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EC96-130-D A 1996 Guide for....Herbicide Use in Nebraska

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1996 Guide for— HERBICIDE USE IN

Nebraska Cooperative
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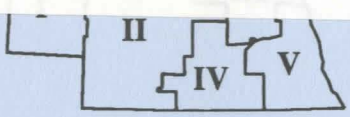
RESTRICTED USE HERBICIDES. Amitrole, Atrazine, AAtrex, Bicep, Bicep II, Bicep Lite, Bladex, Buctril/Atrazine, Bullet, Cannon, Contour, Cyclone, Del-Cycle, Extrazine II, Freedom, Gramoxone Extra, Guardsman, Hoelon, Kerb, Laddok, Lariat, Lasso, Marksman, Micro-Tech, Partner, Ramrod/Atrazine, Shotgun, Surpass 100, 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.



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

PROTECT

"Use Crop Production Chemicals Wisely"

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

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

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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 preemergence herbicide into the top 1 to 2" of soil using a rototiller, mulch treader, field cultivator or similar implement. Weed control with preemergence treatments may be poor if there is no rain to move the herbicide into the top inch. Rainfall required for activation is generally 1/4 to 1/2 inch on course textured soils and 1/2 to 1 inch on fine textured soils. To overcome dependence on rainfall and to increase dependability, some preemergence 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 build-up of any particular herbicide in the soil.

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** postemergence 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 postemergence herbicides. Likewise, crops may be more subject to herbicide damage when growing rapidly. **Adjust herbicide 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 nozzles.

The amount of solution applied per acre depends on the forward speed, the spacing of the nozzles, and the output of the nozzle which is dependent upon the size of the nozzle 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 carrier, the output will be affected. This NebGuide also contains information on using fertilizers as carriers.

The selection of nozzles is an important criteria in herbicide application. The nozzle 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 nozzles 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 nozzle 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 nozzles are recommended. For lower boom heights, 110° nozzles usually are recommended. The 110° nozzles are needed with the lower boom height to maintain 100% overlap. Also the 110° nozzles 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° nozzles, the low pressure (LP) or extended range (XR) nozzles are recommended. The XR and LP nozzles give good patterns at pressures from 15 to 40 psi, and allow for reduced pressures without the pattern distortion that may occur with other nozzles. These nozzles, which maintain patterns over a wide range of pressure, work well with monitors with rate controllers. On the higher booms the 80° nozzles are recommended because of the difficulty in maintaining a good pattern with the 110° nozzles on the higher boom heights. To get the particle sizes needed for good coverage with postemergence herbicides the pressure needs to be 35 to 40 psi with the 80° nozzles and, therefore, the extended range or low pressure nozzles, are probably not as useful.

For banding preemergence herbicides, even-flow flat fan nozzles are recommended.

For banding postemergence herbicides a three nozzle setup over the row with cone nozzles gives the best pattern. The next best selection probably would be the even flat fan nozzle. When the crop is taller than 4" the center nozzle should be removed to minimize crop injury. Higher pressures are normally needed for the postemergence herbicides, especially where good coverage is important. For additional information on nozzles 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 nozzle that requires smaller than a 50 mesh screen in order to reduce nozzle plugging.

2. Buy quality nozzles. Stainless steel, stainless steel inserts in nylon nozzles, polyacetal and ceramic nozzles in the long run are the most economical.

3. Use a special nozzle cleaning brush. Keep pocket knives, paper clips, and wire away from the nozzles as they will distort the pattern and also change the flow rate of the nozzle. Also check the sprayer with water to make sure that the nozzles 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 nozzle 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.

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. 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 preemergence herbicide are made at/or immediately after planting. When established weeds are present, a postemergence herbicide is combined with the preemergence herbicide. Atrazine, Bladex, Extrazine II, Canopy, Preview, Pursuit, Gramoxone Extra, Roundup or Bronco will control established broadleaf weeds, grasses or volunteer wheat depending on plant height. If grasses are less than 2" tall, Atrazine, Bladex, and Extrazine II will provide acceptable control. Control is improved when crop oil concentrate or 28% nitrogen are added. In corn or soybean, 2,4-D ester may also be added for improved weed control. Gramoxone Extra should be applied with X-77 to grasses less than 4" tall. If grasses are taller than 4" and are growing vigorously, apply Roundup[1] at 1 pt/A. Kill volunteer wheat and annual bromes in April to prevent soil moisture loss.

Ridge-Till

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

Select the herbicide treatment from the preemergence 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 should be used. Another option would be to preplant cultivate for row-middle tillage, leaving ridge top weed removal to the planter ridge cleraing 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 39.

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 soils with pH greater than 6.8. Carryover is also a function of application accuracy. Carryover will be more apparent in headlands and other areas where sprayer overlap is common. Herbicide applications made late in the season have greater carryover potential compared to earlier applications.

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

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

Interpreting Soil Herbicide Residue Analysis

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

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

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

Crop	Soil	
	Silt Loam/Clay Loam* 2.5% O.M., pH < 7.0	Sandy Loam/Loamy Sand < 2.0 % O.M., pH > 7.0
	Atrazine ppm*[1]	
Soybean	0.25	———
Oats	0.15	———
Alfalfa	0.10	———
Sugarbeet	———	< .05
	Scepter ppb[2]	
Corn	2-10	———
	Pursuit ppb[2]	
Corn	10-30	———
Sorghum	4-15	———

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

Herbicide Resistance

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

Triazine resistant kochia is common across western Nebraska. Isolated cases of triazine resistant pigweed have also 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 modes of action in successive years and, where possible, within a year. This approach will prevent a weed resistant to one herbicide from increasing rapidly. See the discussion on Classification of Herbicides below.
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.

Classification of Herbicides by Mode of Action and Family

Herbicides can be classified into families based on their chemical similarity. In some cases, herbicides from different families have similar mode of action, the process by which the herbicide kills the weed. Combinations of herbicides with similar modes of action can lead to problems. Repeated use of herbicides in the carbamthioate family (Sutan, Eradicane, etc.) Can lead to reduced control over a period of time by selecting for soil microbes which readily degrade these materials. Repeated use of the same herbicides can result in the selection of herbicide 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. By knowing which herbicides have a similar mode of action, these problems can be avoided.

Site of Herbicide Uptake

COMMON NAME—TRADE NAME—SITE OF UPTAKE

I. Growth Regulators
   1. Phenoxy Acetic Acids
      2,4-D—many—F/R
      2,4-DB—butyrac—F/R
      MCPA—MCPA—F/R
      MCPP—mecroprop—F
   2. Benzoic Acids
      Dicamba—Banvel/Clarity—F/R/S
   3. Pyridines
      Clopyralid—Stinger—F/R
      Picloram—Tordon—F/R
      Triclopyr—Garlon/Crossbow—F/R

SITE OF HERBICIDE UPTAKE
R = Root Uptake
S = Shoot Uptake
F = Foliage Uptake
Letter sequence indicates primary order of herbicide uptake.

II. Amino Acid Synthesis Inhibitors
- A. ALS Inhibitors
  - 1. Imidazolinones
    - Imazamethabenz—Assert—R/F
    - Imazapyr—Arsenal—R/F
    - Imazaquin—Scepter—R/F
    - Imazethapyr—R/F
  - 2. Sulfonylamides
    - Flumetsulam—Broadstrike—R/F
  - 3. Sulfonylureas
    - Chlorimuron—Classic—F/R
    - Chlorsulfuron—Glean—F/R
    - Halosulfuron—Battalion—R/F
    - Halosulfuron—Permit—F/R
    - Nicosulfuron—Accent—F
    - Metsulfuron—Ally—F/R
    - Primisulfuron—Beacon—F/R
    - Prosulfuron—Peak—F/R
    - Rimsulfuron—Basis—F/R
    - Sulfometuron—Oust—F/R
    - Thifensulfuron—Harmony/Pinnacle—F/R
    - Triasulfuron—Amber—F/R
    - Tribenuron—Express—F/R
- B. AHAS Inhibitors
  - 1. Amino Acid Derivatives
    - Glyphosate—Roundup—F

III. Lipid Inhibitors
- 1. Cyclohexanediones
  - Clethodim—Select—F
  - Sethoxydim—Poast—F
- 2. Aryloxyphenoxypropionates
  - Diclofop—Hoelon—F
  - Fenoxaprop—Option—F
  - Fluazifop—Fusilade DX—F
  - Quizalofop—Assure—F

IV. Seedling Growth Inhibitors
- A. Root Inhibitors
  - 1. Dinitroanilines
    - Benefin—Balan—R/S
    - Ethalfluralin—Curbit/Sonalan—S
    - Oryzalin—Surflan—S
    - Pendimethalin—Prowl—S
    - Trifluralin—Treflan—S
  - 2. Unclassified
    - DCPA—Dacthal—R
    - Pronamide—Kerb—R
- B. Shoot Inhibitor
  - 1. Chloroacetamides
    - Acetochlor—Harness/Surpass—S/R
    - Alachlor—Lasso—S/R
    - Dimethenamid—Frontier—S/R
    - Metolachlor—Dual—S/R
    - Propachlor—Ramrod—S/R
  - 2. Thiocarbamate
    - Butylate—Sutan +—S/R
    - Cycloate—Ro-Neet—S/R
    - EPTC—Eptam/Eradicane—S/R
    - Trialiate—Far-Go—S/R
    - Vernolate—Vernam—S/R
  - 3. Phenylcarbamate Family
    - Phenmedipham—Betanal—F

V. Photosynthesis Inhibitors
- A. Mobile Herbicides
  - 1. Triazines
    - Ametryn—Evik—R/F
    - Atrazine—AAtrex—R/F
    - Cyanazine—Bladex—R/F
    - Hexazinone—Velpar—R/F
    - Metribuzin—Lexone/Sencor—R/F
    - Prometon—Pramitol—R/F
    - Simazine—Princep—R
  - 2. Phenylureas
    - Diuron—Karmex—R
    - Linuron—Lorox—R/F
    - Tebuthiuron—Spike—R
  - 3. Uracils
    - Bromacil—Hyvar—R
    - Terbacil—Sinbar—R
- B. Nonmobile Herbicides
  - 1. Benzothiadiazoles
    - Bentazon—Basagran—F
    - Pyridate—Tough—F
  - 2. Nitriles
    - Bromoxynil—Buctril—F
  - 3. Phenylcarbamate
    - Desmedipham—Betanex—F
    - Phenmedipham—Betanal—F

VI. Cell Membrane Disrupters
- 1. Bipyridyliums
  - Diquat—Reward—F
  - Difenzoquat—Avenge—F
  - Paraquat—Cyclone/Gramoxone Extra—F
- 2. Diphenylethers
  - Acifluorfen—Blazer—F
  - Fomesafen—Reflex/Flexstar—R/F
  - Lactofen—Cobra—F
  - Oxyfluorfen—Goal—R/S
- 3. Phenylphthalimide
  - Flumiclorac—Resource—F

VII. Pigment Inhibitor
- 1. Isoxazolidinone
  - Amitrole—Amitrole—F
  - Clomazone—Command—R/S
- 2. Pyridazinones
  - Norflurazol—Zorial—S

VIII. Unknown
- Endothal—R/F
- Fosamine—Krenite—F
- MSMA—Many—F

SITE OF HERBICIDE UPTAKE

R = Root Uptake
S = Shoot Uptake
F = Foliage Uptake
Letter sequence indicates primary order of herbicide uptake.

Minimizing Water Contamination

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

Point Source Contamination

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

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

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

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

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

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

Non-point Source Contamination

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

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

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

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

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

Mixing Herbicides

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

1. Add approximately one-half of the needed water to the tank with agitation on.
2. If called for, add compatibility agents, anti-foaming agents, wetting agents, fertilizer, or other additives except crop oil.
3. Add flowables, dry flowables, or wettable powders, and agitate.
4. If needed, add emulsifiable concentrates, crop oils and/or surfactants, and agitate. Don't over agitate.
5. Finish filling tank with water while continuing agitation.
6. Apply as soon as possible after mixing. Avoid holding overnight whenever possible.

Sprayers should provide good agitation of spray solution and be equipped with appropriate strainers and screens to avoid nozzle clogging. **Do not mix herbicides near water sources. Herbicides may not always mix readily. Conduct a compatibility test if in doubt.**

Cleaning the Sprayer

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

Cleanup Procedures

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

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

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

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

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

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

1. Drain tank, then flush tank, boom and hoses with clean water for a minimum of 10 minutes.
2. Fill the tank with clean water, then add one gallon ammonia per 100 gallons of water. Flush through boom and hoses, allow to sit for 15 minutes with agitation, then drain.
3. Repeat Step 2.
4. Nozzles and screens should be removed and cleaned separately. To remove traces of ammonia, rinse the tank thoroughly with clean water and flush through hoses and boom.

Spray Additives

Additives are commonly used with postemergence herbicides to improve performance. Improved performance results from increased herbicide penetration of the treated plant surface. The most frequently used additives include oils, surfactants, and fertilizers. 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.

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

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

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

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

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

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

Weed Response to Burndown Herbicides*

No-till Corn and Grain Sorghum

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

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

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

** Preplant interval— 2,4-D—7 days for Soybean, 10 days for Sorghum.
Banvel—6 months for Soybean, 14 days for Sorghum.

*** Treatments recommended for use in No-till Grain Sorghum, Y = Yes, N = No.

CRP/Sod Response to Selected Herbicides

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

* Spring treatments must be applied after 3-4" of new growth. Fall applications to warm season grasses must be made prior to dormancy.

** Soil moisture affects the response. Treat warm season grasses prior to October 1. Warm season grasses are normally dormant after a hard freeze.

Weed Response To Selected Herbicides

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

Plant response may be altered by growing conditions, genetic variation in crops and weeds, soil type, pH, organic matter and rates of application. 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 55-64 for additional problem weeds and their control.

Response Ratings: Ratings are 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	B. Nightshade	Cocklebur	Crabgrass	Fall Panicum	Foxtail	Kochia	Kochia, Triazine Resistant	Lambsquarters	Pigweed	Pigweed, Triazine Resistant	Ragweed	R. Thistle	Sandbur	Shattercane/Sorghum	Smartweed	Sunflower	Velvetleaf	Waterhemp	Waterhemp (ALS Resistant)	Crop Safety[a]	Recrop Interval Months[b]
Soil Applied Herbicides																						
AAtrex/Atrazine*,**,***	6	9	8	4	2	7	10	1	10	10	1	9	9	5	2	9	7	7	10	10	1	6-24
Bicep II*,**,***	9	9	7	9	9	9	9	2	9	9	8	8	8	6	4	8	6	6	9	8	1	6-24
Bicep II or Dual + AAtrex*,**,***	9	9	7	9	9	9	9	2	9	9	8	8	8	6	4	8	6	6	9	8	2	6-24
Bladex*,**,***	7	8	7	7	5	8	8	1	9	4	1	9	9	5	4	9	6	6	3	3	3	2-4
Bladex + Atrazine																						
Broadstrike + Dual	9	7	6	9	9	9	9	9	9	9	9	7	8	6	4	8	7	7	9	7	2	6-24
Broadstrike Plus[c]	9	7	8	9	8	8	9	9	9	9	9	7	8	5	4	8	7	7	9	5	2	4-18
Extrazine II*,**,***	6	9	7	7	2	8	8	1	9	8	1	9	9	5	4	9	7	7	7	7	2	6-24
DoublePlay*,***	9	8	2	9	9	9	5	5	8	8	8	6	3	7	8	1	3	3	8	8	2	6-24
Dual/Dual II *,**	9	7	2	9	9	9	2	2	8	8	8	5	3	5	4	2	2	2	8	8	2	4-12
Dual + Bladex	8	8	6	9	9	9	9	3	8	8	8	8	8	5	4	8	6	5	7	7	2	4-18
Eradicane*,**,***	9	6	3	9	9	9	5	5	7	7	7	5	3	7	8	3	2	2	7	7	2	4-18
Eradicane + Atrazine*,**,***	9	9	6	9	9	9	9	5	9	9	7	7	7	7	8	8	7	7	9	7	2	6-24
Eradicane + Bladex*	9	7	9	9	9	9	9	5	9	7	6	7	7	7	8	8	5	5	5	7	2	2-4
Frontier***	9	7	2	9	9	9	2	2	7	7	7	5	3	4	3	2	2	2	7	7	2	4-18
Guardsman***	9	9	7	9	9	9	9	2	9	9	7	8	8	6	4	8	6	6	9	9	2	6-24
Harness*,***	9	7	2	9	9	9	2	2	8	8	9	5	3	6	4	2	2	2	9	9	2	6-24
Harness X-tra*,***	9	9	7	9	9	9	9	2	9	9	9	8	8	6	4	8	6	6	9	9	2	2-18
Lariat/Bullet or Lasso + Atrazine*,**,***	9	9	7	9	9	9	9	2	9	9	9	8	8	6	4	8	6	6	9	9	2	6-24
Lasso/ Micro Tech*,**,***	9	7	7	9	9	9	2	2	8	8	9	5	3	6	4	2	2	2	8	8	2	2-4
Lasso or Dual + (Atrazine+ Bladex) or Extrazine II*.**,***	9	9	7	9	9	8	9	2	9	9	9	9	7	4	2	7	7	7	9	9	2	6-24
Lasso + Bladex*	8	8	6	9	9	9	9	2	8	8	9	8	8	5	4	8	6	5	7	7	2	2-4
Prowl + Atrazine*,**,***	8	9	4	9	9	9	9	5	9	9	8	7	7	7	3	8	6	7	9	8	3	6-24
Prowl + Bladex*	8	8	4	9	9	9	9	5	9	8	8	7	7	7	3	8	5	6	7	7	3	4-12
Surpass*,***	9	7	2	9	9	9	2	2	8	8	8	5	3	6	4	2	2	2	9	9	2	6-24
Surpass 100*,***	9	9	7	9	9	9	9	2	9	9	8	8	8	6	4	8	6	6	9	9	2	2-18
Sutan + *,**,***	9	5	2	9	9	9	5	5	7	5	5	5	2	8	7	2	2	2	5	5	2	1-2
Sutan++ Atrazine*,***	9	9	5	9	9	9	9	2	9	9	5	7	7	7	7	7	6	6	9	9	2	6-24
Sutan++ (Atrazine + Bladex) or Extrazine II*	9	8	2	9	9	9	9	5	9	9	5	7	7	7	7	7	6	4	9	9	2	6-24
Sutan++ Bladex*	9	7	2	9	9	9	9	5	9	7	5	7	7	7	7	7	4	4	7	7	2	2-4
Sutazine+*,**,***	9	9	5	9	9	9	9	5	9	9	5	7	7	7	7	7	6	6	9	9	2	6-24
Topnotch*,***	9	8	3	9	9	9	2	2	8	8	8	6	5	6	4	5	2	3	8	8	2	6-24

[a]Crop varieties vary in their response to herbicides.
[b]Interval values will vary with soil texture, pH, organic matter, rainfall or irrigation, rotational crop, and herbicide rate.
[c]Ratings include a preemergence grass herbicide.
*—Registered for Popcorn, **Registered for Sweet Corn, ***Registered for Silage.

Weed Response To Selected Herbicides

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

Plant response may be altered by growing conditions, genetic variation in crops and weeds, soil type, pH, organic matter and rates of application. 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 55-64 for additional problem weeds and their control.

Response Ratings: Ratings are 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	B. Nightshade	Cocklebur	Crabgrass	Fall Panicum	Foxtail	Kochia	Kochia, Triazine Resistant	Lambsquarters	Pigweed	Pigweed, Triazine Resistant	Ragweed	R. Thistle	Sandbur	Shattercane/Sorghum	Smartweed	Sunflower	Velvetleaf	Waterhemp	Waterhemp (ALS Resistant)	Crop Safety[a]	Recrop Interval[b]
Postemergence Herbicides																						
Weed size influences performance—see label																						
AAtrex/Atrazine or Bicep II*,**,***	5	9	9	4	2	7	9	2	9	9	1	9	4	4	2	9	9	9	9	9	2	6-24
Accent*	8	4	5	2	8	8	6	6	2	7	8	1	3	7	10	7	2	4	7	1	2	1-18
Accent + Atrazine	8	9	9	2	8	8	9	6	9	9	9	9	4	7	10	9	9	9	9	7	2	6-24
Accent + Banvel	8	7	9	2	8	8	8	8	7	7	7	9	9	7	10	9	7	8	7	8	3	1-2
Accent + Beacon	4	8	9	3	7	7	8	8	4	8	9	9	7	7	10	8	9	8	8	1	2	1-18
Accent + Buctril	8	9	9	2	8	8	8	8	7	8	8	8	9	2	10	9	8	7	8	6	2	1-2
Banvel/Clarity	2	7	9	2	2	2	8	8	7	8	8	8	9	2	2	9	7	4	8	8	2	1-2
Basis	7	5	9	3	7	8	3	3	7	9	9	5	4	7	10	8	7	8	8	1	2	0-18
Beacon*,***	2	8	9	2	7	4	9	8	4	8	9	9	4	4	10	8	9	7	8	1	2	1-18
Bladex*,**,***	4	9	7	7	4	7	9	2	9	6	1	9	4	4	4	9	7	7	6	6	3	2-4
Buctril*	2	9	9	2	2	2	8	8	7	6	6	9	7	2	2	9	9	8	6	6	2	0
Buctril + Atrazine*	2	9	9	2	2	2	9	8	9	9	6	9	8	2	2	9	9	9	9	9	2	6-24
Buctril + Banvel	2	9	9	2	2	2	9	9	7	8	8	7	9	2	2	9	9	8	8	8	2	1-2
Contour[d]	5	8	9	5	4	6	7	7	6	9	8	8	7	2	8	8	8	9	8	8	2	0-40
Exceed*,***	2	8	9	2	3	3	8	8	7	9	9	9	4	2	9	8	9	8	8	1	1	0-24
Extrazine II*,**	4	9	9	7	4	7	9	2	9	6	1	9	4	4	4	9	7	7	6	6	2	6-24
Laddok S-12*,**	2	7	9	2	2	2	8	7	7	8	2	9	2	2	2	9	9	9	8	8	1	6-24
Marksman	2	9	9	2	2	2	8	7	9	9	8	9	7	2	2	9	9	8	9	9	2	6-24
Permit	1	3	10	1	1	1	6	5	5	8	8	9	-	1	1	7	9	9	8	1	2	0-10
Poast on Corn[d]	9	1	1	9	9	9	1	1	1	1	1	1	-	9	10	1	1	1	1	1	1	0
Pursuit[d]	7	7	9	7	-	7	8	8	4	9	9	7	5	5	9	7	7	7	9	1	1	4-26
Resolve[d]	5	7	9	6	5	6	9	9	8	8	8	8	8	2	9	9	8	7	8	8	2	0-40
Resource	1	3	7	1	1	1	3	3	7	5	5	7	3	1	1	4	4	10	5	5	2	0
Scorpion III	2	9	10	2	2	2	8	7	7	9	9	8	-	2	1	9	9	8	9	6	3	4-18
Sencor + 2,4-D	2	7	10	2	2	2	8	5	7	7	7	8	2	2	2	7	8	8	7	7	3	6-24
Sencor + Banvel	2	8	9	2	2	2	8	8	7	8	8	8	9	2	2	9	8	7	8	8	2	6-24
Sencor + Basagran	2	7	9	2	2	2	8	7	7	7	2	9	2	2	2	9	9	9	7	7	2	6-24
Tough + Atrazine	4	9	9	4	2	7	9	8	9	9	9	9	4	4	2	9	9	8	9	9	2	6-24
2,4-D**,***	2	6	10	2	2	2	5	4	7	7	7	7	4	2	2	4	7	8	7	7	3	1

[a]Crop Varieties vary in their response to herbicides
[b]Values will vary with soil texture, pH, organic matter and rainfall or irrigation, rotational crop and herbicide rate.
[c]Ratings include a preemergence grass herbicide.
[d]For use in a resistant/tolerant field corn hybrid only.
*—Registered for Popcorn, **Registered for Sweet Corn, ***Registered for Silage.

Corn

No-Till

Herbicide	Commercial product per Acre: Sandy Loam < 1% OM	Silt Loam 1-2% OM	Silty-Clay Loam > 2% OM	Application Time	Remarks and Approximate Cost/A Broadcast
Cool-Season Grass Sod (including bromegrass and bluegrass)					
AATREX 4L[3]*,**,***	Do not use	2 qt	2 qt.	Apply when grass is 4-6" and before corn emerges	Cost: $12.07-$15.92.
+ GRAMOXONE EXTRA[1]		1.5-2.5 pt	1.5-2.5 pt		
ROUNDUP[1]*,**,***	1-1.5 qt	1-1.5 qt	1-1.5 qt	Fall new growth	Use appropriate herbicide at planting. Cost: $11.54-$17.32
Alfalfa/Clover Sod					
2,4-D LV Ester (4L)	1 qt	1 qt	1 qt	Apply in fall or Apr.-May to alfalfa with 4" new growth	2,4-D + Banvel used to kill alfalfa. Don't apply with 28% UAN or a triazine herbicide. If bromegrass or bluegrass is present add Roundup. Apply the 2,4-D + Banvel at least 7 days before planting. On sandy soils don't plant corn for 10 days. Cost: $8.02
+ BANVEL	0.5 pt	0.5 pt	0.5 pt		
followed by: appropriate herbicide at planting or early preplant					
Rye or Winter Wheat					
AATREX 4L*,**,***	1.2 qt	1.4 qt	1.6 qt	Apply when rye and wheat are 4-10" and before corn emerges	On dryland, moisture may be inadequate for corn. Cost: AAtrex $3.78-$5.04; AAtrex + Gramoxone Extra $9.55-$10.81; AAtrex + Bladex + Gramoxone Extra $15.59-$30.00.
ATRAZINE 4L*,**,***	0.5 qt	0.75 qt	1-1.25 qt		
+ BLADEX 4L	1.25 qt	1.75 qt	2.5-2.75 qt		
+ GRAMOXONE EXTRA[1]	1.5-2.5 pt	1.5-2.5 pt	1.5-2.5 pt		
AATREX 4L[3]*,**,***	1.2 qt	1.4 qt	1.6 qt		
+ GRAMOXONE EXTRA	1.5 pt	1.5 pt	1.5 pt		
Continuous Row Crop[4]					
AATREX/ATRAZINE 4L[3]*,**,***	Do not use[a]	2.0 qt	2.0 qt	0-15 days preplant; for 16-30 days preplant increase rates 20%	Add 0.5-1 pt of 2,4-D LV ester or 0.5 pt Banvel to control broadleaf weeds. For triazine resistant kochia add Banvel or Fallow Master. Emerged grass weeds under 1.5 inches are normally controlled with full rates of atrazine or Bladex. Add 1.5-2.5 pt Gramoxone Extra to control larger emerged grass. For volunteer corn use Roundup[1] at 0.75-1 pt/A in 5 gpa water before crop emergence. Cost: 6.31; Bicep $14.63-$19.51; Bicep + Atrazine $15.52-$25.28; Bullet + Atrazine $22.98-$26.67; Dual + Atrazine $16.35-$34.53; Bladex + Atrazine $7.56-$15.12; Bullet $17.31-$21.03; Extrazine Alone $6.77-$18.06; Extrazine II + Dual $18.70-$46.91; Atrazine + Bladex + Dual $19.49-$38.98; Bladex $11.68-$21.24; Atrazine + Partner \ Micro Tech $18.31-$22.91; Micro Tech + Bladex $22.14-$29.89; Guardsman $11.55-$20.80.
AATREX/ATRAZINE 4L[3]*,**,***	1.4 qt	1.6 qt	1.8 qt		
+ DUAL/DUAL II	1.5-2.0 pt	1.5-2.5 pt	2-3 pt		
AATREX/ATRAZINE 4L[3]*,**,***	1.2 qt	1.6 qt	2 qt		
+ MICRO-TECH	2.25 qt	2.25 qt	2.75 qt		
or PARTNER	3.5 lb	3.5 lb	4.0 lb		
BICEP II/BICEP LITE II*,**,***	1.8-2.4 qt	2.4 qt	2.4 qt		
BULLET*,**,***	3.5 qt	3.75 qt	4.25 qt		
AATREX 4L[3]*,**,***	0.5 qt	0.75 qt	1 qt	0-30 days preplant. On sand use at least 14 days preplant.	
+ BLADEX 4L	1.0 qt	1.5 qt	2 qt		
+ DUAL/DUAL II	1.5-2.0 pt	1.5-2.5 pt	2-3 pt		
BLADEX 90DF*,**,***	Do not use	2.2-2.7 lb	3.3-4.0 lb		
BLADEX 4L*,**,***	1.2 qt	1.75 qt	2.0 qt		
+ MICRO-TECH	2.25 qt	2.25 qt	2.75 qt		
EXTRAZINE II*,**,*** with or without	1.5 qt	2.75 qt	4.0 qt		
DUAL/DUAL II	1.5-2.0 pt	1.5-2.5 pt	2-3 pt		
GUARDSMAN	2.5-3.0 pt	3.0-4.0 pt	4-4.5 pt		

[a]Rate required poses risk of groundwater contamination.

