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2016 Weed Control Recommendations for Kentucky Grain Crops

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2016
Weed Control Recommendations
for Kentucky Grain Crops



NOTICE

Kentucky Agriculture Water Quality Act

In 1994, the Kentucky General Assembly passed The Kentucky Agriculture Water Quality Act (AWQA). The AWQA (KRS 224.71-100 through 224.71-140) states that landowners of 10 acres or more that conduct or allow agriculture or silviculture (forestry) production on their land were required to develop and implement a water quality plan by October 23, 2001.

These individual water quality plans will be based upon the guidance found in the Kentucky Agriculture Water Quality Plan. One of the six sections that make up the Kentucky Agriculture Water Quality Plan is Pesticides and Fertilizer (Section 2). Therefore, if your agriculture operation, of 10 acres or more, involves the use and storage of agriculture chemicals, then your water quality plan must include information about those pesticide and fertilizer activities.

In an effort to help landowners/producers more effectively develop and implement the Pesticides and Fertilizer section of their water quality plan, the Extension publication ***Agricultural Chemical Storage and Handling*** (IP-41) is available at your local County Extension Offices. This publication is one of several that make up the Kentucky Assessment System or KY·A·Syst.

For further information about the Kentucky Agriculture Water Quality Act, the sections of the Plan and the KY·A·Syst publications that apply to your situation, contact your local:

- University of Kentucky Cooperative Extension Service County Office
- Division of Conservation
- Division of Water Regional Office
- USDA Natural Resource Conservation Service
- USDA Farm Service Agency
- Division of Forestry District Office
- Local Conservation District Office
- County Health Department
- Kentucky Farm Bureau Federation

Conversion Factors

Liquid Measure

3 teaspoons = 1 tablespoon = 14.8 ml
1 fluid ounce = 2 tablespoons = 29.6 ml
1 pint = 2 cups = 16 fluid ounces = 473.2 ml
1 quart = 2 pints = 4 cups = 32 fl. oz. = 946.4 ml
1 gallon = 4 quarts = 8 pints = 16 cups = 128 fl. oz. = 3786 ml
1 gallon = 3.79 liters = 8.355 pounds
1 cubic foot of water = 62.43 pounds = 7.48 gallons

Area Measure

1 acre = 43,560 sq ft = 160 sq rods = 4840 sq yd = 0.4ha

Dry Measure

1 pound=16 ounces=454 grams
1 short ton = 2000 pounds = 908 kg
1 long ton = 2240 pounds = 1017 kg

Linear Measure

12 inches = 1 foot = 30.5 cm
36 inches = 3 feet = 1 yard = 0.9 meters
1 rod = 16.5 feet
1 mile = 5280 feet = 1760 yards =1.6 km

Listing of pesticide products implies no endorsement by the University of Kentucky or its representatives. Criticism of products not listed is neither implied nor intended.

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2016 Weed Control Recommendations for Kentucky Grain Crops

James R. Martin and J.D. Green

Introduction

The use of herbicides suggested in this publication is based on research at the Kentucky Agricultural Experiment Station and elsewhere. We have given what we believe to be the most effective herbicides, with the most suitable rates and times of application. Use of trade or brand names in this publication does not imply approval of the product to the exclusion of others which may be of similar or suitable composition.

Herbicide registrations and labels are constantly being revised and changed; therefore, herbicides recommended in this publication were registered for the prescribed uses when the publication was printed. If the registration of a herbicide product listed has been canceled, it would no longer be recommended by the University of Kentucky.

Read and follow label directions carefully before you buy, store, mix, apply, or dispose of a pesticide. Follow carefully the precautions stated on the label of the bag or container. It is hazardous to use herbicides for purposes other than those specified on the approved label. Use herbicides only on crops for which they are approved and recommended. Use only recommended amounts. Besides wasting money, using too much material may damage the crop and make it unsafe for food or feed. The seizure of any raw agricultural commodity, moving in interstate commerce, which carries a pesticide residue in excess of the established tolerance, is authorized by the Environmental Protection Agency.

Apply herbicides only at time specified on the label, and observe the recommended intervals between the time of treatment and time of planting, pasturing or harvesting the crop. Guard against possible injury to nearby susceptible crops or plants.

In general, the use of herbicides should supplement good agricultural practices which include:

- 1) the use of high quality crop seed free of weed seed;
- 2) proper planting methods with good seed to soil contact;
- 3) high soil fertility and good crop rotation; and
- 4) practices that prevent weeds from producing mature seeds.

Method and Time of Herbicide Treatment

Herbicides are generally considered to be either soil active or foliar active. Soil active herbicides are generally applied to the soil surface since they are most effective when weeds are germinating. Foliar active herbicides control weeds after they have emerged from the soil.

Herbicides can also be applied at different times for weed control. They are applied either before or after crop planting. The timing of the application is dependent on: a) the herbicide characteristics; b) weed(s) to be controlled; and c) crop being grown. The following terms are often used that refer to the time of herbicide application:

1) Before Planting-- **preplant soil incorporated, preplant surface applied, preplant foliar** as a "burndown" of existing vegetation, or **early preplant** (usually 7 to 30 days before planting);

2) After Planting (before crop and weed emergence) -- **preemergence** onto the soil surface;

3) After Crop and Weed Emergence -- **cracking stage** (at crop emergence), **postemergence, directed** or **semi-directed** between the rows of taller crops on small weeds, or **layby** before crop canopy.

Herbicides used in no-tillage crop production generally consist of a foliar "burndown" herbicide plus a soil residual. A non-selective foliar herbicide is applied before or at planting, but before crop emerges to kill all existing vegetation. Soil residual herbicides provide additional weed control throughout the growing season.

Incorporation

Proper application of any preplant and incorporated herbicide is extremely important. A well-prepared seedbed prior to application of the herbicide is necessary to obtain thorough mixing (incorporation) of the chemical into the soil. It is advisable to incorporate thoroughly immediately after spraying, preferably in the same operation. Delayed incorporation could result in poor weed control.

Incorporation into the top 2 to 3 inches of soil following seedbed preparation is necessary to ensure effective weed control regardless of weather conditions. Incorporation should be made using power-driven cultivation equipment set to cut to a depth of 2 to 3 inches, or a tandem disc set to cut to a depth of 4 to 6 inches, operated at 4 to 6 mph. This should be followed by a spike-tooth harrow or some other leveling tillage equipment which extends beyond the ends of the disc. Incorporation to a depth below 3 inches will reduce effectiveness of the herbicide by one-third or more.

For thorough mixing, disc in two different directions (cross disc). Thorough incorporation to a depth of not more than 2 to 3 inches of a preplant-incorporated herbicide may be the most important part of a management program.

Cultivation

Timely, shallow cultivation may be necessary following herbicide treatment. When cultivating, the cultivator should be set as shallow as possible. This will prevent bringing new weed seeds from below the herbicide layer to the soil surface.

If rainfall does not occur within 7 to 10 days following application of a preemergence herbicide, a shallow incorporation such as with a rotary hoe may be necessary for maximum weed control.

Cultivation following a preplant-incorporated herbicide application should also be shallow, or less than one half the depth that the herbicide was incorporated.

Types of Herbicide Formulations

Herbicides are formulated as water solutions (S), liquids (L), emulsifiable concentrates (EC), dry flowables (DF), soluble granules (SG), water dispersible granules (WDG), wettable powders (WP), flowables (F), or micro-encapsulated (MT, ME),. They are usually added to water and applied as a spray solution. Most spray mixtures require constant agitation to prevent the herbicides from settling to the bottom of the tank. Granular (G) herbicides are applied dry. *Do not mix granular herbicides with different granular pesticides or fertilizers.*

Restricted Use Herbicides

Some herbicide products are classified as Restricted Use Pesticides because they have a higher potential for affecting the environment, human health, or animals. Herbicides currently classified as Restricted Use appear below. Pesticide certification is required to purchase and use these products.

| | | |
|-----------------|---------------|---------------|
| AAtrex | Corvus | |
| Atrazine | Degree Xtra | Marksman |
| Acuron | Expert | Metal II AT |
| Balance Flexx | Firestorm | Milo-Pro |
| Anthem ATZ | FulTime | Parallel Plus |
| Authority MTZ | Gramoxone | Parazone |
| Brawl II ATZ | Guardsman Max | Prequel |
| Breakfree | Harness | Radius |
| Breakfreet ATZ | Harness Xtra | Simazat |
| Callisto Xtra | Keystone | Stalwart XTRA |
| Charger Max ATZ | Lexar EZ | Trizmet II |
| Cinch ATZ | Lumax EZ | Volley |
| Callisto Xtra | Keystone | Volley ATZ |

Current regulations require that accurate records be kept for all pesticides which include Restricted Use Pesticides as well as those classified as General Use Pesticides. An applicator must make a written record within 30 days after the application. Records to keep include product name and EPA registration number, total amount applied, location, crop or site of application, size of treated area, name and certification number of applicator or supervisor, and date of application.

Environmental & Safety Precautions (WPS)

Proper use of herbicides and other pesticides is important to the safety of humans and the environment. Pesticide labels contain precautionary statements to inform people of the potential hazards and safeguards associated with pesticides. The types of precautionary statements may vary depending on particular product and its use. Examples of issues that may require precautionary statements are: 1) use of protective clothing, 2) exposure to domestic animals, 3) storage, 4) disposal of excess pesticides, rinsates and containers, 5) toxicity to fish and wildlife, 6) groundwater, and 7) endangered species. To assure the pesticide is used in a safe manner, it is important to read and follow the label directions.

Worker Protection Standards (WPS) were established to protect pesticide handlers and agricultural workers. This federal EPA regulation requires that employees are informed about pesticide use and protection practices. WPS requires pesticide safety training for workers and handlers, display of safety posters, and access to labeling and other specific information at a central location. Further protection is ensured by excluding workers from areas being treated with a pesticide, REI (Restricted-Entry Intervals) following a pesticide application, and proper use of PPE (Personal Protective Equipment). REI's and protective clothing requirements are listed on the pesticide label.

Water Quality Statements

The potential for contamination of surface and/or ground water has become an important consideration when choosing herbicides. Several products have groundwater advisory statements on their label. Such statements advise not to apply these herbicides where the water table (groundwater) is close to the surface and where the soils are very permeable (i.e. well drained soils such as sands, sandy loams, or loamy sands). Refer to these statements and observe all precautions on the label when using these products. Listed below are herbicide products with active ingredients which have been identified as seeping or leaching through soil and can enter groundwater.

| | | |
|------------------|----------------|-------------|
| *AAtrex | Dual II Magnum | Phoenix |
| *Atrazine | *Expert | Prequel |
| Acuron | Extreme | *Princep |
| Anthem* | Fierce | Pursuit |
| *Anthem ATZ | FirstRate | Python |
| Authority | Flexstar | Radius |
| Authority Assist | *FulTime | Realm Q |
| Authority MTZ | Gangster | Scepter |
| Authority XL | Glory | Sencor |
| Balance Flexx | *Guardsman Max | Sequence |
| *Bicep II Magnum | Halex GT | Sharpen |
| Boundary | Harness | *Simazat |
| *Brawl II ATZ | *Harness Xtra | Status |
| Breakfree | Hornet WDG | Storm |
| *Breakfree ATZ | Instigate | SureStart |
| Callisto | *Keystone | TopNotch |
| *Callisto Xtra | Laudis | TriCor |
| Charger Max | *Lexar EZ | TripleFLEX |
| *Charger Max ATZ | *Lumax EZ | *Trizmet II |
| Cinch | *Marksman | UltraBlazer |
| *Cinch ATZ | Matador | Valor |
| Confidence | *Medal II AT | Verdict |
| *Confidence Xtra | Metribuzin | Volley |
| Corvus | OpTill | *Volley ATZ |
| Define | Outlook | Warrant |
| Degree | Parallel | Zemax |
| Degree Xtra | *Parallel Plus | Zidua |

**Manufacturers of atrazine and simazine containing products have developed strategies for limiting their movement to both ground and surface water. The maximum rate of these products for early preplant, preplant incorporated, or preemergence applications depends on soil erodibility, as defined by the Natural Resources Conservation Service, and percent of ground covered with plant residue. A summary of the label precautions and restrictions can be found at the beginning of the corn section in this publication.*

Herbicide Classification

Herbicide mode of action can be defined as the mechanism whereby a herbicide interferes with plant metabolism or function that inhibits plant growth or leads to plant death. Herbicides are often classified according to their mode of action, since herbicides within the same mode of action class will typically produce similar symptoms on susceptible plants. The major mode of action categories include: ACCase inhibitors, ALS inhibitors of amino acids, synthetic auxins (growth regulators), photosynthesis inhibitors (photosystem II), EPSP synthetase enzyme inhibitors, glutamine synthetase inhibitors, pigment inhibitors (carotenoid biosynthesis and 4-HPPDs), cell membrane disruptors (photosystem I and PPO inhibitors), microtubule assembly inhibitors (root growth inhibition), and cell division (seedling shoot growth inhibitors). The following tables list these herbicide groups with representative examples of herbicide products within each classification and general information on how they function to interfere with plant growth.

Herbicide Resistance

In recent years herbicide resistance has become an important issue to consider when making weed management decisions. Crops traditionally susceptible to some herbicides are being developed which are tolerant (i.e. resistant) to specific herbicides. For example, soybean varieties and corn hybrids resistant to glyphosate products are now available to producers.

On the other hand, herbicide resistance can occur and develop from natural weed populations. For example, resistance of smooth pigweed to triazine type herbicides (i.e. Atrazine and Princep) has been found and documented in some localized areas of Kentucky where corn is grown in consecutive years. Other states have also reported weed resistance in field crops following the continuous use of certain herbicides. The potential for weed resistance to develop increases with continuous use of herbicides that have the same mode of action (i.e. similar chemistry). Therefore, herbicide use should be monitored and production practices implemented to prevent and reduce the potential for weed resistance to occur.

A key to avoiding development of herbicide resistant weed populations is prevention. Listed below are management strategies to consider in preventing and dealing with herbicide resistant weeds.

***Scout fields** regularly and identify weeds present. Respond quickly to shifts in weed populations to restrict spread of weeds.

***Select a herbicide based on weeds present** and use a herbicide only when necessary.

***Rotate crops.** Crop rotation helps disrupt weed cycles and some weed problems are more easily managed in some crops than others.

***Rotate herbicides.** Avoid using the same herbicide or another herbicide with the same mode of action (i.e. herbicides that inhibit the same process in target weeds) for two consecutive years in a field. It is possible for a herbicide used in one crop to have the same mode of action as a different herbicide used in another crop. For example: Accent, Classic, Harmony Extra, Harmony SG, Lightning, Scepter, Option, Osprey, Permit, Pursuit, Spirit, Python, Resolve, Steadfast, Stout, and Synchrony "STS" contain active ingredients with the same mode of activity in plants (i.e. these herbicides are ALS/AHAS inhibitors).

***Apply herbicides with different modes of action** as a tank mixture or sequential application during the same season.

***Combine other weed control practices** such as cultivation with herbicide treatments where soil erosion potential is minimized.

***Clean tillage and harvest equipment** to avoid moving weed problems from one field to the next.

Tank Mixtures & Sequential Applications

For broad spectrum weed control, more than one herbicide may be necessary. In this publication we have included only formulations or tank mixtures registered with the EPA by the manufacturer.

When tank mixing two or more herbicide products it is important to consult the product(s) label to determine if potential problems may occur. Often a jar test may be required to determine if the products are compatible in the spray tank. Some tank mixtures or herbicide combinations can reduce weed control activity (i.e. they are **antagonistic**); whereas, other tank mixes will increase the weed control activity (i.e. **synergistic**). The potential for crop injury is sometimes increased by applying two or more herbicides to the same crop.

In addition to combining herbicides, sequential herbicide applications are used to provide season-long weed control. These applications may consist of an early pre-plant herbicide treatment followed by an application of a soil-applied herbicide at planting or a herbicide treatment before or at planting followed by a postemergence herbicide application later in the season after the crop has emerged. When using herbicides in sequential treatments, extreme care should be taken to keep within the recommended rates for each herbicide. In addition, rotational crop options may be reduced when herbicides with similar modes of action are applied the same crop season.

Herbicide Classification By Mode of Action Groups

| Group CODE | Herbicide Classification | Herbicide Examples | Site of Uptake | Plant Selectivity | Translocation | Symptomology |
|------------|--|---|-------------------|----------------------------------|--|--|
| 1 | ACCase Inhibitors (lipid synthesis) *Aryloxyphenoxy propionates *Cyclohexanediones | Axial XL, Assure II, Fusion, Select, Poast | foliage | grasses | phloem mobile (with sugars) | Growing point rots at the nodes, new leaves pull out easily |
| 2 | ALS Inhibitors (amino acid synthesis) * Imidazolinones * Sulfonylureas * Sulfonamides | Scepter, Pursuit, Accent, Classic, Harmony FirstRate, Python | soil or foliage | selected broadleaves or grasses | phloem mobile (with sugars); xylem mobile in soil uptake | Chlorotic new growth, shortened internodes, reddened veins on soybeans, yellow flash in corn, bottle brush roots |
| 3 | Microtubule Assembly Inhibitors (root growth inhibitor) * Dinitroanilines | Prowl, Treflan | soil | grasses more than broadleaves | minimal transport | Stunting and clubbed root tips |
| 4 | Synthetic Auxins (Growth Regulator) • Phenoxy acids • Benzoic acids • Pyridine carboxylic acids | 2,4-D dicamba [Clarity, Banvel] Starane, Vista | foliage primarily | broadleaves | phloem mobile (with sugars) | Distorted growth of new leaves, callus growth on stems |
| 5 | Photosynthesis Inhibitors [PS II] * Triazines * Triazinones | Binding Site A Atrazine, Princep Sencor | soil or foliage | broadleaves more than grasses | xylem mobile (moves with water) | Contact burn of existing leaves, chlorosis of oldest leaf margins of seedlings if soil uptake |
| 6 | * Benzothiadiazinones * Nitriles | Binding Site B Basagran Buctril | | | | |
| 7 | * Phenylureas | Binding Site C Lorox | | | | |
| 9 | EPSP Synthetase Inhibitor (amino acid synthesis) * Glycines | glyphosate [Durango, Roundup, Touchdown, etc.] | foliage | generally non-selective | phloem mobile (with sugars) | Chlorotic new growth to death depending on rate, occasionally white flash |
| 10 | Glutamine Synthetase Inhibitor (nitrogen metabolism) | Ignite, Liberty | foliage | non-selective | primarily contact | Chlorosis of entire plant in 4 - 5 days |
| 13 | Carotenoid Biosynthesis (pigment inhibitor) | Command | soil or foliage | grasses and selected broadleaves | xylem mobile (moves with water) | Bleaching (whitening) of leaves |
| 14 | PPO Inhibitors (cell membrane disruptors) * Diphenylethers * Triazolinones * N-phenylphthalamides * Pyrimidinedione | Blazer, Cobra, Flexstar Aim, Authority, Spartan Resource, Valor Sharpen | foliage or soil | broadleaves more than grasses | xylem mobile (moves with water), acts as a contact when applied POST | Contact burn of existing leaves, chlorosis of veins if soil uptake |
| 15 | Cell Division Inhibitors (seedling shoot growth inhibitors) * Chloroacetamides * Oxyacetamides | Degree, Harness, Surpass, Warrant, Dual, Outlook, Define, Zidua | soil | grasses more than broadleaves | xylem mobile (minimal transport) | Leafing out under-ground, wrapped leaves of grasses, bugging whipping |
| 19 | Auxin Transport Inhibitor | diflufenzopyr [Status] | foliage | broadleaves | phloem mobile | ----- |
| 22 | Cell Membrane Disruptors [PS I] * Bipyridyliums | paraquat [Gramoxone] | foliage | non-selective | contact activity | Rapid water soaking of existing leaves |
| 27 (28) | 4-HPPDs (pigment inhibitors) | Armezon, Balance, Callisto, Impact, Laudis | soil or foliage | selected broadleaves or grasses | xylem mobile (moves with water) | Bleaching (whitening) of existing leaves |

Relative Risk of Developing Resistance to Herbicides Based on their Mode of Action

HIGH RISK

ACCase Inhibitors [Group 1] (Lipid Synthesis)

Achieve (tralkoxydim)
Arrow (clethodim)
Assure II (quizalofop)
Axial (pinoxaden)
Fusilade DX (fluazifop)
Fusion (fluazifop + fenoxaprop)
Poast, Poast Plus (sethoxydim)
Section, Volunteer (clethodim)
Select, Select MAX (clethodim)

ALS Inhibitors [Group 2] (Amino Acid Synthesis)

Accent Q (nicosulfuron)
Accolade (flumetsulam)
Audit (thifensulfuron + tribenuron)
Basis (rimsulfuron + thifensulfuron)
Basis Blend (rimsulfuron + thifensulfuron)
Beacon (primisulfuron)
Bestow (rimsulfuron)
Canopy EX (chlorimuron + tribenuron)
Classic (chlorimuron)
Cloak EX (chlorimuron+tribenuron)
Crusher (rimsulfuron + thifensulfuron)
Everest (flucarbozone)
Exceed (primisulfuron + prosulfuron)
Express (tribenuron-methyl)
Finesse (chlorsulfuron + metsulfuron)
FirstRate (cloransulam)
FirstShot SG (thifensulfuron+tribenuron)
HarmonyExtra(thifensulfuron+tribenuron)
Harmony SG (thifensulfuron)
LeadOff (rimsulfuron + thifensulfuron)
Nic-IT (nicosulfuron)
Osprey (mesosulfuron)
Panoflex (tribenuron + thifensulfuron)
Permit (halosulfuron)
PowerFlex (pyroxsulam)
Pursuit (imazethapyr)
Python (flumetsulam)
Raptor (imazamox)
Resolve SG (rimsulfuron)
Resolve Q (rimsulfuron + thifensulfuron)
Sanda (halosulfuron)
Scepter (imazaquin)
Solida (rimsulfuron)
Spirit (prosulfuron + primisulfuron)
Steadfast Q (rimsulfuron + nicosulfuron)
Synchrony (chlorimuron+ thifensulfuron)

MEDIUM RISK

Photosynthesis Inhibitors – PS II (Binding Site A) [Group 5]

AAtrex (atrazine)
Glory (metribuzin)
Milo-Pro (propazine)
Metri (metribuzin)
Princep (simazine)
Sencor (metribuzin)
Simazat (atazine + simazine)

(Binding Site B) [Group 6]

Basagran (bentazon)
Buctril (bromoxynil)
Maestro (bromoxynil)

(Binding Site C) [Group 7]

Lorox (linuron)

Cell Membrane Disruptors (PPO Inhibitors) [Group 14]

Aim (carfentrazone)
Authority, Spartan (sulfentrazone)
Battle Star (fomesafen)
Cadet (fluthiacet-methyl)
Cobra (lactofen)
Flexstar (fomesafen)
Marvel (fluthiacet+fomesafen)
Outflank (flumioxazin)
Panther (flumioxazin)
Phoenix (lactofen)
Reflex (fomesafen)
Resource (flumicloric)
Ringside, Rumble (fomesafen)
Rowel (flumioxazin)
Shafen, Shafen Star (fomesafen)
Sharpen (salfufenacil)
Spartan Charge
(sulfentrazone+carfentrazone)
Stellar (lactofen + flumicloric)
Top Gun (fomesafen)
Ultra Blazer (aciflurofen)
Valor, Emcompass (flumioxazin)
Vida (pyraflufen)

(Photosystem I) [Group 22]

Firestorm (paraquat)
Gramoxone (paraquat)
Helmquat (paraquat)

Carotenoid Biosynthesis (Pigment Inhibitor) [Group 13]

Command (clomazone)

4-HPPDs (Pigment Inhibitor) [Group 27 (28)]

Armezon (topramezone)
Balance (isoxaflutole)
Callisto (meostrione)
Impact (topramezone)
Laudis (tembotrione)

LOW RISK

Microtubule Assembly Inhibitors (Root Growth Inhibitors) [Group 3]

Prowl (pendimethalin)
Treflan (trifluralin)

Synthetic Auxins [Group 4] (Growth Regulators)

Banvel (dicamba)
Butoxone 175 (2,4-DB)
Butyrac 200 (2,4-DB)
Clarity, Clash (dicamba)
2,4-D [various products]
DiFlexx (dicamba)
Oracle, Sterling (dicamba)
Spitfire (dicamba + 2,4-D)
Vista (fluroxypyr)
Weedmaster (dicamba + 2,4-D)

EPSP Synthetase Inhibitors (Amino Acid Synthesis) [Group 9]

Glyphosate [various products]
Roundup, Touchdown (glyphosate)

LOWEST RISK

Glutamine Synthetase Inhibitors (Nitrogen Metabolism) [Group 10]

Cheetah (glufosinate-ammonium)
Forfeit 280 (glufosinate-ammonium)
Ignite (glufosinate-ammonium)
Liberty (glufosinate-ammonium)

Cell Division Inhibitors [Group 15] (Seedling Shoot Growth)

Breakfree (acetochlor)
Degree, Harness (acetochlor)
Surpass, Topnotch (acetochlor)
Warrant (acetochlor)
Dual, Parallel (metolachlor)
Dual II Magnum (S-metolachlor)
Medal II (S-metolachlor)
Outlook, Establish (dimethenamid-P)
Define (flufenacet)
Zidua (pyroxsulfone)

Agricultural Herbicides that Contain Two or More Different Modes of Action

ALS Inhibitors [Group 2] *and*

Synthetic Auxins (Growth Regulators) [Group 4]

Hornet WDG (flumetsulam + clopyralid)
NorthStar (primisulfuron + dicamba)
Yukon (halosulfuron + dicamba)

ALS Inhibitors [Group 2] *and*

Synthetic Auxins (Growth Regulators) [Group 4] *and* Cell Division (shoot growth inhibitors) [Group 15]

SureStart (flumetsulam + clopyralid + acetochlor)
TripleFLEX (flumetsulam + clopyralid + acetochlor)

ALS Inhibitors [Group 2] *and*

Photosynthesis Inhibitors (PS II) [Group 5]

Canopy (chlorimuron + metribuzin)
Canopy Blend (chlorimuron + metribuzin)
Cloak (chlorimuron + metribuzin)

ALS Inhibitors [Group 2] *and*

Photosynthesis Inhibitors (PS II) [Group 5] *and* PPO Inhibitors [Group 14]

Trivence (chlorimuron + metribuzin + flumioxazin)

ALS Inhibitors [Group 2] *and*

EPSP Synthetase Inhibitor [Group 9]

Extreme (imazethapyr + glyphosate)
Tackle (imazethapyr + glyphosate)
ThunderMaster (imazethapyr + glyphosate)

ALS Inhibitors [Group 2] *and* PPO Inhibitors [Group 14]

Afforia (thifensulfuron + tribenuron + flumioxazin)
Authority Assist (imazethapyr + sulfentrazone)
Authority First (chloransulam + sulfentrazone)
Authority Maxx (chlorimuron + sulfentrazone)
Authority XL (chlorimuron + sulfentrazone)
Envive (chlorimuron + thifensulfuron + flumioxazin)
Guantlet (chloransulam + sulfentrazone)
OpTill (imazethapyr + saflufenacil)
Rowel FX (chlorimuron + flumioxazin)
Sonic (chloransulam + sulfentrazone)
Surveil / Gangster (chloransulam + flumioxazin)
Torment (imazethapyr + fomesafen)
Valor XLT (chlorimuron + flumioxazin)
Zone (chlorimuron + sulfentrazone)

ALS Inhibitors [Group 2] *and*

4-HPPDs (pigment inhibitors) [Group 27 (28)]

Capreno (thiencarbozone-methyl + tembotrione)
Corvus (thiencarbozone-methyl + isoxaflutole)
Realm Q / Instigate (rimsulfuron + mesotrione)
Revelin Q (nicosulfuron + mesotrione)

