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EC92-130 A 1992 Guide for....Herbicide Use in Nebraska

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A 1992 Guide for---
HERBICIDE USE IN NEBRASKA

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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 stations and elsewhere. Consult product label for additional information. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Cooperative Extension is implied.

RESTRICTED USE HERBICIDES. Amitrole, Atrazine, AAtrex, Bicep, Bladex, Bronate, Buctril, Bullet, Cannon, Cycle, Cyclone, Extrazine II, Freedom, Gramoxone Extra, Hoelon, Kerb, Laddok, Lasso, Lariat, Marksman, Micro-Tech, Partner, Tordon are restricted use herbicides. Other herbicides may be classified as restricted use at some future date. The label wil indicate if a product is restricted use. Only certified applicators should apply or supervise the application of restricted use herbicides. See your Extension Agent if you need to be certified.

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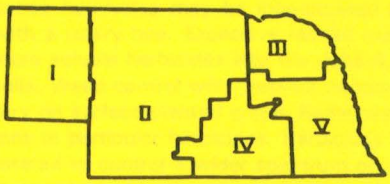

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PROTECT

"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, 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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NOTES

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 row where herbicides are applied PPSA or EPP. **Preplant incorporated** (PPI) treatments are made before planting the crop. Thoroughly incorporate with rototiller or two passes of a tandem disc, field cultivator or similar equipment. **Preemergence** (PRE) treatments are applied from planting time to just before crop emergence or weed seed germination. **Surface mix** 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. 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 emerged 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.

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, or 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 to 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 evenflow 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. Again set up with two or three nozzles for good coverage. Higher pressures are normally needed for the postemergence herbicides, especially where good coverage is important. For additional information on nozzles see NebGuide G89-995, 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, and ceramic nozzles in the long run are the most economical.
3. Get 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 hose 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.

CONSERVATION TILLAGE SYSTEMS

No-Till

Early preplant treatments generally provide the most satisfactory weed control. This involves applying residual 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 residual 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, 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, 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 preceeding year is not worked into the soil when the seedbed is prepared. During planting, sweeps or discs 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 sweep, 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. It is better to apply the 2,4-D at planting time 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 sweep. 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.

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 23.

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. The following is a partial list of herbicides which have carryover potential in Nebraska.

1. Ally
2. Atrazine, AAtrex
3. Atrazine prepacks: Bicep, Bullet, Extrazine II, Lariat, Marksman, Sutazine
4. Command, Commence
5. Canopy, Classic, Preview, Lorox Plus
6. Glean
7. Princep
8. Pursuit, Pursuit Plus, Passport
9. Scepter, Squadron, Tri-Scept
19. Tordon
11. Treflan, Sonalan, Prowl

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 bioassays can be obtained in the NebGuide entitled "A Quick Test for Atrazine Carryover", G74-113.

HERBICIDE RESISTANCE

Herbicide resistant weeds can develop as a result of repeatedly using the same herbicide. 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 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 and Ally are examples) has been confirmed in several states. 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 weed competitiveness. Planting sorghum and soybeans 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, page 4.
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

Herbicides can be classified into families based on their chemical similarity. In some cases, herbicides from different families have a 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 carbamothioate 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 triazine herbicides (Atrazine, Bladex, etc.) 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.

AMINO ACID INHIBITOR
- ALS Inhibitors
  - Imidazolinones
    - Arsenal - imazapyr
    - Pursuit - imazethapyr
    - Scepter - imazaquin
  - Sulfonylureas
    - Accent - nicosulfuron
    - Ally - metsulfuron
    - Beacon - primisulfuron
    - Classic - chlorimuron
    - Glean - chlorsulfuron
    - Oust - sulfometuron
    - Pinnacle - thifensulfuron methyl
  - EPSP Inhibitor
    - Roundup - glyphosate

PIGMENT INHIBITORS
- Unclassified
  - Amitrole - amitrole
  - Command - clomazone
  - Zorial - norflurazol

GROWTH REGULATORS
- Benzoics
  - Banvel - dicamba
- Phenoxys
  - 2,4-D - many
  - 2,4-DB - butyrac
  - MCPA - MCPA
  - MCPP - mecroprop
- Unclassified
  - Garlon - triclopyr
  - Stinger - clopyralid
  - Tordon - picloram

LIPID INHIBITORS
- Carbamothioates
  - Avadex - diallate
  - Eptam - EPTC
  - Eradicane - EPTC
  - Far-Go - triallate
  - Ro-Neet - cycloate
  - Sutan - butylate
  - Vernam - vernolate
- Diphenyl ethers
  - Blazer - acifluorfen
  - Goal - oxyfluorfen
  - Reflex - fomesafen
- Unclassified
  - Assure - quizalopfop
  - Fusilade 2000 - fluazifop
  - Hoelon - diclofop-methyl
  - Option - fenoxaprop
  - Poast - sethoxydim

PHOTOSYNTHETIC INHIBITORS
- Bipyridiliums
  - Cyclone - paraquat
  - Diquat - diquat
  - Gramoxone Extra - paraquat
- Triazines
  - AAtrex - atrazine
  - Bladex - cyanazine
  - Evik - ametryn
  - Igran - terbutryn
  - Lexone/Sencor - metribuzin
  - Milogard - propazine

Pramitol - prometon
Princep - simazine
Velpar - hexazinone
Uracils
Hyvar - bromacil
Sinbar - terbacil
Ureas
Karmex - diuron
Lorox - linuron
Spike - tebuthiuron
Unclassified
Basagran - bentazon
Tough - pyridate

PROTEIN INHIBITORS
Amides
Dual - metolachlor
Lasso - alachlor
Ramrod - propachlor
Phenylcarbamates
Betanal - phenmedipham
Chem-Hoe - propham
Furloe - chlorpropham
Dinitroanalines
Balan - benefin
Prowl - pendimethalin
Sonalan - ethalfluralin
Surflan - oryzalin
Treflan - trifluralin
Unclassified
Dacthal - DCPA
Kerb - pronamide

RESPIRATORY INHIBITORS
Hydroxybenzonitriles
Buctril - bromoxynil

UNKNOWN
Endothall - endothall
Krenite - fosamine
MSMA - many

MINIMIZING GROUNDWATER CONTAMINATION

Pesticide contamination of ground 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, which is to say, the contamination can be traced back to an identifiable area. Point source contamination accounts for large doses being introduced into groundwater and as a result poses the greatest 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 or you can consult NEBGUIDE G89-923: Anti-Pollution Protection When Applying Chemicals with Irrigation Systems.

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 in surface runoff as a result of soil erosion. The extent of non-point source contamination is dependent upon herbicide, soil, geological, production management, and weather factors.

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 minimum 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.

It is also helpful to identify high risk areas. The greatest risk for contamination exists where the groundwater 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.

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 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 or surfactants and agitate. Don't over agitate.
(5) Finish filling tank with water and continue 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 compatability test if in doubt.**

CLEANING THE SPRAYER

First rinse the sprayer with a material which acts as a solvent for the herbicide. Dispose of rinseate 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 more water-soluble herbicides repeated rinsing with water is usually enough. Hormone type require extra precautions. 2,4-D amine salts are water-soluble.

Banvel, 2,4-D — Cleanup Procedure

If Banvel, or 2,4-D were used, fill the tank with water and ammonia. Add 1 gallon of household ammonia to 25 gallons of water. 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 2,4D. Agitate the suspension for 2 to 3 minutes and drain, then rinse thoroughly with clear water.

Atrazine, Bicep, Bladex, Bullet, Extrazine II, Lariat, Lexone, Marksman, Sencor, Sutazine — Cleanup Procedure

See that none of the powder remains in the tank. A thorough rinsing with water is usually sufficient. Thoroughly clean all equipment immediately after use.

Accent, Ally, Amber, Beacon, Classic, Gemini, Glean, Pinnacle, Canopy, Preview — Cleanup Procedure

1) Drain tank, then flush tank, boom and hoses with clean water for a minumum of 10 minutes.
2) Fill the tank with clean water, then add 1 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.

WEED RESPONSE TO SELECTED HERBICIDES

Field Corn, Popcorn *and Sweetcorn**

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 37 - 44 for additional problem weeds and their control.

Response Ratings:
Ratings are for light to moderate weed populations and favorable conditions. High weed populations or adverse conditions will reduce control.
E = Excellent (90-100%)
G = Good (75-90%)
F = Fair (50-75%)
P = Poor (0-50%)

Herbicide	annual morning glory	barnyardgrass	b. nightshade	cocklebur	crabgrass	fall panicum	foxtail	jimsonweed	kochia	kochia-triazine resistant	lambsquarters	pigweed	ragweed	R. thistle	sandbur	shattercane/sorghum	smartweed	sunflower	velvetleaf	w. buckwheat	crop safety[a]	recrop interval in months, when changing to nonlabeled crop[b]
Soil Applied Herbicides																						
AAtrex/Atrazine*,**	E	G	E	G	F	P	G	E	E	P	E	E	E	E	F	P	E	E	E	E	E	6-24
Bicep or Dual + AAtrex*,**	G	E	E	F	G	G	E	G	E	P	E	E	E	G	F	P	G	G	G	G	G	6-24
Bladex	E	G	E	G	G	F	G	E	E	P	E	F	E	E	F	P	E	G	F	E	G	2-4
Bladex + Atrazine or Extrazine II*,**	E	G	E	G	G	F	G	E	E	P	E	G	E	E	F	P	E	G	G	E	G	6-24
Cycle**	G	E	E	F	E	E	E	F	E	P	G	G	E	G	F	P	G	F	F	G	G	4-18
Dual*,**	P	E	G	P	E	E	E	P	P	P	G	G	F	P	F	P	P	P	P	P	G	4-18
Dual + Atrazine + Sencor	G	E	E	F	G	G	E	F	G	P	E	E	E	G	F	P	G	G	G	G	G	6-24
Dual + Bladex	G	E	E	F	E	E	E	F	E	P	G	G	E	G	F	P	G	F	F	G	G	4-18
Dual + Bladex + Sencor	G	E	E	F	E	E	E	F	G	P	G	G	E	G	F	P	G	F	F	G	G	4-18
Eradicane*,**	G	E	E	P	E	E	E	P	F	F	G	G	F	P	G	G	P	P	P	F	G	1-2
Eradicane + Atrazine*,**	G	E	E	F	E	E	E	G	E	F	E	E	G	G	G	G	G	G	G	G	G	6-24
Eradicane + Bladex*	G	E	E	F	E	E	E	G	E	F	E	G	G	G	G	G	G	F	F	G	G	2-4
Lasso*,**	P	E	G	P	E	E	E	P	P	P	G	G	F	P	F	P	P	P	P	P	G	2-4
Lariat/Bullet or Lasso + Atrazine*,**	G	E	E	F	G	G	E	F	E	P	E	E	E	G	F	P	G	G	G	G	G	6-24
Lasso or Dual + (Atrazine + Bladex) or Extrazine II	G	E	E	F	E	E	E	F	E	P	E	E	E	G	F	P	G	G	G	G	G	6-24
Lasso + Atrazine + Sencor	G	E	E	F	G	G	E	F	G	P	E	E	E	G	F	P	G	G	G	G	G	6-24
Lasso + Bladex*	G	E	E	F	E	E	E	F	E	P	G	G	E	G	F	P	G	F	F	G	G	2-4
Lasso + Bladex + Sencor	G	E	E	F	E	E	E	F	G	P	G	G	E	G	F	P	G	F	G	G	G	2-18
Prowl + Atrazine	G	E	G	F	E	E	E	F	E	F	E	E	G	G	F	P	G	G	G	G	G	6-24
Prowl + Bladex	G	E	G	F	E	E	E	F	E	F	E	G	G	G	F	P	G	F	F	F	G	4-12
Sutan+*,**	F	E	G	P	E	E	E	P	P	P	G	F	F	P	G	G	P	P	P	F	G	1-2
Sutan+ + Atrazine*	G	E	E	F	E	E	E	G	E	P	E	E	G	G	G	G	G	G	G	G	G	6-24
Sutan+ + (Atrazine + Bladex) or Extrazine II*	G	E	G	P	E	E	E	G	E	P	E	E	G	G	G	G	G	G	F	G	G	6-24
Sutan+ + Bladex*	F	E	G	P	E	E	E	G	E	P	E	G	G	G	G	G	G	F	F	G	G	2-4
Sutazine+*,**	G	E	E	F	E	E	E	G	E	P	E	E	G	G	G	G	G	G	G	G	G	6-24
Postemergence Herbicides																						
Weed size influences performance — See label																						
AAtrex/Atrazine/Bicep*,**	E	F	E	E	F	P	G	E	E	P	E	E	E	F	F	P	E	E	E	E	G	6-24
Accent	G	G	-	-	P	G	G	G	-	-	-	G	-	-	G	E	G	-	-	-	G	1-18
Banvel	E	P	G	E	P	P	P	F	G	G	G	G	G	E	P	P	E	G	F	E	G	1-2
Beacon	G	P	G	E	P	G	F	G	G	G	F	G	E	F	F	E	G	E	F/G	G	G	1-18
Laddok*,**	G	P	G	E	P	P	P	E	G	G	G	G	E	P	P	P	E	E	E	E	E	6-24
Bladex	G	F	E	G	G	F	G	E	E	P	E	G	E	F	F	P	E	G	G	G	F	2-4
Buctril*	E	P	E	E	P	P	P	E	G	G	G	G	E	G	P	P	E	E	E	E	E	0
Buctril + Atrazine	E	P	E	E	P	P	P	E	G	G	E	E	E	G	P	P	E	E	E	E	E	6-24
Buctril + Banvel	E	P	E	E	P	P	P	G	E	E	G	E	G	E	P	P	E	E	E	E	G	1-2
Extrazine II*,**	G	F	E	E	G	F	G	E	E	P	E	G	E	F	F	P	E	G	G	E	G	6-24
Marksman	E	P	E	E	P	P	P	G	G	G	E	E	E	G	P	P	E	E	E	E	G	6-24
2,4-D**	E	P	G	E	P	P	P	G	F	F	G	G	G	F	P	P	F	G	G	P	F	1
2,4-D + Banvel	E	P	E	E	P	P	P	F	G	G	G	G	G	G	P	P	E	G	G	E	G	1-2

[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. For more information see "Herbicide Carryover", G83-637.

*Registered for popcorn.

**Registered for sweet corn.

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
Corn, No-Till in Cool-Season Grass Sod (including bromegrass and bluegrass)					
AATREX/ATRAZINE 4L	Do not use[a]	2.4 qt	3 qt	Apply in early spring	Weak on warm-season perennial grasses. Add Gramoxone Extra if bromegrass exceeds 4'' tall. Cost: $6.25-$7.80
ROUNDUP[1]	1-1.5 qt	1-1.5 qt	1-1.5 qt	Fall new growth	Use appropriate herbicide at planting. Cost: $10.00-$15.00
Corn, No-Till in Alfalfa Sod					
2,4-D	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: $6.20.
+					
BANVEL	0.5 pt	0.5 pt	0.5 pt		
followed by: appropriate herbicide at planting or early preplant					
Corn, No-Till in 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 + Gramoxone $13.30-$21.30; AAtrex + Bronco $28.30-$41.95; Atrazine + Bladex + Gramoxone Extra $15.40-$28.75.
+					
BRONCO	3 qt	4 qt	4.5 qt		
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 qt	1.5-2.5 qt		
AATREX 4L	Do not use[a]	2.4 qt	3 qt		
+					
GRAMOXONE EXTRA[1]		1.5-2.5 qt	1.5-2.5 qt		
Corn, No-Till Continuous Row Crop[2]					
AATREX/ATRAZINE 4L	Do not use[a]	2.4 qt	3 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 w/o Gramoxone Extra: $5.20-$7.80; Bicep $12.00-$18.00; Dual + Atrazine $13.75-$20.05; Bladex + Atrazine $5.55-$14.80; Bullet $14.00-$17.00; Extrazine II + Dual $15.85-$28.70; Atrazine + Bladex + Dual $16.25-$25.70.
AATREX/ATRAZINE 4L	1.4 qt	1.6 qt	1.8 qt		
+					
DUAL	1.5 pt	1.75 pt	2 pt		
AATREX/ATRAZINE 4L	1.2 qt	1.6 qt	2 qt		
+					
MICRO-TECH	2.25 qt	2.25 qt	2.75 qt		
BICEP	1.8 qt	2.4 qt	3 qt		
BULLET	3.5 qt	3.75 qt	4.25 qt		
AATREX/ATRAZINE 4L	0.75 qt	1.4 qt	2 qt	0-30 days preplant. On sand use at least 14 days preplant.	
+					
BLADEX 4L	0.75 qt	1.4 qt	2 qt		
AATREX 4L	0.5 qt	0.75 qt	1 qt		
+					
BLADEX 4L	1.0 qt	1.5 qt	2 qt		
+					
DUAL	1.5 pt	1.75 pt	2 pt		
EXTRAZINE II	1.5 qt	2.75 qt	4.0 qt		
with or without					
DUAL	1.5 pt	1.75 pt	2 pt		

FIELD CORN, POPCORN*, SWEETCORN** Tilled Seedbed

Herbicide (See Weed Response Chart 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*,**	Do not use[a]	2.6 lb	3.3 lb	EPP, PPSA, PPI, PRE, SURFACE MIX or EARLY POST...May affect sensitive crops the following year especially on high pH soils. Cost: $5.15-$7.70.
BICEP*,**	1.5 qt	1.8 qt	2.4 qt	EPP, PPSA, PRE, SURFACE MIX, EARLY POST or LAYBY... Cost: $9.00-$14.40.
BLADEX DF	Do not use	2.7 lb	3.6 lb	PPSA, PRE, SURFACE MIX or 80W EARLY POST...Injury may occur on soils that are calcareous, sandy or below 1% organic matter. Cost: $12.60-$16.40.

[a]Risk of contaminating groundwater.

FIELD CORN, POPCORN*, SWEETCORN**

Tilled Seedbed, cont.