Corn No Till/Ridge-Till

Herbicide	Commercial product per Acre: Sandy Loam < 1% OM	Silt Loam 1-2% OM	Silty-Clay Loam > 2% OM	Application Time	Remarks and Approximate Cost/A Broadcast
SURPASS 100	1.6-2.2 qt	2.2-2.6 qt	2.6-3.3 qt	Do not apply more than 14 days early preplant on coarse soils. 0-15 days preplant; for 16-30 days preplant increase rates to highest rate for soil given.	Apply burndown treatments as necessary. Cost: $13.48-$27.81.
TOPNOTCH*,**,***	2.0-2.5 qt	2.0-2.5 qt	2.5-3.0 qt	0-30 days preplant. Use the higher rate when applied alone or for applications made more than 10 days prior to planting.	Add burndown herbicide such as Gramoxone Extra as necessary. Cost: $20.47-$30.22.
+ ATRAZINE	1.1 qt	1.5 qt	1.5 qt		

Ridge-Till

ROUNDUP	1 pt	1 pt	1 pt	Apply 1-2 weeks, Preplant.	Roundup provides good control on annual grasses less than 6" tall, good to excellent on broadleaves 6" or less. Follow with appropriate herbicide at planting. Cost: Roundup + Banvel $10.42; 2,4-D + Banvel $6.34; Gramoxone Extra + Atrazine $9.25.
+ BANVEL	0.5 pt	0.5 pt	0.5 pt		
2,4-D LV Ester (4L)	1 pt	1 pt	1 pt		
+ BANVEL	0.5 pt	0.5 pt	0.5 pt		
GRAMOXONE EXTRA	1.5 pt	1.5 pt	1.5 pt		
+ ATRAZINE	1.0 qt	1.0 qt	1.0 qt		

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

Tilled Seedbed

Herbicide (See Weed Response Chart on page 9 before selecting herbicides)	Commercial product per Acre: Sandy Loam <1% OM	Silt Loam 1-2% OM	Silty-Clay Loam > 2% OM	Application Time, Remarks and Approximate Cost/A Broadcast
AATREX/ATRAZINE DF*,**,***[3]	Do not use[a]	2.2 lb	2.2 lb	EPP, PPSA, PPI, PRE, SURFACE MIX or EARLY POST— May affect sensitive crops the following year especially on high pH soils. Cost: $6.00.
BICEP II/BICEP LITE II*,**,***	1.5-1.8 qt	1.8-2.4 qt	1.8-2.4 qt	EPP, PPSA, PRE, SURFACE MIX, or EARLY POST — Cost: Bicep $12.19-$19.51.
BLADEX DF**	Do not use	2.7 lb	3.6 lb	PPSA, PRE, SURFACE MIX, or EARLY POST — Injury may occur on soils that are calcareous, sandy or below 1% organic matter. Cost: $14.33-$19.11.
BLADEX DF**	1.30 lb	2.20 lb	3.10 lb	PPSA, PRE, SURFACE MIX, or EARLY POST— Injury may occur on soils that are calcareous, sandy or below 1% organic matter. Carryover could affect some crops. Cost: $8.11-$20.39.
+ ATRAZINE DF**	0.40 lb	0.90 lb	1.30 lb	
BROADSTRIKE + DUAL	1.75-2.0 pt	2.0-2.25 pt	2.25-2.50 pt	PPSA, PRE, SURFACE MIX, EARLY POST. Cost: Broadstrike + Dual $17.06-$24.38.
BROADSTRIKE PLUS	0.20-0.25 lb	0.20-0.25 lb	0.20-0.25 lb	PPSA, PRE, SURFACE MIX, EARLY POST. Controls Broadleaf weeds only. Cost: $10.44-$13.05.
BULLET*,**	3.0 qt	3.2 qt	3.5 qt	PPSA, PRE, or SURFACE MIX. Cost: $14.84-$17.31.
CONTOUR (Herbicide Tolerant Crop Required)	1.30 pt	1.30 pt	1.30 pt	PPSA, PRE, or SURFACE MIX. Cost: $16.10.

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

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

Tilled Seedbed, continued

(See Weed Response Chart on page 9 before selecting herbicides)	Herbicide Commercial product per Acre: Sandy Loam <1% OM	Silt Loam 1-2% OM	Silty-Clay Loam > 2% OM	Application Time, Remarks and Approximate Cost/A Broadcast
DOUBLEPLAY[b]*,**,***	4.5 pt	5.0 pt	6.0 pt	PPI—Apply treatments to dry surface soil and immediately incorporate by cross tandem disking or field cultivating, Continuous use of Doubleplay can lead to reduced weed control. Treated fields should be rotated to another crop or herbicide class. Cost: Doubleplay $16.60-$24.90; Doubleplay + Atrazine DF $19.92-$29.43.
DOUBLEPLAY*,**,***	4.5 pt	5.0 pt	6.0 pt	
+ ATRAZINE DF*,**,***	1.1 lb	1.3 lb	1.5 lb	
DUAL/DUAL II*,**,***	1.5 pt	2.0 pt	2.5 pt	EPP, PPSA, PRE, SURFACE MIX, or LAYBY— Dual and Dual + AAtrex may be applied early post. Dual may be applied layby. Injury may occur with Dual + Bladex on soils that are calcareous, sandy or below 1% organic matter. Cost: Dual $11.92-$19.87; Dual + AAtrex $12.00-$19.50; Dual + Bladex $13.26-$21.95.
or DUAL 25G*,**,***	6 lb	8 lb	10 lb	
DUAL/DUAL II*,**,***	1.3 pt	1.5 pt	1.75 pt	
+ AATREX DF*,**,***[3]	1.10 lb	1.38 lb	1.85 lb	
or BLADEX DF	0.83-1.1 lb	1.94 lb	2.2-2.4 lb	
DUAL	1.3 pt	1.5 pt	1.75 pt	PPSA or PRE — 3-way mix. Injury may occur on soils that are calcareous, sandy or below 1% organic matter. Cost: $14.92-$23.33.
+ ATRAZINE DF	0.55 lb	0.55 lb	0.69 lb	
+ BLADEX DF	0.55 lb	1.1 lb	1.38 lb	
ERADICANE*,**,***	4.75 pt	5 pt	5 pt	PPI — Apply treatments to dry surface soil and immediately incorporate by cross tandem disking or similar soil mixing. Injury may occur with Bladex on soils that are calcareous, sandy or below 1% organic matter. See page 56 for shattercane control. Repeated use of Eradicane will lead to reduced weed control. Consider rotating herbicides or crop rotations. Cost: Eradicane $14.00; Eradicane + Atrazine $18.79; Eradicane + Bladex $21.31.
ERADICANE*,**,***	4.75 pt	5 pt	5 pt	
+ ATRAZINE DF*,**,***	1.1 lb	1.33 lb	1.77 lb	
or BLADEX DF	1.1 lb	1.77 lb	2.2 lb	
EXTRAZINE II DF*,**,***	1.66 lb	3.05 lb	4.16 lb	PPSA, PRE, or EARLY POST — Injury may occur on soils that are calcareous, sandy or below 1% organic matter. Cost: Extrazine $6.23-$15.61; Extrazine + Dual or Lasso $19.08-$25.20; Frontier + Extrazine $17.15-$34.29.
EXTRAZINE II DF	1.38 lb	1.94 lb	2.50 lb	
+ DUAL/DUAL II	1.3 pt	1.75 pt	1.75 pt	
or LASSO 4EC	2 qt	2 qt	2 qt	
or FRONTIER	13-16 oz	16-20 oz	18-22 oz	
FRONTIER***	16 oz	20 oz	22 oz	PPSA, PRE, or PPI. Cost: Frontier $13.50-$18.56; Guardsman $11.54-$20.79.
GUARDSMAN	2.5-3.0 pt	3.0-4.0 pt	4.0-4.5 pt	
HARNESS[b]*,**,***	1.25-1.75 pt	1.75-2.25 pt	1.75-2.25 pt	PPSA, PRE SURFACE MIX, EARLY POST. Cost: $10.16-$18.28.
HARNESS XTRA[b]*,***	1.8 qt	2.3 qt	2.3 qt	
LASSO (4EC)*,**,***	Do not use[a]	2.5 qt	3 qt	PPSA, PRE, or SURFACE MIX. Cost: $16.07-$19.80.
or LASSO II*,**,***		17 lb	20 lb	
LASSO (4EC)*,**,***	2 qt	2 qt	2.25 qt	PPSA, PRE, or SURFACE MIX, Cost: Lasso + Atrazine $16.17 - $19.81; Lariat $14.41-$16.82.
+ AATREX/ATRAZINE DF*,**,***	1.1 lb	1.33 lb	1.77 lb	
LARIAT*,**,***	3.0 qt	3.2 qt	3.5 qt	

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

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

Tilled Seedbed, continued

(See Weed Response Chart on page 11 before selecting herbicides)	HerbicideCommercial product per Acre Sandy Loam <1% OM	Silt Loam 1-2% OM	Silty-Clay Loam > 2% OM	Application Time, Remarks and Approximate Cost/A Broadcast
LASSO (4EC) + BLADEX DF	2 qt 1.1 lb	2 qt 1.88 lb	2 qt 2.2 lb	PPSA, or PRE — Injury may occur on soils that are calcareous, sandy or below 1% organic matter. Cost: $18.69-$24.13.
LASSO (4EC) + ATRAZINE DF + BLADEX DF	2 qt 0.55 lb 0.55 lb	2 qt 0.55 lb 1.1 lb	2 qt 0.69 lb 1.38 lb	PPSA or PRE — 3-way mix. Injury may occur on soils that are calcareous, sandy or below 1% organic matter. Cost: $17.43-$22.26
PROWL 3.3EC + ATRAZINE DF or BLADEX DF	Do not use 	1.8 qt 1.33 lb 1.88 lb	1.8 qt 1.77 lb 2.2 lb	PRE — Corn injury may occur if replanting is necessary. Rainfall shortly after planting required for performance. See page 57 for wild proso millet. Cost: Prowl + Bladex $23.47-$25.07; Prowl + Atrazine $17.40-$18.73.
SURPASS*,**,***[b]	1.5-2.0 pt	2.0-2.5 pt	2.0-2.5 pt	PPSA, PRE, SURFACE MIX, or EARLY POST. Cost: $10.75-$19.60; Surpass 100 $13.48-$27.81.
SURPASS 100[b]*,**,***	1.6-2.2 qt	2.2-2.6 qt	2.6-3.3 qt	
SUTAN+6.7E	5 pt	5 pt	5 pt	PPI — Apply treatments to dry surface soil and immediately incorporate by cross tandem disking or similar soil mixing. Repeated use will lead to reduced weed control. Cost: $12.92.
SUTAN+6.7E* + ATRAZINE DF* or BLADEX DF**	3.75 pt 1.33 lb 1.84 lb	3.75 pt 1.33 lb 1.94 lb	3.75 pt 1.77 lb 2.2 lb	PPI — Apply treatments to dry surface soil and immediately incorporate by cross tandem disking or similar soil mixing. Increase rates for sandbur and shattercane control. Injury may occur with Bladex on soils that are calcareous, sandy or below 1% organic matter. Repeated use of Sutan will lead to reduced weed control. Cost: Sutan + atrazine $13.01-$15.04; Sutan + Bladex $15.53-$21.37; Sutazine $13.39 $15.62; Sutan + atrazine + Bladex $14.27-$19.10; Sutan + Extrazine II $15.92-$19.62.
SUTAZINE+*	6 pt	7 pt	7 pt	
SUTAN+6.7E*,**,*** + ATRAZINE DF* + BLADEX DF* or EXTRAZINE II DF	3.75 pt 0.55 lb 0.55 lb 1.38 lb	3.75 pt 0.55 lb 1.1 lb 1.94 lb	3.75 pt 0.69 lb 1.38 lb 2.2 lb	
TOPNOTCH*,**,***	2.0 qt	2.0-2.5 qt	2.0-3.0 qt	EPP, PPSA, PRE, or SURFACE MIX. Cost $17.00-$25.50.
TOPNOTCH*,**,*** + 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: $20.47-$30.22.

Postemergence

Herbicide	Rate Per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
AATREX*,**,***[2] ATRAZINE DF	1.4-2.2 lb	Broadleaf weeds 2-6"; grass weeds 1" or less	Add 1 qt/A COC with atrazine. Lower atrazine rate controls broadleaf weeds. Make applications when corn is less than 12" tall. Cost: $5.26-$7.68.
BASIS + SURFACTANT + 28% UAN	0.33 oz 1-2 qt/100 gal 1 gal	Foxtail 1-2" Corn spike to 2 collar/4 leaf	Do not use if Counter was applied to the crop. Do not apply Basis 3 days before or 7 days after foliar applied organophosphate insecticides. Tank mix with 0.25-0.50 pt Banvel/Clarity for additional broadleaf control. Cost: $12.00.

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

Postemergence (continued)

Herbicide	Rate Per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
ACCENT*	0.67 oz	Corn 4-20" broadcast, >20" use post directed Shattercane <4"-12" Broadleaf weeds <4" Grasses <3"	Use with oil concentrate or surfactant. Do not use if Counter was applied to the crop. Do not use Beacon within 20 days of a planting or cultivation application of any organophosphate insecticide. Do not apply Accent 3 days before or 7 days after a foliar postemergence organophosphate insecticide. Do not apply Beacon within 10 days of a foliar postemergence 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. Use COC at 1 gal/100 gal of solution with Atrazine. Use nonionic surfactant with Banvel/Buctril treatments at 1 qt/100 gal of solution. See Herbicide Resistance, page 5. Cost: Accent $17.89; Accent + Atrazine $24.49-$26.86; with Banvel $26.71-$31.57; with Buctril $28.82-$32.09; Beacon $9.52-$17.54; Buctril Gel $6.78-$10.17.
ACCENT* +	0.67 oz		
ATRAZINE 4L[2]	0.75-1.5 qt		
or BANVEL	0.5-1.0 pt		
or BUCTRIL or	1.0-1.5 pt		
BUCTRIL GEL	0.5-0.75 pt		
BEACON*	0.38-0.76 oz		
BEACON +	0.38 oz	Corn 4-20", >20"-Post direct Grasses 1-3", Broadleaves <4"	With Accent + Beacon use COC or NIS with or without liquid nitrogen, use only if grass herbicide has been used preplant or PRE. Cost: $18.61.
ACCENT	0.34 oz		
BANVEL*	0.5-1 pt	Corn spike to 5", Corn 8-24", Corn spike to 5"	Use higher rate only on silty clay loam soil containing more than 2.5% organic matter. Observe precautions regarding use near sensitive crops. Cost: Banvel $4.65-$9.30; Clarity $5.32-$10.64.
or	0.5 pt		
CLARITY***	0.5-1 pt		
BLADEX 90DF**	2.2 lb	Grass weeds 1" or less; corn before 5-leaf stage	Use with water, vegetable oils or surfactants. Do not use on sand or loamy sand. Decrease rate if Bladex was used earlier. Cost: $11.68.
BUCTRIL* or BUCTRIL GEL with or without ATRAZINE[2]	1-1.5 pt or 0.5-0.75 pt 1 pt	Broadleaf weeds 2-6" tall; corn 3-leaf, 12".	Contact herbicide. Thorough coverage, correct nozzles, pressure, spray volume, rate and weed size important. Cost alone: $6.56-$9.83; with atrazine $8.13-$11.40; Buctril + Atrazine $8.67-$11.40; Buctril Gel $6.78-$10.17.
BUCTRIL/ATRAZINE[2]	2-3 pt		
BUCTRIL or BUCTRIL GEL +	1.0 pt or 0.5 pt	Spike to 36", weeds 2-6 leaf	Later applications may cause brittleness and stalk breakage. Use lower rate when good growing conditions exist to reduce corn injury. Do not use Banvel within 1/2 mile of sugarbeet, fieldbean, alfalfa, soybean, gardens and ornamentals unless drop nozzles are used on corn over 8". Do not apply between June 20 and Sept. 1 if sensitive crops are nearby. Cost: 2,4-D $0.84-$2.69; 2,4-D + Banvel $5.07; Banvel + Buctril $11.43; Buctril Gel $6.78.
BANVEL	0.5 pt		
2,4-D AMINE (4L)**,***	1-2 pt	When corn is small, over 8" use drop nozzles	
or 2,4-D LV ESTER (4L)**,***	0.5-1 pt		
2,4-D AMINE (4L)	0.25 pt		
or ESTER (4L)	0.25 pt		
+ BANVEL	0.5 pt		
EXCEED	1 oz	Corn 4-20" broadcast. 20"-tassle post- direct 2-12" broadleaves	Use COC, with 28% UAN for effective control. Cost: $11.00.
EXTRAZINE II DF[2]***	1.8-2.2 lb	Grass weeds 1" or less, corn before 5-leaf stage	Use with water only. Do not use on sand or loamy sand. Decrease rate if Bladex was used earlier. Cost: $6.75-$8.25.
LADDOK S-12*,**,***[2]	1.3-2.3 pt	Broadleaf weeds 2-4" high; corn less than 12".	Use with 1 qt crop oil concentrate or 1 gal 28% UAN, 20 gal water and 40 psi. Increase rate according to the label on weeds 3-8" tall. Cost: $6.25-$11.06.
MARKSMAN*[2]	2-3.5 pt	Before corn exceeds 5-leaf stage	Observe precautions regarding Banvel use near sensitive crops specified above. Use 3 pt only on silty clay loam soil containing more than 2.5% organic matter. Cost: $6.38-$11.17.
PERMIT	0.66 oz-1.33 oz	Broadleaf weeds 2-6". Corn spike-20" Broadcast post-direct >20"	Use 1 qt/100 gal NIS. Cost: $8.59-$17.31.
POAST **(Herbicide Tolerant Crop Required)**	1.0 pt	Grasses less than 8"	Consult label for suitable broadleaf tank mix. Cost: $11.80.

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

Postemergence (continued)

Herbicide	Rate Per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
PURSUIT*** **(Herbicide Resistant Crop Required)** + 28% UAN + SURFACTANT	4 oz 1-2 qt 2 pt/100 gal	Weeds 1-3", Shattercane up too 6"	For some broadleaf weeds, Banvel needs to be added. Cost: $23.31.
RESOLVE SG **(Herbicide Tolerant Crop Required)**	5.3 oz	Corn <12"	Cost: $18.02.
RESOURCE	4.0-8.0 oz	Corn 2-10 leaf, Broadleaf weeds <4"	Use 1 qt/A COC. Especially good on velvetleaf. Cost: $6.40-$12.80.
SCORPION III	4.0 oz	Corn <8" Broadleaves 2-4 leaf	If corn is taller than 8", use post-directed spray. Do not apply if corn was previously treated wtih Broadstrike. Consult label. Use 1 qt/100 gal NIS. Cost: $8.90.
SENCOR 75DF + BASAGRAN or 2,4-D LV ESTER (4L) or BANVEL	1.5-2 oz 0.5-1 pt 0.33-0.50 pt 0.50-1.0 pt	When corn is small, up to 8". Broadleaf weeds 2-4"	Use 1 gallon/A of 28% UAN with Basagran and Sencor only. Cost: Sencor + 2,4-D $2.20-$4.10; Sencor + Banvel $6.30-$12.50; Sencor + Basagran $7.08-$12.55.
TOUGH + ATRAZINE DF	1 pt 1.25-2.0 lb	Broadleaf weeds 2-6"; grass weeds 1" or less. Corn <12"	Add 1 qt/A COC. Cost: $14.60-$16.85.
DUAL*,**	1.5-3 pt	Layby	Apply after furrowing or final cultivation. Cost $11.93-23.85.
PROWL 3.3EC	0.90-1.8 qt	Corn 4" to layby. Weeds unemerged	Cover brace roots by cultivation before application. Incorporate by tillage, irrigation, or rain within a week. Cost: Prowl $6.60-$13.39.
TREFLAN 4EC	1.5-2.0 pt	Corn 2-leaf to layby. Weeds unemerged	Incorporate with rainfall, sprinkler irrigation water or cultivate within 24 hours. Cost: Treflan 4EC $6.21-$8.27; Treflan + atrazine $9.36-$13.02..
TREFLAN 4EC + ATRAZINE 4L[2]	1.5-2.0 pt 1-1.5 qt	Corn 2-leaf to 12". Weeds unemerged	

Harvest Aid

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

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 rates of application. 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 55-64 for additional problem weeds and their control.

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	B. Nightshade	Cocklebur	Crabgrass	Fall Panicum	Foxtail	Kochia	Kochia Triazine Resistant	Lambsquarters	Pigweed	Pigweed Triazine Resistant	Ragweed	R. Thistle	Sandbur	Shattercane/Sorghum	Smartweed	Sunflower	Velvetleaf	Waterhemp	Waterhemp (ALS Resistant)	Crop Safety[a]	Recrop Interval[b]
Soil Applied Herbicides																						
AAtrex*/Atrazine	4	9	7	4	2	7	9	2	9	9	1	9	9	4	2	9	7	7	9	9	2	6-24
Bicep II + Concep	9	9	4	7	7	9	9	2	9	9	8	9	7	4	2	7	6	4	9	9	2	6-24
Bullet + Seed Safener	9	9	5	7	7	9	9	2	9	9	9	9	7	4	2	7	6	5	9	9	2	6-24
Dual* or Lasso + Seed Safener	9	6	2	9	9	9	2	2	7	7	8	4	2	4	2	2	2	2	7	7	2	2-18
Dual* + Lasso + Atrazine + Seed Safener	9	9	5	7	7	9	9	2	9	9	8	9	7	4	2	7	6	5	9	9	2	6-24
Lariat + Seed Safener	9	9	5	7	7	9	9	2	9	9	9	9	7	4	2	7	6	5	9	9	2	6-24
Ramrod	7	2	2	7	7	9	2	2	4	7	7	2	2	2	2	4	2	2	7	7	4	1-2
Ramrod + Atrazine	7	8	4	7	4	9	9	2	9	9	7	7	7	2	2	8	6	6	9	9	2	6-24
Postemergence Herbicides (Weed size influences performance—see label)																						
AAtrex/Atrazine + COC	2	9	9	2	2	4	9	1	9	9	1	9	4	2	2	9	9	9	9	9	9	6-24
Banvel	2	7	9	2	2	2	8	8	7	8	8	7	9	2	2	9	8	5	8	8	4	1-2
Buctril	2	9	9	2	2	2	8	8	7	6	6	9	7	2	2	9	9	8	6	6	2	0
Buctril + Atrazine*	2	9	9	2	2	2	9	8	9	9	6	9	8	2	2	8	9	9	9	9	2	6-24
Laddok S-12*	2	7	9	2	2	2	8	7	7	8	2	9	2	2	2	9	8	9	8	8	1	6-24
Marksman	2	9	9	2	2	2	8	7	9	9	9	9	8	2	2	9	9	8	9	9	2	6-24
Permit	1	3	9	1	1	1	6	6	5	8	9	9	-	1	1	6	9	9	8	1	2	0-10
Roundup-ropewicks, wipers, etc.[c]	-	-	8	-	-	-	6	6	4	5	5	7	4	-	9	7	7	4	5	5	1	0
2,4-D	2	4	10	2	2	2	4	4	7	8	8	7	9	2	2	3	7	7	8	8	4	1

[a]Crop ratings less than 3 result in no yield loss

[b]Values will vary with soil texture, pH, organic matter, rainfall or irrigation, rotational crop, and herbicide rate.

[c]Ratings for weeds tall enough for selective treatment.

Registered for forage sorghum. Sorghum-Grain and Forage

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 preemergence 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, Bladex or Extrazine II. The addition of crop oil concentrate, njtrogen 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 at 1.0 to 1.5 pt/A plus X-77 at 1 qt/100 gal for Gramoxone Extra and 2 qt/100 gal for Roundup. Add 1.0 pt/A 2,4-D LV ester 4 lb/gal if broadleaf weeds are present and apply 7 days before planting.

Herbicide	Commercial product per Acre: Sandy Loam < 1% OM	Silt Loam 1-2% OM	Silty-Clay Loam >2% OM	Application Time	Remarks and Approximate Cost/A Broadcast
Cool-Season Grass Sod (including bromegrass and bluegrass)					
ROUNDUP[1]	1-2 qt	1-2 qt	1-2 qt	Fall or new growth	Use appropriate herbicide at planting. Cost: $11.54-23.09.
Alfalfa Clover Sod					
2,4-D LV Ester (4L)	1 qt	1 qt	1 qt	Apply in fall or Apr to alfalfa with 4" new growth	On dryland, moisture often not adequate for sorghum. 2,4-D + Banvel used to kill alfalfa. Don't plant sorghum for 30 days. If bromegrass or bluegrass is present add Roundup. Don't apply with UAN or triazine herbicides. Cost: $8.02.
+ BANVEL	0.5 pt	0.5 pt	0.5 pt		
followed by: appropriate herbicide at planting or early preplant					
Rye or Winter Wheat					
ATRAZINE 4L*[3]	Do not use	2.0 qt	2.0 qt	Apply when rye and wheat are 4-10" tall and before sorghum emerges	On dryland moisture is often not adequate for sorghum. Use safened seed with Lasso or Dual. Cost: Atrazine + Gramoxone $12.08-$15.92; AAtrex + Atrazine + Roundup + Dual $21.48-$25.63; Atrazine + Roundup + Lasso $24.34-$28.49.
+ GRAMOXONE EXTRA[1]		1.5-2.5 pt	1.5-2.5 pt		
AATREX 4L[3]	1.2 qt	1.4 qt	1.6 qt		
+ ROUNDUP	1.0-1.5 pt	1.0-1.5 pt	1.0-1.5 pt		
+ LASSO	2.3 qt	2.3 qt	2.3 qt		
or DUAL/DUAL II	1.5 pt	1.5 pt	1.5 pt		
Continuous Row Crop[4]					
AATREX 4L*[3]	Do not use	2.0 qt	2.0 qt	Apr. 1-15 1-20 days preplant	Seed must be treated with Concep to protect from Dual and Bicep injury or Screen to protect from Bullet. Atrazine and Bicep will damage sorghum on sandy and low organic matter soils. If weedy, add Gramoxone Extra at 1.5-2.0 pt. Cost: Dual + Atrazine $15.07-$20.63; Bicep $17.88-$19.51; Bullet $14.84-$19.79.
DUAL*/DUAL II	Do not use	1.75 pt	2 pt		
+ AATREX 4L		1 qt	1.5 qt		
BICEP/BICEP II/BICEP LITE II	Do not use	2.2 qt	2.4 qt	Increase rate 20% for 20 + days preplant	
BULLET (Neb. State Label)	Do not use	3.0 qt	3-4 qt	0-7 days preplant	
ROUNDUP	1-2 pt	1-2 pt	1-2 pt	Prior to crop emergence	Add appropriate residual herbicide. If only broadleaf weeds are present, add 2,4-D LV (4L) ester at 1 pt/A. Can be used preplant. Cost: $5.77-$11.54.

[c]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 2/3 rate applied preplant + 1/3 rate banded over the row at planting should be effective. Another strategy is to apply a postemergence herbicide such as Roundup 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 preemergence 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.