Synthetic Auxins (Growth Regulators) [Group 4] *and*

EPSP Synthetase Inhibitor [Group 9]

Enlist Duo (2,4-D + glyphosate)

Synthetic Auxins (Growth Regulators) [Group 4] *and* Auxin Transport Inhibitors [Group 19]

Status (dicamba + diflufenzopyr)

Photosynthesis Inhibitors (PS II) [Group 5] *and*

PPO Inhibitors [Group 14]

Authority MTZ (metribuzin + sulfentrazone)

Photosynthesis Inhibitors (PS II) [Group 5] *and*

PPO Inhibitors [Group 14] *and*

Cell Division (shoot growth inhibitors) [Group 15]

Anthem ATZ (atrazine+fluthiacet-methyl+pyroxasulfone)
Intimidator (metribuzin + fomesafen + S-metolachlor)

Photosynthesis Inhibitors (PS II) [Group 5] *and*

Cell Division (shoot growth inhibitors) [Group 15]

Axiom (metribuzin + flufenacet)
Bicep II Magnum (atrazine + S-metolachlor)
Breakfree ATZ (atrazine + acetochlor)
Boundary (metribuzin + S-metolachlor)
Cinch ATZ (atrazine + S-metolachlor)
Degree Xtra (atrazine + acetochlor)
Domain (metribuzin + flufenacet)
Fultime (atrazine + acetochlor)
Guardman Max (atrazine + dimethenamid-P)
Harness Xtra (atrazine + acetochlor)
Medal II AT (atrazine + S-metolachlor)
Parallel Plus (atrazine + metolachlor)
Tail Wind (metribuzin + metolachlor)
Volley ATZ (atrazine + acetochlor)

Photosynthesis Inhibitors (PS II) [Group 5] *and*

Cell Division (shoot growth inhibitors) [Group 15]] *and* EPSP Synthetase Inhibitor [Group 9]

Expert (atrazine + S-metolachlor + glyphosate)

Photosynthesis Inhibitors (PS II) [Group 5] *and*

4-HPPDs (pigment inhibitor) [Group 27 (28)]

Callisto XTRA (atrazine + mesotrione)

Photosynthesis Inhibitors (PS II) [Group 5] *and*

Cell Division (shoot growth inhibitors) [Group 15] *and* 4-HPPDs (pigment inhibitor) [Group 27 (28)]

Acuron (atrazine+S-metolachlor+mesotrione+bicyclopyrone)
Lexar EZ (atrazine + S-metolachlor + mesotrione)
Lumax EZ (atrazine + S-metolachlor + mesotrione)

EPSP Synthetase Inhibitor [Group 9] *and*

PPO Inhibitors [Group 14]

Spartan Advance (glyphosate + sulfentrazone)
Flexstar GT (glyphosate + fomesafen)

EPSP Synthetase Inhibitor [Group 9] *and*

Cell Division (shoot growth inhibitors) [Group 15]

Sequence (glyphosate + S-metolachlor)

EPSP Synthetase Inhibitor [Group 9] *and*

4-HPPDs (pigment inhibitor) [Group 27 (28)]

Callisto GT (glyphosate + mesotrione)

EPSP Synthetase Inhibitor [Group 9] *and*

Cell Division (shoot growth inhibitors) [Group 15]] *and* 4-HPPDs (pigment inhibitor) [Group 27 (28)]

Halex GT (glyphosate + S-metolachlor + mesotrione)

PPO Inhibitors [Group 14] *and*

Cell Division (shoot growth inhibitors) [Group 15]

Anthem / Anthem Maxx (fluthiacet-methyl + pyroxasulfone)
Anthem Flex (carfentrazone + pyroxasulfone)
Authority Elite (sulfentrazone + S-metolachlor)
Fierce (flumioxazin + pyroxasulfone)
Prefix (fomesafen + S-metolachlor)
Statement / Vise (fomesafen + metolachlor)
Verdict (saflufenacil + dimethenamid-P)
Warrant Ultra (fomesafen + acetochlor)

Cell Division (shoot growth inhibitors) [Group 15] *and*

4-HPPDs (pigment inhibitors) [Group 27 (28)]

Armezon PRO (dimethenamid-P + topramezone)
Radius (flufenacet-methyl + isoxaflutole)
Solstice (flufenacet-methyl + mesotrione)
Zemax (S-metolachlor + mesotrione)

Adjuvants and Additives

An adjuvant is any substance included in the herbicide formulation which enhances the effectiveness of the herbicide. Additives include adjuvants or other substances added to the spray mixture which may result in increased or decreased effectiveness of the spray mixture or for improving application. Products typically recommended for use with herbicides contain 80 to 90% of the active agent. Additives include such substances as:

- 1) **Emulsifier**—a substance which promotes the suspension of one liquid or another
- 2) **Surfactant**—a material which favors or improves the emulsifying, dispersing, spreading, wetting or other surface modifying properties of liquids
- 3) **Oil Concentrate**—a blend of non-phytotoxic crop oils, surfactants and emulsifiers
- 4) **Wetting Agent**—a substance that reduces interfacial tensions and causes spray solutions or suspensions to make better contact with treated surfaces.
- 5) **Nitrogen Fertilizers**—an ammonium containing fertilizer that enhances the uptake of certain post-emergence herbicides inside the cell wall (eg. 28% or 32% Urea Ammonium Nitrate or Ammonium Sulfate)
- 6) **Drift Control Agent**—a substance added to the spray solution to reduce the potential for off-site movement of spray particles.

Weed Sprayers

Even distribution of herbicides at the proper rate is essential for good weed control. A small variation in the rate of application of some herbicides may result in failure to kill weeds or may cause injury to the crop. For spray applications of herbicides in farm crops, the low pressure sprayer (15 to 50 pounds per square inch pressure) is most suitable either for broadcast or band spraying. Hand sprayers of 3 or 4-gallon capacity are suitable for small areas and for spot spraying.

A good field sprayer should have:

- 1) a pump that is easily replaced, resistant to wear and chemicals, and that has a capacity of 8 to 15 gallons per minute;
 - 2) a boom equipped with nozzles with replaceable tips, the nozzles being evenly spaced on the bottom for broadcast spraying;
 - 3) 50-mesh screens for suction line and nozzles, and a gauge that measures pressure accurately from 10 to 100 pounds per square inch; and
 - 4) a mechanical or jet agitator to keep the spray well mixed and prevent the herbicide from settling to the bottom of the tank.
- For row-band spraying, use an even, flat fan nozzle such as a Tee Jet® 8003-E or similar nozzle type for mounting back of each planter press-wheel.

Sprayer Calibration

To be sure of applying the right amount of material per acre, it is necessary to know how much liquid the sprayer is delivering per acre at a given speed and pressure. The following is a fast, simple method of calibrating a sprayer for broadcast application.

Ounce Calibration Method:

- 1) Measure the correct distance in the field shown in the following table. Select the appropriate distance for your nozzle or row spacing.
- 2) In the field to be sprayed, note the time in seconds spent to drive the measured distance at the desired throttle setting (speed).
- 3) Catch the nozzle discharge for the noted time (#2 above) in a measuring cup or other container graduated in ounces.
- 4) The total discharge per row or nozzle spacing in ounces is equal to the gallons per acre applied.
- 5) Repeat for each nozzle or nozzle group to ensure equal distribution.

SPRAYER CALIBRATION (Distance)

| Nozzle Spacing (inches) | Distance to Catch Discharge (feet) |
|----------------------------|---------------------------------------|
| 40 | 102 |
| 38 | 107 |
| 36 | 113 |
| 34 | 120 |
| 32 | 127 |
| 30 | 136 |
| 28 | 146 |
| 26 | 157 |
| 24 | 170 |
| 22 | 185 |
| 20 | 204 |
| 18 | 227 |
| 16 | 255 |
| 14 | 291 |

Sprayer Cleanup

Ideally spray equipment should be cleaned in the field after the spray job has been completed. Do not clean spray equipment in areas where rinse water will contaminate water supplies, streams, or injure susceptible crops.

Flushing of spray equipment with water will be sufficient for removing potentially harmful amounts of many pesticides. However, there are certain groups of pesticides such as a plant growth-regulator, sulfonyleurea herbicides and organophosphate insecticides that may require special attention in cleaning equipment. *Special attention to clean out procedures can be critically important when switching applications between crops to help avoid significant crop injury.* As a rule, a sprayer that has been used to apply 2,4-D, dicamba, or other growth regulator type herbicides should not be used in treating tobacco or other susceptible crops.

Some pesticide labels provide specific information on cleaning spray equipment; therefore, consult the label for guidelines. If specific guidelines are not indicated on the label the following procedure is generally recommended:

1. Fill the tank at least one-half full with fresh water. Flush tanks, lines, booms, and nozzles for at least 5 minutes using a combination of agitation and spraying. Rinsate from this procedure is best sprayed onto cropland to avoid accumulation of pesticide-contaminated rinsate at one site. Thoroughly rinse the inside surfaces of the tank. Pay particular attention to the surfaces around the tank fill access and tank plumbing fixtures. The use of a 360-degree nozzle or other special rinsing nozzles installed permanently to the spray system can help automate this procedure.
2. Fill the tank again with fresh water and add one of the following cleaning solutions or a commercially available tank cleaner. Agitate the solution for 15 minutes and operate the spray booms long enough to ensure that all nozzles and boom lines are filled with the cleaning solution. Let the solution stay in the system for several hours, preferably overnight. When emptying the tank, spray the cleaning solution onto an area suitable for the rinsate solution.

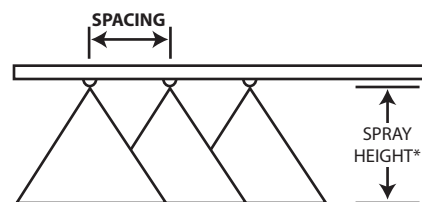
To make a cleaning solution add one of following to each 50 gallons of water:
 a) 2 quarts of household ammonia, or
 b) 4 pounds of trisodium phosphate cleaner.

3. Add more water and rinse the system again by using a combination of agitation and spraying. Remove and clean nozzles, screens, and strainers in a bucket of cleaning agent and water. Use safety precautions for the agrichemicals and cleaning products used.
4. Make a final rinse and flush the system again with clean water.

Nozzles

Many types of nozzles are available for use. Each type provides different patterns, flow rates, spray angles, and droplet sizes. The following chart is meant as an aid in sprayer calibration and are presented courtesy of Spraying Systems Co. of Wheaton, Illinois. Though the TeeJet® brand is popular in Kentucky, similar nozzles from other manufacturers are perfectly acceptable.

| TIP NO. (Strainer Screen Size) | | Liquid Pressure in PSI | Capacity 1 Nozzle in GPM | Capacity 1 Nozzle in oz./min. | GALLONS PER ACRE 20" SPACING | | | | GALLONS PER ACRE 30" SPACING | | | |
|-----------------------------------|------------------------|---------------------------|--------------------------------|-------------------------------------|---------------------------------|----------|----------|----------|---------------------------------|----------|----------|----------|
| 80° SERIES | 110° SERIES | | | | 5 MPH | 6 MPH | 7 MPH | 8 MPH | 5 MPH | 6 MPH | 7 MPH | 8 MPH |
| 8001VS (100 Mesh) | 11001VS (100 Mesh) | 30 | .09 | 11 | 5.1 | 4.3 | 3.7 | 3.2 | 3.4 | 2.9 | 2.5 | 2.1 |
| | | 35 | .09 | 12 | 5.6 | 4.6 | 4.0 | 3.5 | 3.7 | 3.1 | 2.6 | 2.3 |
| | | 40 | .10 | 13 | 5.9 | 5.0 | 4.2 | 3.7 | 4.0 | 3.3 | 2.8 | 2.5 |
| | | 45 | .11 | 14 | 6.3 | 5.3 | 4.5 | 3.9 | 4.2 | 3.5 | 3.0 | 2.6 |
| 80015VS (100 Mesh) | 110015VS (100 Mesh) | 60 | .12 | 15 | 7.3 | 6.1 | 5.2 | 4.6 | 4.9 | 4.0 | 3.5 | 3.0 |
| | | 30 | .13 | 17 | 7.7 | 6.4 | 5.5 | 4.8 | 5.1 | 4.3 | 3.7 | 3.2 |
| | | 35 | .14 | 18 | 8.3 | 6.9 | 6.0 | 5.2 | 5.6 | 4.6 | 4.0 | 3.5 |
| | | 40 | .15 | 19 | 8.9 | 7.4 | 6.4 | 5.6 | 5.9 | 5.0 | 4.2 | 3.7 |
| 8002VS (50 Mesh) | 11002VS (50 Mesh) | 45 | .16 | 20 | 9.5 | 7.9 | 6.8 | 5.9 | 6.3 | 5.3 | 4.5 | 3.9 |
| | | 60 | .18 | 23 | 10.9 | 9.1 | 7.8 | 6.8 | 7.3 | 6.1 | 5.2 | 4.6 |
| | | 30 | .17 | 22 | 10.3 | 8.6 | 7.4 | 6.4 | 6.9 | 5.7 | 4.9 | 4.3 |
| | | 35 | .19 | 24 | 11.1 | 9.3 | 7.9 | 6.9 | 7.4 | 6.2 | 5.3 | 4.6 |
| 8003VS (50 Mesh) | 11003VS (50 Mesh) | 40 | .20 | 26 | 11.9 | 9.9 | 8.5 | 7.4 | 7.9 | 6.6 | 5.7 | 5.0 |
| | | 45 | .21 | 27 | 12.6 | 10.5 | 9.0 | 7.9 | 8.4 | 7.0 | 6.0 | 5.3 |
| | | 60 | .25 | 32 | 14.6 | 12.1 | 10.4 | 9.1 | 9.7 | 8.1 | 6.9 | 6.1 |
| | | 30 | .26 | 33 | 15.4 | 12.9 | 11.0 | 9.7 | 10.3 | 8.6 | 7.4 | 6.4 |
| 8004VS (50 Mesh) | 11004VS (50 Mesh) | 35 | .28 | 36 | 16.7 | 13.9 | 11.9 | 10.4 | 11.1 | 9.3 | 7.9 | 6.9 |
| | | 40 | .30 | 38 | 17.8 | 14.9 | 12.7 | 11.1 | 11.9 | 9.9 | 8.5 | 7.4 |
| | | 45 | .32 | 41 | 18.9 | 15.8 | 13.5 | 11.8 | 12.6 | 10.5 | 9.0 | 7.9 |
| | | 60 | .37 | 47 | 22 | 18.2 | 15.6 | 13.6 | 14.6 | 12.1 | 10.4 | 9.1 |
| 8005VS (50 Mesh) | 11005VS (50 Mesh) | 30 | .35 | 45 | 21 | 17.2 | 14.7 | 12.9 | 13.7 | 11.4 | 9.8 | 8.6 |
| | | 35 | .37 | 47 | 22 | 18.5 | 15.9 | 13.9 | 14.8 | 12.3 | 10.6 | 9.3 |
| | | 40 | .40 | 51 | 24 | 19.8 | 17.0 | 14.9 | 15.8 | 13.2 | 11.3 | 9.9 |
| | | 45 | .42 | 54 | 25 | 21 | 18.0 | 15.8 | 16.8 | 14.0 | 12.0 | 10.5 |
| 8006VS (50 Mesh) | 11006VS (50 Mesh) | 60 | .49 | 63 | 29 | 24 | 21 | 18.2 | 19.4 | 16.2 | 13.9 | 12.1 |
| | | 30 | .43 | 55 | 26 | 21 | 18.4 | 16.1 | 17.2 | 14.3 | 12.3 | 10.7 |
| | | 35 | .47 | 60 | 28 | 23 | 19.8 | 17.4 | 18.5 | 15.4 | 13.2 | 11.6 |
| | | 40 | .50 | 64 | 30 | 25 | 21 | 18.6 | 19.8 | 16.5 | 14.1 | 12.4 |
| 8008VS (50 Mesh) | 11008VS (50 Mesh) | 45 | .53 | 68 | 32 | 26 | 23 | 19.7 | 21 | 17.5 | 15.0 | 13.1 |
| | | 60 | .61 | 78 | 36 | 30 | 26 | 23 | 24 | 20 | 17.3 | 15.2 |
| | | 30 | .52 | 67 | 31 | 26 | 22 | 19.3 | 21 | 17.2 | 14.7 | 12.9 |
| | | 35 | .56 | 72 | 33 | 28 | 24 | 21 | 22 | 18.5 | 15.9 | 13.9 |
| 8002VS (50 Mesh) | 11002VS (50 Mesh) | 40 | .60 | 77 | 36 | 30 | 25 | 22 | 24 | 19.8 | 17.0 | 14.9 |
| | | 45 | .64 | 82 | 38 | 32 | 27 | 24 | 25 | 21 | 18.0 | 15.8 |
| | | 60 | .74 | 95 | 44 | 36 | 31 | 27 | 29 | 24 | 21 | 18.2 |
| | | 30 | .69 | 88 | 41 | 34 | 29 | 26 | 27 | 23 | 19.6 | 17.2 |
| 8002VS (50 Mesh) | 11002VS (50 Mesh) | 35 | .75 | 96 | 44 | 37 | 32 | 28 | 30 | 25 | 21 | 18.5 |
| | | 40 | .80 | 102 | 48 | 40 | 34 | 30 | 32 | 26 | 23 | 19.8 |
| | | 45 | .85 | 109 | 50 | 42 | 36 | 32 | 34 | 28 | 24 | 21 |
| | | 60 | .98 | 125 | 58 | 49 | 42 | 36 | 39 | 32 | 28 | 24 |



*Adjust spray height in the field to overlap approximately 30% of each edge of pattern.

| SUGGESTED MINIMUM SPRAY HEIGHT | |
|-----------------------------------|-----------------------------|
| SPRAY ANGLE | SPRAY HEIGHT 20" SPACING |
| 80° | 17-19" |
| 110° | 10-12" |

Flat Fan Spray Tips

- 8002VS Stainless Steel with VisiFlo color coding
- 8002-HSS Hardened Stainless Steel
- 8002-SS Stainless Steel
- 8002 Brass

Herbicides, Formulations, Manufacturers, and Crops

| Trade Name* | MOA Group | Active Ingredient | Manufacturer | Crops |
|--------------------------------|---|--|---------------------------------|---|
| AAtrex 4WDL 90 WDG | Group 5 | atrazine | Syngenta | corn (field, popcorn), grain sorghum |
| Abundit Extra [3 lb ae/gal] | Group 9 | glyphosate (isopropylamine salt) | Nufarm [DuPont distributor] | corn (field, popcorn, sweet), soybean |
| Accent (SP) 75DF | Group 2 | nicosulfuron (75%) | DuPont | corn (field, popcorn, sweet) |
| Accent Q | Group 2 | nicosulfuron (54.5%)+ isoxadifen (safener) | DuPont | corn (field, popcorn, sweet) |
| Accolade | Group 2 | flumetsulam | FMC | corn (field), soybean |
| Acumen 3.3EC | Group 3 | pendimethalin | Tenkoz | corn (field, popcorn), soybean, tobacco |
| Acuron | Group 15 Group 5 Group 27 Group 27 | S-metolachlor (2.14 lb) + atrazine (1.0 lb) + mesotrione (0.24 lb) + bicyclopyrone (0.06 lb) + benoxacor (safener) | Syngenta | corn (field, popcorn, sweet) |
| Afforia 50.8 WDG | Group 2 Group 2 Group 14 | thifensulfuron (5%) + tribenuron (5%) + flumioxazin (40.8%) | DuPont | soybean |
| Aim 1.9EW or Aim 2EC | Group 14 | carfentrazone | FMC | corn (field, popcorn), grain sorghum, soybean, wheat, barley |
| Alecto 41 HL [3 lb ae/gal] | Group 9 | glyphosate (isopropylamine salt) | Ritter Chemical | corn (field, popcorn), grain sorghum, soybean, wheat, barley |
| Andross | Group 14 | fomesafen (1.88 lb) | Rotam N America | soybean |
| Anthem (2,15L) | Group 14 Group 15 | fluthiacet-methyl (0.063 lb) + pyroxasulfone (2.087 lb) | FMC | corn (field, popcorn, sweet), soybean |
| Anthem ATZ (4.5S) | Group 5 Group 14 Group 15 | atrazine (4.006 lb) + fluthiacet-methyl (0.014 lb) + pyroxasulfone (0.485 lb) | FMC | corn (field, popcorn, sweet) |
| Anthem Flex (4SE) | Group 14 Group 15 | carfentrazone (0.267 lb) + pyroxasulfone (3.733 lb) | FMC | wheat |
| Anthem MAXX (4.3SC) | Group 14 Group 15 | fluthiacet-methyl (0.126 lb) + pyroxasulfone (4.174 lb) | FMC | corn (field, popcorn, sweet), soybean |
| Armezon 2.8SC | Group 27 | topramezone | BASF | corn (field, popcorn, sweet) |
| Armezon PRO (6.25L) | Group 15 Group 27 | dimethenamid-P (5.25 lb) + topramezone (0.1 lb) | BASF | corn (field, popcorn, sweet) |
| Arrow 2EC | Group 1 | Clethodim | Makhteshim-Agan | soybean |
| Assure II 0.88E | Group 1 | quizalofop P-ethyl | DuPont | soybean |
| Atrazine 4 WDL 90 WDG | Group 5 | Atrazine | (various) | corn (field, popcorn), grain sorghum |
| Audit 75 WDG | Group 2 | thifensulfuron (56.25%) + tribenuron (18.75%) | Arysta Life Science | wheat, barley, corn(field), grain sorghum, soybean, fallow |
| Authority Assist 4L | Group 14 Group 2 | sulfentrazone (3.33 lb) + imazethapyr (0.67 lb) | FMC | soybean |
| Authority Elite 7L | Group 14 Group 15 | sulfentrazone (0.7 lb) + S-metolachlor (6.3 lb) | FMC | soybean |
| Authority First (70DF) | Group 14 Group 2 | sulfentrazone (62.1%) + cloransulam (7.9%) | FMC | soybean |
| Authority Maxx (60DF) | Group 14 Group 2 | sulfentrazone (62.12%) + chlorimuron (3.88%) | FMC | soybean |
| Authority MTZ 45DF | Group 14 Group 5 | sulfentrazone (18%) + metribuzin (27%) | FMC | soybean |
| Authority XL 70DF | Group 14 Group 2 | sulfentrazone (62.22%) + chlorimuron (7.78%) | FMC | soybean |

Herbicides, Formulations, Manufacturers, and Crops

| Trade Name* | MOA Group | Active Ingredient | Manufacturer | Crops |
|--|-------------------------|--|---------------------|---|
| Axial 0.83 EC or Axial XL 0.42EC | Group 1 | pinoxaden | Syngenta | wheat, barley |
| Axiom 68DF | Group 15 Group 5 | flufenacet (54.4%) + metribuzin (13.6%) | Bayer CropScience | corn (field), soybean, wheat |
| Balance Flexx | Group 27(28) | isoxaflutole (2 lb) + cyprosulfamide (safener) | Bayer CropScience | corn (field) |
| Banvel 4S | Group 4 | dicamba (dimethylamine salt) | Arysta Life Science | corn, grain sorghum, wheat, barley, oats |
| Basagran 4S | Group 6 | bentazon | Arysta Life Science | corn (field, popcorn), grain sorghum, soybean |
| Basis 75 WDG | Group 2 Group 2 | rimsulfuron (50%) + thifensulfuron (25%) | DuPont | corn (field) |
| Basis Blend | Group 2 Group 2 | rimsulfuron (20%) + thifensulfuron (10%) | DuPont | corn (field) |
| Battle Star | Group 14 | fomesafen (1.88 lb) | Albaugh | soybean |
| Beacon 75DF | Group 2 | primisulfuron | Syngenta | corn (field, popcorn) |
| Bestow 25DF | Group 2 | rimsulfuron (25%) | Chemnova | corn (field) |
| Bicep II Magnum 5.5L | Group 15 Group 5 | S-metolachlor (2.4 lb) + atrazine (3.1 lb) + benoxacor (safener) | Syngenta | corn (all types), grain sorghum |
| Boundary 6.5EC | Group 15 Group 5 | S-metolachlor (5.25 lb) + metribuzin (1.25 lb) | Syngenta | Soybean |
| Brawl II 7.64EC | Group 15 | S-metolachlor (2.4 lb) + benoxacor (safener) | Tenkoz | corn (all types), soybean, grain & forage sorghum |
| Brawl II ATZ 5.5L | Group 15 Group 5 | S-metolachlor (2.4 lb) + atrazine (3.1 lb) + benoxacor (safener) | Tenkoz | corn (all types), grain sorghum |
| Breakfree NXT 7E | Group 15 | acetochlor (7 lb)+ dichlormid (safener) | DuPont | corn (field, popcorn) |
| Breakfree NXT ATZ 5.6L | Group 15 Group 5 | acetochlor (3.1 lb) + atrazine (2.5 lb) + dichlormid (safener) | DuPont | corn (field, popcorn) |
| Buccaneer 4S or Buccaneer Plus [3 lb ae/gal] | Group 9 | glyphosate (isopropylamine salt) | Tenkoz | corn (field, popcorn), grain sorghum, soybean, wheat, barley |
| Buccaneer 5 [3.75 lb ae/gal] | Group 9 | glyphosate (isopropylamine salt) | Tenkoz | corn (field, popcorn), grain sorghum, soybean, wheat, barley |
| Buctril 2EC | Group 6 | bromoxynil (2 lb) | Bayer CropScience | corn (field, popcorn), grain sorghum, wheat, barley, oats |
| Butyrac 200 2EC | Group 4 | 2,4-DB | Albaugh | Soybean |
| Cadet 0.91EC | Group 14 | fluthiacet-methyl (0.91 lb) | FMC | corn (field, popcorn), soybean |
| Callisto 4SC | Group 27 | Mesotrione (4 lb) | Syngenta | corn (field, popcorn, sweet corn), sorghum (grain, sweet) |
| Callisto GT (4.18L) | Group 9 Group 27(28) | glyphosate (3.8 lb) + mesotrione (0.38 lb) | Syngenta | corn (field) |
| Callisto Xtra 3.7L | Group 5 Group 27(28) | atrazine (3.2 lb) + mesotrione (0.5 lb) | Syngenta | corn (field, yellow popcorn, silage, sweet corn) |
| Canopy 75WDG | Group 2 Group 5 | chlorimuron (10.7 %) + metriburin (64.3%) | DuPont | Soybean |
| Canopy Blend | Group 2 Group 5 | chlorimuron (8.3 %) + metribuzin (50%) | DuPont | soybean |
| Canopy EX 29.5 WDG | Group 2 Group 2 | chlorimuron (22.7 %) + tribenuron (6.8%) | DuPont | Soybean |