Herbicide (See Weed Response Chart 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
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: $6.85-$12.85.
+				
ATRAZINE DF	0.40 lb	0.90 lb	1.30 lb	
BULLET*,**	3.0 qt	3.2 qt	3.5 qt	PPSA, PRE, or SURFACE MIX. Cost: $12.00-$14.00.
DUAL 8E*,**	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. Injury may occur with Dual + Bladex on soils that are calcareous, sandy or below 1% organic matter. Cost: Dual $10.00-$20.00; Dual + AAtrex $11.25-$17.40; Dual + Bladex $13.90-$23.45.
or				
DUAL 25G*,**	6 lb	8 lb	10 lb	
DUAL 8E*,**	1.3 pt	1.5 pt	2.0 pt	
+				
AATREX DF*,**	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	2 pt	PPSA or PRE...3-way mix. Injury may occur on soils that are calcareous, sandy or below 1% organic matter. Cost: $12.75-$21.25.
+				
ATRAZINE DF	0.55 lb	0.55 lb	0.69 lb	
+				
BLADEX DF	0.55 lb	1.1 lb	1.38 lb	
ERADICANE 6.7E*,**	4.75 pt	5 pt	5 pt	PPI...Apply treatments to dry surface soil and immediately incorporate by cross tandem discing or similar soil mixing. Injury may occur with Bladex on soils that are calcareous, sandy or below 1% organic matter. See page 42 for shattercane control. Repeated use of Eradicane or Eradicane Extra will lead to reduced weed control. Consider crop rotations. Cost: Eradicane $12.35; Eradicane + Atrazine $16.70; Eradicane + Bladex $21.75.
ERADICANE 6.7E*,**	5.25 pt	5.3 pt	5.5 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 $6.85-$12.85; Extrazine + Dual or Lasso $15.40-$19.40.
EXTRAZINE II DF	1.38 lb	1.94 lb	2.50 lb	
+				
DUAL	1.3 pt	1.75 pt	2 pt	
or				
LASSO 4EC	2 qt	2 qt	2 qt	
LASSO 4EC*,**	Do not use[a]	2.5 qt	3 qt	PPSA, PRE, or SURFACE MIX Cost: $16.20-$22.00.
or				
LASSO II 15G*,**		17 lb	20 lb	
LASSO 4EC*,**	2 qt	2 qt	2.25 qt	PPSA, PRE, or SURFACE MIX, Cost: $12.00-$13.00.
+				
AATREX/ATRAZINE DF*,**	1.1 lb	1.33 lb	1.77 lb	
LARIAT*,**	3.0 qt	3.2 qt	3.5 qt	
LASSO 4EC	2 qt	2 qt	2 qt	PPSA, or PRE...Injury may occur on soils that are calcareous, sandy or below 1% organic matter. Cost: $15.40-$20.00.
+				
BLADEX DF	1.1 lb	1.88 lb	2.2 lb	
LASSO 4EC	2 qt	2 qt	2 qt	PPSA or PRE...3-way mix. Injury may occur on soils that are calcareous, sandy or below 1% organic matter. Cost: $14.45-$18.60.
+				
ATRAZINE DF	0.55 lb	0.55 lb	0.69 lb	
+				
BLADEX DF	0.55 lb	1.1 lb	1.38 lb	
PROWL 4EC	Do not use	1.5 qt	1.5 qt	PRE...Corn injury may occur if replanting is necessary. Rainfall shortly after planting required for performance. See page 44 for wild proso millet. Cost: Prowl + Bladex $17.65-$19.00; Prowl + Atrazine $12.80.
+				
ATRAZINE DF		1.33 lb	1.77 lb	
or				
BLADEX DF		1.88 lb	2.2 lb	
SUTAN+ 6.7E	5 pt	5 pt	5 pt	PPI...Apply treatments to dry surface soil and immediately incorporate by cross tandem discing or similar soil mixing. Repeated use will lead to reduced weed control. Cost: $11.25.

[a]Risk of contaminating groundwater.

FIELD CORN, POPCORN*, SWEETCORN**

Tilled Seedbed, cont.

Herbicide (See Weed Response Chart 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
SUTAN + 6.7E*	3.75 pt	3.75 pt	3.75 pt	PPI...Apply treatments to dry surface soil and immediately incorporate by cross tandem discing 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 $10.50-$12.00; Sutan + Bladex $13.15-$18.20; Sutazine $12.60-$14.70.
+ ATRAZINE DF*	1.1 lb	1.33 lb	1.77 lb	
or BLADEX DF**	1.1 lb	1.94 lb	2.2 lb	
SUTAZINE + *	6 pt	7 pt	7 pt	
SUTAN + 6.7E*	3.75 pt	3.75 pt	3.75 pt	PPI...Tank mix. Apply to dry surface soil. Incorporate immediately by cross tandem discing or equivalent soil mixing. Increase rates for sandbur and shattercane control. Injury may occur on soils that are calcareous, sandy or below 1% organic matter. Repeated use of Sutan will lead to reduced weed control. Cost: Sutan + Atrazine + Bladex $11.30-$13.40; Sutan + Extrazine II $12.95-$16.15.
+ ATRAZINE DF*	0.55 lb	0.55 lb	0.69 lb	
+ BLADEX DF*	0.55 lb	1.1 lb	1.38 lb	
or EXTRAZINE II DF	1.38 lb	1.94 lb	2.2 lb	

Postemergence

Herbicide	Rate Per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
AATREX/*,** 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 layby applications when corn is less than 12" tall and weeds less than 1 1/2" tall. Cost: $5.15-$18.50.
or BICEP*,**	1.8-2.4 qt		
ACCENT	0.67 oz	Corn 4"-20" broadcast, <20" use post directed Shattercane <6"	Use with oil concentrate or surfactant. Do not use if Counter was applied to the crop. Do not use Beacon within 20 days of an 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 postemergence organophosphate treatment. Beacon may be applied at 0.38 oz followed by a second 0.38 oz treatment if required. Corn hybrids vary in tolerance to Beacon. Cost: $19.50.
BEACON	0.75 oz	Corn 4"-20" broadcast <20" use post directed Shattercane <6"	
BANVEL	0.5-1 pt	Corn spike to 5"	Use higher rate only on silty clay loam soil containing more than 2 1/2% organic matter. Observe precautions regarding Banvel use near sensitive crops. Cost: $3.40-$6.80.
	0.5 pt	Corn 8"-24"	
BLADEX 80W	2.5 lb	Grass weeds 1" or less; corn before 5-leaf stage	Use with water or vegetable oils or surfactants. Do not use on sand or loamy sand. Do not use Bladex 4L. Decrease rate if Bladex was used earlier. Cost: $9.30.
or BLADEX 90DF	2.2 lb		
BUCTRIL*	1-1.5 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: $5.60-$8.40; with Atrazine $6.90-$9.70; Buctril + Atrazine $4.80-$7.20.
with or without ATRAZINE	1 pt		
BUCTRIL + ATRAZINE	2-3 pt		
BUCTRIL	1.0 pt	After corn is 8" and before 24" high; 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 sugar beets, fieldbeans, alfalfa, soybeans, 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 $.70-$2.20; 2,4-D + Banvel $3.75; Banvel $3.40; Banvel + Buctril $9.00.
+ BANVEL	0.5 pt		
2,4-D AMINE**	1-2 pt	When corn is small, over 8" use drop nozzles	
or 2,4-D LV ESTER**	0.5-1 pt		
2,4-D AMINE	0.25 pt		
or ESTER	0.25 pt		
+ BANVEL	0.5 pt		
EXTRAZINE II 4L	1.25-2 qt	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: $4.55-$7.50.
LADDOK*,**	2.5 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: $6.00.
MARKSMAN	2-3 pt	Before corn exceeds 5-leaf stage	Observe precautions regarding Banvel use near sensitive crops specified above. Use only on silty clay loam soil containing more than 2 1/2% organic matter. Cost: $5.00-$7.50.
SENCOR 75DF + BUCTRIL + ATRAZINE	1.5-2 oz	Broadleaf weeds 2-4" high	Apply before canopy closes. Use 1 gallon 28% UAN. Cost: $10.50.

FIELD CORN, POPCORN*, SWEETCORN**

Postemergence, cont.

Herbicide	Rate Per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
DUAL*,**	1.5-3 pt	Layby	Apply after furrowing or final cultivation. Weeds less than 1 1/2" tall may be controlled with Bicep. Cost: Dual $10.15-20.25.
PROWL 4EC	0.75-1.5 qt	Corn 4" to Layby	Cover brace roots by cultivation before application. Incorporate by tillage, irrigation or rain within a week. Cost: Prowl $4.90-$9.75.
TREFLAN	1.5-2.0 qt	Corn 2-leaf to layby	Incorporate with rainfall, sprinkler irrigation water or cultivate within 24 hours. Cost: $5.35-$8.00.
TREFLAN EC + ATRAZINE 4L	1.5-2 pt 1-1.5 qt	Corn 2-leaf through 12" weeds unemerged	Incorporate with 1/2" rainfall, sprinkler irrigation water or cultivate within 24 hours of application. Cost: Treflan + Atrazine $7.95-$11.00.
Harvest Aid			
2,4-D LV ESTER	1 qt	After dough stage	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: $2.80.

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 37-44 for additional problem weeds and their control.

Response Ratings:
Ratings are for light to moderate weed populations and favorable conditions. High weed populations or adverse conditions will reduce control.
E = Excellent (90-100%)
G = Good (75-90%)
F = Fair (50-75%)
P = Poor (0-50%)

Herbicide	annual morning glory	barnyardgrass	b. nightshade	cocklebur	crabgrass	fall panicum	foxtail	jimsonweed	kochia	kochia-triazine resistant	lambsquarters	pigweed	ragweed	R. thistle	sandbur	shattercane/sorghum	smartweed	sunflower	velvetleaf	w. buckwheat	crop safety[a]	recrop interval in months, when changing to unlabeled crop[b]
Soil Applied Herbicides																						
AAtrex*/Atrazine	E	G	E	G	F	P	G	G	E	P	E	E	E	E	F	P	E	E	G	E	F	6-24
Bicep* + Concep	G	E	E	F	G	G	E	G	E	P	E	E	E	G	F	P	G	G	F	G	G	6-24
Dual* or Lasso + Seed Safener	P	E	G	P	E	E	E	P	P	P	G	G	F	P	F	P	P	P	P	P	G	2-18
Dual or Lasso + Atrazine + Seed Safener	G	E	E	F	G	G	E	F	E	P	P	E	E	G	F	P	G	G	F	G	G	6-24
Lariat + Seed Safener	G	E	E	F	G	G	E	F	E	P	E	E	E	G	F	P	G	G	F	G	G	6-24
Ramrod	P	G	P	P	G	G	E	P	P	P	F	G	P	P	P	P	F	P	P	F	E	1-2
Ramrod + Atrazine	G	G	G	F	G	F	E	F	E	P	E	E	G	G	P	P	G	G	F	G	G	6-24
Ramrod + Bladex	G	G	E	F	G	G	E	F	E	P	G	F	G	G	F	P	G	F	F	G	F	2-4
Dual or Lasso + Atrazine + Bladex + Seed Safener	G	G	E	F	G	G	E	F	E	P	G	G	G	G	F	P	G	F	F	G	F	6-24
Postemergence Herbicides																						
Weed size influences performance - See label																						
AAtrex/Atrazine + COC	E	P	E	E	F	P	F	E	E	P	E	E	E	F	P	P	E	E	E	E	G	6-24
Banvel	E	P	G	E	P	P	P	F	G	G	G	G	G	E	P	P	E	G	F	E	F	1-2
Buctril + Atrazine	E	P	E	E	P	P	P	E	G	G	E	E	E	G	P	P	E	E	E	E	G	6-24
Laddok	G	P	G	E	P	P	P	E	G	G	G	G	E	P	P	P	E	E	E	E	G	6-24
Roundup-ropewicks, wipers, etc.[c]	-	-	-	G	-	-	-	G	F	G	F	G	G	F	-	E	G	F	F	G		0
Buctril	E	P	E	E	P	P	P	E	G	G	G	G	E	G	P	P	E	E	G	E	G	0
2,4-D	E	P	F	E	P	P	P	G	F	F	G	G	G	E	P	P	P	G	F	P	F	1

[a]Crop varieties vary in their response to herbicides.

[b]Values will vary with soil texture, pH, organic matter, rainfall or irrigation, rotational crop and herbicide rate. For more information see "Herbicide Carryover", G83-637.

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

*Registered for forage sorghum.

SORGHUM—GRAIN AND FORAGE*

No-Till

GENERAL REMARKS

EPP treatments which include Bladex or Extrazine II may injure sorghum if the soil stays dry between application and planting. Delay planting until at least 10 days after a soaking rain after treatment. 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 2 inches or less for control with atrazine, Bladex or Extrazine II. The addition of crop oil concentrate, nitrogen fertilizer or nonionic surfactant will increase control. If grasses are more than 2 inches tall; use Gramoxone Extra at 1.5 to 2.5 pt/A or Roundup 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
Grain Sorghum, No-Till in Cool-Season Grass Sod (Including bromegrass and bluegrass)					
ROUNDUP[1]	1-2 qt	1-2 qt	1-2 qt	Fall new growth	Use appropriate herbicide at planting. Cost: $10.00-$20.00.
Grain Sorghum, No-Till in Alfalfa Sod					
2,4-D	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: $8.95.
+ BANVEL	0.5 pt	0.5 pt	0.5 pt		
followed by: appropriate herbicide at planting or early preplant					
Grain Sorghum, No-Till in Rye or Winter Wheat					
ATRAZINE 4L*	Do not use	2.0 qt	2.4 qt	Apply when rye and wheat are 4"-10" tall and before sorghum emerges	On dryland moisture often not adequate for sorghum. Use safened seed with Bronco. Cost: Atrazine + Gramoxone $13.30-$19.75; AAtrex + Bronco $28.30-$41.95.
+ GRAMOXONE EXTRA[1]		1.5-2.5 pt	1.5-2.5 pt		
AATREX 4L	1.2 qt	1.4 qt	1.6 qt		
+ BRONCO	3 qt	4 qt	4.5 qt		
Grain Sorghum, No-Till Continuous Row Crop[2]					
AATREX 4L*	Do not use	2.4 qt	3 qt	Apr 1-15	Use Bladex treatments west of Hwy. 281. Avoid over 0.8 lb/A Atrazine on sandy soils, eroded soils and soils with pH greater than 7.2. Add 1.5-2.5 pt Gramoxone[1] or 54 oz Landmaster if emerged grass weeds are over 2". If only broadleaf weeds are present add 2,4-D LV ester at 1 pt/A. For volunteer corn or sorghum use Roundup[1] at 0.75-1 pt/A in 5 gpa of water prior to planting. If weed population was high last year, use a preemergence herbicide at planting. With Bladex delay planting until at least 10 days after a soaking rain after treatment. Cost: AAtrex $6.25-$7.80; Bladex + Atrazine $7.00-$15.85.
BLADEX 90DF	1.3 lb[c]	1.7 lb	2.2 lb	14 days EPP	
+ ATRAZINE 4L	0.6 qt	0.8 qt	1 qt		
	1.8 lb	2.2 lb	2.6 lb	28 days EPP	
	0.8 qt	1 qt	1.2 qt		
	2.2 lb	2.6 lb	2.9 lb	35 days EPP	
	1 qt	1.2 qt	1.4 qt		
DUAL 8E*		1.75 pt	2 pt	1-20 days preplant	Seed must be treated with Concep to protect from Dual and Bicep injury or Screen to protect from Lasso. Atrazine and Bicep will damage sorghum on sandy and low organic matter soils. If weedy, add Gramoxone at 1.5-2.0 pt. Cost: Dual + Atrazine $11.45-$17.40; Bicep $20.75-$31.50; Lasso + Atrazine $12.50-$22.15.
+ AATREX 4L		1 qt	1.5 qt		
BICEP*		2.1 qt	2.4 qt	Increase rate 20% for 20+ days preplant	
LASSO 4EC/MICRO-TECH	2 qt	2.5 qt	3 qt	0-7 days preplant	
+ ATRAZINE 4L	0.5-0.75 qt	1 qt	1.5 qt		
ROUNDUP	1.7 pt	1.7 pt	1.7 pt	Prior to crop emergence	Add appropriate residual herbicide. Cost: $12.00-$15.00.
+ BUCTRIL	1.0-1.5 pt	1.0-1.5 pt	1.0-1.5 pt		

[c]21 days preplant on sandy loam

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 banded over the row at planting should be effective. Another strategy is to apply a postemergence herbicide such as Roundup or Gramoxone Super 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.

SORGHUM—GRAIN AND FORAGE*

Tilled Seedbed

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
AATREX/ATRAZINE 4L*	Do not use	2 qt	2.4 qt	EPP, PPSA, PPI, PRE or SURFACE MIX...Preplant applications should be made only on fine textured soils. Cost: $5.20-$6.24.
BICEP*	Do not use	1.8 qt	2.4 qt	EPP, PPSA, PRE or SURFACE MIX...**Seed must be Concep treated.** Do not use atrazine on sandy, high pH or calcareous soils. Rain may leach herbicides, especially Bladex and cause sorghum injury. Cost: atrazine $5.20-$6.24; Bicep $10.35-$13.80; Dual $10.15-$16.90; Dual + Atrazine + Bladex $16.30-$23.75.
DUAL 8E*	1.5 pt	2 pt	2.5 pt	
or				
DUAL 25G	6 lb	8 lb	10 lb	
DUAL 8E*	Do not use	1.5 pt	1.75-2 pt	
with				
AATREX/ATRAZINE 4L		1 qt	1.5 qt	
or with				
ATRAZINE 4L +		0.4	0.5	
BLADEX 4L		0.7 qt	0.9 qt	
LASSO 4EC/MICRO-TECH	2.5 qt	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, especially Bladex, and cause sorghum injury. Cost: Lasso + Atrazine + Bladex $17.00-$21.76; Lasso + Atrazine/Lariat $12.05-$14.25; Lasso $12.50.
LASSO 4EC/MICRO-TECH	Do not use	2 qt	2.25 qt	
with				
ATRAZINE 4L		1 qt	1.25 qt	
or with				
ATRAZINE 4L +		0.4	0.5	
BLADEX 4L		0.7 qt	0.9 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: $18.00.
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. Rain may leach herbicides and cause sorghum injury or poor weed control. Do not feed treated forage to lactating dairy animals. Cost: Ramrod + Bladex $16.60; Ramrod + Atrazine $15.25; Ramrod & Atrazine Flowable $14.50.
+				
AATREX 4L/		0.75-1 qt	1.25 qt	
RAMROD FLOWABLE	Do not use	5 pt	5 pt	
+				
BLADEX 4L		2.4 pt	2.7 pt	
RAMROD & ATRAZINE FC	Do not use	4 qt	4 qt	

Postemergence

Herbicide	Rate Per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
AATREX/ATRAZINE 4L*	1.2 qt	Broadleaf weeds < 6" Sorghum < 12"	Use Atrazine with 1 qt 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 $3.15; Laddok $6.00.
LADDOK	2.5 pt	Broadleaf weeds 2-4"	
BANVEL*	0.5 pt	Sorghum 3-5 leaves	Observe label precautions when sensitive crops are nearby. Cost; $3.40.
2,4-D AMINE*	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 $.70-$1.10; Buctril alone $5.60-$8.40; with Atrazine $6.90-$9.70.
2,4-D LV ESTER*	0.5 pt		
BUCTRIL	1-1.5 pt	Broadleaf weeds 2-6"; sorghum 3-leaf to 12"	
alone or with			
ATRAZINE	1 pt		
or with			
BANVEL	0.12-0.5 pt		
BUCTRIL + ATRAZINE	2-3 pt	Sorghum 3-leaf to 12"	
BUCTRIL + ATRAZINE	1.5-2.0 pt	Sorghum 3-leaf to 12"	
+			
BANVEL	0.12-0.25 pt		

Harvest Aid

CHLORATE 3	1.5-2 gal	7-10 days before harvest	Desiccant. Products are sodium chlorate with a fire retardant. Good coverage required. Do not graze or harvest forage for 14 days after treatment. Cost: $2.80.
or			
LEAFEX-3	1.5-2 gal		

WEED RESPONSE TO SELECTED HERBICIDES

Soybeans

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 37 - 44 for additional problem weeds and their control.