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

Tilled Seedbed

	Commercial product per Acre			
Herbicide	Sandy Loam < 1% OM	Silt Loam 1-2% OM	Silty-Clay Loam >2% OM	Remarks and Approximate Cost/A Broadcast
AATREX/ATRAZINE 4L*3	Do not use	2.0 qt	2.0 qt	EPP, PPSA, PP, PRE, or SURFACE MIX — Preplant applications should be made only on fine textured soils. Cost: $6.31 .
BICEP*/BICEP II/BICEP LITE II	Do not use	1.8 qt	2.2 qt	EPP, PPSA, PRE, or SURFACE MIX — Seed must be Concep treated for Bicep and Dual, Screen treated for Bullet. Do not use atrazine on sandy, high pH or calcareous soils. Rain may leach herbicides, and cause sorghum injury. Cost: Atrazine $6.31 Bicep $14.63-$17.88; Dual $11.93 -$15.90; Dual+ Atrazine $15.09-$20.64; Bullet $14.84-$19.79.
DUAL*/DUAL II	1.5 pt	2 pt	2.5 pt	
or DUAL 25G	6 lb	8 lb	10 lb	
DUAL*/DUAL II	Do not use	1.5 pt	1.75-2 pt	
with AATREX/ATRAZINE 4L		1 qt	1.5 qt	
BULLET (Neb. State Label)	Do not use	3.0 qt	3.5 qt	
LASSO	Do not use	2.5 qt	3 qt	PPSA, PRE, or SURFACE MIX — Seed must be Screen treated. Do not use Atrazine on sandy, high pH or calcareous soils. Rain may leach herbicides and cause sorghum injury. Cost: Lasso + Atrazine/Lariat $12.85-$16.82; Lasso $16.07-$19.28.
LASSO	Do not use	2 qt	2.25 qt	
with ATRAZINE 4L		1 qt	1.25 qt	
LARIAT	Do not use	3 qt	3.5 qt	
RAMROD FLOWABLE	4 qt	4 qt	4 qt	PRE —May cause skin irritation to applicator. Do not feed treated forage to dairy animals. Leaches on sandy soil. Cost: $16.34.
or RAMROD 20G	20 lb	20 lb	20 lb	
RAMROD FLOWABLE	Do not use	3 qt	3 qt	PRE —In southwest Nebraska hold atrazine rate to 0.75 qt/A. Rain may leach herbicides and cause sorghum injury or poor weed control. Do not feed treated forage to lactating dairy animals. Cost: Ramrod + atrazine $16.19; Ramrod & atrazine Flowable $14.92.
+ AATREX 4L		0.75-1 qt	1.25 qt	
RAMROD & ATRAZINE	Do not use	4 qt	4 qt	

Sorghum

Postemergence

Herbicide	Rate Per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
AATREX/ATRAZINE 4L*[2]	1.2 qt	Broadleaf weeds < 6" Sorghum < 12"	Use atrazine with 1 qt/A crop oil concentrate. 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 and apply with 1 qt crop oil concentrate or 1 gal UAN. Cost: Atrazine $4.85; Laddok $5.00-$12.00.
LADDOK S-12[2]	1.3-2.3 pt		
MARKSMAN[2]	1.5-2 pt	Sorghum 2-5 leaf. Broadleaf weeds 2-4"	Cost: $6.38.
BANVEL*	0.5 pt	Sorghum 3-5 leaves	Observe label precautions when sensitive crops are nearby. Cost: $4.65.
2,4-D AMINE* (4L)	1 pt	After sorghum is 5" tall. If over 10" use drop nozzles	Spraying 2,4-D before 5" stage may inhibit root development. Spraying 2,4-D without drop nozzles after 8" through early boot may inhibit head development; use drop nozzles after 8" for all Banvel treatments. Do not use 2,4-D from early boot through soft dough stage. Cost: 2,4-D $0.84-$1.34; Buctril alone $6.55-$9.83; with Atrazine $8.12-$11.40, with Banvel $7.67-$14.48; Buctril Gel $6.78-$10.17.
2,4-D LV ESTER* (4L)	0.5 pt		
BUCTRIL or	1-1.5 pt or	Broadleaf weeds 2-6"; sorghum 3-leaf to 12"	
BUCTRIL GEL alone or with	0.5-0.75 pt		
ATRAZINE[2]	1 pt		
or with BANVEL	0.12-0.5 pt		
BUCTRIL/ATRAZINE[2]	2-3 pt	Sorghum 3-leaf to 12"	
BUCTRIL/ATRAZINE[2] + BANVEL	1.5-2.0 pt 0.12-0.25 pt	Sorghum 3-leaf to 12"	
PERMIT	0.66 oz	Sorghum 2-leaf to layby (before head emergence)	Use 1 qt/100 gal NIS. Cost: $8.59.

Harvest Aid

CHLORATE 3 or LEAFEX-3	1.5-2 gal 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.

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	Field Sandbur	Kochia	Kochia-Triazine Resistant	Russian Thistle	Smartweed—Annual	Velvetleaf	Sunflower	Rye	Winter Wheat	Alfalfa	Sweet Clover	Hairy Vetch
2,4-D Ester** (1.0 pt)	1	4	7	1	1	7	4	7	10	9	10	7	9	6	1	1	9	1	6	4	9	7	8	10	1	1	5	6	7
Canopy/Preview (6/7 oz)	10	10	7	3	7	6	8	8	10	9	10	4	6	9	4	4	9	4	7	4	9	9	8	8	3	3	4	0	6
Command (1.5 pt)	1	1	3	5	4	7	1	2	6	6	6	5	6	6	6	6	6	6	8	8	6	7	9	5	6	6	4	3	3
Command + Prowl (1.5 pt + 3.0 pt)	2	1	3	7	4	7	1	2	6	6	6	6	6	7	7	6	6	6	9	9	7	7	9	6	6	6	3	3	3
Gramoxone Extra (1.5 pt)	8	10	5	7	8	7	9	7	10	8	9	6	9	9	7	7	8	7	9	9	9	6	8	10	6	6	4	4	7
Gramoxone + Canopy /Preview (1.5 pt + 6/7 oz)	9	10	6	8	8	8	9	9	10	10	10	7	9	10	9	10	10	9	9	9	9	9	9	10	6	6	4	4	8
Gramoxone + Lorox/Linex (1.5 pt + 1.6 lb)	9	10	6	7	7	8	9	7	10	10	10	7	9	10	9	9	10	9	10	10	10	6	9	10	7	7	4	4	8
Gramoxone + Pursuit (1.5 pt + 4 oz)	9	10	6	8	9	8	9	8	10	9	10	7	9	10	9	9	9	9	9	9	9	9	9	10	8	6	4	4	8
Gramoxone + Scepter (1.5 pt + 4 oz)	9	10	6	7	9	8	9	7	10	9	10	6	9	10	9	9	10	9	9	9	9	8	9	10	7	6	4	4	8
Gramoxone + Sencor/ Lexone DF (1.5 pt + 12 oz)	10	10	6	7	9	8	9	8	10	10	10	8	9	10	9	9	10	9	10	10	10	8	10	10	7	7	4	4	8
Pursuit (4 oz)	5	8	4	2	7	5	7	4	8	7	8	3	3	3	5	4	5	7	6	6	6	8	9	8	1	1	1	2	2
Pursuit Plus (2.5 pt)	5	9	4	2	7	6	7	5	8	8	8	4	3	4	6	5	5	7	7	7	6	8	9	8	1	1	1	2	2
Roundup (1.0 pt)	10	10	5	10	9	7	9	6	10	6	10	10	9	9	9	10	7	10	7	7	9	7	7	9	10	10	4	3	6
Roundup (1.5 pt)	10	10	7	10	9	8	9	8	10	7	10	10	9	9	10	10	9	10	8	8	9	8	9	9	10	10	5	4	6
Roundup + 2,4-D (1.0 pt + 1.0 pt)	10	10	8	7	9	9	9	9	10	8	10	10	9	9	9	10	9	10	9	9	9	9	10	10	10	10	6	5	7
Roundup + Canopy /Preview (1.0 pt + 6/7 oz)	10	10	8	10	10	7	9	10	10	10	10	10	9	10	10	10	10	10	10	10	10	9	9	10	8	10	3	3	7
Roundup + Scepter (1.0 pt + 4 oz)	10	10	7	10	9	7	9	9	10	8	10	9	9	10	10	10	10	10	10	10	10	9	9	10	10	9	4	3	7
Roundup + Pursuit (1.0 pt + 4 oz)	10	10	8	10	9	8	9	10	10	9	10	9	9	10	10	10	10	10	10	10	10	10	10	10	9	9	4	3	7
Roundup + Sencor/ Lexone DF (1.0 pt + 2-4 oz)	10	10	7	10	8	7	9	8	10	9	10	10	9	10	9	10	8	10	8	7	10	8	8	10	10	10	4	4	7
Roundup + Lorox/Linex (1.0 pt + 1.6 lb)	10	10	8	10	9	7	9	7	10	10	10	9	9	10	9	10	10	10	10	10	10	8	9	10	10	10	3	3	7
Scepter (0.66 pt)	5	9	4	1	5	5	7	4	9	6	9	3	1	3	3	3	5	5	7	7	5	7	7	8	1	1	1	1	3
Sencor/Lexone DF (12 oz)	2	10	5	7	8	6	8	5	10	7	9	2	6	8	5	5	5	6	9	1	7	7	8	8	5	5	5	5	6

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

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

** Preplant interval— 2,4-D—7 days for Soybean.

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 of application. 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 55-64 for additional problem weeds and their control.

Response Ratings: Ratings are 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	B. Nightshade	Cocklebur	Crabgrass	Fall Panicum	Foxtail	Kochia	Kochia, Triazine Resistant	Lambsquarters	Pigweed	Pigweed, Triazine Resistant	Ragweed	R. Thistle	Sandbur	Shattercane/Sorghum	Smartweed	Sunflower	Velvetleaf	Waterhemp	Waterhemp (ALS Resistant)	Crop Safety[a]	Recrop Inteval[b]
Soil Applied Herbicides																						
Broadstrike + Dual	9	7	6	9	9	9	9	9	9	9	9	7	8	6	4	8	7	7	9	7	2	4-26
Broadstrike + Treflan	9	7	6	9	9	9	9	9	9	9	9	8	8	9	9	8	8	8	9	7	1	4-26
Canopy + Dual or Lasso	9	7	8	9	9	9	7	4	9	9	8	9	7	4	3	8	8	8	9	8	2	4-18
Canopy /Preview	2	4	8	2	2	2	7	4	9	9	8	9	7	2	3	8	8	8	9	6	2	4-18
Canopy + Treflan or Sonalan or Prowl	9	2	8	9	9	9	9	7	9	9	8	9	8	8	7	8	8	8	9	8	2	4-18
Command	8	-	2	8	8	8	9	9	7	2	2	4	-	8	8	4	-	10	2	2	1	6-12
Command + Canopy	8	4	9	8	8	8	9	9	9	9	8	9	7	8	8	8	8	10	9	7	2	4-18
Command + Treflan or Sonalan or Prowl	9	4	4	9	9	9	9	9	9	7	7	7	7	9	8	9	4	10	7	7	1	9-18
Detail	9	7	9	9	8	9	7	7	9	9	9	9	9	-	5	9	9	8	9	7	2	0-26
Dual/Dual II	9	7	2	9	9	9	2	3	8	8	8	5	3	5	4	2	2	2	7	7	1	4-18
Dual + Lexone/Sencor	9	7	4	9	9	9	4	2	9	9	8	9	7	4	4	8	4	7	9	7	3	4-18
Frontier	9	6	2	9	9	9	2	2	7	8	8	5	3	4	3	2	2	2	7	7	1	2-4
Lasso/Micro Tech/Partner	9	7	2	9	9	9	2	2	7	8	8	4	2	4	3	2	2	2	7	7	1	2-4
Lasso + Lexone/Sencor	9	7	4	9	9	9	4	2	9	9	7	9	7	4	4	8	4	7	9	7	3	4-18
Preview + Dual or Lasso	9	7	8	9	9	9	7	6	9	9	8	9	7	4	3	8	8	8	9	8	2	4-18
Preview + Treflan or Sonalan or Prowl	9	2	8	9	9	9	7	7	9	9	8	9	7	8	7	8	8	8	9	8	2	4-18
Prowl	9	2	2	9	9	9	7	7	7	7	7	2	7	8	6	2	2	4	7	7	2	4-18
Prowl + Lexone/Sencor	9	2	4	9	9	9	7	7	9	9	7	9	9	8	7	7	4	7	9	9	3	4-18
Pursuit	2	4	4	2	2	2	9	9	4	9	9	9	-	2	7	9	8	8	9	3	2	4-26
Pursuit + Dual	9	8	4	9	9	9	9	9	7	9	9	9	-	7	8	9	8	8	9	7	2	4-26
Pursuit Plus	9	4	4	9	9	9	9	9	9	9	9	9	-	7	8	9	8	8	9	7	2	4-26
Scepter + Dual or Lasso	9	7	9	9	9	9	4	4	9	9	9	9	-	4	4	9	8	7	9	7	2	4-26
Scepter + Prowl, Sonalan or Treflan	9	4	9	9	9	9	7	7	9	9	9	9	-	7	8	9	8	7	9	7	2	4-26
Split Appl.-Treflan/ Trifluralin or Prowl + Lexone/Sencor	9	2	5	9	9	9	8	7	9	9	7	9	9	8	8	9	6	8	9	7	3	4-18
Treflan	9	2	2	9	9	9	7	7	7	7	7	2	7	8	6	2	2	4	7	7	2	5-18
Treflan/Trifluralin + Sencor/Lexone	9	2	4	9	9	9	7	7	9	9	7	9	9	8	7	7	4	7	9	7	3	4-18
Treflan + Lexone/Sencor + Command	9	5	5	9	9	9	9	9	9	9	7	9	9	8	8	7	5	10	9	7	2	9-16

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

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 of application. 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 55-64 for additional problem weeds and their control.

Response Ratings: Ratings are 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	B. Nightshade	Cocklebur	Crabgrass	Fall Panicum	Foxtail	Kochia	Kochia, Triazine Resistant	Lambsquarters	Pigweed	Pigweed Triazine Resistant	Ragweed	R. Thistle	Sandbur	Shattercane/Sorghum	Smartweed	Sunflower	Velvetleaf	Waterhemp	Waterhemp (ALS Resistant)	Crop Safety[a]	Recrop Inteval[b]
Postemergence Herbicides																						
Weed size influences performance—see label																						
Assure/Assure II	9	2	2	9	9	8	2	2	2	2	2	2	2	9	10	0	2	2	2	2	1	4
Basagran	2	2	9	2	2	2	7	7	7	2	2	7	7	2	2	9	8	9	2	2	1	0
Basagran + Blazer or Galaxy	2	7	9	2	2	2	7	7	7	8	8	9	7	8	2	9	8	9	8	8	2	0
Basagran + Cobra	2	7	8	4	4	4	4	4	4	9	9	9	7	4	4	9	8	8	9	9	3	0
Basagran + Scepter	2	2	10	2	2	2	7	7	7	9	9	7	7	2	2	9	9	9	9	3	1	4-26
Blazer	2	7	4	4	4	4	4	4	4	9	9	9	5	4	4	9	2	4	9	9	3	0
Classic	2	2	10	2	2	2	4	7	4	8	8	9	-	2	2	9	9	8	8	3	3	3-15
Cobra	2	7	7	4	4	4	4	4	4	9	9	9	5	4	4	9	7	7	9	9	3	0
Fusilade	9	2	2	9	9	8	2	2	2	2	2	2	2	8	10	2	2	2	2	2	1	2
Fusion	9	2	2	9	9	8	2	2	2	2	2	2	2	8	10	2	2	2	2	2	1	
Pinnacle + Classic	2	2	9	2	2	2	4	4	9	9	9	9	7	2	2	9	9	9	9	3	3	3-9
Poast	9	2	2	9	9	8	2	2	2	2	2	2	2	9	10	2	2	2	2	2	1	0
Poast + Basagran	8	2	9	8	8	7	2	2	2	2	2	7	2	8	9	9	8	9	2	2	1	0
Pursuit	7	7	9	7	-	7	5	5	4	9	9	7	-	-	9	7	7	7	9	3	1	4-26
Pursuit + Blazer or Cobra, or Reflex	7	7	9	7	4	7	5	5	4	9	9	9	5	4	9	9	7	7	9	8	3	4-26
Reflex	2	7	7	4	4	4	4	4	4	9	9	9	5	4	4	9	7	7	9	9	2	3-13
Resource	1	2	7	1	1	1	3	3	7	7	7	7	-	1	1	3	3	10	6	6	2	0
Roundup (1.0 qt.)[d]	9	9	7	10	10	10	8	9	8	9	9	7	7	10	10	7	8	8	9	9	2	0
Roundup-ropewicks, wipers, etc.[c]	-	-	7	-	-	-	2	2	7	7	7	7	4	-	10	7	4	4	7	7	1	0
Select	9	2	2	9	9	8	2	2	2	2	2	2	2	8	10	2	2	2	2	2	1	4
Syncrony	2	23	9	2	2	2	4	4	9	9	9	9	7	2	2	9	9	9	9	3	2	1

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

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 preemergence treatment may be needed.

Herbicide (See Weed Response Chart on page 22 before selecting herbicides)	Commercial product per Acre: Sandy Loam <1% OM	Silt Loam 1-2% OM	Silty-Clay Loam >2% OM	Application Time	Remarks and Approximate Cost/A Broadcast
No-Till in Alfalfa or Clover Sod					
2,4-D Ester LV(4L)	1 qt	1 qt	1 qt	Apply in **FALL** to alfalfa with 4" new growth	Use appropriate residual herbicide at planting 2,4-D + Banvel used to kill alfalfa. Cost: $8.02.
+ BANVEL	0.5 pt	0.5 pt	0.5 pt		
Soybean, No-Till in Cool-Season Grass Sod					
ROUNDUP	1-1.5 qt	1-1.5 qt	1-1.5 qt	Apply in **FALL** to new growth	Cost: $11.55-$17.32.
Soybean, No-Till in Rye or Winter Wheat					
ROUNDUP	0.75-1 pt	0.75-1 pt	0.75-1 pt	Apply when rye and wheat are 4-10" and before soybean emerge	Follow with appropriate EPP treatment. Cost without EPP treatment: $4.33-$5.77.
Soybean, No-Till Continuous Row Crops					
ROUNDUP	1.5-2.0 pt	1.5-2.0 pt	1.5-2.0 pt	15-30 days EPP	Cost: $8.66-$11.55.
ROUNDUP	1-2 pt	1-2 pt	1-2 pt	7-30 days EPP	Use appropriate herbicide at planting. 2,4-D at 1 pt, 7day/planting; at 2 pt, 30 days/planting. Cost: Roundup + 2,4-D $7.75-$14.92.
+ 2,4-D LV Ester (4L)	1-2 pt	1-2 pt	1-2 pt		
LEXONE/SENCOR 75DF		0.83-1 lb	1-1.2 lb	15-30 days EPP	Do not use on soils with less than 1% OM. Use the lower rate for calcareous soils. Use a split application of 2/3 EPP, the remaining 1/3 at planting, especially if applied very early. Use higher rate for split application. Split applications cover soil disturbance by planter. If grasses are present add Roundup. Use higher rates of Roundup when combined with Prowl in a PRE or POST treatment. 0-7 days preplant. EPP treatments may be less effective if rainfall does not occur within 7 days of application. Cost: with Dual $33.65-$51.17; with Micro-Tech $26.08-$34.73; with Partner $25.49-$34.14; with Prowl $21.96-$30.74; with Frontier $32.47-$49.63.
+ DUAL/DUAL II		2.0 pt	2.5 pt		
or MICRO-TECH		2.5 qt	3 qt		
or PARTNER		3.8 lb	4.5 lb		
or PROWL (3.3EC)		3.0 pt	3.6 pt		
or FRONTIER		16-20 oz	18-22 oz		
PURSUIT	4 oz	4 oz	4 oz	15-30 days EPP	If emerged weeds are present add Roundup. Do not plant sorghum the following year. EPP Treatments may be less effective if rainfall does not occur within 7 days of application. Cost: Pursuit + Dual $34.49-$38.46; Pursuit + Micro-Tech $31.63-$38.15; Pursuit + Partner $33.11-$35.19; Pursuit Plus $23.76.
+ DUAL/DUAL II	1.5 pt	2.0 pt	2.5 pt		
or MICRO-TECH	2 qt	2.5 qt	3 qt		
or PARTNER	3.5 lb	3.5 lb	4.0 lb		
PURSUIT PLUS	2.5 pt	2.5 pt	2.5 pt		
COMMAND	1.5-2 pt	1.5-2 pt	1.5-2 pt	0-30 days EPP	Do not use on soils with less than 0.5% OM. Use a split application of 2/3 of the Sencor/Lexone early, the remaining 1/3 at planting if applied more than 14 days preplant. For Canopy/Preview applications, see page 5 for herbicide resistance. If emerged weeds are taller than 2" add Roundup. Cost: Command + Lexone/Sencor: $23.47-$39.38; Command + Canopy/Preview $26.38-$35.96.
+ LEXONE DF	0.33 lb	0.5-0.75 lb	0.5-0.75 lb		
or SENCOR DF	0.33 lb	0.5-0.75 lb	0.5-0.75 lb		
or CANOPY	5 oz	6 oz	7 oz		
or PREVIEW	6 oz	7 oz	8 oz		

Soybean

No-Till, continued

Herbicide (See Weed Response Chart on page 24 before selecting herbicides)	Commercial product per Acre: Sandy Loam <1% OM	Silt Loam 1-2% OM	Silty-Clay Loam >2% OM	Application Time	Remarks and Approximate Cost/A Broadcast
LEXONE/SENCOR 75DF	0.33 lb	0.67 lb	0.83 lb	0-14 days EPP	Lorox should not be applied more than 5-7 days before planting. Add 0.25% surfactant or 1 qt/A crop oil concentrate for better burndown of small weeds up to 1.5-2". If emerged weeds are more than 2", add Gramoxone Extra or Roundup 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 Preview on soils with pH greater than 7.0; corn or grain sorghum should not be planted within 10 months of application. Cost: Lexone/Sencor with Dual $24.96 -$41.53; Lexone/Sencor + Frontier $19.56-$40.12; Lexone/Sencor with Lasso $26.08-$41.21; Lorox with Lasso $24.76-$37.60; Lorox + Frontier $22.68-$36.52; Canopy/Preview with Dual $23.38-$35.19; Canopy + Frontier $22.47-$34.65; Preview with Lasso $24.50-$26.85.
or					
LOROX 50DF	1.3 lb	1.6 lb	2.0 lb		
or					
PREVIEW	6 oz	7 oz	8 oz		
or					
CANOPY	5 oz	6 oz	7 oz		
+					
DUAL/DUAL II	1.5 pt	2 pt	2.5 pt		
or					
LASSO/MICRO-TECH	2.0 qt	2.5 qt	3 qt		
or					
FRONTIER	13-16 oz	16-20 oz	18-22 oz		
Soybean, No-Till Continuous Row Crops					
BRONCO	3.25 qt	4.0 qt	4.0 qt	Preemergence at planting	Do not use on soils with less than 0.5% OM. Apply after planting, but before crop emergence. Apply in 10-30 gal/A spray solution. Add X-77 surfactant to 2 qt/100 gal spray solution. The addition of dry ammonium sulfate at 17 lb/100 gal solution may improve weed control under adverse growing conditions. Cost: Bronco + Lorox $33.54-44.90; Bronco + Lexone/Sencor $30.43-$44.33.
+					
LOROX 50DF	1.3 lb	1.6 lb	2 lb		
or					
LEXONE/SENCOR 75DF	0.33 lb	0.5 lb	0.67 lb		
LEXONE/SENCOR 75DF	0.33 lb	0.5 lb	0.67 lb	Preemergence at planting	Do not use on soils with less than 0.5% OM. Add Gramoxone Extra at 1.5-2.5 pt/A or Round up at 1-1.5 pt/A. Add surfactant at 1 qt/100 gal spray solution. If using Roundup in the tank-mix, the addition of 17 lb dry ammonium sulfate per 100 gal spray solution may increase the performance of Roundup. For tank-mixes with either Gramoxone Extra or Roundup use the higher rate for 4-6" weeds. Control of weeds over 6" will be erratic. Apply in at least 20 gal/A to get thorough coverage. Rainfall within 3 to 5 days of herbicide application will improve weed control. When using tank-mixes with Lexone/Sencor, do not use on sand or loamy sand soils. Do not apply Preview on soils with pH greater than 7.0 Cost: without Gramoxone Extra or Roundup: Lexone/Sencor with Dual $20.53-$37.35; Lexone/Sencor with Micro-Tech $21.65-$37.03; Lorox with Dual $23.64-$37.97; Lorox with Micro-Tech $24.76-$37.60; Preview with Dual $23.38-$35.17; Preview with Micro-Tech $24.50-$34.85; Preview + Frontier $22.38-$33.76; Partner $12.45-$18.67.
or					
LOROX 50DF	1.3 lb	1.6 lb	2 lb		
or					
PREVIEW	6 oz	7 oz	8 oz		
+					
DUAL/DUAL II	1.5 pt	2 pt	2.5 pt		
or					
FRONTIER	13-16 oz	16-20 oz	18-22 oz		
or					
MICRO-TECH/ PARTNER	2.0 qt 3.0 lb	2.5 qt 3.8 lb	3.0 qt 4.5 lb		

Ridge-Till

In crops planted after mid-May, weeds can be expected to grow vigorously before planting. In a ridge plant system these weeds may become too large to uproot and smother unless control efforts are applied in late April or early May. Two approaches can be used to control these weeds. The first would be to select an early preplant treatment from the no-till section and apply by mid to late April. Since the planting operation will destroy this herbicide barrier, a second herbicide application over the row is required at planting. A split application of 2/3 rate applied preplant + 1/3 banded over the row at planting should be effective. Another strategy is to apply a postemergence herbicide such as Roundup 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 preemergence 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 at 1.0 to 2.0 pts/A, 1-3 weeks preplant. Cost: $5.77-$11.54

Tilled Seedbed

Herbicide (See Weed Response Chart on page 21 before selecting herbicides)	Commercial product per Acre: Sandy Loam <1% OM	Silt Loam 1-2% OM	Silty-Clay Loam >2% OM	Remarks and Approximate Cost/A Broadcast
For cocklebur, sunflower and velvetleaf, see Troublesome Weeds and Woody Plants, pages 55-64.				
BROADSTRIKE + DUAL	1.75-2.0 pt	2.0-2.25 pt	2.25-2.50 pt	PPI with Treflan into the upper 2 inches of soil within 24 hours after application. Cost: Broadstrike + Dual $17.06-$24.37; Broadstrike + Treflan $13.50-$20.25.
BROADSTRIKE + TREFLAN	1.5-2.0 pt	2.0 pt	2.25 pt	
COMMAND	1.5 pt	1.5 pt	1.5 pt	PPI with Treflan and Sonalan. PPI or SURFACE MIX with Prowl. SURFACE MIX or PRE with Dual or Lasso. To reduce injury on calcareous soil, reduce Sencor/Lexone rate by 1/3. Command vapor or droplet drift may damage green vegetation. Treflan and Sonalan may be applied to untilled residue prior to incorporation. Cost: Command alone $14.85; with Prowl or Treflan $12.68-$17.19; with Sonalan $15.50-$19.53; with Dual or Lasso $20.28-$23.50.
SENCOR 75 DF	0.33 lb	0.40 lb	0.5 lb	
with				
TREFLAN	1 pt	1.5 pt	2 pt	
or				
SONALAN	2 pt	2.5 pt	3 pt	
or				
PROWL (3.3EC)	1.8 pt	2.4 pt	2.4 pt	
or				
DUAL/DUAL II	1.5 pt	1.5 pt	2 pt	
or				
LASSO	2 qt	2.5 qt	2.5 qt	
COMMAND	0.75 pt	1.2 pt	1.5 pt	PPI with Treflan, Sonalan and Commence. Surface mix or PRE with Lasso. Use 2.5 qt rate of Lasso for heavy infestation of pigweed and lambsquarters. Command vapor drift may damage green vegetation. Carryover may damage wheat seeded the same fall or sugarbeet and fieldbean the next year. Treflan and Sonalan may be applied to untilled residue. Cost: Command + Treflan $11.56-$23.13; Command + Sonalan $15.50-$26.96; Command + Lasso $22.75; Command + Prowl $14.12-$23.79; Commence $14.06-$21.38; Command + Canopy $26.38-$35.95.
+				
TREFLAN	1 pt	1.5 pt	2 pt	
or				
PROWL	1.8 pt	2.4 pt	2.4 pt	
or				
SONALAN	2 pt	2.5 pt	3 pt	
COMMAND	1 pt	1 pt	1 pt	
+				
LASSO 4EC	2 qt	2 qt	2 qt	
COMMAND	1.5-2.0 pt	1.5-2.0 pt	1.5-2.0 pt	
+				
CANOPY	5 oz	6 oz	7 oz	
COMMENCE	1.75-2 pt	2-2.25 pt	2.66 pt	
DETAIL	Do not use	1.0 qt	1.0 qt	PRE, SURFACE MIX. Consult label for area use and rotational crop restrictions. Cost: $30.00
DUAL/DUAL II	2 pt	2 pt	2.5 pt	EPP, PRE, SURFACE MIX. Cost: $15.90-$19.88.
or				
DUAL 25G	8 lb	8 lb	10 lb	
FRONTIER	13-16 oz	16-20 oz	18-22 oz	EPP, PRE, SURFACE MIX. Cost: $10.92-$18.48.
FREEDOM	3.5 qt	3.5 qt	4 qt	PPI into the upper 2 inches of soil within 24 hours after application. To reduce injury on calcareous soil decrease Sencor/Lexone rates by 1/3. Cost: Freedom $10.47-$11.96; Freedom + Sencor/Lexone $16.67-$21.11.
FREEDOM	Do not use	2.7 qt	2.7 qt	
+				
SENCOR/LEXONE 75 DF[6]	Do not use	0.33 lb	0.5 lb	

Soybean

Tilled Seedbed, continued

Herbicide (See Weed Response Chart on page 25 before selecting herbicides)	Commercial product per Acre: Sandy Loam <1% OM	Silt Loam 1-2% OM	Silty-Clay Loam >2% OM	Remarks and Approximate Cost/A Broadcast
LASSO 4EC/ MICROTECH	2.5 qt	2.5 qt	2.5 qt	PRE, SURFACE MIX...To reduce injury on calcareous soil decrease Sencor/Lexone rates by 1/3. Cost: Lasso $16.07; Lasso + Sencor/ Lexone $25.83-$28.42; Partner $14.52.
or LASSO II 15G	17 lb	17 lb	17 lb	
PARTNER	3.5 lb	3.5 lb	3.5 lb	
LASSO	Do not use	2 qt	2 qt	
+ SENCOR/LEXONE DF[6]		0.5 lb	0.6 lb	
LOROX 50DF	1.3 lb	1.6 lb	2 lb	PRE...Do not use on soils with less than 0.5% OM. Cost: Lasso + Lorox $24.57-$30.89; Lorox + Frontier $22.64-$36.52; Dual + Lorox $27.62-$33.94.
with DUAL/DUAL II	1.5 pt	1.5 pt	2 pt	
or with LASSO 4EC	4 pt	4 pt	4 pt	
or FRONTIER	13-16 oz	16-20 oz	18-22 oz	
PREVIEW	6 oz	7 oz	8 oz	PPI with Treflan and Sonalan. PPI or SURFACE MIX with Prowl. PRE or SURFACE MIX with Dual, Lasso, Freedom or Frontier. Rainfall required to activate all treatments. Do not apply to soils with pH greater than 6.8 or organic matter less than 0.5%. Carryover injury may result, see label for recropping restrictions. Treflan and Sonalan may be applied to untilled residue. Cost: Canopy or Preview + Prowl or Treflan or Sonalan $16.71-$29.72; Preview + Dual or Lasso or Freedom $19.53-$31.19; or Frontier $33.76.
or CANOPY	5 oz	6 oz	7 oz	
with TREFLAN	1 pt	1.5 pt	2 pt	
or SONALAN	2 pt	2.5 pt	3 pt	
or PROWL (3.3EC)	1.8 pt	2.4 pt	2.4 pt	
or DUAL/DUAL II	1.5 pt	1.5 pt	2 pt	
or LASSO	2 qt	2 qt	2 qt	
or FREEDOM	2.7 qt	2.7 qt	3.5 qt	
or FRONTIER	13-16 oz	16-20 oz	18-22 oz	
PROWL (3.3EC)	1.8 pt	2.4 pt	3.0 pt	PPI or SURFACE MIX.. To reduce injury on calcareous soil decrease Sencor/Lexone rates by 1/3. Lexone not labeled on sandy soil. Cost: Prowl $6.70-$10.78; Prowl + Sencor $15.30-$24.57.
PROWL (3.3EC)	Do not use	2.4 pt	2.4 pt	
+ SENCOR/LEXONE DF[6]	Do not use	0.5 lb	0.6 lb	
PROWL (3.3EC)	1.8 pt	2.4 pt	2.4 pt	SPLIT SHOT, PPI and PRE — Improves broadleaf control. For best results immediately incorporate first application. On calcareous soils reduce Sencor/Lexone rates by 1/3. Lexone not labeled on sandy soil. Cost: Prowl + Sencor/Lexone + Sencor/Lexone $14.53-$27.18; Treflan/ Trifluralin + Sencor/Lexone + Sencor/Lexone $13.08-$28.01; Prowl Sencor/Lexone + Prowl + Sencor/Lexone $22.11-$36.10.
or TREFLAN/TRIFLURALIN (PPI) with	1 pt	1.5 pt	2 pt	
SENCOR/LEXONE DF[6] PPI		0.4 lb	0.5 lb	
followed by SENCOR/LEXONE DF[6] (PRE Split application)		0.2 lb	0.2 lb	
PURSUIT PLUS	2.5 pt	2.5 pt	2.5 pt	SURFACE MIX — Do not plant sorghum the following year. Do not graze or feed treated soybean forage, hay, or straw to livestock. Cost: $23.76.