Herbicides, Formulations, Manufacturers, and Crops

| Trade Name* | MOA Group | Active Ingredient | Manufacturer | Crops |
|---|--------------------------------|---|--------------------|---|
| Capreno 3.45SC | Group 2 Group 27(28) | thiencarbozone (0.57 lb) + tembotrione (2.88 lb) + isoxadifen (safener) | Bayer CropScience | corn (field, popcorn, sweet corn) |
| Celebrity Plus | Group 4 Group 19 Group 2 | dicamba (42.4%) + diflufenzopyr (17%) + nicosulfuron (10.6%) | BASF | corn (field) |
| Charger Basic 7.62 EC | Group 15 | S-metolachlor | Winfield Solutions | corn (all types), grain sorghum, soybean |
| Charger Max 7.64EC | Group 15 | S-metolachlor + (seed safener) | Winfield Solutions | corn (all types), grain sorghum, soybean |
| Charger Max ATZ 5.5 L | Group 15 Group 5 | S-metolachlor (2.4 lb) + atrazine (3.1 lb) + (seed safener) | Winfield Solutions | corn (all types), grain sorghum |
| Cheetah | Group 10 | glufosinate-ammon. (2.34 lb) | Nufarm | corn (field), soybean |
| Cheetah Max | Group 10 Group 14 | glufosinate-ammonium (2 lb)+ fomesafen (1 lb) | Nufarm | soybean |
| Cinch 7.64EC | Group 15 | S-metolachlor + benoxacor (safener) | DuPont | corn (all types), grain sorghum, soybean |
| Cinch ATZ 5.5L | Group 15 Group 5 | S-metolachlor (2.4 lb) + atrazine (3.1 lb) + benoxacor (safener) | DuPont | corn (all types), grain sorghum |
| Cinco [4 lb ae/gal] | Group 9 | glyphosate (isopropylamine salt) | Loveland Products | corn (field, popcorn), grain sorghum, soybean, wheat, barley |
| Clarity 4S | Group 4 | dicamba (diglycolamine salt) | BASF | corn (field, popcorn), grain sorghum, wheat, barley |
| Classic 25DF | Group 2 | Chlorimuron | DuPont | soybean |
| Clash | Group 4 | dicamba (diglycolamine salt) | Nufarm | corn, grain sorghum, wheat, barley, oats |
| Cloak 75WDG | Group 2 Group 5 | chlorimuron (10.7% + metribuzin (64.3%)) | Nufarm | soybean |
| Cloak EX 29.5WDG | Group 2 Group 2 | chlorimuron (22.7% + tribenuron (6.8%)) | Nufarm | soybean |
| Cobra 2EC | Group 14 | Lactofen | Valent | soybean |
| Command 3ME | Group 13 | Clomazone | FMC | soybean, tobacco |
| Confidence 7E | Group 15 | acetochlor + (safener) | Agrisolutions | corn (field, popcorn) |
| Confidence Xtra 5.6L | Group 15 Group 5 | acetochlor (3.1 lb) + atrazine (2.5 lb) + (safener) | Agrisolutions | corn (field, popcorn) |
| Cornerstone or Cornerstone Plus [3 lb ae/gal] | Group 9 | glyphosate (isopropylamine salt) | Agrisolutions | corn (field, popcorn), grain sorghum, soybean, wheat, barley |
| Cornerstone 5 Plus [4 lb ae/gal] | Group 9 | glyphosate (isopropylamine salt) | Agrisolutions | corn (field, popcorn), grain sorghum, soybean, wheat, barley |
| Corvus 2.63L | Group 2 Group 27(28) | thiencarbozone (0.75 lb) + isoxaflutole (1.88 lb) + safener | Bayer CropScience | corn (field) |
| Credit Xtreme [4.5 lb ae/gal] | Group 9 | glyphosate [isopropylamine salt (2.5 lb)+ potassium salt (2.0 lb)] | Nufarm | corn (field, popcorn), grain sorghum, soybean, wheat, barley |
| Crusher 50WDG | Group 2 Group 2 | rimsulfuron (25%) + thifensulfuron-methyl (25%) | Cheminova | corn (field), soybean |
| 2,4-D [several forms] | Group 4 | 2,4-D | (various) | corn, grain sorghum, soybean, wheat, barley |
| Dawn 2L | Group 14 | fomesafen | Cheminova | soybean |

Herbicides, Formulations, Manufacturers, and Crops

| Trade Name* | MOA Group | Active Ingredient | Manufacturer | Crops |
|-------------------------------------|---------------------------------|---|---------------------|--|
| Define 4SC | Group 15 | flufenacet | Bayer CropScience | corn (field) |
| Degree 3.8CS | Group 15 | acetochlor + MON13900 (safener) | Monsanto | corn (field, popcorn, sweet) |
| Degree Xtra 4.04CS | Group 15 Group 5 | acetochlor (2.7 lb) + atrazine (1.34 lb) + MON13900 (safener) | Monsanto | corn (field, popcorn), grain sorghum |
| Diablo 4S | Group 4 | dicamba (dimethylamine salt) | Nufarm | corn, grain sorghum, wheat, barley, oats |
| DiFlexx 4SC | Group 4 | dicamba (diglycolamine salt) + cyprosulfamide (safener) | Bayer CropScience | corn (field, silage, popcorn) |
| Discover NG 0.5EC | Group 1 | clodinafop-propargyl | Syngenta | wheat |
| Dual II Magnum 7.64EC | Group 15 | S-metolachlor + benoxacor (safener) | Syngenta | corn (all types), grain sorghum, soybean |
| Duramax [4 lb ae/gal] | Group 9 | glyphosate (dimethylamine salt) | Dow AgroSciences | corn (field, popcorn), grain sorghum, soybean, wheat, barley |
| Durango DMA [4 lb ae/gal] | Group 9 | glyphosate (dimethylamine salt) | Dow AgroSciences | corn (field, popcorn), grain sorghum, soybean, wheat, barley |
| Encompass 51DG | Group 14 | flumioxazin | Tenkoz | soybean |
| Enlist Duo | Group 4 Group 9 | 2,4-D [choline salt] (1.6 lb) + glyphosate [DMA salt] (1.7 lb) | Dow AgroSciences | corn, soybean [<i>Enlist</i>] |
| Envive 41.3DG | Group 2 Group 2 Group 14 | chlorimuron (9.2%) + thifensulfuron (2.9%) + flumioxazin (29.2%) | DuPont | soybean |
| Establish 6E | Group 15 | dimethenamid-P | Tenkoz | corn (field, popcorn), grain sorghum, soybean |
| ET 0.298E | Group 14 | pyraflufen-ethyl | Nichino America | corn (field, popcorn), soybean, wheat |
| Expert 4.88L | Group 15 Group 5 Group 9 | S-metolachlor (1.74 lb) + atrazine (2.14 lb) + glyphosate [IPA salt] (1.0 lb) | Syngenta | corn (field corn, Roundup Ready hybrids, popcorn, sweet corn), grain sorghum, forage sorghum |
| Express (TotalSol) 50 DF | Group 2 | tribenuron-methyl | DuPont | corn (field), grain sorghum, soybean, wheat, barley, fall fallow |
| Extreme 2.17L | Group 2 Group 9 | imazethapyr (0.17 lb) + glyphosate [IPA salt] (2 lb) | BASF | soybean |
| Fierce 76 WDG | Group 14 Group 15 | flumioxazin (33.5%) + pyroxasulfone (42.5%) | Valent | corn (field), soybean |
| Fierce XLT | Group 2 Group 14 Group 15 | chlorimuron (6.67%) flumioxazin (24.57 %) pyroxasulfone (31.7%) | Valent | soybean |
| Finesse 75DF | Group 2 Group 2 | chlorsulfuron (62.5%) + metsulfuron-methyl (12.5%) | DuPont | wheat |
| Finesse Grass & Broadleaf 71.7DF | Group 2 Group 2 | chlorsulfuron (25%) + flucarbazone (46.7%) | DuPont | wheat |
| Firestorm 3S | Group 22 | paraquat | Chemtura | corn (field, popcorn), grain sorghum, soybean, wheat, barley |
| FirstRate 84WDG | Group 2 | cloransulam | Dow AgroSciences | soybean |
| FirstShot SG (TotalSol) | Group 2 Group 2 | thifensulfuron (25%) + tribenuron (25%) | DuPont | corn (field), grain sorghum, soybean, wheat, barley, fallow |
| Flexstar 1.88L | Group 14 | Fomesafen | Syngenta | soybean |
| Flexstar GT 3.5 [2.82S] | Group 14 Group 9 | fomesafen (0.56 lb) + glyphosate (2.26 lb) | Syngenta | soybean |

Herbicides, Formulations, Manufacturers, and Crops

| Trade Name* | MOA Group | Active Ingredient | Manufacturer | Crops |
|---|-------------------------------------|--|-----------------------------|--|
| Forfeit 280SL | Group 10 | glufosinate-ammonium (2.34 lb) | Loveland | corn (field), soybean [LibertyLink] |
| FulTime NXT [4SE] | Group 15 Group 5 | acetochlor (2.7 lb) + atrazine (1.34 lb) | Dow AgroSciences | corn (field, popcorn, sweet) |
| Fusilade DX 2E | Group 1 | fluazifop-P-butyl (2 lb) | Syngenta | soybean |
| Fusion 2.56EC | Group 1 Group 1 | fluazifop-P-butyl (2 lb) + fenoxaprop-P-ethyl (0.56 lb) | Syngenta | soybean |
| Glory 75DF | Group 5 | metribuzin (75%) | Makhteshin Agan | Corn (field), soybean, wheat (tolerant varieties) |
| Gly-4 Plus [3 lb ae/gal] | Group 9 | glyphosate (isopropylamine salt) | UniversalCrop Protection | corn (field, popcorn), grain sorghum, soybean, wheat, barley |
| Glyphos X-tra [3 lb ae/gal] | Group 9 | glyphosate (isopropylamine salt) | Cheminova | corn (field, popcorn), grain sorghum, soybean, wheat, barley |
| Glyphogan [3 lb ae/gal] | Group 9 | glyphosate (isopropylamine salt) | Makhteshim Agan | corn (field, popcorn), grain sorghum, soybean, wheat, barley |
| Gly Star Plus [3 lb ae/gal] | Group 9 | glyphosate (isopropylamine salt) | Albaugh | corn (field, popcorn), grain sorghum, soybean, wheat, barley |
| Gly Star Original [3 lb ae/gal] | Group 9 | glyphosate (isopropylamine salt) | Albaugh | corn (field, popcorn), grain sorghum, soybean, wheat, barley |
| GlySupreme Plus [3 lb ae/gal] | Group 9 | glyphosate (isopropylamine salt) | Mey Corp | corn (field, popcorn), grain sorghum, soybean, wheat, barley |
| Gramoxone SL | Group 22 | paraquat (2 lb) | Syngenta | corn (field, popcorn), grain sorghum, soybean, wheat, barley |
| Guardman Max 5E | Group 15 Group 5 | dimethenamid-P (1.7 lb) + atrazine (3.3 lb) | BASF | corn (field, popcorn), grain sorghum |
| Halex GT [4.39EC] | Group 15 Group 9 Group 27(28) | S-metholachlor (2.09) + glyphosate (2.09) + mesotrione (0.209) | Syngenta | corn (Glyphosate-Tolerant hybrids) |
| Harass 75DF | Group 2 | thifensulfuron (75%) | Cheminova | wheat, barley, oats, corn (field), grain sorghum, soybean, fallow |
| Harmony Extra (TotalSol) 50SG | Group 2 Group 2 | thifensulfuron (33.33%) + tribenuron (16.67%) | DuPont | wheat, barley, oats, corn(field), grain sorghum, soybean, fallow |
| Harmony (TotalSol) 50SG | Group 2 | thifensulfuron (50%) | DuPont | wheat, barley, oats, corn (field), grain sorghum, soybean, fallow |
| Harness 7E | Group 15 | acetochlor + furilazole (safener) | Monsanto | corn (field, popcorn) |
| Harness Xtra 5.6L | Group 15 Group 5 | acetochlor (3.1 lb) + atrazine (2.5 lb) + furilazole (safener) | Monsanto | corn (field, popcorn) |
| Helmquat 3SL | Group 22 | paraquat | HELM AGRO | corn (field, popcorn), grain sorghum, soybean, wheat, barley |
| Helosate Plus [3 lb ae/gal] | Group 9 | glyphosate (isopropylamine salt) | HELM AGRO | corn (field, popcorn), grain sorghum, soybean, wheat, barley |
| Honcho or Honcho Plus [3 lb ae/gal] | Group 9 | glyphosate (isopropylamine salt) | Monsanto | corn (field, popcorn), grain sorghum, soybean, wheat, barley |
| Hornet 68.5WDG | Group 2 Group 4 | flumetsulam (18.5%) + clopyralid (50%) | Dow AgroSciences | corn (field) |
| Hoss Ultra [3 lb ae/gal] | Group 9 | glyphosate (isopropylamine salt) | Helena | corn (field, popcorn), grain sorghum, soybean, wheat, barley |
| Huskie | Group 27 Group 6 | pyrasulfotole (0.31 lb) + bromoxynil (1.75 lb) | Bayer CropScience | wheat, barley, grain sorghum |
| Impact 2.8SC | Group 27(28) | topramezone | AMVAC | corn (field, popcorn, sweet) |

Herbicides, Formulations, Manufacturers, and Crops

| Trade Name* | MOA Group | Active Ingredient | Manufacturer | Crops |
|---|-------------------------------------|--|---------------------|--|
| Instigate 45.8 WDG | Group 2 Group 27(28) | rimsulfuron (4.17%) + mesotrione (41.67%) | DuPont | corn (field) |
| Intensity 2EC | Group 1 | clethodim | Loveland | soybean |
| IntensityOne 0.97EC | Group 1 | clethodim | Loveland | soybean, corn (field) |
| Intimidator | Group 15 Group 5 Group 14 | S-metolachlor (3.39 lb) + metribuzin (0.75 lb) + fomesafen (0.67 lb) | Loveland | soybean |
| Keystone NXT 5.6SE | Group 15 Group 5 | acetochlor (3.1 lb) + atrazine (2.5 lb) | Dow AgroSciences | corn (field, popcorn, sweet) |
| Laudis | Group 27(28) | tembotrione (3.5 lb) | Bayer CropScience | corn (field, popcorn, sweet) |
| LeadOff 33.4WDG | Group 2 Group 2 | rimsulfuron (16.7%) + thifensulfuron-methyl (16.7%) | DuPont | corn (field), soybean |
| Lexar EZ | Group 15 Group 27(28) Group 5 | S-metolachlor (1.74 lb) + mesotrione (0.224 lb) + atrazine (1.74 lb) + benoxacor (safener) | Syngenta | corn (field, popcorn, sweet), grain sorghum |
| Liberty 280SL | Group 10 | glufosinate-ammonium (2.34 lb) | Bayer CropScience | corn (field), soybean [<i>LibertyLink</i>] |
| Linex 4L | Group 7 | linuron (4 lb) | Tessenderlo Kerley | soybean |
| Lumax EZ | Group 15 Group 27(28) Group 5 | S-metolachlor (2.49 lb) + mesotrione (0.249 lb) + atrazine (0.935 lb) + benoxacor (safener) | Syngenta | corn (field, popcorn, sweet), grain sorghum |
| Mad Dog or Mad Dog Plus [3 lb ae/gal] | Group 9 | glyphosate (isopropylamine salt) | Loveland | corn (field, popcorn), grain sorghum, soybean, wheat, barley |
| Maestro 2EC | Group 6 | bromoxynil | Nufarm | corn (field, popcorn), sorghum, wheat, barley, oats, rye, triticale |
| Marksman 3.2S | Group 4 Group 5 | dicamba (1.1 lb) + atrazine (2.1 lb) | BASF | corn (field, popcorn) |
| Marvel 3L | Group 14 Group 14 | fluthiacet (0.117 lb) + fomesafen (2.883 lb) | FMC | soybean |
| Matador | Group 15 Group 5 Group 2 | metolachlor (4.01 lb) + metribuzin (0.56 lb) + imazethapyr (0.13) | Loveland | soybean |
| MCPA | Group 4 | MCPA | (various) | small grains |
| Medal 7.62EC | Group 15 | S-metolachlor | Syngenta | corn (all types), grain & forage sorghum, soybean |
| Medal II 7.64EC | Group 15 | S-metolachlor + benoxacor (safener) | Syngenta | corn (all types), grain & forage sorghum, soybean |
| Medal II AT 5.5L | Group 15 Group 5 | S-metolachlor (2.4 lb) + atrazine (3.1 lb) + benoxacor (safener) | Syngenta | corn (all types), grain & forage sorghum |
| Me-Too-Lachlor | Group 15 | metolachlor (8 lb) | Drexel | sorghum, soybean |
| Me-Too-Lachlor II | Group 15 | metolachlor (7.8 lb) | Drexel | corn (field), popcorn |
| Metribuzin 75DF | Group 5 | metribuzin (75%) | Makhteshim Agan | corn(field), soybean, wheat (tolerant varieties) |
| Metri 75DF | Group 5 | metribuzin (75%) | United Phosphorus | corn(field), soybean, wheat (tolerant varieties) |
| Milo-Pro 4F | Group 5 | propazine (4.0 lb) | Albaugh | grain sorghum |
| Mirage or Mirage Plus [3 lb ae/gal] | Group 9 | glyphosate (isopropylamine salt) | Loveland | corn (field, popcorn), grain sorghum, soybean, wheat, barley |
| Nic-It | Group 2 | nicosulfuron (2.0 lb) | Cheminova | corn (field, popcorn, sweet) |

Herbicides, Formulations, Manufacturers, and Crops

| Trade Name* | MOA Group | Active Ingredient | Manufacturer | Crops |
|-----------------------------|---------------------------------|--|----------------------|--|
| Nimble 75DF | Group 2 Group 2 | thifensulfuron (50%) + tribenuron (25%) | Chemnova | wheat, barley, oats, corn (field), grain sorghum, soybean, fallow |
| NorthStar 47.4DG | Group 2 Group 4 | primisulfuron (7.5%) + dicamba [sodium salt] (39.9%) | Syngenta | corn (field, popcorn) |
| OpTill 68WDG | Group 14 Group 2 | saflufenacil (17.8%) + imazethapyr (50.2%) | BASF | corn (CLEARFIELD hybrids), soybean |
| OpTill PRO [co-pack] | Group 14 Group 2 Group 15 | saflufenacil (17.8%) + imazethapyr (50.2%) & dimethenamid (6 lb) | BASF | corn (CLEARFIELD hybrids), soybean |
| Olympus Flex | Group 2 Group 2 | propoxycarbazone (6.75%) + mesosulfuron (4.5%) | Bayer CropScience | wheat |
| Osprey 4.5WDG | Group 2 | mesosulfuron-methyl | Bayer CropScience | wheat |
| Outflank (51WDG) | Group 14 | flumioxazin (51%) | Makhteshim Agan | corn (field), soybean, wheat |
| Outlook 6E | Group 15 | dimethenamid-P | BASF | corn (field, popcorn), grain sorghum, soybean |
| Panoflex 50SG | Group 2 Group 2 | tribenuron (40%) + thifensulfuron (10%) | DuPont | corn (field), soybean, wheat, fallow, burndown, post harvest, |
| Panther 51WDG | Group 14 | flumioxazin (51%) | Nufarm | corn (field), soybean, wheat |
| Panther SC | Group 14 | flumioxazin (4 lb) | Nufarm | corn (field), soybean, wheat |
| Parallel 7.8E | Group 15 | metolachlor + safener | Makhteshim Agan | corn (all types), grain & forage sorghum, soybean |
| Parallel PCS 8E | Group 15 | metolachlor | Makhteshim Agan | grain & forage sorghum, soybean |
| Parallel Plus 5.5L | Group 15 Group 5 | metolachlor (2.7 lb) + atrazine (2.8 lb) + benoxacor (safener) | Makhteshim Agan | corn, grain sorghum |
| Parazone 3SL | Group 22 | paraquat | Makhteshim Agan | corn (field, popcorn), grain sorghum, soybean, wheat, barley |
| Permit 75DF | Group 2 | halosulfuron | Gowan | corn (field), grain sorghum |
| Phoenix 2EC | Group 14 | lactofen | Valent | soybean |
| Poast 1.5E | Group 1 | sethoxydim | Micro Flo /BASF | soybean, tobacco |
| Poast Plus 1EC | Group 1 | sethoxydim | BASF | soybean |
| PowerFlex HL | Group 2 | pyroxsulam (13%) | Dow AgroSciences | wheat |
| Prefix 5.29L | Group 15 Group 14 | S-metolachlor (4.34 lb) + fomesafen (0.95 lb) | Syngenta | soybean |
| Prequel 45WDG | Group 2 Group 27(28) | rimsulfuron (15%) + isoxaflutole (30%) | DuPont | corn (field) |
| Princep 4WDG 90DF | Group 5 | simazine | Syngenta | corn (all types) |
| Priority 62.5DF | Group 14 Group 2 | carfentrazone (12.5%) + halosulfuron (50%) | TENKOZ | corn (all types), grain sorghum |
| Prowl 3.3EC | Group 3 | pendimethalin | BASF | corn (field, popcorn), soybean, tobacco |
| Prowl H ₂ O 3.8L | Group 3 | pendimethalin | BASF | corn (field, popcorn), soybean, tobacco, wheat |
| Pruvn | Group 2 | rimsulfuron (25%) | Makhteshim Agan | corn (field) |
| Pursuit 70DG 2S | Group 2 | imazethapyr | BASF | corn (CLEARFIELD hybrids), soybean |
| Python 80WDG | Group 2 | flumetsulam | Dow AgroSciences | corn (field), soybean |
| Radius 4L | Group 15 Group 27(28) | flufenacet (3.57 lb) + isoxaflutole (0.43 lb) | Bayer CropScience | corn (field) |
| Raptor 1S | Group 2 | imazamox | BASF | soybean |

Herbicides, Formulations, Manufacturers, and Crops

| Trade Name* | MOA Group | Active Ingredient | Manufacturer | Crops |
|--|-------------------------|---|-------------------|---|
| Realm Q 38.8WDG | Group 2 Group 27(28) | rimsulfuron (7.5%) + mesotrione (31.25%) + isoxadifen [safener] | DuPont | corn (field) |
| Reflex | Group 14 | fomesafen (2 lb) | Syngenta | soybean |
| Rely 280 SL | Group 10 | glufosinate-ammonium (2.34 lb) | Bayer CropScience | corn (field), soybean[<i>LibertyLink</i>]; also tree & nut crops |
| Report Extra 75DF | Group 2 Group 2 | chlorsulfuron (62.5%) + metsulfuron-methyl (12.5%) | Chemnova | wheat, barley |
| Resolve Q | Group 2 Group 2 | rimsulfuron (18.4%) + thifensulfuron (4.0%) | DuPont | corn (field) |
| Resource 0.86EC | Group 14 | flumiclorac pentyl | Valent | corn (field), soybean |
| Revulin Q | Group 2 Group 27 | nicosulfuron (14.4%)+ mesotrione (36.8% + isoxadifen (safener) | DuPont | corn (field, popcorn, sweet) |
| Rhythm 1.88L | Group 14 | fomesafen | Chemnova | soybean |
| Rifle | Group 2 | dicamba (dimethylamine salt) | Loveland | corn, grain sorghum, wheat, barley, oats |
| Ringside | Group 14 | fomesafen (2 lb) | Syngenta | soybean |
| Roundup Original [3 lb ae/gal] | Group 9 | glyphosate (isopropylamine salt) | Monsanto | corn (field, popcorn), grain sorghum, soybean, wheat, barley |
| Roundup PowerMAX [4.5 lb ae/gal] | Group 9 | glyphosate (potassium salt) | Monsanto | corn (field, popcorn), grain sorghum, soybean, wheat, barley |
| Roundup WeatherMAX [4.5 lb ae/gal] | Group 9 | glyphosate (potassium salt) | Monsanto | corn (field, popcorn), grain sorghum, soybean, wheat, barley |
| Rowel | Group 14 | flumioxazin | Monsanto | corn (field), soybean |
| RowelFX | Group 14 Group 2 | flumioxazin chlorimuron | Monsanto | soybean |
| Rugged | Group 4 | 2,4-D (3.49 lb ae) | Agrisolutions | corn, grain sorghum, soybean, wheat, barley, oats, rye |
| Rumble | Group 14 | fomesafen (1.88 lb) | Makhteshim Agan | soybean |
| Sandea 75DF | Group 2 | halosulfuron | Gowan | corn (field), grain sorghum |
| Scepter 70DG | Group 2 | imazaquin | BASF | soybean |
| Section 2EC | Group 1 | clethodim | Agrilience | soybean |
| Select 2EC | Group 1 | clethodim | Valent | soybean |
| Select MAX 0.97EC | Group 1 | clethodim | Valent | soybean, corn (field) |
| Sencor 75DF | Group 5 | metribuzin (75%) | Bayer CropScience | corn (field), soybean, wheat (tolerant varieties) |
| Sequence 5.25L | Group 9 Group 15 | glyphosate (2.25 lb ae) + S-metolachlor (3 lb) | Syngenta | corn (field, popcorn), grain & forage sorghum, soybean |
| Shadow | Group 1 | clethodim (2 lb) | Arysta | soybean |
| Shafen | Group 14 | fomesafen (2 lb) | Shardra USA | soybean |
| Shafen Star | Group 14 | fomesafen (1.88 lb) | Shardra USA | soybean |
| Sharpen 2.85S | Group 14 | saflufenacil (2.85 lb) | BASF | corn(field, popcorn),grain sorghum, soybean, wheat, barley, oats |
| Showdown [3 lb ae/gal] | Group 9 | glyphosate (isopropylamine + monoammonium salt) | Helena | corn (field, popcorn), grain sorghum, soybean, wheat, barley |
| Simazat 4L | Group 5 Group 5 | simazine (2 lb)+ atrazine (2 lb) | Drexel | corn |
| Solida | Group 2 | rimsulfuron (25%) | Chemnova | corn (field) |
| Solstice 4.216L | Group 14 Group 27 | fluthiacet methyl (0.216 lb) + mesotrione (4 lb) | FMC | corn (field), popcorn, sweet) |

Herbicides, Formulations, Manufacturers, and Crops

| Trade Name* | MOA Group | Active Ingredient | Manufacturer | Crops |
|---------------------------------------|--------------------------------|---|---------------------|--|
| Sonic 70DG | Group 14 Group 2 | sulfentrazone (62.1%) + cloransulam (7.9%) | Dow AgroSciences | soybean |
| Spartan Advance 3.56L | Group 14 Group 9 | sulfentrazone (0.56 lb) + glyphosate (3 lb ae) | FMC | soybean |
| Spartan Charge | Group 14 Group 14 | sulfentrazone (3.15 lb) + carfentrazone (0.35 lb) | FMC | soybean |
| Spirit 57DF | Group 2 Group 2 | prosulfuron (14.2%) + primisulfuron (42.8%) | Syngenta | corn (field, popcorn) |
| Spitfire | Group 4 Group 4 | dicamba (0.5 lb) + 2,4-D (3.07 lb) | Nufarm | corn, soybean, wheat |
| Stalwart 8EC | Group 15 | metolachlor | Sipcam Advan | soybean |
| Starane Ultra 2.8EC | Group 4 | fluroxypyr | Dow AgroScience | corn (field), grain sorghum, small grains |
| Statement 5.24L | Group 15 Group 14 | metolachlor (4.33 lb) + fomesafen (0.91 lb) | Chemnova | soybean |
| Status 56WG | Group 19 Group 4 | diflufenzopyr (0.16 lb) + dicamba (0.4 lb) + isoxadifen (safener) | BASF | corn (field) |
| Steadfast Q | Group 2 Group 2 | nicosulfuron (25.2%) + rimsulfuron (12.5%) + isoxadifen (safener) | DuPont | corn (field) |
| Stealth 3.3EC | Group 3 | pendimethalin | Loveland | corn (field, popcorn), soybean, tobacco |
| Sterling Blue 4S | Group 4 | dicamba (4 lb) (dimethylamine salt) | Agrilience | corn, grain sorghum, wheat, barley, oats |
| Storm 4S | Group 6 Group 14 | bentazon (2.67 lb) + acifluorfen (1.33 lb) | United Phosphorus | Soybean |
| SureStart II 4.25SE | Group 15 Group 2 Group 4 | acetochlor (3.75 lb) + flumetsulam (0.12 lb) + clopyralid (0.38 lb) + furalazole (safener) | Dow AgroSciences | corn (field, silage) |
| Surpass 6.4EC or Surpass NXT (7SE) | Group 15 | acetochlor + dichlormid (safener) | Dow AgroSciences | corn (field, popcorn, sweet) |
| Surveil | Group 2 Group 14 | cloransulam 12% flumioxazin 36% | Dow AgroSciences | soybean |
| Synchrony XP 28.4DF | Group 2 Group 2 | chlorimuron (21.5%) + thifensulfuron (6.9%) | DuPont | soybean (STS varieties) |
| TailWind 6.5L | Group 15 Group 5 | metolachlor (5.25 lb) + metribuzin (1.25 lb) | Makhteshim Agan | soybean |
| Tackle 4.1L | Group 2 Group 9 | imazethapyr (0.128 lb) + glyphosate [IPA salt] (4 lb) | Chemnova | soybean |
| Targa 0.88E | Group 1 | quizalofop P-ethyl | Gowan | soybean |
| Thief | Group 2 | thifensulfuron | Loveland | wheat, barley, oats, corn (field), grain sorghum, soybean, fallow |
| ThunderMaster 2.17L | Group 2 Group 9 | imazethapyr (0.17 lb) + glyphosate [IPA salt] (2 lb) | Albaugh | Soybean |
| Top Gun | Group 14 | fomesafen (lb) | Loveland | soybean |
| TopNotch 3.2CS | Group 15 | acetochlor + dichlormid (safener) | Dow AgroSciences | corn (field, popcorn, sweet) |
| Torment 2.5L | Group 14 Group 2 | fomesafen (2 lb) + imazethapyr (0.5 lb) | Makhteshim Agan | soybean |
| Touchdown HiTech [5 lb ae/gal] | Group 9 | glyphosate (potassium salt) | Syngenta | corn (field, popcorn), grain sorghum, soybean, wheat, barley |