Response Ratings:
Ratings are for light to moderate weed populations and favorable conditions. High weed populations or adverse conditions will reduce control.
E = Excellent (90-100%)
G = Good (75-90%)
F = Fair (50-75%)
P = Poor (0-50%)

Herbicide	annual morning glory	barnyardgrass	b. nightshade	cocklebur	crabgrass	fall panicum	foxtail	jimsonweed	kochia	kochia-triazine resistant	lambsquarters	pigweed	ragweed	R. thistle	sandbur	shattercane/sorghum	smartweed	sunflower	velvetleaf	w. buckwheat	crop safety[a]	recrop interval in months, when changing to unlabeled crop[b]
Soil Applied Herbicides																						
Canopy + Lasso or Dual	F	E	G	G	E	E	E	G	G	F	E	E	E	G	F	P	G	G	G	E	G	4-18
Canopy + Treflan or Sonalan or Prowl	F	E	F	G	E	E	E	G	G	G	E	E	E	G	G	G	G	G	G	E	G	4-18
Commence	P	E	F	F	E	E	E	G	G	G	E	G	G	-	G	G	E	F	E	-	E	9-18
Command + Treflan or Sonalan or Prowl	P	E	G	F	E	E	E	G	G	G	E	G	G	-	G	G	E	F	E	-	E	9-18
Dual	P	E	G	P	E	E	E	P	P	P	G	G	F	P	F	P	P	P	P	P	E	4-18
Dual + Sencor/Lexone or Turbo	P	E	G	F	E	E	E	G	F	P	E	E	E	G	F	P	G	F	G	E	F	4-18
Freedom	P	E	G	P	E	E	E	P	F	F	G	G	G	P	F	F	P	P	P	P	E	5-18
Lasso/Micro-Tech	P	E	G	P	E	E	E	P	P	P	G	G	G	P	F	P	P	P	P	P	E	2-4
Lasso + Sencor/Lexone	P	E	G	F	E	E	E	G	F	P	E	E	E	G	F	P	G	F	G	E	F	4-18
Lorox + Lasso or Dual	P	E	G	F	E	E	E	F	F	F	G	E	G	F	F	P	G	F	F	G	G	4-18
Preview + Lasso or Dual	F	E	G	G	E	E	E	G	G	F	E	E	E	G	F	P	G	G	G	E	G	4-18
Preview + Treflan or Sonalan or Prowl	F	E	F	G	E	E	E	G	G	G	E	E	E	G	G	G	G	G	G	E	G	4-18
Prowl	P	E	P	P	E	E	E	P	G	G	G	G	P	G	G	F	P	P	F	P	G	4-18
Prowl + Sencor/Lexone	P	E	P	F	E	E	E	G	G	G	E	E	E	E	G	F	G	F	G	E	F	4-18
Pursuit Plus	P	E	F	F	E	E	E	G	G	G	E	E	E	-	G	G	E	E	E	-	E	4-26
Salute	P	E	P	F	E	E	E	G	G	F	E	E	E	E	G	G	G	F	G	E	F	4-18
Scepter + Dual or Lasso	P	E	G	G	E	E	E	G	F	F	E	E	E	-	F	F	E	E	G	-	E	4-26
Scepter + Prowl, Sonalan or Treflan	P	E	F	G	E	E	E	G	G	G	E	E	E	-	G	G	E	E	G	-	E	4-26
Sonalan	P	E	F	P	E	E	E	P	G	G	G	G	P	G	G	G	P	P	P	P	G	4-13
Sonalan + Sencor/Lexone	P	E	F	F	E	E	E	G	G	G	E	E	E	E	G	F	G	F	G	E	F	4-18
Squadron	P	E	F	G	E	E	E	G	G	G	E	E	E	-	G	G	E	E	G	-	E	4-26
Split-Appl.-Treflan/Trifluralin or Prowl + Sencor/Lexone	P	E	P	F	E	E	E	G	G	F	E	E	E	E	G	G	E	F	E	E	G	4-18
Treflan	P	E	P	P	E	E	E	P	G	G	G	G	P	G	G	G	P	P	P	P	G	5-18
Treflan/Trifluralin + Sencor/Lexone	P	E	P	F	E	E	E	G	G	F	E	E	E	E	G	G	G	F	G	E	F	4-18
Treflan + Sencor/Lexone + Command	P	E	G	F	E	E	E	G	G	G	E	E	E	G	G	G	G	F	E	E	G	9-16
Postemergence Herbicides																						
Weed Size Influences Performance — See Label																						
Assure/Assure II	P	E	P	P	E	E	G	P	P	P	P	P	P	P	E	E	P	P	P	P	E	4
Basagran + Blazer or Galaxy	G	P	G	E	P	P	P	E	P	P	F	G	E	P	P	P	E	E	G	G	E	0
Basagran + Cobra	G	P	G	E	F	G	F	E	F	F	F	E	E	P	F	F	E	E	G	G	G	0
Basagran + Scepter	F	P	P	E	P	P	P	E	P	P	P	E	G	P	P	P	E	E	E	G	E	4-26
Basagran	F	P	P*	E	P	P	P	E	P	P	P	P	G	P	P	P	E	E	G	G	E	0
Blazer	E	P	G	F	F	F	F	E	F	F	F	E	E	P	F	F	E	P	F	-	G	0
Classic	G	P	-	E	P	P	P	E	F	F	F	G	E	-	P	P	E	E	G	-	G	3-15
Cobra	G	P	G	G	F	G	F	E	F	F	F	E	E	P	F	F	E	G	G	-	F	0
Fusilade	P	E	P	P	E	E	G	P	P	P	P	P	P	P	E	E	P	P	P	P	E	2
Option	P	E	P	P	E	E	G	P	P	P	P	P	P	P	E	E	P	P	P	P	E	1-4
Pinnacle + Classic	G	P	P	E	P	P	P	E	F	F	E	E	E	G	P	P	E	E	G	E	F	3-9
Poast	P	E	P	P	E	E	G	P	P	F	P	P	P	P	E	E	P	P	P	P	E	0
Poast + Basagran	F	E	P	E	G	E	G	E	P	P	P	P	G	P	E	E	G	E	G	G	E	0
Pursuit	G	G	G	E	G	-	G	G	F	F	G	E	G	-	-	E	G	G	G	-	G	4-26
Roundup-ropewicks, wipers, etc.[c]	-	-	-	G	-	-	-	G	F	F	G	G	G	F	F	E	G	F	F.	-	E	0

[a]Crop varieties vary in their response to herbicides.

[b]Values will vary with soil texture, pH, organic matter, rainfall or irrigation, rotation crop and herbicide rate. For more information see "Herbicide Carryover", G83-637.

[c]Ratings for weeds tall enough for selective treatment.
*Good control of hairy nightshade.

SOYBEANS

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 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
Soybeans, No-Till in Alfalfa Sod					
2,4-D	1 qt	1 qt	1 qt	Apply in fall to alfalfa with 4" new growth	Use appropriate at planting residual herbicide. 2,4-D + Banvel used to kill alfalfa. Cost: $6.20.
+ BANVEL	0.5 pt	0.5 pt	0.5 pt		
Soybeans, 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: $10.00-$15.00.
Soybeans, 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 soybeans emerge	Follow with appropriate EPP treatment. Cost without EPP treatment: $3.75-$5.00.
Soybeans, No-Till Continuous Row Crops					
LEXONE/SENCOR 75DF	0.5-0.67 lb	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. 2,4-D ester at 0.5-1.0 qt/A can be applied with the first amount for emerged broadleaf weeds, if applied 30 days before soybean planting. If grasses are present add Gramoxone Extra or Roundup. Prowl in EPP treatments may be less effective if rainfall does not come within 7 days of application. Cost: with Dual $23.50-$43.90; with Lasso $20.30-$38.90; with Prowl $16.25-$32.65; Turbo: $22.84-$33.00
+ DUAL	2 pt	2.5 pt	3 pt		
or MICRO-TECH/ LASSO MT	2 qt	2.5 qt	3 qt		
or PROWL	2 pt	2.5 pt	3 pt		
TURBO	2.25 pt	2.75 pt	3.25 pt		
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. Cost: Pursuit + Dual $30.70-$37.45; Pursuit + Lasso MT $28.00-$33.40; Pursuit Plus $20.00.
+ DUAL	2 pt	2.5 pt	3 pt		
or MICRO-TECH/ LASSO MT	2 qt	2.5 qt	3 qt		
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 1% OM. Use a split application of 2/3 the Sencor/Lexone early, the remaining 1/3 at planting if aplpied more than 14 days preplant. Use higher rate for split application. If emerged weeds are taller than 2" add Roundup. Cost: $19.00-$33.00.
+ LEXONE DF	.33-.5 lb	.5-.75 lb	.5-.75 lb		
or SENCOR DF	.33-.5 lb	.5-.75 lb	.5-.75 lb		
LEXONE/SENCOR 75DF	0.5 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 $23.75-$33.90; Lexone/Sencor with Lasso $18.35-$33.20; Lorox with Lasso $26.50-$44.60; Preview with Dual $24.00-$30.90; Preview with Lasso $18.60-$30.20; Turbo: $17.76-$27.90.
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	1 pt	2 pt	2.5 pt		
or LASSO	2.0 qt	2.5 qt	3 qt		
TURBO	1.75 pt	2.5 pt	2.75 pt		

SOYBEANS

No-Till, cont.

Herbicide (See Weed Response Chart 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
Soybeans, No-Till Continuous Row Crops					
BRONCO	3.25 qt	4.0 qt	4.0 qt		Apply after planting, but before crop emergence. Apply in 10-30 gal/A spray solution. Add X-77 surfacant 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 $45.75-62.00; Bronco + Lexone/Sencor $34.00-$47.35.
+					
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	Add Gramoxone Extra at 1.5-2.5 pt/A or Roundup at 1-1.5 qt/A. Add X-77 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 lower rate for 4''-6'' weeds. Control of weeds over 6'' will be erratic. Apply in at least 20 gal/A to get through coverage. Rainfall within 3 to 5 days of herbicide application will improve weed control, especially with Prowl. 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 $16.90-$30.65; Lexone/Sencor with Lasso $14.85-$24.55; Lorox with Dual $28.60-$45.30; Lorox with Lasso $26.55-$39.20; Preview with Dual $20.65-$30.90; Preview with Lasso $18.60-$24.80; Turbo: $15.25-$25.40.
or					
LOROX 50DF	1.3 lb	1.6 lb	2 lb		
or					
PREVIEW	6 oz	7 oz	8 oz		
+					
DUAL	1.5 pt	2 pt	2.5 pt		
or					
MICRO-TECH/ LASSO MT					
TURBO	1.5 pt	2.25 pt	2.5 pt		

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.

Tilled Seedbed

For cocklebur, sunflower and velvetleaf, see Troublesome Weed Section.

COMMAND	0.75 pt	0.75 pt	0.75 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. Cost: with Prowl or Treflan $17.20-$29.35; with Sonalan $18.80-$31.25; with Dual or Lasso $23.60-$35.75.
and				
SENCOR	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	1.5 pt	2 pt	2 pt	
or				
DUAL	1.5 pt	2 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 mixed 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 sugar beets and fieldbeans the next year. Cost: Command + Treflan $9.55-$19.10; Command + Sonalan $12.00-$21.00; Command + Lasso $18.80; Commence $11.80-$17.95.
+				
TREFLAN	1 pt	1.5 pt	2 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	
COMMENCE	1.75-2 pt	2-2.25 pt	2.66 pt	

SOYBEANS

Tilled Seedbed, cont.

Herbicide (See Weed Response Chart before selecting herbicides)	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
DUAL 8E	2 pt	2.5 pt	2.5 pt	EPP, PRE, SURFACE MIX...To reduce injury on calcareous soil decrease Sencor/Lexone rates by 1/3. Cost: Dual $13.50-$16.90; Dual + Sencor $20.40-$25.80.
or				
DUAL 25G	8 lb	10 lb	10 lb	
DUAL 8E	Do not use	1.5 pt	2 pt	
+				
SENCOR/LEXONE DF[4]		0.5 lb	0.6 lb	
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 $10.50-$12.00; Freedom + Sencor/Lexone $14.90-$18.35.
FREEDOM	2.7 qt	2.7 qt	2.7 qt	
+				
SENCOR/LEXONE	0.33 lb	0.33 lb	0.5 lb	
LASSO 4EC	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 $13.50; Lasso + Sencor/Lexone $21.00-$22.40.
or				
LASSO II 15G	17 lb	17 lb	17 lb	
LASSO	Do not use	2 qt	2 qt	
+				
SENCOR/LEXONE DF[4]		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 $29.25-$39.20; Dual + Lorox $28.60-$39.20.
with				
DUAL 8E	1.5 pt	2 pt	2 pt	
or with				
LASSO 4EC	4 pt	4 pt	4 pt	
PREVIEW	6 oz	7 oz	8 oz	PPI with Treflan and Sonalan. PPI or SURFACE MIX with Prowl. PRE or SURFACE MIX with Dual or Lasso. 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. Cost: Canopy or Preview + Prowl or Treflan or Sonalan $15.40-$24.00; Preview + Dual or Lasso or Freedom $20.65-31.00.
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	1.5 pt	2 pt	2 pt	
or				
DUAL	1.5 pt	2 pt	2 pt	
or				
LASSO	2 qt	2 qt	2 qt	
or				
FREEDOM	2.7 qt	2.7 qt	3.5 qt	
PROWL 4EC	1.5 pt	2 pt	2.5 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 $4.90-$8.15; Prowl + Sencor $11.65-$18.80.
PROWL	1.5 pt	2 pt	2 pt	
+				
SENCOR/LEXONE DF[4]	0.33 lb	0.5 lb	0.6 lb	
PROWL	1.5 pt	2 pt	2 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 $11.05-$20.60; Treflan/Trifluralin + Sencor/Lexone + Sencor/Lexone $9.70-$21.45; Prowl + Sencor/Lexone + Prowl + Sencor/Lexone $12.65-$24.15.
or				
TREFLAN/TRIFLURALIN (PPI) with	1 pt	1.5 pt	2 pt	
SENCOR/LEXONE DF[4] PPI followed by	0.2 lb	0.4 lb	0.5 lb	
SENCOR/LEXONE DF[4] PRE (Split application)	0.1 lb	0.2 lb	0.2 lb	
PROWL	1 pt	1.5 pt	1.5 pt	
+				
SENCOR/LEXONE DF[4] PPI followed by	0.2 lb	0.4 lb	0.5 lb	
PROWL	1 pt	1.5 pt	1.5 pt	
+				
SENCOR/LEXONE DF[4] PRE (Split application)	0.1 lb	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.

SOYBEANS

Tilled Seedbed, cont.

Herbicide (See Weed Response Chart before selecting herbicides)	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
SCEPTER (with or without SENCOR)	0.67 pt (0.33 lb)	0.67 pt (0.33 lb)	0.67 pt (0.50 lb)	PRE or SURFACE MIX with Lasso or Dual. PPI 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 sugar beets 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. Cost: Scepter + Lasso $25.20; Scepter + Freedom $21.90-$22.65; Scepter + Dual $28.00; Scepter + Prowl or Sonolan or Treflan $19.30-$21.00, with Sencor add $6.00.
with LASSO	2 qt	2 qt	2 qt	
or DUAL	1.5 pt	2 pt	2 pt	
or PROWL	1.5 pt	2 pt	2 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. Cost: Sonalan $6.00-$9.00; Sonalan + Sencor/Lexone $12.75-$21.30.
SONALAN + SENCOR/LEXONE DF[4]	2 pt 0.33 lb	2.5 pt 0.5 lb	3 pt 0.6 lb	
TREFLAN/TRIFLURALIN + SENCOR/LEXONE DF[4]	1 pt 0.33 lb	1.5 pt 0.5 lb	2 pt 0.6 lb	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. Costs: Treflan/Trifluralin $3.55-$7.10; Treflan/Trifluralin + Sencor/Lexone/Salute $10.30-$19.40.
SALUTE	1.5 pt	2.25 pt	3.0 pt	
TURBO 8EC	Do not use	2.0 pt	2.5-2.75 pt	Do not use Turbo on calcareous soil. Turbo also labeled split-shot with additional Turbo or Sencor and tank mix with Command or Scepter. Follow label directions. Cost: Turbo $20.30-$27.90.

Postemergence

Herbicide	Rate Per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
ASSURE	14-16 oz	Grasses 4" Shattercane and corn 12"-18"	COC or surfactant needed for effective control. Cost: $12.04-$13.75.
ASSURE II	7-8 oz		
BASAGRAN + 28% UAN	1-2 pt 1 gal	Most susceptible weeds less than 4" tall	Combining Basagran with Poast reduces effectiveness on volunteer corn and shattercane. Split applications of Basagran at 1 pt/A may improve control of several weeds. See label for rates and specific weed size. Cost: Basagran $8.20-$15.70; Basagran + Blazer $11.25-$22.50; Basagran + Cobra $18.25-$25.75; Basagran + Pinnacle $15.00; Basagran + Scepter $14.60-$22.10; Basagran + Poast $23.65-$31.15.
BASAGRAN with BLAZER + 28% UAN	1-2 pt 0.5-1 pt 1 gal		
or COBRA + 28% + SURFACTANT	12.5 oz 1 gal 2 pt/100 gal		
or PINNACLE	.25 oz		
or SCEPTER + COC	0.33 pt 1 qt		
BASAGRAN + POAST or POAST PLUS + DASH + 28% UAN	1.5-2 pt 1.5 pt 1 qt 1 gal	Use Basagran and Poast guidelines	

SOYBEANS Postemergence

Herbicide	Rate Per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
BLAZER + 28% UAN	1-2 pt 1 gal	Most weeds less than 4" tall	See label for rates and specific weed size. Cost: $8.75-$15.70.
CLASSIC + SURFACTANT or COC	0.5-0.75 oz 1 qt/100 gal 1 gal/100 gal	Most weeds less than 4" tall	Do not use Classic on soils above pH 7.0. Use COC only during drought conditions. Add 28% UAN for velvetleaf. Cost: $8.55-$12.30. Do not use Classic + Pinnacle on soils above pH 7.2. Cost: $12.70.
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	Most weeds 2-4" tall	Do not use during periods of stress or weed control will be poor. See label for specific weed size. Cost: $8.80-$11.55.
FUSILADE 2000	1-1.5 pt	Grasses 4" Shattercane and corn 12"-18"	COC or Surfactant needed for effective control. Cost: $10.75-$16.15.
GALAXY + 28% UAN	2 pt 1 gal	Most weeds less than 4" tall	See label for specific weeds. Cost: $14.00.
OPTION POAST PLUS + COC	0.8-1.2 pt 18-24 oz 2 pt	Grasses 4" Shattercane and corn 12"-18"	COC or Surfactant needed for effective control. Cost: Option $9.20-$13.80; Poast Plus $7.75-$9.75.
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 Fusilade or Option to improve control of volunteer corn. Cost: $18.90.
Harvest Aid			
GRAMOXONE EXTRA	1.25 pt	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: $6.50.

SPECIAL APPLICATION EQUIPMENT

Crop	Applicator	Herbicide and Ratio-(product:water)	Remarks
Soybeans and Sorghum	1. Ropewicks	ROUNDUP 1:2 (33.3% concentration)	Works best on volunteer corn and shattercane. Weeds should be 10-12" taller than soybeans. Travel both directions in heavy stands. In sorghum, too wet or dripping ropes will cause droplet splash and crop injury.
Soybeans	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.
Soybeans	3. Bean Bar—spreading nozzles	BASAGRAN 1:100 (1% concentration)	Complete coverage essential. Add 1 gal nitrogen fertilizer to each 25 gal spray. Add Poast and crop oil for shattercane and volunteer corn.
		CLASSIC + PINNACLE 1/2 oz + 1/2 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. Preharvest, intervals: Poast, 90 days; Fusilade, prebloom; Assure, 80 days.