Soybean

Tilled Seedbed, continued

Herbicide (See Weed Response Chart on page 25 before selecting herbicides)	Commercial product per Acre: Sandy Loam <1% OM	Silt Loam 1-2% OM	Silty-Clay Loam >2% OM	Remarks and Approximate Cost/A Broadcast
SCEPTER	0.67 pt	0.67 pt	0.67 pt	PRE or SURFACE MIX with Lasso or Dual. PPI with Prowl or Squadron 7 days, Treflan or Freedom 1 day, or Sonalan 2 days after application. Crop injury and carryover risk may increase on high pH soils or sandy, eroded soils. Carryover from over application may injure corn and sugarbeet the following year. Scepter and Squadron labeled east of Highway 81. Do not plant corn the year following a Scepter or Squadron treatment north of Highway 34 unless IR/IT corn is used. Cost: Scepter + Lasso $30.83; Scepter + Freedom $25.45; Scepter + Dual $29.90-$33.88; Scepter + Prowl or Sonalan or Treflan $23.23-$31.57; with Sencor, add $8.00.
(with or without SENCOR)	Do not use	(0.33 lb)	(0.50 lb)	
with LASSO	2 qt	2 qt	2 qt	
or DUAL/DUAL II	1.5 pt	1.5 pt	2 pt	
or PROWL (3.3EC)	1.8 pt	2.4 pt	2.4 pt	
or TREFLAN	1.0 pt	1.5 pt	2 pt	
or FREEDOM	2.5 qt	2.5 qt	2.5 qt	
or SONALAN	2 pt	2.5 pt	3 pt	
SONALAN	2 pt	2.5 pt	3 pt	PPI — Incorporate within 48 hours. To reduce injury on calcareous soil reduce Sencor/Lexone rate by 1/3. Increase Sonalan rate by 1/2-1 pt for black nightshade control. Sonalan may be applied to untilled residue. Cost: Sonalan $8.07-$ 12.11; Sonalan + Sencor/Lexone $16.63-$27.67.
SONALAN +	Do not use	2.5 pt	3 pt	
SENCOR/LEXONE DF[6]	Do not use	0.5 lb	0.6 lb	
TREFLAN	1.0 pt	1.5 pt	2.0 pt	PPI — For best results immediately incorporate. To reduce injury on calcareous soil decrease Sencor/Lexone rate by 1/3. Do not use Salute on calcareous soil. Treflan and Sonalan may be applied to untilled residue. Costs: Treflan/Trifluralin $4.14-$8.28; Treflan/Trifluralin + Sencor/Lexone/Salute $12.70-$23.85.
TREFLAN/TRIFLURALIN +	Do not use	1 5 pt	2 pt	
SENCOR/LEXONE DF[6]	Do not use	0.5 lb	0.6 lb	
SALUTE[6]	1.5 pt	2.25 pt	3.0 pt	

Soybean

Postemergence

Herbicide	Rate Per Acre	Application Time	Remarks and Approximate Cost Per Acre
ASSURE II	7-8 oz	Grasses 4" Shattercane and Corn 12-18"	COC or surfactant needed for effective control. Cost: $7.84-$8.96.
BASAGRAN +	1-2 pt	Broadleaf weeds less than 4" tall	Split applications of Basagran at 1 pt/A may improve control of several weeds. See label for and specific weed size. Cost Basagran $8.75 - $16.82; Basagran + Blazer $12.35 -$24.07; Basagran + Cobra $18.64-$32.22; Basagran + Pinnacle $16.36-$24.43; Basagran + Reflex $20.67-$29.22; Basagran + Scepter $17.96-$26.03.
28% UAN	1 qt		
BASAGRAN	1-2 pt		
with BLAZER +	0.5-1 pt		
28% UAN	1 gal		
or COBRA +	6-12.5 oz		
28% UAN +	1 gal		
SURFACTANT	2 pt/100 gal		
or REFLEX +	1 pt		
SURFACTANT	2 pt/100 gal		
or PINNACLE	0.25 oz		
or SCEPTER +	0.33 pt		
COC	1 qt		

Soybean

Postemergence, continued

Herbicide	Rate Per Acre	Application Time	Remarks and Approximate Cost Per Acre
BASAGRAN + POAST PLUS + DASH + 28% UAN	1.5-2 pt 18-24 oz 1 qt 1 gal	Use Basagran and Poast Plus guidelines	See label for rates and weed size. Cost: $18.88-$25.77.
BLAZER + 28 % UAN	1-1.5 pt 1 gal	Apply when most Broadleaf weeds are less than 4" tall	See label for rates and specific weed size. Cost: $7.90-$11.51.
CLASSIC + SURFACTANT or COC	0.5-0.75 oz 1 qt/100 gal 1 gal/100 gal	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 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 $17.68-$22.22; Classic/ Pinnacle $14.67.
CLASSIC + PINNACLE + SURFACTANT + 28% UAN	0.25 oz 0.25 oz 1 pt/100 gal 1 gal		
COBRA + SURFACTANT or COC	10-12.5 oz 1-1.5 pt/100 gal 0.5-1 pt/A	Apply when most Broadleaf weeds are 2-4" tall	Do not use during periods of stress or weed control will be poor. See label for specific weed size. Cost: $11.63-$15.29.
FUSION	6 oz	Grasses 4" Shattercane and corn 12-18"	COC or surfactant needed for effective control. Cost: $6.71.
GALAXY + 28% UAN	2 pt 1 gal	Apply when most Broadleaf weeds are less than 4" tall	See label for specific weeds. Cost: $14.91.
POAST PLUS + COC	18-24 oz 2 pt	Grasses 4" Shattercane and corn 12-18"	COC needed for effective control. Cost: $7.86-$10.13.
PURSUIT + COBRA or BLAZER or REFLEX + 28% UAN + Surfactant	4 oz 4 oz 0.5-1 pt 0.75-1 pt 1-2 qt 2 pt/100 gal	Weeds <4"	Do not plant sorghum the following year. Do not use during periods of stress or weed control will be poor. Cost: Pursuit + Blazer $23.18-$26.78 Pursuit + Cobra $23.25 Pursuit + Reflex $23.04-$24.22
PURSUIT + 28% UAN + SURFACTANT	4 oz 1-2 qt 2 pt/100 gal	Weeds 1-3" Shattercane up to 6"	Do not plant sorghum the following year. Add Select to improve control of volunteer corn. Do not graze or feed treated soybean forage, hay or straw to livestock. Cost: $23.32.

Soybean

Postemergence, continued

Herbicide	Rate Per Acre	Application Time	Remarks and Approximate Cost Per Acre
REFLEX + SURFACTANT or COC	1 pt 1 pt/100 gal 1 gal/100 gal	Apply when most Broadleaf weeds are less than 4" tall	Do not plant sorghum the following year. Do not use west of Highway 81. See label for rates and weed size. Cost: $16.86.
RELIANCE STS **(Herbicide Tolerant Crop Required)** + COC + 28% UAN	0.50 oz 1 gal/100 gal 1 gal	Apply when most broadleaf weeds are less than 6" tall	For use only on soybean varieties designated as "STS". May be tank-mixed with 4-6 oz Cobra where eastern black nightshade or common waterhemp are present. Cost: $12.00.
RESOURCE	4.0-8.0 oz	Broadleaf weeds <4"	Use 1 qt/A COC. Especially good on velvetleaf. Cost: $6.40-$12.80.
ROUNDUP **(Herbicide Tolerant Crop Required)**	1.0 qt	Weeds <12" tall	Cost: $11.54.
SELECT	6 oz	Grasses 4", Shattercane & corn up to 6"	Use COC. Cost: $9.57.

Soybean

REDUCED RATES FOR BROADLEAF WEED CONTROL
READ THIS SECTION BEFORE PROCEEDING

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

Reduced rates may have a fit for you if you are willing to learn about the system and manage accordingly. To evaluate a reduced rate program, we suggest trying it on a limited area until you are comfortable with it. **The herbicide manufacturer has no product performance responsibility for below labeled rate treatments.** Our work with reduced rates has focused on broadleaf weed management in conventional till soybean with grasses being managed with a conventional soil applied or postemergence 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 DAP and 2-3 leaf stage by 17-20 DAP. This of course can vary with conditions. Our experience is that 1/4x rates are appropriate when weeds are in the 1-2 leaf stage and 1/2x rates for weeds in the 2-3 leaf stage. After the 3-leaf stage labelled rates should be used. Cultivation is an important part of this system and should be carried out approximately 15 days after herbicide application. Delaying cultivation beyond this point allows weeds that were stunted to recover and grow. Most growers prefer to wait 5 weeks after planting to cultivate in order to 1) travel faster and 2) minimize weed establishment after cultivation.

The best opportunity for success with a single application reduced rate treatment is provided by the 1/2x rate applied at 17-20 DAP. This program followed by cultivation has provided weed control comparable to standard treatments. Utilizing the 1/4x rate 10-12 DAP has required a second treatment 20-24 DAP 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 postemergence treatments with application rates adjusted accordingly. The risk of adverse weather can be readily managed utilizing the reduced rate early application program. If circumstances prevent a planned early application, simply revert to a standard application.

Herbicide	Rate Per Acre	Application Time	Remarks and Approximate Cost Per Acre
GALAXY + 28% UAN	0.5 pt 1 gal	1-2 leaf weeds. 10-12 DAP	Repeat treatment 20-24 DAP usually required. Cultivate 35 DAP. Cost: $4.20.
GALAXY + 28% UAN	1 pt 1 gal	2-3 leaf weeds. 17-20 DAP	Cultivate 35 DAP. Cost: $7.70.
CONCERT + SURFACTANT + 28% UAN	1/8 oz 1 pt/100 gal 1 gal	1-2 leaf weeds. 10-12 DAP	Repeat treatment 20-24 DAP usually required. Cultivate 35 DAP. Cost: $4.20.
CONCERT + SURFACTANT + 28% UAN	0.25 oz 1 pt/100 gal 1 gal	2-3 leaf weeds. 17-20 DAP	Cultivate 35 DAP. Cost: $7.20.
PURSUIT + 28% UAN + SURFACTANT	1 oz 2 qt 2 pt/100 gal	1-2 leaf weeds. 10-12 DAP	Repeat treatment 20-24 DAP usually required. Cultivate 35 DAP. Cost: $4.45.
PURSUIT + 28% UAN + SURFACTANT	2 oz 2 qt 2 pt/100 gal	2-3 leaf weeds. 17-20 DAP	Cultivate 35 DAP. Cost: $8.40.

Harvest Aid

GRAMOXONE EXTRA	12.8 oz	When 65% of pods are brown	Desiccant. Follow label directions on water volume and X-77 additive. Be careful of drift. Do not graze for 15 days. Cost: $3.07.
ROUNDUP	1 qt	Pods no longer green	Apply 1 qt by air; no more than 6 qt per season. Allow 7 days interval from application to harvest. Do not graze for 25 days. Cost: $11.55.

Bean Bar/Wiper Applications

Crop	Applicator	Herbicide and Ratio-(product:water)	Remarks*
Soybean and Sorghum	1. Ropewicks	ROUNDUP 1:2 (33.3% 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 nozzles	ROUNDUP 1:19 (5% 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 nozzle	BASAGRAN 1:100 (1% concentration)	Complete coverage essential. Add I gal nitrogen fertilizer to each 25 gal spray. Add Poast and COC for shattercane and volunteer corn.
		CLASSIC + PINNACLE 0.5 oz + 0.5 oz per 25 gal water	Add 1 qt COC + 1 gal 28-0-0 per 25 gal.
		POAST, FUSILADE or ASSURE 1:100 (1% concentration)	Add 1 qt crop oil conc. or 1/2 pt adjuvant per 25 gal mix. Pre-harvest, intervals: Poast, 90 days; Fusilade, pre-bloom; Assure, 80 days. Fusion, Prebloom, Select, 50 days.
		SELECT 1:100 (0.25% concentration)	
		FUSION 1:160 (0.62% concentration)	

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

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

[a]Crop ratings of 3 or less result in no yield loss; the addition of liquid N may considerably reduce crop safety.
[b]Values will vary with soil texture, pH, organic matter, rainfall or irrigation, rotational crop and herbicide rate.

Preplant and Preemergence Herbicides for Winter Annual Grasses in Winter Wheat

(See Downy Brome in Troublesome Weeds Section for more information.)

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

BARLEY AND SPRING WHEAT

Herbicide	Rate Per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
ALLY or AMBER or FINESSE + 2,4-D LV ESTER (4L)	0.10 oz 0.28 oz 0.2-0.3 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 Amber + 2,4-D and Ally + 2,4-D, add surfactant 1 pt/100 gallons of spray solution. Cost: Ally + 2,4-D $2.55-$2.97; Amber + 2,4-D $2.60-$3.02; Curtail $8.48; Finesse + 2,4-D $2.67-$4.21.
CURTAIL	2 pt		
2,4-D AMINE (4L) or 2,4-D LV ESTER (4L)	1-1.5 pt 0.5-0.75 pt		

Harvest Aid

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

OAT

MCPA	0.5-1 pt	Weeds and oat in 3-4 leaf stage	Cost: Buctril alone $6.56-$9.83; MCPA $0.86-$1.73; Buctril + 2,4-D or MCPA $7.23-$10.50.
BUCTRIL alone or with 2,4-D AMINE (4L) or MCPA	1.0-1.5 pt 0.5 pt		
CURTAIL M	1.75-2.3 pt	Oat 3-leaf to joint, weeds <3"	Cost: $7.42-$9.95.
2,4-D AMINE (4L)	1-2 pt	Dough stage	Some injury from 2,4-D may be expected at any stage. Cost: $1.34-$2.68.

Harvest Aid

Herbicide	Rate Per Acre3	Application Time	Remarks and Approximate Cost/A Broadcast
2,4-D AMINE (4L)	1-2 pt	Dough stage	Some injury from 2,4-D may be expected at any stage. Cost: $1.34-$2.68.
2,4-D LV ESTER (4L)	1 qt	Hard dough 7 or more days before harvest	Helps desiccate large broadleaf weeds. Only certain brands labeled for use. Cost: $3.38.

WINTER WHEAT

Herbicide	Rate Per Acre[3]	Application Time	Remarks and Approximate Cost/A Broadcast
AMBER or ALLY or FINESSE	0.28-0.35 oz 0.10 oz 0.2-0.4 oz	In fall after 2 leaf stage	Effective control on mustards and pennycress. Add surfactant. Cost: Amber $2.18-$2.73; Ally $2.13; Finesse $2.25-$4.50.
AMBER or ALLY or FINESSE + 2,4-D ESTER (4L) or BANVEL	0.28-0.56 oz 0.10 oz 0.2-0.3 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 in small grain rotation. Amber must be tank-mixed with appropriate herbicides having a different mode of action if the sulfonylurea resistant weeds are suspect. Add surfactant at 1-2 qt/100 gal. Cost: Ally + 2,4-D $2.55-$2.97; Ally + Banvel $3.29-$3.87; Amber + 2,4-D $2.60-$5.21; Amber + Banvel $3.34-$6.11; Finesse + 2,4-D $2.67-4.21; Finesse + Banvel $3.41-$5.11.
2,4-D AMINE (4L) or 2,4-D LV ESTER (4L)	1-1.5 pt 0.5-0.75 pt	Early spring, from 4 tillers to joint stage	Do not spray winter wheat until well tillered. Spray broadleaf weeds as soon as good growing conditions occur. Cost: $0.84-$2.01.
BUCTRIL 2EC + 2,4-D AMINE (4L)	1-1.5 pt 0.5 pt	Wheat from 4 tillers to before canopy covers weeds	Most broadleaf weeds should be in 2-4 leaf stage or mustards in early rosette stage. Cost: $6.82-$10.42.
BANVEL + 2,4-D AMINE (4L)	2-4 oz 0.5-0.75 pt	Spring, 4 tillers to joint stage	Controls most troublesome broadleaf weeds. Cost: $2.50-$4.33. Do not apply with fertilizer solutions.
CURTAIL	2.0 pt	Before boot stage	Use Curtail only in small grain rotations. Cost: Curtail $8.48.
2,4-D LV ESTER (4L) + TORDON 22K	0.5-0.75 pt 1-1.5 oz	Spring 4 tillers to before joint stage	Use only on land to be planted the following year to grass, barley, wheat, oat or fallowed. Cost: $1.55-$2.33.
HARMONY EXTRA + 2,4-D LV ESTER (4L)	0.3-0.46 oz 0.25-0.5 pt	Wheat 2 leaf to joint stage; weeds less than 4" tall	Add a nonionic surfactant at 2 pt/100 gallons. Any crop can be planted 60 days after application. Cost: $4.17.-$6.59

Harvest Aid

ALLY + 2,4-D AMINE (4L)	0.1 oz 0.25-0.50 pt	After dough stage.	Preharvest interval of 10 days. Add surfactant at 1 qt/100 gallons of spray solution. Cost: $2.55-$2.97.
2,4-D LV ESTER (4L)	1 qt	Hard dough 7 or more days before harvest	Rescue treatment for control of late broadleaf weeds. To reduce breakage with 2,4-D and Landmaster BW all green color should be gone from joints. Only certain brands of 2,4-D labeled for this use. For Roundup RT and Roundup RT + 2,4-D add 0.5% nonionic surfactant. Cost: 2,4-D $3.38; Landmaster BW $8.08; Roundup RT $7.65-$8.75; Roundup RT + 2,4-D $6.06-$12.15.
ROUNDUP RT	28-32 oz		
ROUNDUP RT + 2,4-D LV ESTER (4L)	1.0-2.0 pt 1.0-2.0 pt		
LANDMASTER BW	54 oz		

PROSO MILLET

Herbicide	Rate Per Acre[3]	Application Time	Remarks and Approximate Cost/A Broadcast
2,4-D AMINE (4L) Formula 40 only	0.5-1.0 pt	Proso in 2-5 leaf stage	Broadleaf weeds should be small. Observe all Banvel precautions when susceptible crops are within 1/2 mile of application site. Cost: 2,4-D amine $0.67-$1.34; 2,4-D + Banvel $3.34.
2,4-D AMINE (4L) + BANVEL (NE Label)	0.75 pt 0.25 pt		

SUNFLOWER (See Ecofarming for No-Till Sunflower Recommendations)

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

Postemergence

POAST + DASH + 28% UAN	1 pt 1 qt + 1 gal	Good coverage essential. Shattercane and corn 12-18"; other annual grasses less than 4". Cost: $13.38-$16.46.

Harvest Aid

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

Ecofarming

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

Volunteer winter wheat and/or downy brome or jointed goatgrass are not usually controlled with July and early August atrazine treatments. A split after harvest treatment with the early application atrazine rate reduced so 1 lb/A of atrazine can be applied in September can be an effective control measure. If maximum rates of atrazine have been applied the previous fall do not add additional atrazine in the spring. Lower rates of atrazine (or none at all) need to be used on eroded areas, on soils with less than 1.2% O.M., on soils with a pH of 7.0 or greater, some terraces, Canyon and Rosebud soils, and caliche outcroppings. High atrazine rates may carryover and destroy wheat on these areas. Total atrazine applied last year after wheat harvest plus this year's treatment should not exceed 3.75 lb 80W or 3 qt 4L/A for land to be planted to corn or sorghum. To receive the maximum benefits from ecofarming which includes moisture conservation and preventing weed seed production, treatments applied soon after harvest are usually the most successful. This is on the condition the weeds are not under drought stress and the straw has settled. At that time the weeds are smaller and easier to control with the nonselective translocating herbicide (Roundup, Roundup RT and Landmaster BW. The non-selective, non-translocating herbicides (Cyclone CF, Gramoxone Extra) are usually more effective in controlling small weeds and as they approach maturity.

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

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

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

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

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

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

The spring herbicide treatment is necessary. Again, check the rates, etc. for the crop in the ecofarming section. Check labels and be sure to control volunteer crops. Also, do not disturb the herbicide treatment if a residue herbicide was applied last fall. Read all the general remarks under ecofarming and see footnotes on page 64.

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

Weed Response to Herbicides Applied After Winter Wheat Harvest

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

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

Herbicides[a]	Broadleaf Weeds												Summer Annual Grasses							Winter Annual Grasses		
	Buckwheat, Wild	Buffalobur	Horseweed	Knotweed, Tall	Kochia	Lambsquarters	Lettuce, P	Pigweed	Smartweed, P.	Spurge, Tooth	Sunflower	Thistle, R.	Barnyardgrass	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		
Cyclone CF	10	10	10	10	10	10	10	10	5	10	10	9	4	7	4	5	5	8	8	10	10	10
Cyclone CF + atrazine	10	10	10	10	10	10	10	10	10	10	10	10	9	10	9	9	10	10	10	10	10	10
Landmaster BW	10	10	10	10	8	10	8	10	10	9	10	10	10	10	10	10	10	10	10	10	10	10
Landmaster BW + atrazine	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Roundup	7	10	8	8	7	9	6	10	10	5	10	8	10	10	10	10	10	10	10	10	10	10
Roundup + atrazine	10	10	10	10	8	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	12 inches tall												Tillered to boot							Tillered to boot		
Cyclone CF	9	7	7	7	7	7	7	7	4	7	7	7	3	4	4	3	3	5	4	6	6	6
Cyclone CF + atrazine + 2,4-D[b]	9	10	10	10	10	10	10	10	8	10	10	10	3	4	4	3	3	7	6	9	9	9
Landmaster BW	8	10	8	9	8	10	8	8	10	7	10	8	8	10	8	8	10	10	8	10	10	10
Landmaster BW + atrazine	10	10	10	10	8	10	8	10	10	8	10	9	5	10	7	8	10	10	8	10	10	10
Roundup	5	9	6	8	5	8	5	8	9	3	10	7	8	10	8	8	10	10	8	10	10	10
Roundup + atrazine + 2,4-D	10	10	10	10	8	10	8	10	10	8	10	10	5	10	9	8	10	10	8	10	10	10
	24 inches tall												Headed							Headed (in spring)		
Cyclone CF	8	8	9	7	8	8	8	8	4	6	7	7	6	7	8	7	4	8	8	9	9	9
Cyclone CF + atrazine + 2,4-D[b]	10	10	10	8	10	9	10	10	7	9	10	10	8	10	10	10	6	10	10	10	10	10
Landmaster BW	6	8	8	7	5	7	8	8	8	5	7	8	8	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	10	9	9	10	10	8	10	10	10
Roundup	3	7	6	6	4	5	3	6	7	2	7	7	8	10	8	10	10	10	8	10	10	10
Roundup + atrazine + 2,4-D	10	10	8	8	7	9	10	10	9	6	10	8	7	10	9	9	10	10	8	10	10	10

[a]Rate is 1.5 pt/A for Cyclone CF, 54 oz/A for Landmaster BW, and 16 oz/A for Roundup. Atrazine rate is 2.0 qt/A. Consult label to improve weed control with some herbicides. Example, tillered barnyardgrass needs 84 oz/A of Landmaster BW.
[b]Add 2,4-D ester (4L) at 1.5 pt/A.