Herbicides, Formulations, Manufacturers, and Crops

| Trade Name* | MOA Group | Active Ingredient | Manufacturer | Crops |
|----------------------------------|--------------------------------|--|----------------------------------|--|
| Touchdown Total [4.17 ae/gal] | Group 9 | glyphosate (potassium salt) | Syngenta | corn (field, popcorn), grain sorghum, soybean, wheat, barley |
| TriCor 75DF | Group 5 | metribuzin | United Phosphorus | corn (field), soybean, wheat (tolerant varieties) |
| TripleFLEX II 4.25SE | Group 15 Group 2 Group 4 | acetochlor (3.75 lb) + flumetsulam (0.12 lb) + clopypalid (0.38 lb) + furlazole (safener) | Monsanto | corn (field, silage) |
| Trivence | Group 2 Group 14 Group 5 | chlorimuron (3.9%) + flumioxazin (12.8%) + metribuzin (44.6%) | DuPont | soybean |
| Trizmet II | Group 5 Group 15 | atrazine (3.1 lb) + metolachlor (2.4 lb) | Drexel | corn (all types), grain sorghum |
| Treflan 4L or Treflan 4D | Group 3 | trifluralin | UAP Loveland Dow AgroSciences | corn (field), soybean |
| Ultra Blazer 2L | Group 14 | acifluorfen | United Phosphorus | soybean |
| Valor SX 51WDG | Group 14 | flumioxazin | Valent | corn (field), soybean |
| Valor XLT 40.3DG | Group 14 Group 2 | flumioxazin (30%) + chlorimuron (10.3%) | Valent | soybean |
| Verdict | Group 14 Group 15 | saflufenacil (0.57 lb) + dimethenamid-P (5.0 lb) | BASF | corn (field, popcorn, silage), soybean |
| Vida 0.208E | Group 14 | pyraflufen-ethyl | Gowan | corn (field, popcorn) soybean, wheat |
| Vise | Group 15 Group 14 | metolachlor (4.45 lb) + fomesafen (0.95 lb) | Makhteshim Agan | soybean |
| Vision | Group 4 | dicamba (3.8 lb ae) | Helena | corn, grain sorghum, wheat, barley, oats |
| Volley ATZ NXT 5.6SE | Group 15 Group 5 | acetochlor (3.1 lb) + atrazine (2.5 lb) | TENKOZ | corn (field, popcorn) |
| Volunteer 2EC | Group 1 | clethodim | TENKOZ | soybean |
| Warrant 3CS | Group 15 | acetochlor (3 lb) | Monsanto | soybean |
| Warrant Ultra | Group 15 Group 14 | acetochlor (2.82 lb) fomesafen (0.63 lb) | Monsanto | soybean |
| Weedmaster | Group 4 Group 4 | dicamba (2.87 lb) + 2,4-D (1.0 lb) | Nufarm | sorghum |
| Weedone 638 | Group 4 | 2,4-D (2.8 lb ae) [2,4-D acid+butoxyethyl ester] | Nufarm | corn, sorghum, soybean, small grains |
| Weedone 650 | Group 4 | 2,4-D (5.64 lb ae) [ethylhexyl ester] | Nufarm | corn, sorghum, soybean, small grains |
| Weedone LV4 | Group 4 | 2,4-D (3.8 lb ae) [isooctyl ester] | Nufarm | corn, sorghum, soybean, small grains |
| Yukon 67.5WDG | Group 2 Group 4 | halosulfuron (12.5%) + dicamba (55%) | Gowan | corn (field), grain sorghum |
| Zemax | Group 15 Group 27 | S-metolachlor (3.34 lb) + mesotrione (0.33 lb) + benoxacor (safener) | Syngenta | corn (field, sweet, yellow popcorn), grain sorghum |
| Zidua 85WDG | Group 15 | pyroxasulfone (85%) | BASF | corn (field, popcorn, sweet), soybean, wheat |
| Zone Herbicide | Group 14 Group 2 | sulfentrazone (62.2%) + chlorimuron (7.8%) | HELM AGRO | soybean |

*AS=aqueous suspension, DF=dry flowable, EC=emulsifiable concentrate, F=flowable, G=granule, L=liquid, ME or CS= micro-encapsulated, HFP=high flash point formulation, S=water solution, SC=soluble concentrate, SE=soluble emulsion, SG=soluble granule, WDG=water dispersible granule, WDL=water dispersible liquid, WP=wettable powder.

Glyphosate Products Labeled For Use in Grain Crops Including Postemergence Applications in Roundup Ready Corn and Soybeans

| PRODUCT | Salt Form ¹ | Surfactant may be needed? ² | Rate Equivalent 0.56 lb a.e./A | Rate Equivalent 0.75 lb a.e./A | Rate Equivalent 1.13 lb a.e./A |
|------------------------|------------------------|--|-----------------------------------|-----------------------------------|-----------------------------------|
| 3 lb ae/gal | | | | | |
| Abundit Extra | IPA | No | 24 oz | 32 oz (2 pt) | 3 pt |
| Alecto 41 HL | IPA | Yes | 24 oz | 32 oz (2 pt) | 3 pt |
| Buccaneer | IPA | Yes | 24 oz | 32 oz (2 pt) | 3 pt |
| Buccaneer Plus | IPA | Yes | 24 oz | 32 oz (2 pt) | 3 pt |
| Cornerstone | IPA | Yes | 24 oz | 32 oz (2 pt) | 3 pt |
| Cornerstone Plus | IPA | Yes | 24 oz | 32 oz (2 pt) | 3 pt |
| Credit Extra | IPA | No | 24 oz | 32 oz (2 pt) | 3 pt |
| Glyfos X-TRA | IPA | No | 24 oz | 32 oz (2 pt) | 3 pt |
| Glyphogan | IPA | Yes | 24 oz | 32 oz (2 pt) | 3 pt |
| Glyphosate 4 | IPA | Yes | 24 oz | 32 oz (2 pt) | 3 pt |
| Glyphosate 41% | IPA | Yes | 24 oz | 32 oz (2 pt) | 3 pt |
| Gly Star Original | IPA | Yes | 24 oz | 32 oz (2 pt) | 3 pt |
| Gly Star Plus | IPA | No | 24 oz | 32 oz (2 pt) | 3 pt |
| GlySupreme Plus | IPA | No | 24 oz | 32 oz (2 pt) | 3 pt |
| Gly-4 Plus | IPA | No | 24 oz | 32 oz (2 pt) | 3 pt |
| Helosate Plus Advanced | IPA | Yes | 24 oz | 32 oz (2 pt) | 3 pt |
| Honcho / Honcho Plus | IPA | Yes | 24 oz | 32 oz (2 pt) | 3 pt |
| Hoss Ultra | IPA | No | 24 oz | 32 oz (2 pt) | 3 pt |
| Mad Dog / Mad Dog Plus | IPA | Yes | 24 oz | 32 oz (2 pt) | 3 pt |
| Mirage / Mirage Plus | IPA | Yes | 24 oz | 32 oz (2 pt) | 3 pt |
| Showdown | IPA + MOA | No | 24 oz | 32 oz (2 pt) | 3 pt |
| Roundup Original | IPA | Yes | 24 oz | 32 oz (2 pt) | 3 pt |
| 3.75 lb ae/gal | | | | | |
| Buccaneer 5 | IPA | Yes | 19 oz | 26 oz (1.6 pt) | 2.4 pt |
| 4 lb ae/gal | | | | | |
| Cinco | IPA | Required | 18 oz | 24 oz (1.5 pt) | 2.25 pt |
| Cornerstone 5 | IPA | No | 18 oz | 24 oz (1.5 pt) | 2.25 pt |
| Duramax | DMA | --- | 18 oz | 24 oz (1.5 pt) | 2.25 pt |
| Durango DMA | DMA | --- | 18 oz | 24 oz (1.5 pt) | 2.25 pt |
| 4.17 lb ae/gal | | | | | |
| Touchdown Total | K | --- | 17 oz | 23 oz (1.4 pt) | 2.2 pt |
| 4.5 lb ae/gal | | | | | |
| Credit Xtreme | IPA + K | No | 16 oz | 21 oz (1.3 pt) | 2 pt |
| Roundup PowerMAX | K | Yes | 16 oz | 21 oz (1.3 pt) | 2 pt |
| Roundup Weather MAX | K | No | 16 oz | 21 oz (1.3 pt) | 2 pt |
| 5 lb ae/gal | | | | | |
| Touchdown Hi-Tech | K | Required | 14 oz | 19 oz (1.2 pt) | 1.8 pt |

¹ IPA = Isopropylamine salt DMA=Dimethylamine K = Potassium salt MOA = Monoammonium salt

² For products that may need a surfactant, a Non-Ionic Surfactant at 0.25% v/v is the typical recommendation. Consult the herbicide product label to verify when a surfactant is needed and the type and rate of surfactant to include. Ammonium Sulfate (AMS) may also be included to improve glyphosate activity.

CORN

PRECAUTIONS ON USE OF HERBICIDES CONTAINING ATRAZINE AND SIMAZINE NEAR GROUND OR SURFACE WATER

Herbicide products which contain **atrazine** (i.e. AAtrex, Acuron, Anthem ATZ, Atrazine, Bicep II Magnum, Brawl II ATZ, Breakfree NXT ATZ, Callisto Xtra, Cinch ATZ, Charger Max ATZ, Confidence Xtra, Degree Xtra, Expert, FulTime NXT, Guardsman Max, Harness Xtra, Keystone NXT, Lexar EZ, Lumax EZ, Marksman, Metal II AT, Parallel Plus, Simazat, Sterling Plus, Stratos, Trizmet II, Volley ATZ NXT, etc.) and **simazine** (Princep, Simazine, Simazat) have special label restrictions for use near ground or surface waters. Current label guidelines emphasize the use of low rates, buffer zones, and conservation tillage practices as methods for reducing the risk of contamination of water sources. The maximum rate of these herbicide products for early preplant, preplant incorporated, or preemergence applications depends on soil erodibility, as defined by the Natural Resources Conservation Service, and percent of ground covered with plant residue.

Rate Restrictions - For soils that are not highly erodible the maximum use rate for **atrazine** is 2.0 lb ai (active ingredient) per acre and for **simazine** is 2.0 lb ai per acre per season. For highly erodible soils the maximum rate is also 2.0 lb ai per acre for atrazine or simazine if conservation tillage is utilized and at least 30% of the soil is covered with plant residue. If ground cover is less than 30%, the maximum atrazine or simazine rate is 1.6 lb ai/A for highly erodible soils. The total amount of **atrazine** applied to a field should not exceed 2.5 lb ai/A; the total amount for **simazine** should not exceed 2.0 lb ai/A per calendar year. For atrazine the rate for postemergence applications should not exceed 2.0 lb ai/A if no previous atrazine applications were made.

Setbacks - Caution is needed when mixing, loading, or applying **atrazine** and **simazine** near sources of water. According to label directions, atrazine containing products should not be **mixed** or **loaded** within 50 feet of wells (including abandoned wells, drainage wells, or sink holes), rivers, intermittent streams, lakes, or reservoirs. This setback does not apply to the use of properly designed impervious pads and properly diked mixing/loading areas.

These products should not be **applied** within 50 feet of wells or sink holes, within 66 feet of points where field surface water enters permanent or intermittent streams or rivers, or within 200 feet around lakes or reservoirs. If applied to highly erodible soils, the 66 feet buffer area must be planted to a crop or seeded with grass. When atrazine or simazine is to be applied near tile riser pipes applicators can choose to:

1) use a 66 feet setback buffer around the tile riser pipes; 2) apply atrazine and simazine products if field is under no-tillage practices and high crop residue management is maintained; or 3) incorporate atrazine and simazine products in the soil to a depth of 2-3 inches.

Some situations will require a high level of management in order to comply with these restrictions. The maximum labeled rate of atrazine or simazine may not be sufficient to provide season-long control of some problem weeds. Therefore, more emphasis may be needed on using postemergence herbicides, tillage, or crop rotation to help manage such problem weeds as burcucumber, cocklebur, morningglory, giant ragweed, and velvetleaf.

24 Corn

Crop Replant Situations or Volunteer Corn

Emerged corn can be a problem in fields where corn must be replanted due to poor stands, flooding and other unforeseen weather conditions, or where volunteer corn plants emerge prior to planting. For conventional corn hybrids Roundup or other glyphosate products are often used to kill emerged corn prior to replanting. With the introduction of herbicide-tolerant crops such as "Roundup Ready" corn and "Liberty Link" corn hybrids, herbicide options are more limited for control of emerged corn prior to replanting. The table below indicates herbicide options depending on the genetic tolerance of the previous corn hybrid grown.

| Herbicide options for replanting field corn or control of volunteer corn based on previous corn hybrid grown. | | | |
|--|-----------------------------|----------------------|---------------------|
| HERBICIDE | Previous Corn Hybrid | | |
| | Conventional hybrid | Roundup Ready | Liberty Link |
| Glyphosate (Roundup, etc.) | ++ | X | ++ |
| Paraquat + Atrazine | + | + | + |
| Paraquat + Linex (linuron) | + | + | + |
| Select MAX | + | ++ | + |
| + = Recommended; ++ = Highly recommended; X = No control | | | |

Herbicide treatments for control of volunteer corn plants or killing existing stands of corn for replant situations.

GLYPHOSATE

See page 22 for examples of glyphosate formulations. Consult label for specific rate of product and if a surfactant is needed and the type and rate of surfactant to include. Dry Ammonium Sulfate at 1 to 2% by weight (8.5 to 17 lb/100 gal) or an equivalent amount of AMS in a liquid formulation may improve glyphosate activity under certain conditions such as dry weather, or when mixed in hard water or with certain herbicides. Will not control hybrids with Roundup Ready corn technology.

| GLYPHOSATE Product | Volunteer Corn Plant Height | | |
|----------------------------------|------------------------------------|------------------------------------|------------------------------------|
| | 6" tall (0.38 lb ae/A) | 12" tall (0.56 lb ae/A) | 20" tall (0.75 lb ae/A) |
| Roundup (3 lb ae/gal) | 16 oz | 24 oz | 32 oz |
| Duramax (4 lb ae/gal) | 12 oz | 18 oz | 24 oz |
| Touchdown Total (4.17 lb ae/gal) | 12 oz | 17 oz | 24 oz |
| Roundup PowerMax (4.5 lb ae/gal) | 11 oz | 16 oz | 22 oz |
| Touchdown HiTech (5 lb ae/gal) | 10 oz | 14 oz | 20 oz |

Gramoxone SL [2.0] (2.5 to 3.5 pt/A) + Linex 4L (0.67 to 1 pt/A) –OR– Atrazine 4L (0.5 to 1 qt/A)
+ Non-Ionic Surfactant (0.25% to 0.5% v/v)

For control of volunteer corn up to 6 inches in height. Apply the higher rate of both herbicides for corn 7 to 12 inches in height. FIRESTORM, HELMQUAT and PARAZONE are similar paraquat products applied at 1.67 to 2.33 pt/A. With Atrazine maximum rate allowed may depend on previous applications. Apply with a non-ionic surfactant (NIS). Corn or grain sorghum may be planted at any time following application provided the combined maximum label rate has not been exceeded (consult label).

SELECT MAX –OR– INTENSITY ONE (6 fl oz/A) + NIS (0.25% v/v) + AMS (2.5 to 4 lbs/A)

For control of an existing stand of Roundup Ready field corn or other volunteer corn plants prior to replanting to field corn. Apply on field corn up to 12 inches tall. **Replant no sooner than 6 days after application.** Apply with a non-ionic surfactant (NIS) plus Ammonium Sulfate (AMS). Do not use COC or MSO as a spray additive. Do not apply more than 6 oz/A per season.

NO TILLAGE

NOTE: *Herbicides used in no tillage corn production can be applied as either an early preplant treatment (15 to 30 days before planting) or at time of planting (prior to or after planting but before crop emerges). Consult the herbicide labels for specific directions.*

EARLY PREPLANT treatments are soil residual herbicides applied in early spring before weeds emerge, generally 15 to 30 days before planting; thus, the use of a "burndown" herbicide may not be necessary. If vegetation is present, a "burndown" herbicide may be included at time of application to kill the existing weedy vegetation. In addition, use of an early preplant program may require a sequential herbicide treatment applied at or after planting to provide additional length of weed control. Tillage after application may reduce effectiveness of the herbicide treatment.

AT PLANTING treatments include foliar "burndown" herbicides to kill existing vegetation plus a soil residual herbicides for preemergence control of annual grasses and broadleaf weeds. Depending on the amount of vegetation present and herbicide used, spray volume per acre may vary between 10 to 40 gallons of liquid per acre.

Foliar "Burndown" Herbicides for No-Tillage Corn

| | <u>Rate/A</u> | <u>[2,4-D acid equivalent]</u> |
|--|-------------------|--------------------------------|
| 2,4-D LV Ester or Amine [3.8 lb ae/gal] (various) | 1 to 2 pt/A | [0.47 to 0.95 lb ae/A] |
| or | | |
| WEEDONE 638 [2.8 lb ae/gal] | 1.5 to 2.5 pt/A | [0.52 to 0.88 lb ae/A] |
| or | | |
| WEEDONE 650 [5.64 lb ae/gal] | 0.67 to 1.33 pt/A | [0.47 to 0.94 lb ae/A] |

[NOTE: Rates vary with formulation of 2,4-D product used (consult label)]

Weeds Controlled: For control of annual and certain perennial broadleaf weeds including dandelion, prickly lettuce, marestail, mustard spp., and giant ragweed.

Additives: An additive may be used to increase the effectiveness on some weeds. Consult product labels on use of additives in tank mixtures.

Spray Volume: Apply in 10 or more gallons per acre of spray solution.

General Comments: Product formulations vary from 3 to 6 lb ai/gal. Most 2,4-D ESTER or 2,4-D AMINE products can be applied prior to planting corn (Preplant *7 to 14 days before planting*) or Preemergent from *3 to 5 days after planting* [some product labels indicate any time after planting, but before corn emerges]. Be cautious about applications near sensitive broadleaf crops, such as tobacco, soybean, vegetables or ornamental plantings, and avoid potential injury caused by spray drift.

Tank Mixtures: Consult other herbicide product labels for the tank mix partner(s) to be used.

| | <u>Rate/A</u> | <u>(dicamba)</u> |
|--|---------------------------------|-----------------------|
| DICAMBA [eg. BANVEL, CLARITY, DIFLEXX STERLING BLUE, VISION, etc.] | 0.5 to 1 pt/A (8 to 16 oz/A) | [0.25 to 0.5 lb ai/A] |

Weeds Controlled: For control of annual and perennial broadleaf weeds including dandelion, annual fleabane, marestail, prickly lettuce, musk thistle, and giant ragweed. Consult label for applications to legume sods such as alfalfa or clover.

Additives: Although not required, the addition of a Surfactant, Crop Oil, or sprayable fluid fertilizer may improve control of emerged weeds. Do not apply with a spray additive after corn has emerged. Consult product labels on use of additives in tank mixtures.

Spray Volume: Apply at 10 to 50 GPA with ground equipment (consult product label)

General Comments: Apply before, during, or after corn planting to emerged and actively growing broadleaf weeds. For legume sods (e.g. alfalfa and clover) apply after 4-6" of growth has occurred. Be cautious about applications near sensitive broadleaf crops, such as tobacco, soybean, vegetables or ornamental plantings, and avoid potential injury caused by spray drift.

Tank Mixtures: Atrazine, Axiom, Balance Flexx, Bicep II Magnum, Corvus, Define, Degree, Degree Xtra, Dual II Magnum, FieldMaster, FulTime, Glyphosate, Gramoxone, Guardsman, Harness, Harness Xtra, Hornet, Keystone, Liberty, Outlook, Princep, Roundup, TopNotch, Touchdown. Tank mixes with 2,4-D should be applied 7 to 14 days prior to planting corn. *For tank mixtures allowed consult specific product label.*

26 Corn

GLYPHOSATE

Below are examples of GLYPHOSATE formulations and their rates for burndown applications in no-till corn. The application rate of product may vary depending on GLYPHOSATE product used. Dry Ammonium Sulfate at 1 to 2% by weight (8.5 to 17 lb/100 gal) may be included with any of the of the following products to improve weed control during dry weather conditions, or when mixed in hard water or with certain other herbicides.

Recommendations for use of surfactants will vary depending on product. ALWAYS CONSULT THE PRODUCT LABEL FOR SPECIFIC DIRECTIONS.

| Glyphosate formulation ¹ | Annuals <6" tall | Annuals >6" tall |
|--|---|---|
| Roundup, Glyphosate, etc. (3 lb ae/gal) | 1.5 to 2 pt/A (24 to 32 fl oz/A) (0.56 to 0.75 lb ae/A) | 2 to 3 pt/A (32 to 48 fl oz/A) (0.75 to 1.13 lb ae/A) |
| Buccaneer 5 (3.75 lb ae/gal) | 1.2 to 1.75 pt/A (19 to 28 oz/A) (0.56 to 0.82 lb ae/A) | 1.75 to 2.5 pt/A (28 to 40 oz/A) (0.82 to 1.17 lb ae/A) |
| Duramax Durango DMA (4 lb ae/gal) | 1.13 to 1.5 pt/A (18 to 24 fl oz/A) (0.56 to 0.75 lb ae/A) | 1.5 to 2.25 pt/A (24 to 36 fl oz/A) (0.75 to 1.13 lb ae/A) |
| Touchdown Total (4.17 lb ae/gal) | 1.1 to 1.4 pt/A (17 to 23 oz/A) (0.56 to 0.75 lb ae) | 1.5 to 2.2 pt/A (24 to 35 oz/A) (0.78 to 1.14 lb ae/A) |
| Roundup PowerMAX Roundup Weather MAX (4.5 lb ae/gal) | 1 to 1.4 pt/A (16 to 22 fl oz/A) (0.56 to 0.77 lb ae/A) | 1.4 to 2 pt/A (22 to 32 fl oz/A) (0.77 to 1.13 lb ae/A) |
| Touchdown Hi-Tech (5 lb ae/gal) | 0.9 to 1.2 pt (14 to 20 oz/A) (0.56 to 0.78 lb ae/A) | 1.2 to 3 pt/A (20 to 48 oz/A) (0.78 to 1.88 lb ae/A) |

¹ See page 22 for a detailed list of glyphosate products

Annual Weeds Controlled: Annual fleabane, barnyardgrass, brome spp., chickweed, common ragweed, crabgrass, fall panicum, giant foxtail, giant ragweed, henbit, johnsongrass (seedling), lambsquarters, mustards, prickly lettuce, rye, smartweed, wheat.

Perennial Weeds: CONSULT LABEL FOR GLYPHOSATE RATE FOR SPECIFIC PERENNIAL WEED SPECIES. Best control of perennial weeds is usually achieved at late growth stages approaching maturity and when soil moisture is adequate for active plant growth. At normal application times for no-till corn, perennial weeds may not be at the proper growth stage. Control may be reduced if plants are mowed or grazed and not allowed to regrow to recommended growth stage. Perennial weeds may require multiple applications for optimum control.

Spray Volume: Apply in 10 to 20 gallons of clean water/A when mixing with other herbicides. A spray volume of 3 to 10 gallons of water/A is often recommended when glyphosate is used alone at reduced labeled rates for certain annual weed species.

General Comments: Apply before, during, or after planting but before crop emergence. Glyphosate is a translocated herbicide. Rainfall soon after application may reduce effectiveness. Reduced control may occur if mixed with such products as Micro-Tech.

Tank Mixtures: Other foliar and soil residual herbicides are labeled for tank mixing with glyphosate products (consult the label of product used).

| | | |
|---------------------------------|-----------------|----------------------|
| GRAMOXONE SL 2.0 | <u>Rate/A</u> | <u>(paraquat)</u> |
| Annual weeds 1-3 " tall | 2 to 2.5 pt/A | 0.5 to 0.625 lb ai/A |
| Annual weeds 3-6 " tall | 2.5 to 3.0 pt/A | 0.65 to 0.75 lb ai/A |
| Annual weeds >6 " tall | 3.0 to 4.0 pt/A | 0.75 to 1.0 lb ai/A |
| OR | OR | OR |
| FIRESTORM or PARAZONE 3S | <u>Rate/A</u> | <u>(paraquat)</u> |
| Annual weeds 1-3 " tall | 1.3 to 1.7 pt/A | 0.5 to 0.65 lb ai/A |
| Annual weeds 3-6 " tall | 1.7 to 2.0 pt/A | 0.65 to 0.75 lb ai/A |
| Annual weeds >6 " tall | 2.0 to 2.7 pt/A | 0.75 to 1.0 lb ai/A |

Weeds Controlled: Controls small annual grasses and broadleaf weeds including foxtails, common chickweed, and henbit. Regrowth may occur from treated perennial grasses and broadleaf weeds, legume sods, perennial grass sods, or grass cover crops such as wheat treated between tillering and boot stage of growth. Also, emerged annual weeds such as marehail, prickly lettuce, smartweed, and giant ragweed may not be effectively controlled. Split applications 5 to 7 days apart may be more effective on certain hard-to-control weeds.

Additives: Non-Ionic Surfactant at 1 to 2 pt/100 gal or Crop Oil Concentrate at 4 qt/100 gal.

Spray Volume: Apply with at least 10 to 20 GPA of clean water or in a complete clear liquid fertilizer solution. Do not use suspension type fertilizers. A spray volume of more than 20 GPA may be needed if weeds exceed 6" tall.

General Comments: GRAMOXONE, FIRESTORM, and PARAZONE (paraquat) are non-selective contact-type herbicides that are classified as RESTRICTED USE PESTICIDES due to acute toxicity. It is essential to obtain complete coverage to get good control. Apply as a broadcast spray before, during, or after planting, but before crop emergence. Split applications may be more effective on hard-to-control grass species. Rainfall occurring within 15 to 30 minutes after application should not reduce effectiveness. Do not use around home gardens, schools, recreational parks, golf courses or playgrounds.

