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## EC99-130-D A 1999 Guide for -- Herbicide Use in Nebraska

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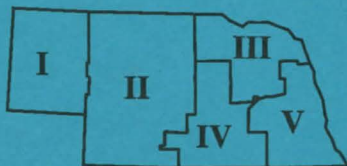
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# 99 Guide for— HERBICIDE USE IN NE

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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 Cooperative Extension is implied.



### RESTRICTED USE HERBICIDES.

Amizol, Atrazine, AAtrex, Balance, Basis Gold, Bicep, Bicep II, Bicep II Magnum, Bicep Lite, Bicep Lite II Magnum, Bladex, Buctril/Atrazine, Bullet, Contour, Double Play, Extrazine II, Field Master, Freedom, Fultime, Gramoxone Extra, Grazon, Guardsman/LeadOff, Harness, Harness Xtra, Hoelon, Kerb, Laddok, Lariat, Lasso, Marksman, Micro Tech, Option II, 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.



*"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-DESTER, ALLY, AMBER, BANVEL (DICAMBA), COMMAND (3ME), AND SIMILAR HERBICIDES NEAR VEGETABLES, ORNAMENTALS, TREES, SHRUBS, AND BROADLEAF CROPS.



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# 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 inch to 2 inches 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 inches 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 two-third 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  $\pm 10\%$ . 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.

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## 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, Canopy, Preview, Pursuit Plus, Gramoxone Extra, FallowMaster, Landmaster BW, Roundup Ultra or Touchdown will control established broadleaf weeds, grasses or volunteer wheat depending on plant height. 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 inches tall. If grasses are taller than 4 inches and are growing vigorously, apply Roundup Ultra at 16 oz/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 51.



# 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 inches 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. Check compliance with herbicide label and follow all label guidelines.

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

Crop	Herbicide	Soil	
		Silt Loam/Clay Loam* 2.5% O.M., pH < 7.0	Sandy Loam/Loamy Sand < 2.0 % O.M., pH > 7.0
	Atrazine ppb* <sup>1</sup>		
Soybean		250 ppb <sup>1</sup>	_____
Oats		150 ppb <sup>1</sup>	_____
Alfalfa		100 ppb <sup>1</sup>	_____
Sugarbeet		5 ppb <sup>1</sup>	< 5 ppb <sup>1</sup>
	Scepter ppb <sup>1</sup>		
Corn		10-15 ppb <sup>1</sup>	_____
	Pursuit ppb <sup>1</sup>		
Corn		30-40 ppb <sup>1</sup>	_____
Sorghum		4-15 ppb <sup>1</sup>	_____

\*Tolerance level would be less on soils lower in organic matter and clay, and for atrazine higher in pH.

<sup>1</sup>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, page 7.
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 five individuals of pigweed (CI 2.5) and two individuals of shattercane (CI 3.5) per 100 sq ft, the competitive load is 5 (Pigweed) X 2.5 (CI of pigweed) + 2 (shattercane) X 3.5 (CI of Shattercane) = 19.5. 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. This equation will give a proximate estimate of yield loss. A more precise estimate can be had with WeedSOFT.

### Competitive Load Required for a 5% Yield Reduction

Crop	Competitive load per 100 ft <sup>2</sup>	Relative competitiveness
Corn	36	7.2
Soybean	10	2.0
Sorghum	10	2.0
Sugarbeet	5	1.0
Wheat	50	1.0

$$CL = CI \times \# \text{ spp.}$$

## WeedSOFT 4.0

WeedSOFT is a bioeconomical decision aid computer program. Weed science expertise from across the Midwest were joined to bring you a powerful weed management support tool.

WeedSOFT is comprised of four modules that cover all areas of weed management. The ADVISOR module allows the user to enter field information via point and click. WeedSOFT then provides yield loss data and recommends the most effective treatments while taking into account biological and economical principles. Yield loss data is based on weed species present, crop size and soil moisture.

MAPVIEW, the newest module, allows users to click on counties in Nebraska and view soil maps. These maps are color-coded indicating soil vulnerability to groundwater contamination.

The ENVIRO FX module allows the user to click on herbicide trade names for valuable information about the herbicide and its mobility in various soil types.

WEEDVIEW is the final module, allowing users to click on weed common names to view images of various weeds. Many weeds have up to four images.

# 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 Inhibition

#### A. ACC ase inhibition

1. Aryloxyphenoxypropionates  
diclofop—Hoelon—F  
fenoxaprop—Option II—F  
flauazifop-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 Inhibition

#### A. ALS-AHAS inhibition

1. Imidazolinones  
imazamox—Raptor—F/R  
imazamethabenz—Assert—R/F  
imazapic—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  
sulfosulfuron—Maverick  
triasulfuron—Amber—F/R  
thifensulfuron—Harmony/Pinnacle—F/R  
tribenuron—Express—F/R  
triflurosulfuron—Upbeet—F
3. Triazolopyrimidines  
chloransulam methyl—First Rate—F/R  
flumetsulam—Broadstrike—R/F

#### B. EPSP synthetase inhibition

- glyphosate—Roundup/Rodeo—F  
sulfosate—Touchdown 5—F

#### C. Glutamine synthetase Inhibitor

- glufosinate—Liberty—F

### III. Seedling Growth Inhibition

#### A. Microtubule assembly inhibition

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 inhibition

1. Chloroacetamides  
acetochlor—Harness/Surpass—S/R  
alachlor—Lasso—S/R  
dimethenamid—Frontier—S/R  
flufenacet—Axiom—S/R  
metolachlor—Dual—S/R  
pronamide—Kerb—S/R  
propachlor—Ramrod—S/R
2. Oxyacetamide  
flufenacet—Axiom—S/R

#### C. Lipid synthesis inhibition (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. Auxin transport

1. Phthalamates  
naptalam—Alanap—R/F
2. Semicarbazone  
diflufenzopyr—Distinct—F

#### E. Cell wall synthesis inhibition

1. Benzamide  
isoxaben—Gallery—R/S
2. Nitrile  
dichlobenil—Casoron—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/R  
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  
 fluroxypyr—Starane—F
4. Quinolines  
 quinclorac—Paramount

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

- A. C<sub>1</sub> 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<sub>2</sub> class
  1. Phenylureas  
 diuron—Karmex—R  
 linuron—Lorox—R/F  
 tebuthiuron—Spike—R  
 siduron—Tupersan—R
- C. C<sub>3</sub> 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  
 carfentrazone ethyl—Aim/Affinity—F
- B. Photosystem I electron diversion
  1. Bipyridyliums  
 diquat—Reward—F  
 paraquat—Gramoxone Extra—F

#### VII. Pigment Inhibition

- A. Carotenoid biosynthesis inhibition
  1. Isoxazole  
 isoxaflutole—Balance—R
  2. Isoxazolidinone  
 clomazone—Command—R/S
  3. Pyridazinone  
 norflurazon—Zorial—S  
 pyrazon—Pyramin—R/F

#### VIII. Unclassified or Unknown

- endothal—Endothal/Aquathol—R/F  
 difenzoquat—Avenge—F  
 ethofumesate—Norton SC—S/R  
 fosamine—Krenite—F  
 MSMA—H-Yield—F  
 DSMA—Ansar 8100—F

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### Site of Herbicide Uptake

R=Root uptake  
 S=Shoot uptake  
 F=Foliage uptake

Letter sequence indicates  
 primary order of  
 herbicide uptake.

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# 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

The "W-A-L-E" or D-A-L-E is one method that helps in remembering the mixing order for herbicides. If you have any questions about the compatibility of the herbicides and carrier, **Do a jar test first** (see compatibility jar test). Some herbicides and/or some carriers require a compatibility agent and some are not compatible even with a compatibility agent.

Now the mixing order:

1. First fill the spray tank with 1/3 of the carrier (water, fertilizer or mix) to be used. Have agitation on.
2. Add ammonium sulfate if used for Roundup Ultra (or other glyphosate products) or Touchdown 5
3. If compatibility problems exist, the compatibility agent is usually added first before the herbicides. Check the label for instructions.

If excessive foam is a problem, a de-foamer may be required. The de-foamer works best if added before foam is a problem. Check the label.

**W or D** The **W** or **D** refers to dry wettable powders, dry flowable materials and water dispersible granules (WP, DR and WDG). These are added first to the tank. Some water soluble packets need to be allowed to soak in a small amount of water before being added to the tank. It is best to preslurry wettable powders

and dry flowables at a 2:1 ratio with water before adding to the partially-filled sprayer tank.

- A** The **A** means agitation to disperse the herbicides added. Agitation means a rolling surface action. Do not use excessive agitation which can reduce compatibility and increase foaming.

It is best to continue the agitation until the spray solution is applied. If agitation is stopped, check if the products are back in suspension before application. After these herbicides are dispersed add carrier to 80% of spray solution to be used.

- L** The **L** chemicals — liquids and flowables are added next.

- E** The **E** chemicals are added next. These are the EC-emulsifiable concentrates. Microencapsulated formulations should be added after the emulsifiable concentrates.

Surfactants and oils are added last. Some surfactants, especially silicone based can cause excessive foaming.

If drift is a problem, consider using a drift control agent.

The last step is to add carrier to 100% of the spray solution to be used and check to make sure the spray solution is mixed thoroughly before starting application.



# Cleaning the Sprayer

Herbicide residuals in the sprayer can be dissolved by herbicides, solvents and/or adjuvants.

Pesticides may settle to the bottom of the tank if agitation is not adequate. The pesticides may also settle out in the tank, hoses, boom, etc. if the sprayer is shut down. Always end the workday, if possible, with an empty tank. A tank for fresh water mounted on the sprayer will provide water to flush the system in the field and the rinsate can be sprayed on the field of the product's labeled use.

Always keep the sprayer's inside and outside clean. Sprayers with stainless steel booms, which reduce the amount of hoses and fittings on the sprayer, are easier to keep clean and have less area for pesticide to build up in the spray booms. Screens and strainers need to be cleaned or replaced. Sumps and pumps along with the inside of the sprayer tank, especially the top and around baffles and plumbing, should be checked.

Select a location to clean the sprayer where any spilled rinsate will not contaminate water supplies, streams, crops or other plants and where puddles will not be accessible to children, pets, livestock or wildlife.

When going between crops follow the specific cleanup procedures listed on the label. Some cleanups require special cleaning agents. Sprayer cleaning agents (see *Table*) should be selected according to the herbicide and formulation to be removed. These agents should penetrate and dissolve residues of pesticides which will then remove them with the rinsate. Commercial tank cleaning agents are generally preferred and do a better job than household detergents in removing and can also deactivate some herbicides. Following is the spray cleanout procedure listed in University of Missouri publication G4852, *Cleaning Field Sprayers to Avoid Crop Injury*.

This procedure is recommended for all herbicides unless the label specifies a different cleanout procedure.

1. Add one-half tank of fresh water and flush tanks, lines, booms and nozzles for at least 5 minutes using a combination of agitation and spraying. Rinsate sprayed through the booms is best sprayed onto cropland that the pesticide is labeled for to avoid accumulation of pesticide-contaminated rinsate. Thoroughly rinse the inside surfaces of the tank, paying particular attention to the surfaces around the tank fill access, baffles and tank plumbing fixtures. The use of a 360-degree nozzle, such as the TeeJet Model 27500E-TEF rinsing nozzle, permanently installed to the spray system can automate the cleaning of tops and sides of the tanks. Several nozzles may need to be carefully positioned to clean tanks with baffles. Pressure sprayers are useful for removing caked on internal and external residues. Hot water can increase penetration of dried residues, but the addition of hot water rinsing may cause unacceptable health hazards due to the vapors produced. Carefully review labeled safety precautions for the agrichemicals and cleaning products used.

2. Fill the tank with fresh water and the recommended cleaning solutions or a commercially available tank cleaner and agitate the solution for 15 minutes. To make a cleaning solution, add **one** of the following to each 50 gallons of water:

- 2 quarts of household ammonia (let stand in sprayer overnight for growth regulator herbicides such as 2,4-D, Banvel, Clarity).
- 4 pounds of trisodium phosphate cleaner detergent.

Operate the spray booms long enough to ensure that all nozzles and boom lines are filled with the cleaning solution. Let the solution stand in the system for several hours, preferably overnight. Agitate and spray the solution onto areas suitable for the rinsate solution.

3. Add more water and rinse the system again by using a combination of agitation and spraying. Remove nozzles, screens, and strainers and clean separately in a bucket of cleaning agent and water.
4. Rinse and flush the system once again with clean water.

**Recommended cleaning agents for selected herbicides.**

Herbicide	Recommended Cleaning Solution	Sensitive Crops
2,4-D amine 2,4-D ester Accent	ammonia + water kerosene or diesel fuel followed by ammonia + water ammonia + water	all broadleaf crops all broadleaf crops sorghum, sunflower, canola
Action Ally Amber	ammonia or commercial tank cleaner + water ammonia + water ammonia + water	— soybean, sunflower, corn, canola soybean, sunflower, corn, sorghum, canola
Assure II/Matador Atrazine Authority Broadleaf/Canopy XL	ammonia + water detergent + water ammonia or commercial tank cleaner + water	corn, sorghum, wheat, other grasses wheat, sunflower, soybean corn, sorghum, sunflower, canola
Banvel/Clarity Basagran Basis Gold	ammonia + water ammonia or commercial tank cleaner + water ammonia + water	all broadleaf crops — wheat, sunflower, soybean, canola
Basis Beacon Bladex	ammonia + water ammonia + water ammonia or commercial tank cleaner + water	soybean, canola sorghum, sunflower, soybean, canola soybean
Blazer/Status Buctril + Atrazine Buctril/Moxy/Moxynil	ammonia or commercial tank cleaner + water ammonia or commercial tank cleaner + water ammonia or commercial tank cleaner + water	corn, sorghum wheat, sunflower, soybean
Canopy Classic/Skirmish Cobra	ammonia or commercial tank cleaner + water ammonia or commercial tank cleaner + water ammonia or commercial tank cleaner + water	corn, sorghum, sunflower, sorghum, canola corn, sorghum, sunflower, sorghum, canola corn, sorghum



Table (continued)

Herbicide	Recommended Cleaning Solution	Sensitive Crops
Command	water	corn, sorghum, wheat, oat
Contour	ammonia or commercial tank cleaner + water	soybean, canola, sorghum, wheat, sunflower
Cover	ammonia or commercial tank cleaner + water	corn, sorghum, canola
Dual/Dual Magnum	ammonia or commercial tank cleaner + water	—
Exceed	ammonia + water	sorghum, soybean, wheat, sunflower
Expert	ammonia + water	sorghum, canola, sunflower
Finesse	ammonia + water	soybean, sunflower, corn, sorghum, canola,
FirstRate	ammonia + water	sunflower, sorghum, canola, corn
Frontier	ammonia or commercial tank cleaner + water	—
Fusilade/Fusion	ammonia or commercial tank cleaner + water	corn, sorghum, wheat, other grasses
Glean	ammonia + water	soybean, sunflower, corn, sorghum, canola
Gramoxone	ammonia or commercial tank cleaner + water	all crops
Harmony Extra	ammonia or commercial tank cleaner + water	canola, corn, soybean, sorghum, sunflower
Harness/Surpass	ammonia or commercial tank cleaner + water	—
Hornet	ammonia or commercial tank cleaner + water	soybean, sunflower
Karmex	ammonia or commercial tank cleaner + water	—
Laddok	ammonia or commercial tank cleaner + water	wheat, sunflower, soybean
Lasso/Partner/Micro Tech	ammonia or commercial tank cleaner + water	—
Liberty	commercial tank cleaner + water	all sensitive crops
Lightning	ammonia or commercial tank cleaner + water	soybean, sorghum, wheat, sunflower, canola
Marksman	commercial tank cleaner + water	all broadleaf crops
MSMA/DSMA	ammonia or commercial tank cleaner + water	—
Optill	commercial tank cleaner + water	all broadleaf crops
Option II	ammonia or commercial tank cleaner + water	corn, sorghum, wheat, other grasses
Passport	ammonia or commercial tank cleaner + water	wheat, corn, sorghum
Peak	ammonia + water	soybean, sunflower, canola
Permit	ammonia + water	soybean, canola, sunflower
Pinnacle	ammonia + water	sunflower, canola
Poast/Poast Plus/Prestige	ammonia, commercial tank cleaner, or detergent + water	corn, sorghum, wheat, other grasses
Prowl	ammonia or commercial tank cleaner + water	—
Pursuit Plus	ammonia or commercial tank cleaner + water	sunflower, canola, sorghum
Pursuit	ammonia or commercial tank cleaner + water	sunflower, canola, sorghum
Reflex/Flexstar	ammonia or commercial tank cleaner + water	sorghum
Resource	ammonia or commercial tank cleaner + water	—
Resolve	ammonia + water	sorghum + all broadleaf crops
Roundup Ultra	water	all sensitive crops
Scepter	ammonia or commercial tank cleaner + water	sunflower, canola, corn
Scorpion III	ammonia or commercial tank cleaner + water	soybean, sunflower
Select	ammonia or commercial tank cleaner + water	corn, sorghum, wheat, other grasses
Sencor/Lexone	detergent + water	—
Shotgun	commercial tank cleaner + water	all broadleaf crops
Squadron	ammonia or commercial tank cleaner + water	sunflower, canola, corn
Steel	ammonia or commercial tank cleaner + water	sunflower, canola, corn
Stinger	ammonia + water	sunflower, soybean
Touchdown	commercial tank cleaner + water	all sensitive crops
Treflan	ammonia or commercial tank cleaner + water	—
Tri-Scept	ammonia or commercial tank cleaner + water	sunflower, canola, corn
Turbo	detergent or commercial tank cleaner + water	—
Zorial/Rapid 80	ammonia or commercial tank cleaner + water	corn, wheat



## 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, spray grade 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	AMS
Accent	1-2 qt/A	1-2 qt/A + 1-2 qt/A	1 gal/100	1 gal/100 + 1-2 qt/A	—	2-4 lb/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	—	—	—	2.5 lb/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	—	—	—	—
Accent Gold	—	—	1-2 gal/100	1-2 gal/100 + 2 qt/A <sup>2</sup>	2-4 qt/A	—
Aim	1 qt/100 gal	—	1 gal/100	—	2-4 qt/A	—
Atrazine	—	—	1 qt/A	—	—	—
Banvel	—	—	—	—	2-4 qt	2.5 lb/A
Basis	—	1-2 qt/100 + 1-2 qt/A	—	1-2 gal/100 + 1-2 qt/100	—	2-4 lb/A
Basis Gold	—	—	1-2 gal/100	1-2 gal/100 + 2 qt/A <sup>2</sup>	—	2-4 lb/A
Beacon	1 qt/100 gal	1 qt/A + 2-4 qt/A <sup>2</sup>	1 qt/A	1 qt/A + 2-4 qt/A	—	2-4 lb/A
Beacon + 2,4-D	1 qt/A	—	—	—	—	—
Beacon + Banvel	1 qt/A	—	—	—	—	2.5 lb/A
Beacon + Buctril	1 qt/A	—	—	—	—	—
Bladex 90DF	1 qt/A dry <sup>3</sup>	—	vegetable oil-dry	—	—	—
Buctril	— <sup>1</sup>	—	— <sup>1</sup>	—	— <sup>1</sup>	—
Buctril + Atrazine	1 qt/100 <sup>1</sup>	—	—	—	—	—
Buctril + Banvel	—	—	—	—	—	—
Clarity	1 qt/100 gal	—	1 qt/A dry	—	2-4 qt/A	2.5 lb/A
Contour	—	1 qt + 1-2 qt/A <sup>2</sup>	—	1.5-2 pt + 1-2 qt/A <sup>2</sup>	—	2.5 lb/A
Exceed	1 qt/100 gal	1 qt/A + 2-4 qt/A	1 qt/A	—	—	2-4 lb/A
Extrazine II 4L	—	—	—	—	—	—
Extrazine II DF	1 qt/A dry	—	vegetable oil-dry	—	—	—
Hornet	1 qt/100 gal	—	1 gal/100 gal	—	2-4 qt/A	—
Laddok S-12	—	—	1 qt/A	1 qt + 2-4 qt/A	2-4 qt/A	2.5 lb/A
Liberty	—	—	—	—	—	3 lb/A
Lightning	—	1 qt/A + 1-2 qt/A	—	—	—	2.5 lb/A
Marksman	1 qt/100 gal	—	1 qt/A <sup>1</sup>	—	2-4 qt/A	—
North Star	1 qt/100 gal	1 qt/100 gal + 2-4 qt/A	1-4 pt/A	1-4 pt/A + 2-4 qt/A	2-4 qt/A	—
Pursuit	—	1 qt/100 + 1-2 qt/A	—	1.5-2 pt/A + 1-2 qt/A	—	2.5 lb/A
Permit	1 qt/100 gal	1 qt/100 + 2-4 qt/A	1 gal/100	1 gal/100 + 2-4 qt/A	—	2-4 lb/A
Permit + Banvel	1 qt/100 gal	—	—	—	—	2.5 lb/A
Permit + Buctril	1 qt/100 gal	—	—	—	—	—
Permit + Accent or Beacon	1 qt/100 gal	—	—	—	—	2-4 lb/A
Poast HC	—	—	1 qt/A	1 qt/A + 2-4 qt/A	—	2.5 lb/A
Resolve (IMI Corn)	—	1 qt/100 + 1-2 qt/A	—	—	—	2.5 lb/A
Resource	—	—	1 qt/A	1 qt/A + 2 qt/A	—	2.5 lb/A
Roundup Ultra	—	—	—	—	—	10 lb/100 gal.
Scorpion III	1 qt/100 gal	1 qt/A + 2.5 gal/100 gal	—	—	—	—
Sencor + Basagran	—	—	—	—	2-4 qt/A	2.5 lb/A
Shotgun	—	—	—	—	—	—
Spirit	1-2 qt/100 gal	—	1-4 pts/A	1-2 qt/100 + .5-1 gal/A	2-4 qt/A	—
2,4-D	—	—	—	—	—	—

<sup>1</sup>Labeled but not normally used due to crop injury.

<sup>2</sup>Ammonium Sulfate (Spray Grade) can be substituted for UAN.

<sup>3</sup>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	AMS
Assure II	1 qt/100	1 qt/100 + 2-4 qt/A <sup>2</sup>	1 qt/A	1 qt/A + 2-4 qt/A <sup>2</sup>	—	—	—	2-4 lb/A
Basagran	—	—	1 qt/A	yes <sup>2</sup>	—	2-4 qt/A <sup>2</sup>	—	2.5 lb/A
Basagran + Blazer	—	—	1 qt/A <sup>1</sup>	—	—	2-4 qt/A <sup>2</sup>	—	—
Basagran + Poast Plus	—	—	1 qt/A	1 qt/A + 1-2 qt/A <sup>1,2</sup>	—	2-4 qt/A <sup>2</sup>	1 qt/A + 2-4 qt/A <sup>2</sup>	2.5 lb/A
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 <sup>1</sup>	—	—	—	—	—
Classic + Assure	1 qt/100	1 qt/100 + 1-2 qt/A <sup>1,2</sup>	1 qt/A	1 qt/A + 1-2 qt/A <sup>2</sup>	—	—	—	2-4 lb/A
Classic + Pinnacle + Assure	1 qt/100	1 qt/100 + 1-2 qt/A <sup>1,2</sup>	—	—	—	—	—	2-4 lb/A
Classic	1 qt/100	1 qt/100 + 2-4 qt/A <sup>2</sup>	1 qt/100 <sup>1</sup>	1 qt/A + 2-4 qt/A <sup>1,2</sup>	—	—	—	2-4 lb/A
Cobra	1 qt/100	1 qt/100 + 2-4 qt/A <sup>2</sup>	1 qt/100 <sup>1</sup>	1 qt/A + 2-4 qt/A <sup>1</sup>	—	2-4 qt/A <sup>2</sup>	—	2-4 lb/A
Concert	—	1 qt/100 + 1-2 qt/A <sup>2</sup>	—	1 qt/A + 1-2 qt/A	—	—	—	2-4 lb/A
First Rate	1 pt/100 gal	1 qt + 2.5 gal/100 gal	1.2 gal/100 gal	1.2 gal + 2.5 gal/100 gal	—	—	—	2 lb/A
Flexstar	1 qt/100	—	—	1 qt/A + 2-4 qt/A	—	—	—	4 lb/A
Fusilade + Basagran	1 qt/100	—	1 qt/A	—	—	—	—	—
Fusilade or Fusion	1 qt/100	—	1 qt/A	—	—	—	—	—
Galaxy	—	—	1 qt/A <sup>1</sup>	1 qt/A + 2-4 qt/A	—	2-4 qt/A <sup>2</sup>	—	2.5 lb/A
Liberty	—	—	—	1 qt/A + 1-2 qt/A	—	—	—	3 lb/A
Matador	1 qt/100	1 qt/100 + 2-4 qt/A <sup>2</sup>	1 qt/A	1 qt/A + 2-4 qt/A	—	—	—	2-4 lb/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 <sup>2</sup>	—	—	—	—	—	2-4 lb/A
Pinnacle + Basagran	—	1 qt/100 + 2-4 qt/A	—	1 qt/A + 2-4 qt/A <sup>1,2</sup>	—	—	—	2-4 lb/A
Pinnacle + Classic	1 qt/100	—	1 qt/A	—	—	—	—	—
Poast Plus	—	—	1 qt/A	1 qt/A + 2-4 qt/A <sup>2</sup>	1 qt/A	—	1 qt/A + 2-4 qt/A <sup>2</sup>	2.5 lb/A
Prestige	—	—	1 qt/A	1 qt/A + 2-4 qt/A <sup>2</sup>	1 qt/A	—	—	2.5 lb/A
Pursuit	—	1 qt/100 + 1-2 qt/A	—	1 qt/A + 1-2 qt/A <sup>1,2</sup>	—	—	—	2.5 lb/A
Raptor	—	1 qt/100 + 2-4 qt/A	—	1 qt/100 + 1-2 qt/A <sup>1,2</sup>	—	—	—	2.5 lb/A
Reliance Synchrony (STS Beans)	—	—	1 qt/A	1 qt/A + 1-2 qt/A <sup>2</sup>	—	—	—	2-4 lb/A
Reflex	1 qt/100	—	—	1 qt/A + 1-2 qt/A	—	—	—	—
Resource	—	—	1 qt/A	1 qt/A + 1-2 qt/A <sup>2</sup>	—	—	—	2.5 lb/A
Rezult	—	—	—	—	—	2-4 qt/A <sup>2</sup>	—	2 lb/A
Roundup Ultra	—	—	—	—	—	—	—	10 lb/100 gal
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 <sup>2</sup>	1 qt/2 <sup>1</sup>	1 qt/A + 2-4 qt/A <sup>1,2</sup>	—	—	—	—
Status	1 qt/100	—	1 qt/A <sup>2</sup>	—	—	2-4 qt/A	—	—
Stellar	1 qt/100	1 qt/100 + 2-4 qt/A <sup>2</sup>	1 qt/A <sup>2</sup>	1 qt/A + 2-4 qt/A <sup>1,2</sup>	—	—	—	2.5 lb/A

<sup>1</sup>Crop injury potential is enhanced with COC. Use only for labeled conditions.

<sup>2</sup>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	AMS
Atrazine	—	—	1 qt/A	—	—	—
Banvel	—	—	—	—	—	2.5 lb/A
Buctril + Atrazine	1 qt/100 <sup>1</sup>	—	—	—	—	—
Laddok S-12	—	—	1 qt/A	—	—	2.5 lb/A
Marksman	—	—	—	—	—	—
Peak	1 qt/100	1 qt/100 + 2-4 qt/A	1 qt/A	1 qt/A + 2-4 qt/A	—	2 lb/A
Permit	1 qt/100	1 qt/100 + 2-4 qt/A	1 gal/100	1 gal/100 + 2-4 qt/A	—	2-4 lb/A
2,4-D	—	—	—	—	—	—
Shotgun	—	—	—	—	—	—

<sup>1</sup>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 5*	Spring	1.0 qt	5	8	5	4	5	5
Roundup Ultra/Touchdown 5*	Spring	2.0 qt	6	9	7	6	7	7
Roundup Ultra/Touchdown 5*	Fall	1.0 qt	6	9	7	6	7	7
Roundup Ultra/Touchdown 5*	Fall	2.0 qt	7	10	9	8	9	9
Roundup Ultra/Touchdown 5* + 2,4-D	Spring	1 qt + 1 pt	7	8	8	4	8	5
Roundup Ultra/Touchdown 5* + 2,4-D	Spring	2 qt + 1 qt	8	9	9	6	9	7
Roundup Ultra/Touchdown 5* + 2,4-D	Fall	1 qt + 1 pt	8	9	9	6	9	7
Roundup Ultra/Touchdown 5* + 2,4-D	Fall	2 qt + 1 qt	9	10	10	8	10	8
Roundup Ultra/Touchdown 5* + Banvel	Spring	1 qt + 0.5 pt	8	8	9	4	9	5
Roundup Ultra/Touchdown 5* + Banvel	Spring	2 qt + 1 pt	9	9	10	6	10	7
Roundup Ultra/Touchdown 5* + Banvel	Fall	1 qt + 0.5 pt	9	9	10	6	10	7
Roundup Ultra/Touchdown 5* + 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 5*	Spring	1.0 qt		4	4
Roundup Ultra/Touchdown 5*	Spring	2.0 qt		7	6
Roundup Ultra/Touchdown 5*	Fall	1.0 qt		7	6
Roundup Ultra/Touchdown 5*	Fall	2.0 qt		9	8
Roundup Ultra/Touchdown 5* + 2,4-D	Spring	1 qt + 1 pt		4	4
Roundup Ultra/Touchdown 5* + 2,4-D	Spring	2 qt + 1 qt		7	6
Roundup Ultra/Touchdown 5* + 2,4-D	Fall	1 qt + 1 pt		7	6
Roundup Ultra/Touchdown 5* + 2,4-D	Fall	2 qt + 1 qt		9	8
Roundup Ultra/Touchdown 5* + Banvel	Spring	1 qt + 0.5 pt		4	4
Roundup Ultra/Touchdown 5* + Banvel	Spring	2 qt + 1 pt		7	6
Roundup Ultra/Touchdown 5* + Banvel	Fall	1 qt + 0.5 pt		7	6
Roundup Ultra/Touchdown 5* + Banvel	Fall	2 qt + 1 pt		9	8
Gramoxone Extra + Atrazine	Spring	1.5 pt + 2 lb		3	7
Gramoxone Extra + 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 inches 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 and appropriate surfactant. 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 two-thirds 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	Longspine or Field Sandbur	Kochia	Kochia-Triazine-resistant	Russian Thistle	Smartweed—Annual	Velvetleaf	Sunflower	Corn — volunteer	Winter Wheat or Rye	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	9	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	1	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	2	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	2	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
Field Master (4.5 qt)	10	10	10	6	8	10	10	10	10	10	10	10	10	10	9	10	10	10	10	9	10	10	10	10 <sup>c</sup>	10	4	3	6	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	4	6	4	6	8	Y
Gramoxone Extra + 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	5	10	5	7	7	Y
Roundup Ultra/Touchdown 5**** (16/13 oz)	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 <sup>c</sup>	10	4	3	5	Y
Roundup Ultra/Touchdown 5**** (24/19 oz)	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 <sup>c</sup>	10	5	4	6	Y
Roundup Ultra/Touchdown 5**** + 2,4-D (16/13 oz + 1.0 pt)	10	10	10	8	9	9	9	9	10	9	10	10	9	9	9	10	9	10	9	9	9	9	10	10	10 <sup>c</sup>	10	6	5	7	Y
Roundup Ultra/Touchdown 5**** + Atrazine (16/13 oz + 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 <sup>c</sup>	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 preplant herbicides 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 5 at 80% the rate listed for Roundup Ultra.