Ecofarming

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

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

Ecofarming

Herbicide	Commercial product per Acre: Sandy Loam <1% OM	Silty Loam 1-2% OM	Silty-Clay Loam >2% OM	Application Time	Remarks and Approximate Cost/A Broadcast
Winter Wheat Stubble to be Seeded 12-14 Months Lates (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 + Cyclone CF to improve control broadleaf weeds may decrease control of grasses. Roundup RT + 2,4-D may be substituted for Landmaster BW. Cost: AAtrex + Cyclone CF $8.15-$11.37; Bladex + Atrazine + Cyclone CF + 2,4-D $14.00-$15.63; AAtrex + Landmaster BW $9.64-$16.02.
+					
CYCLONE CF[1]	1.5-2 pt	1.5-2 pt	1.5-2 pt		
ATRAZINE 4L	1 pt	1.5 pt	1.5 pt		
+					
CYCLONE CF[1]	1.5-2 pt	1.5-2 pt	1.5-2 pt		
+					
2,4-D LV ESTER (4L)	1 pt	1 pt	1 pt		
AATREX 4L	1 pt	2 pt	2 pt		
+					
LANDMASTER BW[1]	54-86 oz	54-86 oz	54-86 oz		
LANDMASTER BW[1]	54 oz	54 oz	54 oz	Apply Landmaster BW at harvest. Apply atrazine between Aug. 20 - Sept. 10	Good for weeds that are present early. Use Cyclone CF or Roundup RT with AAtrex on weeds present in late August to early September. Cost $9.66-$11.23.
followed by					
AATREX	1-2 pt	2 pt	2 pt		
Winter Wheat Stubble to be Seeded to Winter Wheat 4-5 Months Later (Fallow Aid)					
ROUNDUP				Apr. or before boot stage of grass, weeds	Roundup $4.33-$5.77; Roundup RT $3.28-$4.38; Landmaster BW $5.98-$8.08; Fallow Master $5.70-$7.84.
or					
ROUNDUP RT[1]	12-16 oz	12-16 oz	12-16 oz		
LANDMASTER BW[1]	40-54 oz	40-54 oz	40-54 oz		
FALLOW MASTER	32-44 oz	32-44 oz	32-44 oz		
TORDON	1.5 oz	1.5 oz	1.5 oz		Help control Wild Buckwheat. Cost: Tordon + 2,4-D $3.08.
+					
2,4-D	0.75 pt	0.75 pt	0.75 pt		
Winter Wheat Stubble to be Planted to Corn or Sorghum the Next Spring "Check Remarks Under Ecofarming"					
Herbicides to use after winter wheat harvest.					
CYCLONE CF[1]	1.5-2 pt	1.5-2 pt	1.5-2 pt	July-Aug. or Sept.-Oct.	Spray after wheat harvest and before weeds produce seed. If grasses such as barnyardgrass recover, kill weeds before they develop seed. Use 1-1.2 qt Atrazine in Panhandle. Volunteer wheat and downy brome control better with late Aug.-Oct. applications. Minimum rates for Landmaster BW with Atrazine are: 54 oz/A + 2 lb/A or less atrazine 64 oz/A + 3 lb/A or less atrazine Barnyardgrass control requires 86 oz/A of Landmaster BW. Cost: Atrazine + Cyclone CF $11.21-$16.00; AAtrex + Landmaster BW $14.39-$19.04.
+					
AATREX/ATRAZINE 4L	2 qt or 1.5 qt	2.25 qt or 2 qt	2.5 qt or 2.25 qt		
LANDMASTER BW[1]	54-64 oz	54-64 oz	54-64 oz	July-Aug. or Sept.-Oct.	
+					
AATREX/ATRAZINE 4L	2 qt or 1.5 qt	2.5 qt or 2.0 qt	3 qt or 2.5 qt		

Ecofarming

Herbicide	Commercial product per Acre: Sandy Loam <1% OM	Silty Loam 1-2% OM	Silty-Clay Loam >2% OM	Application Time	Remarks and Approximate Cost/A Broadcast
Herbicides to be used after winter wheat harvest.					
Winter Wheat Stubble to be Planted to Soybean or Sunflower the Following Spring (Consider Soybean in Areas With Over 20" Rainfall)					
LANDMASTER BW[1]	54-86 oz	54-86 oz	54-86 oz	2 applications	Volunteer wheat may emerge in fall or spring. Control with Roundup. See spring treatments for soybean, page 26 or sunflower on page 38. Cost: Landmaster BW $8.08-$12.87; Roundup $5.77-$11.55; Roundup RT $4.38-$8.75.
or					
ROUNDUP or ROUNDUP RT	16-32 oz	16-32 oz	16-32 oz		
Corn to be Planted In Winter Wheat Stubble Treated with AAtrex/atrazine After Harvest[4] Herbicides to be used for ecofallow corn in the spring.					
If volunteer wheat and/or downy brome were not controlled in the fall, spray in April or control earlier with Roundup, Roundup RT, or Landmaster BW. Low rates (less than 2 lb active) of atrazine and/or Bladex usually do not give satisfactory volunteer wheat and downy brome control when applied in July or early August of the previous summer. If triazine resistant kochia is a problem see Troublesome Weeds and Woody Plants, page 59.					
BLADEX 4L	1.75 qt	2 qt	2.5 qt	15-30 days preplant	Do not use on sands and loamy sands with less than 1% OM. Cost: Bladex $11.97-$14.96; Bladex + Atrazine $9.85-$13.63; Bladex + Dual $14.93-$23.89; Extrazine $25.28-$72.24.
BLADEX 4L	1.25 qt	1.5 qt	1.75 qt	0-15 days preplant	
+					
AATREX/ATRAZINE 4L	0.75 qt	1 qt	1 qt		
EXTRAZINE II	1.4 lb	2.2-31. lb	3.6-4.0 lb		
BLADEX 4L	1.5 qt	1.75 qt	2 qt		
+					
DUAL/DUAL II	0.75 qt	1 qt	1 qt		
DUAL/DUAL II	2 pt	2.5 pt	3 pt		If annual grasses produced seed in the wheat stubble or if areas of field have history of high grass population use higher rates of Dual or Micro-Tech. Cost: Bicep $14.63-$19.51; Bullet $18.55-$19.79; Dual $11.93-$17.95; Dual + AAtrex $14.30-$21.11; Micro-Tech + AAtrex $15.40-$19.45; Micro-Tech + Bladex $20.52-$34.25.
BICEP II/BICEP LITE II	1.8 qt	2.4 qt	2.4 qt	0-20 days preplant	
DUAL/DUAL II	1.5 pt	2 pt	2 pt		
+					
AATREX 4L	0.75 qt	1 qt	1 qt		
BULLET	3.75 qt	4 qt	4 qt		
MICRO-TECH	2.0 qt	2.5 qt	2.5 qt		
+					
AATREX 4L	0.75 qt	1 qt	1 qt		
or					
BLADEX 4L	1.25 qt	1.5 qt	2 qt		
EXTRAZINE II	1.4 lb	2.2-3.1 lb	3.6-4.0 lb	0-15 days preplant; for 16-30 days preplant increase rates 20%	If annual grasses produced seed in the wheat stubble or if areas of field have history or high grass population use higher rates. Cost: Extrazine $25.28-$72.24; Frontier + atrazine $15.86-$22.05; Guardsman $13.86-$20.79; Harness + atrazine TBA; Surpass + atrazine $13.04-$24.51; Surpass + Bladex $15.16-$33.32; Surpass 100 $13.50-$27.50.
FRONTIER	1.0 pt	1.0-1.25 pt	1.25-1.4 pt		
or					
SURPASS	1.5-2.0 pt	2.0-2.5 pt	2.0-3.0 pt		
or					
HARNESS	1.5-2.0 pt	2.0-2.5 pt	2.0-3.0 pt		
+					
ATRAZINE	0.75 qt	1.0 qt	1.0 qt		
or					
BLADEX	0.75 qt	1.5 qt	2.0 qt		
SURPASS 100	1.6-2.2 qt	2.2-2.6 qt	2.6-3.3 qt		
GUARDSMAN	3.0 pt	3.0-4.0 pt	4.0-4.5 pt		

Ecofarming

Herbicide	Commercial product per Acre: Sandy Loam <1% OM	Silty Loam 1-2% OM	Silty-Clay Loam >2% OM	Application Time	Remarks and Approximate Cost/A Broadcast
Winter Wheat to be Planted in Fall (Fallow Aid)					
Herbicides to be used in spring on corn or sorghum stubble when followed with winter wheat.					
ROUNDUP or ROUNDUP RT	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 for control of downy brome before heading. Do not plant wheat for 20 days. Follow-up weed control may be necessary if one wants to go to No-Till. Cost: Landmaster BW $5.98-$8.08; Roundup $4.33-$5.77; Roundup RT $3.83-$5.11; Amber + Roundup $8.86-$11.95; Glean + Roundup $11.79.
LANDMASTER BW	40-54 oz	40-54 oz	40-54 oz		
AMBER + ROUNDUP OR ROUNDUP RT	0.28-.056 oz 1 pt	0.28-.056 oz 1 pt	0.28-.056 oz 1 pt	Before May 1	
GLEAN + ROUNDUP OR ROUNDUP RT	0.33 oz 1 pt	0.33 oz 1 pt	0.33 oz 1 pt		
Soybean to be Planted into Winter Wheat Stubble Treated With Landmaster BW, Roundup or Roundup RT After Harvest (For Areas With Over 20" Rainfall and Fields With Low Weed Density)					
PURSUIT* + DUAL/DUAL II	4 oz 2 pt	4 oz 2.5 pt	4 oz 3 pt	0-30 days preplant	Add 1-1.5 pt/A of Roundup[1] or Roundup RT[1] if there are emerged weeds. Control weeds when they are small to conserve moisture and improve performance. Check fields within 30 days after planting to determine if postemergence herbicides are needed. Cost without Roundup or Roundup RT: With Dual $34.49-$42.44; With Micro-Tech $31.63-$38.15; With Prowl $27.51-$31.98; Pursuit Plus $23.76.
or MICRO-TECH	2 qt	2.5 qt	3 qt		
or PROWL (3.3EC)	2.4 pt	3 pt	3.6 pt		
PURSUIT PLUS	2.5 pt	2.5 pt	2.5 pt		
Sunflower to be Planted into Winter Wheat Stubble Treated With Landmaster BW, Roundup or Roundup RT After Harvest (Both Treatments Required)					
LANDMASTER BW[1] + PROWL (3.3EC)	40 oz 2.0 pt	40 oz 2.0 pt	40 oz 2.0 pt	Before May 1 and a minimum of 30 days prior to planting to control volunteer wheat and downy brome	Cost: Landmaster BW + Prowl $13.42; Roundup + Prowl $7.25-$11.72.
followed by ROUNDUP1 + PROWL (3.3EC)	16 oz 0.4 pt	16 oz 1.0 pt	16 oz 1.6 pt		

*See rotational crop restrictions on the Pursuit label

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

If volunteer wheat and/or downy brome were not controlled in the fall, spray in April or control earlier with Roundup, Roundup RT, or Landmaster BW. Low rates (less than 2 lb active) of atrazine and/or Bladex usually do not give satisfactory volunteer wheat and downy brome control when applied in July or early August of previous summer. If triazine resistant kochia is a problem see Troublesome Weeds and Woody Plants, page 59.

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

*21 days or more preplant when used on sandy soil.

Weed Response to Selected Alfalfa Herbicides

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

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

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

Alfalfa

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

Area or Use	Herbicide	Commercial Product per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
	To Control Alfalfa, see Troublesome Weeds and Woody Plants, Page 49.			
ALFALFA (Establishing new stands)	BALAN EPTAM TREFLAN (set-aside only)	3.0-4.0 qt 2.5-3.5 pt 1.0-1.5 pt	Preplant	Apply to dry surface soil and immediately incorporate by cross tandem disking or equivalent soil mixing. Use lower rate on sandy soil. Early legume injury may occur. Controls primarily annual grasses. Cost: Balan $12.00-$16.00; Eptam $8.55-$11.97; Treflan $4.13-$6.21
	BUCTRIL	1.0-1.5 pt	Weeds less than 2" tall. Alfalfa at least 2 trifoliate leaves	Apply when the majority of alfalfa has 4 trifoliate leaves. Temperatures above 80°F following Buctril application may result in crop injury. Do not cut spring treated alfalfa for feed within 30 days following treatment. Cost: $6.56-$9.83.
	POAST PLUS	1.0-2.0 pt	Grasses 4" or less	Good coverage necessary. Use higher rate for sandbur, volunteer cereals, or winter annual grasses. Poast will not control over-wintered downy brome. Add COC to spray solution. Do not graze or cut for forage for 7 days or 14 days before cutting for dry hay following a Poast Plus combination. Cost: $11.93-$23.88.
ALFALFA (Seedling or established)	BUTYRAC 200, BUTOXONE, or BUTYRAC 200	1.0-3.0 qt	Postemergence. Weeds less than 3" tall; alfalfa 2-4 trifoliate leaves	DO NOT use treated forage for 60 days after treatment on new stands and 30 days on established stands. Use when temperature is above 50°F. Cost: $8.92-$26.78.

Alfalfa

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

Area or Use	Herbicide	Commercial Product per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
ALFALFA	KERB 50W	1.0-1.5 lb	Pre or post to winter annual grasses Oct.-Mar.	Controls downy brome and volunteer cereals. Do not graze or harvest for forage within 25 days following application. Cost: $26.75-$40.13.
Seedling or established for one year	PURSUIT	3-6 oz	Seedling alfalfa 2nd trifoliate stage. Established alfalfa apply before new growth reaches 3" tall	Do not feed, graze, or harvest alfalfa for 30 days following treatment. Pursuit requires the addition of an adjuvant. Cost: $13.95-$27.90.
ALFALFA	GRAMOXONE EXTRA	1.5-2.0 pt	Dormant alfalfa	Do not cut or harvest within 60 days of application. Primarily for winter annual weeds such as pennycress and other mustards. Sinbar, Velpar, and Lexone/Sencor also control downy brome. Do not use on sand; use lowest rates on soils with less than 1% organic matter. Spring application of Karmex controls annual warm season grasses such as foxtail and barnyardgrass. Cost: Karmex $6.45-$13.00; Sinbar $11.25-$22.50; Lexone Sencor $13.04-$26.08; Gramoxone Extra $5.77-$11.54.
	KARMEX 80W	1.5-3.0 lb	Late fall to early spring to dormant alfalfa	
(Established one year or more. For dodder control see Troublesome Weeds Section)	LEXONE/SENCOR DF SINBAR 80W	0.5-1.0 lb 0.5-1.0 lb		
	VELPAR L	1.0-1.5 qt	Late fall to early spring to dormant alfalfa	The 1 qt/acre rate of Velpar is for low O.M. soils for downy brome control. Cost: $14.75-$22.15.

Pastures and Ranges

(See pages 55-64 for specific weed)

Area or Use	Herbicide	Commercial Product per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
	See NebGuide G88-871, *Chemical Control of Rangeland Weeds* for more information.			
CRP ONLY (established grasses)	AATREX DF	0.6-1.1 lb	PRE, fall or early spring	Use on bluegrama, Indian grass, little bluestem, sand lovegrass, sideoats grama, western wheatgrass. Cost: $1.80-$3.32.
	AATREX DF[2]	1.1-2.2 lb	PRE, fall or early spring	Use on big bluestem and switchgrass. Cost: 3.34-$6.64.
GRASS SEEDLINGS (Cool and warm season grasses)	2,4-D LV Ester (4L)	1.0 pt	Grass 5-leaf stage or beyond	For broadleaf weeds. After grasses are well established, increase rate to 1 qt. Cost: $1.69-$3.38.
WARM SEASON GRASSES (grown for seed production)	AATREX DF[2]	1.0-2.0 lb	Before weeds and crop emerge.	Established grasses. Cost: AAtrex $3.04-$6.08; Bicep $8.00-$12.00.
	BICEP	1.0-1.5 qt		
SOD SEEDING (Legumes into grass)	GRAMOXONE EXTRA	1.5-3.0 pt	Before or immediately after legume seeding	Suppresses established sod. Seed legumes with a sod seeder. If grass is less than 3" use lower rate. During year of establishment, graze intensively for short periods only. Add X-77 surfactant. Cost: $5.76-$11.53.
SOD SEEDING (Native grass planted no-till)	ROUNDUP	1 pt in 10 gal or less water/A	Aug., the season prior to seeding	Suppresses established sod. Seed grasses with a sod seeder. Do not graze seeded area until dormancy after second growing season. Apply in no more than 10 gallons water per acre and add 2 qt X-77 and 17 lb ammonium sulfate per 100 gallons. Cost: $5.77-$23.10.
	ROUNDUP	1.0-2.0 qt	Spring, on cool season grasses	

Pastures and Ranges

(See pages 55-64 for specific weed)

Area or Use	Herbicide	Commercial Product per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
	See NebGuide G88-871, *Chemical Control of Rangeland Weeds* for more information.			
ANNUAL OR BIENNIAL BROADLEAF WEEDS IN PASTURES AND RANGES (For specific weeds see page 55-64.)	2,4-D LV Ester (4L)	1.0 qt	Rosette stage in fall or when weeds are small in spring	Withhold milk cows from grazing treated areas for 7 days. With Banvel mixture do not harvest hay for dairy animals within 37 days. Do not use Banvel within 1/2 mile of sensitive crops. Combination controls greater variety of weed species. Cost: 2,4-D $3.37; 2,4-D + Banvel $8.02; Ally $5.69-8.54; Amber $3.08-$6.17; Curtail $8.48-6.50; Escort $7.00-$14.00; Grazon $3.25-$6.50; Tordon 22K $11.49-$25.74.
	2,4-D LV Ester (4L) + BANVEL	1.0 qt 0.5 pt		
	ALLY	0.2-0.3 oz		
	AMBER	0.28-0.56 oz		
	CURTAIL	2 pt		
	ESCORT	0.2-0.4 oz		
	GRAZON	1.0-2.0 pt		
	TORDON 22K	0.5-1.0 pt		
PERENNIAL BROADLEAF WEEDS IN PASTURE AND RANGES Includes: vervains, broom snakeweed, western ironweed, woolly loco, flodman thistle and wavy leaf thistle. For other weeds see pages 55-64.)	2,4-D LV Ester (4L)	1.5 qt	At bud stage of predominant weed. Oct. or Apr., for dandelion and musk thistle	Annual treatment for 2-3 years may be necessary for 7 days. Withhold milk cows from grazing. With Banvel mixture do not harvest hay for dairy animals for 37 days. Do not use Banvel within 1/2 mile of sensitive crops. Cost: 2,4-D $5.06; 2,4-D + Banvel $12.67; Curtail $8.48-$16.96; Grazon $3.25-$6.50.
	2,4-D LV Ester (4L) + BANVEL	1.0 qt 1.0 pt		
	CURTAIL	2.0-4.0 pt		
	GRAZON	1.0-2.0 pt		
WINTER ANNUAL GRASS CONTROL is established warm season grass	ROUNDUP	1.0 pt	Late winter prior to forage grass growth	Controls downy brome. Not on seed production fields. Do not harvest or graze for 8 weeks. Cost: $5.77.

Grazing Restrictions for Pasture Herbicides

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

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

[B]Restrictions based on the degree of new seedling establishment before grazing. Suggested at least 6 inches of grass or legume seedling growth which is approximately one month. Late fall seeding may require 3 to 5 months before the suggested 6-inch height is reached.

[C]Remove 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. Use only west of Mississippi River. Do not exceed 1 qt/A broadcast. If > 1 qt/A; only spot treatments are allowed; total acres cannot exceed 25% of landowner's areas in any particular watershed.

[D]Be sure to check individual product labels for restrictions and use rates due to the large number of formulations available.

[E]One year if more than 1.5 gal/A rate used.

[F]If no more than 20 lb per acre used.

[G]Withdrawal not needed if 2 weeks or more time elapsed since application.

CRP Acres Establishment

PREPLANT OR PREEMERGENCE

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

Herbicide	Commercial[3] product/A	Application time	Remarks and approximate Cost/A
AATREX 90 DF (NEB. STATE LABEL)	2.2 lb	PPI or PRE	Use only on loam or finer textured soils containing 1% or more organic matter. For use on big bluestem, eastern gamagrass and switchgrass. Cost: $6.64.
ROUNDUP	1 pt	Before or at grass seeding	Will control most emerged seedling grass and broadleaf weeds. Apply Roundup 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 performance. Cost: Roundup $5.77.
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		
PROWL (3.3EC)	1.2-2.4 pt	PPI or PRE	For use on legumes only. Incorporate immediately for best results. Cost: Prowl $4.46-$8.93; Treflan $4.13-$6.21.
TREFLAN	1-1.5 pt	PPI	

POSTEMERGENCE

For established grass, see Pastures and Ranges, page 45.
For specific weeds, see Troublesome Weeds and Woody Plants, page 55-64.

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

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

Non-Crop Acres

Area or Use	Herbicide[5]	Commercial Product[7,8]	Application Time	Remarks and Approximate Cost/A Broadcast
ROADSIDES (Broadleaf weed control)	2,4-D	1 qt/A	Broadleaf weeds 2-6"	Repeat treatments may be necessary. Do not use near susceptible plants/trees. Cost: 2,4-D $3.37; 2,4-D + Banvel $12.67.
	2,4-D + BANVEL	1 qt/A 1 pt/A		
	TELAR	0.25-0.5 oz/A	Weeds 0-2"	Use with surfactant 1 qt/100 gal. Cost: $3.00-$6.00.
GRASS SUPPRESSION	OUST	1 oz/A	Grass 6-12"	Do not apply to bare soil. May move if soil moves. Suppresses height and heading of bromegrass and other cool season grasses. Do not use year after year in order to avoid development of resistant weeds. Trace amounts can harm crops and gardens. Imperative that label directions are read and followed. Cost: $8.00-$16.00.
IRRIGATION DITCHBANKS	KARMEX 80W	5-10 lb/A	Soon after ditches are open. Treat before weeds appear or soon after	Use enough water to insure good coverage. Use 50 mesh or coarser screens. May injure nearby trees and shrubs. Cost: Karmex $21.50-$43.00.
	2,4-D LV Ester (4L)	1 qt/A	Broadleaf weeds 2-6"	Cost: $3.37.
	RODEO + X-77	4 qt in 10 gal or less water/A	Postemergence 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 in some areas. Consult label for specific instructions on problem weeds and conditions. Do not use near root zones of trees or other desirable plants. Do not use on land subject to erosion unless erosion is controlled. Cost/1000 sq ft: Hyvar $4.74; Krovar $4.60; Karmex $1.25-$2.45; Princep $.55-$1.05; Spike $6.00-$12.00; Arsenal $0.55-$1.05.
	HYVAR 80W or HYVAR X-L	0.5 lb/1000 sq ft 0.75 pt/1000 sq ft		
	KROVAR I 80W	0.5 lb/1000 sq ft		
	KARMEX 80W	0.25-0.5 pt/1000 sq ft		
	SPIKE 80W or SPIKE 5G	0.12-0.25 lb/1000 sq ft 2-4 lb/1000 sq ft		
PERENNIAL GRASSES (including bromegrass and quack grass)	ROUNDUP	2 qt/A in 10 gal or less water/A	Full foliage	Nonselective. Perennial grasses should have good top growth. Kills all annuals. Cost: Roundup $23.09.

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 rates of application. Ratings may vary from season to season and geographical areas within the state. Ratings apply when herbicides are used at rates suggested.

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

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

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

Potato and Fieldbean

Herbicide	Commercial product per Acre: Sandy Loam < 1% OM	Silt Loam 1-2% OM	Silty-Clay Loam > 2% OM	Application Time, Remarks and Approximate Cost/A Broadcast
Potato				
EPTAM 7E	3.5 pt	3.5 pt	43.5 pt	PPI, DRAG-OFF, or LAYBY — Apply and incorporate before planting or after potato plants have emerged. 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 Postemergence. Apply and incorporate mechanically or through an irrigation sprinkler system. The Superior variety is sensitive to Eptam. Cost: $20.90-$33.24.
DUAL/DUAL II	1.5 pt	2 pt	2.5 pt	PPI, PRE, or DRAG OFF—If cool, wet soil conditions occur after application, Dual may delay maturity or injure Superior or other early maturing potato varieties. Cost: $11.93-$19.88.
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. Superior and Atlantic varieties are sensitive to Sencor/Lexone. Cost: Dual + Sencor/Lexone $29.76-$36.93; Sencor/Lexone $17.05-$34.10; Prowl + Sencor/Lexone $21.52-$23.74; Turbo $24.82-$43.43.
SENCOR/LEXONE 4L with DUAL/DUAL II	1 pt / 1.5 pt	1 pt / 2.0 pt	1 pt / 2.5 pt	
or with PROWL (3.3EC)	1.2 pt	1.2 pt	1.8 pt	
TURBO	2-2.5 pt	3-3.5 pt	3-3.5 pt	
Postemergence				
POAST PLUS	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. Good coverage essential for effective control. Cost: $13.39-$20.08.
SENCOR/LEXONE 4L	0.5-1 pt	0.5-1 pt	0.5-1 pt	POST BEFORE WEEDS ARE 1" TALL—Highest rate for common sunflower and kochia. Do not use on red skinned or early maturing white varieties or within 60 days of harvest. Cost: $8.52-$17.04.
Harvest Aid				
REWARD	1-2 pt			Harvest Aid—Apply when potato leaves turn yellow. Use 2 pt if a quick kill is desired. Cost: $8.68-$17.36.

Fieldbean
Preplant

Herbicide	Commercial product per Acre: Sandy Loam < 1% OM	Silt Loam 1-2% OM	Silty-Clay Loam > 2% OM	Application Time, Remarks and Approximate Cost/A Broadcast
DUAL/DUAL II	1.5 pt	2 pt	2.5 pt	PPI or PRE—Surface mixing will improve weed control and reduce crop injury. Cost: $15.90-$19.88.
EPTAM 10G or EPTAM 7E	30 lb / 3.5 pt	30 lb / 3.5 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.

Fieldbean Preplant (continued)

Herbicide	Commercial product per Acre: Sandy Loam < 1% OM	Silt Loam 1-2% OM	Silty-Clay Loam > 2% OM	Application Time, Remarks and Approximate Cost/A Broadcast
EPTAM 7E	2.5 pt	2.5 pt		PPI—Apply to dry surface soil, immediately incorporate with a disk or field cultivator. Sonalan, Treflan, or Prowl may injure fall seeded small grains, or spring seed sugarbeet or sorghum the following year. Cost: Eptam + Dual $20.48; Eptam + Lasso $18.11; Eptam + Sonalan $16.62; Lasso $19.28; Partner $18.67; Sonalan + Dual $20.00; Sonalan + Lasso $17.63; Eptam + Prowl $17.48; Eptam + Treflan $12.69.
with				
SONALAN	2 pt	2 pt		
or with				
PROWL (3.3EC)	2.4 pt	2.4 pt		
or with				
TREFLAN	1 pt	1 pt		
EPTAM 7E	2.5 pt	2.5 pt		
with				
DUAL/DUAL II	1.5 pt	1.5 pt		
or with				
LASSO	4 pt	4 pt		
LASSO	3 qt	3 qt		
PARTNER	4.5 lb	4.5 lb		
PARTNER	3.0 lb	3.0 lb		Apply to dry surface soil, immediately incorporate. Treflan at 1 pt may injure fall seeded small grain or spring seeded sugarbeet or sorghum the following year. Cost: Partner $18.67; with Eptam $21.00; Partner + Treflan $22.80; Treflan + Dual $16.05; Treflan + Lasso $16.98.
+				
EPTAM 7E	2.5 pt	2.5 pt		
or with				
TREFLAN	1 pt	1 pt		
TREFLAN 4EC	1 pt	1 pt		
with				
DUAL 8E	1.5 pt	1.5 pt		
or with				
LASSO	4 pt	4 pt		

Postemergence

BASAGRAN	1-2 pt			POST—Unifoliate to first trifoliate leaf stage. Use 1 pt for fieldbean in the unifoliate leaf stage and 2 pt for beans in the first trifoliate leaf stage. Basagran may be reapplied at the 1 pt rate 5 to 7 days after the initial application. Broadleaf weeds 1 to 2" tall. Weeds showing moisture stress or over 6" tall are poorly controlled. Controls hairy but not eastern black nightshade. Cost: $8.06-$16.12.
+				
COC	1 qt			
PURSUIT	3 oz			POSTEMERGENCE—Fieldbean must have 1 trifoliate leaf. Pursuit and Pursuit + Basagran require the addition of an adjuvant. **Pursuit will carryover. Do not plant sugarbeet for 40 months.** Allow at least 60 days between Pursuit application and harvest. Cost: Pursuit $13.94; Pursuit + Basagran $22.00.
PURSUIT	3 oz			
+				
BASAGRAN	1 pt			
POAST	1-1.5 pt			POSTEMERGENCE...Susceptible weeds less than 4" tall. Fieldbean tolerant at all growth stages. Good coverage essential. Cost: $15.51-$22.20.
+				
COC	1 qt			

Harvest Aid

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

Sugarbeet

Herbicide	Commercial Product per Acre: Sandy Loam 1% OM: Broadcast	Product/7" 22" Row	Band 30" Row	Silt Loam 1-2% OM: Broadcast	Product/7" 22" Row	Band 30" Row	Application Time, Remarks, and Approximate Cost/A Broadcast
Sugarbeet, No-Till in Rye or Winter Wheat							
ROUNDUP	1.5-2 pt	9 oz	6.5 oz	1.5-2 pt	9 oz	6.5 oz	Apply in spring when rye or wheat are 6 to 10" tall and before sugarbeet have emerged. Cost: $2.34-$11.55.
PPI or PRE							
NORTRON SC	2.2 pt	11 oz	8 oz	3.7 pt	19 oz	16 oz	PPI or PRE—Furrow irrigation apply preplant and incorporate 1" to 2"; for sprinkler irrigation apply preemergence at planting or shortly after and immediately irrigated with 0.5" water. Cost: $10.37-$45.60.

Sugarbeet, continued

PPI or PRE

Herbicide	Rate Per Acre: Pints Brdcst	Ounces Per 7" Band: 22" Row	Ounces Per 7" Band: 30" Row	Pints Brdcst	Ounces Per 7" Band: 22" Row	Ounces Per 7" Band: 30" Row	Application Time	Remarks and Approximate Cost/A Broadcast
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 postemergence treatments are planned. Primarily annual grass control. Cost: $3.01-$21.54.
Layby								
EPTAM 7E	2.25 pt	11.5 oz	8 oz	3.5 pt	18 oz	13 oz		Apply Eptam after thinning and clean cultivation; incorporate immediately 2" deep with a cultivator. Cost: $1.71-$11.98.
or EPTAM 10G	20 lb	6 lb	4.5 lb	30 lb	9.5 lb	7 lb		
TREFLAN 4EC	1 pt	5 oz	3.5 oz	1.25 pt	6 oz	4.5 oz		Sugarbeet 2 to 6" tall. Cover exposed beet roots with soil before Treflan application to reduce root girdling. Cost: $0.91-$5.18.
BETAMIX		2-3	10-15	7.5-11			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. Works best on Nortron or Ro-Neet treated fields but wait till 4-leaf stage if beets show signs of injury. Treat in late afternoon to reduce injury. Use highest rate as weed size increases. Cost: Broadcast Betamix$21.25-$31.89; Betamix + Stinger $35.83
BETAMIX with STINGER		2 0.25	10 1.3	7.5 1.0			Sugarbeet two leaf stage, Repeat in 5-7 days	
BETAMIX PROGRESS		1.25-1.75	6.4-8.9	4.7-6.5			Sugarbeet cotlyedon to two leaf stage	Use the lower rate when sugarbeet are in the cotyledon stage of growth. Follow with the higher rate in 5 to 7 days when sugarbeet is in the two leaf stage. Cost: Broadcast $15.51-$22.40.
BETAMIX 1.3EC		4.5-6	23-31	17-22			Sugarbeet 4 true leaf stage	Cost: Broadcast $47.89-$63.79.
POAST		1-2	5-10	3-7			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 $13.38-$26.77; Prism $12.00-$15.00; Poast $2.21-$3.98; Ultima 160 TBA.
ULTIMA 160		1.25-2.5	6.4-12.8	4.6-9.2			Grass 1-3"	
PRISM		0.8-1	4.2-5.4	3-4			Grass 1-3"	
BETAMIX with POAST		2 1.5	10 7.5	7.5 5			Sugarbeet two leaf stage	Do not add crop oil to Betamix plus Poast combinations. Grasses should be less than 2 inches. Cost: Broadcast $30.26.
STINGER		0.25-0.66	1.3-3.4	1.0-2.5			Sugarbeet, 2-8 true leaves; Canada thistle rosette to pre-bud.	Use lower rates for annual weeds and higher rates for Canada thistle. Do not plant or rotate for 1 year after treatment to any crop except small grains or corn. Cost: Broadcast $14.57-$38.46.