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:
Weeds less than 4" tall except less than 2" for Buctril treatments.
E = Excellent (90-100%)
G = Good (75-90%)
F = Fair (50-75%)
P = Poor (0-50%)

	blue mustard	erect knotweed	field pennycress	horseweed	kochia	lambsquarters	P. smartweed	prostrate pigweed	redroot pigweed	R. thistle	shepherd's purse	sunflower	tansy mustard	velvetleaf	wild buckwheat	prickly lettuce	wild vetch	crop safety[a]	recrop interval in months when changing to unlabeled crop[b]
Ally + 2,4-D	E	F	E	-	E	E	F	E	E	G	E	G	E	G	F	E	F	G	1-22
Glean + 2,4-D	E	F	E	G	E	E	G	E	E	G	E	E	E	G	F	E	F	G	6-48
MCPA	F	P	G	P	F	G	F	F	F	F	G	F	G	G	P	F	F	E	1
Bronate	F	E	E	F	F	E	F	E	G	G	E	E	G	G	E	-	G	E	1
Buctril	G	E	E	G	F	G	G	F	G	G	E	E	G	E	E	G	F	E	1
2,4-D	E	F	E	F	F	E	G	E	E	G	E	E	E	E	P	E	G	G	1
2,4-D + Banvel	F	G	E	F	E	E	E	E	E	E	E	E	E	G	E	G	G	F	1-2
2,4-D + Buctril	G	E	E	F	G	E	E	E	E	E	E	E	E	E	E	E	G	G	1
Curtail	E	E	E	E	G	E	E	E	E	G	E	E	E	E	E	E	E	G	2-4
Tordon + 2,4-D	G	F	E	F	F	E	G	E	E	G	E	E	E	E	E	E	G	G	6-18
Harmony Extra	E	F	E	-	G	E	G	E	E	G	E	G	E	G	F	E	F	G	1-2

[a]Crop varieties vary in their response to herbicides. Applying herbicides with liquid fertilizer may increase crop injury.

[b]Values will vary with soil texture, pH, organic matter, rainfall or irrigation, rotational crop and herbicide rate. For more information see "Herbicide Carryover", G74-180.

BARLEY AND SPRING WHEAT

Herbicide	Rate Per Acre[3]	Application Time	Remarks and Approximate Cost/A Broadcast
ALLY + 2,4-D LV ESTER	0.10 oz + 0.5 pt	Spring before May 1	Follow with small grain on Curtail and Glean treated fields. For wild buckwheat use Buctril as listed for winter wheat. For Glean + 2,4-D and Ally + 2,4-D, add surfactant 1 pt/100 gallons of spray solution. Cost: 2,4-D $.70-$1.65; Ally + 2,4-D $3.40-$3.80; Curtail $6.00.
CURTAIL	2 pt	Spring during tillering	
2,4-D AMINE or 2,4-D LV ESTER	1-1.5 pt	Spring 5-leaf	

Harvest Aid

2,4-D LV ESTER	1 qt	Hard dough 7 or more days before harvest	Helps desicate large broadleaf weeds. Only certain brands labeled for this use. Cost: $2.80.

OATS

MCPA	0.5-1 pt	Weeds and oats in 3-4 leaf stage	Cost: MCPA $.80-$1.60; Buctril + 2,4-D or MCPA $6.40-$9.20.
BUCTRIL + 2,4-D AMINE or MCPA	1-1.5 pt + 0.5 pt		
CURTAIL M	1.75-2.3 pt	Oats 3-leaf to joint, weeds <3"	Cost: $4.50-$6.00.
2,4-D AMINE	0.5-1 pt	3-4 leaf stage of oats	Some injury from 2,4-D may be expected at any stage. Cost: $1.10.

Harvest Aid

2,4-D LV ESTER	1 qt	Hard dough 7 or more days before harvest	Helps desicate large broadleaf weeds. only certain brands labeled for use. Cost: $2.80.

WINTER WHEAT

Herbicide	Rate Per Acre[3]	Application Time	Remarks and Approximate Cost/A Broadcast
2,4-D AMINE or 2,4-D LV ESTER	1-1.5 pt 0.5-0.75 pt	Early spring, before joint stage	Do not spray winter wheat until well tillered. Spray broadleaf weeds as soon as good growing conditions occur. Cost: $.70-$1.65.
BRONATE 4EC	1-1.5 pt		Most broadleaf weeds should be in 2-4 leaf stage or mustards in early rosette stage. Cost: $6.15-$9.00.
BUCTRIL 2EC + 2,4-D AMINE	1-1.5 pt 0.5 pt	Wheat well tillered before canopy covers weeds	
BANVEL + 2,4-D AMINE	2-4 oz 0.75-1 pt	Spring, before wheat joints	Controls most troublesome broadleaf weeds. Cost: $1.75-$2.90.
CURTAIL	2.0 pt	Before boot stage	Use Curtail in wheat, wheat-fallow or wheat-spring small grain rotations. For Ally + 2,4-D, add surfactant 1 qt/100 gallons of spray solution. Cost: Curtail $6.00; Ally + 2,4-D $3.40.
ALLY + 2,4-D LV ESTER	0.10 oz + 0.5 pt	Spring, 2-4"	
2,4-D LV ESTER + TORDON 22K	0.5-0.75 pt 1-1.5 oz	Spring after resumption of active growth to before joint stage	Use only on land to be planted the following year to grass, barley, wheat, oats or fallowed. Costs: $1.50-$2.25.
HARMONY EXTRA	0.3-0.4 oz	Wheat 2 leaf thru tillering weeds less than 4" tall	Add a nonionic surfactant at 1 qt/100 gallons. Any crop can be planted 60 days after application. Cost: $6.40.

Harvest Aid

ALLY + 2,4-D AMINE	0.1 oz 4-8 oz	After dough stage.	Preharvest interval of 20 days. Cost $3.00-$3.30.
2,4-D LV ESTER	1 qt	Hard dough 7 or more days before harvest	Rescue for control of late broadleaf weeds. To reduce breakage all green color should be gone from joints. Only certain brands labeled for this use. Cost: $2.80.

PROSO MILLET

Herbicide	Rate Per Acre[3]	Application Time	Remarks and Approximate Cost/A Broadcast
2,4-D AMINE + BANVEL	0.67 pt 0.25 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: $2.45.

SUNFLOWER

	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
LASSO 4EC	2 qt	2.75 qt	3.5 qt	Surface mix within 7 days before planting or apply PRE within 5 days after planting. Cost: $10.80-$18.90.
PROWL	1.5 pt	2 pt	2.5 pt	PPI...For best results immediately incorporate. Read label for carryover precautions. Use the lower rates under 20" rainfall. Sensitive crops may be injured the following year. Cost: $3.55-$9.00.
SONALAN 3EC	1.5 pt	2 pt	3 pt	
TREFLAN	1 pt	1.5 pt	1.5-2 pt	

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: $9.25-$12.30.

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, Bladex, Extrazine II, Gramoxone Extra, Cyclone, Roundup, Roundup RT, Landmaster II, Landmaster BW or Fallow Master 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 are added. When planting corn, 2,4-D ester may also be added for improved weed control. Cyclone 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] or Landmaster[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% OM, on soils with a pH of 6.8 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, Landmaster II, Landmaster BW, and Fallow Master). The non-selective, non-translocating herbicides (Cyclone, 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 was used, use 12 oz/A of Roundup and where Landmaster or Roundup was used, use 9 or 12 oz/A of Roundup.

Fields not treated after harvest with AAtrex/Atrazine are not true 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 maximum rate the crop can tolerate and still not cause damage to the succeeding crop. Be sure to add a grass herbicide. Add Cyclone at 1.5 to 2 pt after April 15 depending upon size of weeds. Rates suggested depending on soil type, pH, OM, time of application, and weed size. For corn use 1.5 to 2.5 qt/A AAtrex/atrazine, for grain sorghum use 1.25 to 2.25 qt/A AAtrex/atrazine. An early spring treatment of Roundup or Landmaster with atrazine as soon as good growing conditions exist in the spring is an effective treatment for volunteer wheat and downy brome. Dual or Lasso MT/Micro-Tech should be applied 20 to 30 days before corn or sorghum planting. For sorghum use the appropriate seed treatment for Dual and Lasso/Micro-Tech.

PLANTING ROW CROPS NO-TILL INTO LAST YEAR'S SPRING SMALL GRAIN STUBBLE (Oats, 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 and 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 evaluated to determine if retreatment or other weed control measures are necessary.

The most important part of this program is weed control after spring small grain harvest. Keeping the weeds from producing seed and using stored soil moisture is done with a timely herbicide treatment after harvest. The herbicide treatments listed for winter wheat after harvest can be used in small grain stubble in most situations (check label to be sure and also the recropping intervals for the crops in your rotation). The higher labeled rates of herbicides are usually required. Roundup, Roundup RT, Landmaster II, Landmaster BW, and Fallow Master are usually the choice nonselective herbicides for control of emerged summer annual grass weeds that are growing rapidly. As weeds approach maturity, Gramoxone Extra and Cyclone have given good results if combined with atrazine and/or Bladex. 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 residual herbicide was applied last fall. Read all the general remarks under ecofarming.

SEE FOOTNOTES ON PAGE 44.

WEED RESPONSE TO HERBICIDES APPLIED AFTER WINTER WHEAT HARVEST

Response rating is: Based on 12 inch tall stubble with 400 stems/yd^2 and weeds not under drought stress and no rain within 24 hours after application.
E = Excellent (90-100%)
G = Good (75-90%)
F = Fair (50-75%)
P = Poor (0-50%)

Herbicides[a]	Broadleaf weeds											Summer annual grasses							Winter annual grasses	
	buffalobur	horseweed	knotweed, e.	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 + atrazine	E	E	E	E	E	E	E	E	E	E	E	E	E	E	G	F	E	E	E	E	E
Landmaster BW	E	E	E	G	E	G	E	E	E	E	E	E	E	E	G	E	E	E	E	E	E
Landmaster BW + atrazine	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Roundup	E	E	G	G	E	G	E	E	F	E	G	E	E	E	E	E	E	E	E	E	E
Roundup + atrazine	E	E	E	G	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
	12 inches tall											Tillered to boot							Tillered to boot	
Cyclone + atrazine + 2,4-D[b]	E	E	E	E	E	E	E	G	E	E	E	F	G	F	F	P	G	G	E	E	E
Landmaster BW	E	G	E	G	E	G	G	E	G	E	G	G	E	G	G	E	E	G	E	E	E
Landmaster BW + atrazine	E	E	E	G	E	G	E	E	G	E	E	G	E	G	G	E	E	G	E	E	E
Roundup	E	G	G	F	G	G	G	E	P	E	G	G	E	G	G	E	E	G	E	E	E
Roundup + atrazine + 2,4-D	E	E	E	G	E	G	E	E	G	E	E	G	E	G	G	E	E	G	E	E	E
	24 inches tall											Headed							Headed	
Cyclone + atrazine + 2,4-D[b]	E	E	G	E	E	E	E	G	E	E	E	E	E	E	E	P	E	E	E	E	E
Landmaster BW	G	G	G	F	G	G	G	G	F	G	G	G	E	G	E	E	E	G	E	E	E
Landmaster BW + atrazine	E	G	G	G	E	E	E	E	F	E	G	G	E	E	E	E	E	G	E	E	E
Roundup	G	G	F	P	F	F	F	G	P	G	F	G	E	G	E	E	E	G	E	E	E
Roundup + atrazine + 2,4-D	E	G	G	F	E	E	E	E	F	E	G	G	E	E	E	E	E	G	E	E	E

[a]Rate is 1.5 pt/A for Cyclone, 54 oz/A for Landmaster BW, and 16 oz/A for Roundup. Atrazine rate is 2 to 2.5 qt/A. Consult label to improve weed control with some herbicides. Example, barnyardgrass needs 84 oz/A of Landmaster BW.

[b]Add 2,4-D ester at 1.5 pt/A.

ECOFARMING

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 30 days before planting wheat with Landmaster II or 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 $3.75-$10.00; Roundup RT $3.65-$9.65; Landmaster II, Landmaster BW $5.20-$10.25
LANDMASTER BW[1]	40-64 oz	40-64 oz	40-64 oz		
Winter Wheat Stubble to be Seeded 12-14 Months Later to Winter Wheat					
"FALLOW AID"					
	Winter Wheat Stubble Free of Grass Weeds				
AATREX 4L	1 pt	2 pt	2 pt	Aug 10-Sept 10 (12 months or more before seeding)	Spray stubble soon after harvest with 2,4-D or Landmaster BW. Follow with atrazine Aug.-Sep. Add 1 qt/A 2,4-D LV ester for broadleaf weed control. Volunteer wheat and downy brome control are better with late Aug. and early Sept. application. Cost: AAtrex $1.30-$2.60; Bladex + Atrazine $8.85-$11.20.
BLADEX 90DF +	1.8 lb	2.2 lb	2.2 lb		
ATRAZINE 4L	1 pt	1.5 pt	1.5 pt		

ECOFARMING

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 with Grass Weeds					
AATREX 4L	1 pt	2 pt	2 pt		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. Add 1 pt 2,4-D LV ester to AAtrex + Cyclone to improve control broadleaf weeds. Roundup RT + 2,4-D may be substituted for Landmaster BW. Cost: AAtrex + Cyclone $7.65-$20.55; Bladex + Atrazine + 2,4-D $14.00-$20.55; AAtrex + Landmaster BW $6.90-$14.60.
+					
CYCLONE[1]	1.5-2 pt	1.5-2 pt	1.5-2 pt		
BLADEX 90DF	1.1 lb	1.1 lb	1.1 lb		
+					
ATRAZINE 4L	1 pt	1.5 pt	1.5 pt		
+					
CYCLONE[1]	1.5-2 pt	1.5-2 pt	1.5-2 pt	Aug 10-Sept 10 (12 months or more before seeding)	
+					
2,4-D LV ESTER	1 pt	1 pt	1 pt		
AATREX 4L	1 pt	2 pt	2 pt		
+					
LANDMASTER BW[1]	40-86 oz	40-86 oz	40-86 oz		
Winter Wheat Stubble to be Seeded 4-5 Months Later to Winter Wheat					
"FALLOW AID"					
BLADEX 90DF	2.7 lb	2.9 lb	3 lb	Mar-Apr 15 or before boot stage of weeds	Do not use on undercut stubble. Controls volunteer wheat, downy brome, jointed goatgrass and broadleaf weeds Cost: $16.70-$26.65.
+					
CYCLONE[1]	1.5-2 pt	1.5-2 pt	1.5-2 pt		
ROUNDUP or ROUNDUP RT[1]	12-16 oz	12-16 oz	12-16 oz	Post in Apr or before boot stage of weeds	Roundup $3.75-$5.00; Roundup RT $3.65-$4.90; Landmaster II $5.25-$7.08; Landmaster BW $5.60-$7.55; Fallow Master $6.40-$8.80.
or					
LANDMASTER BW[1]	40-54 oz	40-54 oz	40-54 oz		
FALLOW MASTER	32-44 oz	32-44 oz	32-44 oz		
2,4-D LV ESTER	1 qt	1 qt	1 qt	May-Aug for broadleaf weeds	Do not plant small grain for 20 days after treatment. Cost: $4.80.
+			+		
BANVEL	0.5 pt	0.5 pt	0.5 pt		
Winter Wheat Stubble to be Planted to Corn or Sorghum the Next Spring					
"Check Remarks Under Ecofarming"					
Stubble Free of Grass Weeds					
AATREX/ATRAZINE 4L	2 qt	2.5 qt	3 qt	Jul-Aug or Sep-Nov	1 qt/A 2,4-D ester or 1 pt Banvel improves annual or perennial broadleaf weed and annual grass control. Spray before weeds produce seed. Use 1-1.2 qt Atrazine 4L in Panhandle. Cost: $2.60-$7.80.
	1.5 qt	2 qt	2.5 qt		
Stubble with Grass Weeds					
CYCLONE[1]	1.5-2 pt	1.5-2 pt	1.5-2 pt		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.-Nov. applications.
+					
AATREX/ATRAZINE 4L	2 qt	2.5 qt	3 qt	Jul-Aug	
	1.5 qt	2 qt	2.5 qt	Sep-Nov	
LANDMASTER BW[1]	54-86 oz	54-86 oz	54-86 oz		
+					
AATREX/ATRAZINE 4L	2 qt	2.5 qt	3 qt	Jul-Aug or	
	1.5 qt	2.0 qt	2.5 qt	Sep.-Nov.	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. Cost: Atrazine + Cyclone $8.15-$14.30; AAtrex + Landmaster BW $14.20-$23.45.

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 planted to Soybeans the following Spring (For 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. Cost: Landmaster BW $7.55-$12.05; Roundup $5.00-$10.00; Roundup RT $4.90-$9.75.
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[1,2]					
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 II. Low rates (less than 2 lbs 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 Weed section.					
BLADEX 4L	2 qt	2 qt	2.5 qt	0-30 days preplant	Do not use on sands and loamy sands with less than 1% OM. Cost: Bladex $9.60-$12.00; Bladex + Atrazine $7.95-$11.00; Bladex + Dual $17.35-$23.10.
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		
BLADEX 4L	1.5 qt	1.75 qt	2 qt		
+	+	+	+		
DUAL 8E	0.75 qt	1 qt	1 qt		
DUAL	2 pt	2.5 pt	3 pt	0-20 days preplant	If annual grasses produced seed in the grain stubble or if areas of field have history of high grass population use higher rates of Dual or Lasso. Cost: Dual $13.50-$20.25; Bullet $15.00-$16.00; Lasso + AAtrex $12.75-$16.00; Lasso + Bladex $18.00-$23.10; Bronco $29.40-$33.60; Bronco + Atrazine $31.35-$36.20.
DUAL 8E	1.5 pt	2 pt	2 pt		
+					
AATREX 4L	0.75 qt	1 qt	1 qt		
BULLET	3.75 qt	4 qt	4 qt		
LASSO MT/MICRO-TECH	2 qt	2.5 qt	2.5 qt	0-7 days preplant	
+					
AATREX 4L	0.75 qt	1 qt	1 qt		
or					
BLADEX 4L	1.25 qt	1.5 qt	2 qt		
BRONCO	3.5 qt	4 qt	4 qt		
BRONCO	3.5 qt	4 qt	4 qt		
+					
AATREX 4L	0.75 qt	1 qt	1 qt		
Soybeans to be Planted into Winter Wheat Stubble Treated With Landmaster After Harvest (For Areas With Over 20" Rainfall and Fields With Low Weed Density)					
PURSUIT	4 oz	4 oz	4 oz	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 $30.70-$37.45; With Lasso $28.00-$33.40; With Prowl $23.70-26.95; Pursuit Plus $20.00.
+					
DUAL	2 pt	2.5 pt	3 pt		
or					
LASSO MT/MICRO-TECH	2 qt	2.5 qt	3 qt		
or					
PROWL	2 pt	2.5 pt	3 pt		
PURSUIT PLUS	2.5 pt	2.5 pt	2.5 pt	0-30 days preplant	
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 II. Low rates (less than 2 lbs 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 Weed section.