Tank Mixtures: Atrazine, Balance, Banvel, Bicep II Magnum, Callisto, Camix, Cinch, Cinch ATZ, Clarity, 2,4-D, Define, Degree, Degree Xtra, Distinct, Dual II Magnum, Epic, Frontier, FulTime, Guardsman, Harmony Extra, Harness, Harness Xtra, Hornet, Keystone, Lexar, Lorox, Lumax, Outlook, Princep, Prowl, Python, Sharpen, Simazine, Surpass, TopNotch. Tank mixtures with 2,4-D Ester should be applied 7 to 14 days prior to planting corn.

| | | |
|--------------------------------|-------------------|---|
| EXPRESS (TotalSol) 50DF | 0.25 to 0.5 oz./A | tribenuron-methyl (0.008 to 0.016 lb ai/A) |
| OR | | |
| HARMONY SG 50DF | 0.45 to 0.9 oz/A | thifensulfuron-methyl (0.014 to 0.028 lb ai/A) |
| OR | | |
| HARMONY EXTRA SG 50DF | 0.45 to 0.9 oz/A | [thifensulfuron-methyl:tribenuron-methyl (0.009:0.005) to (0.019:0.009) lb ai/A] |

Weeds Controlled: EXPRESS controls wild garlic and certain broadleaf weeds such as common chickweed, henbit, curly dock, and suppression of mustard species; HARMONY SG provides control of wild garlic, curly dock and wild mustard species; HARMONY EXTRA is a premix of HARMONY (thifensulfuron) and EXPRESS (tribenuron-methyl).

Additives: Apply with a Non-Ionic Surfactant at 0.25 - 0.5% v/v (1-2 qt/100 gal spray solution), or with a petroleum based Crop Oil Concentrate or vegetable-seed oil-based product at 1% v/v (1 gal/100 gal of spray solution). An ammonium nitrogen fertilizer or a high quality, sprayable grade of ammonium sulfate may be added to enhance control.

General Comments: Apply pre-plant for "burndown" control of emerged wild garlic and cool-season broadleaf weeds. Apply to actively growing wild garlic and other broadleaf weeds when temperatures are generally above 60 F or more. For EXPRESS and HARMONY EXTRA allow at least 14 days between application and planting of corn. HARMONY may be applied to corn anytime pre-plant, at-planting (0 days before planting), and/or post-emergence. Do not make more than one pre-plant application per growing season.

Tank Mixtures: Tank mixtures in corn may include other pre-plant burndown products such as paraquat, glyphosate (eg. Roundup), dicamba (eg. Banvel/Clarity), and/or 2,4-D (consult individual labels).

28 Corn

LIBERTY 280 SL 29 to 36 fl oz/A (glufosinate-ammonium 0.53 to 0.66 lb ai/A)

Weeds Controlled: Chickweed, marestail (horseweed), giant foxtail, crabgrass, johnsongrass (seedling), lambsquarters, common ragweed, giant ragweed, smartweed, vetch.

Additives: Anti-foams or drift control agents may be added if needed.

Timing: Apply preplant or prior to crop emergence of any conventional or transgenic corn hybrid.

Spray Volume: A minimum of 15 GPA. For dense weed canopies use 20 to 40 GPA. Do not use nozzles or pressures that result in coarse sprays.

General Comments: Weed control may be reduced when applied to weeds stressed from drought or cool temperatures. ***If LIBERTY is applied in a burndown application, no additional application may be made postemergence to the crop during the growing season.***

Harvest & Forage Restrictions: Do not apply within 60 days of harvesting corn as a forage or within 70 days of harvesting corn as grain or fodder.

Tank Mixtures: LIBERTY may be tank mixed with 2,4-D, acetochlor, atrazine, Callisto, Camix, Guardsman Max, Lexar, Lumax, metolachlor, pendimethalin. Consult label for application rates or other precautions.

Generic Products: Other glufosinate-ammonium products for burndown use include CHEETAH and FORFEIT.

Preplant Foliar “Burndown” plus Residual Herbicides

ATRAZINE

ATRAZINE 4L 3 to 4 pt/A or
AATREX NINE-O 1.6 to 2.2 lb/A

(atrazine 1.5 to 2 lb ai/A)

Weeds Controlled: Black nightshade, burcucumber, cocklebur, jimsonweed, lambsquarters, morningglories, pigweeds, prickly sida, common ragweed, giant ragweed, smartweed, velvetleaf. Can be used to “burndown” emerged small annual weeds (generally less than 3” tall).

Crop Stage: Apply to the soil either preplant incorporated or preemergence at or before planting. ATRAZINE can also be applied up to 30 days before planting, either as a single or split application. For treatments after planting apply before corn reaches 12 inches in height.

General Comments: AATREX 4L or ATRAZINE 4L contains 4 lb ai atrazine per gal. AATREX NINE-0 contains 0.9 lb ai of atrazine per lb product. Foliar “burndown” weed control is improved when applied with crop oil and/or a liquid fertilizer solution. Low soil moisture or soil pH above 7.0 may increase persistence; whereas, ATRAZINE dissipates more rapidly when soil pH is acidic.

Environmental Statements: ATRAZINE containing products are RESTRICTED-USE pesticides and contain a GROUND and SURFACE WATER ADVISORY statement on the label. Do not use on very permeable soils or where groundwater is close to the soil surface. [NOTE: See page 23 for PRECAUTIONS on use of ATRAZINE (AATREX) near ground or surface water]

Rain Delay: None

Rotation Restrictions: Do not plant small grains or small-seeded legumes and grasses in the fall of the same year or the year following application, or injury may occur. Plant only corn, sorghum or soybeans in the spring following use of ATRAZINE. If applied after June 10, plant only corn or sorghum the following season.

Harvest & Forage Restrictions: Wait 60 days before grazing or feeding forage from treated areas.

Tank Mixtures: Dual, glyphosate, Gramoxone, Partner, Princep, Prowl, simazine, Roundup. Also consult the product label of the tank mix partner(s) to be used. If annual grasses and broadleaf weeds exceed 3 inches in height at time of application, use of 2,4-D, dicamba, glyphosate (eg. Roundup, Touchdown, etc.), or paraquat (eg. Gramoxone) is recommended.

BALANCE FLEXX

BALANCE FLEXX 5 fl.oz/A

(isoxaflutole 0.078 lb ai/A)

NOTE: Apply BALANCE FLEXX up to 6 fl.oz/A for applications 8 to 30 days prior to planting [Use lower rates for course soils.]

Weeds Controlled: Foxtails, jimsonweed, lambsquarters, black nightshade, fall panicum, pigweed, common ragweed, smartweed, velvetleaf. Can also “burndown” emerged small annual weeds (generally less than 3” tall).

Crop Stage: BALANCE FLEXX may be preplant incorporated or preplant surface-applied up to 21 days prior to corn planting (30 days when applied as a planned sequential program). When applied preemergence apply after planting or behind planter after furrow closure, but before weeds and crop emerge. Corn should be planted a minimum of 1.5 inches deep with complete and firm coverage of the seed furrow to avoid direct contact with the seed. BALANCE FLEXX alone or tank mixed with atrazine can also be applied to corn from spiking through the 2 leaf-collar growth stage (V2).

BALANCE FLEXX (continued)

Additives: When BALANCE FLEXX is applied alone Crop Oil Concentrate or Methylated Seed Oil is recommended to enhance "burndown" activity of emerged weeds when applied prior to corn emergence. For weeds not controlled by BALANCE FLEXX or when weeds are greater than 3 inches the addition of another "burndown" herbicide such as Gramoxone, glyphosate, or 2,4-D is recommended.

General Comments: BALANCE FLEXX contains 2 lb ai isoxaflutole per gal plus cyprosulfamide (corn safener). For use on field corn; do not use on other types of corn such as popcorn and sweet corn.

Environmental Statements: BALANCE FLEXX is a RESTRICTED-USE pesticide and has GROUND and SURFACE water advisory statements on the label. Do not apply BALANCE on certain loamy sand and sandy soil types found in Kentucky if the water table is less than 25 feet below ground and less than 2% organic matter by weight. BALANCE FLEXX should not be mixed or loaded within 50 feet of any wells, sink holes, perennial or intermittent streams and rivers, and natural or impounded lakes and reservoirs, unless an impervious pad is used.

Rain Delay: None.

Rotation Restrictions: Crops that may be planted include wheat after 4 months; soybeans, barley, popcorn, sweet corn, and grain sorghum after 6 months; and alfalfa after 10 months; Other crops may require an 18 month waiting period with a minimum of 15 inches of cumulative precipitation from time of application to planting of rotational crop.

Harvest & Forage Restrictions: Corn forage harvest is permitted at 45 days or more after an early postemergence treatment.

Tank Mixtures: Atrazine, Bicep II Magnum, 2,4-D, Degree, Degree Xtra, Dual II Magnum, Frontier, FulTime, Glyphosate, Gramoxone, Guardsman, Harness, Harness Xtra, Ignite 280 SL, Keystone, Outlook, Princep, Prowl, simazine, TopNotch.

CORVUS

CORVUS 4.5 to 5.6 fl.oz/A [thiencarbozone-methyl:isoxaflutole (0.026:0.07) to (0.033:0.08) lb ai/A]

Weeds Controlled: Barnyardgrass, crabgrass, foxtails, lambsquarters, black nightshade, fall panicum, pigweed, common ragweed, smartweed, velvetleaf. Can also "burndown" emerged small annual weeds (generally less than 6" tall).

Crop Stage: CORVUS may be preplant incorporated or preplant surface-applied up to 21 days prior to corn planting (30 days when applied as a planned sequential program). When applied preemergence apply after planting or behind planter after furrow closure, but before weeds emerge. Corn should be planted a minimum of 1.5 inches deep with complete and firm coverage of the seed furrow to avoid direct contact with the seed. CORVUS alone or tank mixed with atrazine can also be applied to corn from spiking through the 2 leaf-collar (V2) growth stage.

Additives: When applied alone Crop Oil Concentrate or Methylated Seed Oil is recommended to enhance "burndown" activity of labeled weeds when applied prior to corn emergence. For weeds not controlled by CORVUS or when weeds are greater than 6 inches the addition of another "burndown" herbicide such as paraquat, glyphosate, or 2,4-D is recommended.

General Comments: CORVUS is a premixture containing thiencarbozone-methyl + isoxaflutole [0.75 + 1.88 lb ai per gal] plus cyprosulfamide (corn safener). For use on field corn and corn grown for silage; do not use on other types of corn such as popcorn and sweet corn. Do not use CORVUS in the same season as Counter, Dyfonate, Lorsban, Thimet, or any other organophosphate or carbamate insecticide. Poncho, Aztec, Regent, and Force insecticides may be used prior to application.

Environmental Statements: CORVUS is a RESTRICTED-USE pesticide and has GROUND and SURFACE water advisory statements on the label. Do not apply BALANCE on certain loamy sand and sandy soil types found in Kentucky if the water table is less than 25 feet below ground and less than 2% organic matter by weight. CORVUS should not be mixed or loaded within 50 feet of any wells, sink holes, perennial or intermittent streams and rivers, and natural or impounded lakes and reservoirs, unless an impervious pad is used.

Rain Delay: None.

Rotation Restrictions: Crops that may be planted include wheat after 4 months; soybeans, barley, popcorn, and sweet corn after 9 months; and alfalfa, canola, oats, and sorghum after 17 months. Rotational interval may be longer for some crops when soil pH is 7.5 or above. Other crops may require a 17 to 24 month waiting period with a minimum of 30 inches of cumulative precipitation from time of application to planting of rotational crop.

Harvest & Forage Restrictions: Do not harvest field corn for forage within 45 days of application.

Tank Mixtures: Atrazine, Buctril, 2,4-D, Define, Glyphosate, Ignite 280SL, Laudis, paraquat, Princep, simazine.

30 Corn

EXPERT

| EXPERT | Rate/A | (S-metolachlor:atrazine:glyphosate) |
|--------------------------|-----------|-------------------------------------|
| Annual weeds <6 " tall | 3 qt/A | [1.3:1.6:0.75 lb ai/A] |
| Annual weeds 6-12 " tall | 3.75 qt/A | [1.6:2.0:0.94 lb ai/A] |

Weeds Controlled: Provides "burndown" of existing vegetation and soil residual "preemergence" control of various annual grasses and broadleaf weeds such as barnyardgrass, cocklebur, crabgrass, fall panicum, foxtails, jimsonweed, lambsquarters, morningglory, black nightshade, pigweed, prickly sida, common ragweed, smartweed. Regrowth may occur from treated perennial grasses and broadleaf weeds, legume sods, perennial grass sods, or grass cover crops such as wheat treated between tillering and boot stage of growth.

Crop Stage: Apply up to 30 days before, during or after planting for all types of corn grown under no-tillage or reduced tillage practices, **but prior to emergence of corn that is not designated as Roundup Ready.**

Additives: Dry Ammonium Sulfate at 2% by weight (17 lb/100 gal) may increase performance if emerged annual weeds are growing under adverse conditions.

Spray Volume: Apply with at least 10 to 20 gallons of clean water.

General Comments: EXPERT is a premixture containing S-metolachlor + atrazine + glyphosate [1.74 + 2.14 + 1 lb ai per gal]. Apply before or after weed emergence for control of annual grass and broadleaf weeds in corn.

Environmental Statements: EXPERT is a RESTRICTED-USE pesticide with a GROUNDWATER ADVISORY statement on the label. Do not apply to sand or loamy sand soils where the water table is close to the surface and where these soils are very permeable. [NOTE: See page 23 for PRECAUTIONS on use of atrazine containing products near ground or surface water].

Rain Delay: Rainfall within 2 hours of application may reduce control of emerged weeds.

Rotation Restrictions: Corn, sorghum (milo), or soybeans may be planted the spring following application. Do not plant tobacco, vegetables, or small-seeded legumes the year following application, or injury may occur.

Harvest & Forage Restrictions: Do not graze or feed forage for 60 days following application.

Tank Mixtures: When applied before corn emergence EXPERT may be applied in a tank mixture with the following products: Atrazine, Dual II Magnum, Hornet, Princep, Prowl, Python, Roundup (glyphosate), Touchdown. Banvel or 2,4-D (when applied 7 days before planting) may be added as a tank mix partner to obtain acceptable "burndown" control of emerged vegetation prior to corn planting.

INSTIGATE

INSTIGATE 5.25 to 6 oz/A [rimsulfuron:mesotrione (0.014:0.14) to (0.016:0.16) lb ai/A]

Weeds Controlled: For "burndown" control of small annual weeds (generally less than 3" tall) and residual control for barnyardgrass, foxtail, lambsquarters, black nightshade, pigweeds, common ragweed.

Crop Stage: May be applied either preplant surface (up to 14 days prior to planting), preplant incorporated, preemergence, or at a maximum rate of 5.4 oz/A as an early post emergence treatment (up through 2 leaf collars) to field corn.

Additives: Control of emerged weeds will require the addition of Crop Oil Concentrate, Modified Seed Oil, or Non-Ionic Surfactant. In addition, nitrogen based adjuvant (UAN or AMS) must be used unless prohibited by tankmix partner.

General Comments: INSTIGATE is a selective herbicide for burndown and residual control of certain annual grass and broadleaf weeds in field corn. INSTIGATE 45.8% WDG is a premixture containing rimsulfuron + mesotrione [4.17% + 41.67% per lb product]. INSTIGATE may be applied at 5.25 to 5.4 oz/A for early postemergence rescue treatment on corn exhibiting up to 2 leaf collars. Do not apply more than 1 oz active ingredient rimsulfuron per acre or 3.85 oz active ingredient mesotrione in a growing season from all product sources that contain rimsulfuron (eg. Prequel, Realm Q, Steadfast Q, or Resolve) or mesotrione (eg. Callisto, etc.). DO NOT apply to corn when certain soil insecticides such as "Counter" will be applied within 60 days of application. Consult label directions before applying with other insecticides such as Lorsdan or Thimet. Crop injury may occur under certain environmental conditions such as cold weather and/or wet soils.

Rainfall Delay: Not indicated on the label.

Rotation Restrictions: Rotational crops which may be planted include field corn anytime; winter cereals (wheat, etc.) after 9 months; alfalfa, canola, popcorn, sweet corn, sorghum, and soybean after 10 months following INSTIGATE application. Other crops may require an 18 month waiting period.

Harvest & Forage Restrictions: Do not graze, feed forage, grain or fodder (stover) from treated areas to livestock within 45 days of application.

Tank Mixtures: For improved control of emerged weeds may be tank mixed with glyphosate, glufosinate, 2,4-D, and dicamba products. May also be tank mixed with other soil-residual herbicides for added grass and broadleaf control such as Atrazine, Breakfree brands and Cinch brand herbicides.

LEADOFF or CRUSHER

LEADOFF 1.5 oz/A or (rimsulfuron:thifensulfuron-methyl 0.016:0.016 lb ai/A)
 CRUSHER 1.0 oz/A

Weeds Controlled: For “burndown” control of common chickweed, curly dock, henbit, and certain mustard species; and residual control for barnyardgrass, foxtail, lambsquarters, pigweeds.

Crop Stage: Apply preplant after fall harvest through early spring, up to planting; or preemergence anytime after planting but before corn emergence. Do not apply postemergence to corn. Consult label and your seed supplier before applying to corn hybrids potentially sensitive to ALS-type herbicides.

Additives: Control of emerged weeds will require the addition of Crop Oil Concentrate, Modified Seed Oil, or Non-Ionic Surfactant. In addition an ammonium nitrogen fertilizer (28% or 32% N) or ammonium sulfate may be needed. If applied with glyphosate (eg. Roundup) or glufosinate (eg. Ignite) that contains a built-in adjuvant no additional surfactant needs to be added to the spray tank.

General Comments: LEADOFF 33.4% WDG and CRUSHER 50% WDG are premixtures containing rimsulfuron + thifensulfuron-methyl. Similar products include BASIS and BASIS Blend. These products are selective herbicides for burndown and residual control of certain annual grass and broadleaf weeds. Do not apply more than 1 oz active ingredient rimsulfuron per acre per crop year from all product sources that contain rimsulfuron (eg. Leadoff, Crusher, Prequel, Realm Q, Steadfast Q, Resolve Q, or Solida). DO NOT apply to corn when certain soil insecticides such as “Counter” will be applied within 60 days of application. Consult label directions before applying LEADOFF or CRUSHER with other insecticides such as Lorsdan or Thimet. Crop injury may occur under certain environmental conditions such as cold weather and/or wet soils.

Rainfall Delay: Not indicated on the label.

Rotation Restrictions: Rotational crops which may be planted include field corn anytime; soybeans after 1 month [when LEADOFF is applied at >1.5 to 2 oz/A wait 2 months]; winter cereals (wheat) after 3 months; or alfalfa, canola, popcorn, sweet corn, red clover, sorghum, and tobacco after 10 months following application. Tobacco can be planted 1.5 months after LEADOFF application. Other crops may require an 18 month waiting period. Consult label for additional crop rotation intervals for certain crops or when higher rates have been applied.

Harvest & Forage Restrictions: Do not graze, feed forage, grain or fodder from treated areas to livestock within 30 days of application.

Tank Mixtures: For improved control of emerged weeds may be tank mixed with glyphosate, paraquat, glufosinate, 2,4-D LVE, and dicamba products. LEADOFF may also be tank mixed with other soil-residual herbicides for added residual control such as Atrazine, Breakfree brands and Cinch brand herbicides.

SHARPEN

SHARPEN 2.5 to 3 fl oz/A (saflufenacil 0.056 to 0.067 lb ai/A)

Weeds Controlled: For “burndown” and residual control of selected broadleaf weeds such as cocklebur, marehail (horseweed), morningglory, giant ragweed, and velvetleaf.

Crop Stage: May be preplant surface applied up to 14 days before planting field corn (30 days when applied as a planned sequential program with a postemergence herbicide). DO NOT apply after corn emergence or severe crop injury will occur.

Additives: For optimum “burndown” activity of labeled weeds Methylated Seed Oil (MSO) plus Ammonium Sulfate (AMS) or Urea Ammonium Nitrate (UAN) is recommended. For control of emerged grasses and/or broadleaf weeds not controlled by SHARPEN a tank mix with another herbicide (such as glyphosate) is recommended. The use of AMS is recommended when mixing SHARPEN with glyphosate-based herbicides.

General Comments: SHARPEN contains 2.85 lb ai saflufenacil per gal. Spray volumes of 15 to 20 GPA are recommended to increase spray coverage and optimize burndown activity. If limited or no residual broadleaf weed control is desired, SHARPEN can be applied at 1.0 fl.oz/A with an adjuvant system any time prior to corn emergence. Do not apply SHARPEN when an at-planting application of an organophosphate or carbamate insecticide is planned or has been used (consult label for use of other insecticides).

Environmental Statements: SHARPEN has Ground and Surface water advisory statements on the label.

Rain Delay: SHARPEN is rainfast 1 hour after application.

Rotation Restrictions: Corn (field), sorghum, and small grains may be replanted immediately. For sweet corn wait a minimum of 2 months; soybean 2 to 3 months (consult label) after application; Other crops require a minimal of at least 6 months. Crop rotation interval may be reduced for lower use rates.

Harvest & Forage Restrictions: Do not graze or feed forage for 80 days following application.

Tank Mixtures: SHARPEN can be tank mixed or applied sequentially with Atrazine, Clarity, Glyphosate (eg. Roundup), Guardsman MAX, Harness, Harness Xtra, Outlook, Prowl H2O, Status, Verdict.

32 Corn

SEQUENCE

| SEQUENCE | Rate/A | (S-metolachlor:glyphosate) |
|----------|----------|----------------------------|
| | 3.5 pt/A | [1.3:1.0lb ai/A] |
| | 4 pt/A | [1.5:1.13 lb ai/A] |

Weeds Controlled: Provides “burndown” of existing vegetation and soil residual “preemergence” control of the following annual grasses and broadleaf weeds such as barnyardgrass, crabgrass, fall panicum, foxtails, black nightshade.

Crop Stage: SEQUENCE may be applied before, during, or after planting. **Do not apply to emerged conventional corn (i.e. hybrids not designated as Glyphosate Tolerant) or severe crop injury will occur.** SEQUENCE may be applied to Glyphosate Tolerant corn hybrids after crop emergence until corn plants reach 30 inches in height.

General Comments: SEQUENCE 4.25L contains S-metolachlor + glyphosate [3.0 + 2.25 lb ai/gal].

Environmental Statements: SEQUENCE has GROUNDWATER ADVISORY statements on the label. Do not use on very permeable soil or where ground water is close to the soil surface.

Rain Delay: Rainfall soon application may reduce control of emerged weeds.

Rotation Restrictions: Corn, sorghum (with Concep treated seed), and soybean may be planted immediately; alfalfa after 4 months; wheat, barley, rye, and oats after 4.5 months; clover after 9 months; and tobacco in the spring following application.

Harvest & Forage Restrictions: Do not graze or feed forage from treated areas for 30 days following application.

Tank Mixtures: When applied before corn emergence SEQUENCE may be applied in a tank mixture with the following products: Atrazine, Aim, Axom, Balance Pro, Bicep II Magnum, Callisto, Camix, Clarity, 2,4-D, Degree, Degree Xtra, Dicamba, Distinct, Dual II Magnum, Guardsman, Harness, Harness Xtra, Hornet, Lexar, Lumax, Marksman, Princep, Prowl, Touchdown.

VERDICT

| | | |
|---------|------------------|--|
| VERDICT | 13 to 15 fl oz/A | [saflufenacil:dimethenamid-P (0.058:0.51) to (0.067:0.59) lb ai/A] |
|---------|------------------|--|

Weeds Controlled: Barnyardgrass, crabgrass, fall panicum, foxtails, black nightshade, cocklebur, lambsquarters, morningglory, pigweed, prickly sida, common ragweed, giant ragweed, smartweed, velvetleaf.

Crop Stage: Apply as an early preplant surface (15 to 30 days EPP), preplant surface or preplant incorporated treatment (<14 days), preemergence, or as a burndown with residual control of certain broadleaf weeds. Do not apply after corn emergence or severe crop injury will occur.

Additives: For optimum “burndown” activity of labeled weeds Methylated Seed Oil (MSO) plus Ammonium Sulfate (AMS) or Urea Ammonium Nitrate (UAN) is recommended. For control of emerged grasses and/or broadleaf weeds not controlled by VERDICT a tank mix with another herbicide (such as glyphosate) is recommended. The use of AMS is recommended when mixing VERDICT with glyphosate-based herbicides.

General Comments: VERDICT contains saflufenacil + diethenamid-P [0.57 + 5.0 lb ai per gal]. When used as part of a burndown plus residual weed control program an adjuvant system is required for optimum burndown activity. Do not apply more than 25 fl oz/A of VERDICT per crop season or exceed a maximum amount of 0.134 lb ai/A saflufenacil. Do not apply where an at-planting application of an organophosphate or carbamate insecticide is planned (consult label for use with other soil insecticides).

Environmental Statements: VERDICT has GROUND and SURFACE WATER ADVISORY statements on the label.

Rain Delay: Rainfast 1 hour after application for burndown activity. For residual control applications must be activated by at least 1/2 inch rainfall.

Rotation Restrictions: Field corn, popcorn, and grain sorghum may be replanted immediately after crop failure. Fall-seeded small grains may be planted 4 months or more following treatment; soybean may be planted 2 months after application on medium and fine textured soil or course soil with >2% OM. Other rotational crop may be planted the following spring.

Harvest & Forage Restrictions: Corn may be harvested, fed, or grazed 80 or more days after application.

Tank Mixtures: VERDICT may be tank mixed or applied sequentially with Atrazine, Clarity, Glyphosate (eg. Roundup), Guardsman Max, Sharpen, Status.