Vine Crops and Onion

Herbicide	Commercial Product per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
Melons and Cucurbits			
CURBIT	3-4.5 pt	Preemergence	Apply postplant to the soil surface prior to weed emergence. Apply to seeded crop prior to crop emergence or apply as a banded spray between rows after crop emergence or transplanting. Do not preplant incorporate or do not use under plastic mulch. Cost: $14.60-$21.95.
PREFAR + ALANAP-L	4-6 qt 4-8 qt	Preplant	Immediately incorporate to a depth of 1". Use lower rate on sandy soil. Controls many annual grasses and broadleaf weeds. Cost: $48.80-$80.00.

Vine Crops and Onion, continued

Herbicide	Commercial Product per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
DACTHAL 75W	8-14 lb	Crop 4-5 true leaves	Crop should be weeded prior to application. Controls annual grasses. Use lower rate on sandy soil. Cost: $38.40-$67.20.
RAMROD FLOWABLE	4-5 qt	Apply immediately after planting and before crop and weed emergence.	Use lower rate on sandy soils. **For Processing Pumpkins Only.** Cost: $16.34-$20.43.
TREFLAN	1-1.5 pt	Crop 3-4 true leaves	Direct material to soil between the rows and mechanically incorporate. Controls germinating annual grasses and some broadleaves. Use the lower rate on sandy soils. Cost: $4.14-$6.21.
POAST PLUS	1-1.5 pt	Grasses most susceptible under 4"	Do not apply within 14 days of harvest. Crop oil concentrate and good coverage essential for effective control. Cost: $13.39-$20.08.
COMMAND (Pumpkins only)	2.0 pt	Preplant	Immediately incorporate. Use on pumpkins only. Controls many annual grasses and broadleaf weeds. Cost: $19.81.

Onion

Herbicide	Commercial Product per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
DACTHAL 75W	8-14 lb	Preemergence at seeding or trans-planting and/or at layby	Preplant incorporation not recommended. Use lower rate on soils with less than 1% organic matter. Cost: $38.40-$67.20.
BUCTRIL	1-1.5 pt	Postemergence; onion should have 2-5 true leaves	Water volume is important. Use 50-70 gallons of water per acre. Do not add surfactants. Cost: $6.55-$9.83.
GOAL	0.6-1 25 pt	Onion, 2 fully developed true leaves; weeds, 2-4 leaves	Do not apply to onion under drought stress. Do not mix Goal with oil, surfactant or fertilizer. Cost: $5.76-$12.00.
FUSILADE 2000	1.5 pt	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: $13.39-$20.08.
POAST PLUS	1-1.5 pt		
PRISM	0.8-1 pt	Grass 1-3"	Do not apply within 45 days of harvest. Crop oil concentrate and good coverage essential for effective control. Cost: $12.00-$15.00.
PROWL	2-3 pt	Preemergence to weeds, onion must have 2 to 9 true leaves	Do not apply within 45 days of harvest. Cost: $7.44-$11.16.

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	Preemergence 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	Preemergence	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	Postemergence to weeds	Keep off new bark and foliage. Controls broadleaf weeds. Cost: $6.53.
*FUSILADE DX or *POAST	1 pt 2 pt	Postemergence before grasses tiller	Use on fruit trees limited to nonbearing trees. Add 1 qt crop oil concentrate per acre. Thorough coverage required. On ornamentals use nonionic surfactant with Fusilade. Cost: Fusilade DX $15.00; Poast $26..77
GOAL	2-4 qt	PRE- or POST-emergence to weeds	Conifers only. Grasses should be treated before they are beyond 2-leaf stage. Use before bud break or after new growth hardens. Cost: $38.40-$76.80.
*KARMEX 80W	2.5-5 lb	Preemergence on trees at least 2 years old	Karmex use limited to conifers, honey locust, green ash, apples, and peaches. Cost: $10.75-$21.50.
*GRAMOXONE EXTRA	1.5-3 pt	Directed post-emergence	Nonselective contact herbicide. Keep spray off tree foliage. Add X-77 surfactant. Cost: $5.76-$11.54.
*PRINCEP 80W	1-5 lb	Preemergence 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 T. R. Kochia. Cost: $5.25-$17.40.
*ROUNDUP	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. Add surfactant 0.5% v/v with 1 qt rate. Cost: $11.54-$46.19.
*SOLICAM 80WP	2.5-5.0 lb	Preemergence, late fall or early spring	Fruit trees only. May be combined with Karmex and Princep for improved broadleaf control. Cost: $27.00-$54.00.
*SURFLAN A.S.	2-4 qt	Preemergence	Fruit trees only. May be combined with Karmex and Princep for improved broadleaf control. Cost: $33.50-$67.00.
TREFLAN	1-2 pt	Preplant	Incorporate 2-3" deep prior to planting. If applied after planting adjust machine to throw treated soil towards trees in the row. Cost: $4.13-$8.27.

*Denotes products registered for use on fruit trees.

Aquatic Weed Control

Slow Moving and Still Water

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

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

Aquatic Weed Control

Slow moving and still water, continued

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

Stock and Nurse Tanks

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

CUT STUMP TREATMENTS—TREES and WOODY PLANTS

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

Troublesome Weeds and Woody Plants

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. See NebGuide G88-871, *Chemical Control of Rangeland Weeds.*

Weed	Herbicide[5]	Product Per Acre or Per 100 Gallons[7,8]	Application Time	Remarks and Approximate Cost/A Broadcast
ALFALFA (for control of alfalfa in corn or sorghum)	2,4-D AMINE (4L) + Banvel (corn only) or Banvel	0.25 pt 0.5 pt 0.5 pt	Alfalfa with 4-6" growth	Use drop nozzles on crop taller than 8". See no-till section of corn, sorghum or soybean to kill alfalfa prior to planting. Sorghum 3-5 leaf stage. Cost: 2,4-D + Banvel $4.98; Banvel $4.65.
ALFALFA (for control prior to planting wheat, fieldbean, and potato)	2,4-D LV Ester (4L)	1.5-2.0 qt	Alfalfa with 4-6" new growth	Delay planting wheat 15 days and delay planting fieldbean and potato 30 days after application. Ester formulations are more persistent than amine formulations. Cost: $10.10-$13.48.

Troublesome Weeds and Woody Plants, continued

Weed	Herbicide[5]	Product Per Acre or Per 100 Gallons[7,8]	Application Time	Remarks and Approximate Cost/A Broadcast
ARTICHOKE JERUSALEM	2,4-D AMINE (4L) + Banvel	0.5 pt 0.5 pt	12-18" tall	For use in corn. Use drop nozzles on corn taller than 8". Cost: $5.32.
	Curtail 2,4-D LV Ester (4L)	2.0 pt 1 qt	12-18" tall 18-24" tall	For use where no crop is present. Cost: 2,4-D $3.37; Curtail $8.48.
BARNYARD SAGE	Command + Canopy or Preview or Sencor/Lexone DF	1.5-2.0 pt 5-8 oz 6-10 oz 0.33-0.5 lb	PPI	Do not use Canopy or Preview on soils above pH 6.8. Reduce Sencor/Lexone rate 1/3 on calcareous soil. Cost: Command + Canopy $16.30-$22.13; Command + Sencor $23.43-$32.80; Pursuit $18.59.
	Pursuit	4 oz		
BLUE MUSTARD	2,4-D LV Ester (4L) 2,4-D Amine (4L)	0.5 pt 1 pt	Nov. 15-Mar. 15 before blue mustard stem elongation	Use only on fully tillered wheat. Cost: $0.85-$1.34. See NebGuide G74-92, *Blue Mustard Control.*
	Ally or Amber or Finesse + 2,4-D LV Ester (4L)	0.1 oz 0.28 oz 0.2 oz 4.0 oz	Nov. 15-Mar. 15 before blue mustard stem elongation In spring, broadleaf weeds 2-4"	Add surfactant. Use only on wheat with 4 or more tillers. Use only on continuous wheat or wheat fallow. Do not use on soils with pH of 7.9 or higher. Cost: Ally + 2,4-D $3.26; Amber + 2,4-D $3.50; Finesse + 2,4-D $4.00.
BUCKBRUSH (snowberry)	2,4-D LV Ester	1-2 qt	Full foliage (May 10-25)	Use sufficient water to insure good coverage. Cost: $3.37-$6.74.
BUFFALOBUR	Atrazine 4L[2]	2 qt	Preplant or preemergence in corn	Reduced rates less effective. Cost: $6.31
	Buctril	1.5 pt	Weeds 3-5 leaf stage in corn or sorghum	Plants taller than 4" not controlled. Cost: $9.83.
	Blazer	1.5 qt	Weeds 3-4 leaf stage in soybean	Weeds must be small. Follow-up treatments necessary. Cost: $14.41.
	Cobra	12.5 oz	Postemergence on soybean	Weeds need to have 4 true leaves. Cost: $11.47.
	Eradicane 6.7E	5-5.5 pt 5.5 pt	Preplant to corn	Apply to dry surface soil and immediately incorporate by cross tandem disking or similar mixing. Cost: $14.73-$16.21.
	Exceed	1.0 oz	Postemergence on corn	Cost: $11.00.
	2,4-D LV Ester (4L) + Banvel	0.5 pt 0.5 pt	Postemergence on corn	Plants must be small. Cost: $5.50.
BURCUCUMBER and WILD CUCUMBER	Buctril	1.5 pt	Weeds 3-5 leaf stage in corn	Thorough coverage required. Cost: $9.83.
	Atrazine 4L[2]	2 qt	Preemergence in corn	Atrazine can also be used postemergence. Cost: Atrazine $6.31; Princep $12.60.
	Princep 4L	3 qt	Preemergence in trees or corn	
	Sencor/Lexone 4L (split-application)	0.5 pt + 0.5 pt	Preplant plus preemergence	Split-shot in soybean. Cost: $17.83.
BURSAGE, (Skeletonleaf and Woollyleaf)	Tordon 22K	2 pt	Flower bud stage or when growing actively	Non-crop areas. Tordon may remain in soil for three or more years. Cost: $22.81.
	2,4-D LV Ester (4L) + Banvel	1 qt 1 qt	June or when growing actively	See remarks for field bindweed. If soil moisture conditions are poor, use oil-water emulsions as a carrier. Cost: $21.98.
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 3 or more years. Cost: $22.81. See NebGuide G80-509, *Canada Thistle Control.*

Troublesome Weeds and Woody Plants, continued

Weed	Herbicide[5]	Product Per Acre or Per 100 Gallons[7,8]	Application Time	Remarks and Approximate Cost/A Broadcast
CANADA THISTLE (cont'd)	Tordon 22K + 2,4-D LV Ester (4L)	1 pt 1 qt	Fall; Spring during flower bud	Cost: $14.77
	Roundup	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 3 days. Cost: $23.09-$34.64.
	Banvel	1-2 qt	Fall—actively growing or spring early flower bud	Idle ground or grassland. Avoid tillage for 5 days. Injury to forage grasses may occur. Broadleaf crops may be injured for 2 year, after treatment. Cost: $18.61-$37.22.
	Curtail Stinger	2-4 pt 0.67 pt	Rosette to pre-bud or in fall when actively growing	Curtail—Use lower rate in wheat and barley, higher rate in fallow pasture, or CRP. Stinger used in sugarbeet and corn. Cost: Curtail $8.48-$16.96; Stinger $29.14.
	Ally + Surfactant Telar + Surfactant or Escort + Surfactant	0.1 oz 1.0-3.0 oz 1.0 oz	4"-6" or rosettte stage Prebloom to bloom or in the fall when actively growing	Escort or Telar for use in non crop land only. Use Ally in wheat, barley, or fallow to be planted to winter wheat. One application suppresses Canada thistle. Cost: Ally $2.85; Escort $34.50; Telar $21.50-$64.65.
CACTUS (Prickly Pear)	Tordon 22K	1-2 pt	Early summer	Spot treatment in pasture and grazingland. Cost: $11.41-$22.81.
CATTAILS	2,4-D LV Ester (4L)	1.5 gal + 5% diesel oil + 0.5% emulsifier	Boot to early flowering	Use the equivalent of 150 gal of water per acre. Retreat regrowth as necessary. Cost: 2,4-D $20.22.
	Roundup	3 qt in 10 gal	At flowering	Avoid water contamination. Cost: $34.64.
CHEAT GRASS	See Downy Brome			
COCKLEBUR	See Velvetleaf — For additional treatments Beacon	 0.38-0.76 oz		Cost: $9.52-$19.05. Post in corn use COC or nonionic surfactant.
COTTONWOOD, WILLOWS & SIBERIAN ELM CHINESE ELM	2,4-D LV ester (4L) Crossbow	2-3 qt 1 gal	Full foliage (June-July); basal treatment anytime	2,4-D with aerial equipment at least 5 gal carrier, annual treatment for 2-3 years may be necesasry. Basal or stump treatment: 2 qt of herbicide/10 gal of diesel; apply to point of runoff. Cost: 2,4-D $6.74-$10.11; Crossbow $43.00.
	Krenite S	2-3 gal in 100 gal water + surfactant	Late July, Aug. and Sept.	Has little effect on grasses. Results show the following spring. Cost: $116.70-$175.05.
	Spike 20P	0.25 oz/1" dia	Spring or fall	Apply under drip line. Cost: $8.60/lb.
	Velpar L	4 ml/1" dia	Spring with spot gun to tree base	Cost: $0.08/tree inch.
DANDELION	See No-Till Burndown Tables for Corn and Soybean			
DEVILSCLAW	See Velvetleaf for control in corn & sorghum			
DIFFUSE KNAPWEED	SEE SPOTTED KNAPWEED			
DOCK (Curled & Pale)	2,4-D LV Ester (4L) + Banvel	1 qt 0.5 pt	Before flowering in spring or fall	For use on idle ground or grassland. Cost: $8.02.
DODDER (Control in alfalfa)	Kerb 50-W	3 lb	Apply before dodder germinates in the spring	Dodder seed will begin to germinate when soil temperatures reach 60F. Apply Kerb before soil temperatures reach 60F and incorporate the herbicide by irrigating with 1 in of water. Cost: $80.25.
DOGWOOD	Banvel Crossbow	1-2 qt 1.0 to 1.5 gal	Full foliage during June	Ground application only. Observe all drift precautions when using within 1/2 mile of sensitive crops. Cost: Banvel $18.61-$37.22; Crossbow $43.00-$64.50.
	Spike 20P	0.25 oz/1" dia	Spring or fall	Apply under drip line. Cost: $8.60/lb.

Troublesome Weeds and Woody Plants, continued

Weed	Herbicide[5]	Product Per Acre or Per 100 Gallons[7,8]	Application Time	Remarks and Approximate Cost/A Broadcast
DOWNY BROME	Roundup	12-16 oz	Fall or early spring when desirable grasses are dormant	Use Roundup in fallow. Cost: Roundup $4.33-$5.77; Oust $8.00.
	Oust (non-cropland)	1-2 oz	Early spring	
	Treflan	1-1.5 pt	Preplant to winter wheat	Approximately 50%-80% control. Wheat must be planted with hoe drill. Will not control emerged downy brome. Cost: $4.13-$6.21.
	Amber	0.56 oz	Preplant or preemergence	Approximately 30-50% control. Will not control emerged downy brome. Cost: $4.37.
	Finesse	0.5 oz	Preemergence	Approximately 40-60% control. Will not control emerged downy brome. Cost: $5.62.
	Alternate system			Crop rotation—Include a late spring seeded crop in the rotation. See NebGuide G78-422, *Downy Brome Control.*
FIELD BINDWEED (when treating crops adjust rates)	2,4-D LV Ester (4L)	1 qt	Vigorous fall growth or flower bud stage in spring	Avoid tillage 5 weeks before and 1 week after application. Do not plant small grains for 15 days after 2,4-D and 45 days after Banvel. Plan to treat for several consecutive years. Cost: 2,4-D $3.37; 2,4-D + Banvel $8.02-$12.31.
	2,4-D LV Ester (4L) + Banvel	1 qt 0.5-1 pt		
	Banvel	1-2 pt	Late summer or late fall actively growing	For Roundup apply in 10 gal or less water/acre add 2 qt X-77 or similar surfactant plus 17 lb ammonium sulfate per 100 gallons. Avoid tillage for 5 days. Do not plant small grains for 15 days 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 + 2,4-D $6.44; Roundup + Banvel $10.42; Banvel $9.31-$19.61; Landmaster BW $8.08.
	Landmaster BW	54 oz		
	Roundup + 2,4-D Amine (4L) or Banvel	1 pt 0.5 pt 0.5 pt		
	Tordon 22K + 2,4-D LV Ester (4L)	0.5-1 pt 1-2 pt	Fall after wheat harvest.	Use in a wheat fallow rotation. Retreat with 2,4-D or Landmaster BW in spring. Cost: $5.70-$22.88.
GUMWEED (Curlycup)	2,4-D LV Ester (4L)	1.5 qt	Pre-bud	Cost: $5.06.
HEMP (Marijuana)	2,4-D LV Ester (4L)	1 qt	2-12" tall	Cost: $3.37.
HEMP DOGBANE	2,4-D LV Ester (4L)	0.5-1 qt	Flower bud stage, spring	Use lower rates in crops. Cost: $1.69-$3.37.
	2,4-D LV Ester (4L)	1 qt	After corn is in the dough stage. Apply to dogbane before leaves start to turn yellow	Dogbane roots should have pink swollen buds. Cost: 2,4-D $3.37. See NebGuide G83-665, *Hemp Dogbane.*
	Roundup	4 qt	Late summer or fall	Idle ground or spot treatment in cropland before head or pod fill of crop. Avoid tillage for at least 7 days after treatment. Cost: $46.19.
HOARY CRESS	2,4-D LV Ester (4L)	2 qt	Rosette stage in the fall or early bud in spring	Suppression only. Growth starts in early spring. Treat twice a year for 2 to 3 years. Cost: $6.74.
IRONWEED	2,4-D LV Ester (4L)	1.5 qt	Flower to bud stage	Cost: $5.05.
	Grazon D+D	1 qt	Prior to bud stage	Rangeland. Cost: $6.50.

Troublesome Weeds and Woody Plants, continued

Weed	Herbicide[5]	Product Per Acre or Per 100 Gallons[7,8]	Application Time	Remarks and Approximate Cost/A Broadcast
JOHNSONGRASS	Accent	0.67 oz	6-16"	See corn postemergence for application restrictions. Split-applications more effective. Cost: $18.79.
	Beacon	0.75 oz		
	Fusilade 2000	1.5 pt	12-18" new growth	Can be used in soybean. Add 1 qt/A crop oil concentrate. Cost: Fusilade $17.65.
(see shattercane for seedling control)	Poast Plus + Am sulfate	2.25 pt		Cost: Poast Plus $13.60.
	Roundup	2-3 qt	12" through boot stage	Idle ground or spot treatment in cropland before head or pod fill of crop. Avoid tillage for 7 days. Cost: $23.09-$34.64.
JOINTED GOATGRASS	SEE DOWNY BROME		See NebGuide G95-1252 *Controlling Jointed Goatgrass*	
KNAPWEED—See specified knapweed—Russian, spotted or diffuse				
KOCHIA (triazine resistant). May have to spray twice or cultivate for row crops.				
	Banvel	0.5 pt	Preplant to corn or sorghum. Kochia less than 2" tall	Wait 20 days before planting sorghum. Include appropriate pre-emergence herbicides. Cost: Fallow Master $9.62; Landmaster BW $6.58; Banvel $3.40; Cyclone CF $4.90.
	Landmaster BW	54 oz	Preplant to corn sorghum or wheat	
	Fallow Master	44 oz		
	Cyclone CF	1.5 pt	Kochia less than 4" tall	
			Postemergence to corn or sorghum	
	Banvel	0.5 pt		Sorghum must have 3-5 leaves when using Banvel. Use higher Buctril rate for taller kochia. Buctril + Banvel on corn only. Use higher rates on dense stands of Kochia. Cost: Banvel $4.65; Buctril $6.55-$9.93; Buctril + Banvel $11.20; Buctril/Atrazine + Banvel $13.16-$15.49; Marksman $6.12-$9.19; Tough + Atrazine $11.62.
	Buctril	1.0-1.5 pt	Kochia less than 2" tall	
	Buctril + Banvel	1.0 + 0.5 pt		
	Buctril/Atrazine	2-3 pt	Kochia less than 4"	
	Buctril/Atrazine + Banvel	2.5 pt + 0.25 to 0.5 pt		
	Marksman	2 to 3 pt		
	Tough + Atrazine	1 pt + 1 pt	Corn only	
	Command 4EC	1.5 pt	Preplant incorporate in soybean, before kochia emerges	Do not rotate to small grains. Cost: $14.86.
	Command 4EC + Roundup	1.5 pt + 1 pt	Preplant to soybean	A postemergence herbicide may be needed to control kochia escapes. Cost: $20.63.
	Pursuit Plus + Roundup	2.5 pt + 1 pt	Preplant to soybean 15-30 days	Cost: $29.53.
LEAFY SPURGE	2,4-D LV Ester (4L)	2 qt	Bud stage spring or late fall	Retreatment necessary. Annual applications gradually reduce infestation. Cost: 2,4-D LV $6.74; 2,4-D + Tordon $14.10. See NebGuide G87-834, *Leafy Spurge*.
	2,4-D Amine (4L) + Tordon 22K	1 qt + 1 pt		
	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 for use in trees or areas where grass stand is not a factor. Cost: Tordon $45.62-$91.24; Roundup + 2,4-D $14.24.
	Roundup + 2,4-D Amine (4L)	1 qt + 1 qt		

Troublesome Weeds and Woody Plants, continued

Weed	Herbicide[5]	Product Per Acre or Per 100 Gallons[7,8]	Application Time	Remarks and Approximate Cost/A Broadcast
LOCUST (Honey and Black)	Banvel Crossbow	2 qt 1.0-1.5 gal	Full foliage during June; cut stump or basal treatment anytime	Ground application only. Observe all drift precautions. See cottonwood for basal and cut stump treatment. Cost: Banvel $37.22; Crossbow $43.00-$64.50.
	Spike 20P	0.25 oz/1" dia	Spring or fall	Apply under drip line. Cost: $8.60/lb.
	Velpar RP	4 ml/1" dia	Spot gun-spring	Cost: $0.08/tree inch.
MARESTAIL (Horseweed)	2,4-D LV Ester (4L)	1 qt	Prior to bolt	Cost $3.37
	Roundup	24 oz	Before 6" tall	Cost $8.66
MILKWEED, COMMON	2,4-D LV Ester (4L) + Banvel	1 qt 0.5 pt	Flower bud to bloom stage	Do not plant small grains for 15 days after 2,4-D Banvel treatment. 2,4-D + Banvel suppresses growth for 1 year. Cost: $8.02.
	Roundup	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: $34.64.
MILKWEED, HONEYVINE (climbing)	2,4-D Amine (4L) 2,4-D LV Ester (4L)	1-2 pt 0.5-1 pt	Before vines reach 3' in length	For use in corn or sorghum. Use lower rates in sorghum. Gives suppression only. Cost: $.85-$2.69. See NebGuide G77-384, *Common Milkweed.*
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: $5.69.
MUSK AND PLUMELESS THISTLE	Ally Curtail	0.3 oz 2 pt	Late fall or spring before bolting	Use in pastures, grasses for seed, fallow and CRP. Curtail may be used in wheat. Cost: Ally $8.54; Curtail $8.48.
	Escort	1 oz	Bolted plants in spring prior to flowering	Use in noncropland and roadsides. Add surfactant 1 pint/100 gal. Cost: $34.50.
	2,4-D LV Ester (4L) 2,4-D LV Ester (4L) + Banvel Tordon 22K (musk only)	1.5-2 qt 1 qt 0.5 pt 6-8 oz	Late fall treatment 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 $5.05-$6.74; 2,4-D + Banvel $8.02; Tordon $4.28-$5.70.
OAKS	Banvel	2 qt	Full foliage June to July; cut stump or basal treatment anytime	Non-cropland only for Spike and Crossbow. Cost: Banvel $37.22; Crossbow $64.50; Spike $8.60/lb; Velpar RP $0.08/tree inch.
	Crossbow	1.5 gal		
	Spike 20P	0.25 oz/1" dia	Spring or fall	
	Velpar L	4 ml/1" dia	Spot gun-spring to tree base	
OSAGE ORANGE	Crossbow	1.0-1.5 gal	Full foliage June to July; basal treatment anytime	Non-crop areas only. See remarks for cottonwood. Cost: Crossbow $43.00-$64.50; Spike $8.60/lb; Velpar RP $.08/tree inch.
	Spike 20P	0.5 oz/1" dia	Spring or fall	
	Velpar L	4 ml/1" dia	Spring. Spot gun. Apply to tree base	

Troublesome Weeds and Woody Plants, continued

Weed	Herbicide[5]	Product Per Acre or Per 100 Gallons[7,8]	Application Time	Remarks and Approximate Cost/A Broadcast
POISON HEMLOCK	2,4-D LV Ester (4L) + Banvel	1 qt 0.5 pt	Rosettes—fall or early spring	Cost: $8.02.
POISON IVY	Crossbow	1.0 - 1.5 gal		
	Amino Triazole/ Weedazol 90SP	2 tbs/gal of water	Full foliage (June)	Thoroughly wet all vegetation. Do not apply to cropland. Cost: $1.10/1000 sq ft.
	Amitrol-T/ Cytrol-T 2WS	0.5 cup/ gal of water		
POVERTYWEED — See Bursage				
PUNCTURE VINE	2,4-D LV Ester (4L)	1 qt	Pre-bud stage most effective	Mature burs not affected by 2,4-D. Retreatment necessary on new plants. Cost: $3.37.
	Ally + 2,4-D LV Ester (4L)	0.3 oz 1 pt		Ally provides residual control. Cost: $10.23.
	Exceed	1.0 oz	Postemergence on corn	Cost: $11.00.
PURPLE LOOSESTRIFE	Rodeo Roundup	2 qt 2 qt	Apply to plants with active growth in bloom stage or later.	Use Rodeo in or near water sources. Add appropriate surfactant to Rodeo. Cost: Rodeo $55.23; Roundup $23.09.
PURSLANE (in fallow)	2,4-D LV Ester (4L)	1 qt	When growing actively	Till 5-7 days after treatment. Do not plant small grains for 15 days. Cost: 2,4-D $3.37.
	Ally or Amber or Finesse + 2,4-D LV Ester (4L)	0.1 oz 0.2 oz-0.3 oz 0.4 oz 4.0 oz	Early post	Add surfactant when used post-emergence. Surfactant 1-2 qt/100 gal solution. Do not use on soils with pH of 7.9 or higher. Cost: Ally + 2,4-D $2.46; Amber + 2,4-D $2.71-$3.86; Finesse + 2,4-D $4.00.
RAGWEED, WESTERN (perennial)	2,4-D LV Ester (4L)	1 qt	Early summer	Follow-up treatments may be necessary. Cost: $3.37.
	Grazon P + D	1-2 qt	Lower rate when weeds are small	Cost: $6.50-$13.00.
RED CEDAR	Spike 20P	0.5 oz/1" dia	Spring or fall	Spike for use in non-crop areas only. Tordon and Velpar LP can be used on grazingland. Cost: Spike $8.60/lb; Tordon $91.24; Velpar RP $0.08/ tree inch.
	Tordon 22K	4 qt/100 gal	Spring or fall	
	Velpar L	4 ml/1" dia	Spot gun in spring to tree base	
RUSSIAN KNAPWEED	Banvel 4WS Curtail Tordon 22K	1-2 qt 3-4 qt 1-2 qt	Early flower	Idle ground or grassland. Avoid tillage for 7 days. bud stage Injury to forage grasses may occur. Broadleaf crops may be injured for 2 years after treatment. Cost: Banvel $18.61-$37.22; Tordon $22.81-$45.62.
RUSSIAN OLIVE	2,4-D LV Ester (4L) + Banvel	2 qt 1 qt	Full foliage (early June)	See remarks for cottonwood. Cost: $25.35.
	Spike 20P	0.5 oz/1" dia	Spring or fall	Use on non-cropland only. Cost: $8.60/lb.
RUSSIAN THISTLE	See Kochia for controls.			
RYE, VOLUNTEER	SEE DOWNY BROME	See NebGuide G94-1225 *Controlling Volunteer Rye in Winter Wheat*		

Troublesome Weeds and Woody Plants, continued

Weed	Herbicide[5]	Product Per Acre or Per 100 Gallons[7,8]	Application Time	Remarks and Approximate Cost/A Broadcast
SAGEBRUSH (sand and fringed and green sagewort)	2,4-D LV Ester (4L)	1.5-2 qt	4"-8" new growth (June)	1.5 qt/A 2,4-D adequate on sand sagebrush. Cost: $5.05-$6.74. See NebGuide G80-510, *Sagebrush Control.*
SANDBUR (Corn treatments) (Rotate to Soybean)	Accent + COC	0.67 oz 1%	Postemergence in Corn. Sandbur < 1" Corn < 12"	Cost: Accent $17.89; Atrazine $6.31. See NebGuide G74-121, *Field Sandbur Control in Corn.*
	Atrazine 4L[2] + COC	2 qt 2 pt		
	Dual II	2.5-3.0 pt	PRE followed by irrigation	Cost $19.87-$23.85.
	Harness or Surpass	1.75-2.25 pt 1.5-2.75 pt	PRE/PPI to Corn	Cost: Harness $12.50-$18.27; Surpass $10.00-$19.59.
	Eradicane 25G	16-24 lb	PRE to Corn	Cost: $18.40-$27.60.
	Sutan+ + Atrazine 4L	5 pt 2-2.5 pt	PPI to Corn	Cost: $16.07-$16.87.
	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 postemergence organophosphate treatment. Do not apply Beacon within 10 days of a foliar post emergence organophosphate treatment. Beacon may be applied at 0.38 oz followed by a second 0.38 oz treatment if required. Corn hybrids vary in tolerance to Beacon. Dual gives only partial control. Cost: Accent/Beacon $18.90; Dual $19.88-$23.85. Eradicane $14.74; Sutan $18.08.
	Beacon	0.75 oz	Corn 4"-20" Shattercane 4"-6"	
	Dual II	2.5-3.0 pts	PRE + Irrigation	
	Eradicane or Sutan	5 pt 7 pt	PPI	
	Pursuit + Surfactant	4 oz 2 pt/100 gal	Shattercane < 6"	IR Corn Only. Cost: $27.34.
An alternate system— Ridge-till.				
SHATTERCANE **Soybean treatments**	Prowl (3.3EC)	3.6 pt	Preplant to soybean	Incorporate by cross disking or equivalent soils mixing. Cost: Prowl $13.39; Sonalan $12.11; Treflan $6.21-$10.35.
	Sonalan	3 pt		
	Treflan 4EC	1.5-2.5 pt		
	Assure II	7 oz	Postemergence Cane 6-12"	Use with crop oil concentrate. Cost: Assure $9.75; Fusilade DX $5.70: Fusion $6.71; Poast $13.38.
	Fusilade DX	0.38 pt		
	Fusion	6 oz		
	Poast	1 pt		
	Pursuit	4 oz	Postemergence Cane 4-8"	Add nonionic surfactant 1/4% v/v plus 2 qt/A UAN. Cost: $18.94.
	Select	6 oz	Cane 6-12"	Use with COC. Cost: $12.76.
An alternate system — Ridge-till.				