<sup>c</sup>Glyphosate products will not control volunteer Roundup Ready corn.



# Broadleaf Weed Response To Selected Herbicides

## Field Corn, Popcorn<sup>○</sup>, Sweet Corn<sup>□</sup>, and Silage<sup>△</sup>

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 70-78 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) <sup>§</sup>	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 <sup>a</sup>	Recrop Interval, in Months <sup>b</sup>
<b>Soil Applied Herbicides</b>																		
AAtrex/Atrazine <sup>○□△</sup>	9	8	10	10	1	10	10	1	9	9	9	7	7	10	10	1	1	6-24
Axiom <sup>△</sup>	7	5	5	5	2	8	9	7	7	5	6	6	6	9	9	7	2	0-4
Axiom + Atrazine <sup>△</sup>	9	6	9	9	2	9	10	6	8	6	8	7	7	10	10	6	2	6-24
Balance	8	5	8	8	8	8	8	8	8	—	8	6	9	8	8	8	2	6
Balance + Atrazine	8	7	9	9	8	9	9	8	8	—	9	7	9	9	9	8	2	6-24
Balance + Bicep II	9	6	8	8	7	9	9	9	7	—	8	6	8	9	9	9	2	6-24
Bicep II Magnum or Dual II Magnum + Aatrex <sup>○□△</sup>	9	7	9	9	2	9	9	8	8	8	8	6	6	9	9	7	2	6-24
Bladex/Cypro <sup>○□</sup>	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	9	2	6-24
Contour <sup>d</sup>	9	8	5	2	2	8	9	8	9	9	9	8	7	9	5	6	2	4-26
DoublePlay <sup>○△</sup>	8	2	5	5	5	8	8	8	6	3	1	3	3	8	8	8	2	6-24
Dual II Magnum <sup>○□△</sup>	7	2	2	2	2	8	8	8	5	3	2	2	2	8	8	8	2	4-12
Dual II Magnum + Bladex <sup>○□</sup>	8	6	9	9	2	8	8	7	8	8	8	6	5	7	7	7	2	4-18
Eradicane <sup>○□△</sup>	6	3	5	5	5	7	7	7	5	3	3	2	2	7	7	7	2	1-2
Eradicane + Atrazine <sup>○□△</sup>	9	6	9	9	5	9	9	7	7	7	8	7	7	9	9	7	2	6-24
Eradicane + Bladex <sup>○</sup>	7	5	7	7	5	9	7	6	7	7	8	5	5	7	7	7	2	2-4
Extrazine II/Cypro AT <sup>○□</sup>	9	7	8	8	1	9	8	1	9	9	9	7	7	7	7	1	2	6-24
Frontier <sup>○□△</sup>	7	2	2	2	2	7	7	7	5	3	2	2	2	7	7	7	2	4-18
Fultime <sup>□△</sup>	9	7	9	9	2	9	9	7	8	8	8	6	6	9	9	7	2	6-24
Guardsman/LeadOff <sup>○□</sup>	9	7	9	9	2	9	9	7	8	8	8	6	6	9	9	7	2	6-24
Harness <sup>○△</sup>	7	2	2	2	2	8	8	8	5	3	2	2	2	8	8	8	2	6-24
Harness Xtra <sup>○△</sup>	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	9	2	4-18
Lariat/Bullet or Micro Tech + Atrazine <sup>○□△</sup>	9	7	9	9	2	9	9	9	8	8	8	6	6	9	9	7	2	6-24
Micro Tech <sup>○□△</sup>	7	2	2	2	2	8	8	8	5	3	2	2	2	8	8	8	2	2-4
Micro Tech or Dual + (Atrazine+ Bladex) or Extrazine II <sup>○□</sup>	9	7	9	9	2	9	9	7	9	7	7	7	7	9	9	7	2	6-24
Micro Tech + Bladex <sup>○□</sup>	8	6	9	9	2	8	8	7	8	8	8	6	5	7	7	7	2	2-4
OpTill	7	4	6	6	6	8	8	8	8	7	7	5	4	8	8	8	3	4-12
Prowl + Atrazine <sup>○□△</sup>	9	4	9	9	5	9	9	7	7	7	8	6	7	9	9	6	3	6-24
Prowl + Bladex <sup>□</sup>	8	4	9	9	5	9	7	7	7	7	8	5	6	7	7	6	3	4-12
Python	3	5	8	1	8	8	8	8	3	8	8	5	7	8	1	8	2	0-18
Surpass <sup>○△</sup>	7	2	2	2	2	8	8	8	5	3	2	2	2	8	8	8	2	2-18
Surpass 100 <sup>○△</sup>	9	7	9	9	2	9	9	7	8	8	8	6	6	9	9	7	2	6-24
Topnotch <sup>○△</sup>	8	3	2	2	2	8	8	8	6	5	3	2	3	8	8	8	2	6-24

<sup>a</sup>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.

<sup>b</sup>The recrop interval varies with herbicide rate, soil texture, pH, organic matter, rainfall or irrigation, and rotational crop.

<sup>c</sup>Ratings include a PRE grass herbicide.

<sup>d</sup>For use in a resistant/tolerant hybrid only.

<sup>○</sup>Registered for popcorn, <sup>□</sup>Registered for sweet corn, <sup>△</sup>Registered for silage.

<sup>§</sup>Weed Competitive Index—See page 6.



# Grass Weed Response To Selected Herbicides

## Field Corn, Popcorn<sup>○</sup>, Sweet Corn<sup>□</sup>, and Silage<sup>△</sup>

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 69-78 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) <sup>§</sup>	Crabgrass (0.5)	Fall Panicum (0.4)	Foxtail (1.0)	Sandbur (0.4)	Shattercane/Sorghum (3.5)	Shattercane, ALS-resistant (3.5)	Crop Safety <sup>a</sup>	Recrop Interval, in Months <sup>b</sup>
<b>Soil Applied Herbicides</b>									
AAtrex/Atrazine <sup>○□△</sup>	6	4	2	7	5	1	1	1	6-24
Axiom <sup>△</sup>	9	9	9	9	7	6	6	2	0-4
Axiom + Atrazine <sup>△</sup>	9	9	9	9	7	6	6	2	6-24
Balance	7	7	7	8	5	5	5	2	6
Balance + Atrazine	7	6	6	8	5	4	4	2	6-24
Balance + Bicep II	8	8	8	9	5	5	5	2	6-24
Bicep II Magnum <sup>○□△</sup>	9	9	9	9	6	4	4	2	6-24
Bladex/Cypro <sup>○□</sup>	7	7	6	8	5	4	4	3	2-4
Broadstrike + Dual	9	9	9	9	6	4	4	2	6-24
Contour <sup>d</sup>	6	3	9	9	6	8	1	2	4-26
DoublePlay <sup>○△</sup>	9	9	9	9	7	8	8	2	6-24
Dual II Magnum <sup>○□</sup>	9	9	9	9	5	4	4	2	4-12
Dual II Magnum + Bladex <sup>○□</sup>	8	9	9	9	5	4	4	2	4-18
Eradicane <sup>○□△</sup>	9	9	9	9	7	8	8	2	1-2
Eradicane + Atrazine <sup>○□△</sup>	9	9	9	9	7	8	8	2	6-24
Eradicane + Bladex <sup>○</sup>	9	9	9	9	7	8	8	2	2-4
Extrazine II/Cypro AT <sup>○□</sup>	6	7	5	8	5	4	4	2	6-24
Frontier <sup>△</sup>	9	9	9	9	4	3	3	2	4-18
Fultime	9	9	9	9	6	4	4	2	6-24
Guardsman/LeadOff <sup>○□</sup>	9	9	9	9	4	3	3	2	6-24
Harness <sup>○△</sup>	9	9	9	9	6	4	4	2	6-24
Harness Xtra <sup>○△</sup>	9	9	9	9	6	4	4	2	6-24
Hornet	1	1	1	1	1	1	1	2	4-18
Lariat/Bullet or Micro Tech + Atrazine <sup>○□△</sup>	9	9	9	9	6	4	4	2	6-24
Micro Tech <sup>○□△</sup>	9	9	9	9	6	4	4	2	2-4
Micro Tech or Dual + (Atrazine+ Bladex) or Extrazine II <sup>○□</sup>	9	9	9	8	4	3	3	2	6-24
Micro Tech + Bladex <sup>○□</sup>	8	9	9	9	5	4	4	2	2-4
OpTill	9	9	9	9	4	3	3	3	4-12
Prowl + Atrazine <sup>○□△</sup>	8	9	9	9	7	3	3	3	6-24
Prowl + Bladex <sup>□</sup>	8	9	9	9	7	3	3	3	4-12
Python	1	1	1	1	1	1	1	2	0-18
Surpass <sup>○△</sup>	9	9	9	9	6	4	4	2	2-18
Surpass 100 <sup>○△</sup>	9	9	9	9	6	4	4	2	6-24
Topnotch <sup>○△</sup>	9	9	9	9	6	4	4	2	6-24

<sup>a</sup>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.

<sup>b</sup>The recrop interval varies with herbicide rate, soil texture, pH, organic matter, rainfall or irrigation, and rotational crop.

<sup>c</sup>Ratings include a PRE grass herbicide.

<sup>d</sup>For use in a resistant/tolerant hybrid only.

<sup>○</sup>Registered for popcorn, <sup>□</sup>Registered for sweet corn, <sup>△</sup>Registered for silage.

<sup>§</sup>Weed Competitive Index—See page 6.

# Broadleaf Weed Response To Selected Herbicides

## Field Corn, Popcorn<sup>○</sup> Sweet Corn<sup>□</sup> and Silage<sup>△</sup>

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 69-78 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) <sup>§</sup>	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) <sup>e</sup>	Waterhemp, Triazine-resistant (2.5)	Crop Safety <sup>a</sup>	Recrop Interval, in Months <sup>b</sup>
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## Postemergence Herbicides

Weed size influences performance—see label

AAtrex/Atrazine or Bicep II Magnum <sup>○□△</sup>	9	9	9	9	9	2	9	9	1	9	4	9	8	8	9	1	2	6-24
Accent <sup>○</sup>	3	5	6	1	6	4	7	7	1	3	7	4	4	7	1	7	2	1-18
Accent + Atrazine <sup>○</sup>	9	9	9	9	6	9	9	7	9	4	9	9	8	9	7	7	2	6-24
Accent + Banvel/Celebrity <sup>○</sup>	7	9	8	7	8	7	8	8	8	8	9	7	6	8	7	8	3	1-2
Accent + Beacon <sup>○</sup>	8	9	8	1	8	4	8	8	9	7	8	9	6	8	1	8	2	1-18
Accent + Buctril <sup>○</sup>	9	9	8	8	8	7	8	8	8	9	9	8	7	8	6	8	2	1-2
Accent Gold	7	9	6	6	6	7	7	7	8	5	8	9	8	6	4	6	3	4-26
Action	5	5	3	3	3	7	5	5	7	3	4	4	10	5	5	5	2	0
Aim	9	4	4	4	4	9	8	8	1	6	5	1	10	6	6	6	2	1
Aim + Atrazine	9	5	8	8	4	9	9	9	7	6	6	4	10	8	8	6	2	6-24
Aim + Clarity	9	8	9	8	8	9	9	9	8	9	9	7	10	8	8	8	2	1-2
Aim + Atrazine + Clarity	9	7	8	8	7	9	9	9	8	8	8	6	10	8	8	7	2	6-24
Banvel/Clarity <sup>○△</sup>	7	9	8	8	8	8	8	8	8	9	9	8	6	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	8	3	5	9	9	6	9	9	8	8	9	8	7	6	3	1-18
Beacon <sup>○△</sup>	8	8	8	1	8	5	8	8	9	5	8	9	6	8	1	8	2	1-18
Bladex <sup>○□</sup>	5	3	5	4	1	4	2	1	5	2	5	3	3	2	2	1	3	2-4
Buctril <sup>○</sup>	9	9	8	8	8	8	6	6	9	7	9	9	7	6	6	6	2	0
Buctril + Atrazine <sup>○</sup>	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 <sup>d</sup>	8	9	8	5	8	6	9	9	8	5	8	7	8	8	7	8	1	4-26
Distinct	7	9	8	8	8	8	8	8	8	9	9	8	6	7	7	7	3	1-2
Exceed <sup>○△</sup>	7	9	8	1	8	7	9	9	9	4	8	9	8	8	1	8	2	0-24
Extrazine II <sup>○□</sup>	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	8	7	7	8	5	8	9	8	6	5	6	2	4-26
Laddok S-12 <sup>○□</sup>	7	9	8	8	7	7	8	2	9	2	9	9	9	8	8	1	1	6-24
Liberty <sup>d</sup>	8	9	7	7	7	7	7	7	9	8	9	9	8	7	7	7	1	0
Liberty ATZ <sup>d</sup>	9	9	9	9	7	9	9	7	9	9	9	9	9	9	9	7	1	0
Lightning <sup>d</sup>	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
Northstar <sup>○△</sup>	7	9	8	8	8	8	8	8	9	8	9	9	8	8	7	8	2	1-18
Peak	3	9	8	1	6	8	9	9	9	4	6	9	9	8	1	8	2	0-18
Permit	3	9	6	1	6	5	9	9	9	4	7	9	9	8	1	8	2	0-10
Poast <sup>d</sup>	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
Pursuit <sup>d</sup>	8	9	8	1	8	4	9	9	7	5	8	7	8	6 <sup>a</sup>	1	6 <sup>a</sup>	1	4-26
Resolve <sup>d</sup>	10	9	9	8	9	8	9	9	8	8	9	8	8	9	6	8	2	0-40
Resource	4	5	3	3	3	7	5	5	7	3	4	4	10	5	5	5	2	0
Roundup Ultra (1.0 qt) <sup>d</sup>	8	9	8	8	8	8	9	9	8	7	8	9	8	9	9	9	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
Spirit	8	8	8	1	8	6	8	8	9	4	8	9	7	8	1	8	2	1-18
Tough + Atrazine	9	9	9	9	8	9	9	9	9	4	9	9	8	9	9	4	2	6-24
2,4-D <sup>□△</sup>	6	10	5	5	5	8	7	7	8	4	5	7	8	8	8	8	3	1

<sup>a</sup>Crop varieties vary in their response to herbicides. Crop ratings less than 3 result in no yield loss.

<sup>b</sup>Values will vary with soil texture, pH, organic matter and rainfall or irrigation, rotational crop and herbicide rate.

<sup>c</sup>Ratings include a PRE grass herbicide.

<sup>d</sup>For use in a resistant/tolerant field corn hybrid only.

<sup>e</sup>Pursuit not labeled for control of waterhemp.

<sup>○</sup>Registered for popcorn, <sup>□</sup>Registered for sweet corn, <sup>△</sup>Registered for silage.

<sup>§</sup>Weed Competitive Index—See page 6.



# Grass Weed Response To Selected Herbicides

## Field Corn, Popcorn<sup>○</sup> Sweet Corn<sup>□</sup> and Silage<sup>△</sup>

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 69-78 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 (3.5)	Crop Safety <sup>a</sup>	Recrop Interval, in Months <sup>b</sup>
<b>Postemergence Herbicides</b>									
Weed size influences performance—see label									
AAtrex/Atrazine or Bicep II Magnum <sup>□□△</sup>	5	4	2	6	4	2	1	2	6-24
Accent <sup>○</sup>	8	4	8	8	8	10	1	2	1-18
Accent + Atrazine <sup>○</sup>	8	2	8	8	8	10	1	2	6-24
Accent + Banvel/Celebrity <sup>○</sup>	8	2	8	8	8	10	1	3	1-2
Accent + Beacon <sup>○</sup>	4	3	7	7	8	10	1	2	1-18
Accent + Butril <sup>○</sup>	8	2	8	8	8	10	1	2	1-2
Accent Gold	8	7	8	8	7	10	1	3	4-26
Action	1	1	1	1	1	1	1	2	0
Aim	1	1	1	1	1	1	1	2	1
Aim + Atrazine	3	2	1	3	1	1	1	2	6-24
Aim + Clarity	1	1	1	1	1	1	1	2	1-2
Aim + Atrazine + Clarity	2	1	1	2	1	1	1	2	6-24
Banvel/Clarity <sup>○△</sup>	2	2	2	2	2	2	2	2	1-2
Basis	7	7	7	8	7	10	1	3	0-18
Basis Gold	8	7	8	8	7	10	1	3	1-18
Beacon <sup>○△</sup>	2	3	7	4	4	10	1	2	1-18
Bladex <sup>□□</sup>	2	4	2	4	2	2	2	3	2-4
Bucril <sup>○</sup>	2	2	2	2	2	2	2	2	0
Bucril + Atrazine <sup>○</sup>	2	2	2	2	2	2	2	2	6-24
Bucril + Banvel	2	2	2	2	2	2	2	2	1-2
Contour <sup>d</sup>	8	7	8	8	6	9	1	1	4-26
Distinct	2	2	2	2	2	2	2	3	1-2
Exceed <sup>○△</sup>	2	2	3	3	2	9	1	2	0-24
Extrazine II <sup>□□</sup>	4	7	4	7	4	4	4	2	6-24
Hornet	1	1	1	1	1	1	1	2	4-26
Laddok S-12 <sup>□□</sup>	2	2	2	2	2	2	2	1	6-24
Liberty <sup>d</sup>	7	8	7	9	6	8	8	1	0
Liberty ATZ <sup>d</sup>	6	7	6	9	6	7	7	1	0
Lightning <sup>d</sup>	8	7	8	8	6	9	1	1	4-26
Marksman	2	2	2	2	2	2	2	2	6-24
Northstar	2	2	2	2	2	9	2	2	1-18
Peak	1	1	1	1	1	1	1	2	0-18
Permit	1	1	1	1	1	1	1	2	0-10
Poast <sup>d</sup>	9	9	9	9	9	10	10	1	0
Pursuit <sup>d</sup>	8	7	8	8	6	9	1	1	4-26
Resolve <sup>d</sup>	7	6	7	8	6	9	2	2	0-40
Resource	1	1	1	1	1	1	1	2	0
Roundup Ultra (1.0 qt) <sup>d</sup>	10	9	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
Spirit	2	2	5	3	3	10	1	2	1-18
Tough + Atrazine	4	4	2	7	4	2	2	2	6-24
2,4-D <sup>□△</sup>	2	2	2	2	2	2	2	3	1

<sup>a</sup>Crop varieties vary in their response to herbicides

<sup>b</sup>Values will vary with soil texture, pH, organic matter and rainfall or irrigation, rotational crop and herbicide rate.

<sup>c</sup>Ratings include a PRE grass herbicide.

<sup>d</sup>For use in a resistant/tolerant field corn hybrid only.

<sup>e</sup>Pursuit not labeled for control of ALS-resistant waterhemp.

<sup>○</sup>Registered for popcorn, <sup>□</sup>Registered for sweet corn, <sup>△</sup>Registered for silage.

<sup>§</sup>Weed Competitive Index—See page 6.

# Corn

## No-Till

Herbicide	Commercial Product per Acre			Application Time	Remarks and Approximate Cost/A Broadcast
	Sandy Loam < 1% OM	Silt Loam 1-2% OM	Silty-Clay Loam > 2% OM		
Cool-Season Grass Sod (including smooth brome and bluegrass)					
AATREX 4L <sup>3</sup> □□Δ + GRAMOXONE EXTRA <sup>1</sup>	1.4 qt 1.5-2.5 pt	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 \$12.18-\$19.12.
TOUCHDOWN 5	38-51 oz	38-51 oz	38-51 oz		
ROUNDUP ULTRA <sup>1</sup> □□Δ	48-64 oz	48-64 oz	48-64 oz	Fall new growth	Use appropriate herbicide at planting. Cost: Roundup Ultra \$16.03-\$21.52; Touchdown 5 \$14.10-\$18.88.
Alfalfa/Clover Sod					
2,4-D 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 smooth brome or bluegrass is present add Round Ultra. On sandy soils don't plant corn for 10 days. Cost: \$14.78
Rye or Winter Wheat					
ATRAZINE 4L <sup>3</sup> □□Δ + BALANCE WDG + GRAMOXONE EXTRA <sup>1</sup>	Do not use Do not use Do not use	1.4 qt 2.0 oz 1.5 pt	1.5 qt 2.5 oz 1.5 pt	Apply when rye and wheat are 4-10" and before corn emerges	On dryland, moisture may be inadequate for corn. Cost: AAtrex + Gramoxone Extra \$11.46-\$12.54; Atrazine + Balance + Gramoxone Extra \$28.08-\$32.42.
AATREX 4L <sup>3</sup> □□Δ + GRAMOXONE EXTRA	1.2 qt 1.5 pt	1.4 qt 1.5 pt	1.5 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 \$3.54-\$4.72; Touchdown 5 \$4.20-\$5.46.
TOUCHDOWN 5	10-13 oz	10-13 oz	10-13 oz		

<sup>a</sup>Rate required poses risk of groundwater contamination.

<sup>b</sup>Do not use on sandy soil if water table is shallower than 30 feet.

See page 82 for additional footnotes.



## Corn No-Till (Continued)

Herbicide	Commercial Product per Acre			Application Time	Remarks and Approximate Cost/A Broadcast
	Sandy Loam < 1% OM	Silt Loam 1-2% OM	Silty-Clay Loam > 2% OM		
Continuous Row Crop <sup>4</sup>					
If split-applications are made, use 2/3 of broadcast rate 30-45 days before planting and rest at planting. Products, AAtrex, Dual II Magnum, Bicep II, Bicep Lite II, Guardsman					
AATREX/ATRAZINE 4L <sup>30□Δ</sup>	1.4 qt	2.0 qt	2.0 qt		Add 0.5-1 pt of 2,4-D ester or 0.5 pt Banvel to control broadleaf weeds. For triazine-resistant kochia add Banvel. Add Gramoxone Extra or Roundup Ultra to control emerged grass. For volunteer corn (non Roundup Ready) use Roundup Ultra <sup>1</sup> at 12-16 oz in 5 gpa water before crop emergence. Cost: AAtrex/Atrazine 5.00-\$7.14; Bicep II Magnum \$15.90-\$25.84; Bicep II Lite Magnum \$21.20-\$29.15; Dual II Magnum + Atrazine \$10.20-\$16.96; Bladex + Atrazine \$7.56-\$15.12; Bullet \$17.25-\$20.94; Contour \$16.52; FulTime \$17.47-\$34.94; Atrazine + Partner/Micro Tech \$18.89-\$25.07; Guardsman \$14.97-\$22.46; Harness Xtra \$20.84-\$26.63; Balance \$7.95-\$23.85; Balance + Atrazine \$18.58-\$27.60; Balance + Dual II Magnum \$25.75-\$37.16; Surpass 100 \$13.73-\$28.32; Harness Xtra 5.6 \$16.20-\$38.26; Top Notch \$20.93-\$37.18; LeadOff \$12.50-\$25.00.
AATREX/ATRAZINE 4L <sup>30□Δ</sup>	1.1-1.4 qt	1.2-1.6 qt	1.6-1.8 qt	0-45 DBP	
+ DUAL II MAGNUM	0.8-1.0 pt	1.0-1.33 pt	1.33 pt		
AATREX/ATRAZINE 4L <sup>30□Δ</sup>	1.2 qt	1.6 qt	2 qt		
+ MICRO TECH	2.25 qt	2.5 qt	2.75 qt	0-30 DBP	
or PARTNER	3.5 lb	3.5 lb	4.0 lb		
BALANCE	Do not use	3.0 oz	3.0 oz	8-14 DBP	
		2.0 oz	2.5 oz	0-7 DBP	
BALANCE	Do not use	3.0 oz	3.0 oz	8-14 DBP	
+ ATRAZINE		2.0 oz	2.5 oz	0-7 DBP	
+ DUAL II MAGNUM		0.75 pt	1.0 pt		
BICEP II MAGNUM <sup>0□Δ</sup>	1.6 qt	2.1 qt	2.1-2.6 qt	0-45 DBP	
BICEP LITE II MAGNUM <sup>0□Δ</sup>	1.5 qt	1.5-1.9 qt	1.9-2.2 qt	0-45 DBP	
BULLET <sup>0□Δ</sup>	3.5 qt	3.75 qt	4.25 qt	0-7 DBP	
AATREX 4L <sup>30□Δ</sup>	0.5 qt	1.0 qt	1.5 qt	0-30 DBP	
+ BLADEX 4L	1.0 qt	1.1 qt	1.1 qt		
+ DUAL II MAGNUM	0.8-1.0 pt	1.0-1.33 pt	1.33 pt		
CONTOUR	1.30 pt	1.30 pt	1.30 pt	0-45 DBP	
[Herbicide Tolerant Crop Required (IMI)]					
FIELDMASTER <sup>0□Δ</sup>	3.5-5 qt	4-5 qt	4-5 qt	0-7 DBP	
FULTIME <sup>0□Δ</sup>	Do not apply	2.7-4.0 qt	3.3-5.0 qt	10-30 DBP	
	2.5-3.0 qt	2.7-3.3 qt	3.0-5.0 qt	0-10 DBP	
GUARDSMAN	2.5-3.0 pt	3.0-4.0 pt	4-4.5 pt	0-45 DBP	
HARNESS Xtra <sup>0Δ, Δb</sup>	1.8 qt	2.3 qt	2.3 qt	14 DPB	
HARNESS XTRA 5.6 <sup>0□Δ</sup>	1.4 qt	2.3-2.6 qt	2.3-3.0 qt	0-14 DBP	
LEADOFF <sup>0□Δ</sup>	3.0-3.5 pt	3.5-4.5 pt	4.5-5.0 pt	16-30 DBP	
	2.5-3.0 pt	3.0-4.0 pt	4.0-4.5 pt	0-15 DBP	
SURPASS 100		2.6-3.3 qt	3.3 qt	14-30 DBP	
	1.6-2.4 qt	2.2-2.6 qt	2.6-3.3 qt	0-14 DBP	
TOPNOTCH <sup>0□Δ</sup>	2.5 qt	2.5-3.0 qt	3.0-3.75 qt	30-40 DBP	
+ ATRAZINE	2.0-2.5 qt	2.5 qt	2.5-3.0 qt	10-30 DBP	
	2.0 qt	2.0-2.5 qt	2.5-3.0 qt	0-10 DBP	
	1.1 qt	1.5 qt	1.5 qt		

<sup>b</sup>Do not use on sandy soil if water table is shallower than 30 feet.

See page 82 for additional footnotes.

## Ridge-Till

Herbicide (See <i>Weed Response Chart</i> on page 16 before selecting herbicides)	Commercial Product per Acre			Application Time, Remarks and Approximate Cost/A Broadcast
	Sandy Loam <1% OM	Silt Loam 1-2% OM	Silty-Clay Loam > 2% OM	
ROUNDUP ULTRA	24-32 oz	24-32 oz	24-32 oz	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 \$15.96; 2,4-D + Banvel \$13.00; Gramoxone Extra + Atrazine \$11.74; Touchdown 5 + Banvel \$9.95; Touchdown 5 \$7.19-\$9.85; Roundup Ultra \$7.19-\$9.45.
ROUNDUP ULTRA OR TOUCHDOWN 5	16 oz	16 oz	16 oz	
+ BANVEL	13 oz	13 oz	13 oz	
	0.5 pt	0.5 pt	0.5 pt	
TOUCHDOWN 5	19-26 oz	19-26 oz	19-26 oz	
2,4-D Ester (4L)	1 pt	1 pt	1 pt	
+ BANVEL	0.5 pt	0.5 pt	0.5 pt	
	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<sup>○</sup> Sweet Corn<sup>□</sup> and Silage<sup>△</sup>

### Tilled Seedbed — Soil Applied

Herbicide (See <i>Weed Response Chart</i> on page 17 before selecting herbicides)	Commercial Product per Acre			Application Time, Remarks and Approximate Cost/A Broadcast
	Sandy Loam <1% OM	Silt Loam 1-2% OM	Silty-Clay Loam > 2% OM	
AATREX/ATRAZINE DF <sup>○□△3</sup>	Do not use <sup>a</sup>	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: \$6.60.
AXIOM DF <sup>△</sup> alone	8-10 oz	15-18 oz	16-20 oz	EPP, PPSA, PPI, PRE, or SURFACE MIX — Tank-mix with atrazine improves broadleaf weed control and increases soil residual. Cost: Axiom \$9.20-\$22.90; Axiom + atrazine \$12.50-\$28.30.
or with ATRAZINE DF	1.1 lb	1.4-1.7 lb	1.7-1.8 lb	
BALANCE	1.0-1.25 oz	1.5-2.5 oz	1.5-2.5 oz	PPSA, PPI, or PRE. Do not apply after corn emerges. Tank-mix Balance with a grass herbicide for improved grass control. Balance + atrazine improves cocklebur and sunflower control. Do not use Balance where water table is within 25 feet of surface and soil organic matter is less than 2%. Cost: Balance \$8.75-\$21.90; Balance + Atrazine \$11.30-\$20.50; Balance + Bicep \$16.20-\$22.90.
BALANCE + ATRAZINE	1.1 lb	1.3 lb	1.5 lb	
BALANCE + BICEP II MAGNUM	1.0 oz	1.5 oz	1.5 oz	
	0.9 qt	1.2 qt	1.2 qt	
BICEP II MAGNUM <sup>○□△</sup>	1.3-1.6 qt	1.6-2.1 qt	2.1-2.6 qt	EPP, PPSA, PPI, PRE, SURFACE MIX, or EARLY POST — Bicep Lite has 40% less Atrazine when s-metolochlor is applied at 1.0 lb/A for each product. Cost: \$11.80-\$19.10.
BICEP LITE II MAGNUM <sup>○□△</sup>	0.9 qt	1.1-1.5 qt	1.5-2.2 qt	
BLADEX DF <sup>○□△</sup>	1.1 lb	Rate limit of 1.1 lb/A of Bladex DF limits its usefulness to coarse soils		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. Bladex is being phased out. Cost: Bladex \$16.80; Bladex + Atrazine \$9.30.
BLADEX DF <sup>○□△</sup> + ATRAZINE DF	1.1 lb			
	0.55 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: \$20.70-\$29.60.
BULLET <sup>○□△</sup>	3.0 qt	3.2 qt	3.5 qt	PPSA, PRE, or SURFACE MIX. Cost: \$14.80-\$17.30.
CONTOUR (IMI hybrid required)	1.3 pt	1.3 pt	1.3 pt	PPSA, PRE, SURFACE MIX, or POST. Cost: \$16.50.

