimuron + 0.22 oz thifensulfuron). For POST broadleaf control in STS soybean. DuPont. EPA Reg. No. 352-568. [IIA2 + IIA2].

2,4-D A growth regulating phenoxy herbicide for broadleaf weed control in grass crops. Many trade names. [IVA1].

2,4-DB A growth regulating phenoxy herbicide for broadleaf weed control in alfalfa and soybean. An active ingredient in Buctyrac 175, Butyrac 200, and Rescue. [IVA1].

Tebuthiuron Active ingredient in Spike. [VB1].

Telar (chlorsulfuron—75%DF). Used to control weeds in noncrop areas. DuPont. EPA Reg. No. 352-404. [IIA2].

Terbacil Active ingredient in Sinbar. [VA4].

Thifensulfuron An active ingredient in Basis, Harmony Extra, Pinnacle, and Synchrony STS. [IIA2].

TopHand (acetochlor + halosulfuron + furalazole). Being developed for selective PRE weed control in corn. Monsanto. [IIIB1 + IIA2].

TopNotch (acetochlor + safener—3.2 lb/gal). An encapsulated form of Surpass for selective PRE weed control in corn. Zeneca. EPA Reg. No. 10182-391. [IIIB1].

Topsite (0.5% imazapyr + 2.0% diuron—2.5%). Controls many annual and perennial weeds in non-crop areas. Am. Cyanamid. EPA Reg. No. 241-344. [IIA2 + VB1].

Tordon (picloram—available in 2 lb/gal (22K) or 1.25 lb/gal RTU). A POST herbicide for annual and perennial broadleaf weeds. Residues may last for several years in the soil. RTU is applied as a cut surface treatment on trees. Dow AgroSciences. EPA Reg. No. 62719-6 or 62719-31. [IVA3].

Tornado (0.75 lb fluazifop + 1 lb fomesafen). Used POST for grass and broadleaf weed control in soybean. Zeneca. EPA Reg. No. 10182-141. [IA1 + VIA1].

Touchdown (sulfosate—6 lb/gal). A nonselective, nonresidual translocated POST herbicide. Zeneca. EPA Reg. No. 10182-324. [IIB1].

Tough (pyridate—3.75 lb/gal). Used in combination with atrazine for POST weed control in corn. Novartis. EPA Reg. No. 55947-161. [VC3].

Tralkoxydim Active ingredient in Achieve. [IA2].

Treflan E.C. or Treflan 5 (trifluralin—4 or 5 lb/gal). Used PPI in field bean, soybean, several vegetables, and nursery stock for annual grass control. Dow AgroSciences. EPA Reg. No. 62719-93 or 62719-118. [IIIA1].

Triallate Active ingredient in Far-Go. [IIIC1].

Triasulfuron Active ingredient of Amber. [IIA2].

Tribenuron An active ingredient of Express and Harmony Extra. [IIA2].

Triclopyr An active ingredient in Grazon P + D. [IVA3 + IVA1].

Trific DF Formulation of trifluralin. Riverside/Terra. [IIIA1].

Trifluralin An active ingredient in Broadstrike + Treflan, Freedom, Passport, Treflan, Trific, Trillin, and Tri-Scept. [IIIA1].

Triflusulfuron Active ingredient in Upbeet. [IIA2].

Herbicide Dictionary (Continued)

Trillin (trifluralin 4 lb/gal or 10G). Griffin. EPA Reg. No. 1812-355 or 1812-328. [IIIA1].

Trimec (2.03 lb 2,4-D, 1.08 lb mecoprop, and 0.21 lb dicamba—3.32 lb/gal). For lawn weed and woody plant control. PBI-Gordon. EPA Reg. No. 2217-721. [IVA1 + IVA1 + IVA2].

Tri-Scept (3 lb imazaquin + 2.57 lb trifluralin—5.57 lb/gal). For PPI use in soybean. Am. Cyanamid. EPA Reg. No. 241-307. [IIA1 + IIIA1].

Turbo (6.55 lb metolachlor + 1.45 lb metribuzin—8 lb/gal). Used to control weeds in potato and soybean. Bayer. EPA Reg. No. 3125-366. [IIIB1 + VA2].

Twister An under development combination of fomesafen, fluazifop, and fenoxaprop for POST weed control in soybean. Zeneca. [VIA1 + IA1 + A1].

Typhoon (0.47 lb fluazifop + 0.94 lb fomesafen—1.14 lb/gal). For POST control of grass and broadleaf weeds in soybean. Zeneca. EPA Reg. No. 10182-368. [IA1 + VIA1].