Troublesome Weeds and Woody Plants, continued

Weed	Herbicide[5]	Product Per Acre or Per 100 Gallons[7,8]	Application Time	Remarks and Approximate Cost/A Broadcast
SOAPWEED (Yucca)	Velpar L	4 ml/plant		Apply with spot gun at base of plant.
SOW THISTLE (Perennial)	2,4-D LV Ester (4L)	1.5 qt	Fall rosette or spring bud stage	See remarks for field bindweed. Cost: $5.05.
SPOTTED KNAPWEED	2,4-D LV Ester (4L)	1 qt	Rosette stage	Cost: $3.37.
SUMAC	2,4-D LV Ester (4L)	1-2 qt	Full foliage	Use sufficient water for good coverage. Cost: $3.37-$6.74.
SWAMP SMARTWEED (tanweed, shoestring)	2,4-D LV Ester (4L) + Banvel	1 qt 1 pt	When growing vigorously	On crops use lower rates and amine formulations. Cost: $12.68.
	Roundup	3-4 qt in 10 gal or less water/A	Full foliage mid to late summer	Idle ground or spot treatment in cropland before head or pod fill of crop. Avoid tillage for 7 days. Cost: $34.64-$46.19.
VELVETLEAF **Corn and Sorghum treatments** (also controls cocklebur, devil's claw & common sunflower)	AAtrex/ Atrazine 4L[2]	1.2 qt	Velvetleaf less than 4"	Use crop oil concentrate with AAtrex/atrazine and Laddok. Cost: AAtrex/atrazine $3.78; Basagran $8.75-$16.81; Beacon $12.53-$21.00; Buctril $6.55-$9.83; 2,4-D $0.85-1.69; Marksman $6.37-$11.40; Laddok $8.12-$12.17.
	Basagran + 28% N	1-2 pt 1 gal		
	Laddok[2]	2.4 to 3.6 pt		
	Buctril 2EC + Atrazine 4L[2]	1-1.5 pt 1-2 pt		
	Exceed + 28% + COC	0.5-.76 oz 1 gal 1 qt	4-12"	Use on corn only. Cost: $5.50-$8.36.
	2,4-D LV Ester (4L)	0.5-1 pt	Velvetleaf less than 6"	
	Marksman[2]	2-3.5 pt	Before 5-leaf stage of corn	
VELVETLEAF **Soybean treatments**	Command 4 EC	1-1.5 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 and additional herbicide costs. Basagran $8.76; Classic $9.77-$14.31; Pursuit $18.94. See NebGuide G83-681, *Velvetleaf.*
	Basagran + 28% N	1 pt 1 gal	Velvetleaf less than 4"	
	Classic + Pinnacle + 28% N + Surfactant	0.25 oz 0.25 oz 1 gal 1/8% v/v		
	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.			

Troublesome Weeds and Woody Plants, continued

Weed	Herbicide[5]	Product Per Acre or Per 100 Gallons[7,8]	Application Time	Remarks and Approximate Cost/A Broadcast
WILD PROSO MILLET (See NebGuide G83-648)	Eptam	3.5 pt	Preplant to fieldbean	Apply to dry surface soil and incorporate immediately with a disk or field cultivator. Cost: $11.40.
	Eradicane 6.7E	5 pt		
	Eradicane 25-G	17 lb		
	Prowl (3.3EC) + Bladex 90DF	1.2 qt 1.1 lb	Spike stage of corn. Wild proso millet less than 1"	Cost: $18.54.
	Prowl 3.3EC	1.5-1.8 qt	Layby to corn	Direct spray to cover the base of the corn plant and in between corn rows. Incorporate with irrigation water or with cultivation. Cost: $11.16.
	Accent	0.67 oz	Post in corn Wild proso millet 1-3 leaf stage.	Follow label directions. Cost: $17.89.
	Poast Plus	0.75 pt	Postemergence on 4-8" wild proso millet	Post on sugarbeet, soybean, fieldbean and alfalfa. Add 1 qt crop oil concentrate per acre. Cost: Poast Plus $4.53.
	Ro-Neet	3.3-4 pt	Preplant to sugarbeet	Cost: $21.24-$25.75.
YARROW	2,4-D LV Ester (4L) + Banvel	1.0 lb 0.5 pt	Fall or spring Pre-bloom	Cost: $8.02.

[1]Add X-77 spreader 2 pt (0.25% v/v) per 100 gal spray solution for Cyclone and Gramoxone Extra; 4 pt/100 gal. (0.5% v/v), for Roundup, Roundup RT, Landmaster BW, and Fallow Master application, apply 10 gal or less water per acre, and add 17 lb ammonium sulfate (spray grade) per 100 gal spray For Roundup/Roundup RT, add 4 pt nonionic surfactant per 100 gal.
[2]If atrazine was applied at planting, the total amount of atrazine per calendar year cannot exceed 2.5 lb of active ingredient per year.
[3]Use no more than 1.6 qts on <30% crop residue on highly erodible land.
[4]The addition of 0.5 to 1 pt 2,4-D LV ester improves control of broadleaf weeds. Do not apply 2,4-D preemergence after planting sorghum.
[5]Low volatile ester and salt formulations preferred over volatile esters such as isopropyl because of vapor hazards. 2,4-D and MCPA calculated on the basis of 4 lb/gal of acid equivalent (the chemicals responsible for herbicidal effects). For other formulations see Conversion Table on page 65.
[6]Do not use on soils with less than 1% organic matter. Increase injury risk on soils where triazine carryover exists.
[7]For spot treatment add 1 1/2 tablespoons of herbicide per gallon of water for each 1 qt per acre required broadcast, and apply to 1,000 sq ft.
[8]Rates per 100 gallons pertain to handgun on a power sprayer.

Conversion Tables

Rate Per Acre To 1,000 Square Feet

1. Known Facts and Assumptions:

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

2. Convert Herbicide Rate Per Acre to Ounces:

   For example, 2 qt per acre = 64 oz

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

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

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

Spot Treatment

For hand sprayers used for spot treatments, add 1 1/2 tablespoons of herbicide per gallon of water for each 1 qt per acre required broadcast. Apply to 1,000 sq ft. Application amounts are dependent upon spray pressure, walking speed during treatment, and nozzle 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 atrazine 80W = 1.1 lb 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
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	Hrs Until Rainfast	Herbicide	Hrs Until Rainfast
ACCENT	4	FALLOW MASTER	6
ALLY	4	GRAMOXONE EXTRA/ CYCLONE	0.5
AMBER	4	GLEAN	4
ASSURE II	1	HARMONY EXTRA	4
ASSERT	3	HOELON	1
ATRAZINE	4	LADDOK S-12	4
AVENGE	6	LANDMASTER BW	6
BANVEL/CLARITY	4	MARKSMAN	4
BASAGRAN	4	MCPA	1
BASIS	4	OPTION/WHIP	1
BEACON	4	PERMIT	4
BICEP/BICEP II	4	PINNACLE	1
BLADEX	4	POAST PLUS	1
BLAZER	6	PRISM	1
BRONCO	6	PURSUIT	1
BRONATE	1	REFLEX	4
BUCTRIL	1	RELIANCE	1
BUCTRIL/ATRAZINE	1	RESCUE	6
BUTYRAC 200	6	RESOLVE	4
CONTOUR	4	RESOURCE	1
CROSSBOW	6	RESULT	4
CURTAIL	8	ROUNDUP/RASCAL	6
CURTAIL M	8	SCEPTER	2
CLASSIC	1	SCORPION III	8
COBRA	0.5	STINGER	8
EXCEED	4	SYCHRONY	1
EXPRESS	4	TACKLE	6
EXTRAZINE II	4	TOUGH	2
FINESSE	4	2,4-D	1
FLEXSTAR	4	TORDON	2
FUSILADE 2000	1		
FUSION	1		

Pre-harvest interval/crop stage limits for postemergence herbicides in corn

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

Preharvest interval/crop stage limits fo postemergence 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"
Permit	pre-boot
2,4-D	8" broadcast, boot directed

Preharvest interval/crop stage limits for postemergence herbicides in soybean

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

ABBREVIATIONS

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

COMBINATION HERBICIDES

Trade Name	Equivalent Amount of Each Component Contained in 1 gal or 1b of Product (a.i.)	Manufacturer
Betamix	0.65 lb phenmedipham + 0.6 lb desmedipham	Nor-Am
Betamix Progress	0.6 lb phenmedipham + 0.6 lb desmedipham + 0.6 lb ethofumesate	Nor-Am
Bicep 6E	3.33 lb metolachlor + 2.67 lb atrazine	Ciba
Bicep Lite	3.33 lb metolachlor + 1.67 lb atrazine	Ciba
Broadstrike + Dual	0.2 lb flumetsulam + 7.47 lb metolachlor	Dow Elanco
Broadstrike + Treflan	0.25 lb flumetsulam + 3.4 lb trifluralin	Dow Elanco
Broadstrike Plus	0.23 lb flumetsulam + 0.62 lb clopyralid	Dow Elanco
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
Commence 5.25 EC	3 lb trifluralin + 2.25 lb clomazone	Elanco/FMC
Concert	2 oz package equals 0.125 oz chlorimuron + 0.125 oz thifensulfuron	DuPont
Conclude	bentazon + sethoyxdim	BASF
Contour	atrazine + imazethapyr, co-pack	Am. Cyanamid
Crossbow	1 lb triclopyr + 2 lb 2,4-D	Dow Elanco
Curtail	2.0 lb 2,4-D amine + 0.38 clopyralid	Dow Elanco
Cycle	2.0 lb metolachlor + 2.0 lb cyanazine	Ciba
Detail	3.6 lbs dimethenamid + 0.5 lb imazaquin	Am. Cyanamid
DoublePlay	5.6 lbs EPTC + 1.4 lb acetochlor	Zenecca
Exceed	0.285 prosulfuron + 0.285 primisulfuron	CIBA
Extrazine II 4-L	3 lb cyanazine + 1.0 lb atrazine	DuPont
Fallow Master	1.5 lb glyphosate + 0.6 lb dicamba	Monsanto
Finesse	0.625 chlorimuron + 0.125 metsulfuron	DuPont
Freedom	2.67 lb alachlor + 0.33 lb trifluralin	Monsanto
Fusion 2.66E	2 lb fluazifop + 0.66 lb fenoxaprop	ICI Americas
Galaxy	3 lb bentazon +0 .67 lb acifluorfen	BASF
Gemini 60 DF	0.55 lb linuron + .045 lb chlorimuron	DuPont
Guardsman	2.33 lb dimethenamid + 2.67 lb atrazine	Sandoz
Harmony Extra	0.50 lb thifensulfuron + 0.25 lb tribenuron	DuPont
Laddok	1.66 lb bentazon + 1.66 lb atrazine	BASF
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
Landmaster II	1.2 lb glyphosate + 1.0 lb 2,4-D amine	Monsanto
Lariat 4 F	2.5 lb alachlor + 1.5 lb atrazine	Monsanto
Lasso + atrazine	2.5 lb alachlor + 1.5 lb atrazine	Monsanto
Lorox Plus 60 DF	0.57 lb linuron + 0.03 lb chlorimuron	DuPont
Marksman	1.1 lb dicamba + 2.1 lb atrazine	Sandoz
Matrix 75 DF	0.67 lb thifensulfuron + .033 lb tribenuron	DuPont
Milocep	3.33 lb Milogard + 3.3 lb metolachlor	Ciba
Preview 75 DF	0.69 lb metribuzin + 0.07 lb chlorimuron	DuPont
Pursuit Plus	2.9 lb pendimethalin + 0.2 lb imazethapyr	Am. Cyanamid
Ramrod & atrazine	3 lb propachlor + 1 lb atrazine	Monsanto
Reliance	0.02 lb chorimuron + 0.01 lb thifensulfuorn	DuPont
Rescue	2 lb naptalam + 0.06 lb 2,4-DB	Uniroyal
Resolve	dicamba + imazethapyr, co-pack	Am. Cyanamid
Rezult	bentazon + sethoxydim	BASF
Salute 4 EC	2.67 lb trifluralin + 1.33 lb metribuzin	Bayer
Scepter O.T.	0.5 lb imazaquin + 2 lb acifluofen	Am. Cyanamid
Scorpion III	0.078 lb flumetsulam + .21 lbs chlopyralid + 0.423 lbs 2,4-D	Dow
Shotgun	2.5 lb atrazine + 1.5 lb 2,4-D	UAP
Squadron 2.33 EC	2.0 lb pendimethalin + 0.33 lb imazaquin	Am. Cyanamid
Surpass 100	3 lb acetochlor + 2.0 lb atrazine	Zenecca
Sutazine	4.8 lb butylate + 1.2 lb atrazine	Zenecca
Sycrony	0.039 lb chlorimuron + 0.014 lb thifensulfuron	DuPoint
Tornado	0.75 lb fluazifop + 1 lb fomesafen	Zenecca
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 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 Elanco

Herbicide Dictionary

AAtrex* (atrazine—available in 4 lb/gal, 90%DF or 80%WP formulations.) Ciba-Geigy. EPA Reg. No. 100-49

Accent (nicosulfuron—75%DF formulation) Postemergence grass control in corn. DuPont.

EPA Reg. No. 352-534

Action Under development for postemergence broadleaf weed control in corn and soybean. Ciba-Geigy.

Alachlor Active ingredient in Lasso, Judge, Confidence, Stall, Saddle and Arena. Monsanto.

Alanap (naptalam—2 lb/gal formulation) A pre and postemergence broadleaf and grass herbicide for soybean and vine crops. Uniroyal. EPA Reg. No. 400-49

Ally (metsulfuron—available as a 20%WG or a 60%DF formulation) Used in wheat, barley, and fallow for broadleaf and certain grass weed control. 3-6 week residual. DuPont. EPA Reg. No. 352-435

Amber (triasulfuron—75%DF formulation) A pre and postemergence herbicide for broadleaf weed control in wheat, barley, and fallow. Ciba-Geigy. EPA Reg. No. 100-701

Amino Triazole Trade name for amitrole. American Cyanamid.

Amitrole* (2 lb/gal formulation) A translocated herbicide that inhibits chlorophyll formation and regrowth from root buds. Trade names are Amino T. Cytrol and Weedazol. EPA Reg. No. 264-135-ZA

Amitrol-T* Amitrole + ammonium thiocyanate. Rhone-Poulenc.

Arena Generic alachlor. Monsanto.

Aquathol (endothall—10%DF formulation) An aquatic herbicide for use in still water. Pennwalt. EPA Reg. No. 4581-204

Aquazine (simazine—80%WP formulation) An aquatic herbicide for use in still water. Ciba-Geigy. EPA Reg. No. 100-650

Arsenal (imazapyr—4 lb/gal formulation) Provides total vegetation control for noncrop areas. American Cyanamid. EPA Reg. No. 241-273

Assert (imazamethabenz—2.5 lb/gal formulation) Control wild oats not annual bromes in wheat. American Cyanamid. EPA Reg. No. 241-285

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

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

Atrazine* A preplant, preemergence and post-emergence s-triazine for broadleaf and certain grass weeds in corn, sorghum and rangeland. Available under several trade names.

Authority—Under development for selective weed control in soybean. FMC.

Avenge (difenzoquat—2 lb/gal formulation) Controls wild oats not annual bromes postemergence in spring small grain. American Cyanamid. EPA Reg. No. 241-266

Axiom Under development for selective preemergence weed control in corn and soybean. Bayer.

Balan (benefin—available in 1.5 and 2.5 lb/gal formulation) A preplant incorporated herbicide for annual grass control in alfalfa. DowElanco. EPA Reg. No. 62719-94

Banvel (dicamba—4 lb/gal formulation) A post and preemergence herbicide for selective broadleaf weed control in corn, sorghum, small grains and grasses. Sandoz. EPA Reg. No. 55947-1

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

Basis (rimsulfuron—75%DF formulation) A postemergence herbicide for selective grass control in corn. DuPont. EPA Reg. No. 352-571

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

Beacon (primisulfuron—75%DF formulation) Postemergence grass and broadleaf control in corn. Ciba-Geigy. EPA Reg. No. 100-705

Betamix (0.65 lbs phenmedipham + 0.65 lbs desmedipham—1.3 lb/gal formulation) For postemergence broadleaf weed control in sugarbeet. NOR-AM. EPA Reg. No. 45639-87

Betamix Progress (0.6 lbs phenmedipham + .6 lbs desmedipham + 0.6 lbs ethofumesate—1.8 lb/gal) For postemergence weed control in sugarbeet. Agrevo USA. EPA Reg. No. 45639-159.

Betanex (desmedipham—1.3 lb/gal formulation) Used postemergence for redroot pigweed control in sugarbeets. Agrevo USA. EPA Reg. No. 407-MN-1

Bicep* (3.33 lbs metolachlor + 2.67 lbs atrazine—6 lb/gal formulation) For preemergence use in corn and sorghum safened with Concep . Ciba-Geigy. EPA Reg. No. 100-645

Bicep II* (3.30 lbs metolachlor + 2.64 lbs atrazine +benoxacor—5.94 lb/gal formulation) For preemergence use in corn and sorghum treated with Concep. Ciba-Geigy. EPA Reg. No. 100-710

Bicep Lite* (3.33 lbs metolachlor + 1.67 lbs atrazine—5 lb/gal formulation) For preemergence use in corn and sorghum safened with Concep. Ciba-Geigy. EPA Reg. No. 100-731

Bladex* (cyanazine—available as a 4 lb/gal, 80%WP, 90%DF formulation) A short residual triazine for grass and broadleaf weed control in corn and sorghum. DuPont. EPA Reg. No. 352-470

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

**Restricted Use Pesticide*

Herbicide Dictionary

Broadstrike + Dual (0.20 lbs flumetsulam + 7.47 lbs metolachlor—7.67 lb/gal) For PRE and PPI use in corn and soybean. Dow Elanco. EPA Reg. No. 62719-239.

Broadstrike Plus (0.23 lbs flumetsulam + 0.62 lbs clopyralid—0.856 lb/gal) For selective preemergence broadleaf control in corn. Dow Elanco. EPA Reg. No. 62719-253

Broadstrike + Treflan (0.25 lbs flumetsulam + 3.4 lbs trifluralin—3.65 lb/gal) For PRE and PPI use in soybean. Dow Elanco. EPA Reg. No. 62719-222.

Bronate (4 lb/gal formulation) A combination of 2 lb bromoxynil and 2 lb MCPA for use in small grain. Rhone-Poulenc. EPA Reg. No. 264-438

Bronco (2.6 lbs alachlor + 1.4 lbs glyphosate—4 lb/gal formulation) For use in no-till corn, soybean. and Screen safened sorghum. Monsanto. EPA Reg. No. 524-341-AA

Buctril (bromoxynil—available in 2 lb/gal EC and 4 lb/gal GEL formulations) A contact herbicide for broadleaf control in corn, sorghum and small grains. Rhone-Poulenc. EPA Reg. No. 264-437

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

Bullet* (2.5 lbs alachlor + 1.5 lbs atrazine—4 lb/gal formulation) For PRE and PPI use in corn. Monsanto. EPA Reg. No. 524-418

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

Cannon* (2.5 lbs alachlor + 0.5 lbs trifluralin—3 lb/gal formulation) For PRE and PPI use in soybean. Monsanto. EPA Reg. No. 524-412

Canopy (75%DF formulation) Combinations of 10.7% chlorimuron active ingredient and 64.3% metribuzin, for preemergence use in soybean DuPont. EPA Reg. No. 352-444

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

Chart Under development for postemergence broadleaf weed control in soybean. Ciba-Geigy.

Chlorate-3 (sodium chlorate) Used as a sorghum desiccant. Midwest Companies.

Chopper RTU (0.255 lb/gal) Woody brush control for basal and cut stump treatments. American Cyanamid. EPA Reg. No. 241-330.

Clarity (dicamba-glycomin—4 lb/gal formulation) A low volatile formulation of dicamba to be used post-emerge in corn and sorghum. Sandoz. EPA Reg. No. 55947-46

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

**Restricted Use Pesticide*

Cobra (lactofen—2.0 lb/gal formulation) Used postemergence for broadleaf weed control in soybean. Chevron. EPA Reg. No. 59639-34

Command (clomazone—4 lb/gal formulation) A preplant incorporated herbicide for grass and broadleaf weed control in soybean. FMC. EPA Reg. No. 279-3053

Commence (5.25 lb/gal formulation) A prepack of 3 lbs trifluralin + 2.25 lbs clomazone for use in soybean. FMC, DowElanco. EPA Reg. No. 279-3104

Concep II (oxabatrinil—70%WP formulation) A protectant for sorghum seed to prevent Dual and Bicep injury. Ciba-Geigy. EPA Reg. No. 100-AL-1

Concep III (fluxofenim—75%WP formulation) A protection for sorghum seed to prevent Dual and Bicep injury. Ciba-Geigy. EPA Reg. No. 100-NC-2

Concert (50% chlorimuron + 50% thifensulfuron—25%WP formulation) For postemerge broadleaf control in soybean. Dupont. EPA Reg. No. 352-563

Confidence Generic alachlor. Cenex Land O'Lakes.

Contour (0.38 lbs imazethapyr + 3.0 lbs atrazine—3.38 lb/gal) A combination of Pursuit and Atrazine for use in imidazolinone resistant corn hybrids. American Cyanamid. EPA Reg. No. 241-353.

Copper Sulphate Available as crystals or in cheated form for algae control in moving and still water. Several brand names.

Cropstar Lasso granular.

Crossbow (2 lbs 2,4-D + 1 lb trichlopyr—3 lb/gal formulation) EsteFor broadleaf weeds and woody plant control. DowElanco. EPA Reg. No. 62719-67

Curbit (ethalfluralin—3 lb/gal formulation) Used PRE and PPI in melons and cucumbers for grass controls. UAP. EPA Reg. No. 34704-610.

Curtail (2.38 lb/gal formulation) A combination of 0.38 lbs clopyralid + 2 lbs 2,4-D for postemergence broadleaf control in small grain. DowElanco. EPA Reg. No. 62719-48

Curtail M (2.77 lb/gal formulation) A combination of 0.42 lbs clopyralid + 2.35 lbs MCPA for postemergence broadleaf control in small grains. DowElanco. EPA Reg. No. 62719-86

Cycle* (cyanazine + metolachlor—4 lb/gal formulation) A prepack of 2 lbs cyanazine and 2 lbs metolachlor for weed control in field corn and sorghum. Ciba-Geigy. EPA Reg. No. 100-716

Cyclone (paraquat) A 2.0 lb/gal formulation of paraquat for weed control in fallow situations. Zenecca. EPA Reg. No. 10182-111

Cyclone CF* (paraquat) A 2.5 lb/gal formulation of paraquat for weed control in fallow situations. Zenecca.

Cytrol* (2 lb/gal formulation) Trade name for amitrole. Am. Cyanamid.

Dacamine An oil soluble amine salt formulation of 2,4-D. Fermenta.

Herbicide Dictionary

Dacthal (DCPA—75%WP formulation) Used preemergence for annual grass and certain broadleaf weeds in turf, ornamentals and horticultural crops. Fermenta. EPA Reg. No. 50534-1

Detail (0.5 lbs imazaquin + 3.6 lbs dimethenamid—4.1 lb/gal) A combination of Scepter and Frontier for pre and early postemergence use in soybean. Am. Cyanamid. EPA Reg. No. 241-361

Diquat (diquat—2 lb/gal formulation) Used for aquatic weed control and desiccation of legume, soybean and grain sorghum seed crops. Zenecca. EPA Reg. No. 10182-354

Direx 4L (diuron—4 lb/gal formulation) Similar to Karmex. Griffin. EPA Reg. No. 1812-257

DoublePlay (5.6 lbs EPTC + 1.4 lbs acetochlor—7.0 lb/gal) A preplant incorporated combination of EPTC (Eradicane) and Surpass for selective grass control in corn. Zeneca. EPA Reg. No. 10182-388

Dual (metolachlor—7.8 lb/gal formulation) Used preplant or preemergence for annual grass and some broadleaf weeds in corn, sorghum and soybean. Ciba-Geigy. EPA Reg. No. 100-673

Dual II (metolachlor—7.8 lb/gal formulation) metolachlor + a safener. Ciba-Geigy. EPA Reg. No. 100-711

Endothal (endothall) Used preemergence and postemergence for annual grass and broadleaf weeds in sugar beets and as a desiccant. BLF Atochem. 4581-79

Eptam (EPTC—7 lb/gal formulation) Used preplant soil incorporated for grass and certain broadleaf weeds in corn, legumes, sugar beets and many horticultural crops. Zenecca EPA Reg. No. 10182-160

Eradicane (EPTC + R-29148 antidote—available as a 25%DF and 6.7 lb/gal formulation) Used preplant incorporated in corn. The antidote provides greater crop safety. Zenecca. EPA Reg. No. 10182-323

Eradicane Extra (EPTC + R-29148 antidote + R-33865 extender—6 lb/gal formulation) The extender restores performance on soils where Eradicane has ceased to perform. Zenecca. EPA Reg. No. 10182-244

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

Evik (ametryn—80%WP formulation) Used as a directed postemergence contact spray for weeds in corn. Ciba-Geigy. EPA Reg. No. 100-473

Exceed (28.5% prosulfuron + 28.5% primsulfuron—57%DF) For postemergence broadleaf and shattercane control in corn. Ciba EPA Reg. No. 100-774

Express (tribenuron—75%DF) A short residual herbicide for broadleaf weed control in cereal crops. EUP. DuPont. EPA Reg. No. 352-509

Extrazine II* (3 lbs cyanazine + 1 lb atrazine—available in 4 lb.gal, and 90%DF formulations) For PP or preemergence use in corn. DuPont. EPA Reg. No. 352-500

**Restricted Use Pesticide*

Fallow Master (1.5 lbs glyphosate + .6 lbs dicamba—2.1 lb/gal formulation) For total weed control in Ecofallow. Monsanto. EPA Reg. No. 524-390

Far-Go (triallate—available as a 10%DF and a 4 lb/gal formulation) For preplant control of downy brome and other grasses in winter wheat. Monsanto. EPA Reg. No. 524-145-AA

Finesse (62.5% chlorsulfuron + 12.5% metsulfuron—75%DF) For selective weed control in small grains and wheat. DuPont. EPA Reg. No. 352-445

First Rate Under development for postemergence broadleaf weed control in soybean. Dow Elanco

Flexstar (fomesafen—1 lb/gal) Postemergence broadleaf control in soybean. Zeneca. EPA Reg. No. 10182-390

Freedom* (0.33 lbs trifluralin + 2.67 lbs alachlor—3 lb/gal formulation) For preplant incorporated use in soybean. Monsanto. EPA Reg. No. 524-422

Frontier (dimethenamid—7.5 lb/gal formulation) PRE and PPI grass control in corn and soybean. Sandoz. EPA Reg. No. 55947-140

Fusilade 2000 (fluazifop—1 lb/gal formulation) A selective postemergence herbicide for shattercane, volunteer corn and other grasses in soybean, nursery stock and ornamentals. Zenecca. EPA Reg. No. 10182-104

Fusilade DX (fluazifop—2 lb/gal formulation) A selective postemergence herbicide for shattercane, volunteer corn and other grasses in soybean, nursery stock and ornamentals. Zenecca. EPA Reg. No. 10182-367

Fusion (2 lbs fluazifop + 0.66 lbs fenoxaprop—2.66 lb/gal formulation) For postemergence grass control in soybean. Zenecca EPA Reg. No. 10182-343

Galaxy (3 lbs bentazon + 0.67 lbs acifluorfen—3.67 lb/gal formulation) For postemergence broadleaf control in soybean . BASF. EPA Reg. No. 7969-77

Garlon (triclopyr—4 lb/gal formulation) For control of woody plants and broadleaf weeds in non-crop areas. Dow. EPA Reg. No. 62719-32

Gemini (55.4% linuron + 4.6% chlorimuron—60%DF formulation) For preemergence use in soybean. DuPont. EPA Reg. No. 352-544

Glean (chlorsulfuron—75%DF formulation) A pre and postemergence broadleaf herbicide for small grains. DuPont. EPA Reg. No. 352-522

Glyphosate Active ingredient in Honcho, Jury, Mirage, Rascal, Rattler, Ruler, Showoff, and Silhouette. Monsanto.