<sup>a</sup>Rate required poses risk of groundwater contamination.

<sup>b</sup>Do not use on sandy soil if water table is shallower than 30 feet.

See page 82 for additional footnotes.



# Field Corn, Popcorn<sup>○</sup>, Sweet Corn<sup>□</sup>, and Silage<sup>△</sup>

## Tilled Seedbed (Continued)

Herbicide (See <i>Weed Response Chart</i> on pages 17-18 before selecting herbicides)	Commercial Product per Acre			Application Time, Remarks and Approximate Cost/A Broadcast
	Sandy Loam <1% OM	Silt Loam 1-2% OM	Silty-Clay Loam > 2% OM	
DOUBLEPLAY <sup>b○△</sup> alone or with ATRAZINE DF	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 \$17.90-\$23.80; with Atrazine \$21.20-\$28.30.
DUAL II MAGNUM <sup>○□△</sup> or DUAL IIG MAGNUM <sup>○□△</sup>	1.0 pt	1.3 pt	1.7 pt	EPP, PPSA, PRE, or SURFACE MIX — Dual and Dual + AAtrex may be applied early post. Dual II may be applied layby. Bladex injury may occur on soils that are calcareous, sandy or below 1% organic matter. Cost: Dual II \$12.80-\$21.50; Dual + AAtrex \$14.80-\$21.00; Dual + Bladex \$16.70-\$18.40; Dual + Atrazine + Bladex \$16.60-\$21.20.
DUAL II MAGNUM <sup>○□△</sup>	0.9 pt	1.9 pt	1.2 pt	
+ AATREX DF <sup>3○□△</sup> or BLADEX DF	1.1 lb	1.4 lb	1.8 lb	
	0.83-1.1 lb	See Bladex note on rates.		
DUAL II MAGNUM <sup>○□△</sup> + ATRAZINE DF <sup>3○□△</sup> + BLADEX DF <sup>○□△</sup>	0.9 pt	1.0 pt	1.2 pt	PPI — Apply treatments to dry surface soil and immediately incorporate by cross-tandem disking or similar soil mixing. Bladex injury may occur on soils that are calcareous, sandy or below 1% organic matter. See pages 76-77 for shattercane control. Repeated use of Eradicane will lead to reduced weed control. Consider rotating herbicides or crops. Cost: Eradicane \$16.90-\$17.80; with Atrazine \$20.20-\$23.10; with Bladex \$23.70-\$31.50.
	0.55 lb	0.55 lb	0.70 lb	
	0.55 lb	1.1 lb	1.1 lb	
ERADICANE <sup>○□△</sup> ERADICANE <sup>○□△</sup> + ATRAZINE DF <sup>○□△</sup> or BLADEX DF	4.75 pt	5.0 pt	5.0 pt	PPSA, PRE, or EARLY POST — Extrazine injury may occur on soils that are calcareous, sandy or below 1% organic matter. Extrazine is being phased out. Cost: Extrazine \$7.00; with Dual II \$18.50; with Micro Tech \$21.00; with Frontier \$15.70-\$17.70.
	4.75 pt	5.0 pt	5.0 pt	
	1.1 lb	1.3 lb	1.8 lb	
	1.1 lb	See Bladex note on rates.		
EXTRAZINE II DF <sup>○□△</sup> EXTRAZINE II DF <sup>○□△</sup> + DUAL II MAGNUM or MICRO TECH or FRONTIER	1.5 lb	Rate limit of 1.5 lb/A of Extrazine DF limits its usefulness to coarse soils.		PPSA, PRE, or EARLY POST. Cost: \$13.40-\$20.10.
	1.5 lb			
	0.9 pt			
	2.0 qt			
	13-16 oz			
FRONTIER <sup>△</sup>	20 oz	25 oz	30 oz	PPSA, PRE, or PPI. Cost: \$13.40-\$20.10.
FULTIME <sup>b○△</sup>	2.5-2.7 qt	2.7-3.0 qt	3.0-3.5 qt	EPP, PPSA, PRE, or SURFACE MIX. Cost: \$17.50-\$24.50.
GUARDSMAN/LEADOFF <sup>○□△</sup>	2.5-3.0 pt	3.0-4.0 pt	4.0-4.5 pt	PPSA, PRE, PPI or EARLY POST. Cost: \$25.00-\$34.90.
HARNESS <sup>b○△</sup>	1.25-1.75 pt	1.75-2.25 pt	1.75-2.25 pt	PPSA, PRE, SURFACE MIX, or EARLY POST. Cost: Harness \$11.80-\$21.20; Harness Xtra \$20.80-\$26.60.
HARNESS XTRA <sup>b○△</sup>	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: \$10.40-\$13.10.
MICRO TECH/LASSO <sup>○□△</sup> or LASSO II	2.0 qt	2.5 qt	3.0 qt	PPSA, PRE, or EARLY POST — Bladex injury may occur on soils that are calcareous or sandy with below 1% organic matter. Cost: Micro Tech \$14.00-\$21.00; with Bladex \$17.30; with Atrazine \$14.10-\$20.80.
	Do not use <sup>a</sup>	17 lb	20 lb	
MICRO TECH <sup>○□△</sup> + ATRAZINE DF or BLADEX DF	1.5 qt	2.0 qt	2.2 qt	
	1.2 lb	1.5 lb	1.8 lb	
	1.1 lb	See Bladex note on rates.		

See page 82 for additional footnotes.

# Field Corn, Popcorn<sup>○</sup>, Sweet Corn<sup>□</sup>, and Silage<sup>△</sup>

## Tilled Seedbed (Continued)

Herbicide (See Weed Response Chart on pages 17-18 before selecting herbicides)	Commercial Product per Acre			Application Time, Remarks and Approximate Cost/A Broadcast
	Sandy Loam <1% OM	Silt Loam 1-2% OM	Silty-Clay Loam > 2% OM	
PROWL + ATRAZINE DF	Do not use	1.8 qt  1.33 lb	1.8 qt  1.77 lb	PRE — Corn injury may occur if replanting is necessary. Rainfall shortly after planting required for performance. See page 78 for wild proso millet. Cost: Prowl + Atrazine \$17.40-\$18.70.
PYTHON	.80 oz	1.0 oz	1.33 oz	PPSA, PPI, or PRE. Controls broadleaf weeds only. Cost: \$7.80-\$12.90.
SURPASS <sup>b○△</sup>	1.5-2.0 pt	2.0-2.25 pt	2.0-2.5 pt	PPSA, PRE, SURFACE MIX, or EARLY POST. Cost: Surpass \$13.00-\$21.70; Surpass 100 \$13.70-\$28.30.
SURPASS 100 <sup>b○□△</sup>	1.6-2.2 qt	2.2-2.6 qt	2.6-3.3 qt	
TOPNOTCH <sup>○△</sup>	2.0 qt	2.0-2.5 qt	2.0-3.0 qt	EPP, PPSA, PRE, or SURFACE MIX. Cost: \$17.00-\$25.50.
TOPNOTCH <sup>○△</sup> + ATRAZINE DF	2.0 qt  1.1 lb	2.0-2.5 qt  1.3 lb	2.0-3.0 qt  1.5 lb	EPP, PPSA, PRE, or SURFACE MIX. Cost: \$20.30-\$30.00.

### Postemergence (see page 13 for additives)

Herbicide	Rate Per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
AATREX <sup>2○□△</sup> or ATRAZINE DF	1.4-2.2 lb	Corn <12" Broadleaf weeds 2-6"; grass weeds 1" or less	Lower atrazine rate controls broadleaf weeds. Atrazine maximum use rate (all uses) is 2.5 lb ai/A per year. Cost: \$4.20-\$6.60.
ACCENT <sup>○</sup> alone or with CLARITY/BANVEL or BUCTRIL 2E	0.67 oz  0.5-1.0 pt  1.0-1.5 pt	Corn 4-20" broadcast, >20" use drops Shattercane 4-12" Broadleaves 1-4" Grasses 1-3"	Do not use if Counter was applied to the crop. Do not apply 3 days before or 7 days after foliar applied organophosphate insecticides. See <i>Herbicide Resistance</i> , page 6. Refer to Clarity precautions. Cost: Accent \$20.90; Accent + Clarity \$26.50-\$32.10; Accent + Buctril \$28.30-\$31.90.
ACCENT GOLD	2.9 oz	Corn <12" (V6) Grasses 1-3" Broadleaves 1-6"	Can be tank mixed with atrazine, Banvel/Clarity, or Marksman. Same restrictions as for Accent. Cost: \$22.50.
AIM <sup>○</sup> alone or with ATRAZINE DF or CLARITY or ATRAZINE + CLARITY	0.33 oz  0.56-1.1 lb  8.0 oz  .56 lb  3-4 oz	Corn 8-collar Broadleaves 1-4" Velvetleaf up to 36"	Aim is a contact herbicide so thorough spray coverage is required. Cost: Aim \$4.00; Aim + Atrazine \$5.70-\$7.30; Aim + Clarity \$9.60; Aim + Atrazine + Clarity \$7.80-\$8.50.
BASIS	0.33 oz	Corn spike to 2-collar/4-leaf Foxtail 1-2"	Do not use if Counter was applied to the crop. Do not apply 3 days before or 7 days after foliar applied organophosphate insecticides. Tank-mix Basis with 4-8 oz Banvel/Clarity, Marksman, or Atrazine for additional broadleaf control. Can tank mix Basis Gold with Banvel/Clarity (2-4 oz), Hornet, or Tough. Cost: Basis \$9.10; Basis Gold \$17.20.
BASIS GOLD	14 oz	Corn up to 12" or V6 stage Weeds 1-3"	

See page 82 for additional footnotes.



# Field Corn, Popcorn<sup>○</sup>, Sweet Corn<sup>□</sup>, and Silage<sup>△</sup>

## Postemergence (Continued)

Herbicide	Rate Per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
BEACON <sup>○△</sup>	0.38-0.76 oz	Corn 4-20" broadcast, >20" use drops Shattercane 4-12" Broadleaves 1-4" Grasses 1-3"	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 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 <i>Herbicide Resistance</i> , page 6. Use only if grass herbicide has been used preplant or PRE. Beacon may be tank-mixed with Atrazine, Banvel/Clarity, Buctril, Marksman, or 2,4-D. Cost: Beacon \$10.30-\$20.60; Beacon + Accent \$20.90.
BEACON <sup>○</sup> + ACCENT	0.38 oz 0.34 oz	Corn 4-20" >20" use drops Grasses 1-3", Broadleaves 1-4"	
BLADEx 90DF	1.1 lb	Corn before 5-leaf stage	Maximum allowable use rate for 1999 is 1.1 lb/A which is not enough for dependable weed control. Cost: \$6.80.
BUCTRIL <sup>○</sup> 2E alone or with ATRAZINE DF <sup>2</sup>	1.0-1.5 pt 1.1 lb	Corn 3-leaf to 12" Broadleaf weeds 2-6" tall	Contact herbicide. Thorough coverage, correct tips, pressure, spray, volume, rate and weed size important. Cost: Buctril \$7.40-\$11.00; Buctril + Atrazine \$10.70-\$14.30; Buctril/Atrazine \$9.60-\$14.40.
BUCTRIL/ATRAZINE <sup>2</sup>	2.0-3.0 pt		
BUCTRIL 2E + CLARITY/BANVEL	1.0 pt or 0.5 pt 0.5 pt	Spike to 36", >8" use drops weeds 2-6 leaf	Later applications may cause brittleness and increase greensnap risk. Use lower rate for good growing conditions to reduce corn injury. Do not use Clarity/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. Use higher rate of Clarity/Banvel only on corn at spike to 8" and on silty clay loam containing more than 2.0% organic matter. Hybrids vary in sensitivity to growth regulator herbicides. Cost: Buctril + Clarity \$13.00; Clarity/Banvel \$5.60-\$11.20; 2,4-D \$0.90-\$1.80; 2,4-D + Clarity \$6.10.
CLARITY/BANVEL <sup>□△</sup>	0.5-1.0 pt	Corn spike to 36"	
2,4-D ESTER (4L) <sup>□△</sup>	0.5-1.0 pt	Less risk when corn is small, over 8" use low rate and drop pipes to keep spray out of corn whorl. Weeds at 2-6"	
2,4-D AMINE (4L) or 2,4-D ESTER (4L)	0.25 pt 0.25 pt		
+ CLARITY/BANVEL	0.50 pt		
CELEBRITY <sup>○</sup>	6.67 oz	Corn up to 20" (V6), Weeds 2-4"	Copack of Accent and Banvel. Same restrictions as for Accent and Banvel. Use drops when possible. Cost: \$23.00.
CONTOUR (IMI hybrid 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: \$16.90.
EXCEED	1.0 oz	Corn 4-20" broadcast. use drops 20"-tassel 2-12" weeds	Banvel/Clarity may be added for resistant weed management. On soil above pH 7.3 carryover may injure soybean and other sensitive crops. 18 month soybean rotation restriction, but 10 months if south of I-80 and STS soybean variety planted. Refer to Beacon for OP insecticide restrictions. Cost: \$11.50.
EXTRAZINE II DF <sup>2△</sup> + ATRAZINE	1.5 lb 0.8 lb	Corn before 5-leaf stage Grass weeds 1" or less	Use with water only. Extrazine maximum use rate for 1999 is 1.5 lb/A, so mix with Atrazine as shown. Cost: \$10.80.
HORNET	1.6-4.0 oz	Broadleaf weeds <8" Corn at spike to 24"	Use higher rate for control of dense weed population, larger weeds, or when a longer residual is desired. Cost: \$6.10-\$15.20.
LADDOK S-12 <sup>20□△</sup>	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: \$7.25-\$12.80.
LIBERTY (Liberty Link hybrid required)	20-28 oz	Weeds 1-4" Corn up to 24"	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 Sencor/Lexone and Basis. Cost: Liberty \$16.10-\$22.50; Liberty ATZ \$15.50-\$21.40.
LIBERTY ATZ (Liberty Link hybrid required)	32-40 oz	Corn up to 12"	

See page 82 for additional footnotes.

# Field Corn, Popcorn<sup>○</sup>, Sweet Corn<sup>□</sup>, and Silage<sup>△</sup>

## Postemergence (Continued)

Herbicide	Rate Per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
LIGHTNING (IMI hybrid 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: \$21.60.
MARKSMAN <sup>○2</sup>	2.0-3.5 pt	Before corn exceeds 5-leaf stage	Observe precautions regarding Banvel/Clarity use near sensitive crops specified above. Do not use more than 2.0 pt/A on sands, loamy, or sandy loam soil, or soil having less than 2.0% organic matter. Cost: \$7.00-\$12.30.
PERMIT	0.66-1.33 oz	Broadleaf weeds 2-6" Corn spike-20" Drops >20"	Banvel/Clarity may be added for resistance management. Cost: \$8.60-\$17.30.
POAST PLUS or POAST (Poast Protected hybrid required)	1.5-2.25 pt  1.0-1.5 pt	Grasses less than 8" Shattercane up to 18"	Consult label for suitable broadleaf tank mix. Can apply twice per season, if needed. Cost: Poast Plus \$9.80-\$14.80; Poast \$9.80-\$14.80.
RESOLVE SG (IMI hybrid required)	5.3 oz	Weeds 1-3"	Observe precautions regarding Banvel/Clarity as listed previously. Cost: \$17.00.
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.
ROUNDUP ULTRA (Roundup Ready hybrid required)	32 oz	Up to 30" (V8) corn	May apply sequentially over a preemergence herbicide. Can apply twice per season for 64 oz maximum. Add RR technology fee of \$7.00/A. Cost: \$9.50.
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 with Broadstrike or Python. Cost: \$8.90.
SENCOR 75DF + BASAGRAN or 2,4-D ESTER (4L) or CLARITY/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"	Observe precautions for Clarity and 2,4-D. Cost: Sencor + Basagran \$6.30-\$12.00; Sencor + 2,4-D \$2.45-\$3.40; Sencor + Clarity \$4.70-\$8.10.
SPIRIT	1.0 oz	Corn 4-20" broadcast, >20" use drop nozzles, 2-8" weeds	Soybean rotation interval is 10 months south of I-80 and 18 months north of I-80. More rotation restrictions on soils with pH >7.8. Refer to Beacon for OP insecticide restrictions. Cost: \$11.50.
TOUGH + ATRAZINE DF	1.0-2.0 pt 1.25-2.0 lb	Corn <12" Broadleaf weeds 2-6" Grass weeds 1" or less	Apply at 10 or more GPA. Cost: \$14.60-\$16.80.

See page 82 for additional footnotes.



# Field Corn, Popcorn<sup>○</sup>, Sweet Corn<sup>□</sup>, and Silage<sup>△</sup>

## Postemergence (Continued)

Herbicide	Rate Per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
<b>Layby</b>			
DUAL II MAGNUM <sup>□△</sup>	1.0-1.2 pt	Layby	Apply after furrowing or final cultivation. Cost: \$12.80-\$15.30.
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-\$13.40.
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 \$6.20-\$8.30; Treflan + atrazine \$9.40-\$13.00.
<b>Harvest Aid</b>			
2,4-D ESTER (4L)	1.0 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: \$3.40.

# 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 69-78 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) <sup>§</sup>	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 <sup>a</sup>	Recrop Interva, in Months <sup>b</sup>
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### 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 Magnum	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 II Magnum	6	2	2	2	2	7	7	7	4	2	2	2	2	7	7	7	2	2-18
Dual* + Micro Tech + 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
LeadOff	9	7	9	9	2	9	9	7	8	8	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/Clarity	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
Paramount	-	-	5	5	5	5	5	5	5	5	-	5	5	-	5	5	2	0-10
Paramount + Atrazine	9	9	9	9	8	9	9	9	9	7	9	9	9	9	9	8	2	6-24
Peak	3	9	6	1	6	5	8	9	9	-	7	9	8	9	1	8	2	0-18
Peak + Clarity	7	9	8	7	8	7	9	9	9	7	9	9	8	9	8	8	4	1-18
Permit	3	9	6	6	6	5	8	9	9	-	7	9	8	8	1	8	2	0-10
Roundup Ultra-ropewicks, wipers, etc. <sup>c</sup>	-	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

<sup>a</sup>Crop ratings less than 3 result in no yield loss

<sup>b</sup>Values will vary with soil texture, pH, organic matter, rainfall or irrigation, rotational crop, and herbicide rate.

<sup>c</sup>Ratings for weeds tall enough for selective treatment.

\*Registered for forage sorghum, sorghum-grain and forage.

<sup>§</sup>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 69-78 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) <sup>§</sup>	Crabgrass (0.5)	Fall Panicum (0.4)	Foxtail (1.0)	Sandbur (0.4)	Shattercane/Sorghum (3.5)	Shattercane, ALS-resistant	Crop Safety <sup>a</sup>	Recrop Interval, in Months <sup>b</sup>
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### Soil-applied Herbicides

AAtrex*/Atrazine	4	4	2	7	4	2	2	2	6-24
Bicep II Magnum	9	7	7	9	4	2	2	2	6-24
Bullet	9	7	7	9	4	2	2	2	6-24
Dual II Magnum	9	9	9	9	4	2	2	2	2-18
Dual* + Micro Tech + Atrazine	9	7	7	9	4	2	2	2	6-24
Lariat	9	7	7	9	4	2	2	2	6-24
LeadOff	9	9	9	9	4	3	3	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
Paramount	7	7	-	8	5	2	2	2	0-10
Paramount + Atrazine	8	8	-	9	-	2	2	2	6-24
Peak	1	1	1	1	1	1	1	2	0-18
Peak + Clarity	1	1	1	1	1	1	1	3	1-18
Permit	1	1	1	1	1	1	1	2	0-10
Roundup Ultra-rope-wicks, wipers, etc. <sup>c</sup>	-	-	-	-	-	8	8	1	0
2,4-D	2	2	2	2	2	3	2	4	1

<sup>a</sup>Crop ratings less than 3 result in no yield loss

<sup>b</sup>Values will vary with soil texture, pH, organic matter, rainfall or irrigation, rotational crop, and herbicide rate.

<sup>c</sup>Ratings for weeds tall enough for selective treatment.

\*Registered for forage sorghum, sorghum-grain and forage.

<sup>§</sup>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 for Gramoxone Extra and for Roundup Ultra. Add 1.0 pt/A 2,4-D ester 4 lb/gal if broadleaf weeds are present and apply 7 days before planting.

Herbicide	Commercial Product per Acre			Application Time	Remarks and Approximate Cost/A Broadcast
	Sandy Loam < 1% OM	Silt Loam 1-2% OM	Silty-Clay Loam >2% OM		
Cool-Season Grass Sod (including smooth brome and bluegrass)					
ROUNDUP ULTRA <sup>1</sup>	16-32 oz	16-32 oz	16-32 oz	Fall or new growth	Use appropriate herbicide at planting. Cost: \$3.54-\$4.72.
Alfalfa Clover Sod					
2,4-D 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 brome-grass or bluegrass is present add Roundup Ultra. Don't apply with UAN or atrazine. Cost: \$14.75.
+ 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 <sup>3</sup>	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 Micro Tech or Dual. Cost: Atrazine + Gramoxone Extra \$12.08-\$15.92; AAtrex + Roundup Ultra + Dual \$21.48-\$25.63; Atrazine + Roundup Ultra + Micro Tech \$24.34-\$28.49.
+ GRAMOXONE EXTRA <sup>1</sup>		1.5-2.5 pt	1.5-2.5 pt		
AATREX 4L <sup>3</sup>	1.2 qt	1.4 qt	1.6 qt		
+ ROUNDUP ULTRA	16-24 oz	16-24 oz	16-24 oz		
+ MICRO TECH or DUAL II MAGNUM	2.3 qt 1.3 pt	2.3 qt 1.5 pt	2.3 qt 1.67 pt		
Continuous Row Crop <sup>4</sup>					
AATREX 4L <sup>*3</sup>	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 Magnum 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 II MAGNUM	Do not use	1.6 qt	2.0 qt	0-30 DAP	
BICEP LITE II MAGNUM		1.1 lb 0.5 qt 1.6 qt	1.2 lb 0.6 qt 1.8 qt	30-45 DBP fb 1 DAP 0-30 DPB	
BULLET (Neb. State Label)	Do not use	3.0 qt	3-4 qt	0-7 DBP	
GUARDSMAN or LEADOFF	3.0-3.5 pt 2.5-3.0 pt	3.5-4.5 pt 3.0-4.0 pt	4.5-5.0 pt 4.0-4.5 pt	16-30 DBP 0-15 DBP	Seed must be treated with an appropriate sorghum seed safener to reduce injury to sorghum. Add 0.5 pt for heavy residues. Do not exceed 5.0 pt/A. Cost: Guardsman \$15.21-\$24.79; LeadOff \$15.37-\$25.63.
ROUNDUP ULTRA	16-32 oz	16-32 oz	16-32 oz	Prior to crop emergence	Add appropriate residual herbicide. If only broadleaf weeds are present, add 2,4-D (4L) ester at 1 pt/A and delay planting 10 days. Can be used preplant. Cost: Roundup Ultra \$4.73-\$9.45; Touchdown 5 \$4.87-\$9.75.
TOUCHDOWN 5	13-26 oz	13-26 oz	13-26 oz		

<sup>d</sup>21 days preplant on sandy loam



# 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 two-thirds rate applied preplant + one-third 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.

Herbicide	Commercial Product per Acre			Application Time	Remarks and Approximate Cost/A Broadcast
	Sandy Loam < 1% OM	Silt Loam 1-2% OM	Silty-Clay Loam >2% OM		
ROUNDUP ULTRA	24-32 oz	24-32 oz	24-32 oz	1-3 weeks preplant to prevent soil water loss	Roundup Ultra and Touchdown 5 are 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 Extra \$5.76-\$9.61; Touchdown 5 \$7.25-\$9.75.
GRAMOXONE EXTRA	1.5-2.5 pt	1.5-2.5 pt	1.5-2.5 pt		
TOUCHDOWN 5	19-26 oz	19-26 oz	19-26 oz		

## Tilled Seedbed

Herbicide	Commercial Product per Acre			Remarks and Approximate Cost/A Broadcast
	Sandy Loam < 1% OM	Silt Loam 1-2% OM	Silty-Clay Loam >2% OM	
AATREX/ATRAZINE DF <sup>3</sup>	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 II MAGNUM	Do not use	2.0 qt	2.4 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.
BICEP LITE II	Do not use	1.8 qt	2.2 qt	
DUAL II MAGNUM or DUAL 25G	1.5 pt 6 lb	2 pt 8 lb	2.5 pt 10 lb	
BULLET (Neb. State Label)	Do not use	3.0 qt	3.5 qt	0-30 days. Add 2-5 fluid oz for heavy residues. Do not exceed 32 fluid oz/A. Need seed safener. Cost \$16.90-\$25.30.
FRONTIER	20 oz	25 oz	30 oz	
GUARDSMAN	3.0 pt	3.5-4.0 pt	4.0-4.5 pt	
MICRO TECH	Do not use	2.5 qt	3 qt	PPSA, PRE, or SURFACE MIX — Seed must be Screen treated. Cost: Lariat \$12.80-\$16.80; Micro Tech \$16.00-\$19.30.
LARIAT	Do not use	3 qt	3.5 qt	
LEADOFF	Do not use	3.5 pt	4.5 pt	PPSA, PPI, PRE — Use safener seed only. Cost: \$17.94-\$23.06.

See page 82 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 <sup>2</sup>	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 S-12 \$5.00-\$12.00.
LADDOK S-12 <sup>2</sup>	1.3-2.3 pt		
MARKSMAN <sup>2</sup>	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 2,4-D ESTER* (4L)	1 pt 0.5 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.
BUCTRIL or BUCTRIL GEL alone or with ATRAZINE <sup>2</sup> or with BANVEL	1 -1.5 pt or 0.5-0.75 pt 0.55 lb 0.12-0.5 pt	Broadleaf weeds 2-6"; sorghum 3-leaf to 12"	
BUCTRIL/ATRAZINE <sup>2</sup>	2-3 pt	Sorghum 3-leaf to 12"	
BUCTRIL/ATRAZINE <sup>2</sup> + 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 Clarity. On soil above pH 7.5, carryover may injure soybean 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. Good for tall water hemp and velvetleaf. Cost: \$8.59.

## Harvest Aid

SODIUM CHLORATE 3	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.
DIQUAT	1.5-2.0 pt	1-2 weeks before harvest.	Seed no more than 30% moisture.

See page 82 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, Longspine	Kochia	Kochia, Triazine-resistant	Russian Thistle	Smartweed—Annual	Velvetleaf	Sunflower	Corn—volunteer	Winter Wheat or Rye	Alfalfa	Sweet Clover	Hairy Vetch
2,4-D Ester** (1.0 pt)	1	4	7	1	1	7	4	7	8	9	8	7	7	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	3	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	3	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	4	6	4	4	7
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	3	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	4	1	1	2	2
Roundup Ultra <sup>a</sup> /Touchdown 5 <sup>a***</sup> (16/13 oz)	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 <sup>c</sup>	10	4	3	6
Roundup Ultra <sup>a</sup> /Touchdown 5 <sup>a***</sup> (24/19 oz)	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 <sup>c</sup>	10	5	4	6
Roundup Ultra <sup>a</sup> /Touchdown 5 <sup>a***</sup> + 2,4-D (16/13 oz + 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 <sup>c</sup>	10	6	5	7
Roundup Ultra <sup>a</sup> /Touchdown 5 + Canopy/Preview (16/13 oz + 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	10 <sup>c</sup>	10	3	3	7
Roundup Ultra <sup>a</sup> /Touchdown 5 <sup>a***</sup> + Pursuit (16/13 oz + 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	10 <sup>c</sup>	9	4	3	7
Roundup Ultra <sup>a</sup> /Touchdown 5 <sup>a***</sup> + Sencor/Lexone DF (16/13 oz + 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 <sup>c</sup>	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	3	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	3	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.

\*\*\* Use Touchdown 5 at 80% the rate listed for Roundup Ultra.

<sup>c</sup> Roundup Ultra will not control Roundup Ready volunteer corn. Refer to soybean section for listing of grass herbicides for control of volunteer Roundup Ready 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 69-78 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) <sup>§</sup>	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)	Waterhemp, ALS-resistant (2.5)	Waterhemp, Triazine-resistant (2.5)	Crop Safety <sup>a</sup>	Recrop Interval, in Months <sup>b</sup>
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### Soil Applied Herbicides

Authority	8	4	3	3	3	8	8	8	5	-	7	3	6	8	8	8	2	3-24
Axiom	7	5	5	5	2	8	9	7	7	5	6	6	6	9	9	7	3	0-4
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 II Magnum or Micro Tech	7	8	7	7	4	9	9	8	9	7	9	8	8	9	8	9	2	4-18
Canopy	4	8	7	7	4	9	9	8	9	7	9	8	8	9	6	9	2	4-18
Canopy XL	9	8	9	9	9	9	9	9	8	8	9	5	7	9	8	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	4	6	9	9	9	7	2	2	4	7	8	8	10	2	2	2	1	6-12
Command + Canopy	4	9	9	9	9	9	9	8	9	7	8	8	10	9	7	9	2	4-18
Command + 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 II Magnum	7	2	2	2	2	8	8	8	5	3	2	2	2	8	8	8	1	4-18
Dual II Magnum + Lexone/Sencor	7	4	4	4	2	9	9	8	9	7	8	4	6	9	9	7	3	4-18
First Rate	3	8	8	1	8	6	8	8	9	-	8	8	8	6	1	6	2	0-30
Frontier	6	2	2	2	2	7	8	8	5	3	2	2	2	8	8	8	1	2-4
Micro Tech/Partner/Lasso	7	2	2	2	2	7	8	8	4	2	2	2	2	8	8	8	1	2-4
Micro Tech + 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	7	7	9	9	7	9	9	7	4	7	9	9	7	3	4-18
Pursuit	8	6	8	1	8	8	9	9	9	-	9	8	8	6 <sup>c</sup>	1	6 <sup>c</sup>	2	4-26
Pursuit + Dual II Magnum	8	6	8	2	9	9	9	9	9	-	9	8	8	9 <sup>c</sup>	7	9 <sup>c</sup>	2	4-26
Pursuit Plus	8	6	9	7	9	9	9	9	9	-	9	8	8	8 <sup>c</sup>	7	8 <sup>c</sup>	2	4-26
Python	3	5	8	1	8	8	8	8	3	8	8	5	7	8	1	8	1	0-18
Scepter + Dual II Magnum or Micro Tech	8	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	7	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	2	7	7	7	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	5	5	9	9	9	9	9	7	9	9	7	5	10	9	9	7	2	9-16

<sup>a</sup>Crop ratings less than 3 usually result in no yield reduction.