Relative Response of Cover Crops and Weeds to Burndown Herbicides

| HERBICIDE | COVER CROPS | | | | | | | | | WEEDS | | | | | | | | | | | | | | | | |
|--|-------------|-------------|---------------|--------------|--------------|-----|------------------|--------------|-------|------------|-----------------|-------------------|-----------|-------------|------------------|----------|-------------------|-------------------------|------------------------|------------------|------------------------|--------------|----------|----------------|---------------|-------------|
| | Alfalfa | Clover, Red | Clover, White | Fescue, Tall | Orchardgrass | Rye | Ryegrass, Annual | Vetch, Hairy | Wheat | Brome spp. | Corn, Volunteer | Chickweed, Common | Dandelion | Dock, Curly | Fleabane, Annual | Foxtails | Henbit/Deadnettle | Johnsongrass (seedling) | Johnsongrass (rhizome) | Lettuce, Prickly | Marestail (Horseweed)# | Mustard spp. | Pokeweed | Ragweed, Giant | Thistle, Musk | Wild Garlic |
| Atrazine + Oil | 3 | 5 | 4 | 6 | 3 | 6 | 5 | 6 | 6 | 7 | 0 | 9 | 4 | 4 | - | 6 | 8 | 0 | 0 | 8 | 7 | 8 | 2 | 8 | 4 | - |
| Dicamba ¹ (Clarity, DiFlexx, etc) | 8 | 9 | 8 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 7 | 8 | 7 | 8 | 0 | 6 | 0 | 0 | 9 | 8 | 7 | 6 | 9 | 7 | 6 |
| 2,4-D Ester | 6 | 8 | 5 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 5 | 8 | 4 | 6 | 0 | 4 | 0 | 0 | 8 | 8 | 8 | 5 | 8 | 7 | 6 |
| Expert / Sequence | 4 | 4 | 3 | 5 | 3 | 6 | 6 | 4 | 7 | 9 | 9* | 9 | 5 | 2 | 6 | 9 | 8 | 9 | 7 | 7 | 8* | 7 | 5 | 9 | 5 | - |
| Express | - | - | - | - | - | 0 | 0 | 7 | 0 | 0 | 0 | 9 | - | 8 | - | - | 8 | 0 | 0 | - | - | 7 | - | - | - | 8 |
| Harmony Extra | - | - | - | - | - | 0 | 0 | 7 | 0 | 0 | 0 | 9 | - | 8 | - | - | 8 | 0 | 0 | - | 5 | 8 | - | - | - | 9 |
| Harmony SG | - | - | - | - | - | 0 | 0 | 7 | 0 | 0 | 0 | 6 | - | 8 | - | - | 6 | 0 | 0 | - | - | 8 | - | - | - | 8 |
| Glyphosate ² | 6 | 6 | 5 | 7 | 5 | 8 | 7 | 6 | 9 | 9 | 9* | 9 | 6 | 4 | 8 | 9 | 8 | 9 | 8 | 8 | 8* | 8 | 6 | 9 | 6 | - |
| Leadoff / Crusher | - | - | - | - | - | 0 | 0 | 7 | 0 | 0 | 0 | 9 | 8 | 8 | - | 0 | 8 | 0 | 0 | 6 | 7 | 8 | - | - | - | - |
| Liberty ³ | - | - | - | - | - | - | 3 | 8 | 5 | - | 7* | 9 | 6 | 7 | - | 8 | 7 | 8 | 3 | 8 | 8 | 8 | - | 8 | - | - |
| Paraquat (Gramoxone) | 3 | 7 | 5 | 5 | 3 | 7 | 6 | 7 | 7 | 7 | 6 | 9 | 4 | 2 | 6 | 9 | 8 | 7 | 3 | 5 | 4 | 6 | 4 | 7 | 3 | 8 |
| Paraquat (Gramoxone) + Atrazine | 4 | 7 | 5 | 8 | 6 | 8 | 7 | 8 | 9 | 8 | 7 | 9 | 7 | 5 | 6 | 9 | 9 | 7 | 3 | 9 | 8 | 9 | 4 | 9 | 5 | 8 |
| Sharpen | 4 | 6 | 5 | 0 | 0 | 2 | - | 6 | 2 | 2 | 0 | 7 | 5 | 5 | 7 | 2 | 6 | 0 | 0 | 8 | 8 | 8 | - | 8 | 5 | - |
| Verdict | 4 | 6 | 5 | 0 | 0 | 2 | - | 6 | 2 | 2 | 0 | 7 | 5 | 5 | 7 | 2 | 6 | 0 | 0 | 8 | 8 | 8 | - | 8 | 5 | - |

GOOD= 8-9 FAIR = 6-7 POOR = 5 or less - Insufficient Data

***This table should be used only as a guide.** Information presented in this table is the relative burndown response of emerged plants to herbicides applied at normal rates for no-till corn. This information generally does not reflect soil residual effects of the herbicides. The relative response values are based on a numerical scale from 0 to 9 and compare effectiveness of herbicides to control a particular cover crop or weed species. A herbicide may perform better or worse than indicated in the table due to weed size, environmental conditions or when tank mixed with other herbicides. If a farmer is achieving satisfactory results under their conditions, they should not necessarily change products as a result of information in this table.*

¹ Examples of DICAMBA products labeled for use as a burndown treatment in corn include Clarity, Banvel, Sterling Blue, and Vision.

² Examples of GLYPHOSATE products labeled for use as a burndown treatment in corn include: **Abundit Extra, Buccaneer, Credit, Duramax, DurangoDMA, Glyphosate, GlyStar Plus, Honcho, Roundup Original, Roundup PowerMAX, Roundup WeatherMAX, Touchdown Total.** Consult the label for specific use directions including use of additives, if needed. [See page 22 for list of other GLYPHOSATE products]

³ Environmental stress conditions such as cool temperatures and cloudy weather may limit burndown activity for weed control with LIBERTY

Glyphosate will not effectively control biotypes of horseweed (marestail) that are tolerant to this herbicide.

* Volunteer corn plants containing genetic traits with herbicide tolerance (eg. RR-corn hybrids or LL-corn hybrids) will not be effectively controlled.

Guide to Weed and Crop Response to Soil Applied Herbicides¹

| | Barnyardgrass | Broadleaf Signalgrass | Crabgrass | Fall Panicum | Foxtail | Johnsongrass (seedling) | Johnsongrass (rhizome) | Shattercane (Wild Cane) | Yellow Nutsedge | Black Nightshade | Burcucumber | Cocklebur | Lambsquarters | Marestail (Horseweed) | Morningglory | Palmer Amaranth | Pigweed, Smooth | Prickly Sida (Teaweed) | Ragweed, Common | Ragweed, Giant (Horseweed) | Sicklepod | Smartweed | Velvetleaf | Waterhemp | Crop Response ² |
|--|---------------|-----------------------|-----------|--------------|---------|-------------------------|------------------------|-------------------------|-----------------|------------------|-------------|-----------|---------------|-----------------------|--------------|-----------------|-----------------|------------------------|-----------------|----------------------------|-----------|-----------|------------|-----------|----------------------------|
| Acetochlor ³ | 8 | 7 | 8 | 8 | 9 | 5 | 0 | 5 | 7 | 8 | 0 | 0 | 7 | 0 | 0 | 8 | 8 | 0 | 6 | 0 | 4 | 5 | 0 | 8 | 1 |
| Acuron (PRE only) | 8 | 7 | 8 | 7 | 9 | 5 | 0 | 5 | 7 | 9 | 6 | 7 | 9 | 8 | 7 | 9 | 9 | 7 | 8 | 7 | - | 9 | 9 | 9 | 2 |
| Anthem ATZ | 8 | 7 | 8 | 8 | 8 | 5 | 0 | 4 | - | 9 | 6 | 7 | 9 | 6 | 7 | 9 | 9 | 9 | 8 | 7 | 7 | 9 | 7 | 9 | 1 |
| Atrazine | 6 | 4 | 5 | 3 | 6 | 0 | 0 | 0 | 5 | 9 | 7 | 9 | 9 | 7 | 8 | 9 | 9 | 9 | 9 | 8 | 7 | 9 | 8 | 9 | 0 |
| Balance Flexx | 7 | 7 | 6 | 8 | 8 | 6 | 0 | 6 | 2 | 9 | 7 | 3 | 9 | 8 | 4 | 7 | 9 | 7 | 8 | 6 | 4 | 8 | 9 | 8 | 2 |
| Bicep II Magnum / Cinch ATZ | 8 | 7 | 8 | 8 | 9 | 5 | 0 | 5 | 7 | 9 | 6 | 8 | 9 | 7 | 7 | 9 | 9 | 9 | 9 | 7 | 6 | 9 | 7 | 9 | 1 |
| Corvus | 8 | 7 | 8 | 8 | 8 | 6 | 0 | 6 | 4 | 9 | 7 | 6 | 9 | 8 | 6 | 7 | 9 | - | 8 | 6 | - | 8 | 9 | 8 | 2 |
| Degree Xtra/HarnessXtra/FulTime/ Breakfree ATZ / Keystone | 8 | 7 | 8 | 8 | 9 | 5 | 0 | 5 | 7 | 9 | 5 | 8 | 9 | 7 | 7 | 9 | 9 | 9 | 9 | 7 | 6 | 9 | 7 | 9 | 1 |
| Dual II Magnum / Cinch | 8 | 7 | 8 | 8 | 9 | 5 | 0 | 5 | 7 | 8 | 0 | 0 | 5 | 0 | 0 | 7 | 7 | 0 | 5 | 0 | 4 | 5 | 0 | 8 | 1 |
| Expert | 8 | 7 | 8 | 8 | 9 | 5 | 0 | 5 | 7 | 9 | 6 | 8 | 9 | 8 [#] | 7 | - | 9 | 9 | 9 | 7 | 6 | 9 | 7 | 9 | 1 |
| Fierce ⁴ (PRE only) | 8 | 7 | 8 | 8 | 8 | 7 | 2 | - | - | 8 | - | 6 | 8 | 7 | 7 | 8 | 9 | 8 | 8 | 6 | - | 7 | 7 | 9 | 2 |
| Guardman MAX | 8 | 7 | 8 | 8 | 9 | 5 | 0 | 5 | 7 | 9 | 6 | 8 | 9 | 7 | 7 | 9 | 9 | 9 | 9 | 7 | 6 | 9 | 7 | 9 | 1 |
| Instigate | 8 | 6 | 6 | 7 | 9 | 7 | 0 | - | 4 | 8 | 6 | 7 | 8 | - | 6 | 8 | 9 | - | 8 | 6 | - | 7 | 7 | 6 | 2 |
| LeadOff ⁴ / Crusher ⁴ | 8 | - | 6 | 6 | 8 | - | - | 2 | - | - | - | 6 | 7 | - | 6 | - | 8 | - | 7 | 3 | - | 6 | 6 | - | 2 |
| Lexar EZ or Lumax EZ (PRE only) | 8 | 7 | 8 | 8 | 9 | 5 | 0 | 5 | 7 | 9 | 6 | 7 | 9 | 8 | 7 | 9 | 9 | 7 | 8 | 7 | 5 | 9 | 9 | 9 | 2 |
| Outlook | 8 | 7 | 8 | 8 | 9 | 5 | 0 | 5 | 7 | 8 | 0 | 0 | 6 | 0 | 0 | 8 | 8 | 0 | 5 | 0 | 4 | 5 | 0 | 8 | 1 |
| Princep | 8 | 5 | 7 | 6 | 8 | 2 | 0 | 3 | 2 | 9 | 6 | 7 | 9 | - | 7 | 9 | 9 | 9 | 9 | 7 | 7 | 9 | 8 | 9 | 0 |
| Prowl (PRE only) | 8 | 7 | 8 | 8 | 9 | 6 | 2 | 6 | 0 | 0 | 0 | 0 | 8 | 0 | 2 | 7 | 8 | 2 | 0 | 0 | 0 | 6 | 6 | 7 | 2 |
| Sharpen | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | - | 8 | - | 7 | 8 | 8 | 8 | 8 | 8 | 7 | 8 | 8 | 5 | 8 | 8 | 8 | 1 |
| SureStart ⁴ / TripleFLEX ⁴ | 8 | 7 | 8 | 7 | 9 | 5 | 0 | 5 | 6 | 8 | 3 | 8 | 9 | - | 7 | 8 | 9 | 8 | 8 | 6 | 6 | 8 | 7 | 8 | 1 |
| Verdict ⁴ | 8 | 7 | 8 | 8 | 9 | 5 | 0 | 5 | 7 | 8 | - | 7 | 8 | 8 | 8 | 9 | 9 | 7 | 9 | 8 | 5 | 9 | 8 | 9 | 1 |
| Zemax (PRE only) | 8 | 7 | 8 | 8 | 9 | 5 | 0 | 5 | 7 | 9 | 6 | 7 | 9 | 7 | 6 | 9 | 9 | 6 | 7 | 6 | 5 | 9 | 9 | 9 | 2 |
| Zidua | 8 | 7 | 8 | 8 | 9 | 5 | 0 | 6 | 5 | 8 | - | 5 | 6 | 5 | 0 | 8 | 8 | 6 | 7 | 3 | - | 6 | 7 | 8 | 1 |

GOOD = 8-9 FAIR = 6-7 POOR = 5 or less - Insufficient Data

¹This table should be used only as a guide. The relative response value is based on a numerical scale from 0 to 9 comparing the effectiveness of herbicides to a particular weed. Under certain weather or environmental conditions, a herbicide may perform better or worse than indicated in the table. Response may be less in no-tillage than in conventional tillage. If a farmer is getting satisfactory results under their conditions, they should not necessarily change products as a result of the information in the table.

²A rating of 3 or less will not result in a crop yield loss under normal conditions. Certain corn hybrids vary in their injury response to a herbicide treatment.

³Acetochlor containing products include Breakfree NXT, Confidence, Degree, Harness, Surpass NXT, and Volley.

⁴Crusher, Fierce, Instigate, LeadOff, SureStart, TripleFLEX, and Verdict are intended for use in a planned preemergence followed by a postemergence program. Ratings indicate early-season effectiveness.

[#] Glyphosate will not effectively control biotypes of horseweed (marestail) that are tolerant to this herbicide.

SOIL APPLIED

Preemergence (Surface Applied) or Preplant Incorporated

The following soil-residual herbicide treatments may be applied before or after planting but before crop and weeds emerge using one of the following methods: 1) preemergence surface applied in no-tillage or conventional tillage or 2) shallowly incorporated (surface blended) before planting in conventional tillage usually within the upper 1 to 2 inches of soil. Preemergence surface applied treatments need rainfall to move the herbicide into the soil for preemergence control of weeds.

ACETOCHLOR (VARIOUS PRODUCTS)

DEGREE 3.8CS 3.25 to 4.25 pt/A OR (acetochlor 1.5 to 2 lb ai/A)
 HARNESS 7E or BREAKFREE NXT 1.75 to 2.25 pt/A
 OR
 TOPNOTCH 3.2CS 2 to 2.5 qt/A OR (acetochlor 1.6 to 2 lb ai/A)
 SURPASS 6.4EC or VOLLEY 6.4EC 2 to 2.5 pt/A

Weeds Controlled: Barnyardgrass, crabgrass, fall panicum, foxtails, black nightshade, pigweed.

Crop Stage: Apply preplant incorporated, preemergence, or early postemergence for control of annual grasses and certain broadleaf weeds. Acetochlor products and certain tank mixtures may be applied up to 30 days before planting. For treatments after planting, apply prior to weed seedling emergence and before corn reaches 11 inches in height.

General Comments: DEGREE 3.8CS is an encapsulated herbicide that contains 3.8 lb ai per gal acetochlor plus MON 13900 (corn safener). HARNESS 7E and BREAKFREE NXT contains 7 lb ai per gal acetochlor plus MON 13900 (corn safener). TOPNOTCH 3.2CS is an encapsulated herbicide that contains 3.2 lb ai per gal acetochlor plus dichlormid (corn safener); SURPASS and VOLLEY contain 6.4 lb ai per gal acetochlor plus dichlormid (corn safener). Application rates may vary depending on soil texture, percent organic matter, tillage system, weed species, and tank mixture components. Incorporation and higher use rates will improve control of some weeds.

Environmental Statements: These herbicides have a GROUNDWATER ADVISORY statement on the label and some products are classified as RESTRICTED USE pesticides. Do not use in areas where soils are very permeable, particularly where the groundwater is shallow. Consult label for specific guidelines.

Rain Delay: None

Rotation Restrictions: Consult individual product labels for specific guidelines on rotational crops.

Harvest & Forage Restrictions: None.

Tank Mixtures: Atrazine, Balance Pro, Banvel, Clarity, 2,4-D, Glyphosate (Roundup, etc.), Gramoxone, Hornet, Princep, Prowl, Python. Consult the product label to apply early postemergence with Accent, Aim, Atrazine, Banvel, Beacon, Buctril, Clarity, Distinct, Liberty, Lightning, Marksman, Permit, Spirit, Steadfast.

ACURON

ACURON 2.5 to 3 qt/A [S-metolachlor:atrazine:mesotrione:bicyclopyrone
 (1.3:0.63:0.15:0.038) to (1.6:0.75:0.18:0.045) lb ai/A]

Weeds Controlled: Barnyardgrass, black nightshade, crabgrass, foxtails, lambsquarters, marestalk, Palmer amaranth, pigweeds, common ragweed, smartweed, velvetleaf, waterhemp.

Crop Stage: Apply preemergence on the soil surface no more than 28 days prior to planting or early postemergence before corn exceeds 12 inches in height. When applied early postemergence apply before small broadleaf weeds exceed 3 inches tall.

General Comments: ACURON contains S-metolachlor + atrazine + mesotrione + bicyclopyrone [2.14 + 1.0 + 0.24 + 0.06 lb ai/gal] plus the safener benoxacor. When tank mixing or applying sequentially with other herbicides do not exceed rate limitations for products containing atrazine, mesotrione and S-metolachlor. Applying ACURON postemergence to corn that has received an at-plant application of "Counter" insecticide can result in severe crop injury. Consult label before use with other organophosphate or carbamate insecticides.

Environmental Statements: ACURON is a RESTRICTED-USE pesticide with a GROUND and SURFACE WATER ADVISORY statements. Do not use on very permeable soils or where groundwater is close to the soil surface or where the potential exists to enter surface water. [NOTE: See page 23 for PRECAUTIONS on use of atrazine containing products (eg. ACURON) near ground or surface water].

Rain Delay: None.

Rotation Restrictions: Crops that may be planted include corn (all types) anytime; before planting wheat, barley, or rye wait 4 months; sorghum and soybeans wait 10 months; and for other rotational crops wait 18 months (consult label). If applied after June 1, rotating to crops other than corn may result in crop injury.

Harvest & Forage Restrictions: Do not graze or feed forage from treated areas for 45 days following application. Corn can be harvested for grain, seed, or silage when treated before 12 inches tall. Do not harvest for forage within 60 days after application.

Tank Mixtures: Atrazine, Glyphosate, Gramoxone, Princep, Roundup, Touchdown, and Warrior insecticide. Tank mixtures with 2,4-D is allowed; however, check compatibility before mixing. Tank mixtures for early postemergence applications include Atrazine, Accent Q, Basis brands, Glyphosate products [apply to glyphosate-tolerant corn hybrids], or Steadfast Q.

36 Corn

ANTHEM ATZ

ANTHEM ATZ 2 to 2.25 pt/A

[pyroxasulfone:fluthiacet-methyl:atrazine
(0.12:0.003:1.0) to (0.15:0.004:1.25) lb ai/A]

Weeds Controlled: Barnyardgrass, crabgrass, fall panicum, foxtails, lambsquarters, Eastern black nightshade, Palmer amaranth, pigweeds, prickly sida, common ragweed, smartweed, waterhemp.

Crop Stage: Apply early preplant (up to 45 days prior to planting), preplant incorporated or preemergence. ANTHEM ATZ can also be applied after planting from crop emergence up to V4 corn stage (visible 4th leaf collar). A temporary crop response may occur under certain environmental conditions (consult seed supplier on the potential sensitivity to certain hybrids).

General Comments: ANTHEM ATZ is a premixture containing pyroxasulfone + fluthiacet-methyl + atrazine [0.485 + 0.014 + 4.006 lb ai/gal]. Application rate depends on a variety of factors such as weeds present, stage of weed growth for early post treatments, environmental conditions, and soil type. Consult label for adjuvants needed with some burndown and postemergence applications.

Environmental Statements: ANTHEM ATZ is a RESTRICTED-USE pesticide with a GROUND and SURFACE WATER ADVISORY statements. [NOTE: See page 23 for PRECAUTIONS on use of atrazine containing products (eg. ANTHEM ATZ near ground or surface waters)].

Rain Delay: None

Rotation Restrictions: Do not rotate to any crop except corn until the following year. Soybean can be planted the following year if applied before June 10. Do not plant tobacco, vegetables, or small seeded legumes and grasses the year following application. For other crops the rotational interval is a minimum of 18 months (consult label for details).

Harvest & Forage Restrictions: Do not harvest field corn for forage within 60 days after application; do not harvest or feed corn or stover (fodder) within 70 days after application.

Tank Mixtures: For enhanced control of emerged weeds tank mix with Aim, 2,4-D, glufosinate, glyphosate, paraquat, or saflufenacil (Sharpen, Verdict). For additional residual control can be tank mix with atrazine, Balance, or Hornet. ANTHEM ATZ can also be tank-mixed with insecticides such as Hero or Mustang and with fungicides.

BICEP II MAGNUM or CINCH ATZ

BICEP II MAGNUM 1.6 to 2.1 qt/A or
CINCH ATZ 1.6 to 2.1 qt/A

[S-metolachlor:atrazine (1.0:1.2) to (1.3:1.6) lb ai/A]

OR

DUAL II MAGNUM or CINCH 1.33 pt/A

OR

(S-metolachlor 1.3 lb ai/A)

+

+

AATREX 4L 1.2 to 2 qt/A or

(atrazine 1.2 to 2 lb ai/A)

AATREX NINE-O 1.3 to 2.2 lb/A

Weeds Controlled: Barnyardgrass, cocklebur, crabgrass, fall panicum, foxtails, jimsonweed, lambsquarters, morningglories, black nightshade, pigweeds, prickly sida, common ragweed, smartweed.

Crop Stage: Apply preplant incorporated, preplant surface, or preemergence. These products may be applied up to 30 days before planting as a single application. When applying 30 to 45 days before planting, apply 2/3 full rate early, followed by 1/3 full rate at planting. BICEP II MAGNUM or CINCH ATZ can be applied after planting, but as a broadcast treatment before corn exceeds 5 inches in height and weeds pass the 2-leaf stage.

General Comments: BICEP II MAGNUM and CINCH ATZ are prepackage mixtures containing S-metolachlor + atrazine [2.4 + 3.1 lb ai/gal] plus benoxacor (corn safener). Other products include BRAWL II ATZ, CHARGER MAX ATZ, MEDAL II AT, PARALLEL PLUS, and TRIZMET II.

Environmental Statements: These products are RESTRICTED-USE pesticides with a GROUNDWATER ADVISORY statement. Do not use on very permeable soils or where groundwater is close to the soil surface. [NOTE: See page 23 for PRECAUTIONS on use of atrazine containing products (eg. BICEP II MAGNUM, BRAWL II ATZ, CINCH ATZ, MEDAL II AT, PARALLEL PLUS, TRIZMET II) near ground or surface water].

Rain Delay: None

Rotation Restrictions: Do not plant small grains or small-seeded legumes in the fall of the same year or the year following application, or injury may occur. Plant only corn, sorghum or soybeans in the spring following application. If applied after June 10, plant only corn or sorghum the following season.

Harvest & Forage Restrictions: Do not graze or feed forage from treated areas for 60 days.

Tank Mixtures: AAtrex, Atrazine, Balance, Banvel, Cinch, 2,4-D, Dual II Magnum, Gramoxone, Princep, Roundup. Postemergence tank mixtures include Exceed, Spirit alone or plus Accent, and Liberty (LL-corn) or Roundup Ultra (RR-corn). Consult label to apply with other herbicides regarding corn growth stages, weed heights, and other precautions.

DEGREE XTRA

| | |
|------------------------------------|--|
| DEGREE XTRA 4.04CS 2.9 to 3.7 qt/A | [acetochlor:atrazine (1.95:0.97) to (2.49:1.23) lb ai/A] |
| OR | OR |
| DEGREE 3.8CS 3.25 to 4.25 pt/A | (acetochlor 1.5 to 2 lb ai/A) |
| + | + |
| ATRAZINE 4L 1.0 to 1.5 qt/A or | (atrazine 1 to 1.5 lb ai/A) |
| AATREX NINE-O 1.1 to 1.6 lb/A | |

Weeds Controlled: Barnyardgrass, crabgrass, fall panicum, foxtails, jimsonweed, lambsquarters, black nightshade, pigweed, prickly sida, common ragweed, smartweed.

Crop Stage: Apply preplant incorporated, preemergence, or early postemergence before weed seedlings reach the 2-leaf stage and corn is no more than 11 inches in height. DEGREE XTRA may be applied up to 30 days before planting.

General Comments: DEGREE XTRA 4.04CS is a pre-package mixture containing encapsulated acetochlor + atrazine [2.7 + 1.34 lb ai/gal] plus MON 13900 (corn safener). Rate may vary depending on soil texture, percent organic matter, tillage system, weed species, and tank mixture components. Incorporation and higher use rates will improve control of some weeds. Consult label for reduced rates when DEGREE XTRA is used as part of a planned program with postemergence herbicides.

Environmental Statements: DEGREE XTRA and ATRAZINE are RESTRICTED-USE pesticides with a GROUNDWATER ADVISORY statement on the label. Do not use in areas where soils are very permeable, particularly where the groundwater is shallow. Do not apply to coarse soils where depth of groundwater is within 30 feet of the soil surface. NOTE: See page 23 for PRECAUTIONS on use of atrazine containing products (eg. DEGREE XTRA) near ground or surface water].

Rain Delay: None

Rotation Restrictions: Do not rotate to crops other than corn, soybeans, sorghum (milo), wheat, or tobacco. The possibility of crop injury can occur to soybeans or other nonlabeled crops planted in the year following application.

Harvest & Forage Restrictions: Do not graze or feed forage from treated areas for 60 days.

Tank Mixtures: Atrazine, 2,4-D, Gramoxone, Harness, Princep, Roundup. Consult label to apply early postemergence with Accent, Banvel, Clarity, Marksman, or Permit. DEGREE XTRA may also be tank mixed with Hornet, Python, Prowl, or Roundup (RR-corn).

DUAL II MAGNUM [S-metolachlor]

| | |
|-------------------------------------|------------------------------------|
| DUAL II MAGNUM 1.33 to 1.67 pt/A or | (S-metolachlor 1.3 to 1.6 lb ai/A) |
| CINCH 1.33 to 1.67 pt/A | |
| OR | OR |
| PARALLEL 7.8E 1.33 to 1.67 pt/A or | |
| STALWART C 7.8E 1.33 to 1.67 pt/A | (metolachlor 1.3 to 1.6 lb ai/A) |

Weeds Controlled: Barnyardgrass, black nightshade, crabgrass, fall panicum, foxtails. Higher use rates and incorporation will improve control of weeds such yellow nutsedge, black nightshade, triazine resistant pigweed.

Crop Stage: Apply preplant incorporated or preemergence for control of annual grasses and certain broadleaf weeds. Metolachlor products may be applied up to 30 days before planting as a single or split application and/or when tank mixed with atrazine. May also be applied as a broadcast treatment after planting, but before weed seedlings have emerged and before corn exceeds 5 inches tall.

General Comments: Other metolachlor containing products include CHARGER MAX, CINCH, and PARALLEL. DUAL II MAGNUM, CHARGER MAX, CINCH, MEDAL II contain 7.64 lb ai S-metolachlor per gal plus benoxacor (corn seed safener). PARALLEL contains 7.8 lb ai metolachlor per gal plus a corn seed safener.

Environmental Statements: These products have a GROUNDWATER ADVISORY statement on the label. Do not use on very permeable soils or where groundwater is close to the soil surface.

Rain Delay: None

Rotation Restrictions: Corn, soybean and grain sorghum (use Concep or Screen treated sorghum seed) may be planted anytime following application. Small grains may be planted 4 1/2 months, alfalfa 4 months, and clover 9 months following application; and tobacco may be planted the next spring following treatment. Other crops may require a 12 month waiting period.

Harvest & Forage Restrictions: Do not graze or feed forage for 30 days following application.

Tank Mixtures: AAtrex, Atrazine, Balance, Banvel, 2,4-D, Gramoxone, Princep, Prowl, Roundup. Postemergence tank mixtures include Liberty (LL-corn) or Roundup (RR-corn). Consult label to apply with other herbicides regarding corn growth stages, weed heights, and other precautions.

38 Corn

FIERCE

FIERCE 76WDG 3 oz/A [7 to 30 days EPP] [flumioxazin:pyroxasulfone (0.063:0.079) lb ai/A]

Weeds Controlled: Crabgrass, fall panicum, foxtail, black nightshade, lambsquarters, smooth pigweed, prickly sida, common ragweed, waterhemp.

Crop Stage: Apply FIERCE at 3 oz/A to field corn between 7 and 30 days early pre-plant [EPP] prior to planting. Do not use on popcorn, sweet corn or corn grown for seed.

General Comments: *Apply at least 7 days before corn planting. Use only on no-till or minimum tillage fields where last year's crop residue has not been incorporated into the soil.* For control of emerged weeds FIERCE must be applied with a tank mix partner as part of a burndown program for field corn. Apply in a minimum of 15 gal of spray solution per acre to ensure thorough coverage. Spray equipment must be cleaned each day following FIERCE application. Clean out tank, hoses, and nozzles with the product such known as "Valent Tank Cleaner" in place of ammonia.

Environmental Statements: FIERCE has ground and surface water advisory statements on the label.

Rain Delay: 1 hour

Rotation Restrictions: Crops that may be planted include soybeans immediately; field corn 7 days after FIERCE application (for minimum and no-till situations) or 30 days when FIERCE has been applied to conventional tilled areas; wheat 4 months; and other crops 18 months.