2 plus 2 (MCPP + 2,4-D) (1.9 lb mecoprop + 1.8 lb 2,4-D amine—3.7 lb/gal). Used to control broadleaf weeds in turf. ISK Biosciences. EPA Reg. No. 50534-11. [IVA1 + IVA1].

Upbeet (trisulfuron methyl—50%DF). Used for selective POST control of broadleaf and grass weeds in sugarbeet. DuPont. EPA Reg. No. 352-569. [IIA2].

Velpar or Velpar L (hexazinone—90%DF or 4L). Used for nonselective POST weed control on noncropland, Christmas tree plantings, and alfalfa. DuPont. EPA Reg. No. 352-378 or 352-392. [VA2].

Weedone 638 (1 lb 2,4-D acid and 1.8 lb of 2,4-D ester—2.8 lb/gal). Rhone-Poulenc. EPA Reg. No. 264-37. [IVA1 + IVA1].

Weedone 2,4-DP (dichloroprop)

Weedtrine-D (diquat). Use for aquatic weed control.

Zorial Rapid 80 (norflurazon—78.6%WP). Used for controlling weeds in soybean. Novartis. EPA Reg. No. 55947-77. [VIIA3].

Approximate Retail Prices of Selected Herbicides

Herbicide	Price	Herbicide	Price	Herbicide	Price
Accent	$ 26.70/oz	Detail	$ 120.00/gal	Plateau	$ 265.00/gal
Ally	$ 28.46/oz	Diquat	$ 77.80/gal	Poast	$ 68.00/gal
Amber	$ 11.03/oz	DoublePlay	$ 33.22/gal	Poast Plus	$ 48.00/gal
AAtrex 4L	$ 12.62/gal	Dual 8E	$ 63.61/gal	Pramitol SP	$ 1.20/gal
AAtrex 80W	$ 3.00/lb	Eptam 7E	$ 27.38/gal	Pramitol 25E	$ 20.50 gal
AAtrex DF	$ 3.02/lb	Eptam 10G	$ .39/lb	Prefar	$ 35.40/gal
Alanap L	$ 13.30/gal	Eptam 20G PRE/PPI	$ .85/lb	Prestige	$ 45.75/gal
Amitrol-T	$ 21.50/gal	Eradicane	$ 23.58/gal	Princep 80W	$ 3.55/lb
Ammonium Sulfate	$ 0.18/lb	Eradicane 25G	$ 1.15/lb	Princep 4L	$ 16.80/gal
Aquathol	$ 1.10/lb	Escort	$ 34.50/oz	Prowl	$ 29.76/gal
Aquathol 1.6E	$ 45.10/gal	Exceed	$ 11.00/oz	Pursuit DG	$ 233.00/lb
Aquazine	$ 8.85/gal	Extrazine II	$ 18.06/gal	Pursuit Plus	$ 76.03/gal
Assure II	$ 139.00/gal	Finesse	$ 16.52 oz	Ramrod-Atrazine	$ 14.92/gal
Arsenal	$ 184.54/gal	Fallow Master	$ 22.80/gal	Ramrod-Flowable	$ 16.34/gal
Authority Broadleaf	$ 2.69/oz	Far-Go 10G	$ 1.00/lb	Raptor	$ 175.25/qt
Balan	$ 16.00/gal	Freedom	$ 11.96/gal	Reflex	$ 36.93/gal
Banvel	$ 74.45/gal	Frontier (6.0)	$ 108.00/gal	Reliance	$ 7.20/oz
Basagran	$ 64.47/gal	Fultime	$ 35.00/gal	Resource	$ 206.00/gal
Basis	$ 36.36/oz	Fusilade DX	$ 120.00/gal	Reward	$ 95.30/gal
Basis Gold	$ 18.25/lb	Fusion	$ 143.25/gal	Reward PRE/PPI	$ 69.50/gal
Beacon	$ 25.06/oz	Galaxy	$ 56.84/gal	Rodeo	$ 110.45/gal
Betamix	$ 85.00/gal	Glean	$ 18.23/oz	Ro-Neet 7E	$ 51.50/gal
Betamix Progress	$ 99.00/gal	Goal 1.6E	$ 77.00/gal	Roundup Ultra	$ 46.19/gal
Bicep/Bicep II	$ 32.51/gal	Gramoxone Extra	$ 30.76/gal	Roundup Ultra RT	$ 35.00/gal