<sup>b</sup>Values will vary with soil texture, pH, organic matter, rainfall or irrigation, rotational crop, and herbicide rate. Refer to product label for specific information.

<sup>c</sup>Pursuit — Not labeled for control of waterhemp.

<sup>§</sup>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 69-78 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) <sup>§</sup>	Crabgrass (0.5)	Fall Panicum (0.4)	Foxtail (1)	Sandbur (0.4)	Shattercane/Sorghum (3.5)	Shattercane, ALS-resistant (3.5)	Crop Safety <sup>a</sup>	Recrop Interval, in Months <sup>b</sup>
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## Soil Applied Herbicides

Authority	5	7	7	5	3	3	3	2	3-24
Axiom	9	9	9	9	7	6	6	3	0-4
Broadstrike + Dual	9	9	9	9	6	4	4	2	4-26
Broadstrike + Treflan	9	9	9	9	9	7	7	1	4-26
Canopy + Dual II Magnum or Micro Tech	9	9	9	9	4	3	3	2	4-18
Canopy	4	4	4	4	2	2	2	2	4-18
Canopy XL	4	6	4	4	4	2	2	2	4-18
Canopy + Treflan or Sonalan or Prowl	9	9	9	9	8	7	7	2	4-18
Command	9	9	9	9	6	6	6	1	6-12
Command + Canopy	8	8	8	8	6	6	6	2	4-18
Command + Treflan or Sonalan or Prowl	9	9	9	9	9	8	8	1	9-18
Detail	9	9	8	9	3	5	4	2	0-26
Dual II Magnum	9	9	9	9	5	4	4	1	4-18
Dual II Magnum + Lexone/Sencor	9	9	9	9	4	4	4	3	4-18
First Rate	1	1	1	1	1	1	1	1	0-30
Frontier	9	9	9	9	4	4	4	1	2-4
Micro Tech/Partner/Lasso	9	9	9	9	4	3	3	1	2-4
Micro Tech + Lexone/Sencor	9	9	9	9	4	4	4	3	4-18
Prowl	9	9	9	9	8	6	6	2	4-18
Prowl + Lexone/Sencor	9	9	9	9	8	7	7	3	4-18
Pursuit	6	2	6	6	5	7	1	2	4-26
Pursuit + Dual II Magnum	9	9	9	9	7	7	3	2	4-26
Pursuit Plus	9	9	9	9	7	8	5	2	4-26
Python	1	1	1	1	1	1	1	1	0-18
Scepter + Dual II Magnum or Micro Tech	9	9	9	9	4	4	4	2	4-26
Squadron or Scepter + Sonalan or Treflan	9	9	9	9	7	6	5	2	4-26
Steel	9	9	9	9	7	9	5	1	4-26
Treflan	9	9	9	9	8	7	7	2	5-18
Treflan/Trifluralin + Sencor/Lexone	9	9	9	9	8	7	7	3	4-18
Treflan + Lexone/Sencor + Command	9	9	9	9	8	8	8	2	9-16

<sup>a</sup>Crop ratings less than 3 usually result in no yield reduction.

<sup>b</sup>Values will vary with soil texture, pH, organic matter, rainfall or irrigation, rotational crop, and herbicide rate.

<sup>§</sup>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 69-78 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) <sup>§</sup>	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)	Waterhemp, ALS-resistant (2.5)	Waterhemp, Triazine-resistant (2.5)	Crop Safety <sup>a</sup>	Recrop Interval, in Months <sup>b</sup>
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### Postemergence Herbicides

Weed size influences performance—see label

Assure II/Matador	2	2	2	2	2	2	2	2	2	1	2	2	2	2	1	4
Basagran	2	9	7	7	7	7	2	2	7	7	9	8	9	2	2	0
Basagran + Blazer/Galaxy	7	9	7	7	7	7	8	8	9	7	9	8	9	8	8	0
Basagran + Cobra	7	9	4	4	4	4	9	9	9	7	9	8	8	9	9	0
Basagran + Scepter	4	10	7	7	7	7	9	9	7	7	9	9	9	8	3	4-26
Blazer/Status	8	6	4	4	4	4	9	9	9	5	9	4	4	9	9	0
Classic/Skirmish	2	10	4	1	4	4	8	8	9	3	9	9	8	6 <sup>e</sup>	1 <sup>e</sup>	3-15
Cobra	8	8	4	4	4	4	9	9	9	5	7	7	7	9	9	0
First Rate	2	9	4	1	4	3	5	5	9	3	8	9	9	4	1	0-30
Fusilade	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Fusion	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
Liberty <sup>d</sup>	8	9	7	7	7	7	7	7	9	9	9	9	8	7	7	0
Pinnacle	2	6	4	1	4	8	8	8	4	3	8	6	8	6 <sup>e</sup>	1	1-5
Pinnacle + Classic	2	9	4	1	4	9	9	9	9	7	9	9	9	6 <sup>e</sup>	1	3-9
Poast Plus/Prestige	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0
Poast Plus/Prestige + Basagran	2	9	7	7	2	2	2	2	7	2	9	8	9	2	2	0
Pursuit	8	9	8	1	8	4	9	9	7	5	8	7	8	6 <sup>e</sup>	1	4-26
Pursuit + Blazer or Cobra or Reflex	8	9	8	4	5	4	9	9	9	5	9	7	7	9	8	4-26
Raptor	9	9	8	1	8	8	9	9	7	-	7	9	9	6 <sup>e</sup>	1	2-18
Reflex/Flexstar	8	7	4	4	4	5	9	9	9	5	8	7	7	9	9	3-13
Reliance STS <sup>d</sup>	2	10	4	3	4	7	9	9	9	5	9	9	9	6 <sup>e</sup>	1	3-30
Resource	4	7	3	3	3	7	5	5	7	3	4	4	10	4	4	0
Roundup Ultra (1.0 qt) <sup>d</sup>	8	9	8	8	8	8	9	9	8	7	8	9	8	9	9	0
Roundup Ultra/Touchdown-ropewicks, wipers, etc. <sup>e</sup>	-	7	2	2	2	7	7	7	7	4	7	4	4	7	7	0
Select	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	4
Stellar	7	7	4	1	4	7	9	9	9	5	5	7	10	9	9	0
Synchrony STS <sup>d</sup>	2	9	6	1	6	9	9	9	9	7	9	9	9	6 <sup>e</sup>	1	3-30

<sup>a</sup>Crop ratings less than 3 usually result in no yield reduction.

<sup>b</sup>Values will vary with soil texture, pH, organic matter, rainfall or irrigation, rotational crop, and herbicide rate.

<sup>c</sup>Ratings for weeds tall enough for selective treatment

<sup>d</sup>For use in herbicide tolerant soybean varieties.

<sup>e</sup>Not labeled for control.

<sup>§</sup>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 69-78 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—less than 60%, 1—0%

	Barnyardgrass (0.3) <sup>§</sup>	Crabgrass (0.5)	Fall Panicum (0.4)	Foxtail (1)	Sandbur (0.4)	Shattercane/Sorghum (3.5)	Shattercane, ALS-resistant (3.5)	Crop Safety <sup>a</sup>	Recrop Interval, in Months <sup>b</sup>
<b>Postemergence Herbicides</b>									
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	2	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
First Rate	1	1	1	1	1	1	1	2	0-30
Fusilade	9	9	9	8	8	10	10	1	2
Fusion	9	9	9	8	8	10	10	2	1
Liberty <sup>d</sup>	7	8	7	9	7	7	7	1	0
Pinnacle	1	1	1	1	1	1	1	2	1-5
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	5	8	5	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 <sup>d</sup>	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) <sup>d</sup>	10	9	10	10	10	10	10	1	0
Roundup Ultra/Touchdown—ropewicks, wipers, etc. <sup>c</sup>	-	-	-	-	-	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 STS <sup>d</sup>	2	2	2	2	2	2	2	1	3-30

<sup>a</sup>Crop ratings less than 3 usually result in no yield reduction.

<sup>b</sup>Values will vary with soil texture, pH, organic matter, rainfall or irrigation, rotational crop, and herbicide rate.

<sup>c</sup>Ratings for weeds tall enough for selective treatment

<sup>d</sup>For use in herbicide tolerant soybean varieties.

<sup>§</sup>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. A non-selective herbicide such as Roundup Ultra may be needed to control emerged weeds at time of application of residual herbicides. If only non-residual PPE or POST herbicides are used, apply appropriate PRE or POST herbicides as necessary. If Roundup Ready or Liberty-Link varieties are planted, consider using a residual herbicide if a high weed density is expected. Also, Roundup Ultra does not control volunteer Roundup Ready corn.

Herbicide	Commercial Product per Acre			Application Time	Remarks and Approximate Cost/A Broadcast
(See <i>Weed Response Chart</i> on page 31 before selecting herbicides)	Sandy Loam <1% OM	Silt Loam 1-2% OM	Silty-Clay Loam >2% OM		
<b>No-Till in Alfalfa or Clover Sod</b>					
2,4-D Ester (4L)	1.0 qt	1.0 qt	1.0 qt	Apply in <b>FALL</b> to alfalfa with 4" new growth	Generally it is not wise to follow alfalfa with soybean. Use appropriate residual herbicide at planting. 2,4-D' + Banvel used to kill alfalfa. Cost: \$8.02.
+ BANVEL	0.5 pt	0.5 pt	0.5 pt		
<b>Soybean, No-Till in Cool-Season Grass Sod</b>					
ROUNDUP ULTRA	24-32 oz	24-32 oz	24-32 oz	Apply in <b>FALL</b> to 6-12" of new growth	Cost: Roundup Ultra \$7.09-\$9.45; Touchdown 5 \$8.00-\$10.97.
OR TOUCHDOWN 5	19-26 oz	19-26 oz	19-26 oz		
<b>Soybean, No-Till in Warm-Season Grass Sod</b>					
ROUNDUP ULTRA/GLYFOS	32 oz	32 oz	32 oz	Apply in August to early September	Cost: Roundup Ultra \$9.45; Touchdown 5 \$10.97.
OR TOUCHDOWN 5	26 oz	26 oz	26 oz		
<b>Soybean, No-Till in Rye or Winter Wheat</b>					
ROUNDUP ULTRA	12-16 oz	12-16 oz	12-16 oz	Apply when rye and wheat are 4-10" and before soybean emerge	Follow with appropriate EPP treatment. Cost without EPP treatment: Roundup Ultra \$3.54-\$4.73; Touchdown 5 \$4.00-\$8.53.
OR TOUCHDOWN 5	10-13 oz	10-13 oz	10-13 oz		
<b>Soybean, No-Till Continuous Row Crops. An early application is needed to prevent soil water loss by weeds.</b>					
ROUNDUP ULTRA	24-32 oz	24-32 oz	24-32 oz	0-30 DBP	Cost: Roundup Ultra \$5.61-\$7.68; Touchdown 5 \$8.00-\$10.97.
OR TOUCHDOWN 5	19-26 oz	19-26 oz	19-26 oz		
ROUNDUP ULTRA	16-32 oz	16-32 oz	16-32 oz	7-30 DBP	Use appropriate herbicide at planting. 2,4-D at 1 pt, 7day before planting; at 2 pt, 30 days before planting. Cost: Roundup Ultra + 2,4-D \$7.35-\$13.72; Touchdown 5 \$8.00-\$10.97.
OR TOUCHDOWN 5	13-26 oz	13-26 oz	13-26 oz		
+ 2,4-D LV Ester (4L)	1-2 pt	1-2 pt	1-2 pt		
BROADSTRIKE + DUAL	Do not apply	2.25-2.5 pt	2.5-2.75 pt	15-30 days DBP	Use higher rate for common ragweed, morning glory or jimsonweed. Do not apply to soils with pH greater than 7.8. Cost: Broadstrike + Dual \$23.67-\$29.60.
	2.0 pt	2.25 pt	2.5 pt	0-14 DBP	
AXIOM	8-10 oz	15-18 oz	16-20 oz	0-14 DBP	Do not plant sorghum the following year. EPP treatments may be less effectively if rainfall does not occur within 7 days of application. Cost: Axiom \$9.16-\$22.00; Pursuit + Dual \$26.80-\$35.63; Pursuit + Micro Tech \$24.23-\$30.75; Pursuit + Partner \$25.71-\$28.02; Pursuit Plus \$12.84; Pursuit + Frontier \$24.34-\$34.64.
PURSUIT DG	1.44 oz	1.44 oz	1.44 oz	0-30 days DBP	
+ DUAL II	1.5 pt	2.0 pt	2.5 pt	0-30 DBP	
or MICRO TECH	2.5 qt	2.5-3 qt	2.5-3 qt	0-30 DBP	
or PARTNER	2.3-3 lb	2.3-3 lb	2.6-3.4 lb	0-30 DBP	
or FRONTIER	16-20 oz	20-25 oz	25-30 oz	0-30 DBP	
PURSUIT PLUS	2.5 pt	2.5 pt	2.5 pt	0-45 DBP	

See page 82 for additional footnotes.



# Soybean

## No-Till (Continued)

Herbicide (See <i>Weed Response Chart</i> on page 37 before selecting herbicides)	Commercial Product per Acre			Application Time	Remarks and Approximate Cost/A Broadcast
	Sandy Loam <1% OM	Silt Loam 1-2% OM	Silty-Clay Loam >2% OM		
COMMAND 3ME + CANOPY	2-2.67 pt 5 oz	2-2.67 pt 6 oz	2-2.67 pt 7 oz	0-30 DBP	Do not use on soils with less than 0.5% OM. Cost: Command 3ME + Canopy \$26.38-\$35.96.
LEXONE/SENCOR 75DF or CANOPY + DUAL II or MICRO TECH or FRONTIER	0.33 lb 5 oz 1.5 pt 2.0 qt 16 oz	0.67 lb 6 oz 2 pt 2.5 qt 20 oz	0.83 lb 7 oz 2.5 pt 3 qt 25 oz	0-14 DBP	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, Roundup Ultra or Touchdown 5 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 \$26.37-\$43.11; Lexone/Sencor + Frontier \$22.24-\$36.12; Lexone/Sencor with Micro Tech \$26.08-\$41.21; Canopy with Dual \$23.38-\$35.19; Canopy + Frontier \$20.65-\$31.73.

See page 82 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 two-thirds rate applied preplant and one-third 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, one to three weeks preplant. Cost: \$4.70-\$9.40.

## Tilled Seedbed

Herbicide	Commercial Product per Acre			Remarks and Approximate Cost/A Broadcast
(See <i>Weed Response Chart</i> on pages 35-36 before selecting herbicides)	Sandy Loam <1% OM	Silt Loam 1-2% OM	Silty-Clay Loam >2% OM	
For cocklebur, sunflower and velvetleaf, see <i>Troublesome Weeds and Woody Plants</i> , pages 69-78.				
AXIOM	8-10 oz	15-18 oz	16-20 oz	EPP, PPSA, PRE, or SURFACE MIX. Cost: \$9.20-\$22.90.
BROADSTRIKE + DUAL	1.8-2.0 pt	2.0-2.2 pt	2.2-2.5 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 \$21.30-\$29.60; Broadstrike + Treflan \$16.60-\$25.00.
BROADSTRIKE + TREFLAN	1.5-2.0 pt	2.0 pt	2.2 pt	
CANOPY XL	5.1 oz	6.4 oz	7.9 oz	PPI with Treflan and Sonalan. PPI or SURFACE MIX with Prowl.
or				SURFACE MIX or PRE with Dual or Micro Tech. EPP, PPSA, PPI, or
CANOPY	5.0 oz	6.0 oz	7.0 oz	PRE with First Rate. PPSA, PPI, or PRE with Python. To reduce injury
or				on calcareous soil or soil with pH > 7.5, reduce Sencor/Lexone rate by
FIRST RATE	.60 oz	.60 oz	.60 oz	one-third. Do not use Canopy or Canopy XL on soils with pH > 6.8.
or				Treflan and Sonalan may be applied to untilled residue prior to
PYTHON	.80 oz	1.0 oz	1.33 oz	incorporation. Cost: Canopy XL \$13.70-\$21.25; Canopy \$13.50-\$21.30;
or				First Rate \$15.10; Python \$7.80-\$12.90; Sencor/Lexone \$6.00-\$10.00;
SENCOR/LEXONE 75DF	0.33 lb	.40 lb	0.50 lb	additional cost for combination with Dual \$12.80-\$17.00; Frontier \$10.70-
with				\$16.80; Micro Tech \$14.00-\$17.50; Prowl \$6.70-\$8.90; Sonalan \$8.10-
DUAL II MAGNUM	1.0 pt	1.0 pt	1.33 pt	\$12.10; Treflan \$4.10-\$8.30.
or				
FRONTIER	16 oz	20 oz	20 oz	
or				
MICRO TECH/LASSO	2.0 qt	2.5 qt	2.5 qt	
or				
PROWL	1.8 pt	2.4 pt	2.4 pt	
or				
SONALAN	2.0 pt	2.5 pt	3.0 pt	
or				
TREFLAN	1.0 pt	1.5 pt	2.0 pt	
COMMAND (3ME)	1.0 pt	1.6 pt	2.0 pt	0-30 days PPI with Treflan, Sonalan, or Commence. SURFACE MIX
+				or PRE with Micro Tech. Use 2.5 qt rate of Micro Tech for heavy
TREFLAN	1.0 pt	1.5 pt	2.0 pt	infestation of pigweed and lambsquarters. Command (3ME) vapor
or				drift may damage green vegetation. Carryover may damage wheat
PROWL	1.8 pt	2.4 pt	2.4 pt	seeded the same fall or sugarbeet and fieldbean the next year. Treflan
or				and Sonalan may be applied to untilled residue. Cost: Command +
SONALAN	2.0 pt	2.5 pt	3.0 pt	Treflan \$11.70-\$23.50; Command + Prowl \$14.30-\$24.10; Command
COMMAND (3ME)	1.33 pt	1.33 pt	1.33 pt	+ Sonalan \$15.70-\$27.30; Command + Micro Tech \$24.10; Command
+				+ Canopy \$28.70-\$41.50; Command + Canopy XL \$28.90-\$41.60;
MICRO TECH/LASSO	2.0 qt	2.0 qt	2.0 qt	Commence \$14.10-\$21.40; Canopy + Dual \$28.00-\$35.00.
COMMAND (3ME)	2.0-2.67 pt	2.0-2.67 pt	2.0-2.67 pt	
+				
CANOPY	5.0 oz	6.0 oz	7.0 oz	
or				
CANOPY XL	5.1 oz	6.4 oz	7.9 oz	
or				
DUAL II MAGNUM	1.0 pt	1.0 pt	1.33 pt	
COMMENCE	1.8-2 pt	2-2.5 pt	2.7 pt	

See page 82 for additional footnotes.



# Soybean

## Tilled Seedbed (Continued)

Herbicide (See Weed Response Chart on pages 35-36 before selecting herbicides)	Commercial Product per Acre			Remarks and Approximate Cost/A Broadcast
	Sandy Loam <1% OM	Silt Loam 1-2% OM	Silty-Clay Loam >2% OM	
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
DUAL II MAGNUM or DUAL IIG MAGNUM	1.33 pt 6-8 lb	1.33 pt 8-10 lb	1.67 pt 10-12 lb	EPP, PRE, or SURFACE MIX. Cost: \$17.00-\$21.30 for liquid.
FRONTIER	16-20 oz	20-25 oz	25-30 oz	EPP, PRE, or SURFACE MIX, Cost: \$10.70-\$20.10.
MICRO TECH/LASSO or LASSO II 15G	2.5 qt 17 lb	2.5 qt 17 lb	2.5 qt 17 lb	PRE or SURFACE MIX. Cost: Micro Tech \$17.50; Lasso \$14.90; Lasso IIG \$16.80; Partner \$14.50.
PARTNER	3.5 lb	3.5 lb	3.5 lb	
PROWL (3.3EC)	1.8 pt	2.4 pt	3.0 pt	PPI or SURFACE MIX — Cost: Prowl \$6.00-\$9.70.
PURSUIT PLUS	2.5 pt	2.5 pt	2.5 pt	SURFACE MIX — Do not graze or feed treated soybean forage, hay, or straw to livestock. Do not plant sorghum the following year. Cost: \$13.00.
SONALAN	2.0 pt	2.5 pt	3.0 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 \$8.10-\$ 12.10.
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: \$15.30.
TREFLAN	1.0 pt	1.5 pt	2.0 pt	PPI — For best results immediately incorporate. Treflan may be applied to untilled residue. Cost: Treflan/Trifluralin \$4.10-\$8.30.
TURBO	Do not use	2.25 pt	2.8 pt	PRE or SURFACE MIX prior to planting. Do not use on sandy loam soils with less than 2% organic matter. Cost: \$24.30-\$30.30.

See page 82 for additional footnotes.

# Soybean

## Postemergence (See page 14 for additives)

Herbicide (See Weed Response Chart on pages 37-38 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: \$7.10-\$8.10.
BASAGRAN alone	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 \$9.50-\$19.00; additional cost with Blazer \$4.25-\$8.50; Pinnacle \$9.70; Reflex \$11.00; Scepter \$9.20.
or with BLAZER	0.5-1 pt		
or PINNACLE	0.25 oz		
or REFLEX	1.0 pt		
or SCEPTER	0.33 pt		
BASAGRAN + POAST PLUS/PRESTIGE	1.5-2 pt 1.5-2.5 pt	Use Basagran and Poast Plus guidelines	See label for rates and weed size. Cost: \$24.00-\$33.80.
BLAZER/STATUS	1-1.5 pt	Apply when most broadleaf weeds are less than 4" tall	See label for rates and specific weed size. Cost: \$8.50-\$12.75.
CLASSIC	0.50-.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 \$5.30-\$8.00; Classic + Pinnacle \$12.30.
CLASSIC +	0.25 oz		
PINNACLE	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: \$10.50-\$13.20.
FIRST RATE	0.30 oz	Broadleaf weeds 1-6"	Tank-mix with Blazer or Cobra for waterhemp control. Cost: \$7.50.
FUSION	6 oz	Grasses 4" Shattercane and corn 12-18"	Cost: \$6.70.
GALAXY	2 pt	Apply when most broadleaf weeds are less than 4" tall	See label for specific weeds. Cost: \$16.10.
LIBERTY (Liberty Link variety required)	20-28 oz	Weeds 2-6"	Refer to label for specific rates and weed sizes. May be tank-mixed with other post-soybean herbicides, except Classic or Cobra. Cost: \$16.10-\$22.40.
POAST PLUS/PRESTIGE	1.5-2.25 pt	Grasses 8" Shattercane and corn 12-18"	Use lower rate for most grasses. COC needed for effective control. UAN or AMS will improve control of some species. Refer to label. Cost: \$9.80-\$14.75.
PURSUIT DG alone	1.44 oz	Weeds less than 4"	Do not plant sorghum the following year. Do not use during periods of stress or weed control will be poor. Add Select to improve control of volunteer corn. Use a combination for waterhemp control. Do not graze or feed treated soybean forage, hay, or straw to livestock. Cost: Pursuit alone \$12.40; additional cost with Cobra \$4.20; Blazer \$4.25-\$8.50; Reflex \$8.25-\$11.00.
or with COBRA	4 oz	Shattercane up to 6"	
or BLAZER/STATUS	0.5-1.0 pt		
or REFLEX	0.75-1.0 pt		



# Soybean

## Postemergence (Continued) (See page 14 for additives)

Herbicide (See <i>Weed Response Chart</i> on pages 37-38 before selecting herbicides)	Rates Per Acre	Application Time	Remarks and Approximate Cost Per Acre
RAPTOR	5 oz	Weeds 2-4" Shattercane up to 8"	Apply only once per season. Do not graze or feed treated forage to livestock. Use 4 oz rate if a preemergence herbicide was used. Add Blazer/Status for waterhemp control. Cost: \$21.50.
REFLEX/FLEXSTAR	1.0 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: \$11.00.
RELIANCE STS (STS variety required)	0.50 oz	Apply when most broadleaf weeds are less than 6" tall	May be tank-mixed with 4-6 oz Cobra for eastern black nightshade or waterhemp control. Can be tank-mixed with post grass herbicides under certain conditions. Reliance STS may reduce post grass herbicide activity. Cost: \$3.10.
RESOURCE	4.0-8.0 oz	Broadleaf weeds less than 4"	Especially effective on velvetleaf. Cost: \$6.40-\$12.90.
ROUNDUP ULTRA (Roundup Ready variety required)	32 oz	Weeds less than 12" tall	Can be applied twice per season up to 64 oz/A maximum. Add RR technology fee of \$7.00/A. Cost: \$9.40.
SYNCHRONY STS (STS variety required)	0.50 oz	Broadleaf weeds less than 6"	May be tank-mixed with 4-6 oz Cobra or labeled rates of Blazer or Reflex (where eastern black nightshade or waterhemp are present). Can be tank-mixed with POST grass herbicides under certain conditions. Synchrony STS may reduce POST grass herbicide activity. Cost: \$3.90
SELECT	6 oz	Grasses 4", Shattercane 6-18" Corn 12-24"	Cost: \$9.00.
STELLAR	5-7 oz	Broadleaf weeds less than 6"	May be tank-mixed with 6-8 oz of Select for grass control. Cost: \$10.20-\$14.30.

## Harvest Aid

GRAMOXONE EXTRA	12.8 oz	When 65% of pods are brown	Desiccant. Follow label directions on water volume and X-77 additive. Do not graze for 15 days. Cost: \$3.80.
ROUNDUP ULTRA	32 oz	Pods no longer green	Allow seven-day interval from application to harvest for normal varieties and 14 days for Roundup Ready varieties. Do not graze for 25 days. Cost: \$9.40.

# 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 five 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 <sup>o</sup>	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: \$4.35.
GALAXY	1 pt	2-3 leaf weeds. 17-20 DAP	Cultivate 35 DAP. Cost: \$8.70.
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: \$6.42.
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: \$3.54.
PURSUIT	0.72 oz	2-3 leaf weeds. 17-20 DAP	Cultivate 35 DAP. Cost: \$7.08.

### 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: \$3.90.
ROUNDUP ULTRA	32 oz	Pods no longer green	Allow 7 days interval from application to harvest for normal varieties and 14 days for Roundup Ready varieties. Do not graze for 25days. Cost: \$11.55.

<sup>o</sup>DAP = days after planting.

See page 82 for additional footnotes.



# Bean Bar/Wiper Applications

Crop	Applicator	Herbicide:Water Ratio	Remarks <sup>o</sup>
Soybean and Sorghum	1. Ropewicks	ROUNDUP ULTRA 1:2 (33.3% concentration) TOUCHDOWN (30% 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 (4% 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)  CLASSIC + PINNACLE 0.5 oz + 0.5 oz per 25 gal water  POAST, FUSILADE or ASSURE 1:100 (1% concentration)  SELECT 1:100 (0.25% concentration)  FUSION 1:160 (0.62% concentration)	Complete coverage essential. Add 1 gal UAN to each 25 gal spray. Add Poast and COC for shattercane and volunteer corn.  Add 1 qt COC + 1 gal 28-0-0 per 25 gal.  Add 1 qt COC 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.

<sup>o</sup>Herbicide costs per acre vary from \$1.00 with light weed infestations to \$15.00 in heavy infestations.

See page 82 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) <sup>§</sup>	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 <sup>a</sup>	Recrop Interval in Months, When Changing to Nonlabeled Crop <sup>b</sup>
Ally	9	4	9	7	6	1	7	4	8	8	6	9	7	9	5	8	1	1	10-34
Ally + 2,4-D	10	7	10	6	9	6	10	6	10	10	8	10	10	10	6	10	6	2	10-34
Ally + Banvel	9	7	10	6	10	7	10	9	10	10	9	10	9	10	7	10	8	4	10-34
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/Rave	9	7	10	6	10	7	10	9	10	10	9	10	10	10	9	10	8	4	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
Canvas	9	4	9	7	6	1	7	4	8	8	6	9	7	9	5	8	1	1	10-34
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

<sup>a</sup>Crop ratings of 3 or less result in no yield loss; adding liquid nitrogen may considerably reduce crop safety, for some herbicide combinations.

<sup>b</sup>Values will vary with soil texture, pH, organic matter, rainfall or irrigation, temperature rotational crop herbicide rate and application rate.

<sup>§</sup>Weed Competitive Index—see page 6.

## Herbicides for Winter Annual Grasses in Winter Wheat

(See Downy Brome in *Troublesome Weeds* Section, pages 69-78, for more information.)

Herbicide(s)	Downy Brome	Jointed Goatgrass	Crop Safety <sup>a</sup>	Recrop Interval in months Changing to Nonlabeled Crop <sup>b</sup>
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
Early postemergence				
Maverick	6-9*	3	1	-

\*Requires rainfall shortly after application for best results.

See page 82 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 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 \$2.72-\$3.16; Amber + 2,4-D \$3.14-\$3.58; Curtail \$9.68; Finesse + 2,4-D \$3.28-\$5.15; Peak + 2,4-D \$3.22-\$6.44.
CURTAIL	2 pt		
2,4-D AMINE (4L) or 2,4-D ESTER (4L)	1-1.5 pt  0.5-0.75 pt		

### Harvest Aid

2,4-D 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: \$3.57.
ALLY + 2,4-D 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: \$2.72-\$3.16.

### 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 \$3.68-\$7.35; MCPA \$0.92-\$1.84; Buctril + 2,4-D or MCPA \$4.56-\$8.24.
BUCTRIL + MCPA	0.5-1.0 pt  0.5 pt	Oat 4-leaf to joint	Cost: \$4.59-\$8.27.
CURTAIL M	1.75-2.3 pt	Oat 3-leaf to joint, weeds <3"	Cost: \$8.47-\$11.13.
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: \$8.29-\$16.58.
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: \$0.73-\$1.46.