Harvest & Forage Restrictions: None indicated.

Tank Mixtures: Tank mix partners for burndown and/or residual control include 2,4-D LVE, atrazine, Basis, dicamba, Express, glyphosate, Hornet, paraquat, Python, Resolve, simazine, and Weedmaster.

GUARDSMAN MAX

GUARDSMAN MAX 5S 3 to 4.6 pt/A [dimethenamid-P:atrazine (0.64:1.2) to (0.98:1.9) lb ai/A]
OR OR

OUTLOOK 6E 14 to 21 oz/A (dimethenamid-P 0.66 to 0.98 lb ai/A)
+ +

ATRAZINE 4L 1 to 2 qt/A or (atrazine 1 to 2 lb ai/A)
AATREX NINE-O 1.1 to 2.2 lb/A

Weeds Controlled: Barnyardgrass, cocklebur, crabgrass, fall panicum, foxtails, jimsonweed, lambsquarters, morningglory, black nightshade, pigweed, prickly sida, common ragweed, smartweed.

Crop Stage: Apply preplant incorporated or preemergence for control of annual grasses and broadleaf weeds. GUARDSMAN MAX may be applied up to 30 days before planting as a single or split application. For treatments after planting, apply before corn exceeds 12" tall and before weeds are greater than 1.5 inches.

General Comments: GUARDSMAN MAX 5S contains dimethenamid-P + atrazine [1.7 + 3.3 lb ai per gal]. Rates may vary depending on soil CEC (Cation Exchange Capacity) or soil texture and organic matter. Higher use rates, incorporation, and/or a tank mixture with other herbicides will improve control of some weeds.

Environmental Statements: GUARDSMAN MAX and ATRAZINE are RESTRICTED-USE pesticides with GROUNDWATER ADVISORY statements on the label. Do not use on very permeable or coarse soils and where groundwater is close to the soil surface. [NOTE: See page 23 for PRECAUTIONS on use of atrazine containing products (eg. GUARDSMAN MAX) near ground or surface water].

Rain Delay: None

Rotation Restrictions: Plant only corn, sorghum, or soybeans in the spring following use of GUARDSMAN MAX. Do not plant small grains, small-seeded legumes, grasses, tobacco, or vegetable crops the year following application.

Harvest & Forage Restrictions: Do not graze or feed forage from treated areas for 60 days.

Tank Mixtures: Atrazine, Balance, Banvel, Clarity, 2,4-D, Gramoxone, Hornet, Outlook, Princep, Prowl, Python, Roundup, Touchdown. Consult product labels to apply early postemergence with Accent, Accent Gold, Atrazine, Banvel, Basis Gold, Beacon, Clarity, Liberty (LL-corn), Lightning (IMI-corn), Marksman, Permit, Prowl, Pursuit (IMI-Corn), ReadyMaster ATZ (RR-corn), Roundup Ultra (RR-corn).

HARNESS XTRA or BREAKFREE NXT ATZ

HARNESS XTRA (5.6L) 2.3 to 2.4 qt/A or [acetochlor:atrazine (1.78:1.4) to (1.86:1.5) lb ai/A]
 BREAKFREE NXT ATZ (5.6L) 2.3 to 2.4 qt/A

OR

OR

HARNESS 7E 1.75 to 2.25 pt/A or
 BREAKFREE NXT (7E) 1.75 to 2.25 pt/A or
 Surpass NXT (7SE) 1.75 to 2.25 pt/A

(acetochlor 1.5 to 2 lb ai/A)

+

+

ATRAZINE 4L 1.25 to 1.5 qt/A or
 AATREX NINE-O 1.4 to 1.6 lb/A

(atrazine 1.25 to 1.5 lb ai/A)

Weeds Controlled: Barnyardgrass, cocklebur, crabgrass, fall panicum, foxtails, jimsonweed, lambsquarters, morningglory, black nightshade, pigweed, prickly sida, common ragweed, smartweed.

Crop Stage: Apply preplant incorporated, preemergence, or early postemergence before weed seedlings reach the 2-leaf stage and corn is no more than 11 inches in height. HARNESS XTRA and BREAKFREE NXT ATZ may be applied up to 30 days before planting.

General Comments: HARNESS XTRA and BREAKFREE NXT ATZ (5.6L) are premixtures containing acetochlor + atrazine [3.1 + 2.5 lb ai/gal] plus MON 13900 (corn safener). Application rate may vary depending on soil texture, percent organic matter, tillage system, weed species, and tank mixture components. Incorporation and higher use rates will improve control of some weeds.

Environmental Statements: HARNESS XTRA, BREAKFREE NXT ATZ, and ATRAZINE are RESTRICTED-USE pesticides with a GROUNDWATER ADVISORY statement on the label. Do not use in areas where soils are very permeable, particularly where the groundwater is shallow. Do not apply to coarse soils where depth of groundwater is within 30 feet of the soil surface. NOTE: See page 23 for precautions on use of atrazine containing products (eg. HARNESS XTRA, BREAKFREE NXT ATZ, etc.) near ground or surface water.

Rain Delay: None

Rotation Restrictions: Corn, sorghum (milo), and soybeans may be planted the year following application. Crop injury can occur to soybeans or other nonlabeled crops planted the year following application (see label).

Harvest & Forage Restrictions: Do not graze or feed forage from treated areas for 60 days.

Tank Mixtures: Atrazine, 2,4-D, Gramoxone, Harness, Princep, Roundup. Consult HARNESS XTRA label to apply early postemergence with Accent, Banvel, Clarity, Marksman, or Permit.

KEYSTONE NXT or FULTIME NXT

KEYSTONE NXT [5.6SE] 2.3 to 2.6 qt/A or
 FULTIME NXT [4SE] 2.9 to 3.7 qt/A

[acetochlor:atrazine (1.8:1.4) to (2.0:1.6) lb ai/A]
 [acetochlor:atrazine (1.9:0.97) to (2.5:1.23) lb ai/A]

OR

OR

TOPNOTCH 3.2CS 2 to 2.5 qt/A

(acetochlor 1.6 to 2 lb ai/A)

+

+

ATRAZINE 4L 1 to 1.5 qt/A or
 ATRAZINE NINE-O 1.1 to 1.6 lb/A

(atrazine 1 to 1.5 lb ai/A)

Weeds Controlled: Barnyardgrass, cocklebur, crabgrass, fall panicum, foxtails, jimsonweed, lambsquarters, morningglory, black nightshade, pigweed, prickly sida, common ragweed, smartweed.

Crop Stage: Apply preplant incorporated, preemergence, early postemergence, or may also be applied up to 30 days prior to planting. For treatments after planting apply before corn reaches 11 inches in height.

General Comments: KEYSTONE NXT (5.6SE) is a premixture containing acetochlor + atrazine [3.1 + 2.5 lb ai/gal] plus dichlormid (corn safener). FULTIME NXT (4SE) is a premixture containing an encapsulated combination of acetochlor + atrazine [2.7 + 1.34 lb ai/gal] plus dichlormid (corn safener). Similar products include VOLLEY ATZ NXT. Application rate may vary depending on soil texture, percent organic matter, tillage system, time of application, and tank mixture components.

Environmental Statements: KEYSTONE and FULTIME are Restricted-Use pesticides with a GROUND WATER ADVISORY statement on the label. Do not use in areas where soils are very permeable, particularly where the groundwater is shallow or areas with high groundwater tables. [NOTE: See page 23 for precautions on use of atrazine containing products (eg. KEYSTONE, FULTIME) near ground or surface water].

Rain Delay: None

Rotation Restrictions: Corn may be replanted immediately if crop is lost. Do not apply after June 10, unless only corn will be planted the following year. Otherwise, sorghum or soybean may be planted the spring following application. Alfalfa, barley, millet, oats, rye, tobacco, or wheat may be planted 15 months after application. The potential for injury to tobacco may occur because of atrazine carryover.

Harvest & Forage Restrictions: Do not graze or feed forage for 60 days following application.

Tank Mixtures: Atrazine, Balance Pro, Banvel, Clarity, 2,4-D, glyphosate (Glyphomax Plus, Roundup, Touchdown), Gramoxone, Hornet WDG, Marksman, Princep, Prowl, Python, Surpass EC. Consult label to apply early postemergence with other tank mix products.

40 Corn

LEXAR EZ

LEXAR EZ 3 qt/A

[S-metolachlor:mesotrione:atrazine (1.3:0.17:1.3) lb ai/A]

Weeds Controlled: Barnyardgrass, black nightshade, crabgrass, fall panicum, foxtails, lambsquarters, pigweeds, prickly sida, common ragweed, smartweed, velvetleaf.

Crop Stage: Apply preemergence on the soil surface no more than 14 days before planting or early postemergence before corn exceeds 12 inches in height. When applied early postemergence apply before small broadleaf weeds exceed 5 inches tall.

General Comments: LEXAR EZ contains S-metolachlor + mesotrione + atrazine [1.74 + 0.224 + 1.74 lb ai/gal] plus benoxacor (corn safener). Do not apply LEXAR early postemergence if corn received an at-plant application of "Counter" insecticide. Consult label before use with other organophosphate or carbamate insecticides. Do not apply mesotrione products (eg. Callisto, Camix, Lumax) in the same season as LEXAR.

Environmental Statements: LEXAR EZ is a RESTRICTED-USE pesticide with a GROUNDWATER ADVISORY statement. Do not use on very permeable soils or where groundwater is close to the soil surface or where the potential exists to enter surface water. [NOTE: See page 23 for PRECAUTIONS on use of atrazine containing products (eg. LEXAR) near ground or surface water].

Rain Delay: None.

Rotation Restrictions: Do not plant crops other than corn, soybeans, sorghum, or small grain cereals the spring following application. If applied after June 1, do not rotate to crops other than corn or sorghum. For other crops wait 18 months before planting as a rotational crop.

Harvest & Forage Restrictions: Do not graze or feed forage from treated areas for 45 days following application. Do not harvest forage, grain, or stover within 60 days after application.

Tank Mixtures: Atrazine, Glyphosate, Gramoxone, Princep, Roundup, Touchdown, and Warrior insecticide. Tank mixtures for early postemergence applications (before corn < 12 inches) include Atrazine, Accent Q, Basis, glyphosate products [eg. Roundup, Touchdown-glyphosate tolerant hybrids], Liberty [LL-corn], Resolve Q, Spirit, Status, Steadfast,. Tank mixtures with 2,4-D is allowed; however, check compatibility before mixing.

LUMAX EZ

LUMAX EZ 2.7 to 3.25 qt/A
[use higher rate when OM ≥ 3%]

[S-metolachlor:mesotrione:atrazine (1.68:0.17:0.65)
to (2.0:0.2:0.75) lb ai/A]

Weeds Controlled: Barnyardgrass, black nightshade, crabgrass, fall panicum, foxtails, lambsquarters, pigweeds, common ragweed, smartweed, velvetleaf.

Crop Stage: Apply preemergence on the soil surface no more than 14 days before planting or early postemergence before corn exceeds 12 inches in height. When applied early postemergence apply before small broadleaf weeds exceed 3 inches tall.

General Comments: LUMAX EZ contains S-metolachlor + mesotrione + atrazine [2.49 + 0.249 + 0.935 lb ai/gal] plus benoxacor (corn safener). Do not apply LUMAX EZ early postemergence if corn received an at-plant application of "Counter" insecticide. Consult label before use with other organophosphate or carbamate insecticides. Do not apply other mesotrione products (eg. Callisto, Lexar) in the same season as LUMAX EZ.

Environmental Statements: LUMAX EZ is a RESTRICTED-USE pesticide with a GROUNDWATER ADVISORY statement. Do not use on very permeable soils or where groundwater is close to the soil surface or where the potential exists to enter surface water. [NOTE: See page 23 for PRECAUTIONS on use of atrazine containing products (eg. LUMAX EZ) near ground or surface water].

Rain Delay: None.

Rotation Restrictions: Do not plant crops other than corn, soybeans, or sorghum the spring following application. If applied after June 1, do not rotate to crops other than corn or sorghum. Winter wheat, barley, or rye may be planted 4.5 months following application. For other crops wait 18 months before planting as a rotational crop.

Harvest & Forage Restrictions: Do not graze or feed forage from treated areas for 45 days following application. Do not harvest forage, grain, or stover within 60 days after application.

Tank Mixtures: Atrazine, Glyphosate, Gramoxone, Princep, Roundup, Touchdown and Warrior insecticide. Tank mixtures for early postemergence applications (before corn exceeds 12 inches) include Atrazine, Accent, Basis, Glyphosate products [eg Roundup, Touchdown-glyphosate tolerant hybrids], Liberty [LL-corn], Steadfast, Steadfast ATZ. Tank mixtures with 2,4-D is allowed; however, check compatibility before mixing.

OUTLOOK

OUTLOOK 6E 14 to 21 oz/A

(dimethenamid-P 0.66 to 0.98 lb ai/A)

Weeds Controlled: Barnyardgrass, crabgrass, fall panicum, foxtails, black nightshade, pigweed. Incorporation and higher rates will improve control of some weeds.

Crop Stage: Apply preplant, preemergence or early postemergence for control of annual grasses and certain broadleaf weeds. OUTLOOK may be applied up to 30 days before planting as a single or split application and/or when tank mixed with other herbicides. When used after crop emergence but prior to weed germination, apply OUTLOOK as a broadcast application to corn up to 12 inches tall. As a lay-by treatment, apply to corn that is between 12" to 36" tall (directed applications are recommended for best performance).

General Comments: OUTLOOK 6E contains 6 lb ai diethenamid-P per gal. Application rate may vary depending on soil CEC (cation exchange capacity) or soil texture and percent organic matter.

Environmental Statements: OUTLOOK has a GROUNDWATER ADVISORY statements on the label. Do not use on very permeable soils or where groundwater is close to the soil surface. OUTLOOK may not be mixed or loaded within 50 feet of wells, sink holes, perennial or intermittent streams and rivers, and natural or impounded lakes and reservoirs. This setback does not apply to properly capped or plugged abandoned wells and to impervious pads or properly diked mixing/loading areas.

Rain Delay: None

Rotation Restrictions: Fall-seeded small grains may be planted 4 months or more following treatment. Other rotational crop may be planted the following spring.

Harvest & Forage Restrictions: Corn may be grazed or fed to livestock 40 days after application.

Tank Mixtures: 2,4-D, Acquire, Atrazine, Balance, Banvel, Clarity, Gramoxone, Princep, Prowl, Roundup, Touchdown. Consult product labels to apply early postemergence with Accent, Atrazine, Banvel, Beacon, Clarity, Liberty (LL-corn), Lightning (IMI-corn), Marksman.

PROWL

PROWL 3.3E 2.4 to 3.6 pt/A

(pendimethalin 1 to 1.5 lb ai/A)

OR

OR

PROWL H2O 3 pt/A

(pendimethalin 1.4 lb ai/A)

Weeds Controlled: Barnyardgrass, crabgrass, fall panicum, foxtails, lambsquarters, pigweeds.

Crop Stage: Corn injury can result when PROWL contacts the germinating corn seed; therefore, apply to the soil surface after corn planting. **Do not incorporate PROWL or severe corn injury can result.** To reduce the risk of corn injury, plant at least 1 1/2 inches deep; corn seed must be completely covered with soil. In minimum or no-tillage situations ensure good seed coverage. PROWL may be applied postemergence until field corn is 30 inches tall or in the V8 growth stage, whichever is more restrictive. Consult label for tank mixing with other herbicides.

General Comments: PROWL 3.3E contains 3.3 lb ai/gal pendimethalin. PROWL H2O 3.8L contains 3.8 lb ai/gal pendimethalin. Other pendimethalin products include PENDIMAX.

Environmental Statements: None

Rain Delay: None

Rotation Restrictions: Most crops may be planted following normal growth and harvest of corn. For wheat and barley wait 4 months after application of PROWL before planting. Do not feed forage or graze livestock for 75 days after planting wheat or barley as rotational crops. If tank mixed or used with other herbicides consult the labels for additional crop rotation guidelines.

Harvest & Forage Restrictions: Livestock can graze or be fed forage 21 days after treatment with PROWL H2O.

Tank Mixtures: Atrazine, Banvel, Bicep, Dual, Guardsman, Harness, Harness Xtra, Marksman. Early postemergence mixtures include Accent, Atrazine, Banvel, Basis Gold, Beacon, Marksman. Consult label to apply PROWL with other soil-applied or postemergence herbicides regarding maximum corn growth stages, weed heights, and other precautions.

42 Corn

PROWL + ATRAZINE

| | |
|---|---|
| PROWL 3.3E 2.4 to 3.6 pt/A or PROWL H2O 3 pt/A | (pendimethalin 1 to 1.5 lb ai/A) (pendimethalin 1.4 lb ai/A) |
| + | + |
| ATRAZINE 4L 1 to 1.5 qt/A or AATREX NINE-O 1.1 to 1.6 lb/A | (atrazine 1 to 1.5 lb ai/A) |

Weeds Controlled: Barnyardgrass, black nightshade, cocklebur, common ragweed, crabgrass, fall panicum, foxtails, jimsonweed, lambsquarters, morningglories, pigweeds, prickly sida, smartweed

Crop Stage: Corn injury can result when PROWL contacts the germinating corn seed; therefore, apply to the soil surface after corn planting. **Do not incorporate PROWL or severe corn injury can result.** To reduce the risk of corn injury, plant at least 1 1/2 inches deep; corn seed must be completely covered with soil. In minimum or no-tillage situations ensure good seed coverage. Prowl + Atrazine treatments may be applied postemergence until corn is 12 inches tall. Consult label for tank mixing with other herbicides.

General Comments: See comments above for use of PROWL on corn.

Environmental Statements: ATRAZINE containing products are RESTRICTED-USE pesticides and contain a GROUND and SURFACE WATER ADVISORY statement on the label. Do not use on very permeable soils or where groundwater is close to the soil surface. [NOTE: See page 23 for PRECAUTIONS on use of ATRAZINE (i.e. AATREX) near ground or surface water]

Rain Delay: None

Rotation Restrictions: Do not plant small grains or small-seeded legumes and grasses in the fall of the same year or the year following application, or injury may occur. Plant only corn, sorghum or soybeans in the spring following use of ATRAZINE. If applied after June 10, plant only corn or sorghum the following season.

Harvest & Forage Restrictions: Do not graze or feed forage from treated areas for 60 days following application.

SIMAZAT

| | |
|---|--|
| SIMAZAT 4L 4 to 6 pt/A | [simazine:atrazine (1.0:1.0) to (1.5:1.5) lb ai/A] |
| OR | OR |
| ATRAZINE 4L 2 to 3 pt/A or AATREX NINE-O 1.1 to 1.6 lb/A | (atrazine 1 to 1.5 lb ai/A) |
| + | + |
| PRINCEP 4L 2 to 3 pt/A or PRINCEP CALIBER 90 1.1 to 1.6 lb/A | (simazine 1 to 1.5 lb ai/A) |

Weeds Controlled: Black nightshade, cocklebur, foxtails, giant ragweed, jimsonweed, lambsquarters, morningglories, pigweeds, prickly sida, common ragweed, smartweed, velvetleaf.

Crop Stage: Apply to the soil either preplant incorporated or preemergence. May be applied early preplant within 2 weeks prior to planting. Do not apply after corn emergence.

General Comments: SIMAZAT 4L is a premixture containing simazine + atrazine [2.0 + 2.0 lb ai/gal]. Low soil moisture or soil pH above 7.0 may increase persistence; whereas, simazine and atrazine dissipate more rapidly when soil pH is acidic.

Environmental Statements: SIMAZAT is a RESTRICTED-USE pesticide and contains a GROUND and SURFACE WATER ADVISORY statement on the label. Do not use on very permeable soils or where groundwater is close to the soil surface. [NOTE: See page 23 for PRECAUTIONS on use of SIMAZAT near ground or surface water]

Rain Delay: None

Rotation Restrictions: Land treated with SIMAZAT should not be planted to any crop except corn or sorghum until the following year or injury may occur. Do not plant tobacco, vegetables, small grains or small-seeded legumes and grasses in the fall of the same year or the year following application, or injury may occur. When applied after June 10, plant only corn or sorghum the following season. If SIMAZAT is applied at rates higher than 4 pt/A a crop of untreated corn or sorghum should precede the next rotational crop.

Harvest & Forage Restrictions: Do not graze treated areas or feed treated forage to livestock for 60 days after application.

Tank Mixtures: Atrazine, Paraquat

SIMAZINE

PRINCEP 4L 2 to 4 pt/A or
PRINCEP CALIBER 90 1.1 to 2.2 lb/A

or
SIMAZINE 4L 2 to 4 pt/A or
SIMAZINE 90DF 1.1 to 2.2 lb/A

(simazine 1 to 2 lb ai/A)

Weeds Controlled: Barnyardgrass, black nightshade, foxtails, lambsquarters, pigweeds, prickly sida, common ragweed, smartweed, velvetleaf.

Crop Stage: Apply to the soil either preplant incorporated or preemergence. Do not apply after corn emergence. PRINCEP is also labeled for applications the previous fall before corn planting to target weed problems such as Italian ryegrass and other cool-season annual weeds.

General Comments: PRINCEP 4L and SIMAZINE 4L contains 4 lb ai simazine per gal. PRINCEP CALIBER 90 and SIMAZINE 90DF contains 0.9 lb ai of simazine per lb product. PRINCEP is more persistent in soil than atrazine. Low soil moisture or soil pH above 7.0 may increase persistence. Whereas, PRINCEP dissipates more rapidly when soil pH is acidic.

Environmental Statements: PRINCEP and SIMAZINE have a GROUNDWATER ADVISORY statements. Do not use on very permeable soils or where groundwater is close to the soil surface. [NOTE: See page 23 for PRECAUTIONS on use of Simazine near ground or surface water.]

Rain Delay: None

Rotation Restrictions: Do not plant small grains or small-seeded legumes in the fall of the same year. Plant only corn or soybeans in the spring following use of PRINCEP (simazine). If rate exceeds 3 lb active ingredient per acre, a crop of untreated corn should precede the next rotational crop.

Harvest & Forage Restrictions: Do not graze corn treated with PRINCEP (simazine). No label restrictions which prohibit use of treated corn for silage or haylage.

Tank Mixtures: Atrazine, Glyphosate, Gramoxone Extra.

SURESTART II or TRIPLEFLEX II

SURESTART II 4.25SE 1.75 to 3 pt/A

[acetochlor:flumetsulam:clopyralid (0.82:0.03:0.08) to
(1.4:0.045:0.14 lb ai/A)]

or
TRIPLEFLEX II 4.25SE 1.75 to 3 pt/A

Weeds Controlled: Barnyardgrass, cocklebur, crabgrass, foxtails, lambsquarters, morningglory, black nightshade, pigweed, common ragweed, prickly sida, smartweed.

Crop Stage: Apply preplant surface, preplant incorporated, postplant preemergence, or early postemergence (up to 11 inch tall corn). SURESTART may also be applied up to 30 days before planting.

General Comments: SURESTART and TRIPLEFLEX are pre-package mixtures containing acetochlor + flumetsulam + clopyralid [3.75 + 0.12 + 0.38 lb ai per lb product] plus MON13900 (furilazole) corn safener. Corn planting depth should be at least 1.5 inches. When applied at lower rates it should be part of a planned preemergence followed by a postemergence program. Do not apply in areas where 1) soil pH>7.8, 2) soil pH<5.9 and organic matter exceeds 5%, or 3) soils that average less than 1.5% organic matter, unless the risk of crop injury is acceptable. Do not apply SURESTART or TRIPLEFLEX if Counter or Thimet insecticide has been applied to corn. Soil applied organophosphate insecticide should be applied in a T-band or a band to avoid potential crop injury. The maximum application amount on corn is 3.5 pt/A per crop season.

Environmental Statements: SURESTART and TRIPLEFLEX have ground and surface water advisory statements on the label. Do not use on very permeable soils or where groundwater is close to the soil surface.

Rain Delay: None

Rotation Restrictions: The following rotational crops may be planted as indicated: wheat after 4 months; alfalfa, barley, clover, oats, rye, soybean the spring following application; sorghum 12 months; and sweet corn and tobacco 18 months following application.

Harvest & Forage Restrictions: An interval of at least 85 days is required between SURESTART or TRIPLEFLEX application and field corn harvested for grain.

Tank Mixtures: Glyphosate products [eg. Durango, Roundup, Touchdown], glufosinate [eg. Liberty], paraquat [eg. Gramoxone], and 2,4-D. Do not tank mix with another pesticide product that contains the same active ingredient as this product.

44 Corn

ZEMAX

ZEMAX 2 to 2.4 qt/A

[S-metolachlor:mesotrione (1.67:0.17) to (2.0:0.2) lb ai/A]

[use higher rate when OM \geq 3%]

Weeds Controlled: Barnyardgrass, black nightshade, crabgrass, fall panicum, foxtails, lambsquarters, pigweeds, smartweed, velvetleaf.

Crop Stage: May be applied early preplant (up to 14 days before planting) or preemergence. ZEMAX may also be applied postemergence from corn emergence until the plants reach 30 inches tall (up to 8-leaf stage of corn growth). [Consult label on use of additives when applied postemergence to corn].

General Comments: ZEMAX contain S-metolachlor + mesotrione [3.34 + 0.33 lb ai/gal] plus benoxacor (corn safener). Do not apply postemergence if corn received an at-plant application of "Counter" or other organophosphate insecticide. Consult label before use with other organophosphate or carbamate insecticides. Do not apply other mesotrione products (eg. Callisto, Lexar, Lumax, etc.) in the same season .

Environmental Statements: ZEMAX contain GROUND and SURFACE WATER advisory statements on the label. Do not use on very permeable soils or where groundwater is close to the soil surface or where the potential exists to enter surface water.

Rain Delay: None.

Rotation Restrictions: Corn (all types) and sorghum may be replanted anytime; soybeans the spring following application; and winter wheat, barley, oats or rye may be planted 4½ months after application. The rotational interval is 18 months for other crops.

Harvest & Forage Restrictions: Do not graze, feed, or harvest corn for forage or grain from treated areas for 45 days following application.

Tank Mixtures: Atrazine, Princep, 2,4-D, Gramoxone, Roundup brands, Touchdown brands, and Warrior insecticide. Early postemergence tank mixtures include Atrazine, Accent Q, Basis, Ignite (LL-corn) Liberty (LL-corn), Roundup brands (RR-corn), Spirit, Status, Steadfast Q, Touchdown brands (RR-corn).

ZIDUA

ZIDUA (85WDG) 2 to 3 oz/A

(pyroxasulfone 0.11 to 0.16 lb ai/A)

Weeds Controlled: Barnyardgrass, crabgrass, fall panicum, foxtails, black nightshade, pigweed, waterhemp.

Crop Stage: Apply preplant incorporated, preplant surface, or early postemergence for preemergence control of annual grasses and certain broadleaf weeds. ZIDUA may be applied up to 45 days before planting before weeds emerge and/or tank mixed with an appropriate postemergence herbicides for emerged weeds. As an early postemergence treatment broadcast apply to corn at spiking up to V4 leaf stage of growth.

General Comments: ZIDUA contains 85% proxasulfone per lb product. Application rate may vary depending on soil texture and weeds present. Always pre-dissolve ZIDUA before adding it into the spray tank. Corn seed must be planted a minimum of 1-inch deep.

Environmental Statements: ZIDUA has a GROUND and SURFACE WATER ADVISORY statements on the label.

Rain Delay: None

Rotation Restrictions: Corn and soybean may be planted at any time following application. Wheat may be planted after 4 months, alfalfa and grain sorghum 10 months (consult label), and other small grains 11 months after application. Other rotational crops may be planted 18 months after treatment (consult label).