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
BLADEX 4L	2.5 qt	3 qt	3.5 qt	35 days preplant	Add 1.5-2 pt Cyclone[1] or 54 oz Landmaster for emerged weeds if Bronco is not used. **Seed must be treated with Concep for Dual or Screen for Lasso or Bronco treatments.** Cost: Dual $13.50-$16.90; Dual + AAtrex $11.45-$16.10; Lasso + Atrazine $12.10-$16.10; Bronco $29.40-$33.60; Bronco + Atrazine $30.70-$36.20; Lasso + Bladex $18.00-$23.10; Bladex $9.60-$16.80; Bladex + Atrazine $6.55-$15.70; Bladex + Dual $21.20-$25.50.
BLADEX 4L	2.0 qt	2.5 qt	3 qt	28 days preplant	
BLADEX 4L + ATRAZINE 4L	2 qt* / 0.5 qt*	2.5 qt / 0.5 qt	3 qt / 0.5 qt	35 days preplant	
BLADEX 4L + ATRAZINE 4L	1.2 qt / 0.3 qt	1.5 qt / 0.4 qt	2 qt / 0.5 qt	14 days preplant	
BLADEX 4L + DUAL 8E	1.6 qt / 2 pt	2 qt / 2 pt	2.5 qt / 2 pt	28 days preplant	
BLADEX 4L + DUAL 8E	1.25 qt / 1.5 pt	1.6 qt / 1.5 pt	2 qt / 1.75 pt	14 days preplant	
DUAL 8E	2.0 pt	2.25 pt	2.5 pt	0-28 days preplant	
DUAL 8E + AATREX 4L	1.5 pt / 0.5 qt	2 pt / 1 qt	2 pt / 1 qt	0-20 days preplant	
LASSO EC + AATREX 4L	2 qt / 0.5 qt	2.5 qt / 1 qt	2.5 qt / 1 qt	0-7 days preplant	
or BLADEX 4L	1.5 qt	1.75 qt	2 qt		
BRONCO	3.5 qt	4 qt	4 qt		
BRONCO + AATREX 4L	3.5 qt / 0.5 qt	4 qt / 1 qt	4 qt / 1 qt		

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

Winter Wheat to be Planted in Less Than Six Months in Winter Wheat Ecofallow Corn/Sorghum-Fallow Rotation

(Treat Ecofallow corn or sorghum stubble)

BLADEX 4L + 2,4-D LV ESTER	3 qt / 1.5 pt	3 qt / 1.5 pt	3.5 qt / 1.5 pt	Mar-Apr 10	Early application necessary to control winter annuals. Use Roundup for control of downy brome before heading, volunteer corn or sorghum. If weeds are emerged add Landmaster, Roundup or Roundup RT. Do not plant wheat for 20 days after using 2,4-D and Banvel. Follow-up weed control may be necessary. Cost: Bladex + 2,4-D $16.50-$19.00; Bladex + Cyclone $21.70-$24.20; Landmaster BW $6.40-$8.65; Roundup $6.60-$8.80; Roundup RT $5.50-$7.35; Fallow Master $6.40-$8.80; 2,4-D + Banvel $6.20.
BLADEX 4L + CYCLONE[1]	2.5 qt / 1.5-2.5 pt	2.5 qt / 1.5-2.5 pt	3 qt / 1.5-2.5 pt	Apr 15-May 1	
ROUNDUP or ROUNDUP RT[1]	12-16 oz	12-16 oz	12-16 oz	Apr 16-May 1	
or LANDMASTER BW[1]	40-54 oz	40-54 oz	40-54 oz		
or FALLOW MASTER	32-44 oz	32-44 oz	32-44 oz		
2,4-D ESTER + BANVEL	1 qt / 0.5 pt	1 qt / 0.5 pt	1 qt / 0.5 pt	Broadleaf weeds less than 4"	

WEED RESPONSE TO SELECTED ALFALFA HERBICIDES

Response Ratings:
E = Excellent (90-100%)
G = Good (75-90%)
F = Fair (50-75%)
P = Poor (0-50%)

	barnyardgrass	dandelion	downy brome	field pennycress	foxtail	kochia	kochia-triazine resistant	lambsquarters	pigweed	R. thistle	sandbur	shepherd's purse	tansy mustard	crop tolerance[a]	recrop interval in months when changing to unlabeled crop[b]
Preplant															
Balan	E	P	E	P	E	G	G	E	G	G	G	P	P	G	12
Eptam	E	P	E	P	E	G	G	G	G	P	G	P	P	G	2
Seedling															
Butyrac/Butoxone	P	P	P	P	P	P	P	F	G	F	P	P	P	G	1
Poast Plus	E	P	G	P	G	P	P	P	P	P	E	P	P	E	0
Buctril (seedling only)	P	P	P	F-G	P	F	F	G	P	G	P	E	F-G	G	0
Established															
Karmex	E	P	F	G	G	E	E	G	G	F	F	E	E	G	24
Lexone/Sencor	G	G	E	E	F	E	P	E	E	G	P	E	E	G	4
Sinbar	F	F	E	E	F	G	G	E	E	G	F	E	E	G	24
Velpar	F	G	E	G	P	G	P	G	G	G	F	E	E	G	12-24

[a]Crop varieties vary in their response to herbicides. Applying herbicides with liquid fertilizer may increase crop injury.

[b]Values will vary with soil texture, pH, organic matter, rainfall or irrigation, rotational crop and herbicide rate. For more information see "Herbicide Carryover," G74-180.

ALFALFA

See NebGuide G75-220 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, Page 37.			
ALFALFA (Establishing new stands)	BALAN 1.5EC	3-4 qt	Preplant	Apply to dry surface soil and immediately incorporate by cross tandem discing 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 $8.15-$11.40; Treflan $3.55-$5.35.
	EPTAM 7E	2.5-3.5 pt		
	TREFLAN (set-aside only)	1-1.5 pt		
	BUCTRIL	1-1.5 pt	Weeds less than 2" tall. Alfalfa at least 2 trifoliate leaves	Do not treat when temperature is above 70 F. Cost: $5.60-$11.40.
	POAST PLUS	1 pt	Grasses 4" or less	Good coverage necessary. Cost: $9.65. COC needed for effective control.
	BUTYRAC or BUTOXONE (2,4-DB)	1-3 qt	Postemergence. Weed sless than 3" tall; alfalfa 2-4 trifoliate leaves	**DO NOT** use treated forage for 30 days. Use when temperature is above 50 F. Cost: $3.80-$11.40.
ALFALFA (Seedling or established)	BUTYRAC or BUTOXONE (2,4-DB)	1-3 qt	Postemergence. Weeds less than 3" tall; alfalfa 2-4 trifoliate leaves	**DO NOT** use treated forage for 30 days. Use when temperature is above 50 F. Cost: $3.80-$11.40.
	KERB 50W	1-1.5 lb	Pre or post to winter annual grasses — October-March	Controls Downy Brome. Cost: $16.00-$24.00.
ALFALFA (Established one year or more)	KARMEX 80W	1.5-3 lb	Late fall to early spring to dormant alfalfa	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 $10.25-$20.50; Velpar $14.75-$44.25.
	LEXONE/SENCOR DF	0.5-1 lb		
	SINBAR 80W	0.5-1 lb		
	VELPAR L	1-1.5 qt		

PASTURES AND RANGES

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, indiangrass, little bluestem, sand lovegrass, sideoats grama, western wheatgrass.
	AATREX DF	1.1-2.2 lb		Use on big bluestem and switchgrass. Cost: $1.25-$5.00.
GRASS SEEDLINGS (Cool and warm season grasses)	2,4-D	1 pt	Grass 5-leaf stage or beyond	For broadleaf weeds. After grasses are well established, increase rate to 1 qt. Cost: $1.40-$2.80.
SOD SEEDING (Legumes into grass)	GRAMOXONE EXTRA	1.5-3 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: $8.80-$16.90.
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: $5.00-$20.00.
	ROUNDUP	1-2 qt	Spring on cool season grasses	
ANNUAL OR BIENNIAL BROADLEAF WEEDS IN PASTURES AND RANGES (For specific weeds see page 37-44.)	2,4-D	1 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 $2.20; 2,4-D + Banvel $5.60; Ally $8.00; Curtail $6.50.
	2,4-D + BANVEL	1 qt 0.5 pt		
	ALLY	0.2-0.3 oz		
	CURTAIL	2 pt		
PERENNIAL BROADLEAF WEEDS IN PASTURES AND RANGES (Includes vervains, broom snakeweed, western ironweed, wooly loco, Flodman thistle and wavy leaf thistle. For other weeds see pages 37-44.)	2,4-D	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. Withhold lactating dairy cows from treated areas for 7 days. With Banvel mixture do not harvest hay for dairy animals for 37 days. Do not use Banvel within 1/2 mile of sensitive crops. Cost: 2,4-D $3.30; 2,4-D + Banvel $9.00; Curtail $6.50-$13.00.
	2,4-D + BANVEL	1 qt 1 pt		
	CURTAIL	2-4 pt		

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 90DF	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: $2.50-$5.00.
ROUNDUP	1 pt	Before or at grass seeding	Will control most emerged seedling grass and broadleaf weeds. Apply Roundup in 10 GPA carrier or less and include surfactant at 0.5% v/v. Ammonium sulfate added at 17 lbs per 100 gal solution improve Roundup performance. Cost: Roundup $5.00.
2,4-D AMINE or ESTER	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.
LANDMASTER II	40-72 oz		Cost: 2,4-D $1.40-$2.80; Landmaster $5.20-$9.35.
PROWL	1-2 pt	PPI or PRE	For use on legumes only. Incorporate immediately for best results.
TREFLAN	1-1.5 pt	PPI	Cost: Prowl $3.25-$6.50; Treflan $3.55-$5.35.

POSTEMERGENCE

For established grass, see Pasture and Range Section, page 28.
For specific weeds, see Troublesome Weeds Section, page 37 - 44.

ALLY**	0.1 oz	After 3-4 leaf stage of grass	Controls most broadleaf weeds. 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: $2.70.
BANVEL + 2,4-D	0.25-0.5 pt 0.5-1 pt	After 5-leaf stage of grass	Controls most broadleaf weeds. Use lower rates 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: $2.40-$9.00.
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: $8.40-$11.20.
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: $6.00-$12.00.
2,4-D AMINE or 2,4-D ESTER	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: $.70-$1.10.

Ally can be applied **postemergence only at 0.1 oz/acre to the following grasses: Orchardgrass, Russian wild-rye, and crested, intermediate, western, tall, bluebunch, pubescent, slender Siberian, streambank, and thickspike wheatgrass.

NON-CROP ACRES

Area or Use	Herbicide[3]	Commercial Product[5,6]	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 $2.20; 2,4-D + Banvel $9.00
	2,4-D + BANVEL	1 qt/A 1 pt/A		
	TELAR	1/4-1/2 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	1 qt/A	Broadleaf weeds 2-6"	Cost: $2.20.
	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: $110.00.
LONG TERM VEGETATION CONTROL	ARSENAL	1 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 $3.45; Krovar $4.60; Karmex $1.25-$2.45; Princep $.55-$1.05; Spike $6.00-$12.00; Arsenal $1.10.
	HYVAR X 80W or HYVAR XL 2WS	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		
	PRINCEP 4L	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 quackgrass)	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 $20.00.

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 and favorable conditions. High weed populations or adverse conditions will reduce control.
E = Excellent (90-100%)
G = Good (75-90%)
F = Fair (50-75%)
P = Poor (0-50%)

Herbicide and Application Site (PPI or PRE on soil or POST on foliage)	annual morning glory	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 interval in months, when changing to unlabeled crop[b]
Potatoes																						
Eptam-ppi	G	E	P	E	E	E	P	F	F	G	E	G	F	P	E	E	P	P	P	F	G	1-2
Eptam + Treflan or Prowl-ppi	F	E	P	E	E	E	P	E	E	G	F	G	P	F	E	E	P	P	P	F	E	6-12
Sencor/Lexone-pre	P	G	F	G	G	G	G	F	P	E	F	E	E	G	P	P	G	F	G	E	G	4-18
Sencor/Lexone + Dual or Turbo-pre	P	E	F	F	E	E	G	F	P	E	G	E	E	G	F	P	G	F	G	E	F	4-18
Sencor/Lexone-post	P	P	G	F	P	F	P	G	E	P	P	E	G	E	F	P	G	G	F	P	G	4-18
Poast-post	P	E	P	E	E	G	P	P	P	P	P	P	P	P	E	E	P	P	P	P	E	0
Fieldbeans																						
Basagran-post*	F	P	E	P	P	P	E	P	P	P	P*	P	G	P	P	P	E	E	G	G	E	0
Dual + Treflan-ppi	F	E	P	E	E	E	P	F	F	G	G	G	P	F	E	G	P	P	P	F	E	6-12
Eptam-ppi	G	E	P	E	E	E	P	F	F	G	E	G	F	P	E	E	P	P	P	F	G	1-2
Eptam + Treflan or Prowl-ppi	F	E	P	E	E	E	P	E	E	G	G	G	P	F	E	E	P	P	P	F	E	6-12
Poast-post	P	E	P	E	E	G	P	P	P	P	P	P	P	P	E	E	P	P	P	P	E	0
Eptam + Dual-ppi	F	E	P	E	E	E	P	F	F	G	E	G	P	F	E	G	P	P	P	F	E	2-5
Eptam + Lasso-ppi	F	E	P	E	E	E	P	G	G	G	E	E	P	F	E	G	P	P	P	F	E	2-4
Lasso or Dual-ppi	P	E	P	E	E	E	P	P	P	G	G	G	G	P	F	P	P	P	P	P	G	2-4
Lasso + Treflan/Cannon-ppi	F	E	P	E	E	E	P	G	G	G	G	G	P	F	E	G	P	P	P	F	E	6-12
Eptam + Sonalan-ppi	F	E	P	E	E	E	P	E	E	G	G	G	P	F	E	E	P	P	P	F	E	6-12
Sugar Beets																						
Antor-ppi	P	E	P	E	G	E	P	P	P	F	G	G	P	P	G	F	P	P	P	P	G	2-3
Eptam layby	G	E	P	E	E	E	P	F	F	G	E	G	F	P	E	E	P	P	P	F	G	1-2
Nortron-ppi	-	G	F	G	G	G	-	G	G	G	F	E	-	F	F	-	G	P	-	G	G	5-12
Nortron + Antor-ppi	P	E	P	E	G	E	P	G	G	E	F	E	P	F	G	F	G	P	P	G	G	5-12
Ro-Neet-ppi	P	E	P	E	E	E	P	P	P	G	G	E	F	P	G	G	P	P	P	P	G	1-2
Betanal + Betanex or Betamix-post	F	P	-	P	P	P	F	F	F	G	F	G	F	P	P	P	F	F	P	G	G	1
Betanex-post	F	P	-	P	P	P	P	F	F	G	F	G	F	P	P	P	F	F	P	F	G	1
Herbicide 273-post	P	F	-	P	P	F	P	F	F	F	F	F	P	P	P	P	G	G	P	G	G	1
Poast-post	P	E	P	E	E	G	P	P	P	P	P	P	P	P	E	E	P	P	P	P	E	0
Stinger-post	P	P	G	P	P	P	F	P	P	P	P	P	G	P	P	P	F	G	P	G	G	12
Onions																						
Dacthal 75W-pre	P	G	P	E	P	E	P	P	P	E	F	E	P	P	G	P	P	P	P	P	G	3-8
Buctril 2EC-post	E	P	G	P	P	P	E	F	F	G	E	G	E	G	P	P	E	E	E	E	G	0
Goal-post	P	P	G	P	P	P	-	F	F	G	F	G	-	F	P	P	-	F	-	G		10
Fusilade-post	P	E	P	E	E	G	P	P	P	P	P	P	P	P	E	E	P	P	P	P	E	0
Poast-post	P	E	P	E	E	E	P	P	P	P	P	P	P	P	E	E	P	P	P	P	E	0
Vine Crops																						
Dacthal 75W-pre	P	G	P	E	P	E	P	P	P	E	F	E	P	P	G	P	P	P	P	P	G	3-8
Treflan-pre	P	E	P	E	E	E	P	G	G	G	P	G	P	G	G	G	P	P	P	P	G	6-12
Prefar 4E + Alanap-pre	P	E	G	E	F	E	-	-	-	G	-	G	G	-	F	F	-	G	-	G		4-6
Poast-post	P	E	P	E	E	G	P	P	P	P	P	P	P	P	E	E	P	P	P	P		0

[a]Crop varieties vary in their response to herbicides.

[b]Values will vary with soil texture, pH, organic matter, rainfall or irrigation, rotational crop and herbicide rate. For more information see "Herbicide Carryover", G74-180.

*Good control of hairy nightshade.

POTATO AND FIELDBEANS

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
Potatoes				
EPTAM 7E	3.5 pt	3.5 pt	3.5 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: $11.40.
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 $11.70; Eptam + Prowl $13.00-$14.65.
EPTAM 7E + PROWL 4EC	3 pt 1 pt	3 pt 1 pt	3 pt 1.5 pt	
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 onions or sugar beets during next growing season. Superior and Atlantic varieties are sensitive to Sencor/Lexone. Cost: Dual + Sencor/Lexone $26.25-$29.65; Sencor/Lexone $12.75-$25.50; Prowl + Sencor/Lexone $16.00-$17.65; Turbo $20.30-$35.55.
SENCOR/LEXONE 4L with DUAL 8E	1 pt 2 pt	1 pt 2.5 pt	1 pt 2.5 pt	
or with PROWL	1 pt	1.5 pt	1.5 pt	
TURBO	2-2.5 pt	3-3.5 pt	3-3.5 pt	
Postemergence				
POAST	1-1.5 pt	1-1.5 pt	1-1.5 pt	Most susceptible grasses less than 4" tall. Potatoes tolerant at all growth stages. Add 2 pints of crop oil concentrate. Good coverage essential for effective control. Cost: $10.75-$16.15.
SENCOR/LEXONE 4L	0.5-1 pt	0.5-1 pt	0.5-1 pt	POST BEFORE WEEDS ARE 1" TALL...Highest rate for sunflower and kochia. Do not use on red skinned or early maturing white varieties or within 60 days of harvest. Cost: $6.40-$12.75.
Fieldbeans				
Preplant				
EPTAM 10G or EPTAM 7E	30 lb 3.5 pt	30 lb 3.5 pt		PPI...Apply to dry surface soil; immediately incorporate with disc 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: $12.90.
EPTAM 7E with SONALAN	2.5 pt 2 pt	2.5 pt 2 pt		PPI...Apply to dry surface soil, immediately incorporate with a disc or field cultivator. Sonalan or Prowl may injure fall seeded small grains, sugar beets or sorghum the following year. Plowing reduces injury. Cost: Eptam + Dual $18.30; Eptam/ + Dual $18.30; Eptam + Lasso $18.95; Eptam + Eptam + Sonalan $14.15; Sonalan + Dual $16.15; Sonalan + Lasso $16.80; Eptam + Prowl $14.65.
or with PROWL	2 pt	2 pt		
EPTAM 7E or SONALAN with DUAL 8E	2.5 pt 2 pt 1.5 pt	2.5 pt 2 pt 1.5 pt		
or with LASSO	4 pt	4 pt		
EPTAM 7E + TREFLAN 4EC	2.25 pt 1 pt	2.25 pt 1 pt		PPI...Do not follow with fall seeded small grain. Sugar beets and sorghum may be injured the next year. Plowing reduces injury. Cost: Lasso + Treflan $14.35; Dual + Treflan $13.70; Eptam + Treflan $10.85; Cannon $11.30.
TREFLAN 4EC with DUAL 8E	1 pt 1.5 pt	1 pt 1.5 pt		
or with LASSO	4 pt	4 pt		
CANNON	4 qt	4 qt		
LASSO or DUAL 8E	3 qt 2.5 pt	3 qt 2.5 pt		PPI or SURFACE MIX...Surface mixing will improve weed control and reduce crop injury. Cost: Dual $16.90; Lasso $16.20.
Postemergence				
BASAGRAN + CROP OIL CONC.	0.75-1 qt			POSTEMERGENCE...At least one trifoliate leaf fully expanded. Broadleaf weeds 2-4" tall. Weeds showing moisture stress or over 6" tall are poorly controlled. Controls hairy but not eastern black nightshade. Cost: $12.85-$16.60.
POAST	1-1.5 pt			POSTEMERGENCE...Susceptible weeds less than 4" tall. Fieldbeans tolerant at all growth stages. Add 2 pt COC per acre. Good coverage essential. Cost: $10.75-$16.15.
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: $6.10-$8.80.