### Harvest Aid

Herbicide	Rate Per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
2,4-D ESTER (4L)	1 qt	Hard dough 7 or more days before harvest	Helps desiccate large broadleaf weeds. Only certain brands labeled for use. Cost: \$3.57.

See page 82 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 \$2.70-\$3.37; Ally \$2.28; Finesse \$2.84-\$5.68; Peak \$2.78-\$5.55.
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 \$2.72-\$3.16; Ally + Banvel \$4.18-\$4.80; Amber + 2,4-D \$3.14-\$6.28; Amber + Banvel \$4.10-\$7.50; Finesse + 2,4-D \$3.28-\$5.15; Finesse + Banvel \$4.24-\$6.27; Peak + 2,4-D \$3.22-\$6.43; Peak + Banvel \$4.18-\$7.65.
2,4-D AMINE (4L) or 2,4-D 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: \$1.46-\$2.18.
BUCTRIL + 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: \$8.08-\$11.76.
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: \$2.13-\$4.29. Do not apply with fertilizer solutions.
CURTAIL	2.0 pt	Before boot stage	Use Curtail only in small grain rotations. Cost: Curtail \$9.68.
2,4-D 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: \$1.56-\$2.32.
HARMONY EXTRA + 2,4-D 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: \$4.69-\$7.40.

### 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: \$2.65-\$3.01.
2,4-D 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 \$3.56; Landmaster BW \$9.42; Roundup Ultra RT \$8.31-\$9.50; Roundup Ultra RT + 2,4-D \$8.31-\$13.06.
ROUNDUP ULTRA RT	28-32 oz		
ROUNDUP ULTRA RT + 2,4-D ESTER (4L)	1.0-2.0 pt 1.0-2.0 pt		
LANDMASTER BW	54 oz		

See page 82 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 3-5 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 \$1.73-\$1.46; 2,4-D + Banvel \$4.29.
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-\$6.29.

## SUNFLOWER (See Ecofarming for No-Till Sunflower Recommendations)

Herbicide	Commercial Product per Acre			Remarks and Approximate Cost/A Broadcast
	Sandy Loam	Silt Loam	Silt-Clay Loam	
EPTAM 7E or EPTAM 20G	2.5 pt 10 lb	3.5 pt 15 lb	3.5 pt 15 lb	Apply and incorporate just before planting. Cost: \$8.50-\$14.65.
EPTAM 7E + TREFLAN	2.5 pt 1.5 pt	2.5 pt 1.5 pt	2.5 pt 1.5 pt	Apply and incorporate just before planting. Cost: \$14.70.
PROWL (3.3EC) PPI	1.2-2.4 pt	1.8-3.0 pt	2.4-3.6 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: \$4.46-\$18.09.
PROWL (3.3 EC) PRE + ROUNDUP ULTRA	3.0 pt 16 oz	3.6 pt 16 oz	3.6 pt 16 oz	
SONALAN or SONALAN 10G	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	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	1 pt	1.25-1.5 pt	1.5-2 pt	
TREFLAN TR-10	5 lb	6.25-7.5 lb	7.5-10 lb	

## Postemergence

POAST + DASH HC or oil concentrate	1-1.5 pt 1 pt 2 pt	Good coverage essential. Shattercane and corn 12-18"; other annual grasses less than 4". Add 4-8 pt of UAN or 2.5 lbs AMS/A to control crabgrass and all volunteer cereals. Cost: \$13.02-\$17.79.
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## Harvest Aid

GRAMOXONE EXTRA	1.0-1.5 pt	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 \$4.79-7.19.
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See page 82 for additional footnotes.



# Ecofarming

Ecofarming (Ecofallow) is a system based on quality winter wheat stubble and timely weed control. Good quality stubble is the result of growing an adapted winter wheat varieties 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. Herbicides should be applied within 30 days after wheat harvest. Weather and weed conditions need to be correct for good results. Fallow Master, Gramoxone Extra plus atrazine, Landmaster BW, Roundup Ultra, Roundup Ultra RT, or Touchdown 5 will control established broadleaf and grass weeds, and volunteer wheat depending on herbicide rate, plant height, density, and species. If rain is expected within six hours Gramoxone plus atrazine is a good choice. The rainfall period required for glyphosate products can be shortened by increasing the rate and not adding atrazine to the tank-mix.

Maximum benefits from ecofarming, which includes moisture conservation and prevention of weed seed production, usually occur when treatments are applied soon after harvest. This is on the condition the weeds are not under drought stress, the straw has settled, dust is not present on the plants, and good coverage of the plants is possible with the spray solution. At that time the weeds are smaller and easier to control with the nonselective translocating herbicides containing glyphosate. Gramoxone Extra plus atrazine is usually more effective in controlling small weeds and as they approach maturity.

If weeds recover from initial after harvest herbicide applications use 16 oz/A of Roundup Ultra or 12.8 oz/A of Touchdown 5 where Gramoxone Extra was used and use 12 to 16 oz/A of Roundup Ultra or atrazine + Gramoxone Extra where Landmaster BW, Fallow Master, Touchdown 5, Roundup Ultra or Roundup Ultra RT was used. More effort is needed to prevent weeds from producing seed in the wheat stubble.

Volunteer winter wheat and/or downy brome or jointed goatgrass are not always controlled with July and early August atrazine treatments. A split after harvest treatment with the early application of Fallow Master, Landmaster BW, Roundup Ultra, Roundup Ultra RT, or Touchdown 5 followed by 1 lb/A or more of atrazine plus Gramoxone Extra (if needed) applied in September can be an effective control measure. If maximum rates of atrazine are applied in the 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 between wheat harvest and planting corn or sorghum should not exceed 3.25 lb 90DF or 3 qt 4 L/A.

In the spring, kill volunteer wheat and annual bromes in March to prevent soil moisture loss. If grasses are less than 1 inch tall, atrazine or atrazine + Bladex will provide acceptable control. Control is improved when COC or UAN is added. When planting corn, 2,4-D ester may also be added for improved weed control. Gramoxone Extra should be included with a nonionic surfactant to grasses less than 4 inches tall. If grasses are taller than 4 inches and are growing vigorously, apply Fallow Master, Roundup Ultra<sup>1</sup>, Roundup Ultra RT, Landmaster BW<sup>1</sup>, or Touchdown 5. Mixing atrazine or Bladex with glyphosate or sulfosate products can create antagonism and decrease performance. Consider banding over the row in weedy fields at planting for planters which disturb the soil and remove some of the preplant herbicide.

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 late summer and 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 soil moisture lost after harvest may be critical to the crop if the moisture during the winter and spring or limited with these considerations and if one wishes to try the spring-only treatment, the following is suggested. An early spring treatment of Fallow Master, Roundup Ultra, Roundup Ultra RT, Landmaster BW, or Touchdown 5 with atrazine as soon as good growing conditions exist in the spring is an effective treatment for volunteer wheat and downy brome. 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 or Roundup 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. Dual II Magnum or Bicep II Magnum, Bullet, or Fultime should be applied 20 to 30 days before corn or sorghum planting. Balance should be applied 8 to 14 days before corn planting. For sorghum, use the appropriate seed treatment for Dual II Magnum, Bicep II Magnum, Bullet, or Fultime.

## 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 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 key to 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 spring small grain stubble in most situations. The higher labeled rates of herbicides are usually required. Roundup Ultra, Roundup Ultra RT, Fallow Master, Landmaster BW, and Touchdown 5 are usually the choice nonselective herbicides for control of emerged summer annual grass weeds that are growing rapidly. As weeds approach maturity, Gramoxone Extra plus atrazine may be used. 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 with tillage if a residue herbicide was applied last fall. Read all the general remarks under ecofarming and see footnotes on page 78.

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

## CONTINUOUS WINTER WHEAT AND WINTER WHEAT FOLLOWING SOYBEAN

**Continuous Winter Wheat.** Select winter wheat fields that are free of downy brome, hairy chess, Japanese brome, and jointed goatgrass. Apply Fallow Master, Landmaster BW, Roundup Ultra, Roundup Ultra RT, or Touchdown 5 within 30 days after winter wheat harvest but before summer annual weeds head. Apply Roundup Ultra or Touchdown 5 about 10 days before winter wheat planting.

**No-till Wheat Following Soybean Harvest.** Select early maturing soybean cultivars so that winter wheat can be planted within the optimum window. Plant wheat at 90 lb/A dryland and 120 lb/A irrigated with a no-till drill equipped to apply starter fertilizer in the row with the seed. Weeds such as kochia are a problem in late planted winter wheat. Therefore, a herbicide treatment is usually needed in the spring. Use Ally or Amber plus 2,4-D as 2,4-D is ineffective on triazine resistant kochia. Butrill may not be effective because of multiple flushes of kochia.



# Weed Response to Herbicides Applied After Winter Wheat Harvest

## Response Ratings:

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

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

## Herbicides<sup>a</sup>

erate weed populations, good wheat stubble, favorable conditions and weed growth stage as specified on product label. High weed density, adverse conditions, or large weeds will reduce control. 10 — (96-100%) 5 — (60-69%) 9 — (90-95%) 4-2—less 8 — (85-90%) than 60% 7 — (80-84%) 1 — 0 6 — (70-79%)	Broadleaf Weeds												Summer Annual Grasses								Winter Annual Grasses				
	Buckwheat, Wild	Buffalobur	Horseweed	Knotweed, Tall	Kochia	Lambsquarters	Lettuce, P	Pigweed	Smartweed, P.	Spurge, Tooth or Spotted	Sunflower, Common	Thistle, R.	Barnyardgrass	Crabgrass or Fall Panicum	Cupgrass, Prairie	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				
	Fallow Master	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Gramoxone Extra	10	10	10	10	10	10	10	10	5	10	10	9	4	2	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	6	10	9	9	10	10	10	10	10	10
	Landmaster BW	10	10	10	10	10	10	8	10	10	9	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Landmaster BW + atrazine	10	10	10	10	8	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Roundup Ultra (RT)	6	10	8	8	8	9	6	10	9	5	10	8	10	10	10	10	10	10	10	10	10	10	10	10
	Roundup Ultra + atrazine	10	10	10	10	7	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Touchdown 5	6	10	8	8	8	10	6	10	10	5	10	8	10	10	10	10	10	10	10	10	10	10	10	10	
12 inches tall												Tillered to boot								Tillered to boot					
Fallow Master	8	10	8	9	8	10	8	8	10	7	10	8	8	8	6	10	8	8	10	10	8	10	10	10	
Gramoxone Extra	9	7	7	7	7	7	7	7	4	7	7	7	3	1	1	4	4	3	3	5	4	6	6	6	
Gramoxone Extra + atrazine + 2,4-D <sup>b</sup>	9	10	10	10	10	10	10	10	8	10	10	10	3	2	2	4	4	3	3	7	6	9	9	9	
Landmaster BW	8	10	8	9	8	10	8	8	9	7	10	8	8	8	6	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	4	10	7	8	10	10	8	10	10	10	
Round Ultra (RT)	5	9	6	8	5	8	5	8	7	3	10	7	8	8	6	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	4	10	5	8	10	10	8	10	10	10	
Touchdown 5	5	9	6	8	5	8	5	8	7	3	10	7	8	8	6	10	8	8	10	10	8	10	10	10	
24 inches tall												Headed								Headed (in spring)					
Fallow Master	6	8	8	7	6	7	8	8	8	5	7	8	8	9	6	10	8	10	10	10	10	10	10	10	
Gramoxone Extra	8	8	9	7	8	8	8	8	4	6	7	7	6	6	6	7	8	7	4	8	8	9	9	9	
Gramoxone Extra + atrazine + 2,4-D <sup>b</sup>	10	10	10	8	10	9	10	10	7	9	10	10	8	9	7	10	10	10	6	10	10	10	10	10	
Landmaster BW	5	8	8	7	5	7	8	8	8	5	7	8	8	9	5	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	6	10	9	9	10	10	8	10	10	10	
Roundup Ultra (RT)	3	7	6	6	4	5	3	6	6	2	7	7	8	9	6	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	5	10	7	9	10	10	8	10	10	10	
Touchdown 5	3	7	6	6	4	5	3	6	6	2	7	7	8	9	6	10	8	10	10	10	8	10	10	10	

<sup>a</sup>Rate is: 32 oz/A Fallow Master, 1.5 pt/A for Gramoxone Extra, 54 oz/A for Landmaster BW, 16 oz/A for Roundup Ultra or Roundup Ultra RT and 13 oz for Touchdown 5. Atrazine rate is 2.0 qt/A, and 2,4-D amine rate (3.8EC) is 1.5 pt/A. Increasing the rate of glyphosate products and Touchdown 5 will improve weed control of difficult to control weeds. For example, to control barnyardgrass, yellow foxtail, or prairie cupgrass may require 24 oz/A of Roundup Ultra alone or 26-32 oz/A when mixed with atrazine.

<sup>b</sup>Add 2,4-D amine (3.8 EC) 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			Application Time	Remarks and Approximate Cost/A Broadcast
	Sandy Loam <1% OM	Silt Loam 1-2% OM	Silty-Clay Loam >2% OM		

## Winter Wheat Stubble to be Seeded 2-3 Months Later to Winter Wheat (Continuous Wheat)

Herbicides to be used within 30 days after wheat harvest.

ROUNDUP ULTRA RT <sup>1</sup>	12-32 oz	12-32 oz	12-32 oz	POST; two or more applica- tions 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 \$3.65-\$9.75; Landmaster BW \$5.88-\$9.40; Touchdown 5 \$3.79-\$9.85.
LANDMASTER BW <sup>1</sup>	40-64 oz	40-64 oz	40-64 oz		
TOUCHDOWN 5 <sup>1</sup>	10-26 oz	10-26 oz	10-26 oz		

## 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. Cost: AATrex + Gramoxone Extra \$7.94-\$11.27; Atrazine + Gramoxone Extra + 2,4-D \$8.83-\$12.66; AATrex + Landmaster BW \$11.19-\$12.97; Roundup Ultra + AATrex \$9.10-\$13.32.
+ GRAMOXONE EXTRA <sup>1</sup>	1.5-2 pt	1.5-2 pt	1.5-2 pt		
ATRAZINE 4L	1 pt	2 pt	2 pt		
+ GRAMOXONE EXTRA <sup>1</sup>	1.5-2 pt	1.5-2 pt	1.5-2 pt		
+ 2,4-D ESTER (4L)	1 pt	2 pt	2 pt		
AATREX 4L	1 pt	2 pt	2 pt		
+ LANDMASTER BW <sup>1</sup>	64 oz	64 oz	64 oz		
or ROUNDUP ULTRA (RT) <sup>1</sup>	28-32 oz	28-32 oz	28-32 oz		
LANDMASTER BW <sup>1</sup>	54 oz	54 oz	54 oz		
or ROUNDUP ULTRA (RT) <sup>1</sup>	16-32 oz	16-32 oz	16-32 oz		
followed by AATREX	1-2 pt	2 pt	2 pt	Apply glyphosate product after harvest. Apply atrazine between Aug. 20 - Sept 10	Good for weeds that are present early. Use Gramoxone Extra or Roundup Ultra with AATrex on weeds present in late August to early September. Cost: Landmaster BW fb AATrex \$9.72-\$11.50; Roundup Ultra fb AATrex \$6.67-\$13.32.

## Winter Wheat Stubble to be Seeded to Winter Wheat 4-5 Months Later (Fallow Aid)

ROUNDUP ULTRA (RT) <sup>1</sup>	16-32 oz	16-32 oz	16-32 oz	April or before boot stage of grass, weeds	Cost: Roundup Ultra \$4.88-\$9.75; Landmaster BW \$5.88-\$7.93.
LANDMASTER BW <sup>1</sup>	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 \$2.35.
+ 2,4-D ester	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 be used within 30 days after winter wheat harvest and 4 to 6 weeks later

Single Application

GRAMOXONE EXTRA <sup>1</sup>	1.5-2 pt	1.5-2 pt	1.5-2 pt	July-Aug.	Spray after wheat harvest and before weeds produce seed. If weeds recover, kill weeds before they develop seed. Volunteer wheat and downy brome control is better with late Aug.-Oct. applications. Barnyardgrass and yellow foxtail control requires 86 oz/A of Landmaster BW. Cost: Atrazine + Gramoxone Extra \$13.29-\$18.91; AATrex + Landmaster BW \$16.54-\$23.34; AATrex + Roundup Ultra \$14.45-\$20.46; AATrex + Touchdown 5 \$14.34-\$20.56.
+ AATREX/ATRAZINE 4L	2 qt	2-2.5 qt	2-3 qt		
LANDMASTER BW <sup>1</sup>	64 oz	64 oz	64 oz		
or ROUNDUP ULTRA (RT) <sup>1</sup>	24-32 oz	24-32 oz	24-32 oz		
or TOUCHDOWN 5	19-26 oz	19-26 oz	19-26 oz		
+ AATREX/ATRAZINE 4L	2 qt	2-2.5 qt	2-3 qt		

See page 82 for additional footnotes.



## Ecofarming (Continued)

Herbicide	Commercial Product per Acre			Application Time	Remarks and Approximate Cost/A Broadcast
	Sandy Loam <1% OM	Silty Loam 1-2% OM	Silty-Clay Loam >2% OM		
Two Applications — Split Treatments					
ROUNDUP ULTRA (RT) <sup>1</sup>	16-32 oz	16-32 oz	16-32 oz	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. Cost: Roundup Ultra \$4.88-\$9.75; Landmaster BW \$9.40; Fallow Master \$4.40-\$9.63; Touchdown 5 \$4.93-\$9.85.
LANDMASTER BW <sup>1</sup>	64 oz	64 oz	64 oz		
FALLOW MASTER <sup>1</sup>	32-70 oz	32-70 oz	32-70 oz		
TOUCHDOWN 5 <sup>1</sup>	13-26 oz	13-26 oz	13-26 oz		
----- followed by -----					
GRAMOXONE EXTRA	1 pt	1 pt	1 pt	Late Aug. or Early Sept.	Purpose is to control escaped weeds and volunteer wheat. Cost: Gramoxone Extra + Atrazine \$9.46-\$13.03.
+ AATREX/ATRAZINE 4L	1.5 qt	2 qt	2.5 qt		

Herbicides to be used within 30 days 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 <sup>1</sup> or ROUNDUP ULTRA (RT) <sup>1</sup>	54-64 oz 16-32 oz	54-64 oz 16-32 oz	54-64 oz 16-32 oz	2 applications with second one at lower rates	See spring treatments for soybean, page 36, or sunflower on page 47. Cost: for two applications \$9.42 + \$7.93 = \$17.35; Landmaster BW + Roundup Ultra \$9.75 + \$4.88 = \$14.63.
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### Corn to be Planted in Winter Wheat Stubble Treated with AAtrex/atrazine After Harvest<sup>4</sup>

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 Fallow Master, Round Ultra, Roundup Ultra RT, Landmaster BW or Touchdown 5. Low rates (less than 2 lb/A active) of atrazine 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 73.

AATREX/ATRAZINE 4L	1.2 qt	1.4 qt	1.6 qt	15-30 DBP	Cost: AAtrex \$4.28-\$5.71; Bladex + Atrazine \$11.18-\$13.86; Balance + Dual II Magnum \$29.90-\$38.82.
BLADEX 4L	1.1 qt	1.1 qt	1.1 qt	0-15 DBP	
+ AATREX/ATRAZINE 4L	0.75 qt	1.25 qt	1.5 qt		
BALANCE WDG + DUAL II MAGNUM	Do not use	2.0 oz 1.1 qt	2.5 oz 1.25 qt	0-7 DBP	
FRONTIER or SURPASS or HARNESS + ATRAZINE	1.0 pt 1.5-2.0 pt 1.5-2.0 pt 0.75 qt	1.0-1.25 pt 2.0-2.5 pt 2.0-2.5 pt 1.0 qt	1.25-1.4 pt 2.0-3.0 pt 2.0-3.0 pt 1.0 qt	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: Frontier + atrazine \$13.42-\$18.79; Guardsman \$14.97-\$22.46; Surpass + atrazine \$15.67-\$28.66; Surpass 100 \$13.70-\$28.32.
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		
ROUNDUP ULTRA (Roundup Ready) POAST PLUS (PP Corn)	16-32 oz 1 pt	16-32 oz 1 pt	16-32 oz 1pt	POST	Excellent for fields with high grass densities. Cost: Roundup Ultra \$4.88-\$9.75; Poast Plus \$9.85-\$22.46.

See page 82 for additional footnotes.

## Ecofarming (Continued)

Herbicide	Commercial Product per Acre			Application Time	Remarks and Approximate Cost/A Broadcast
	Sandy Loam <1% OM	Silty Loam 1-2% OM	Silty-Clay Loam >2% OM		
DUAL II MAGNUM	1.3 pt	1.67 pt	1.67 pt	0-20 DBP	If annual grasses produced seed in the wheat stubble or if areas of field have history of high grass population, use higher rates of grass herbicides. Cost: Bicep II Magnum \$17.89-\$23.85; Dual II Magnum \$16.58-\$21.29; Dual II Magnum + Aatrex \$18.62-\$24.86; Balance + Atrazine \$19.47-\$27.42.
BICEP II MAGNUM	1.8 qt	2.1 qt	2.4 qt		
DUAL II MAGNUM	1.25 pt	1.5 pt	1.67 pt		
+ AATREX 4L	0.75 qt	1 qt	1 qt	8-14 DBP	
BALANCE WDG	Do not use	2.5 oz	3.0 oz		
+ ATRAZINE	Do not use	1.0 qt	1.0 qt	0-7 DBP	Cost: FulTime \$17.48-\$20.27; TopNotch \$17.00-\$21.25.
TOPNOTCH	2.0 qt	2.2 qt	2.5 qt		
FULLTIME	2.5 qt	2.7 qt	2.9 qt		

### Soybean to be Planted into Winter Wheat Stubble Treated With Landmaster BW, Roundup Ultra (RT) or Touchdown 5 After Harvest (For Areas With Over 20" Rainfall and Fields With Low Weed Density)

PURSUIT*	4 oz	4 oz	4 oz	0-30 DBP	Add 16-24 oz/A of Roundup Ultra <sup>1</sup> 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 With Dual \$23.70-\$30.45; With Pursuit Plus \$13.07; Canopy XL \$13.72-\$21.25.
+ DUAL II MAGNUM	0.8 pt	1.0 pt	1.33 pt		
PURSUIT PLUS	2.5 pt	2.5 pt	2.5 pt		
CANOPY XL	5.1 oz	6.4 oz	7.9 oz		

### 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 <sup>1</sup>	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 \$12.33; Roundup Ultra + Prowl \$6.17-\$10.04.
+ PROWL (3.3EC) followed by ROUNDUP ULTRA (RT) <sup>1</sup>	2.0 pt	2.0 pt	2.0 pt		
+ PROWL (3.3EC)	0.4 pt	1.0 pt	1.6 pt		

\*See rotational crop restrictions on the Pursuit label

### 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 (RT) <sup>1</sup>	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 \$5.88-\$7.93; Roundup Ultra \$3.65-\$4.88 Amber + Roundup Ultra \$7.58-\$10.28; Glean + Roundup Ultra \$10.96; Touchdown 5 \$3.79-\$4.93; Amber + Touchdown 5 \$7.65-\$10.33; Glean + Touchdown 5 \$11.01.
TOUCHDOWN 5	10-13 oz	10-13 oz	10-13 oz		
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 TOUCHDOWN 5	16 oz	16 oz	16 oz		
GLEAN	13 oz	13 oz	13 oz		
+ ROUNDUP ULTRA (RT) OR TOUCHDOWN 5	0.33 oz	0.33 oz	0.33 oz		
	16 oz	16 oz	16 oz		
	13 oz	13 oz	13 oz		

See page 82 for additional footnotes.



## Ecofarming (Continued)

Herbicide	Commercial Product per Acre			Application Time	Remarks and Approximate Cost/A Broadcast
	Sandy Loam <1% OM	Silty Loam 1-2% OM	Silty-Clay Loam >2% OM		
<b>Grain Sorghum to be Planted in Winter Wheat Stubble Treated With AAtrex/Atrazine After Harvest</b>					
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 <i>Troublesome Weeds and Woody Plants</i> , page 73.					
BICEP II MAGNUM	Do not use	1.8 qt	2.1 qt	0-30 DBP	Add 1.5-2 pt Gramoxone Extra <sup>1</sup> 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 Micro Tech, and Bullet treatments and approved chloroacetamide herbicide safener for LeadOff or Guardsman. Cost: Bicep II Magnum \$17.89-\$20.87; Bicep Lite II Magnum \$21.20-\$23.85; Bullet \$18.49-\$19.71; Dual II Magnum \$15.90-\$19.88; Dual II Magnum + AAtrex \$17.72-\$24.86; Frontier \$16.88-\$25.32; Guardsman \$13.85-\$20.77; Micro Tech + AAtrex \$11.15-\$13.52.
BICEP LITE II MAGNUM	Do not use	1.6 qt	1.8 qt		
BULLET	3.75 qt	3.75 qt	4.0 qt	0-28 DBP	
DUAL II MAGNUM	1.25 pt	1.5 pt	1.67 pt	0-28 DBP	
or					
MICRO TECH	2.25 qt	2.5 qt	2.75 qt		
+					
AATREX 4L	0.5 qt	1.0 qt	1.0 qt		
GUARDSMAN	3-3.5 pt	3.5-4.5 pt	4.5-5.0 pt	16-30 DBP	
or					
LEADOFF	2.5-3.0 pt	3.0-4.0 pt	4.0-4.5 pt	0-15 DBP	
MICRO TECH	2.25 qt	2.5 qt	2.75 qt		
+				0-28 DBP	
AATREX 4L	0.5 qt	1.0 qt	1.0 qt		

See page 82 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 <sup>a</sup>	Recrop Interval in Months When Changing to Nonlabeled Crop <sup>b</sup>
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## 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
Treflan	2	9	1	2	9	2	9	8	8	7	7	7	8	2	2	3	18

## 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
Diuron	8	9	8	3	5	7	7	10	7	7	7	8	6	10	10	2	24
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
Select	1	9	1	1	9	1	8	1	1	1	1	1	8	1	1	1	4
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

<sup>a</sup>Crop ratings of 3 or less result in no yield loss.

<sup>b</sup>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
<b>To Control Alfalfa, see Troublesome Weeds and Woody Plants, Page 65.</b>				
ALFALFA (Establishing new stands)	BALAN	3.0-4.0 qt	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; Treflan \$6.20-\$9.30.
	EPTAM	2.5-3.5 pt		
	TREFLAN	1.0-1.5 pt		
	BUCTRIL	1.0-1.5 pt	Weeds less than 2" tall. Alfalfa at least 4 trifoliate leaves	
ALFALFA (Seedling or established)	BUCTRIL	1.0 pt	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: \$9.19-\$27.58.
	+ PURSUIT DG	1.08 oz		
	BUTYRAC 200,	1.0-3.0 qt		
	POAST	1.0-2.0 pt	Grasses 4" or less	

See page 82 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 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: \$17.34-\$34.68.
	SELECT 2EC	6-8 oz	Grasses 2"	Controls downy brome and perennial bluegrass. Do not feed, graze, or harvest alfalfa for 15 days following applications. Cost: \$11.03-\$13.77.
ALFALFA  (Established one year or more. For dodder control see <i>Troublesome Weeds Section</i> , page 72.)	DIURON 80DF	1.5-3.0 lb	Late fall to early spring to dormant alfalfa	For control of winter and summer annual weeds. Cost: \$6.45-\$12.90.
	GRAMOXONE EXTRA	1.5-2.0 pt	Dormant alfalfa	For control of downy brome and winter annual weeds. Do not cut or harvest for 42 days after application. Cost: \$7.19-\$9.58.
	LEXONE/SENCOR DF Harvest Interval (28 days)	0.5-1.0 lb	Late fall to early spring to dormant alfalfa	For control of downy brome, winter annual weeds and suppression of dandelions. Do not cut or harvest for 28 days after application. Cost: Sinbar \$11.25-\$22.50; Lexone Sencor \$13.04-\$26.08.
	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: \$2.38-\$3.56.
	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: \$16.56-\$24.84.
	ZORIAL RAPID 80	1.25-2.5 lb	Late fall to early spring to dormant alfalfa or following removal of hay	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: \$20.14-\$40.28.

## Pastures and Ranges

(See pages 69-78 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: \$1.81-\$3.32.
	AATREX DF <sup>2</sup>	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 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: \$1.78.
WARM SEASON GRASSES (Grown for seed production)	AATREX DF <sup>2</sup>	1.0-2.0 lb	Before weeds and crop emerge	Established grasses. Cost: AAtrex \$3.04-\$6.08; Bicep \$9.07-\$13.61.
	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: \$7.19-\$14.38.
SOD SEEDING (Native grass planted no-till)	ROUNDUP ULTRA	16-32 oz	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: \$9.45-\$18.90.

See page 82 for additional footnotes.



# Pastures and Ranges

(See pages 69-73 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 69-78.)	2,4-D 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 \$3.56; 2,4-D + Banvel \$9.76; Ally \$5.56-8.34; Amber \$2.70-\$5.40; Curtail \$9.68; Escort \$7.00-\$14.00; Grazon \$3.71-\$6.58; Tordon 22K \$5.36-\$10.72.
	2,4-D Ester (4L) + BANVEL	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		
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 69-78.)	TORDON 22K	0.5-1.0 pt	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 \$5.34; 2,4-D + Banvel \$14.10; Curtail \$9.68-\$19.36; Grazon \$6.50-13.00; Tordon 22K \$21.20-\$42.40.
	2,4-D LV Ester (4L)	1.5 qt		
	2,4-D LV Ester (4L)	1.0 qt		
	BANVEL	1.0 pt		
	CURTAIL	2.0-4.0 pt		
WINTER ANNUAL GRASS CONTROL in established warm season grass	TORDON 22K	1-2 qt	Late winter prior to forage grass growth	Controls downy brome. Not on seed production fields. Do not harvest or graze for 8 weeks. Cost: \$4.13.
	GRAZON P + D	1.0-2.0 qt		
	ROUNDUP ULTRA	1.0 pt		
WOOD PLANT CONTROL	SPIKE 20P	0.37-0.75 oz per 100 sq. ft.		For woody plant control, can be used for individual plant or small stands. Use lower rate in areas receiving 20 inches or less average rainfall. Cost: \$0.20-\$0.40.