Bladex 4L	$ 23.93/gal	Grazon P + D	$ 26.00/gal	Sceptor	$ 214.65/gal
Bladex 90DF	$ 5.31/lb	Guardsman	$ 36.93/gal	Scorpion III	$ 2.23/oz
Blazer 2L	$ 57.67/gal	Harmony Xtra	$ 11.97/oz	Select	$ 204.24/gal
Broadstrike + Dual	$ 78.00/gal	Harness	$ 65.00/gal	Sencor 4L	$ 136.39/gal
Broadstrike + Treflan	$ 72.00/gal	Harness Xtra	$ 43.30/gal	Sencor DF	$ 25.96 lb
Brominal 3+3	$ 77.00/gal	Herbicide 273	$ 38.00/gal	Sinbar	$ 22.50/lb
Bronate	$ 54.61/gal	Hoelon	$ 60.25/gal	Solicam	$ 10.80/lb
Bronco	$ 26.86/gal	Hornet	$ 61.00/lb	Sonalan	$ 32.29/gal
Buctril	$ 52.45/gal	Hyvar X	$ 17.25/gal	Sonalan PRE/PPI	$ 1.25/lb
Buctril Gel	$ 108.61/gal	Hyvar XL	$ 50.55/gal	Spike 5G	$ 3.00/lb
Buctril + Atrazine	$ 34.71/gal	Karmex 80W	$ 4.30/lb	Spike 80W	$ 21.50/lb
Bullet	$ 19.71/gal	Kerb	$ 26.75/lb	Spike 20P	$ 8.60/lb
Butoxone	$ 15.00/gal	Krenite	$ 58.35/gal	Squadron	$ 60.39/gal
Butyrac	$ 35.71/gal	Krovar I	$ 9.20/lb	Status	$ 55.75/gal
Canopy	$ 36.88/lb	Laddok	$ 36.72/gal	Steel	$ 62.00/gal
Canopy XL	$ 2.69/oz	Laddok S-12	$ 38.50/gal	Stellar	$ 226.00/gal
Casoron 10G	$ 3.40/lb	Landmaster BW	$ 19.15/gal	Stinger	$ 466.22/gal
Casoron 50W	$ 15.00/lb	Lasso	$ 25.71/gal	Surflan	$ 67.00/gal
Casoron 4G	$ 1.25/lb	Lasso II	$ 0.99/lb	Surpass	$ 57.00/gal
Classic	$ 10.00/oz	Lariat	$ 19.22/gal	Surpass 100	$ 33.70/gal
Clarity	$ 85.10/gal	Leafex 3	$ 3.45/gal	Sutan+	$ 20.67/gal
Cobra	$ 117.51/gal	Lexone 4L	$ 142.70/gal	Sutazine	$ 17.85/gal
Commence	$ 64.30/gal	Lexone DF	$ 26.08/lb	Synchrony	$ 5.25/oz
Command 3ME	$ 60.00/gal	Lightning	$ 14.00/oz	Team	$ 25.00/oz
Command 4EC	$ 79.26/gal	Lorox DF	$ 9.02/lb	Telar	$ 21.55/oz
Concert PRE/PPI	$ 24.00/oz	Lorox Plus	$ 16.01/lb	Treflan	$ 33.11/gal
Contour	$ 99.18/gal	Marksman	$ 25.51/gal	Treflan PRE/PPI	$ 1.09/lb
Crop Oil Conc.	$ 4.24/gal	Matrix	$ 16.50/oz	Topnotch	$ 34.00/gal
Crossbow	$ 43.00/gal	MCPA	$ 13.83/gal	Tordon 22K	$ 91.24/gal
Curbit	$ 39.00/gal	Micro-Tech	$ 26.08/gal	Touchdown	$ 64.00/gal
Curtail	$ 33.93/gal	MSO	$ 27.00/gal	Tough	$ 56.00/gal
Cycle	$ 33.93/gal	Norosac 4G	$ 1.25/gal	Turbo	$ 99.27/gal
Gramoxone Extra	$ 26.13/gal	Nortron SC	$ 166.00/gal	UAN	$ 0.70/gal
2,4-D amine	$ 10.75/gal	X-77	$ 17.50/gal	Upbeet	$ 43.00/oz
2,4-D ester	$ 13.51/gal	Partner	$ 4.15/lb	Velpar	$ 52.00/lb
Dacthal 75W	$ 4.80/lb	Peak	$ 10.00/oz	Vernam	$ 28.00/gal
Dash	$ 12.75/gal	Permit	$ 13.02/oz	Zorial Rapid 80	TBA
Defol 6	$ 5.60/gal	Pinnacle	$ 28.99/oz		

Weed Science References

The following resources are published by the University of Nebraska Extension and are available from your County Extension Educator.