SUGAR BEETS

Herbicide	Commercial Product per Acre: Sandy Loam 1 % OM, Broadcast	Sandy Loam 1 % OM, Product/7" Band, 22" Row	Sandy Loam 1 % OM, Product/7" Band, 30" Row	Silt Loam 1 -2 % OM, Broadcast	Silt Loam 1 -2 % OM, Product/7" Band, 22" Row	Silt Loam 1 -2 % OM, Product/7" Band, 30" Row	Application Time, Remarks and Approximate Cost/A Broadcast
PPI or PRE							
ANTOR 4ES	3 qt	30 oz	22 oz	4 qt	41 oz	30 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 irrigate with 0.5" water. Cost: Antor $28.80-$38.40; Nortron $37.20-$62.00; Nortron + Antor $40.60-$64.00.
NORTRON 1.5EC	3 qt	30 oz	22 oz	5 qt	51 oz	36 oz	
NORTRON 1.5EC + ANTOR 4ES	2.5 qt 1 qt	25 oz 10 oz	18 oz 7 oz	4 qt 1.5 qt	40 oz 15 oz	29 oz 11 oz	
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: $15.00-$24.75.
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: $7.30-$11.40.
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	Sugar beets 2-6" tall. Cover exposed beet roots with soil before Treflan application to reduce root girdling. Cost: $3.55-$4.45.

Postemergence

Herbicide	Rate Per Acre: Pints Brdcst	Ounces Per 7" Band, 22" Row	Ounces Per 7" Band, 30" Row	Application Time	Remarks and Approximate Cost/A Broadcast
BETAMIX 1.3EC	2-3	10-15	7.5-11	Any stage of sugar beet 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.
BETAMIX 1.3EC	4.5-6	23-31	17-22	Sugar beets past two true leaf stage	Use highest rate as weed size increases. Cost: Brdcst $40.50-$54.00; 22" row $12.90-$17.35; 30" row $9.50-$12.30.
HERBICIDE 273	2-4	10-21	8-15	Beets 4-6 true leaves; weeds less than 5" tall	Use higher rates on large weeds. Apply when temperatures are above 60 F. Do not apply when sugar beets are past the 8 leaf stage of growth. Primarily for wild buckwheat and sunflower control. Cost: Brdcst $9.50-$19.00; 22" row $3.00-$6.30; 30" row $2.40-$4.50.
POAST	1-2	5-10	3-7	Grass 1-3"	Use higher rate for larger grass or grass under drought stress. Requires 1 qt crop oil concentrate per acre. See label. Cost: $12.35-$23.10.
STINGER	0.25-0.66	1.3-3.4	1.0-2.5	Beets 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: $15.65-$41.25.

VINE CROPS AND ONIONS

Herbicide	Commercial Product per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
Melons and Cucurbits			
PREFAR + ALANAP-L	4-6 qt 4-8 qt	Preplant	Immediately incorporate to a depth of 1''. Use lower rate on sandy soil. Controls many annual grasses and broadleaf weeds. Cost: $48.80-$80.00.
DACTHAL 75W	8-14 lb	Crop 4-5 true leaves	Crop should be weeded prior to application. Controls annual grasses. Use lower rate on sandy soil. Cost: $38.40-$67.20.
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: $3.55-$5.35.
POAST	1-1.5 pt	Grasses most susceptible under 4''	Don't apply within 14 days of harvest. Crop oil concentrate and good coverage essential for effective control. Cost: $10.75-$16.15.
COMMAND (Pumpkins only)	2.0 pt	Preplant	Immediately incorporate. Use on pumpkins only. Controls many annual grasses and broadleaf weeds. Cost: $16.00.
Onions			
DACTHAL 75W	8-14 lb	Preemergence at seeding or transplanting and/or at layby	Preplant incorporation not recommended. Use lower rate on soils with less than 1% organic matter. Cost: $38.40-$67.20.
BUCTRIL	1-1.5 pt	Postemergence; onions should have 2-5 true leaves	Water volume is important. Use 50-70 gal of water per acre. Do not add surfactants. Cost: $5.60-$8.40.
GOAL	0.6-1.25 pt	Onions 2 fully developed true leaves; weeds 2-4 leaves	Do not apply to onions under drought stress. Do not mix Goal with oil, surfactant or fertilizer. Cost: $5.76-$12.00.
FUSILADE 2000 POAST	1.5 1-1.5 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: $10.75-$16.15.

TREES AND SHRUBS INCLUDING CHRISTMAS AND FRUIT TREES*

Herbicide	Rate Per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
*CASORON 50W or CASORON 4G or *NOROSAC 4G	8 lb 100 lb 100 lb	Preemergence on trees at least 2 years old	Apply 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	1 qt	Postemergence to weeds	Keep off new bark and foliage. Controls broadleaf weeds. Cost: $2.20.
*FUSILADE 2000 or *POAST	2 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 $23.10; Poast $23.10.
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.

TREES AND SHRUBS INCLUDING CHRISTMAS AND FRUIT TREES* con't.

Herbicide	Rate Per Acre	Application Time	Remarks and Approximate Cost/A Broadcast
*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: $8.10-$16.20.
*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. 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 1/2% v/v with 1 qt rate. Cost: $10.00-$40.00.
*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: $30.00-$60.00.
TREFLAN	1-2 pt	Preplant	Incorporate 2-3" deep prior to planting. After planting adjust machine to throw treated soil towards trees in the row. Cost: $3.55-$7.10.
VELPAR L	1.8-3.6 qt	Pre- or post-emergence to weeds at least 2 months after transplanting	Use on Scotch, Austrian and Ponderosa Pine only. Use lower rates on sandy soils, soils low in organic matter, and on first year plantings. May be applied directly over the trees before bud break. Adjacent broadleaf trees may be injured. Cost: $40.65-$81.30.

*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 or COPPER CHELATES (Cutrine plus, Algetol or Algecide)	5.4 lb/SA 0.67-1.25 gal/AF	Algae (Moss) Chara	When growth first becomes visible	No restrictions on water usage at recommended rates. Copper compounds can be corrosive to equipment. Use Chelated Copper in high pH water. Cost/SA: Copper Sulfate $3.90.
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: $14.30-$148.50.
AQUAZINE (Simazine)	1.7-6.8 lb/AF	Algae (Moss) Chara Coontail Naiad Pondweed Milfoil	Spring before heavy weed growth appears	Treat total water volume. Best suited for still water. Do not use water for irrigation or livestock use. Cost: $9.45-$37.80.

AQUATIC WEED CONTROL

Slow Moving and Still Water con't

Herbicide	Rate Per AF (Acre Foot) or SA (Surface Acre)	Weeds Controlled	Application Time	Remarks and Approximate Cost
DIQUAT	1-2 gal/SA	Arrowhead Cattail Bulrush Elodea Pondweed	Post on foliage or on surface for submerged species	Do not use water for 10 days for swimming, livestock or irrigation. Not effective in water with suspended silt. Cost: $68.00-$136.00.
NOROSAC 10G	100-150 lb/ acre	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/acre.
2,4-D AMINE or ESTER 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: $4.20-$11.20.
RODEO + ORTHO X-77	1 gal/SA 2 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. Cost: $109.15.

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.

CUT STUMP TREATMENTS—TREES and WOODY PLANTS

Herbicide	Herbicide Concentration	Remarks and Cost
2,4-D LV ESTER	2 qt/10 gal diesel	Use to prevent resprouting of cut stumps. Apply to runoff to freshly cut surface. Delayed applications less effective. See NebGuide G84-704 Brush and Woody Plant Control. Cost/10 gal of solution: 2,4-D ester $5.50 + 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.

Weed	Herbicide[3]	Product Per Acre or Per 100 Gallons[5,6]	Application Time	Remarks and Approximate Cost/A Broadcast
ALFALFA (for control of alfalfa in corn or sorghum)	2,4-D AMINE + 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 soybeans to kill alfalfa prior to planting. Sorghum 3-5 leaf stage. Cost: 2,4-D + Banvel $3.95; Banvel $3.40.
ALFALFA (for control prior to planting fieldbeans, wheat, and potatoes	2,4-D	1.5-2 qt	Alfalfa with 4-6" new growth	Delay planting wheat 15 days and delay planting fieldbeans and potatoes 30 days after application. Ester formulations are more persistent than amine formulations. Cost: $4.20-$5.60.
ARTICHOKE JERUSALEM	2,4-D AMINE + Banvel	0.5 pt 0.5 pt	12-18" tall	For use in corn. Use drop nozzles on corn taller than 8". Cost: $3.95.
	Curtail	2.0 pt	12-18" tall	For use where no crop is present. Cost: 2,4-D $2.80; Curtail $6.00.
	2,4-D LV ester	1 qt	18-24" tall	

TROUBLESOME WEEDS AND WOODY PLANTS

Weed	Herbicide[3]	Product Per Acre or Per 100 Gallons[5,6]	Application Time	Remarks and Approximate Cost/A Broadcast
BARNYARDSAGE	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	Cost: Command + Canopy $20.00-$29.50; Command + Sencor $15.00-$23.50; Pursuit $17.00. Do not use Canopy or Preview on soils above pH 6.8. Reduce Sencor/Lexone rate 1/3 on calcareous soil.
	Pursuit	4 oz		
BLUE MUSTARD	2,4-D LV ester	0.5 pt	Nov 15-Mar 15 before blue mustard stem elongation	Use only on fully tillered wheat. Cost: $.70-$1.10. See NebGuide G74-92 Blue Mustard Control.
	2,4-D amine	1 pt		
	Glean 75DF + 2,4-D LV ester	0.17-0.33 oz 4.0 oz	Spring, 2"-4" broadleaf weeds	Do not use on soils with pH of 7.9 or higher. Use only on continuous wheat or wheat fallow. Use Glean east of Hwy. 183. Cost: Ally $2.70; Glean + 2,4-D $3.45-$6.35.
	Ally 60 DF + 2,4-D LV ester	0.1 oz 4.0 oz		
BUCKBRUSH (snowberry)	2,4-D LV ester	1-2 qt	Full foliage (May 10-25)	Use sufficient water to insure good coverage. Cost: $2.80-$5.60.
BUFFALOBUR	Atrazine 4L	2-3 qt	Preplant or preemergence in corn	Reduced rates less effective. Cost: $5.20-$7.80.
	Buctril 2EC	1.5 pt	Weeds 3-5 leaf stage in corn or sorghum	Plants taller than 4" not controlled. Cost: $8.40.
	Blazer 2S	1 qt	Weeds 3-4 leaf stage in soybeans	Weeds must be small. Follow-up treatments necessary. Cost: $15.00.
	Eradicane 6.7E or Eradicane Extra	5 pt 5.5 pt	Preplant to corn	Apply to dry surface soil and immediately incorporate by cross tandem discing or similar mixing. Cost: $14.70-$18.70.
	2,4-D + Banvel	0.5 pt 0.5 pt	Postemergence on corn	Plants must be small. Cost: $4.80.
BURCUCUMBER and WILD CUCUMBER	Buctril	1.5 pt	Weeds 3-5 leaf stage in corn	Thorough coverage required. Cost: $9.00.
	Atrazine 4L	3 qt	Preemergence in corn	Atrazine can also be used postemergence. Cost: Atrazine $7.80; Princep $12.60.
	Princep 4L	3 qt	Premergence in trees or corn	
	Sencor/Lexone 4L (split-application)	0.5 pt + 0.5 pt	Preplant plus preemergence	Split-shot in soybeans. Cost: $12.75.
BURSAGE, SKELETONLEAF AND WOOLLYLEAF	Tordon 22K	2 qt	Flower bud stage or when growing actively	Non-crop areas. Tordon may remain in soil for three or more years. Cost: $49.60.
	2,4-D + 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: $15.80.
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: $24.80. See NebGuide G80-509 Canada Thistle Control.
	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: $35.00-$52.50.
	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 years after treatment. Cost: $13.60-$27.20.
	Curtail	2-4 pts	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 for use in sugarbeets and corn. Cost: Curtail $6.00-$12.00; Stinger $31.25-$41.90.
	Stinger	0.5-0.67 pt		
	Ally + Surfactant	0.1 oz	4"-6" stage	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: $3.05-$6.10.
	Telar + Surfactant	0.5 oz		

TROUBLESOME WEEDS AND WOODY PLANTS

Weed	Herbicide[3]	Product Per Acre or Per 100 Gallons[5,6]	Application Time	Remarks and Approximate Cost/A Broadcast
CACTUS (Prickly Pear)	Tordon 22K	1-2 pt	Early summer	Spot treatment in pasture and grazingland. Cost: $12.40-$24.80.
CATTAILS	2,4-D LV ester	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 $16.80; Dowpon $29.00.
	Dowpon M 74SP	13.5 lb + 0.5% emulsifier	After flowering to fruiting	
	Roundup	3 qt in 10 gal or	At flowering	Avoid water contamination. Cost: $30.00.
CHEATGRASS	See Downy Brome			
COCKLEBUR	See Velvetleaf			
COTTONWOOD, WILLOWS & SIBERIAN ELM	2,4-D LV ester	2-3 qt	Full foliage (Jun-Jul); basal treatment anytime	2,4-D with aerial equipment at least 5 gal carrier/A; annual treatment for 2-3 years may be necessary. Basal or stump treatment: 2 qt of herbicide/10 gal of diesel; apply to point or runoff. Cost: 2,4-D $5.60-$8.40; Crossbow $43.00.
	Crossbow	1 gal		
	Krenite S	2-3 gal in 100 gal water + surfactant	Late Jul, Aug and Sep	Has little effect on grasses. Results show the following spring. Cost: $87.00-$130.50.
	Spike 20P	0.25 oz/1" dia	Spring or fall	Apply under drip line. Cost: $8.60/lb.
	Velpar RP	4 ml/1" dia	Spring with spot gun to tree base	Cost: $.08/tree inch.
DEVILSCLAW	See Velvetleaf for control in corn & milo			
DIFFUSE KNAPWEED	SEE SPOTTED KNAPWEED			
DOCK; CURLED & PALE	2,4-D + Banvel	1 qt 0.5 pt	Before flowering in spring or fall	For use on idle ground or grassland. Cost: $6.20.
DOGWOOD	Banvel	1-2 qt	Full foliage during Jun	Ground application only. Observe all drift precautions when using within 1/2 mile of sensitive crops. Cost: Banvel $13.60-$27.20; Crossbow $43.00-$64.50.
	Crossbow	1.0 to 1.5 gal		
	Spike 20P	0.25 oz/1" dia	Spring or fall	Apply under drip line. Cost: $8.60/lb.
DOWNY BROME	AAtrex or Atrazine 4L (non-crop)	2 qt	Preemergence (fall or spring prior to Apr 1)	Cost: AAtrex/Atrazine $5.20; Princep $8.40; Oust $8.00.
	Princep 4L (non-crop)	2 qt		
	Oust (non-cropland)	1-2 oz	Early spring	
	Far-Go 10G	15 lb	Preplant to winter wheat	Approximately 50%-80% control. With Far-Go wheat must be planted with hoe drill. Will not control emerged downy brome. Cost: Far-Go $15.00; Treflan $3.55-$5.35.
	Treflan	1-1.5 pt		
	Alternate system			Crop rotation—Include a spring seeded crop in the rotation. See NebGuide G78-422 Downy Brome.
FIELD BINDWEED (when treating crops adjust rates)	2,4-D	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 $2.20; 2,4-D + Banvel $5.65-$9.00.
	2,4-D + Banvel	1 qt 0.5-1 pt		
	Banvel	1-2 pt	Late summer or fall when actively growing	For Roundup apply in 10 gal or less water per 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 after 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 $5.55; Roundup + Banvel $8.40; Banvel $13.65-$27.20; Landmaster $8.65.
	Landmaster BW	54 oz		
	Roundup + 2,4-D amine or Banvel	1 pt 0.5 pt 0.5 pt		
	Tordon 22K + 2,4-D	1 pt 2 pt	Fall after wheat harvest.	Use in a wheat fallow rotation. Retreat with 2,4-D or Landmaster in spring. Cost: $15.00.

TROUBLESOME WEEDS AND WOODY PLANTS

Weed	Herbicide[3]	Product Per Acre or Per 100 Gallons[5,6]	Application Time	Remarks and Approximate Cost/A Broadcast
HEMP (Marijuana)	2,4-D	1 qt	2-12" tall	Cost: $2.20.
HEMP DOGBANE	2,4-D	0.5-1 qt	Flower bud stage-spring	Use lower rates in crops. Cost: $2.20.
	2,4-D	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 $2.20-$3.30. See NebGuide G84-665 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: $40.00.
HOARY CRESS	2,4-D LV ester	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: $5.60.
JOHNSONGRASS	Accent	0.67 oz	6-16"	See corn postemergence for application restrictions. Split-applications more effective. Cost: $19.50.
	Beacon	0.75 oz		
	Fusilade 2000	1.5 pt	12-18" new growth	For use in soybeans. Add 1 qt/A crop oil concentrate. Cost: Fusilade $17.65; Poast $17.65.
(see shattercane for seedling control)	Poast + Am sulfate	1.5 pt 2.5 lb		
	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: $20.00-$30.00.
JOINTED GOATGRASS	SEE DOWNY BROME			
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 preemergence herbicides. Cost: Fallow Master $9.00; Landmaster $8.65; Banvel 3.40; Cyclone $5.00.
	Landmaster BW Fallow Master	54 oz 44 oz	Preplant to corn sorghum or wheat.	
	Cyclone	1.5 pt	Kochia less than 4" tall	
			Postemergence to corn or sorghum	Use higher Buctril rate for taller Kochia.
	Banvel	0.5 pt	Kochia less than 2" tall	Sorghum must have 3-5 leaves when using Banvel. Buctril + Banvel on corn only. Cost: Banvel $3.40; Buctril $5.60-$8.40; Buctril Banvel $9.00. Buctril + Atrazine $6.90-$9.70.
	Buctril	1.0-1.5 pt		
	Buctril + Banvel	1-1.5 pt 0.5 pt		
Buctril		2 pt	Kochia 2"	Atrazine
		+		
		3 pt	Kochia 4"	
	Command 4EC	1.5 pt	Preplant incorporated in soybeans, before kochia emerges	Do not rotate to small grains. Cost: $12.00.