Goal (oxyfluorfen—1.6 lb/gal formulation) A preemergence herbicide for soybean, onions and nursery stock. Rohm Haas. EPA Reg. No. 707-174

Gramoxone Extra* (paraquat—2.5 lb/gal formulation) Zenecca EPA Reg. No. 10182-280

Grazon P + D (0.54 lb picloram + 2.0 lb of 2,4-D) For woody and perennial weed control in range and permanent grass pastures. Dow Elanco EPA Reg. No. 62719-182

Herbicide Dictionary

Guardsman (2.33 lbs dimethenamid + 2.67 lbs atrazine—5 lb/gal) For selective preemergence and early postemergence weed control in corn. Sandoz. EPA Reg. No. 55947-150.

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

Harness (Acetochlor + safener—7 lb/gal) Used preemergence for selective weed control in corn. Monsanto. EPA Reg. No. 524-476.

Harness Xtra (4.3 lbs acetochlor + safener + 1.7 lbs atrazine—6.0 lb/gal) Use preemergence for selective weed control in corn. Monsanto EPA Reg. No. 524-480

Herbicide 273 (endothall) A postemergence sugarbeet herbicide especially effective against broadleaf weeds. Pennwalt. EPA Reg. No. 4581-223

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

Hoelon* (diclofop—3 lb/gal formulation) Used postemergence for annual grass in soybean and wheat. American Hoechst. EPA Reg. No. 8340-20-54382

Honcho Generic glyphosate. Cornbelt/Independents.

Hyvar (bromacil—80%WP formulation) Used as a soil sterilant and for woody plant control. DuPont. EPA Reg. No. 352-287

Judge Generic Alachlor. Terra.

Jury Generic glyphosate. Terra.

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

Kerb* (pronamide—50%WP formulation) Used preemergence and early postemergence in alfalfa. Rohm & Haas. EPA Reg. No. 707-159

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

Krovar (80%WP formulation) A combination of 40% Hyvar and 40% Karmex. DuPont. EPA Reg. No. 352-505

Laddok* (1.66 lbs bentazon + 1.66 lb atrazine—3.32 lb/gal formulation) For postemergence broadleaf weed control in corn and sorghum. BASF. EPA Reg. No. 7969-54

Laddok S-12* (2.5 lbs bentazon + 2.5 lbs atrazine—5.0 lb/gal formulation) For postemergence broadleaf weed control in corn and sorghum. BASF EPA Reg. No. 7969-100.

Landmaster BW (3.1 lb/gal formulation) A combination of 1.2 lbs glyphosate and 1.9 lbs 2,4-D primarily for no-till. Monsanto. EPA Reg. No. 524-351

Landmaster II (2.2 lb/gal formulation) A combination of 1.2 lbs glyphosate + 1 lb 2,4-D amine. Monsanto. EPA Reg. No. 524-376

Lariat* (4 lb/gal formulation) A prepack of 2.5 lbs alachlor + 1.5 lbs atrazine. Monsanto. EPA Reg. No. 524-329

Lasso* (alachlor—available in 4 lb/gal and 67%DF formulations) Used preplant and preemergence for annual grass and some broadleaf weeds in corn, sorghum, soybean and fieldbean. Monsanto. EPA Reg. No. 524-314

Lasso II* (alachlor—15%WP formulation) Granular formulation of Lasso. Monsanto. EPA Reg. No. 524-296

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

Lexone (metribuzin—available in 4 lb/gal and 75%DF formulations) Trade name for metribuzin. DuPont. EPA Reg. No. 352-390

Linex 4L (linuron—4 lb/gal formulation) Trade name for linuron. Griffin. EPA Reg. 1812-245

Liberty (glufosinate—1.67 lb/gal) Under development for use in herbicide resistant crops. Hoechst-Rousel Agri-Vet.

Linuron (50%WP formulation) Used primarily preemergence for broadleaf weeds in corn, sorghum and soybean. Linex and Lorox.

Lorox (linuron—50%DF formulation) Trade name for linuron. DuPont. EPA Reg. No. 352-394

Lorox Plus (60%DF formulation) A combination of 56.9% Lorox + 3.1% Classic for preemergence use in corn, sorghum, and soybean. DuPont. EPA Reg. No. 352543

Marksman* (3.2 lb/gal formulation) A combination of 1.1 lbs dicamba and 2.1 lbs atrazine for postemergence weed control in corn. Sandoz. EPA Reg. No. 55947-39

MCPA (4 lb/gal formulation) A phenoxy similar to 2,4-D but safer on oats and legumes. Often used in combination. Many trade names. Rhone-Poulenc.

Metribuzin Used for annual broadleaf weeds in soybean, alfalfa and potatoes; often used in combination. Trade names - Lexone and Sencor.

Micro-Tech (4 lb/gal formulation) Micro-encapsulated alachlor. Monsanto. EPA Reg. No. 524-344

Mirage Generic glyphosate. UAP.

MSMA (monosodium methanearsonate) Used for selective crabgrass control in turn and johnsongrass in noncrop areas. Rhone-Poulenc.

Nortron (ethofumesate—4 lb/gal formulation) A preemergence or preplant incorporated herbicide for sugar beet. NOR-AM. EPA Reg. No. 45639-8

Option II (fenoxaprop—0.79 lb/gal formulation) Formerly called Whip. A postemergence grass herbicide similar to Fusilade and Poast. Hoechst-Roussel. EPA Reg. No. 8340-40-54382

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

**Restricted Use Pesticide*

Herbicide Dictionary

Paraquat A nonselective contact herbicide used for no-till and ecofarming, soybean and sunflower desiccation, and on noncropland. Gramoxone Extra. Zenneca

Partner* (alachlor—65%DF formulation) Dry flowable formulation of Lasso. Monsanto. EPA Reg. No. 524-403

Passport (2.6 lb/gal formulation) A combination of 2.4 lbs trifluralin + .2 lbs imazethapyr. American Cyanamid. EPA Reg. No. 241-325

Peak (Prosulfuron—57% DF) Under development for pre and postemergence broadleaf control in sorghum, postemergence control in cereals and proso millet. Ciba-Geigy.

Pendimethalin Common name for Prowl. Also active ingredient in some preemergence turf herbicides. American Cyanamid.

Pennant (metolachor—5 lb/gal formulation) Industrial label for Dual. Ciba-Geigy.

Permit (halosulfuron—75%DF formulation) Used postemergence broadleaf weed control in corn and sorghum. Monsanto. EPA Reg. No. 524-465

Picloram* Common name for Tordon. Dow Elanco

Pinnacle (thifensulfuron—75%DF formulation) Used postemergence for broadleaf control in soybean. DuPont. EPA Reg. No. 352-525

Poast (sethoxydim—1.59 lb/gal formulation) A postemergence herbicide for shattercane, volunteer corn and other grass weeds in soybean and other broadleaf crops. BASF. EPA Reg. No. 7969-58

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

Pramitol (prometon—2 lb/gal formulation) Used primarily for season long control of annual and perennial weeds in noncropped areas. Ciba-Geigy. EPA Reg. No. 100-479

Prefar 4E (bensulide—4 lb/gal formulation) Used preplant for grass and broadleaf weeds in cantaloupe, cucumbers and watermelons. Zenecca. EPA Reg. No. 510-231-1182

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

Princep (simazine—4 lb/gal formulation) A long lasting preemergence or preplant herbicide for corn, shelterbelts. Ciba-Geigy. EPA Reg. No. 100-603

Prism (clethodim—0.94 lbs/gal) Selective postemergnece grass control in onions and sugarbeets. Valent.

Propachlor Active ingredient in Ramrod. Used for grass weed control in corn and sorghum. Monsanto.

Prowl (pendimethalin—4 lb/gal formulation) Used preemergence on corn and preemergence or preplant on soybean grown on soils with more than 1.5% organic matter. American Cyanamid. EPA Reg. No. 241-337

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Pursuit (imazethapyr—2 lb/gal formulation) Same family as Scepter registered postemergence for use in soybean. American Cyanamid. EPA Reg. No. 241-350

Pursuit Plus (.2 lbs imazethapyr 2.7 lbs pendimethalin—2.9 lb/gal formulation) For preplant incorporation use in soybean. American Cyanamid. EPA Reg. No. 241-331

Pyramin FL (pyrazon—4.2 lb/gal formulation) Use for preemergence for broadleaf weeds in sugarbeet. BASF. EPA Reg. No. 7969-81

Rascal Generic glyphosate. Cooperatives.

Ramrod (available in 4 lb/gal and 20%DF formulations) Trade name for propachlor. Monsanto. EPA Reg. No. 524-152-AA

Ramrod-atrazine Flowable (3 lbs propachlor + 1 lb atrazine—4 lb/gal formulation) For broad spectrum weed control in corn and sorghum. Monsanto. EPA Reg. No. 524-328-AA

Raptor Under development for selective postemergence weed control in soybean. Am Cyanamid.

Rattler Generic glyphosate. Helena.

Reflex (fomesafen—2 lb/gal) Used postemergence for selective broadleaf control in soybean. Zenecca. EPA Reg. No. 10182-83

Reliance A combination of 0.32 oz Classic and 0.18 oz of Pinnacle for selective postemergence broadleaf control in STS only. EPA Reg. No 352-580.

Rescue (2 lbs alanap + 0.06 lbs 2,4DB—2.06 lb/gal formulation) For postemergence use for broadleaf weeds in soybean. Uniroyal. EPA Reg. No. 400-166

Resolve (imazethapyr + dicamba) A combination of Pursuit plus Banvel for postemergence weed control in imidazolinone resistant corn hybrids. American Cyanamid EPA Reg. No. (Pursuit—241-310) (Banvel 55947-28-241)

Resource (flumiclorac—0.86 lb/gal) Used for selective postemergence broadleaf control in soybean. Valent. EPA Reg. No. 59639-82

Reward (diquat—2 lb/gal) Used for aquatic and noncrop weed control. Zenecca EPA Reg. No. 10182-353

Rezult (bentazon + sethoxydim) A combination of Basagran and Poast for postemergence for weed control in soybean. BASF EPA Reg. No.(Basagran 7969-45) (Poast 7969-88)

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

Ro-Neet (cycloate—6 lb/gal formulation) Used preplant incorporated in sugarbeet for annual grass and some broadleaf weeds. Zenecca EPA Reg. No. 10182-222

Roundup (glyphosate—4 lb/gal formulation) A postemergence non-selective translocated herbicide for annual and perennial grasses and broadleaf weeds. No soil activity. Monsanto. EPA Reg. No. 524-445

Roundup RT (glyphosate—4 lb/gal formulation) Same as Roundup, but available only in a 100-gallon returnable shuttle. Monsanto. EPA Reg. No. 524-308

Herbicide Dictionary

Ruler Generic glyphosate. Wilber Ellis/Brayton.

Saddle* Generic Alachlor. Van Deist.

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

Salvo A low volatile ester of 2,4-D. Vertac.

Savage (2,4-D—95%WP formulation) Dry formulation of 2,4-D. UAP.

Scepter (imazaquin—available in 1.5 lb/gal and 70%DF formulations) A preplant incorporated, pre- emergence and postemergence grass and broadleaf weed control herbicide for soybean American Cyanamid. EPA Reg. No. 241-289

Scepter O.T. (0.5 lbs imazaquin + 2 lbs acrifluorfen—2.5 lb/gal formulation) For selective postemergence broadleaf control in soybean. American Cyanamid. EPA Reg. No. 241-321

Scorpion III (9.3% flumetsulam, 25% clopyralid, 50% 2,4-D) Used postemergence for selective broadleaf control in corn. DOW.

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

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

Sencor (metribuzin—available in 4 lb/gal, 50%WP and 75%DF formulations) Trade name for metribuzin. Bayer. EPA Reg. No. 3125-325

Showoff Generic glyphosate. Van Deist.

Shotgun* (1.5 lbs 2,4-D + 2.5 lbs atrazine—3.75 lb/gal formulation) For postemergence use in sorghum and corn. UAP.

Silhouette Generic glyphosate. Cenex/Land O'Lakes.

Simazine Common name for Princep. Ciba-Geigy.

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

Solicam (norflurazon—80%DF formulation) Used preemergence in fruit trees. Sandoz. EPA Reg No. 55947-78

Sonalan (ethalfluralin—3 lb/gal formulation) Used preplant incorporated for annual grasses and certain broadleaf weeds in soybean. DowElanco. EPA Reg. No. 62719-120

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

Squadron (0.33 lbs imazaquin + 2 lbs pendimethalin—2.33 lb formulation) For preplant weed control in soybean. American Cyanamid. EPA Reg. No. 241-327

Stall* Generic Alachlor. UAP.

Stature Under development combination of Frontier and Pursuit for preemergence weed control in corn. Am. Cyanamid.

Stinger (clopyralid—3 lb/gal formulation)—For postemergence broadleaf control in sugarbeet and corn. DowElanco. EPA Reg. No. 62719-73

Surflan (oryzalin—4 lb/gal formulation) Used preemergence for annual grasses in trees, turf and ornamentals. Often used in combination. DowElanco. EPA Reg. No. 62719-112

Surpass (acetochlor + safener—6.4 lb/gal formulation) Under development for use pre in corn. Zenecca EPA Reg. No. 10182-325

Surpass 100 (3 lbs acetochlor + safener + 2 lbs atrazine—5 lb/gal) For preemergence control of annual grass and broadleaf weeds in corn. Zenecca. EPA Reg. No. 10182-363

Sutan+ (butylate + R-25788—available in 10%DF and 6.7 lb/gal formulations) A preplant incorporated herbicide for annual grasses in corn. Zeneca. EPA Reg. No. 10182-222

Sutazine+ (4.8 lbs sutan+ + 1.2 lbs atrazine—6 lb/gal formulation) For preplant incorporated weed control in corn. Zeneca. EPA Reg. No. 10182-248

Sychrony A combination of .62 oz of Chlorimuron and .23 oz of Thifensulfuron for postemergence broadleaf control in soybean. EPA Reg No. 352-568.

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

Telar (chlorsulfuron—75%DF) An industrial formulation of the active ingredient in Glean. DuPont. EPA Reg. No. 352-404

Telone (dichlorophene—10.6 lb/gal formulation) A fumigant used preplant for quackgrass in potatoes. DowElanco. EPA Reg. No. 62719-12

Tillam (pebulate—6 lb/gal formulation) Registered preplant incorporated for annual grass control in sugar beet. Zeneca. EPA Reg. No. 10182-158

TopHand (acetochlor + halosulferon + furilazole) A combination of Harness and Battalion for selective preemergence weed control in corn. Monsanto

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

Topsite (0.5% imazapyr + 2.0% diuron) Controls many annual and perennial weeds in non-crop areas. American Cyanamid. EPA Reg. No. 241-344.

Tordon* (picloram—available in 2 lb/gal (22K) or 1.25 lb/gal RTU) formulations) A postemergence herbicide for annual and perennial broadleaf weeds. Residues may last for several years in the soil. DowElanco. EPA Reg. No. 62719-6

Tornado (.75 lbs fluazifop + 1 lb fomesafen) Used postemergence for grass control in soybean. Zeneca EPA Reg. No. 10182-141

Touchdown (sulposate—6 lb/gal formulation) A non selective, non-residual translocated postemergence herbicide. Zeneca. EPA Reg. No. 10182-324

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Herbicide Dictionary

Tough (pyridate—3.75 lb/gal formulation) Used in combination with Bladex or atrazine for postemergence weed control in corn. Agrolinz. EPA Reg. No. 55947-161

Treflan (trifluralin—4 lb/gal formulation) Used preplant incorporated in soybean and nursery stock for annual grass control. DowElanco. EPA Reg. No. 62719-118

Tri-Scept (3 lbs imazaquin + 2.57 lbs trifluralin—5.57 lb/gal formulation) For use in soybean. American Cyanamid. EPA Reg. No. 241-307

Trific DF formulation of trifluralin. Terra.

Trifluralin The active ingredient in Treflan.

Trimec A three way combination of 2.03 lbs 2,4-D, 1.08 lbs micoprop and .21 lbs dicamba for lawn weed and woody plant control. PBI-Gordon. EPA Reg. No. 2217-721

Trinilin Trifluralin.

Turbo (6.55 lbs metolachlor + 1.45 lbs metribuzin—8 lb/gal formulation) For use in soybean. Bayer. EPA Reg. No. 3125-366

Ultima 160 (sethoxydim—1.3 lbs/gal) For selective postemergence grass control in sugarbeets. BASF

Velpar L (hexazinone—90%DF formulation) Used for nonselective postemergence weed control on noncropland, Christmas tree plantings and alfalfa. DuPont. EPA Reg. No. 352-378

Weedazole Trade name for amitrole. Rhone-Poulenc.

Weedone 638 (2.8 lb/gal) A combination of 1 lb 2,4-D acid and 1.8 lbs of 2,4-D ester. Rhone-Poulenc.

Weedtrine II (2,4-D) Granular formulation for aquatic weed control.

Weedtrine D (diquat) Use for aquatic weed control.

Approximate Retail Prices of Selected Herbicides

Herbicide	Price	Herbicide	Price	Herbicide	Price
Accent	$ 26.70/oz	Detail	$120.00/gal	Poast	$ 94.45/gal
Ally	$ 28.46/oz	Diquat	$ 77.80/gal	Poast Plus	$ 48.39/gal
Amber	$ 11.03/oz	DoublePlay	$ 33.22/gal	Pramitol SP	$ 1.20/gal
AAtrex 4L	$ 12.62/gal	Dowpon M	$ 2.15/lb	Pramitol 25E	$ 20.50 gal
AAtrex 80W	$ 3.00/lb	Dual 8E	$ 63.61/gal	Prefar	$ 35.40/gal
AAtrex DF	$ 3.02/lb	Eptam 7E	$ 27.38/gal	Preview	$ 30.57/lb
Alanap L	$ 13.30/gal	Eptam 10G	$ .39/lb	Princep 80W	$ 3.55/gal
Amitrol-T	$ 21.50/gal	Eptam 20G PRE/PPI	$ .85/lb	Princep 4L	$ 16.80/gal
Ammonium Sulfate	$ 0.18/lb	Eradicane	$ 23.58/gal	Prism	$120.00/gal
Aquathol	$ 1.10/lb	Eradicane 25G	$ 1.15/lb	Prowl	$ 29.76/gal
Aquathol 1.6E	$ 45.10/gal	Escort	$ 34.50/oz	Pursuit	$594.87/gal
Aquazine	$ 8.85/gal	Exceed	$ 11.00/oz	Pursuit Plus	$ 76.03/gal
Assure II	$139.00/gal	Exceed	$ 11.82/oz	Ramrod-Atrazine	$ 14.92/gal
Arsenal	$184.54/gal	Extrazine II	$ 18.06/gal	Ramrod-Flowable	$ 16.34/gal
Balan	$ 16.00/gal	Finesse	$ 16.52 oz	Reflex	$ 36.93/gal
Banvel	$ 74.45/gal	Fallow Master	$ 22.80/gal	Reliance	$ 24.00/oz
Basagran	$ 64.47/gal	Far-Go 10G	$ 1.00/lb	Resource	$206.00/gal
Basis	$ 36.36/oz	Freedom	$ 11.96/gal	Reward	$ 95.30/gal
Beacon	$ 25.06/oz	Frontier	$108.00/gal	Reward PRE/PPI	$ 69.50/gal
Betamix	$ 85.00/gal	Fusilade DX	$120.00/gal	Rodeo	$110.45/gal
Betamix Progress	$ 99.00/gal	Fusilade 2000	$ 86.00/gal	Ro-Neet 7E	$ 51.50/gal
Bicep/Bicep II	$ 32.51/gal	Fusion	$143.25/gal	Roundup	$ 46.19/gal
Bladex 4L	$ 23.93/gal	Galaxy	$ 56.84/gal	Roundup RT	$ 35.00/gal
Bladex 90DF	$ 5.31/lb	Glean	$ 18.23/oz	Salute	$ 65.90/gal
Blazer 2L	$ 57.67/gal	Goal 1.6E	$ 77.00/gal	Sceptor	$214.65/gal
Broadstrike Plus	$ 61.00/gal	Gramoxone Extra	$ 30.76/gal	Scorpion III	$ 2.23/oz
Broadstrike + Dual	$ 78.00/gal	Grazon P + D	$ 26.00/gal	Select	$204.24/gal
Broadstrike + Treflan	$ 72.00/gal	Guardsman	$ 36.93/gal	Sencor 4L	$136.39/gal
Brominal 3+3	$ 77.00/gal	Harmony Xtra	$ 11.97/oz	Sencor DF	$ 25.96 lb
Bronate	$ 54.61/gal	Harness Plus	$ 65.00/gal	Sinbar	$ 22.50/lb
Bronco	$ 26.86/gal	Herbicide 273	$ 38.00/gal	Solicam	$ 10.80/lb
Buctril	$ 52.45/gal	Hoelon	$ 60.25/gal	Sonalan	$ 32.29/gal
Buctril Gel	$108.61/gal	Hyvar X	$ 17.25/gal	Sonalan PRE/PPI	$ 1.25/lb
Buctril + Atrazine	$ 34.71/gal	Hyvar XL	$ 50.55/gal	Spike 5G	$ 3.00/lb
Bullet	$ 19.71/gal	Karmex 80W	$ 4.30/lb	Spike 80W	$ 21.50/lb
Butoxone	$ 15.00/gal	Kerb	$ 26.75/lb	Spike 20P	$ 8.60/lb
Butyrac	$ 35.71/gal	Krenite	$ 58.35/gal	Squadron	$ 60.39/gal
Canopy	$ 36.88/lb	Krovar I	$ 9.20/lb	Stinger	$466.22/gal
Casoron 10G	$ 3.40/lb	Laddok	$ 36.72/gal	Surflan	$ 67.00/gal
Casoron 50W	$ 15.00/lb	Laddok S-12	$ 38.50/gal	Surpass	$ 57.00/gal
Casoron 4G	$ 1.25/lb	Landmaster BW	$ 19.15/gal	Surpass 100	$33.70/gal
Classic	$ 18.14/oz	Lasso	$ 25.71/gal	Sutan+	$ 20.67/gal
Clarity	$ 85.10/gal	Lasso II	$ 0.99/lb	Sutazine	$ 17.85/gal
Cobra	$117.51/gal	Lariat	$ 19.22/gal	Syncrony	$ 17.50/oz
Commence	$ 64.30/gal	Leafex 3	$ 3.45/gal	Team	$ 25.00/oz
Command 4EC	$ 79.26/gal	Lexone 4L	$142.70/gal	Telar	$ 21.55/oz
Concert PRE/PPI	$ 24.00/oz	Lexone DF	$ 26.08/lb	Treflan	$ 33.11/gal
Contour	$ 99.18/gal	Lorox DF	$ 9.02/lb	Treflan PRE/PPI	$ 1.09/lb
Crop Oil Conc.	$ 4.24/gal	Lorox Plus	$ 16.01/lb	Topnotch	$ 34.00/gal
Crossbow	$ 43.00/gal	Marksman	$ 25.51/gal	Tordon 22K	$ 91.24/gal
Curbit	$ 39.00/gal	MCPA	$ 13.83/gal	Tough	$ 56.00/gal
Curtail	$ 33.93/gal	Micro-Tech	$ 26.08/gal	Turbo	$ 99.27/gal
Cycle	$ 33.93/gal	Norosac 4G	$ 1.25/gal	UAN	$ 0.70/gal
Cyclone CF	$ 26.13/gal	Nortron SC	$166.00/gal	Ultima 160	TBA
2,4-D amine	$ 10.75/gal	X-77	$ 17.50/gal	Velpar	$ 52.00/lb
2,4-D ester	$ 13.51/gal	Partner	$ 4.15/lb	Vernam	$ 28.00/gal
Dacthal 75W	$ 4.80/lb	Permit	$ 13.02/oz		
Defol 6	$ 5.60/gal	Pinnacle	$ 28.99/oz		

Weed Science Publications

Annual Broadleaf Control in Winter Wheat - G88-863
Banvel and 2,4-D Damage to Fieldbeans and Soybean - G86-802
Band Application of Herbicides - G76-294
Calibrating a Sprayer - G82-566
Canada Thistle Control - G80-509
Chemical Control of Rangeland Weeds - G88-871
Common Milkweed - G77-384
Control of Downy Brome in Alfalfa - G79-436
Controlling Jointed Goatgrass - G95-1252
Controlling Volunteer Rye in Winter Wheat - G94-1225
Disposal of Excess Pesticides and Related Waste - G79-473
Downy Brome Control - G78-422
Ecofarming: Fallow Aids in Winter Wheat Fallow Rotations - G81-546
Ecofarming: Floaters for Herbicide Application - G81-550
Ecofarming: Management of Atrazine Carryover in Ecofallow - G81-570
Ecofarming: Selection of Sprayers - G80-500
Ecofarming: Spring Row Crop Planting and Weed Control in Winter Wheat Stubble - G81-551
Ecofarming-Growing the Winter Wheat Crop - G91-1009
Ecofarming-Managing Corn and Sorghum Residue During Fallow - G91-1010
Factors Affecting Foliar-Applied Herbicides G84-700
Fine Tuning a Sprayer With the "Ounce" Calibration Method - G88-865
Field Sandbur Control in Corn - G74-121
Guidelines for Constructing a Pipewick Applicator - G81-555
Hay Fever Plants of Nebraska - EC77-199
Hemp Dogbane - G83-665
Herbicides and Soils - G83-653
Lawn Weeds - NC Regional Pub. No. 26
Leafy Spurge - G87-834
NebraskaHERB (4.0) Computer Program for Postemergence Weed Control in Selected Crops CP-11
No-Till Corn in Alfalfa Sod - G74-131
Nozzles-Selection and Sizing - G89-955
Plumbing Systems for Agricultural Sprayers - G91-1020
Right Crop Stage for Herbicide Use: Alfalfa, Sugarbeet, Soybean and Fieldbeans - G78-390
Right Crop Stage for Herbicide Use: Corn, Sorghum, Small Grains - G77-382
Sagebrush Control - G80-510
Spray Drift of Pesticides - G90-1001
Quick Test for Atrazine Carryover - G74-113
Velvetleaf - G83-681
Vine Weeds - NC Regional Pub. No. 33
Weed Control in Alfalfa - G95-1254
Weed Control Along Irrigation Pipe and Ditchbanks - G78-420
Weed Control in No-Till Corn, Grain Sorghum and Soybean Production - G89-899
Weed Control in Reduced Tillage Corn - G74-123
Weed Control on CRP Acres - G89-905