Annual Broadleaf Weed Control in Winter Wheat — G863
Annual Grass and Perennial Weed Identification — RP92
Aquatic Weed Control — RP241
Banvel and 2,4-D Damage to Fieldbeans and Soybean — G802
Best Management Practices for Agricultural Pesticide to Protect Water Resources — G1182
Blue Mustard Control G1272
Canada Thistle Control — G509
Common Milkweed — G384
Common Weed Seedlings of the United States and Canada. Coop Ext. Serv. U. of Georgia.
Conducting a Prescribed Burn — EC90-121
Control of Downy Brome in Alfalfa — G436
Controlling Jointed Goatgrass — G1252
Controlling Volunteer Rye in Winter Wheat — G1225
Disposal of Excess Pesticides and Related Waste — G473
Downy Brome Control — G422
Ecofarming: Fallow Aids in Winter Wheat Fallow Rotations — G546
Ecofarming: Spring Row Crop Planting and Weed Control in Winter Wheat Stubble — G551
Ecofarming-Growing the Winter Wheat Crop — G1009
Ecofarming-Managing Corn and Sorghum Residue During Fallow — G1010
Ecofarming — No-Till Sorghum Following Ecofallow Corn or Sorghum — G809
Effective Herbicide Use in Christmas Tree Plantations — RP251
Factors Affecting Foliar-Applied Herbicides — RP250
Factors That Affect Soil-Applied Herbicides — G1081
Fertilizer and Pesticide Containment Guidelines — G1185
Field Records for Restricted Use Pesticide Applications and Integrated Crop Management by Private Applicators — EC2540
Fine Tuning a Sprayer With the "Ounce" Calibration Method — G865
Grassland Management with Prescribed Burning — G88-894
Hemp Dogbane — G665
Herbicide Mode of Action and Injury Symptoms — RP377
Herbicide Resistant Weeds — RP468
Integrated Turfgrass Management for the Northern Great Plains — EC97-1557
Lawn Weed Prevention and Management — G1045
Lawn Weeds and Their Control — RP26
Leafy Spurge — G834
Management of Eastern Redcedar on Grasslands — G96-1308
Musk Thistle — G1109
Nebraska Poisonous Plants — EC85-198
No-Till Corn in Alfalfa Sod — G131
Nozzles-Selection and Sizing — G955
Pesticide Laws and Regulations — G479
Pigweed Identification — A Pictorial Guide to the Common Pigweeds of the Great Plains — EC138
Plumbing Systems for Agricultural Sprayers — G1020
Prescribed Burn — EC121
Questions and Answers About Atrazine — G1158
Quick Test for Atrazine Carryover — G113
Right Crop Stage for Herbicide Use: Alfalfa, Sugarbeet, Soybean and Fieldbeans — G390
Right Crop Stage for Herbicide Use: Corn, Sorghum, Small Grains — G382
Rinsing Pesticide Containers — G1150
Sagebrush Control — G510
Sandbur Control in Corn — G121
Shattercane and Its Control — G1205
Spray Drift of Pesticides — G1001

References (Continued)

The Thistles of North Dakota — NDSU Ext. Serv. W-1120.
Toxic Varieties — Plants and Mushrooms in the Midwest. Poison Control Center, Children's Memorial Hospital, Omaha.
Velvetleaf — G681
Vine Weeds — RP33
Weed Control in Alfalfa — G1254
Weed Control in No-Till Corn, Grain Sorghum and Soybean Production — G899
Weed Control in CRP Acres — G905
Weed Control in Soybean — G875
WeedSOFT — Computer Program for Postemergence and Soil Applied Herbicide
Where Do Weeds Come From — G807
Wild Proso Control — G648
Worker Protection Standard for Agricultural Pesticides — G1219

Others

Weeds of Nebraska and the Great Plains. Bureau of Plant Industry, Nebraska Dept. of Agriculture.
Crop Watch Newsletter, P.O. Box 830918, University of Nebraska, Lincoln, NE 68583-0918

Internet Web Sites

Agronomy Department, University of Nebraska
http://www.ianr.unl.edu/ianr/agronomy

Pesticide Education Resources, University of Nebraska
http://www.ianr.unl.edu/ianr/pat/ephone.html

Software

WeedSOFT — Weed Management Decisions Support System