TROUBLESOME WEEDS AND WOODY PLANTS

Weed	Herbicide[3]	Product Per Acre or Per 100 Gallons[5,6]	Application Time	Remarks and Approximate Cost/A Broadcast
LEAFY SPURGE	2,4-D LV ester	2 qt	Bud stage spring or late fall	Retreatment necessary. Annual applications gradually reduce infestation. Cost: 2,4-D LV $5.60; 2,4-D + Tordon $14.60. See NebGuide G87-834 Leafy Spurge.
	2,4-D amine + Tordon 22K	1 qt 1 pt		
	Tordon 22K	2-4 qt	Fall or spring	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 $49.60-$99.20; Roundup + 2,4-D $12.15.
	Roundup + 2,4-D amine	1 qt 1 qt	Sep to early Oct	
LOCUST, HONEY AND BLACK	Banvel	2 qt	Full foliage during Jun; cut stump or basal treatment anytime	Ground application only. Observe all drift precautions. See cottonwood for basal and cut stump treatment. Cost: Banvel $27.20; Crossbow $43.00-$64.50.
	Crossbow	1.0-1.5 gal		
	Spike 20P	0.25 oz/1" dia	Spring or fall	Apply under drip line. Cost: $8.60/lb.
	Velpar RP	4 ml/1" dia	Spot gun-spring	Cost: $.08/tree inch.
MILKWEED, COMMON	2,4-D + 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: $6.20.
	Roundup	3 qt in 10 gal or less water/A	Flowering thru maturity; ropewick application in soybeans	Idle ground or spot treatment on cropland before head or pod fill of crop. Avoid tillage for 7 days. Cost: $30.00.
MILKWEED, HONEYVINE (climbing)	2,4-D amine	1-2 pt	Before vines reach 3' in length	For use in corn or sorghum. Use lower rates in sorghum. Gives suppression only. Cost: $.70-$2.20. See NebGuide G77-384 Common Milkweed.
	2,4-D LV ester	0.5-1 pt		
MULLEIN, COMMON	Tordon 22K	0.5 pt	Late fall on rosettes or spring before flowering stalks lengthen	Essential to apply in rosette stage. Cost: $6.20.
MUSK AND PLUMELESS THISTLE	Ally	0.3 oz	Late fall or spring before bolting	Use in pastures, wheat, grasses for seed, fallow and CRP. Cost: Ally $5.40; 2,4-D $6.00.
	Curtail	2 pt		
THISTLE	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	1.5-2 qt	Late fall treatment	Annual treatments necessary for control of new seedlings. Fall applications after trees drop leaves and before leafing out in the spring reduces damage. Do not apply after "soil freeze-up" in the fall. For use on ranges and permanent pastures only. Cost: 2,4-D $4.20-$5.60; 2,4-D + Banvel $6.20; Tordon $4.80-$6.40. See NebGuide G76-160 Musk Thistle.
	2,4-D + Banvel	1 qt 0.5 pt	treatment of rosettes or spring before flowering stalks lengthen	
	Tordon 22K (musk only)	6-8 oz	Oct 1-Dec 1 or spring before flowering stalks lengthen	
OAKS	Banvel	2 qt	Full foliage Jun to Jul; cut stump or basal treatment anytime	Non-cropland only for Spike and Crossbow. Cost: Banvel $25.40; Crossbow $64.50; Spike $8.60/lb; Velpar RP $.08/tree inch.
	Crossbow	1.5 gal		
	Spike 20P	0.25 oz/1" dia	Spring or fall	
	Velpar RP	4 ml/1" dia	Spot gun-spring to tree base	
OSAGE ORANGE	Crossbow	1.0 - 1.5 gal	Full foliage Jun to Jul; 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 RP	4 ml/1" dia	Spring. Spot gun Apply to tree base	
PERENNIAL SOW THISTLE	2,4-D LV ester	1.5 qt	Fall rosette or spring bud stage	See remarks for field bindweed. Cost: $4.20.

TROUBLESOME WEEDS AND WOODY PLANTS

Weed	Herbicide[3]	Product Per Acre or Per 100 Gallons[5,6]	Application Time	Remarks and Approximate Cost/A Broadcast
POISON IVY	Crossbow	1.0 - 1.5 gal		
	Amino Triazole/ Weedazol 90SP	2 tbs/gal of water	Full foliage (Jun)	Thoroughly wet all vegetation. Do not apply to cropland. Cost: $1.10/1000 sq ft.
	or Amitrol-T/ Cytrol-T 2WS	0.5 cup/ gal of water		
POISON HEMLOCK	2,4-D + Banvel	1 qt 0.5 pt	Rosettes-fall or early spring	Cost: $6.20.
PUNCTUREVINE	2,4-D LV ester	1 qt	Pre-bud stage most effective	Mature burs not affected by 2,4-D. Retreatment necessary on new plants. Cost: $2.80.
RYE VOLUNTEER	SEE DOWNY BROME			
PURSLANE (In fallow)	2,4-D LV ester	1 qt	When growing actively	Till 5-7 days after treatment. Do not plant small grains for 15 days. Cost: 2,4-D $2.80; Banvel $3.40-$6.80.
	Banvel	0.5-1 pt		
	Ally + 2,4-D	0.1 oz 4 oz	Early post	Add surfactant when used post-emergence. Cost: Ally + 2,4-D $3.70.
RAGWEED, WESTERN (perennial)	2,4-D LV ester	1 qt	Early summer	Follow-up treatments may be necessary. Cost: $2.80.
RED CEDAR	Spike 20P	0.5 oz/1" dia	Spring or fall	Spike for use in non-crop areas only. Tordon and Velpar RP can be used on grazingland. Cost: Spike $8.60/lb; Tordon $99.00; Velpar RP $.08/tree inch.
	Tordon 22K	4 qt/100 gal	Spring or fall	
	Velpar RP	4 ml/1" dia	Spot gun in spring to tree base	
	Mechanical shear or prescribed burning also effective.			
RUSSIAN KNAPWEED	Banvel 4WS	1-2 qt	Early flower bud stage	Idle ground or grassland. Avoid tillage for 7 days. Injury to forage grasses may occur. Broadleaf crops may be injured for 2 years after treatment. Cost: Banvel $13.60-$27.20; Tordon $49.50.
	Tordon 22K	2 qt		
RUSSIAN OLIVE	2,4-D + Banvel 4WS	2 qt 1 qt	Full foliage (early Jun)	See remarks for cottonwood. Cost: $19.20.
	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.			
PURPLE LOOSESTRIFE	Rodeo	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 $40.00; Roundup $20.00.
	Roundup	2 qt		
SAGEBRUSH (sand and fringed and green sagewort)	2,4-D LV ester	1.5-2 qt	4-8" new growth (Jun)	1.5 qt/A 2,4-D adequate on sand sagebrush. Cost: $4.20-$5.60. See NebGuide G80-510 Sagebrush Control.
SANDBUR	Accent + COC	0.67 oz 1%		Cost: Accent $20.00; Atrazine $6.25. See NebGuide G74-121 Field Sandbur Control.
	Atrazine 4L + COC	2 qt 2 pt	Postemergence in Corn. Sandbur < 1" Corn ≤ 12"	
	Treatments listed for shattercane also control or suppress sandbur.			

TROUBLESOME WEEDS AND WOODY PLANTS

Weed	Herbicide[3]	Product Per Acre or Per 100 Gallon[5,6]	Application Time	Remarks and Approximate Cost/A Broadcast
		Corn treatments		
SHATTERCANE	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 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 postemergence organophosphate treatment. Beacon may be applied at 0.38 oz followed by a second 0.38 oz treatment if required. Corn hybrids vary in tolerance to Beacon. Cost: $19.50.
	Beacon	0.75 oz	Corn 4''-20'' Shattercane 4''-6''	
	Sutan +	7.3 pt	Preplant to corn	Incorporate immediately by cross discing or equivalent soil mixing. Do not use Princep or Bladex on sand. Repeated use of Sutan+ will lead to reduced weed control. Lasso and Dual provide suppression of light infestations. Incorporate Treflan with cultivation or sprinkler irrigation water within 24 hours. Cost: plus Bladex $26.60; plus Princep $25.40; Sutan $15.40; plus Bladex $25.30, plus Princep $24.10. Treflan $7.10.
	Princep or Bladex 4L + Sutan +	2 qt 7.3 pt		
	Treflan 4EC	1.5-2 pt	Corn 2-leaf through 30'' weed unemerged	See NebGuide G74-122 Shattercane.
An alternate system — Ridge-till.				
		Soybean treatments		
SHATTERCANE	Prowl 4EC	3 pt	Preplant to soybeans	Incorporate by cross discing or equivalent soil mixing. Cost: Prowl $9.75; Sonalan $9.00; Treflan $3.55-$8.90.
	Sonalan or Treflan 4EC	3 pt 1.5-2.5 pt		
	Assure II	7 oz	Postemergence in soybeans. Cane 6-12''	Use with crop oil concentrate. Cost: Assure $9.75; Fusilade $9.75; Option $10.50; Poast $12.25.
	Fusilade 2000	0.75 pt		
	Option	0.8 pt		
	Poast	1 pt		
	Pursuit	4 oz	Cane 4-8''	Add nonionic surfactant 1/4% v/v plus 2 qt/A UAN. Cost: $18.00.
An alternate system — Ridge-till.				
SOAPWEED (Yucca)	Velpar RP	4 ml/plant		Apply with spot gun at base of plant.
SPOTTED KNAPWEED	2,4-D	1 qt	Rosette stage	Cost: $2.50.
SUMAC	2,4-D LV ester	1-2 qt	Full foliage	Use sufficient water for good coverage. Cost: $2.50-$5.00.
SUNFLOWER	See Velvetleaf			
SWAMP SMARTWEED (tanweed, shoestring)	2,4-D LV ester + Banvel	1 qt 1 pt	When growing vigorously	On crops use lower rates and amine formulations. Cost $8.85.
	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: $30.00-$40.00.

TROUBLESOME WEEDS AND WOODY PLANTS

Weed	Herbicide[3]	Product Per Acre or Per 100 Gallons[5,6]	Application Time	Remarks and Approximate Cost/A Broadcast
	Corn and Sorghum treatments (also control cocklebur, devils claw & common sunflowers)			
VELVETLEAF	AAtrex/ Atrazine 4L	1.2 qt		Use crop oil concentrate with AAtrex/Atrazine and Laddok. Cost: AAtrex/Atrazine $4.40; Basagran $7.60-$14.60; Brominal/Buctril $5.25-$7.90; 2,4-D $.65-$1.25; Marksman $4.80-$8.40; Laddok $5.50-$7.50.
	Basagran + 28% N	1-2 pt 1 gal	Velvetleaf less than 4"	
	Laddok	2.4 to 3.6 pt		
	Buctril 2EC + Atrazine 4L	1-1.5 pt 1-2 pt		
	2,4-D LV ester	0.5-1 pt	Velvetleaf less than 12"	
	Marksman	2-3.5 pt	Before 5-leaf stage of corn	
	Soybean treatments			
VELVETLEAF	Command 4 EC	1-1.5 pt	PPI to soybean planting	Command drift may damage green vegetation. Command residue may damage wheat planted the same fall. Cost: Command $7.50-$11.75 and additional herbicide costs. Basagran $7.60; Classic $8.00-$11.50; Pursuit $18.00. See NebGuide G83-681 Velvetleaf.
	Basagran + 28% N	1 pt 1 gal	Velvetleaf less than 4"	
	Classic + 28% N + Surfactant	0.5-0.75 oz 1 gal 1/8% v/v		
	Pursuit + 28% N + Surfactant	4 oz + 2 qt + 1/4% v/v		
WILD OAT	In Nebraska probably weedy annual brome. See Downy brome.			
WILD PROSO MILLET (See NebGuide)	Eptam	3.5 pt	Preplant to fieldbeans	Apply to dry surface soil and incorporate immediately with a disc or field cultivator. Cost: $11.40.
	Eradicane 6.7E	5 pt		
	Sutan+ 6.7	5 pt	Preplant to corn	Apply to dry surface soil and incorporate immediately with disc or field cultivator. Repeated use of Eradicane Extra or Sutan+ will lead to reduce weed control. Cost: $10.75.
	Prowl 4EC + Bladex 80W	1 qt 1.25 lb	Spike stage of corn. Wild proso millet less than 1"	Cost: $11.20.
	Prowl 4EC	1.5 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: $9.75.
	Accent	0.67 oz	Post in corn Wild proso millet 1-3 leaf stage.	Follow label directions. Cost: $19.00.
	Poast	0.5 pt	Postemergence on 4-8" wild proso millet	Poast on sugar beets, soybeans, field beans and alfalfa. Add 1 qt crop oil concentrate per acre. Cost: Poast $7.00.
	Ro-Neet	3.3-4 pt	Preplant to sugar beets	Cost: $21.45-$26.00.

[1] Add X-77 spreader 2 pt (0.25% v/v) per 100 gal spray solution for Cyclone and Gramoxone Extra, 4 pt (0.5% v/v) per 100 gal. For Roundup, Roundup RT, Landmaster II, Landmaster BW, and Fallow Master application, apply 10 gal or less water per acre, and add 17 lbs ammonium sulfate (spray grade) per 100 gal spray solution. For Roundup and Roundup RT, add 4 pt nonionic surfactant per 100 gal.

[2] The addition of 0.5 to 1 pt 2,4-D LV ester improves control of broadleaf weed. Do not apply 2,4-D preemergence after planting sorghum.

[3] 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.

[4] Do not use on soils with less than 1% organic matter. Increased injury risk on soils where triazine carryover exists.

[5] 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 1000 sq ft.

[6] Rates per 100 gallons pertain to handgun on a power sprayer.

CONVERSION TABLES

Rate Per Acre To 1000 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 1000 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 1000 sq ft

   64 ÷ 43 = 1.50 oz or 3 tablespoons per 1000 sq ft

4. Add 3 tablespoons of the product to 1 gal of water and apply uniformly to 1000 sq ft

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 1000 sq ft should be carefully measured by weighing on a precision scale.

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

Equivalent Amounts of Different Formulations

1 qt AAtrex or Atrazine 4L = 1.25 lb AAtrex or Atrazine 80W = 1.1 lb AAtrex Nine-0
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

HERBICIDE DICTIONARY

AAtrex—A trade name for atrazine. Ciba-Geigy.

Accent (nicosulfuron)—Postemergence grass control in corn. DuPont.

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

Alanap (naptalam)—A pre-and postemergence broadleaf and grass herbicide for soybeans and vine crops. Uniroyal.

Ally (metsulfuron)—Used in wheat, barley, and fallow for broadleaf and certain grass weed control. 3-6 week residual. DuPont.

Amber (CGA-131036)—Similar to Glean for broadleaf control in wheat. Registration pending. Ciba-Geigy.

Amiben (chloramben)—A pre- and early postemergence herbicide for grass and broadleaf weeds in soybeans. Rhone-Poulenc.

Amino Triazole—Trade name for amitrole. American Cyanamid.

Amitrole—A translocated herbicide that inhibits chlorophyll formation and regrowth from root buds. Trade names are Amino Triazole, Cytrol and Weedazol.

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

Amizine (amitrole + simazine)—A combination of amitrole and simazine for use in tree plantings and non-crop areas. Rhone-Poulenc.

Antor—A selective soil applied herbicide for weed control in sugar beets. NOR-AM.

Arena—Generic alachlor. Monsanto.

Aquathol (endothall)—An aquatic herbicide for use in still water. Pennwalt.

Aquazine (simazine)—An aquatic herbicide for use in still water. Ciba-Geigy.

Arsenal (imazapyr)—Provides total vegetation control for noncrop areas. American Cyanamid.

Assert—Control wild oats not annual bromes in wheat. American Cyanamid.

Assure II(quizalofop)—A postemergence grass herbicide for use in soybeans. DuPont.

Asulox (asulam)—For postemergence weed control in turf, ornamentals, Christmas trees and non-crop areas. Rhone-Poulenc.

Atrazine—A preplant, preemergence and postemergence s-triazine for broadleaf and certain grass weeds in corn, sorghum and rangeland. Available under several private labels.

Avenge (difenzoquat)—Controls wild oats not annual bromes postemergence in spring small grain. American Cyanamid.

Balan (benefin)—A preplant incorporated herbicide for annual grass control in alfalfa. DowElanco.

Banvel (dicamba)—A post- and preemergence herbicide for selective broadleaf weed control in corn, sorghum, small grains and grasses. Sandoz.

Basagran (bentazon)—A postemergence fieldbean, corn, sorghum and soybean herbicide for velvetleaf, cocklebur and other broadleaf weeds under 6''. BASF.

Beacon (primisulfuron)—Postemergence grass control in corn. Ciba-Geigy.

Betamix (phenmedipham + desmedipham)—A prepackaged combination of Betanal + Betanex for postemergence broadleaf weed control in sugar beets. NOR-AM.

Betanal (phenmedipham)—Postemergence broadleaf weed control in sugar beets. NOR-AM.

Betanex (desmedipham)—Used postemergence for redroot pig weed control in sugar beets. NOR-AM.

Bicep 6E (metolachlor + atrazine)—A combination of 3.33 lbs Dual + 2.67 lbs AAtrex for preemergence use in corn and sorghum safened with Concep II. Ciba-Geigy.

Bladex (cyanazine)—A short residual triazine for grass and broadleaf weed control in corn and sorghum. DuPont.

Blazer (acifluorfen)—A postemergence herbicide for broadleaf weed control in soybeans. BASF.

Brominal 3+3—A combination of bromoxynil and MCPA for use in small grains. Rhone-Poulenc.

Bronate—A combination of bromoxynil and MCPA for use in small grain. Rhone-Poulenc.

Bronco (alachlor + glyphosate)—A prepackaged combination of Lasso + Roundup for use in no-till corn, soybeans, and screen safened sorghum. Monsanto.

Buctril (bromoxynil)—A contact herbicide for broadleaf control in corn, sorghum and small grains. Rhone-Poulenc.

Bullet (Alachlor MT + Atrazine)—A combination of 2.5 lb Lasso MT plus 1.5 lb Atrazine. Monsanto.

Butoxone (2,4-DB)—For selective control of cocklebur in soybeans and some small broadleaf weeds inseedling alfalfa. Vertac.

Butyrac (2,4-DB)—Similar to Butoxone. Rhone-Poulenc.

Cannon (alachlor + trifluralin)—A 5:1 combination of Lasso + trifluralin. Monsanto.

Canopy—Combinations of 10.7% Classic active ingredient and 64.3% metribuzin, for preemergence use in soybeans. DuPont.

Carbyne (barban)—Used for wild oat control in spring small grain. Sandoz.

Casoron (dichlobenil)—Used for preemergence weed control in woody plants and certain herbaceous perennials. Uniroyal.

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

Classic (chlorimuron ethyl)—A postemergence herbicide for broadleaf weed control in soybeans. DuPont.

Cobra (lactofen)—Used postemergence for broadleaf weed control in soybeans. Chevron.

Command (clomazone)—A preplant incorporated herbicide for grass and broadleaf weed control in soybeans. FMC.

Commence—A prepack of 3 lbs trifluralin + 2.25 lbs Command for use in soybeans. FMC, DowElanco.

Concep II (cyoxmetrinil)—A protectant for sorghum seed to prevent Dual and Bicep injury. Ciba-Geigy.

Confidence—Generic Alachlor.

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

Cropstar—Lasso granular.

Crossbow (2,4-D + trichlopyr)—Ester formulation of 2,4-D and Garlon for broadleaf weeds and woody plants. DowElanco.

Curtail—A combination of clopyralid + 2,4-D for postemergence broadleaf control in small grain. DowElanco.

Curtail M—A combination of clopyralid + MCPA for postemergence broadleaf control in small grains. DowElanco.

Cycle (cyanazine + metolachlor)—A prepack of 2 lbs cyanazine and 2 lbs metolachlor for weed control in field corn and sorghum. Ciba-Geigy.

Cyclone (paraquat)—A 2 lb/gal formulation of paraquat for weed control in fallow situations. ICI.

HERBICIDE DICTIONARY

Cytrol—Trade name for amitrole. Am. Cyanamid.

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

Dacthal (DCPA)—Used preemergence for annual grass and certain broadleaf weeds in turf, ornamentals and horticultural crops. Fermenta.

Deploy (glyphosate)—Roundup without a surfactant. For use in set-aside. Monsanto.