## Grazing Restrictions for Pasture Herbicides

Herbicides	Product	Lactating Dairy Animals		Beef and Non-Lactating Dairy Animals		
		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 <sup>E</sup>	1 year	3 days
CURTAIL	2.0 to 4.0 pt	14 days	30 days	0	30 days	7 days <sup>G</sup>
ESCORT	0.2-0.4 oz	0	0	0	0	0
GRAMOXONE EXTRA <sup>B</sup>	0.8 to 1.5 pt	1 month	1 month	1 month	1 month	0
GRAZON P + D <sup>C</sup>	3.0-4.0 pt	0	30 days	0	30 days	3 days
ROUNDUP ULTRA						
Spot or Wiper <sup>A</sup>	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 <sup>G</sup>	1 year <sup>F</sup>	0	1 year <sup>F</sup>	0 days <sup>F</sup>
STINGER 3E	0.66 to 1.31 pt	0	0	0	0	0
TORDON 22K <sup>C</sup>	0.5 to 2.0 pt	14 days	14 days	0	14 days	3 days
					(if < 1qt/A)	
2,4-D/MCPA <sup>D</sup>		7-14 days	30 days	0-7 days	0-30 days	0

<sup>A</sup>Do not treat more than one-tenth of any given acre at one time with spot or wiper applications. Remove livestock before application.

<sup>B</sup>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.

<sup>C</sup>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.

<sup>D</sup>Be sure to check individual product labels for restrictions and use rates due to the large number of formulations available.

<sup>E</sup>One year if more than 1.5 gal/A rate used.

<sup>F</sup>If no more than 20 lb per acre used.

<sup>G</sup>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 <sup>3</sup> 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	16-32 oz	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 \$4.72-\$6.50.
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, indiagrass, buffalograss, sideoats grama, blue grama, selected wildflowers and legumes. Cost: \$8.70.
PROWL (3.3EC)	1.2-2.4 pt	PPI or PRE	For use on legumes only. Incorporate immediately for best results.
TREFLAN	1-1.5 pt	PPI	Cost: Prowl \$3.94-\$7.88; Treflan \$4.13-\$6.21.

## POSTEMERGENCE

For established grass, see *Pastures and Ranges*, page 58.

For specific weeds, see *Troublesome Weeds and Woody Plants*, page 69-78.

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 \$2.70-\$5.40; Ally \$2.27; Escort \$3.40-\$34.00.
ALLY*	0.1 oz		
ESCORT**	0.1-1.0 oz		
BANVEL	0.25-0.5 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: \$3.69-\$7.38.
+ 2,4-D Ester (4L)	0.5-1 pt		
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: \$11.03-\$14.71.
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: \$9.68-\$19.37.
PLATEAU	4 oz	Spring	Apply when annual broadleaf and grass weeds are less than 6" tall. Cost: \$8.69.
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: \$14.92.
ROUNDUP ULTRA <sup>1</sup>	12-16 oz	Late fall or late winter	Apply when perennial grasses are dormant. Do not use ammonium sulfate. Cost: \$3.54-\$4.73.
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: \$0.89-\$1.46.

\*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 wilmar 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 <sup>5</sup>	Commercial Product <sup>7,8</sup>	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 \$3.56; 2,4-D + Banvel \$13.92.
	2,4-D + BANVEL	1 qt/A		
	PLATEAU	1 pt/A	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: \$8.77-\$25.11
	TELAR	4-12 oz		
GRASS SUPPRESSION	TELAR	0.25-0.5 oz/A	Weeds 0-2"	Use with surfactant 1 qt/100 gal. Cost: \$3.21-\$6.42.
	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.
IRRIGATION DITCHBANKS	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: \$8.77-\$25.11.
	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 \$23.75-\$47.50; 2,4-D \$3.56.
	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 \$6.79; Krovar \$5.26; Karmex \$1.25-\$2.45; Spike \$3.52-\$12.37; Arsenal \$1.99; Sahara \$??
	HYVAR 80W or HYVAR X-L	0.5 lb/1000 sq ft		
	KROVAR I 80W	0.75 pt/1000 sq ft		
	KARMEX 80W	0.5 lb/1000 sq ft		
	SAHARA	0.25-0.5 pt/1000 sq ft		
	SPIKE 80W or SPIKE 5G	.2-.4 lb/100 ft <sup>2</sup>		
		0.12-0.25 lb/1000 sq ft		
		2-4 lb/1000 sq ft		
SHORT-TERM VEGETATION CONTROL	EVIK DF	2.5 lb/A	Weeds 2-6"	Apply to actively growing weeds, include a surfactant with Evik. Avoid drift. Cost: \$??.
	ROUNDUP ULTRA	1 qt/A		
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.
TRANSLINE	0.3-0.6 pt			For non-cropland use, can be used in wildlife openings including grazed areas on these sites. Provides control of knapweeds, Canada and Musk thistle. Cost: \$\$.

See page 82 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—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 <sup>a</sup>	Recrop Interval in Months, When Changing to Nonlabeled Crop <sup>b</sup>
<b>Potato</b>																						
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 II Magnum 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
<b>Fieldbean</b>																						
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	9	6	6	5	5	4	1	1	8	8	7	6	2	0
Dual II Magnum + 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 II Magnum-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 II Magnum-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
Select	1	9	1	9	9	8	1	1	1	1	1	1	1	1	8	10	1	1	1	1	1	4
<b>Sugarbeet</b>																						
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
Liberty	7	7	9	8	7	8	7	7	7	7	8	7	9	8	7	7	9	7	8	7	1	0
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
Roundup Ultra	8	10	10	10	10	10	8	9	9	9	10	10	10	8	10	10	10	10	9	7	1	0
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
<b>Onion</b>																						
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 2XL-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
<b>Vine Crop</b>																						
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
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

<sup>a</sup>Crop ratings less than 3 result in no yield loss.

<sup>b</sup>Values will vary with soil texture, pH, organic matter, rainfall or irrigation, rotational crop and herbicide rate.

\*Good control of hairy nightshade.

# Potato

## 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
<b>Potato</b>				
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 II MAGNUM	1 pt	1.33 pt	1.67 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: \$8.33-\$14.65.
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 \$26.82-\$38.97; Sencor/Lexone \$17.05-\$34.10; Prowl + Sencor/Lexone \$21.52-\$23.74; Turbo \$23.47-\$41.71.
SENCOR/LEXONE 4L with DUAL/DUAL II or with PROWL (3.3EC)	1 pt 1.5 pt 1.2 pt	1 pt 2.0 pt 1.2 pt	1 pt 2.5 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: \$9.84-\$14.77.
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: \$10.25-\$20.50.		
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See page 82 for additional footnotes.



## Fieldbean Preplant

Herbicide	Commercial Product per Acre			Application Time, Remarks and Approximate Cost/A Broadcast
	Sandy Loam < 1% OM	Silt Loam 1-2% OM	Silty-Clay Loam > 2% OM	
DUAL II MAGNUM	1 pt	1.33 pt	1.67 pt	PPI or PRE—Surface mixing will improve weed control and reduce crop injury. Cost: \$8.77-\$14.66.
EPTAM 20G or EPTAM 7E	11 lb 2.5 pt	20 lb 4.5 pt		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.
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: \$10.74-\$14.77.
EPTAM 7E with SONALAN or with PROWL (3.3EC) or with TREFLAN	2.5 pt 2 pt 2.4 pt 1 pt	2.5 pt 2 pt 2.4 pt 1 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 II Magnum \$18.78; Eptam + Lasso \$17.88; Eptam + Sonalan \$16.62; Lasso \$18.47; Partner \$18.67; Sonalan + Dual \$18.67; Sonalan + Lasso \$18.02; Eptam + Prowl \$17.48; Eptam + Treflan \$12.69.
EPTAM 7E with DUAL II MAGNUM or with LASSO	2.5 pt 1 pt 4 pt	2.5 pt 1 pt 4 pt		
LASSO	3 qt	3 qt		
PARTNER	4.5 lb	4.5 lb		
PARTNER + EPTAM 7E or with TREFLAN	3.0 lb 2.5 pt 1 pt	3.0 lb 2.5 pt 1 pt		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 II Magnum \$15.73; Treflan + Lasso \$17.36.
TREFLAN 4EC with DUAL II MAGNUM or with LASSO	1 pt 1 pt 4 pt	1 pt 1 pt 4 pt		
SELECT 2 EC	6-8 oz			POSTEMERGENCE—Grasses 2 inches tall. Do not apply within 30 days of dry bean harvest (cutting or pulling plants from ground) Cost: \$8.95-\$13.43.

### Postemergence

ASSURE II + COC	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: \$6.09-\$12.19.
BASAGRAN + COC	1-2 pt 1 qt	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: \$9.55-\$19.10.
PURSUIT DG	1.08 oz	POSTEMERGENCE—Fieldbean must have one trifoliate leaf. Pursuit and Pursuit + Basagran require the addition of an adjuvant. <b>Pursuit will carryover. Do not plant sugarbeet for 40 months.</b> Allow at least 60 days between Pursuit application and harvest. Cost: Pursuit \$13.94; Pursuit + Basagran \$23.55.
PURSUIT DG + BASAGRAN	1.08 oz 1 pt	
POAST + COC	1-1.5 pt 1 qt	POSTEMERGENCE—Susceptible weeds less than 4" tall. Fieldbean tolerant at all growth stages. Good coverage essential. Cost: \$15.51-\$23.37.

### 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: \$4.79-\$7.19.
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See page 82 for additional footnotes.

# Sugarbeet

## Commercial Product per Acre

Herbicide	Sandy Loam 1% OM			Silt Loam 1-2% OM			Application Time, Remarks, and Approximate Cost/A Broadcast
	Broad-cast	Product/7" Band 22" Row	30" Row	Broad-cast	Product/7" Band 22" Row	30" Row	
Sugarbeet, No-Till in Rye or Winter Wheat							
ROUNDUP ULTRA	24-32 oz	9 oz	6.5 oz	24-32 oz	9 oz	6.5 oz	Apply in spring when rye or wheat are 6" to 10" tall and before sugarbeet have emerged. Cost: \$1.92-\$9.45.

## 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: \$11.56-\$48.56.
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: \$3.59-\$25.27.

## Layby

EPTAM 7E or EPTAM 20G	2.25 pt 11 lb	11.5 oz 3.5 lb	8 oz 2.5 lb	3.5 pt 15 lb	18 oz 4.7 lb	13 oz 3.5 lb	Apply Eptam after thinning and clean cultivation; incorporate immediately 2" deep with a cultivator. Cost: \$1.71-\$11.98.
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	Brdcst	Rate per acre		Application Time	Remarks and Approximate Cost/A Broadcast
		22" Row	30" Row		
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: \$7.12-\$8.13.
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 \$25.34-\$38.00; Betamix + Stinger \$41.17.
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	
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 to 2-leaf stage of growth. Follow with the higher rate in 5 to 7 days when sugarbeet is in the 4-leaf stage. Cost: Broadcast \$18.82-\$33.88.
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 \$9.47-\$18.17; Select \$8.37-\$11.70.
SELECT 2 EC	6-8 oz	2-2.5 oz	1.4-1.8 oz	Grass 1-3"	

See page 82 for additional footnotes.



# Sugarbeet (Continued)

## Postemergence

Herbicide	Rate per Acre			Application Time	Remarks and Approximate Cost/A Broadcast
	Brdcst	Ounces per 7" Band			
		22" Row	30" Row		
BETAMIX with POAST or SELECT 2 EC	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 \$39.79; Betamix plus Select \$36.98.
	1.5 pt	7.5 oz	5 oz		
	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 \$16.17-\$42.69.
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 \$22.07; Betamix + Upbeet \$47.82.
UPBEET	0.5 oz	0.17 oz	0.12 oz		
+ BETAMIX	2 pt	10 oz	7.5 oz		

## Micro-Rate Herbicide Applications to Sugarbeet

The micro-rate herbicide concept involves the application of Betamix in tank mixtures with UpBeet and Stinger at reduced rates with the addition of methylated seed oil. The rate of Betamix must not exceed 0.5 pints/acre (broadcast application), the rate of UpBeet would be 1/8 oz/acre (broadcast application) and the rate of Stinger would be 0.08 pint/acre (broadcast application). Methylated seed oil should be utilized at a finished spray concentration of 1.5%. A minimum of three sequential applications should be utilized. The initial herbicide application should begin immediately after weed emergence and repeat applications should occur on a 5-day interval. The herbicide applications should be applied broadcast.

The micro-rate herbicide concept is being examined by the University of Nebraska on a research basis. Since this concept involves the use of Betamix, UpBeet, and Stinger at less than labeled rates the companies that manufacture these herbicides may not service complaints for poor weed control or crop injury. **The inclusion of this definition of micro-rate herbicide application in the Guide for Herbicide Use in Nebraska should not be construed as a recommendation of this concept by the University of Nebraska.**

## Vine Crops and Onion

Herbicide	Commercial Product per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
<b>Melons and Cucurbits</b>			
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	Preplant	For cucurbits only. Immediately incorporate to a depth of 1". Use lower rate on sandy soil. Controls many annual grasses and broadleaf weeds. Cost: \$70.77-\$116.82.
	4-8 qt		
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: \$117.12-\$226.24.
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: \$9.84-\$14.77.
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 82 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: \$113.12-\$197.75.
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: \$6.79-\$10.21.
GOAL 2 XL	0.5-1.0 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: \$6.24-\$12.48.
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: \$8.21-\$14.77.
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: \$11.03-\$13.77.

See page 82 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: \$2.91.
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 non-ionic surfactant with Fusilade. Cost: Fusilade DX \$15.88; Poast \$19.69.
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: \$54.78-\$109.56.
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: \$7.19-\$14.37.
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: \$3.91-\$19.55.
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: \$9.45-\$37.80.
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: \$34.65-\$69.30.
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 Algicide)	0.67-1.25 gal/AF			

See page 82 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. \$118.00.

## 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 ESTER (4L)	2 qt/10 gal diesel	Use to prevent resprouting of cut stumps. Apply to runoff to freshly cut surface.
CROSSBOW	2 qt/10 gal diesel	Delayed applications less effective. Injury to nearby trees may result from Tordon.
TORDON RTU	Use undiluted	Cost/10 gal of solution: 2,4-D ester \$7.13 + diesel, Crossbow \$25.55 + diesel.

## Troublesome Weeds and Woody Plants

(See pages 13 and 14 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 <sup>5</sup>	Product Per Acre or Per 100 Gallons <sup>7,8</sup>	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 \$5.86; Banvel \$5.22.
	Banvel	0.5 pt		
ALFALFA (for control before planting wheat, soybean, fieldbean, and potato)	2,4-D 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 persis- tent than amine formulations. Cost: \$3.57.

See page 82 for additional footnotes.



## Troublesome Weeds and Woody Plants (Continued)

Weed	Herbicide <sup>5</sup>	Product Per Acre or Per 100 Gallons <sup>7,8</sup>	Application Time	Remarks and Approximate Cost/A Broadcast
ARTICHOKE JERUSALEM	2,4-D Amine (4L)	0.5 pt	12-18" tall	For use in corn. Use drop tips on corn taller than 8". Cost: \$6.35.
	+ Banvel	0.5 pt		
	Classic	0.75 oz	2-8" tall	For use in soybean. Cost: \$8.00.
	Exceed	1.0 oz	1-6" tall	For use in corn. Cost: \$11.48.
	Curtail	2.0 pt	12-18" tall	For use where no crop is present. Cost: 2,4-D \$3.56; Curtail \$9.68.
BLUE MUSTARD	2,4-D 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, <i>Blue Mustard Control</i> .
	2,4-D Amine (4L)	1 pt		
	Ally	0.1 oz	Mar. 1-15 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 \$2.72; Amber + 2,4-D \$3.15; Finesse + 2,4-D \$3.29; Peak + 2,4-D \$3.78-\$6.00.
	or Amber	0.28 oz		
	or Finesse	0.2 oz		
	or Peak	0.38-0.5 oz		
	+ 2,4-D Ester (4L)	4.0 oz		
BUCKBRUSH (snowberry)	2,4-D Ester	1-2 qt	Full foliage (May 10-25)	Use sufficient water to insure good coverage. Cost: \$3.56-\$7.12.
BUFFALOBUR	Atrazine 4L <sup>2</sup>	2 qt	Preplant or PRE in corn	Reduced rates less effective. Cost: \$7.14
	Buctril	1.5 pt	Weeds 3-5 leaf stage in corn or sorghum	Plants taller than 4" not controlled. Cost: \$11.03.
	Blazer	1.5 qt	Weeds 3-4 leaf stage in soybean	Weeds must be small. Follow-up treatments necessary. Cost: \$17.02.
	Cobra	12.5 oz	POST on soybean	Weeds need to have 4 true leaves. Cost: \$13.18.
	Exceed	1.0 oz	POST on corn and weeds 1-5" tall	Cost: \$11.48.
	2,4-D Ester (4L) + Banvel	0.5 pt 0.5 pt	POST on corn	Plants must be small. Cost: \$6.51.
BURCUCUMBER and WILD CUCUMBER	Atrazine 4L <sup>2</sup>	2 qt	PRE in corn	Atrazine can also be used POST. Cost: Atrazine \$7.14.
	Buctril 2 EC	1.5 pt	Weeds 3-5 leaf stage in corn	Thorough coverage required. Cost: \$14.73.
	Exceed	1.0 oz	POST on corn and weeds 1-8" tall	Cost: \$11.48.
	Princep 4L	3 qt	PRE in trees	Cost: Princep \$13.10.
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: \$21.53.
	2,4-D 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: \$26.04.

See page 82 for additional footnotes.

## Troublesome Weeds and Woody Plants (Continued)

Weed	Herbicide <sup>5</sup>	Product Per Acre or Per 100 Gallons <sup>7,8</sup>	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: \$21.53. See NebGuide G80-509, <i>Canada Thistle Control</i> .
	Tordon 22K + 2,4-D Ester (4L)	1 pt 1 qt	Fall; Spring during flower bud	Cost: \$14.32.
	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: \$18.90-\$28.35.
	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: \$22.45-\$44.90.
	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 \$9.68- \$19.36; Stinger \$42.43.
	Ally + Surfactant Telar + Surfactant or Escort + Surfactant	0.1 oz 1.0-3.0 oz 1.0 oz	4-6" or rosette 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 \$2.27; Escort \$34.50; Telar \$24.44-\$73.32.
CACTUS — See Prickly Pear				
CATTAILS	2,4-D 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 \$21.39.
	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 \$28.35.
CEDAR — See Red Cedar				
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: \$10.34-\$20.68.
COTTONWOOD, WILLOWS, SIBERIAN ELM, CHINESE ELM	2,4-D 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 \$7.12-\$10.68; Crossbow \$51.10.
	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 fol- lowing 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.
CUPGRASS, PRAIRIE	Broadstrike + Dual	2.25-2.50 pt	< 14 DBP	POST treatments may be needed. Cost: Broadstrike + Dual \$26.64-\$29.60; Harness Xtra + Atrazine \$11.70.
	Harness + Atrazine 4L	1.25 pt 2-2.5 qt		
CUPGRASS, WOOLLY	Harness Xtra 5.6L	2.7 qt	0-7 DBP	Cost: \$31.25.
	Surpass 100	1.6-3.3 qt	< 14 DBP or PRE	Cost: \$13.73-\$28.32.
DANDELION	See No-Till Burndown Tables for Corn and Soybean			
DEVILSCLAW	See Velvetleaf for control in corn and sorghum			
DIFFUSE KNAPWEED	See Spotted Knapweed			

See page 82 for additional footnotes.



## Troublesome Weeds and Woody Plants (Continued)

Weed	Herbicide <sup>5</sup>	Product Per Acre or Per 100 Gallons <sup>7,8</sup>	Application Time	Remarks and Approximate Cost/A Broadcast
DOCK (Curled & Pale)	2,4-D Ester (4L) + Banvel	1 qt  0.5 pt	Before flowering in spring or fall	For use on idle ground or grassland. For corn in spike stage use 1.3 pt of 2,4-D + 0.5 pt of Banvel. Cost: \$9.16.
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 herbi- cide by irrigating with 1" of water. Cost: \$98.76.
DOGWOOD	Banvel	1-2 qt	Full foliage during June	Ground application only. Observe all drift precau- tions when using within 1/2 mile of sensitive crops. Cost: Banvel \$22.48-\$44.96; Crossbow \$51.10-\$76.65.
	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, sor- ghum, soybean and in fallow. Cost: Roundup Ultra \$3.65-\$4.88; Oust \$8.00; Touchdown 5 \$3.79- \$4.93.
	Touchdown 5	10-13 oz	Early spring	
	Oust (non-cropland)	1-2 oz	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.
	Treflan	1-1.5 pt		
	Amber	0.56 oz	Preplant or PRE to winter wheat	Approximately 30-50% control. Will not control emerged downy brome. Cost: \$5.64.
	Finesse	0.5 oz	PRE to winter wheat	Approximately 40-60% control. Will not control emerged downy brome. Cost: \$7.11.
	Alternate system			Crop rotation—include a late spring seeded crop in the rotation. See NebGuide G78-422, <i>Downy Brome Control</i> .
FIELD BINDWEED	2,4-D Ester (4L)	1 qt	Vigorous fall growth or	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 \$3.56; 2,4-D + Banvel \$9.17-\$14.78.
Retreatment is necessary (when treating crops adjust rates)	2,4-D Ester (4L) + Banvel	1 qt  0.5-1 pt	flower bud stage in spring	
	Banvel	1-2 pt	Late summer or late fall actively growing	Apply Roundup Ultra in 10 gal or less water/acre, plus 17 lb AMS/100 gal. Avoid tillage for 5 days. Do not plant small grains for 15 days with 2,4-D and 45 days per pint of Banvel. Broadleaf crops may be injured 2 years after high rates of Banvel in western Nebraska. Cost: Roundup Ultra + 2,4-D \$5.61; Roundup Ultra + Banvel \$10.40; Banvel \$12.22- \$22.45; Landmaster BW \$7.83; Touchdown 5 \$5.65-\$10.64.
	Landmaster BW	54 oz		
	Roundup Ultra	32 oz		
	or Touchdown 5	13 oz		
	+ 2,4-D Amine (4L)	0.5 pt		
	or Banvel	0.5 pt		
	Tordon 22K + 2,4-D 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: \$7.16- \$14.32.
GUMWEED (Curlycup)	2,4-D Ester (4L)	1.5 qt	Pre-bud	Cost: \$5.34.
HEMP (Marijuana)	2,4-D Ester (4L) Grazon P+D	1 qt 2 pt	2-12" tall	Cost: 2,4-D Ester (4L) \$3.56; Grazon \$6.67.
HEMP DOGBANE	2,4-D Ester (4L)	0.5-1 qt	Flower bud stage, spring	Use lower rates in crops. Cost: \$1.78-\$3.56.
	2,4-D Ester (4L)	1 qt	Apply after corn is in the dough stage, but before the dogbane leaves start to turn yellow	Dogbane roots should have pink swollen buds. Cost: 2,4-D \$3.56. See NebGuide G83-665, <i>Hemp Dogbane</i> .
	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: \$37.90.

See page 82 for additional footnotes.

# Troublesome Weeds and Woody Plants (Continued)

Weed	Herbicide <sup>5</sup>	Product Per Acre or Per 100 Gallons <sup>7,8</sup>	Application Time	Remarks and Approximate Cost/A Broadcast	
HOARY CRESS	2,4-D 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: \$7.12.	
IRONWEED	2,4-D Ester (4L)	1.5 qt	Flower to bud stage	Cost: \$5.34.	
	Grazon P+D	1 qt	Prior to bud stage	Rangeland. Cost: \$6.67.	
JOHNSONGRASS  (see shattercane for seedling control)	Accent	0.67 oz	6-16"	See corn POST for application restrictions. Split-applications more effective. Cost: \$20.92.	
	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 \$23.94.	
	Poast Plus + AMS	2.25 pt	Shattercane 12-18"	Cost: Poast Plus \$14.77.	
	Roundup Ultra or Touchdown 5	2-3 pt 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 \$9.78-\$14.62; Touchdown \$6.06-\$9.09.	
JOINTED GOATGRASS	See Dowony Brome		See NebGuide G95-1252	Controlling Jointed Goatgrass	
KNAPWEED—See specified knapweed—Russian, spotted or diffuse					
KOCHIA (triazine-, ALS-resistant). May have to spray twice or cultivate for row crops.					
(In corn or sorghum)	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 \$9.47; Banvel \$5.61; Gramoxone Extra \$7.19; Fallow Master \$4.50; Balance \$14.25- \$17.50; include a grass herbicide.	
	Fallow Master	32 oz			
	Landmaster BW	54 oz			
	Gramoxone Extra	1.5 pt			
	Balance	1.5-2.0 oz	PP or PRE to corn only		
(Soybean)	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. Use higher rates on dense stands of kochia. Cost: Banvel \$9.42; Buctril \$7.27-\$10.92; Buctril + Banvel \$16.70; Buctril/Atrazine + Banvel \$15.64- \$19.27; Marksman \$7.00-\$10.51; Tough + Atrazine \$13.36; Buctril \$9.60-\$14.40.	
	Buctril	1.0-1.5 pt			
	Buctril	1.0 pt			
	+ Banvel	0.5 pt			
	Buctril/Atrazine	2-3 pt	POST to Kochia less than 4" Corn or sorghum		
	Buctril/Atrazine	2.5 pt			
	+ Banvel	0.125-0.25 pt			
	Marksman	2 to 3 pt			
	Tough + Atrazine	1 pt 1 pt	POST to corn only		
	Command (3ME)	2.0 pt	Preplant incorporate in soybean, before kochia emerges	Do not rotate to small grains. Cost: \$16.92.	
	Command (3ME) + Roundup Ultra	2.0 pt 16 oz	Preplant to soybean for no-till	A POST herbicide or cultivation may be needed to control kochia escapes. Cost: \$19.29.	
	Pursuit Plus + Roundup Ultra	2.5 pt 16 oz	Preplant to soybean 15-30 days	A POST herbicide or cultivation may be needed to control ALS kochia escapes. Cost: \$28.87.	
	Basagran	2 pt	Kochia <3"	Classic + Pinnacle + Pursuit will not control ALS- resistant kochia. Cost: Basagran \$19.12; Classic + Pinnacle \$12.00; Pursuit \$23.35.	
(Transgenic crops)	Classic + Pinnacle	0.25 oz 0.25 oz	POST to soybean Kochia < 1"	POST—May need to control late emerging Kochia with a repeat application or another herbicide. Cost: \$19.00.	
	Pursuit	1.44 oz	POST to soybean Kochia < 5"		
	Roundup Ultra	32 oz	Kochia < 4" in RR crops		

See page 82 for additional footnotes.



## Troublesome Weeds and Woody Plants (Continued)

Weed	Herbicide <sup>5</sup>	Product Per Acre or Per 100 Gallons <sup>7,8</sup>	Application Time	Remarks and Approximate Cost/A Broadcast
LEAFY SPURGE	2,4-D Ester (4L)	2 qt	Bud stage in spring	Retreatment necessary. Annual applications gradually reduce infestation. Cost: 2,4-D \$7.13; 2,4-D + Tordon \$14.33. See NebGuide G87-834, <i>Leafy Spurge</i> .
	2,4-D Amine (4L) +	1 qt		
	Tordon 22K	1 pt		
	Plateau	8-12 oz	In fall 2 weeks before first killing frost	An additional 4 oz/A may need to be applied in the spring following a fall application of 8 oz/A 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/A. Use with COC 1.5 to 2.0 pt/A and 28% UAN 2 to 3 pt/A. Cost: \$17.38-\$26.06.
	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 \$43.06-\$86.11; Roundup Ultra + 2,4-D \$13.01.
	Roundup Ultra +	32 oz		
LOCUST (Honey and Black)	2,4-D Amine (4L)	1 qt		
	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 \$44.09; Crossbow \$51.00-\$76.50.
	Crossbow	1.0-1.5 gal		
	Spike 20P	0.25 oz/1" dia	Spring or fall	Apply under drip line. Cost: \$8.60/lb.
MARESTAIL (Horseweed)	Velpar RP	4 ml/1" dia	Spot gun-spring	Cost: \$0.10/tree inch.
	2,4-D Ester (4L)	1 qt	Prior to bolt	Cost \$3.56.
	Roundup Ultra	24 oz	Before 6" tall	Cost \$7.09.
MILKWEED, COMMON	2,4-D Ester (4L) +	1 qt	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: \$9.17.
	Banvel	0.5 pt		
	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 \$28.35; Touchdown \$30.00.
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: \$0.89-\$2.91. See NebGuide G77-384, <i>Common Milkweed</i> .
	2,4-D 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 \$4.54; Grazon \$6.71-\$13.32.
	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 \$4.54-\$6.75; Curtail \$9.68.
	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 Ester (4L)	1.5-2 qt	Late fall treatment of rosettes or spring before flowering stalks lengthen Oct. 1-Dec. 1	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 \$4.72-\$7.42; 2,4-D + Banvel \$9.17; Tordon \$5.38.
	2,4-D Ester (4L) +	1 qt		
	Banvel	0.5 pt		
	Tordon 22K (musk only)	8 oz		

See page 82 for additional footnotes.

## Troublesome Weeds and Woody Plants (Continued)

Weed	Herbicide <sup>5</sup>	Product Per Acre or Per 100 Gallons <sup>7,8</sup>	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 \$44.90; Crossbow \$76.50; Spike \$8.60/ lb; Velpar RP \$0.10/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 cotton- wood. Cost: Crossbow \$51.00-\$76.50; Spike \$8.60/lb; Velpar RP \$0.10/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 Ester (4L) + Banvel	1 qt 0.5 pt	Rosettes—fall or early spring	Cost: \$9.17.
POISON IVY	Crossbow	1.0 - 1.5 gal		Thoroughly wet all vegetation. Do not apply to cropland. Cost: Crossbow \$1.75/1000 sq ft; Roundup Ultra \$28.35-\$47.25.
	Roundup Ultra	3-5 qt		
POVERTYWEED — See Bursage				
PRICKLY PEAR	Tordon 22K	1-2 pt	Early summer	Spot treatment in pasture and grazingland. Include NIS in spray mixture. Cost: \$10.76-\$21.52.
PUNCTURE VINE	2,4-D Ester (4L)	1 qt	Pre-bloom stage most effective	Mature burs not affected by 2,4-D. Retreatment necessary on new plants. Cost: \$3.56.
	Ally + 2,4-D Ester (4L)	0.3 oz 1 pt		Ally provides residual control in non-crop areas. Cost: \$8.56.
	Exceed	1.0 oz	POST on corn	Cost: \$11.48.
	Peak	0.75-1 oz	POST or sorghum or proso millet	Cost: \$8.75-\$11.11.
PURPLE LOOSESTRIFE	Rodeo	2 qt	Apply to plants with active growth in bloom stage or later.	Use Rodeo in or near water sources. Add appro- priate surfactant to Rodeo. Cost: Rodeo \$55.23; Roundup Ultra \$18.54.
	Roundup Ultra	2 qt		
PURSLANE (in fallow to be planted to winter wheat)	2,4-D 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 \$3.56.
	Ally	0.1 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 \$2.72; Amber + 2,4-D \$2.24-\$3.38; Finesse + 2,4-D \$6.14.
	or Amber	0.2-0.3 oz		
	or Finesse	0.4 oz		
	+ 2,4-D Ester (4L)	4.0 oz		
RAGWEED, WESTERN (perennial)	2,4-D Ester (4L)	1 qt	Early summer	Follow-up treatments may be necessary. Cost: \$3.56.
	Grazon P+D	2-3 pt	Lower rate when weeds are small	Cost: \$6.50-\$9.75.
RED CEDAR, Eastern	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; Velpar RP \$0.10/tree inch.
	Tordon 22K	4 ml/3 ft of tree	Spring or fall	
	Velpar L	4 ml/1" dia	Spot gun in spring to tree base	
Alternative treatment — Prescribed Burn — See NebGuides G88-894 or G96-1308, or EC90-121.				