Diquat (diquat)—Used for acquatic weed control and desiccantion of legume, soybean and grain sorghum seed crops. Valent

Direx (diuron)—Similar to Karmex. Griffin.

Dowpon—Trade name for dalapon. Vertac.

Dual (metolachlor)—Used preplant or preemergence for annual grass and some broadleaf weeds in corn, sorghum and soybeans. Ciba-Geigy.

Dual II (metolachlor) — Dual + a safener. Ciba-Geigy.

Endothall (endothall)—Used preemergence and postemergence for annual grass and broadleaf weeds in sugar beets and as a desiccant. Pennwalt.

Enide (diphenamid)—Used preemergence for annual grasses and some broadleaf weeds in potatoes and other horticultural crops. Upjohn.

Eptam (EPTC)—Used preplant soil incorporated for grass and certain broadleaf weeds in corn, legumes, sugar beets and many horticultural crops. ICI.

Eradicane (EPTC + R-25788 antidote)—Used preplant incorporated in corn. The antidote provides greater crop safety. ICI.

Eradicane Extra (EPTC + R-25788 antidote + R-33865 extender)—The extender restores performance on soils where Eradicane has ceased to perform. ICI.

Escort (metsulfuron)—An industrial formulation of Ally. DuPont.

Evik (ametryn)—Used as a directed postemergence contact spray for weeds in corn. Ciba-Geigy.

Express (tribenuron methyl)—A short residual herbicide for broadleaf weed control in cereal crops. EUP. DuPont.

Extrazine II (cyanazine + atrazine)—A combination of 3.0 lbs Bladex + 1.0 lb atrazine for PPI or preemergence use in corn. DuPont.

Fallow Master (glyphosate + dicamba)—A combination of 1.5 lb Roundup plus 0.6 lb Banvel. Monsanto.

Far-Go (triallate)—For preplant control of downy brome and other grasses in winter wheat. Monsanto.

Freedom (trifluralin + alachlor)—A combination of 2.67 lbs Lasso + 0.33 lbs Treflan for preplant incorporated use in soybeans. Monsanto.

Furloe (chlorpropham)—Used PPI and preemergence for smartweed in soybeans. Chevron.

Fusilade 2000 (fluazifop)—A selective postemergence herbicide for shattercane, volunteer corn and other grasses in soybeans, nursery stock and ornamentals. ICI.

Galaxy (bentazon + acifluorfen)—A 9:2 ratio of Basgran and Blazer for postemergence broadleaf control in soybeans. BASF.

Gemini—4.6% Classic + 55.4% linuron (Lorox) on an active ingredient basis for preemergence use in soybeans. DuPont.

Glean (chlorsulfuron)—A pre- and postemergence broadleaf herbicide for small grains. DuPont.

Goal (oxyfluorfen)—A preemergence herbiciee for soybeans, onions and nursery stock. Rohm & Haas.

Gramoxone Extra (paraquat)—2.5 lb/gal formulation. ICI.

Graslan (tebuthiuron)—Used for brush control in rangeland. DowElanco.

Harmony Extra (thifensulfuron + tribenuron)—2:1 ratio of Harmony plus Express for weed control in small grains. DuPont.

Herbicide 273 (endothall)—A postemergence sugar beet herbicide especially effective against broadleaf weeds. Pennwalt.

Hi-Dep—Formulation of 2,4-D ester for low volume application. PBI Golden.

Hoelon (diclofop)—Used postemergence for annual grass in soybeans and wheat. American Hoechst.

Hyvar (bromacil)—Used as a soil sterilant and for woody plant control. DuPont.

Igran (terbutryn)—A short residual s-triazine for use in sorghum. Generally combined with AAtrex or Milogard for broader spectrum control and reduced carryover. Discontinued. Ciba-Geigy.

Judge—Generic Alachlor.

Karmex (diuron)—A substituted urea for selective annual weed control at low rates and as a soil sterilant at higher rates. DuPont.

Kerb (pronamide)—Used preemergence and early postemergence in alfalfa. Rohm & Haas.

Krenite (fosamine)—A water soluble brush control agent that can be used on noncropland areas adjacent to water. DuPont.

Krovar—A combination of Hyvar and Karmex. DuPont.

Laddok (bentazon + atrazine)—A combination of Basagran + atrazine for postemergence broadleaf weed control in corn. BASF.

Landmaster BW—A combination of 1.2 lb glyphosate (Roundup) and 1.6 lb 2,4-D primarily for no-till. Monsanto.

Landmaster II (glyphosate + 2,4-D amine)—A combination of 1.2 lb Roundup plus 1.0 lb 2,4-D amine. Monsanto.

Lariat—A prepack of 2.5 lbs Lasso +1.5 lb atrazine. Monsanto.

Lasso (alachlor)—Used preplant and preemergence for annual grass and some broadleaf weeds in corn, sorghum, soybeans and fieldbeans. Monsanto.

Lasso II (alachlor)—Granular formulation of Lasso. Monsanto.

Lasso-Atrazine Flowable—A prepackaged combination of 2.5 lbs Lasso and 1.5 lb atraizine. Monsanto.

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

Lexone (metribuzin)—Trade name for metribuzin. DuPont.

Linex (linuron)—Trade name for linuron. Griffin.

Linuron—Used primarily preemergence for broadleaf weeds in corn, sorghum and soybeans. Linex and Lorox.

Lorox (linuron)—Trade name for linuron. DuPont.

Lorox Plus—A 18:1 ratio of Lorox + Classic. DuPont.

Marksman—A combination of 1.1 lb dicamba and 2.1 lbs atrazine for postemergence weed control in corn. Sandoz.

MCPA—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 soybeans, alfalfa and potatoes; often used in combination. Trade names - Lexone and Sencor.

HERBICIDE DICTIONARY

Micro-Tech—Micro-encapsulated alachlor. Monsanto.

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

Norosac—Same as Casoron. PBI-Gordon.

Nortron (ethofumesate)—A preemergence or prelant incorporated herbicide for sugar beets. NOR-AM.

Option (fenoxaprop)—Formerly called Whip. A postemergence grass herbicide similar to Fusilade and Poast.

Oust (sulfometuron methyl)—A noncropland herbicide that also provides suppression of perennial grasses at lower rates. DuPont.

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

Partner (alachlor)—Dry flowable formulation of Lasso. Monsanto.

Passport—Trifluralin + Pursuit. American Cyanamid.

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

Phytar (cacodylic acid)—Nonselective contact herbicide used for weed control on noncropland.

Picloram—Common name for Tordon.

Pinnacle (thifensulfuron methyl)—Pinnacle is used postemergence for broadleaf control in soybeans. DuPont.

Poast (sethoxydim)—A postemergence herbicide for shattercane, volunteer corn and other grass weeds in soybeans and other broadleaf crops. BASF.

Poast Plus—A combination of Poast + Dash. BASF.

Pramitol (prometon)—Used primarily for season long control of annual and perennial weeds in noncropped areas. Ciba-Geigy.

Prefar (bensulide)—Used preplant for grass and broadleaf weeds in cantaloupe, cucumbers and watermelons. ICI.

Preview—10 parts Lexone + 1 part Classic on an active ingredient basis. For use in soybeans. DuPont.

Princep (simazine)—A long lasting preemergence or preplant herbicide for corn, shelterbelts and for fall weed control in alfalfa. Ciba-Geigy.

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

Prowl (pendimethalin)—Used preemergence on corn and preemergence or preplant on soybeans grown on soils with more than 1.5% organic matter. American Cyanamid.

Pursuit (imazethapyr)—Same family as Scepter under development for use in soybeans. American Cyanamid.

Pursuit Plus (imazethapyr + pendimethalin)—A 6:1 ratio of Prowl- and Pursuit for preplant incorporation use in soybeans. American Cyanamid.

Pyramin (pyrazon)—Use for preemergence for broadleaf weeds in sugar beets. BASF.

Ramrod—Trade name for propachlor. Monsanto.

Ramrod-atrazine Flowable—A combination of 3 lbs Ramrod and 1 lb atrazine for broad spectrum weed control in corn and sorghum. Monsanto.

Rescue (Alanap + 2,4-DB)—Use postemergence in mid-season for broadleaf weeds in soybeans. Uniroyal.

Rodeo (glyphosate)—Special formulation of glyphosate for aquatic weed control. Similar to Roundup. Monsanto.

Ro-Neet (cycloate)—Used preplant incorporated in sugar beets for annual grass and some broadleaf weeds. ICI.

Roundup (glyphosate)—A postemergence nonselective translocated herbicide for annual and perennial grasses and broadleaf weeds. No soil residual. Monsanto.

Roundup RT (glyphosate)—Same as Roundup, but available only in a 100-gallon returnable shuttle. Monsanto.

Saddle—Generic Alachlor

Salute 4EC—Package blend of 1.33 lb metribuzin (Sencor) and 2.66 lbs trifluralin for soybeans. Mobay.

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

Scepter (imazaquin)—A preplant incorporated, preemergence and postemergence grass and broadleaf weed control herbicide for soybeans. American Cyanamid.

Screen—A protectant for application to sorghum seed to prevent Lasso injury. Monsanto.

Sencor—Trade name for metribuzin. Mobay.

Simazine—Common name for Princep. Ciba-Geigy.

Sinbar (terbacil)—Used for dormant season control of annual grass and broadleaf weeds in established alfalfa. DuPont.

Solicam (norflurazon)—Used preemergence in fruit trees. Sandoz.

Sonalan (ethalfluralin)—Used preplant incorporated for annual grasses and certain broadleaf weeds in soybeans. DowElanco.

Spike (tebuthiuron)—Used for total vegetation and selective brush control in grassland and noncrop areas. DowElanco.

Squadron—Package mix of Prowl and Scepter. American Cyanamid.

Stall—Generic Alachlor.

Stinger (clopyralid)—For postemergence broadleaf control in sugar beets and corn. DowElanco.

Surflan (oryzalin)—Used preemergence for annual grasses in trees, turf and ornamentals. Often used in combination. DowElanco.

Sutan + (butylate + R-25788)—A preplant incorporated herbicide for annual grasses in corn. ICI.

Sutazine + (Sutan+ + atrazine)—A combination of 4 parts Sutan+ and 1 part atrazine for preplant incorporated weed control in corn. ICI.

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

Tandem (tridiphane)—A postemergence herbicide for weed control in corn. Use in combination with atrazine or Bladex. DowElanco.

Telar (chlorsulfuron)—An industrial formulation of the active ingredient in Glean. DuPont.

Telone (dichlorophene)—A fumigant used preplant for quackgrass in potatoes. DowElanco.

Tillam (pebulate)—Registered preplant incorporated for annual grass control in sugar beets. ICI.

Tordon (picloram)—A postemergence herbicide for annual and perennial broadleaf weeds. Residues may last for several years in the soil. DowElanco.

Touchdown (sulphosate)—A nonselective, nonresidual translocated postemergence herbicide. ICI.

Tough (pyridate)—Used in combination with Bladex or atrazine for postemergence weed control in corn. Label pending. Agrolinz.

HERBICIDE DICTIONARY

Treflan (trifluralin)—Used preplant incorporated in soybeans and nursery stock for annual grass control. DowElanco.

Tri-Scept—A prepack of trifluralin + Scepter. American Cyanamid.

Trific—DF formulation of trifluralin. Terra.

Trifluralin—The active ingredient in Treflan.

Trimec—A three way combination of 2,4-D, micoprop and dicamba for lawn weed and woody plant control. PBI-Gordon.

Trinilin—Trifluralin.

Turbo 8EC—A package mix of 6.55 lbs Dual and 1.45 lb Sencor for use in soybeans. Mobay.

Velpar L (hexazinone)—Used for nonselective postemergence weed control on noncropland, Christmas tree plantings and alfalfa. DuPont.

Velpar R.P.—A liquid formulation used undiluted for spot spraying woody plants in range and pasture. DuPont.

Vernam (vernolate)—Used preplant incorporated in soybeans for annual grass and some broadleaf weeds. ICI.

Weedazole—Trade name for amitrole. Rhone-Poulenc.

Weedone 638—A combination of 2,4-D acid and ester. Rhone-Povlenc.

APPROXIMATE RETAIL PRICES OF SELECTED HERBICIDES

Herbicide	Price	Herbicide	Price	Herbicide	Price
Accent	$ 27.00/oz	Cycle	$ 24.75/gal	Nortron	$ 49.50/gal
Ally	$ 27.00/oz	Cyclone	$ 26.00/gal	Option	$ 92.00/gal
AAtrex 4L	$ 10.30/gal	2,4-D amine	$ 8.60/gal	X-77	$ 16.00/gal
AAtrex 80W	$ 1.70/lb	2,4-D ester	$ 10.80/gal	Pinnacle	$ 26.00/oz
AAtrex DF	$ 2.30/lb	Dacthal 75W	$ 4.80/lb	Poast Plus	$ 45.00/gal
Alanap L	$ 13.30/gal	Diquat	$ 68.00/gal	Pramitol 5P	$ 1.20/gal
Amitrol-T	$ 21.50/gal	Dowpon M	$ 2.15/lb	Pramitol 25E	$ 20.50 gal
Antor	$ 38.50/gal	Dual 8E	$ 54.00/gal	Prefar	$ 35.40/gal
Aquaclean	$ 1.10/lb	Eptam 7E	$ 26.00/gal	Preview	$ 28.00/lb
Aquathol	$ 1.10/lb	Eptam 10G	$ .43/lb	Princep 80W	$ 3.55/gal
Aquathol 1.6E	$ 62.00/gal	Eradicane	$ 21.00/gal	Princep 4L	$ 16.80/gal
Aquazine	$ 5.60/gal	Escort	$ 34.50/oz	Prowl	$ 26.00/gal
Assure II	$110.00/gal	Extrazine II	$ 15.00/gal	Pursuit	$552.00/gal
Arsenal	$140.00/gal	Fallow Master	$ 25.20/gal	Pursuit Plus	$ 64.00/gal
Balan	$ 16.00/gal	Far-Go 10G	$ 1.00/lb	Ramrod-Atrazine	$ 14.50/gal
Banvel	$ 54.50/gal	Freedom	$ 11.80/gal	Ramrod Flowable	$ 16.00/gal
Basagran	$ 60.00/gal	Fusilade 2000	$ 86.00/gal	Rodeo	$ 80.00/gal
Beacon	$ 25.50/oz	Galaxy	$ 56.00/gal	Ro-Neet 7E	$ 52.50/gal
Betanex	$ 70.00/gal	Glean	$ 18.20/oz	Ro-Neet 10G	$ 1.60/lb
Betamix	$ 72.00/gal	Goal 1.6E	$ 77.00/gal	Roundup	$ 40.00/gal
Bicep	$ 23.00/gal	Gramoxone Extra	$ 43.00/gal	Salute	$ 50.50/gal
Bladex 4L	$ 19.00/gal	Harmony Extra	$ 11.10/oz	Scepter	$ 172.00/gal
Bladex 90DF	$ 4.75/lb	Herbicide 273	$ 38.00/gal	Sencor	$102.00/gal
Blazer 2L	$ 60.00/gal	Hyvar X	$ 11.60/gal	Sencor	$ 20.50 lb
Brominal 3+3	$ 77.00/gal	Hyvar XL	$ 36.80/gal	Sinbar	$ 22.50/lb
Bronate	$ 77.00/gal	Karmex 80W	$ 4.30/lb	Solicam	$ 10.80/lb
Bronco	$ 33.20/gal	Krenite	$ 43.50/gal	Sonalan	$ 24.00/gal
Buctril	$ 45.00/gal	Krovar I	$ 9.20/lb	Spike 5G	$ 3.00/lb
Buctril + Atrazine	$ 19.00/gal	Laddok	$ 19.00/gal	Spike 80W	$ 21.50/lb
Bullet	$ 16.00/gal	Landmaster II	$ 16.80/gal	Spike 20P	$ 8.60/lb
Butoxone	$ 15.00/gal	Landmaster BW	$ 20.20/gal	Squadron	$ 48.00/gal
Butyrac	$ 15.00/gal	Lasso	$ 21.50/gal	Stinger	$500.00/gal
Canopy	$ 33.25/lb	Lasso II	$ 1.10/lb	Surflan	$ 60.00/gal
Casoron 10G	$ 3.40/lb	Lariat	$ 16.00/gal	Sutan+	$ 17.20/gal
Casoron 50W	$ 15.00/lb	Leafex 3	$ 3.45/gal	Sutazine	$ 16.80/gal
Casoron 4G	$ 1.25/lb	Lexone 4L	$102.00/gal	Telar	$ 25.00/oz
Classic	$ 16.00/oz	Lexone DF	$ 20.50/lb	Treflan	$ 28.50/gal
Cobra	$110.00/gal	Lorox 4L	$ 58.00/gal	Tordon 22K	$ 99.00/gal
Commence	$ 54.00/gal	Lorox Plus	$ 14.20/lb	Turbo	$ 81.00/gal
Command 4EC	$ 64.00/gal	Marksman	$ 20.50/gal	UAN	$ 0.70/gal
Crop Oil Conc.	$ 6.40/gal	MCPA	$ 13.00/gal	Velpar	$ 29.50/lb
Crossbow	$ 43.00/gal	Micro-Tech	$ 22.00/gal	Vernam	$ 28.00/gal
Curtail	$ 23.00/gal	Norosac 4G	$ 1.25/gal		

WEED SCIENCE PUBLICATIONS

Annual Broadleaf Control in Winter Wheat - G88-863
Banvel and 2,4-D Damage to Fieldbeans and Soybeans - G86-802
Blue Mustard Control - G74-92
Broadcast or Band Herbicides - G76-294
Brush and Woody Plant Control - G84-704
Calibrating a Sprayer - G82-566
Canada Thistle Control - G80-509
Chemial Control of Rangeland Weeds - G88-871
Close Drilled Soybeans - G77-329
Common Milkweed - G77-384
Constructing a Pipewick Applicator - G81-555
Disposal of Excess Pesticides - G79-473
Downy Brome Control in Alfalfa - G79-436
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
Factors That Make Herbicides Work - G76-272
Fine Tuning a Sprayer With the "Ounce" Calibration Method - G88-865
Field Sandbur Control in Corn - G74-121
Hay Fever Plants - EC77-199
Hemp Dogbane - G83-665
Herbicide Carryover - G83-637
Herbicide-Fertilizer Combinations - G74-164
Herbicides and Soils - G83-653
Jointed Goatgrass - G75-210
Know and Control Downy Brome - G78-422
Lawn Weeds - NC Regional Pub. No. 26
Leafy Spurge - G87-834
Musk Thistle - EC76-160
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, Sugarbeets, Soybeans and Fieldbeans - G78-390
Right Crop Stage for Herbicide Use—Corn, Sorghum, Small Grains - G77-382
Sagebrush Control - G80-510
Shattercane—What To Do About It - G74-122
Spray Drift of Pesticides - G90-1001
Surfactants and Herbicides - G88-872
Test for Atrazine Carryover - G74-113
Using Pipewick and Other Selective Applicators - G81-555
Velvetleaf - G83-681
Vine Weeds - NC Regional Pub. No. 33
Weed Control in Alfalfa - G75-220
Weed Control Along Irrigation Pipe and Ditchbanks - G78-420
Weed Control in Gardens - G79-444
Weed Control in Grain Sorghum - G74-137
Weed Control in No-Till Corn, Grain Sorghum and Soybean Production - G89-899
Weed Control in Reduced Tillage Corn - G74-123
Weed Control in Soybeans - G83-647
Weed Control on CRP Acres - G89-905

NOTES