See page 82 for additional footnotes.



## Troublesome Weeds and Woody Plants (Continued)

Weed	Herbicide <sup>5</sup>	Product Per Acre or Per 100 Gallons <sup>7,8</sup>	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 \$22.45-\$44.90; Tordon \$22.10-\$43.05.
	Curtail	3-4 qt		
	Tordon 22K	1-2 qt		
RUSSIAN OLIVE	2,4-D Ester (4L) + Banvel	2 qt  1 qt	Full foliage (early June)	See remarks for cottonwood. Cost: \$29.55.
	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 <i>Controlling Volunteer Rye in Winter Wheat</i>		
SAGEBRUSH (sand and fringed and green sagewort)	2,4-D Ester (4L)	1.5-2 qt	4"-8" new growth (June)	1.5 qt/A 2,4-D adequate on sand sagebrush. Cost: \$5.34-\$7.10. See NebGuide G80-510, <i>Sagebrush Control</i> .
SANDBUR (Corn treatments) (Rotate to Soybean improves control)	Accent + COC	0.67 oz  1%	POST in Corn. Sandbur < 1" Corn < 12"	Cost: Accent \$17.89; Atrazine \$7.14; Basis Gold \$16.82; Accent \$20.92. See remarks in shattercane on precautions. See NebGuide G74-121, <i>Field Sandbur Control in Corn</i> .
	Atrazine 4L <sup>2</sup> + COC	2 qt  2 pt		
	Basis Gold	14 oz		
	Poast (SR Corn)	24 oz	POST	Cost: \$9.83.
	Roundup Ultra (RR corn)	16-24 oz	POST	Cost: \$9.60-\$14.85.
	Liberty (LL corn) + Atrazine DF	20 oz  0.85-1.3 lb	POST	Cost: \$16.85-\$18.21.
	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 Accent and Beacon. Cost: Accent/Beacon \$20.92; Eradicane \$17.81.
	Beacon	0.75 oz	Corn 4"-20" Shattercane 4"-6"	
	Eradicane	5 pt	PPI	
	Poast Plus (SR Corn)	16-24 oz	<3"	Cost: \$6.56-\$9.84.
	Pursuit DG (IMI Corn)	1.44 oz	Shattercane < 6"	Cost: \$23.21.
	Roundup Ultra (RR Corn)	16-24 oz	Shattercane < 18"	Cost: \$9.60-\$14.85.
An alternate system — Ridge-till.				

See page 82 for additional footnotes.

## Troublesome Weeds and Woody Plants (Continued)

Weed	Herbicide <sup>5</sup>	Product Per Acre or Per 100 Gallons <sup>7,8</sup>	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 \$11.81; Sonalan \$12.11; Treflan \$6.21-\$10.35.
	Sonalan	3 pt		
	Treflan 4EC	1.5-2.5 pt		
	Assure II	7 oz	POST Shattercane 6-12"	Use with crop oil concentrate. Cost: Assure \$9.50; Fusilade DX \$5.70; Fusion \$6.71; Poast Plus \$6.56-\$9.84.
	Fusilade DX	0.38 pt		
	Fusion	6 oz		
	Poast Plus/Prestige	16-24 oz		
	Pursuit DG	1.44 oz	POST Shattercane 4-8"	Add nonionic surfactant 1/4% v/v plus 2 qt/A UAN. Use Roundup Ultra with Roundup Ready Seed. Cost: Pursuit \$12.85; Roundup Ultra \$4.72-\$9.45; Liberty \$14.28.
	Roundup Ultra (RR seed)	16-24 oz	POST	
	Liberty (LL soybean)	20 oz		
Select	6 oz	Shattercane 6-12"	Use with COC. Cost: \$8.95.	
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 Ester (4L)	1.5 qt	Fall rosette or spring bud stage	See remarks for field bindweed. Cost: \$5.34.
SPOTTED KNAPWEED	2,4-D Ester (4L)	1 qt	Rosette stage	Cost: \$3.56.
SUMAC	2,4-D Ester (4L)	1-2 qt	Full foliage	Use sufficient water for good coverage. Cost: \$3.56-\$7.12.
SWAMP SMARTWEED (tanweed, shoestring)	2,4-D Ester (4L)	1 qt	When growing vigorously	On crops use lower rates and amine formulations. Cost: \$14.79.
	+ Banvel	1 pt		
	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: \$28.35-\$37.80.
VELVETLEAF				
Corn and Sorghum treatments (also controls cocklebur, devil's claw and common sunflower)	AAtrex/ Atrazine 4L <sup>2</sup>	1.2 qt	Velvetleaf less than 4"	Use crop oil concentrate with AAtrex/atrazine and Laddok. Cost: AAtrex/atrazine \$4.28; Basagran \$9.55-\$19.70; Buctril + Atrazine \$9.27-\$13.92; 2,4-D \$0.89-\$1.78; Marksman \$7.00-\$12.26; Laddok \$13.38-\$20.07.
	Basagran	1-2 pt		
	+ 28% N	1 gal		
	Laddok S-12 <sup>2</sup>	2.4 to 3.6 pt		
	Buctril 2EC	1-1.5 pt		
	+ Atrazine 4L <sup>2</sup>	1-2 pt	Velvetleaf 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.
	Exceed	0.80-1.0 oz		
	2,4-D Ester (4L)	0.5-1 pt		
	Marksman <sup>2</sup>	2-3.5 pt	Before 5-leaf stage of corn	Apply to corn up to V6 stage. Include 1 gal COC + 2.5 gal. of UAN/100 gal of water. Cost: \$9.15.
	Hornet	2.4 oz	Velvetleaf <6"	
	Scorpion III	4 oz	Velvetleaf 2-6"	
	Peak (Sorghum only)	0.75-1.0 oz	Velvetleaf 1-6"	Cost: \$8.21-\$11.11.
	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 82 for additional footnotes.



## Troublesome Weeds and Woody Plants (Continued)

Weed	Herbicide <sup>5</sup>	Product Per Acre or Per 100 Gallons <sup>7,8</sup>	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	0.25 oz		See NebGuide G83-681, <i>Velvetleaf</i> . Cost: Classic + Pinnacle \$12.00
	+ 28% UAN	1 gal		
	+ Surfactant	1/8% v/v		
	Pursuit	1.44 oz	Velvetleaf less than 3"	Use with 1-2 qt of 28% UAN + NIS at 2 pt/100 gal. Cost: \$23.21.
	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 imme- diately with a disk or field cultivator. Cost: Eptam \$14.65; Eradicane \$17.81.
	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: \$19.40.
	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: \$20.92.
	Liberty (Liberty Link corn)	28 oz	1"-4" wild proso millet	Cost: \$26.60.
	Poast Plus (PP corn)	24 oz	POST on 4-8" wild proso millet	POST on sugarbeet, soybean, fieldbean and alfalfa and SR corn. Add 1 qt COC per acre. Cost: Poast Plus \$4.89.
	Ro-Neet	3.3-4.0 pt	Preplant to sugarbeet	Cost: \$22.30-\$27.03.
	RoundUp Ultra	16-24 oz	POST 3-12"	Use only on RR corn, soybean and sugarbeet varieties. Cost: \$9.60-\$14.80.
	2,4-D LV Ester (4L) + Banvel	1.0 lb 0.5 pt	Fall or spring Pre-bloom	Cost: \$8.02.

# Conversion Tables

## Rate Per Acre To 1,000 Square Feet

### 1. Known facts and assumptions:

1 acre = 43,560 sq ft  
 2 lb = 32 oz; 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	GLEAN	4
ACCENT GOLD	4	HARMONY EXTRA	4
AIM	1	HOELON	1
ALLY	4	HORNET	6
AMBER	4	LADDOK S-12	4
ASSURE II	1	LANDMASTER BW	6
ASSERT	3	LIBERTY	4
ATRAZINE	4	LIBERTY ATZ	4
AVENGE	6	LIGHTNING	1
BANVEL	4	MARKSMAN	4
BASAGRAN	4	MATADOR	1
BASIS	4	MCPA	1
BASIS GOLD	4	NORTH STAR	4
BEACON	4	PEAK	4
BICEP/BICEP II	4	PERMIT	4
BLADEX	4	PINNACLE	1
BLAZER	6	POAST PLUS	1
BRONCO	6	PURSUIT	1
BRONATE	1	RAPTOR	1
BUCTRIL	1	REFLEX	4
BUCTRIL/ATRAZINE	1	RELiance	1
BUTYRAC 200	6	RESOLVE	4
CLARITY	4	RESOURCE	1
CONTOUR	4	RESULT	4
CROSSBOW	6	ROUNDUP ULTRA	6
CURTAIL	8	SCEPTER	2
CURTAIL M	8	SCORPION III	8
CLASSIC	1	SELECT 2 EC	1
COBRA	0.5	SKIRMISH	1
EXCEED	4	SPIRIT	4
EXPRESS	4	STELLAR	1
EXTRAZINE II	4	STINGER	8
FINESSE	4	SYCHRONY	1
FIRST RATE	2	TOUCHDOWN	6
FLEXSTAR	4	TOUGH	2
FUSILADE DX	1	2,4-D	1
FUSION	1	TORDON	2
FALLOW MASTER	6	ULTIMA 60	1
GRAMOXONE EXTRA	0.5	UPBEET	6



### Preharvest Interval/Crop Stage Limits for POST Herbicides in Corn

Herbicide	PreHarvest Interval or Crop Height Limit
Accent	24" broadcast, 36" directed
Accent Gold	12"
Aim	8 collar
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
Hornet	20", 85 days
Laddok S-12	12"
Liberty	24" or V7
Lightning	45 days
Marksman	5th leaf
North Star	4-20" broadcast, 20-36" directed
Permit	36" directed
Pursuit (IR, IT Corn)	45 days
Resource	10 leaf
Scorpion III	8" broadcast, pretassel directed 85 days
Sencor + Basagran	60 days
Spirit	20" broadcast, 24" directed
Stinger	24" graze or harvest silage in 40 days
Tough	68 days
2,4-D	8" broadcast, pre-tassel 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
First Rate	Bloom, forage or hay 14 days
Fusilade	Bloom
Fusion	Bloom
Liberty	Bloom
Matador	80 days
Pinnacle	60 days
Poast Plus	90 days
Pursuit	85 days
Pursuit Plus	85 days
Raptor	85 days
Reflex	Bloom
Reliance	60 days
Resource	80 days
Roundup Ultra	25 days
Select	60 days
Scepter	90 days
Skirmish	60 days

### 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

### Abbreviations

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

## Replant Options — Corn Herbicides

Herbicide	Replant Crops	Time Delay	Herbicide	Replant Crops	Time Delay
Accent	Corn	None	Lasso	Corn, Sorghum (safened seed)	None
Accent Gold	Corn	None		Soybeans	None
Aim	Corn	None	Lariat	Corn, Sorghum (safened seed)	None
Atrazine	Corn, Sorghum	None	LeadOff	Corn, Sorghum	None
Authority Broadleaf	Soybeans	None	Liberty	Corn, Sorghum, Soybeans	None
Axiom	Corn, Soybean	None	Lightning	IMI Corn	None
Balance	Corn	None	Marksman	Corn	None
Banvel	Corn, Sorghum	15-30 days (depending on rate)		Sorghum	30 days
Basis Gold	Corn	None	Matador	Corn, Soybeans	None
Beacon	Corn	None	Micro Tech	Corn, Soybeans	None
Bicep/Bicep Lite/ Bicep II Mag	Corn Sorghum (safened seed)	None		Sorghum (safened seed)	None
Bladex	Corn	None	NorthStar	Corn (tolerant hybrids)	14 days
	Sorghum, Soybeans	15-30 days (depending on rate)		IR, IMR Corn	None
Broadstrike + Dual	Corn, Soybeans	None	Peak	Corn, Sorghum	None
Broadstrike + Treflan	Soybeans	None	Permit	Corn, Sorghum	None
Buctril/Atrazine	Corn, Sorghum	None	Poast Plus	PP Corn, Soybeans	None
Bullet	Corn, Sorghum (safened seed)	None	Princep	Corn only	None
Canopy	Soybeans	None	Prowl	Soybeans, Sunflowers	None
Canopy XL	Soybeans	None	Pursuit	Corn (IR, IT), Soybeans	None
Clarity	Corn, Sorghum	15-30 days	Pursuit Plus	Soybeans	None
Command	Soybeans	None	Python	Corn, soybeans	None
Contour	IMI Corn	None	Ramrod	Corn, Sorghum, Soybeans	None
Cycle	Corn	None	Ramrod/Atrazine	Corn, Sorghum	None
	Sorghum (safened seed)	0-15 days	Raptor	Soybeans	None
Dual/Dual II	Corn, Sorghum (safened seed)	None	Resolve	IMI Corn	None
	Soybeans	None	Resource	Corn, Soybeans	None
DoublePlay	Corn	None	Roundup Ultra	Corn, Sorghum, Soybeans	None
	Sorghum	30 days	Scepter	Corn (IMI), Soybeans	None
Eradicane	Corn	None	Scorpion III	Corn	None
	Sorghum	30 days	Skirmish	Soybeans	None
	Soybeans	10-15 days	Spirit	IR, IMR Corn	None
Exceed	Corn	None		Conventional Corn	4 weeks
Extrazine II	Corn	None	Steel	Soybeans	None
	Sorghum	15-30 days (depending on rate)	Sutan	Corn	None
Frontier	Corn, Soybeans	None		Sorghum	30 days
	Sorghum (safened seed)	None		Soybeans	10-15 days
First Rate	Soybeans	None	Surpass	Corn, Soybeans,	None
Fultime	Corn, Sorghum (safened seed)	None		Sorghum (safened seed)	None
Guardman	Corn, Sorghum (safened seed)	None	Surpass 100	Corn, Sorghum (safened seed)	None
Harness Plus	Corn, Soybeans,		Sutazine	Corn	None
	Sorghum (safened seed)	None		Sorghum	30 days
Harness Xtra	Corn, Sorghum (safened seed)	None	Topnotch	Corn, Soybeans	None
Hornet	Corn	None		Sorghum (safened seed)	None
Laddok	Corn, Sorghum	None	Tough	Corn, Sorghum	None
				Soybeans	30 days
			Treflan	Soybeans	None
			2,4-D	Corn	3-7 days
				Sorghum	10-30 days
				Soybeans	7-30 days



## Replant Options — Sugarbeet Herbicides

Herbicide	Replant Crops	Time Delay
Assure II	Soybean, dry bean Corn	None 120 days
Betamix	Corn, soybean, dry bean Cereal grain crops	None 120 days
Eptam	Dry beans	None
Nortron	Sugarbeet, ryegrass All other crops	None 12 months
Poast	Poast tolerant corn Soybean, dry bean	None
Progress	Corn, soybean, dry bean Cereal grain crops	6 months 120 days
Ro-Neet	Corn, dry bean	30 days
Select	Soybeans, dry bean Corn, cereal grain crops	None 30 days
Stinger	Corn, cereal grain crops Soybean, Dry bean	None 10.5 to 18 months
Treflan	Soybean, Dry bean Corn	None 12 months
UpBeet	Soybean, dry bean, cereal grain crops corn	14 days 21 days

## Replant Options — Wheat Herbicides

Herbicide	Replant Crops	Time Delay
Ally	Winter or spring wheat	30 days
Banvel	Soybean (> 30" annual rainfall) Soybean (< 30" annual rainfall) Wheat	30 days/pint 45 days/pint 3 days/ounce
Amber	Wheat	None
Buctril	Wheat	None
Curtail	Wheat, barley, oats, grasses, and corn	30 days
Finesse	Wheat, rye, and tritcale (soil pH < 7.9 and use rate ≤ 0.4 oz/acre)	None
Harmony Extra	All	60 days
MCPA	All	None
Peak	Wheat, barley, rye, oats, tritcale, and IR and IMR field corn Normal field corn, sorghums, proso millet	None 30 days
Tordon	Wheat, barley, oats, tritcale (use rate ≤ 0.5 pint/acre and soil temperatures > 40 F)	45 days
2,4-D	All	None

## List of Footnotes

<sup>1</sup>Add X-77 spreader 2 pt (0.25% v/v) per 100 gal spray solution for Gramoxone Extra. For Fallow Master, Landmaster BW, Roundup Ultra, Roundup Ultra RT, and Touchdown 5 add 17 lb ammonium sulfate (spray grade) per 100 gal spray and apply in 10 gpa of spray solution.

<sup>2</sup>If atrazine was applied at planting, the total amount of atrazine per calendar year cannot exceed 2.5 lb of active ingredient per year.

<sup>3</sup>Use no more than 1.6 qt on <30% crop residue on highly erodible land.

<sup>4</sup>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.

<sup>5</sup>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.

<sup>6</sup>Do not use on soils with less than 1% organic matter. Increased injury risk on soils where triazine carryover exists.

<sup>7</sup>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.

<sup>8</sup>Rates per 100 gallons pertain to handgun on a power sprayer.

<sup>9</sup>Rate required poses risk for groundwater contamination.

<sup>10</sup>Do not use on sandy soil if water is shallower than 30 feet.

<sup>11</sup>Glyphosate products will not control volunteer Roundup Ready corn.

<sup>12</sup>21 days preplant on sandy loam.

## COMBINATION HERBICIDES

Trade Name	Equivalent Amount of Each Component Contained in 1 gal or 1b of Product (a.i.)	Manufacturer
Accept Gold	.52 lb clopyralid + .19 lb flumetsulam + .065 lb nicosulfuron + 0.65 lb rimsulfuron	DuPont
Axiom	.068 lb flufenacet + .017 lb metribuzin	Bayer
Basis	0.50 lb rimsulfuron + 0.25 lb thifensulfuron	DuPont
Basis Gold	0.013 lb nicosulfuron + 0.013 lb 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 II Magnum	3.1 lb atrazine + 2.4 lb S-metolachlor	Novartis
Bicep Lite	3.3 lb metolachlor + 1.67 lb atrazine	Novartis
Broadstrike + Dual	0.2 lb flumetsulam + 7.47 lb metolachlor	Dow AgroSciences
Broadstrike + Treflan	0.25 lb flumetsulam + 3.4 lb trifluralin	Dow AgroSciences
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
Celebrity	nicolsulfuron + dicamba	Novartis
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 + sethoxdim	BASF
Contour	atrazine + imazethapyr, co-pack	Am. Cyanamid
Crossbow	1 lb triclopyr + 2 lb 2,4-D	Dow AgroSciences
Curtail	2.0 lb 2,4-D amine + 0.38 clopyralid	Dow AgroSciences
Detail	3.6 lbs dimethenamid + 0.5 lb imazaquin	Am. Cyanamid
DoublePlay	5.6 lbs EPTC + 1.4 lb acetochlor	Zeneca
EPIC	flufenacet + metribuzin + isoxaflutole	Bayer + Rhone-Poulenc
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
Field Master	1.5 lb atrazine + .75 lb glyphosate + 2.0 lb acetochlor	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
Guardman	2.33 lb dimethenamid + 2.67 lb atrazine	BASF
Harmony Extra	0.50 lb thifensulfuron + 0.25 lb tribenuron	DuPont
Harness Xtra	4.3 lb acetochlor + 1.7 lb atrazine	Monsanto
Hornet	0.23 lb flumetsulam + 0.62 lb clopyralid	Dow AgroSciences
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
LeadOff	2.33 lb dimethenamid + 2.67 lb atrazine	DuPont
Liberty ATZ	1.0 lb glufosinate + 3.34 lb atrazine	AgrEvo
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
North Star	0.48 lb primisulfuron + 2.55 lb dicamba	Novartis
OpTill	5 lb dimethenamid + 1.0 lb dicamba	BASF
Pursuit Plus	2.9 lb pendimethalin + 0.2 lb imazethapyr	Am. Cyanamid
Ramrod + atrazine	3 lb propachlor + 1 lb atrazine	Monsanto
Reliance	1.2 lb chlorimuron + 0.72 lb thifensulfuron	DuPont



## COMBINATION HERBICIDES (continued)

Trade Name	Equivalent Amount of Each Component Contained in 1 gal or 1b of Product (a.i.)	Manufacturer
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 AgroSciences
Shotgun	2.5 lb atrazine + 1.5 lb 2,4-D	UAP
Spirit	0.14 lb prosulfuron + .42 lb primisulfuron	Novartis
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 AgroSciences

# 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 page 7.

**Aatrex** (atrazine—4 lb/gal or 90%DF). Used for weed control in corn, sorghum, fallow, and CRP. Novartis. EPA Reg. No. 100-497 or 100-585. [VA1].

**Accent Gold** (6.5% nicosulfuron + 19.1% flumetsulam + 51.7% clopyralid). Used POST for broadleaf and grass weed control in field corn. DuPont. EPA Reg. No. 352-593. [IIA2 + IIA3 + IVA3].

**Accent SP** (nicosulfuron—75%DF). POST grass control in corn. DuPont. EPA Reg. No. 352-560. [IIA2].

**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. [VIA3].

**Aim** (carfentrazone-ethyl—40% w/w). For early POST control of broadleaf weeds in field and seed corn, popcorn, and silage. FMC. EPA Reg. No. 279-3194. [VIA3].

**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. [VA1].

**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. Zeneca. EPA Reg. No. 50534-16. [VIII].

**Aquathol K** (endothall—10%G or 4.3 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].

**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, 241-299 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-P—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 or Terra 9779-342. [IIIA3].

**Atrazine** A PP, PRE, and POST s-triazine for control of 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, Brozine, Buctril + Atrazine, Bullet, Contour, Cy-Pro AT, Extrazine, FulTime, Guardsman, Harness Xtra, Laddok S-12, Lariat, LeadOff, Liberty ATZ, Marksman, Moxy + Atrazine, Ramrod + Atrazine, Shotgun, and Surpass 100. [VA1].

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

**Authority Broadleaf** (46.9% sulfentrazone + 9.4% chlorimuron—56.3%). For PRE broadleaf control in soybean. FMC. EPA Reg. No. 279-3179. [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** (54% flufenacet + 13.6% metribuzin). For PP, PPI, or PRE broadleaf and grass weed control in field and silage corn and soybean. Bayer. EPA Reg. No. 3125-488. [IIIB1 + VA2].

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

**Balance 75WDG** (isoxaflutole). For selective PP and PRE control of grass and broadleaf weeds in field corn. Rhone-Poulenc. EPA Reg. No. 264-567. [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].

**Baricade 65 WG**. (Prodiamine). A PRE for turf. Novartis. EPA Reg. No. 5594-143.

**Basagran** (bentazon—4 lb/gal). A POST fieldbean, corn, sorghum, and soybean herbicide for control of 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 broadleaf and grass control in corn. DuPont. EPA Reg. No. 352-571. [IIA2 + IIA2].

**Basis Gold** (1.34% rimsulfuron + 1.34% nicosulfuron + 82.4% atrazine). Used POST for broadleaf and grass weed control in corn. EPA Reg. No. 352-585. DuPont. [IIA2 + IIA2 + VA1].



## Herbicide Dictionary (Continued)

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

**Benefin** Active ingredient in Balan DF. [IIIA1].

**Benoxacor** Safener for corn and sorghum seed. Trade name Concep. Novartis.

**Bensulide** Active ingredient in Prefar 4E. [IIC2].

**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 + 2.67 lb atrazine + benoxacor—5.9 lb/gal). For PP and PRE use in corn and grain and forage sorghum treated with Concep or Screen. Novartis. EPA Reg. No. 100-710. [IIIB1 + VA1].

**Bicep II Magnum** (2.4 lb s-metolachlor + 3.1 lb atrazine + benoxacor—5.5 lb/gal). For PRE broadleaf and grass weed control in corn and forage and grain sorghum. Novartis. EPA Reg. No. 100-817. [IIIB1 + VA1].

**Bicep Lite II** (3.23 lb metolachlor + 1.67 lb atrazine—5.0 lb/gal). For PRE use in corn and grain and forage sorghum safened with Concep or Screen. Novartis. EPA Reg. No. 100-766. [IIIB1 + VA1].

**Bicep Lite II Magnum** (3.33 lb s-metolachlor + 2.67 lb atrazine + benoxacor—6 lb/gal). For PRE broadleaf and grass weed control in corn and grain and forage sorghum. Novartis. EPA Reg. No. 100-827. [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). Used PPI, PP, or PRE for broadleaf and grass control in corn and soybean. Novartis. EPA Reg. No. 62719-239. [IIA3 + IIIB1].

**Broadstrike + Treflan** (0.25 lb flumetsulam + 3.4 lb trifluralin—3.65 lb/gal). Used PPI to control broadleaf and grass weeds in soybean. Dow AgroSciences. EPA Reg. No. 62719-222. [IIA3 + IIIA1].

**Broclean** (bromoxynil—2 and 4 lb/gal EC or 4 lb/gal GEL). A contact herbicide for broadleaf weed control in alfalfa, corn, sorghum, and small grains. Platte Chemical Co. EPA Reg. No. 51-36-256-24704. [VC2].

**Bromacil** Active ingredient in Hyvar X. [VA4].

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

**Bronate** (2 lb bromoxynil + 2 lb/gal MCPA—4 lb/gal). Used to control broadleaf weeds in small grain. Rhone-Poulenc. EPA Reg. No. 264-438. [VC2 + IVA1].

**Brozine** (1 lb bromoxynil + 2 lb atrazine—3.0 lb/gal) For POST broadleaf weed control in corn and grain sorghum. Platte Chemical Co. EPA Reg. No. 51036-255-34704. [VC2 + VA1].

**Buctril** (bromoxynil—2 and 4 lb/gal EC or 4 lb/gal GEL). A contact herbicide for broadleaf weed 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 broadleaf 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). Used PRE or PPI to control broadleaf and grass weeds in corn and grain sorghum. Monsanto. EPA Reg. No. 524-418. [IIIB1 + VA1].

**Butylate** Active ingredient in Sutan+. [IIC1].

**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. [IVA1].

**Canopy** (10.7% chlorimuron + 64.3% metribuzin—75%DF). Used PRE for broadleaf and grass control in soybean. DuPont. EPA Reg. No. 352-444. [IIA2 + VA2].

**Canopy XL** (46.9% sulfentrazone + chlorimuron 9.4%). Used PRE for broadleaf and grass weed control in soybean. DuPont. EPA Reg. No. 352-589. [VIA3 + IIA2].

**Carfentrazone** Active ingredient in Aim and Affinity. [IVA3].

**Casoron** (dichlobenil—50%WP). 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). For broadleaf weed control in wheat, barley, and fallow. DuPont. EPA Reg. No. 352-586. [IIA2 + IIA2 + IIA2].

**Celebrity** Copack of Accent. (Celebrity G) + Banvel (Celebrity B). BASF. [IIA2 + IVA2].

**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, Skirmish, and Synchron STS. [IIA2].

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

**Chloransulam methyl** Active ingredient in FirstRate [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. [IIA1].



## Herbicide Dictionary (Continued)

**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. [IIA1].

**Clarity** (dicamba-glycolamine—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. 7969-137. [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 in Accent Gold, Broadstrike Plus, Confront, Curtail, Hornet, Scorpion III, Stinger, and Transline. [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].

**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 PPI to control weeds in soybean. FMC. EPA Reg. No. 279-3104. [IIIA1 + VIIA2].

**Concep II** (oxabatriniol—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 protectant 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). Controls 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. [IIB1].

**Confront** (2.25 lb triclopyr + 0.75 lb clopyralid—3 lb/gal). For control of annual and perennial broadleaf weeds in established turf (golf course). Dow Agro Sci. EPA Reg. No. 62719-92. [IVA3 + IVA3].

**Contain** (imazapyr—1 lb/gal). Used for nonselective control of grass and broadleaves on industrial sites. Am. Cyanamid. EPA Reg. No. [IIA1].

**Contend** (imazapic) Experimental herbicide by Am. Cyanamid. [IIA1].

**Contour** (0.38 lb imazethapyr + 3.0 lb atrazine—3.38 lb/gal). Used for broadleaf and grass weed control in IMI 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 brand names.

**Cover** (75%DF sulfentrazone). For selective POST weed control in soybean. Offers increased nightshade and pigweed control. DuPont. EPA Reg. No. 241- [VIA3].

**Crossbow** (2 lb 2,4-D + 1 lb triclopyr—3 lb/gal). For broadleaf weeds and woody plant control in rangeland and noncrop areas. Dow AgroSciences. EPA Reg. No. 62719-260. [IVA1 + IVA3].

**Curbit EC** (ethalfuralin—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, 50534-10, or 50534-20. [IIIA4].

**Dash HC** An anionic surfactant by BASF. EPA Reg. No. 34313-TX01.

**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 broadleaf and grass weed control in soybean. Am. Cyanamid. EPA Reg. No. 241-361. [IIA1 + IIB1].

**Dicamba** An active ingredient in Banvel, Clarity, Fallow Master, Marksman, NorthStar, 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].

**Diflufenzopyr** Active ingredient in Distinct. Used POST in corn for broadleaf weed control.



## Herbicide Dictionary (Continued)

**Dimension** (dithiopyr—1 lb/gal). Lawn herbicide for control of annual grasses and broadleaf weeds. Rohm and Haas. EPA Reg. No. 707-245. [IIIA2].

**Dimethenamid** An active ingredient in Detail, Frontier, LeadOff, 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].

**Distinct** (diflufenzopyr - 70% WP). Experimental. Used POST to control broadleaf weeds in corn. BASF.

**Dithiopyr** Active ingredient in Dimension. [IIIA2].

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

**Diuron 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 or Terra. EPA Reg. No. 352-508 or 9779-318. [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. Zeneca. 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, potato, sorghum, and soybean. Novartis. EPA Reg. No. 100-597 or 100-673. [IIIB1].

**Dual Magnum** (s-metolachlor—7.62 lb/gal). Active isomer of metolachlor used to control annual broadleaf and grass weeds in corn, grain or forage sorghum, potato, and soybean. Novartis. EPA Reg. No. 100-816. [IIIB1].

**Dual II or Dual IIG** (metolachlor—7.8 lb/gal or 25%G). Used PP, PPI, or PRE for annual broadleaf and grass 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].

**Dual II Magnum** (s-metolachlor + benoxacor—7.64 lb/gal or 16% G). For annual broadleaf and grass weed control. The granules are used only on corn, potato, and soybean. Novartis. EPA Reg. No. 100-818. [IIIB1].

**Dual II Magnum SI** (s-metolachlor—6.3 lb/gal). Custom application to dry fertilizer for weed control in corn and soybean. Novartis. EPA Reg. No. 100-829. [IIIB1].

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

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

**Enthametsulfuron** Active ingredient in Muster. [IIA2].

**EPIC** (Flufenacet + metribuzin + isoxaflutole). PP, PPI, or PRE broadleaf and grass weed control in field corn. Available in 1999 from Bayer and Rhone-Poulenc. [IIIB1 + VA2 + VIIA1].

**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].

**Ethalfuralin** Active ingredient in Curbit and Sonalan. [IIIA1].

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

**Expert** (oxasulfuron - 75% DFM). Under development for POST broadleaf weed control in soybean. Novartis. [IIA2].

**Exceed** (28.5% prosulfuron + 28.5% primisulfuron

—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, barley, and tall fescue grass for seed. 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 control of broadleaf and grass weeds 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 and non-cropland. Novartis. EPA Reg. No. 100-473. [VA1].

**Fallow Master** (1.5 lb glyphosate + 0.6 lb dicamba—2.1 lb/gal). For total weed control in fallow in selected counties. 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 grass weeds in winter wheat. Monsanto. EPA Reg. No. 524-292 or 524-145. [IIIC1].

**Fenoxaprop** Active ingredient in Option II. [IA1].

**Field Master** (21.6% acetochlor + 16.2% atrazine + 8.2% glyphosate—46%). For PP or PRE control of weeds in no-till corn. Monsanto. EPA Reg. No. 524-497. [IIIB1 + VA1 + IIB1].

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

**FirstRate** (chloransulam methyl - 84% DG). For PRE and POST broadleaf weed control in soybean. Dow AgroSciences. EPA Reg. No. 62719-275. [IIA3].

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



## Herbicide Dictionary (Continued)

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

**Flufenacet** An active ingredient in Axiom. [IIB2].

**Flumetsulam** An active ingredient in Accent Gold, Broadstrike + Dual, Broadstrike + Treflan, Hornet, Python, and Scorpion III. [IIA3].

**Flumiclorac** An active ingredient in Resource and Stellar. [VIA2].

**Fluroxypyr** Active ingredient in Starane and Vista [IVA3].

**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). Used PPI for controlling broadleaf and grass weeds in soybean. Monsanto. EPA Reg. No. 524-422. [IIIA1 + IIB1].

**Frontier** (dimethenamid—6.0 lb/gal). For PRE or PPI grass weed control in corn and soybean. BASF. EPA Reg. No. 55947-140. [IIB1].

**FulTime** (2.4 lb of encapsulated acetochlor + 1.6 lb/gal of atrazine—4 lb/gal). For selective PRE annual grass and broadleaf weed control in corn. Zeneca. EPA Reg. No. 10182-419. [IIB1 + VA1].

**Furilazole** Reduces corn and sorghum seed injury from metolachlor. Novartis.

**Fusilade DX** (fluazifop-P—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-P + 0.66 lb fenoxaprop—2.66 lb/gal). For POST grass weed 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].

**Gallery 75DE** (75% isoxaben). For PRE control of broadleaf weeds in established turf, landscape ornamentals, ornamental bulbs, Christmas trees, and non-bearing orchards. Dow AgroSci. EPA Reg. No. 62719-145. [IIIE1].

**Garlon 3A or 4** (triclopyr—3 or 4 lb/gal). For control of woody plants and broadleaf weeds on right-of-way, industrial sites, and noncrop areas. Dow Agro Sciences. EPA Reg. No. 62719-37 or 62719-40. [IVA1].

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

**Glufosinate** Active ingredient in Liberty and Liberty ATZ [IIC1].

**Glyphos** (glyphosate) For POST control of broadleaf and grass weeds in Roundup Ready soybean. Monsanto and Cheminova. EPA Reg. No. [IIB1].

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

**Goal 2XL** (oxyfluorfen—2 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].

**Guardman** (2.33 lb dimethenamid + 2.67 lb atrazine—5 lb/gal). For selective PRE or EPOST broadleaf and grass weed control in corn. BASF. EPA Reg. No. 55947-150. [IIB1 + VA1].

**Halosulfuron** Active ingredient in Permit and Tophand. [IIA2].

**Harmony Extra** (50% thifensulfuron + 25% tribenuron—75% DF). For broadleaf 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 grass weed control in corn. Monsanto. EPA Reg. No. 524-473. [IIB1].

**Harness Xtra 5.6L** (3.1 lb acetochlor + 2.5 lb atrazine—5.6 lb/gal). For PRE control of broadleaf and grass weeds in field corn, seed corn, silage corn, and pop corn. Monsanto. EPA Reg. No. 524-485. [IIB1 + VA1].

**Harness Xtra** (4.3 lb acetochlor + safener + 1.7 lb atrazine—6.0 lb/gal). Used PRE for selective broadleaf and grass weed control in corn. Monsanto. EPA Reg. No. 524-480. [IIB1 + 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 for controlling broadleaf weeds. PBI-Gordon. EPA Reg. No. 2217-703. [IVA1].

**Hi-Yield 529** (MSMA—4.04 lb/gal). For selective POST control of sandbur, nutsedge, and crabgrass in bluegrass lawns. Hi-Yield Chemical Co. EPA Reg. No. 7401-246-34911-AA. [VIII].

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

**Hornet** (23.1% flumetsulam + 62.5% clopyralid—0.856 lb/gal). For selective PP, PRE, or POST broadleaf control in corn. Dow AgroSciences. EPA Reg. No. 62719-253. [IIA3 + IVA3].

**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].

**Imazamox** Active ingredient in Raptor. [IIA1].

**Imazapic** Active ingredient in Contend and Plateau. [IIAI].



## Herbicide Dictionary (Continued)

**Imazamethabenz** Active ingredient in Assert. [IIA1].

**Imazapyr** An active ingredient in Arsenal, Contain, 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].

**Isoxaben** Active ingredient in Gallery [IIIE1].

**Isoxaflutole** Active ingredient in Balance. [VIIA1].

**Karmex DF** (diuron—80% WP). For annual weed control in alfalfa at low rates and a soil sterilant at high rates. Griffin. EPA Reg. No. 1812-362.

**Kerb** (pronamide—50%WS). Use PRE or EPOST in alfalfa. Rohm and Haas. EPA Reg. No. 707-159. [IIIB1].

**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 glyphosate + 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). Used PRE for selective weed control in corn and grain sorghum. Monsanto. EPA Reg. No. 524-329. [IIIB1 + VA1].

**Lasso** (alachlor—4 lb/gal). 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].

**LeadOff** (2.33 lb dimethenamid + 2.67 lb atrazine - 5 lb/gal). Used PRE for field corn, seed corn, sweet corn, or popcorn, and grain sorghum. DuPont. EPA Reg. No. 352-600. [IIIB1 + VA1].

**Lexone DF** (metribuzin—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 corn and soybean. AgrEvo. 45639-199. [IIC1].

**Libert ATZ** (10% glufosinate + 31% atrazine). For POST control of broadleaf and grass weeds in Liberty Link corn. Will control many weeds PRE. AgrEvo. EPA Reg. No. 45639-219. [VA1+IIC1].

**Lightning** (52.5 % imazethapyr + 17.5% imazapyr). Used for POST broadleaf and grass control in IMI corn. Am. Cyanamid. EPA Reg. No. 241-377. [IIA1 + IIA1].

**Linuron** An active ingredient in Lorox DF and Lorox Plus. [VB1].

**Lorox DF** (linuron—50% DF). For PRE grass and broadleaf weed control in field and sweet corn, soybean, and selected vegetable crops. Griffin. EPA Reg. No. 1812-320. [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].

**Manifest** Experimental for POST weed control in soybean. BASF.

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

**Matador** (quizalofop-p—0.88 lb/gal). POST grass control in soybean. FMC. EPA Reg. No. 279-3183. [IA1].

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

**Maverick** (sulfosulfuron—75% WG). A POST herbicide for control of downy brome and broadleaf weeds in winter wheat. Monsanto. [IIA2].

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

**MCPP** mecoprop. [IVA1].

**Mecoprop** Active ingredient in MCPP. [IVA1].

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

**Metribuzin** Used PRE or POST for annual weeds in corn, soybean, alfalfa, and potato; often used in combination. An active ingredient in Axiom, Canopy, Lexone DF, 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].

**Milestone 80DG** (azafenidin—80%). For PRE weed control in hybrid poplar. DuPont expects registration in 2000-2001.

**MON 37500** (sulfosulfuron—proposed trade name is Maverick). 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. 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. 51036-255-9779. Terra. [VC2 + VA1].

**MSMA** (monosodium methanearsonate). Used for selective crab-grass control in turf. Helena. [VIII].

**Muster** (ethametsulfuron). DuPont. [IIA2].

**Naptalam** Active ingredient in Alanap. [IIID1].

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



## Herbicide Dictionary (Continued)

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

**NorthStar** (7.5% primisulfuron + 39.9% sodium salt of dicamba). For POST control of broadleaf weeds in field corn and popcorn. Novartis. EPA Reg. No. 100-923.

**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—6 lb/gal). For PRE or PPI control of grass and broadleaf weeds in reduced till corn. BASF. EPA Reg. No. 7969-148. [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].

**Oxabatrinitil** A seed protectant (Concep II) for reducing corn and sorghum injury from metolachlor.

**Oxasulfuron** Active ingredient in Expert. [IIA1].

**Oxyfluorfen** Active ingredient in Goal. [VIA1].

**Paramount** (quinclorac). Used POST for grass and broadleaf control in grain sorghum, BASF. EPA Reg. No. [IVA4].

**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 broadleaf and grass weed control in soybean. Am. Cyanamid. EPA Reg. No. 241-325. [IIIA1 + IIA1].

**Pathfinder II** (triclopyr—0.75 lb/gal). Ready to use for control of woody plants in right-of-way, etc. Dow AgroSci. EPA Reg. No. 62719-176. [IVA1].

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

**Pendimethalin** An active ingredient in Prowl and in some PRE turf herbicides. Am. Cyanamid. [IIIA1].

**Pennant Liquid** (metolachlor—8 lb/gal). For weed control in nurseries, zoysiagrass, and landscape plantings. Novartis. EPA Reg. No. 100-691. [IIIB1].

**Pentagon DG** (pendimethalin 60%). For weed control in selected crops including sunflower. Am. Cyanamid. EPA Reg. No. 241-268. [IIIA1]

**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. [VA3].

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

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

**Plateau** (imazapic—2 lb/gal). For PRE or POST control of selected 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 surfactant. 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 + 0.76% simazine + 40% sodium chlorate + 40% sodium metaborate). Soil sterilant. Novartis. EPA Reg. No. 100-479. [VA1, VA1, VIII, VIII].

**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. [IA2].

**Preview** (68.5% metribuzin + 6.5% chlorimuron—75%DF). For controlling broadleaf and grass weeds in soybean. DuPont. EPA Reg. No. 352-448. [VA2+IIA2].

**Primisulfuron** Active ingredient in Beacon, Exceed, NorthStar, and Spirit. [IIA1].

**Princep 4L or Princep 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 weeds 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. [IIIB1].

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

**Prosulfuron** Active ingredient in Exceed, Peak, and Spirit. [IIA2].

**Prowl** (pendimethalin—3.3 lb/gal). Used PRE or EPOST on corn and PP or PRE on soybean. Am. Cyanamid. EPA Reg. No. 241-337. [IIIA1].

**Pursuit** (imazethapyr—2 lb/gal or 70%DG). Used PP, PRE, or POST for broadleaf and grass 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). Used PPI to control broadleaf and grass weeds in IMI field corn and soybean. Am. Cyanamid. EPA Reg. No. 241-331. [IIA1 + IIIA1].



## Herbicide Dictionary (Continued)

**Pursuit W** (imazethapyr - 70% DG). Used for controlling broadleaf and grass weeds POST in alfalfa, IMI corn, and fieldbean. Am. Cyanamid. EPA Reg. No. 241-386. [IIA1].

**Pyramin DF or SC** (pyrazon—4.5 lb/gal or 67.7% DF). Used PRE for control of 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].

**Python WDG** (80% flumetsulam). For broadleaf weed control in field corn and soybean. Dow AgriSci. EPA Reg. No. 62719-277. [IIA3].

**Quinclorac** Active ingredient in Paramount. [IVA4].

**Quizalofop** Active ingredient in Assure II and Matador. [IA1].

**Ramrod** (propachlor—4 lb/gal). For grass weed control in grain sorghum. Monsanto. EPA Reg. No. 524-331. [IIIB1].

**Ramrod + Atrazine** (48.1% + 15.2% atrazine). For controlling broadleaf and grass weeds in grain sorghum. Monsanto. EPA Reg. No. 524-423. [IIIB1 + VA1].

**Raptor** (imazamox - 1 lb/gal). Used for selective POST grass and broadleaf weed control in soybean. Am. Cyanamid. EPA Reg. No. 241-379. [IIA1].

**Rattler** (glyphosate 3 lb ae lb/gal). Helena. EPA Reg. No. 524-455-5905. [IIB1].

**Rave** (8.8% triasulfuron + 50% sodium salt of dicamba). Experimental premix of Amber and dicamba for controlling broadleaf weeds in small grain. Novartis. [IIA2 + IVA2].

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

**Reliance STS or SP** (15% chlorimuron + 9% thifen-sulfuron). For selective POST broadleaf weed control in STS soybean only. DuPont. EPA Reg. No. 352-584 or 580. [IIA2 + IVA2].

**Remedy** (triclopyr—4 lb/gal). For control of woody plants and broadleaf weeds on rangeland and grass pasture. Dow Agro Sciences. EPA Reg. No. 62719-70. [IIA1].

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

**Resolve SG** (18.7% imazethapyr + 56.3% dicamba—70%). Used POST for broadleaf and grass 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 weed control (especially velvetleaf) 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].

**Result** (bentazon—5 lb/gal + Sethoxydim—1 lb/gal). A twin pack of Result B (bentazon) and Result G (sethoxydim) for POST for broadleaf and grass weed control in soybean. BASF. EPA Reg. No. 7969-12, 7969-45, and 7969-88. [VC1 + IA2].

**Rhomene** (MCPA amine—4 lb/gal). Used for broadleaf weed control in small grain. Rhone-Poulenc. EPA Reg. No. 264-47AA. [IVA1].

**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 Accent Gold, Basis Gold, Matrix, Shadeout, and Spirit. [IIA2].

**Ro-Neet** (cycloate—6 lb/gal). Used PPI in sugarbeet for controlling 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 Pro** (glyphosate—3 lb/gal). For industrial, turf, and ornamental weed control. Monsanto. EPA Reg. No. 524-475. [IIB1].

**Roundup Solugran** (86.5% ae glyphosate) dry ammonium salt formulation. Must add  $\geq 80\%$  surfactant. Monsanto. EPA Reg. No. 524-502. [IIB1].

**Roundup Ultra** (glyphosate—3 lb/gal + surfactant). A POST non-selective translocated herbicide for annual and perennial grass and broadleaf weed control. Roundup is labeled for weed control in Roundup Ready corn hybrids and 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].

**S-metolachlor** Active ingredient in Bicep II Magnum, Bicep II Magnum, Dual Magnum, Dual II Magnum, and Dual II, Magnum SI. More active isomer than Dual. [IIIB1].

**Saber** (2,4-D dimethyl amine salt—3.8 lb/gal). For control of broadleaf weeds in small grain, corn, and grain sorghum. UAP. EPA Reg. No. 34704-803. [IVA1].

**Saddle** Generic alachlor. Van Deist. [IIIB1].

**Salute 4EC** (2.67 lb trifluralin + 1.33 lb metribuzin—4 lb/gal). Used to control broadleaf and grass weeds 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. 34704-609. [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 weed 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 weed control in corn. Dow AgroSciences. EPA Reg. No. 62719-264. [IIA3 + IVA3 + IVA1].



## Herbicide Dictionary (Continued)

**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].

**Shadeout** (rimsulfuron 25% DF). PRE or POST for broadleaf and grass weed control in tomato. DuPont. EPA Reg. No. 352-556. [IIA2].

**Shotgun** (1.0 lb 2,4-D + 2.25 lb atrazine—3.25 lb/gal). For POST broadleaf weed control 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—25% DG) A POST herbicide for broadleaf weed control in soybean. FMC. EPA Reg. No. 279-3184. [IIA2].

**Sodium chlorate** (sodium chlorate 3, 5, or 6 lb/gal). Used as a corn, drybean, sorghum, soybean, or sunflower desiccant. Terra. EPA Reg. No. 9779-142 or 4917-3-9779. [VIII].

**Sodium chlorate** Active ingredient in sodium chlorate. [VIII].

**Solicam DF** (norflurazon—78.6%DF). Used PRE for controlling weeds in asparagus and fruit trees. BASF. EPA Reg. No. 100-849. [VIIA3].

**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].

**Spirit** (14.2% prosulfuron + 42.8% primsulfuron). Used for POST broadleaf weed control in field corn. Norvartis. EPA Reg. No. 100-911. [IIA2 + IIA2].

**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 controlling kochia and other broadleaf weeds in small grain. Expect registrations of premixes of Starane + Salvo and Starane + Sword by January. UAP. EPA Reg. No. 62719-286. [IVA3].

**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. [IIA2].

**Sulfometuron** Active ingredient in Oust. [IIA2].

**Sulfosate** Active ingredient in Touchdown 5. [IIIB1].

**Sulfosulfron** Active ingredient in Maverick. [IIA2].

**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 weeds 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—6.7 lb/gal). A PPI herbicide for annual grass control in corn. Micro Flo. EPA Reg. No. 51036-248. [IIIC1].

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

**Synchrony STS DF OR SP** (31.8% chlorimuron + 10.2% thifensulfuron). For POST broadleaf control in STS soybean. DuPont. EPA Reg. No. 352-573 or 574. [IIA2 + IIA2].

**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, Reliance STS, and Synchrony STS. [IIA2].

**TopHand** (acetochlor + halosulfuron + furalazole safener). 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 or Riverdale. EPA Reg. No. 241-344 or 228-308. [IIA2 + VB1].



## Herbicide Dictionary (Continued)

**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 5** (sulfosate—5 lb/gal). A nonselective, nonresidual translocated POST herbicide for broadleaf and grass control. Zeneca. EPA Reg. No. 10182-429. [IIB1].

**Tough** (pyridate—3.75 or 5 lb/gal). Used in combination with atrazine for POST weed control in corn. Tough 5EC will be available in 1999. Novartis. EPA Reg. No. 55947-161 or 100-877. [VC3].

**Tralkoxydim** Active ingredient in Achieve. [IA2].

**Transline** (clopyralid—3 lb/gal). For selective control of broadleaf weeds in non-crop areas. Dow AgroSciences. EPA Reg. No. 62719-259. [IVA3].

**Treflan HFP** (trifluralin—4 lb/gal). Used PPI or PRE (spinkler irrigation) in fieldbean, soybean, several vegetables, and nursery stock for annual grass and broadleaf weed control. Dow AgroSciences. EPA Reg. No. 62719-250. [IIIA1].

**Tri-4 HF** (trifluralin - 4 lb/gal). Used PPI or PRE (sprinkler irrigation) for grass and broadleaf weed control in established alfalfa, fieldbean, and soybean. Am. Cyanamid. EPA Reg. No. 241-243. [IIIA1].

**Triallate** Active ingredient in Far-Go. [IIC1].

**Triasulfuron** Active ingredient of Amber. [IIA2].

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

**Triclopyr** An active ingredient in Confront, Crossbow, and Garlon 3A or 4. [IVA3 + IVA1].

**Trific 60 DF** Formulation of trifluralin. Terra. [IIIA1].

**Trifluralin** An active ingredient in Broadstrike + Treflan, Freedom, Passport, Salute, Treflan, Tri-4, Tri-f, Trific, Trillin, and Tri-Scept. [IIIA1].

**Triflusulfuron** Active ingredient in Upbeet. [IIA2].

**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). Used PPI to control broadleaf and grass weeds in soybean. Am. Cyanamid. EPA Reg. No. 241-307. [IIA1 + IIIA1].

**Turbo 8EC** (6.55 lb metolachlor + 1.45 lb metribuzin—8 lb/gal). Used to control broadleaf and grass 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 + IA1].

**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].

**2 plus 2 (MCP + 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].

**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].

**Upbeet** (triflusulfuron 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, 75%DF or 4L). Used for nonselective POST weed control on noncropland, Christmas tree plantings, and alfalfa. DuPont. EPA Reg. No. 352-378, 352-581, or 352-392. [VA2].

**Vista** (fluroxypyr 1.5 lb/gal). Selective POST control of annual and perennial broadleaf weeds in noncrop areas. (Dow AgroSciences. EPA Reg. No. 62719-308. [IVA3].

**Weedar 64** (2,4-D dimethylamine salt—3.8 lb/gal). For broadleaf weed control in small grain, field and sweet corn, grain sorghum, and preplant to soybean. EPA Reg. No. 71368-264. [IVA1].

**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].

**Zorial Rapid 80** (norflurazon—78.6%WP). Used for controlling weeds in alfalfa and soybean. Norvartis. EPA Reg. No. 100-848. [VIIA3].



# Approximate Retail Prices of Selected Herbicides

Herbicide	Price	Herbicide	Price	Herbicide	Price
Accent	\$ 31.22/oz	Defol 6	\$ 5.60/gal	Plateau	\$ 278.00/gal
Accent Gold	\$ 7.77/oz	Detail	\$ 120.00/gal	Poast	\$ 78.77/gal
Ally	\$ 22.71/oz	Diquat	\$ 82.00/gal	Poast Plus	\$ 52.51/gal
Amber	\$ 9.64/oz	Diuron	\$ 4.37/lb	Pramitol SP 5 PS	\$ 2.11/gal
AAtrex 4L	\$ 14.28/gal	DoublePlay	\$ 31.78/gal	Pramitol 25E	\$ 28.05 gal
AAtrex DF	\$ 3.02/lb	Dual II	\$ 70.50/gal	Prefar	\$ 66.67/gal
Aim	\$ 12.00/oz	Dual II Magnum	\$ 102.00/gal	Prestige	\$ 52.20/gal
Alanap L	\$ 31.39/gal	Eptam 7E	\$ 33.49/gal	Princep 80W	\$ 3.91/lb
Amitrol-T	\$ 21.50/gal	Eptam 10G	\$ .39/lb	Princep 4L	\$ 17.46/gal
Ammonium Sulfate	\$ 0.14/lb	Eptam 20G PRE/PPI	\$ .85/lb	Prism	\$ 120.01/gal
Aquathol	\$ 1.10/lb	Eradicane	\$ 28.49/gal	Prowl	\$ 26.25/gal
Aquathol 1.6E	\$ 45.10/gal	Eradicane 25G	\$ 1.15/lb	Pursuit DG	\$ 157.33/lb
Aquazine	\$ 8.85/gal	Escort	\$ 34.50/oz	Pursuit Plus	\$ 41.84/gal
Assure II	\$ 130.00/gal	Exceed	\$ 11.48/oz	Python	\$ 9.00/oz
Arsenal	\$ 255.00/gal	Extrazine II	\$ 20.06/gal	Ramrod-Atrazine	\$ 14.92/gal
Authority	\$ 2.69/oz	Finesse	\$ 14.22 oz	Ramrod-Flowable	\$ 18.11/gal
Authority Broadleaf	\$ 2.69/oz	Fallow Master	\$ 17.61/gal	Raptor	\$ 4.30/oz
Axion	\$ 18.33/lb	Far-Go 10G	\$ 1.00/lb	Rave	TBA
Balan	\$ 16.00/gal	Fieldmaster	\$ 23.75/gal	Reflex	\$ 88.07/gal
Balance	\$ 7.95/oz	First Rate	\$ 25.12/oz	Reliance STS	\$ 6.20/oz
Banvel	\$ 89.80/gal	Freedom	\$ 12.38/gal	Resolve SG	\$ 3.22/oz
Basagran	\$ 76.42/gal	Frontier (6.0)	\$ 85.92/gal	Resource	\$ 206.00/gal
Basis	\$ 27.32/oz	Fultime	\$ 27.95/gal	Reward	\$ 113.44/gal
Basis Gold	\$ 19.66/lb	Fusilade DX	\$ 127.70/gal	Reward PRE/PPI	\$ 69.50/gal
Beacon	\$ 27.22/oz	Fusion	\$ 143.25/gal	Rodeo	\$ 110.45/gal
Betamix	\$ 101.37/gal	Galaxy	\$ 64.29/gal	Ro-Neet 7E	\$ 61.30/gal
Betamix Progress	\$ 120.47/gal	Glean	\$ 18.23/oz	Roundup Ultra	\$ 39.00/gal
Bicep/Bicep II	\$ 36.30/gal	Goal 1.6E	\$ 109.56/gal	Roundup Ultra RT	\$ 35.50/gal
Bicep II Magnum	\$ 39.75/gal	Gramoxone Extra	\$ 32.80/gal	Sahara	\$ 9.79/lb
Bicep II Lite Magnum	\$ 53.00/gal	Grazon P + D	\$ 26.67/gal	Sceptor DE ECD Polk	\$ 116.82/lb
Bladex 4L	\$ 30.90/gal	Guardsman	\$ 39.92/gal	Scorpion III	\$ 2.23/oz
Bladex 90DF	\$ 6.22/lb	Harmony Xtra	\$ 14.17/oz	Select	\$ 191.00/gal
Blazer 2L	\$ 68.10/gal	Harness	\$ 75.28/gal	Sencor 4L	\$ 136.39/gal
Broadstrike + Dual	\$ 94.70/gal	Harness Xtra	\$ 46.32/gal	Sencor DF	\$ 19.84 lb
Broadstrike + Treflan	\$ 88.80/gal	Herbicide 273	\$ 38.00/gal	Sinbar	\$ 26.84/lb
Brominal 3+3	\$ 77.00/gal	Hoelon	\$ 60.25/gal	Sodium Chlorate 5	
Bronate	\$ 46.88/gal	Hornet	\$ 61.00/lb	Solicam	\$ 10.80/lb
Bronco	\$ 28.00/gal	Hyvar XL	\$ 65.00/gal	Sonalan	\$ 32.29/gal
Buctril	\$ 58.82/gal	Karmex 80W	\$ 4.75/lb	Spike 80W	\$ 29.30/lb
Buctril + Atrazine	\$ 38.38/gal	Kerb	\$ 32.92/lb	Spike 20P	\$ 8.60/lb
Bullet	\$ 19.71/gal	Krenite	\$ 58.35/gal	Spirit	\$ 11.48/oz
Butoxone	\$ 15.00/gal	Krovar I	\$ 10.52/lb	Squadron	\$ 41.95/gal
Butyrac	\$ 36.77/gal	Laddok	\$ 44.61/gal	Status	\$ 67.68/gal
Canopy	\$ 43.22/lb	Laddok S-12	\$ 44.61/gal	Steel	\$ 40.53/gal
Canopy XL	\$ 2.69/oz	Landmaster BW	\$ 18.80/gal	Stellar	\$ 262.22/gal
Canvas	\$ 14.60/oz	Lasso	\$ 23.81/gal	Stinger	\$ 126.66/qt
Casoron 10G	\$ 3.40/lb	Lasso II	\$ 0.99/lb	Surflan	\$ 72.52/gal
Casoron 50W	\$ 15.00/lb	Lariat	\$ 19.22/gal	Surpass	\$ 69.30/gal
Casoron 4G	\$ 1.25/lb	LeadOff	\$ 40.01/gal	Surpass 100	\$ 34.33/gal
Celebrity	\$ 55.54/oz	Lexone DF	\$ 20.10/lb	Sutan+	\$ 20.67/gal
Classic	\$ 10.67/oz	Liberty	\$ 96.00/gal	Sutazine	\$ 17.85/gal
Clarity	\$ 89.80/gal	Liberty ATZ	\$ 64.00/gal	Synchrony	\$ 7.87/oz
Cobra	\$ 135.00/gal	Lightning	\$ 16.87/oz	Team	\$ 158.00/lb
Commence	\$ 64.30/gal	Lorox DF	\$ 11.59/lb	Telar	\$ 24.44/oz
Command 3ME	\$ 60.70/gal	Marksman	\$ 28.03/gal	Treflan	\$ 33.11/gal
Command 4EC	\$ 81.60/gal	Matrix	\$ 16.50/oz	Treflan PRE/PPI	\$ 1.09/lb
Concert PRE/PPI	\$ 7.87/oz	MCPA	\$ 14.72/gal	Topnotch	\$ 34.00/gal
Contour	\$ 101.68/gal	Micro Tech	\$ 26.08/gal	Tordon 22K	\$ 86.11/gal
Crop Oil Conc.	\$ 4.24/gal	MSO	\$ 11.31/gal	Touchdown 5	\$ 48.50/gal
Crossbow	\$ 51.10/gal	Norosac 4G	\$ 1.25/gal	Tough	\$ 56.00/gal
Curbit	\$ 40.28/gal	North Star	\$ 256.00/gal	Turbo	\$ 86.56/gal
Curtail	\$ 38.73/gal	Nortron SC	\$ 166.00/gal	UAN	\$ 0.70/gal
Gramoxone Extra	\$ 38.33/gal	X-77	\$ 15.67/gal	Upbeet	\$ 45.94/oz
2,4-D amine	\$ 11.65/gal	Partner	\$ 4.15/lb	Velpar	\$ 66.25/lb
2,4-D ester	\$ 14.26/gal	Peak	\$ 11.11/oz	Zorial Rapid 80	\$ 16.11/lb
Dacthal 75W	\$ 14.14/lb	Permit	\$ 13.02/oz		
Dash	\$ 12.75/gal	Pinnacle	\$ 38.96/oz		



## Weed Science References

The following resources are published by the University of Nebraska Cooperative 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 and Prescribed Burning Checklist — 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  
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 — G1308  
Musk Thistle — G1109  
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  
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  
The Thistles of North Dakota — NDSU Ext. Serv. W-1120.

## References (Continued)

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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 Decision Support System, available from the Department of Agronomy,  
P.O. Box 830910, University of Nebraska, Lincoln, NE 68583-0910

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