Harvest & Forage Restrictions: None

Tank Mixtures: Atrazine, Glyphosate products, Outlook, Prowl H20, Sharpen, Status, Verdict.

Tank Mixtures Labeled for Postemergence Corn Herbicides

| | Accent Q | Aim | Atrazine | Callisto | Clarity (dicamba) | 2,4-D | Glyphosate | Laudis | Liberty | Permit | Spirit | Status | Steadfast Q |
|--------------------------|----------|-----|----------|----------|-------------------|-------|------------|--------|---------|--------|--------|--------|-------------|
| Accent Q | - | L | L | L | L | X | NL | L | L | L | L | L | X |
| Armezon | L | L | L | X | L | L | L | X | L | L | X | L | L |
| Atrazine | L | L | - | L | L | NL | L | L | L | L | L | L | L |
| Callisto | L | L | L | - | NL | L | L | NL | L | L | NL | L | L |
| Callisto GT | NL | NL | L | X | L | NL | NL | NL | NL | NL | NL | L | NL |
| Callisto Xtra | L | NL | L | X | L | NL | L | NL | L | NL | NL | L | L |
| Capreno | NL | NL | L | NL | NL | NL | L | NL | L | NL | NL | NL | NL |
| Clarity (dicamba) | L | L | L | NL | - | NL | NL | NL | NL | L | L | X | L |
| 2,4-D | X | L | NL | L | NL | - | NL | NL | L | L | L | X | X |
| DiFlexx (dicamba) | NL | NL | NL | NL | - | NL | L | L | L | NL | NL | NL | NL |
| Glyphosate (eg. Roundup) | NL | L | L | L | NL | NL | - | L | X | L | L | L | NL |
| Impact | L | L | L | X | L | L | L | NL | --- | L | NL | L | L |
| Laudis | L | NL | L | NL | NL | NL | L | - | L | NL | NL | NL | L |
| Liberty | L | L | L | L | NL | L | X | L | - | L | NL | L | NL |
| Permit | L | L | L | L | L | L | L | NL | L | - | NL | L | L |
| Prowl | L | NL | L | L | NL | NL | NL | NL | --- | NL | NL | NL | L |
| Resolve Q | - | - | L | - | L | - | L | - | --- | - | - | NL | - |
| Spirit | L | L | L | NL | L | L | L | NL | NL | NL | - | L | L |
| Status | L | L | L | L | X | X | L | NL | L | L | L | - | L |
| Steadfast Q | X | L | L | L | L | X | NL | L | NL | L | L | L | - |
| Touchdown | NL | L | L | L | L | L | NL | L | X | NL | NL | L | NL |
| Zemax | L | NL | L | NL | NL | NL | L | NL | - | NL | L | L | L |

L = Labeled tank mixture. Consult labels for use of additives and precautions.

NL = Not a labeled tank mixture. Consult each herbicide label for precautions or restrictions that may limit mixing with chemicals not listed on the label.

X = Do not tank mix these products since severe crop injury, maximum herbicide active ingredient use rates per calendar year may be exceeded, herbicide carryover, or herbicide antagonism may occur.

Guide to Weed and Crop Response to Postemergence Corn Herbicides¹

| | Barnyardgrass | Broadleaf Signalgrass | Crabgrass | Fall Panicum | Foxtail | Johnsongrass (seedling) | Johnsongrass (rhizome) | Ryegrass, Annual (Italian) | Shattercane (Wild Cane) | Yellow Nutsedge | Black Nightshade | Burcucumber | Cocklebur | Lambsquarters | Marestail (Horseweed) | Morningglory | Palmer Amaranth | Pigweed, Smooth | Prickly Sida (Teaweed) | Ragweed, Common | Ragweed, Giant | Sicklepod | Smartweed | Velvetleaf | Waterhemp | Crop Response ² |
|--|---------------|-----------------------|----------------|--------------|----------------|-------------------------|------------------------|----------------------------|-------------------------|-----------------|------------------|-------------|-----------|---------------|-----------------------|--------------|-----------------|-----------------|------------------------|-----------------|----------------|-----------|-----------|------------|----------------|----------------------------|
| Accent Q | 8 | 8 | 5 | 7 | 8 | 9 | 8 | 7 | 9 | 5 | 2 | 7 | 6 | 5 | 2 | 6 | 3 | 8 | 2 | 2 | 2 | 4 | 6 | 5 | 7 | 3* |
| Callisto / Zemax ⁷ | 6 | 6 | 6 ⁵ | 2 | 3 | 0 | 0 | 2 | 0 | 5 | 8 | 7 | 8 | 9 | 6 | 7 | 7 | 8 | 5 | 7 | 8 | 5 | 8 | 9 | 8 | 2 |
| Callisto GT (RR-corn) ⁴ | 9 | 9 | 9 | 9 | 9 | 9+ | 9 | - | 9 | 7 | 9 | 8 | 9 | 9 | 6 [#] | 7 | 8 [#] | 9 | 7 | 7 | 8 | 8 | 8 | 9 | 8 [#] | 1 |
| Callisto Xtra | 6 | 6 | 6 ⁵ | 2 | 5 | 0 | 0 | 2 | 0 | 5 | 9 | 7 | 9 | 9 | 7 | 8 | 8 | 9 | 7 | 8 | 8 | 6 | 9 | 9 | 9 | 2 |
| Capreno | 8 | 7 | 7 | 8 | 8 | 8 | 6 | - | 9 | 5 | 9 | 7 | 8 | 9 | 6 | 6 | 8 | 9 | 6 | 8 | 7 | 6 | 8 | 9 | 9 | 1 |
| 2,4-D | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 3 | 9 | 9 | 7 | 8 | 8 | 9 | 8 | 9 | 9 | 6 | 7 | 8 | 8 | 3 |
| Dicamba [Clarity, DiFlexx, etc] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 7 | 9 | 9 | 8 | 9 | 9 | 9 | 8 | 9 | 9 | 7 | 9 | 8 | 8 | 2 |
| Expert (RR-corn) ⁴ | 9 | 9 | 9 | 9 | 9 | 9+ | 9 | 8 | 9 | 6 | 7 | 8 | 9 | 9 | 7 [#] | 7 | 7 [#] | 9 | 7 | 9 | 8 | 7 | 9 | 8 | 7 [#] | 1 |
| Glyphosate ³ (RR-corn) ⁴ | 9 | 9 | 9 | 9 | 9 | 9+ | 9 | 8 | 9 | 6 | 8 | 8 | 9 | 8 | 7 [#] | 7 | 7 [#] | 9 | 7 | 7 | 8 | 8 | 8 | 8 | 7 [#] | 0 |
| Halex GT (RR-corn) ⁴ | 9 | 9 | 9 | 9 | 9 | 9+ | 9 | 8 | 9 | 6 | 8 | 8 | 9 | 9 | 7 [#] | 7 | 8 [#] | 9 | 7 | 7 | 8 | 8 | 8 | 9 | 9 | 2 |
| Impact / Armezon | 6 | 3 | 7 | 7 | 7 | 6 | 0 | 0 | 6 | 4 | 9 | 7 | 8 | 9 | 6 | 6 | 8 | 9 | 7 | 7 | 7 | 6 | 7 | 9 | 9 | 1 |
| Laudis | 7 | 7 | 7 | 2 | 6 | 7 | 0 | 3 | 7 | 4 | 8 | 7 | 8 | 8 | 6 | 6 | 8 | 8 | 7 | 7 | 8 | 7 | 8 | 8 | 9 | 1 |
| Liberty (LL-corn) ⁴ | 7 | 7 | 7 | 8 | 9 ⁶ | 8 | 6 | 7 | 8 | 5 | 8 | 7 | 9 | 8 | 6 | 8 | 7 | 8 | 8 | 9 | 8 | 7 | 9 | 8 | 8 | 0 |
| Permit | 2 | 2 | 2 | 3 | 3 | 3 | 0 | 0 | 3 | 8 | 4 | 3 | 9 | 4 | 2 | 4 | 6 | 8 | 7 | 8 | 7 | 2 | 7 | 8 | 6 | 2 |
| Realm Q | 7 | 7 | 6 | 7 | 8 | 7 | 6 | 6 | 9 | 6 | 8 | 7 | 9 | 8 | - | 6 | 8 | 9 | 7 | 7 | 7 | 6 | 9 | 8 | 8 | 2* |
| Resolve Q | 7 | 7 | 6 | 7 | 8 | 7 | 6 | 5 | 9 | 6 | 3 | - | 7 | 7 | - | 6 | - | 9 | 6 | 6 | 4 | 6 | 7 | 8 | 7 | 2* |
| Spirit | 3 | 2 | 3 | 6 | 6 | 8 | 6 | 5 | 9 | 5 | 8 | 8 | 9 | 6 | 6 [#] | 6 | 8 | 8 | 7 | 9 | 9 | 6 | 8 | 7 | 8 | 3 |
| Status | 5 | 1 | 3 | 5 | 5 | 5 | 2 | 0 | 5 | 0 | 8 | 7 | 9 | 9 | 8 | 8 | 9 | 9 | 8 | 9 | 9 | 8 | 8 | 8 | 8 | 2 |
| Steadfast Q | 8 | 8 | 6 | 7 | 8 | 9 | 8 | 7 | 9 | 6 | 2 | 7 | 6 | 5 | 2 | 6 | 4 | 8 | 2 | 2 | 2 | 4 | 6 | 5 | 7 | 3* |

EXCELLENT = 9+ GOOD = 8-9 FAIR = 6-7 POOR = 5 or less - Insufficient Data

¹ This table should be used only as a guide. The relative response value is based on a numerical scale from 0 to 9 comparing the effectiveness of herbicides to a particular weed. Under certain weather or environmental conditions, a herbicide may perform better or worse than indicated in the table. If a farmer is getting satisfactory results under their conditions, they should not necessarily change products as a result of the information in the table.

² A rating of 3 or less will not result in a crop yield loss under normal conditions. Certain corn hybrids vary in their injury response to a herbicide treatment.

* NOTE: When applied within label guidelines the potential crop response may be less for herbicide products designated with a "Q" that contain the crop safener (isoxadifen).

³ Examples of GLYPHOSATE products labeled for use on Roundup Ready corn include: **Abundit Extra, Buccaneer Plus, Credit, Durango, Glyphos X-tra, Glyphomax XRT, Roundup Power MAX, Roundup WeatherMAX, Touchdown Total.**

⁴ Apply only on selected field corn hybrids designated with GENETIC resistance/tolerance to LibertyLink (LL-corn) or to Roundup-Ready (RR-corn). Consult the label for guidelines and specific directions.

⁵ Effectiveness rating for large crabgrass; less effective on smooth crabgrass.

⁶ Effectiveness of LIBERTY on yellow foxtail may be lower (7)

⁷ ZEMAX provides additional residual control of annual weeds such as barnyardgrass, crabgrass, fall panicum, foxtail, black nightshade, lambsquarters, and pigweeds.

Will not effectively control weed biotypes resistant to the class of chemistry associated with this herbicide.

Response of Perennial Broadleaf Weeds to Postemergence Corn Herbicides¹

| | Bindweed, Field | Dandelion | Dogbane, Hemp | Horsenettle | Milkweed, Common | Milkweed, Honeyvine | Pokeweed, Common | Thistle, Canada | Thistle, Musk | Trumpet creeper |
|------------------------------------|-----------------|-----------|---------------|-------------|------------------|---------------------|------------------|-----------------|---------------|-----------------|
| Accent Q | 3 | 7 | 6 | 3 | 6 | 6 | 4 | 5 | 2 | 2 |
| Callisto | - | 7 | 5 | 6 | - | 6 | 7 | 6 | - | - |
| Callisto GT (RR-corn) ² | - | 8 | 7 | 7 | 7 | 6 | 7 | 8 | - | - |
| Callisto Xtra | - | 7 | 5 | 7 | - | 6 | 7 | 6 | - | - |
| Capreno | - | 6 | 3 | 7 | - | - | 6 | 5 | - | - |
| 2,4-D | 5 | 7 | 5 | 4 | 4 | 4 | 5 | 5 | 7 | - |
| Dicamba [Clarity, DiFlexx, etc] | 6 | 7 | 6 | 6 | 6 | 6 | 7 | 6 | 7 | 7 |
| Expert (RR-corn) ² | 7 | 7 | 7 | 7 | 7 | 6 | 7 | 7 | 5 | 7 |
| Glyphosate (RR-corn) ² | 7 | 8 | 7 | 7 | 7 | 6 | 7 | 8 | 5 | 7 |
| Halex GT (RR-corn) ² | 7 | 8 | 7 | 7 | 7 | 6 | 7 | 8 | 5 | 7 |
| Liberty (LL-corn) ² | 5 | 7 | 6 | 4 | 6 | 6 | 5 | 4 | - | - |
| Permit | 3 | 5 | 3 | - | 6 | 7 | 5 | 2 | - | - |
| Spirit | 6 | 6 | 6 | 7 | 6 | 7 | 6 | 6 | 3 | 3 |
| Status | 6 | 8 | 6 | 6 | 6 | 7 | 7 | 6 | 7 | - |
| Steadfast Q | 3 | 7 | 5 | 3 | - | - | 3 | 5 | 2 | 2 |

GOOD = 8-9 FAIR = 6-7 POOR = 5 or less - Insufficient Data

¹ **Effectiveness of in-season herbicide treatments for perennial and biennial broadleaf weeds often provides only partial control or suppression.** The response value indicated is based on a numerical scale from 0 to 9 comparing the relative effectiveness of the herbicides listed to a particular weed. Under certain weather or environmental conditions, a herbicide may perform better or worse than indicated in the table. **Therefore, this table should be used only as a guide for selecting treatments to deal with problem weeds.**

² Apply only on selected field corn hybrids designated with GENETIC resistance/tolerance to LibertyLink (LL-corn) or to Roundup-Ready (RR-corn). Consult the label for guidelines and specific directions.

Maximum Weed Size Labeled for Postemergence Herbicide Applications

| HERBICIDE | Rate/A | Barnyardgrass | Broadleaf Signalgrass | Crabgrass, Large | Fall Panicum | Foxtail | Johnsongrass (seedling) | Johnsongrass (rhizome) | Ryegrass, Annual (Italian) | Shattercane (Wild Cane) | Yellow Nutsedge |
|----------------------------|------------------|---------------|-----------------------|------------------|-----------------|-----------------|-------------------------|------------------------|----------------------------|-------------------------|-------------------|
| Accent Q | 0.67 oz / 0.9 oz | 4" | 2" | X | 4" | 4" | 12" | 18" | 6" | 12" | X |
| Callisto GT (RR-corn) | 2 pt | 4" | 4" | 4" | 4" | 4" | X | X | X | 4" | 4" |
| Capreno | 3 fl.oz | 5" | 5" | 3" | 5" | 3" | 5" | X | X | 12" | X |
| Halex GT (RR-corn) | 3.6 - 4 pt | 4" | 4" | 4" | 4" | 4" | 4" | 4" | X | 4" | 4" |
| Impact or Armezon | 0.75 fl.oz | 4" | 3" ¹ | 3" | 3" ¹ | 3" ² | 4" ¹ | X | X | 4" ¹ | X |
| Laudis | 3 fl.oz | 5" | 4" | 3" | X | 3" | 5" | X | X | 6" | X |
| Liberty (LL-corn) | 22 oz | 3" | 3" | 3" ³ | 3" | 6" ³ | 3" | X | X | 6" | X |
| Permit | 0.67 oz | X | X | X | X | X | X | X | X | X | 12" ¹ |
| | 1.33 oz | X | X | X | X | X | X | X | X | X | 12" |
| Realm Q | 4 oz | 1-2" | 1-2" ¹ | 0.5 | 1-2" | 1-2" | 1-2" ¹ | X | 1-2" ¹ | 4" | 1-2" ¹ |
| Resolve Q | 1.25 oz | 2" | 2" ¹ | 0.5" | 2" | 2" | 2" ¹ | X | 2" ¹ | 4" | 2" ¹ |
| GLYPHOSATE 4S (RR-corn) | 1.5 pt | 5" | 5" | 18" | 6" | 12" | 18" | X | X | 18" | X |
| | 2 pt | 7" | 7" | 18" | 8" | 20" | 18" | Boot stage | 6" | 18" | <6" ¹ |
| Roundup PowerMAX (RR-corn) | 16 fl.oz | 3" | 3" | 6" | 4" | 12" | 12" | X | X | 12" | X |
| | 22 fl.oz | 6" | 6" | 12" | 6" | 20" | 18" | Boot stage | 6" | 20" | <6" ¹ |
| Steadfast Q | 1.5 oz | 4" | 2" | 1" | 4" | 4" | 12" | 12" | 4" | 6" | 4" ¹ |

X = Not labeled for control. Some weeds may be labeled for suppression or partial control.

¹ Suppression, partial control, or reduced competition.

² Maximum size for giant foxtail with ARMEZON or IMPACT is 4 inches; suppression or partial control of green and yellow foxtail.

³ Maximum size for yellow foxtail with LIBERTY is 3 inches. Crabgrass and yellow foxtail must be treated prior to tiller initiation

Maximum Weed Size Labeled for Postemergence Herbicide Applications

| HERBICIDE | Rate/A | Black Nightshade | Burcucumber | Cocklebur | Lambsquarters | Marestail (Horseweed) [#] | Morningglory | Palmer Amaranth # | Pigweed, Smooth | Prickly Sida | Ragweed, Common # | Ragweed, Giant # | Sicklepod | Smartweed | Velvetleaf | Waterhemp # |
|-------------------------------|------------|------------------|------------------|-----------------|-----------------|------------------------------------|---------------------|-------------------|-----------------|---------------------|-------------------|------------------|------------------|-----------------|------------------|-------------|
| Accent Q | 0.67 oz | X | 3" | X | X | X | 3" | X | 4" | X | X | X | X | 4" | X | X |
| Callisto | 3 oz | 5" | 5" ¹ | 5" | 5" | 5" ¹ | 5" ¹ | 3" ¹ | 5" | X | 5" ¹ | 5" | X | 5" | 5" | 2" |
| Callisto GT (RR-corn) | 2 pt | 4" | 4" | 4" | 4" | 4" | 4" | 4" | 4" | 4" | 4" | 4" | 4" | 4" | 4" | 4" |
| Callisto Xtra | 20 fl.oz | 5" | 2" | 5" | 5" | 5" | 2" | 2" | 5" | 2" | 3" | 3" | X | 5" | 5" | 3" |
| | 24 fl.oz | 10" | 10" | 10" | 10" | 5"/10" ¹ | 5"/10" ¹ | 3" | 10" | 2"/10" ¹ | 10" | 10" | X | 10" | 10" | 10" |
| Capreno | 3 fl.oz | <6" | <6" ¹ | <6" | <6" | <6" ¹ | <6" ¹ | <6" | <6" | <6" ¹ | <6" | <6" | <6" ¹ | <6" | <6" | <6" |
| Halex GT (RR-corn) | 3.6–4 pt | 4" | 4" | 4" | 4" | 4" | 4" | 4" | 4" | 4" | 4" | 4" | 4" | 4" | 4" | 4" |
| Impact or Armezon | 0.75 fl.oz | 6" | 6" | 8" | 6" | 6" | 6" ¹ | 6" | 6" | 3" | 6" | 8" | X | 3" | 8" | 6" |
| Laudis | 3 fl.oz | <6" | <6" ¹ | <6" | <6" | <6" | <6" ¹ | <6" | <6" | X | <6" | <6" | <6" ¹ | <6" | <6" | <6" |
| Liberty (LL-corn) | 22 oz | 6" | 6" | 6" | 4" | X ¹ | 6" | X | 3" | 4" | 6" | 6" | 4" | 6" | 3" | 4" |
| Permit | 0.67 oz | X | 3" ¹ | 9" | 2" ¹ | X | X | X | 3" | X | 9" | 3" | X | 2" | 9" ² | X |
| | 1.33 oz | X | 12" ¹ | 14" | 2" ¹ | X | 3" ¹ | X | 6" ² | X | 12" | 6" | X | 2" | 12" ² | X |
| Realm Q | 4 oz | <5" | <5" | <5" | <5" | X | <5" ¹ | <5" | <5" | <5" | <5" | <5" | X | <5" | <5" | <5" |
| Resolve Q | 1.25 oz | X | X | 3" ¹ | 3" | X | 3" ¹ | X | 3" | X | 3" ¹ | X | X | 3" ¹ | 3" ¹ | X |
| GLYPHOSATE 4S (RR-corn) | 1.5 pt | 12" | 6" | 18" | 8" | 6" | 2" | 12" | 18" | 2" | 6" | 4" | 2" | 6" | 3" | X |
| | 2 pt | 12" | 12" | 24" | 12" | 12" | 4" | 18" | 24" | 3" | 8" | 6" | 4" | 8" | 4" | 6" |
| Roundup PowerMAX (RR-corn) | 16 oz | 4" | 6" | 18" | 6" | 6" | X | 12" | 12" | 2" | 6" | 6" | 2" | X | X | X |
| | 22 oz | 6" | 12" | 24" | 12" | 12" | 3" | 18" | 18" | 4" | 12" | 12" | 4" | 6" | 6" | 6" |
| Spirit | 1 oz | 5" | 6" | 8" | 3" | 1-6" | 4" ¹ | 4" | 4" | 3" ¹ | 9" | 9" | 3" | 6" | 6" ² | 4" |
| Steadfast Q | 1.5 oz | X | 4" | 4" ¹ | 4" ¹ | X | 4" | X | 4" | X | X | X | X | 4" ¹ | 4" ¹ | 2" |
| Zemax | 2.0 qt | <3" | X | <3" | <3" | <3" | <3" ¹ | <3" ¹ | <3" | <3" ¹ | <3" | <3" | X | <3" | <3" | <3" |

NOTE: 2,4-D, CLARITY, DIFLEXX, STATUS and other dicamba products do not indicate size of weeds. Most seedling broadleaf weeds <3" can be effectively controlled; however, some species may be more difficult to control at the use rates labeled for corn and may depend on timing of the application.

X = Not labeled for control. Some weeds may be labeled for suppression or partial control.

¹ Suppression, partial control, or reduced competition.

² Liquid Nitrogen or Ammonium Sulfate may be added to improve control (consult label)

[#]Biotypes of this weed resistant to the class of chemistry associated with certain herbicides will not be effectively controlled.

50 Corn

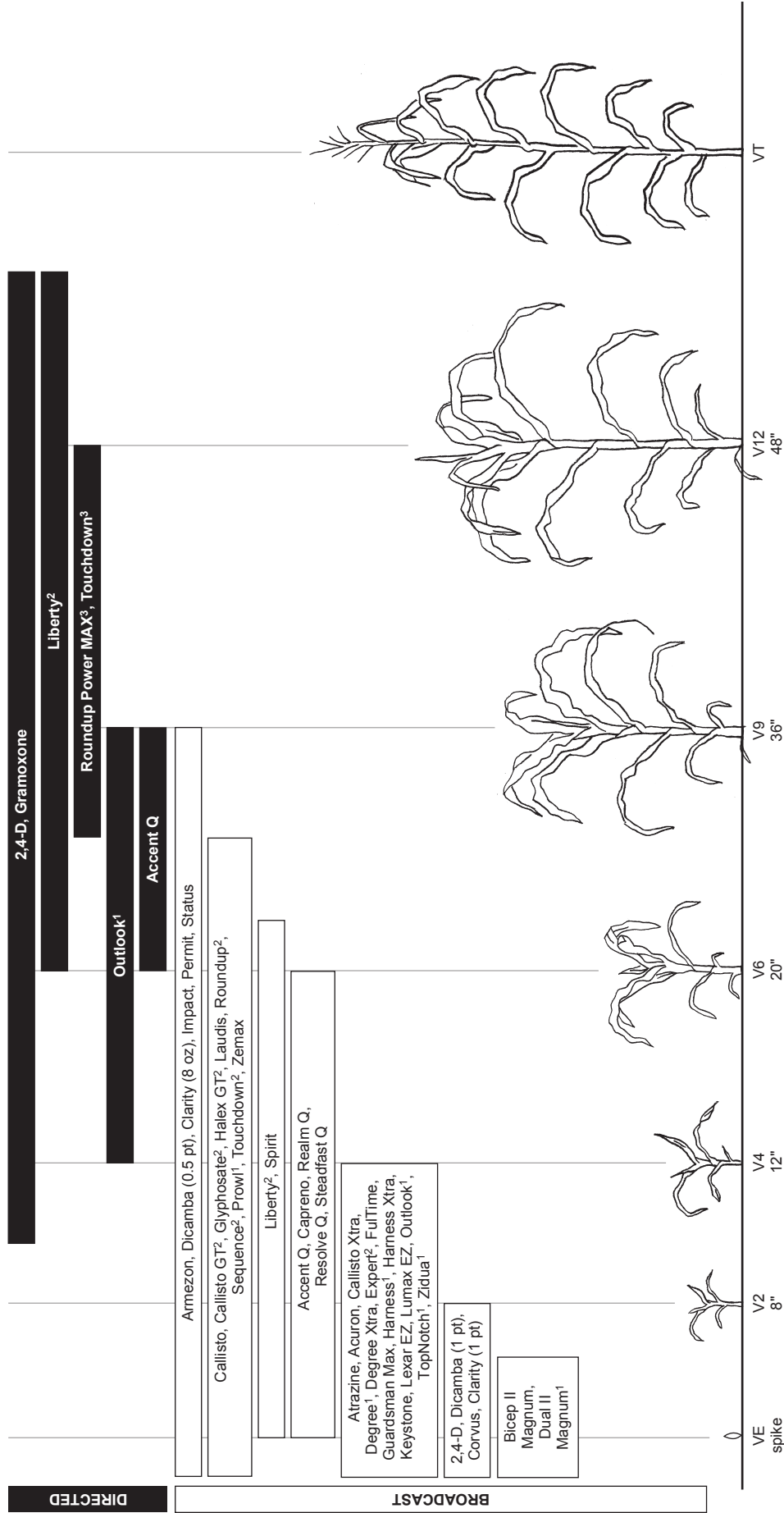
| Corn Growth Stages, Adjuvants, and Rain-Free Periods | | | |
|---|---|---|-----------------------|
| Herbicide | Adjuvant ¹ | Crop Stage | Rainfast ² |
| Accent Q | COC, MSO, or NIS plus UAN or AMS | Broadcast up to 20" tall corn or that exhibits 6 or fewer collars (V6); Use only drop nozzles for corn between 20" to 36" tall. Do not apply to corn that exceeds 36" tall or that has 10 or more collars (V10). | 4 hours |
| Armezon | MSO or COC plus UAN or AMS | May be applied anytime after corn emergence up to 45 days prior to harvest. | 1 hour |
| Atrazine | COC or Crop Oil | Apply before corn reaches 12" tall | ** |
| Callisto | COC plus UAN or AMS | Broadcast on corn up to 30" tall or up to the 8-leaf stage of corn growth. | 1 hour |
| Callisto GT (RR-corn) 3 | NIS (or COC) plus AMS | Apply from emergence up to 30" tall or up to the 8-leaf stage of growth | ** |
| Callisto Xtra | COC or NIS plus UAN or AMS | Apply after crop emergence but before corn exceeds 12" in height | ** |
| Capreno | COC plus UAN or AMS | Broadcast apply from the 1 leaf collar (V10 to 6-leaf (V6) growth stage. Use directed applications when corn is V6 to V7 growth stage | 1 hour |
| 2,4-D | generally not recommended | Broadcast apply before corn exceeds 8" tall; Use directed applications when corn is 8" tall till tassel emergence | ** |
| Dicamba [Banvel, Clarity, Sterling Blue, Vision, etc] | NIS, UAN, or AMS may be added. Consult label for use of COC | Apply 8 to 16 oz/A (0.5 to 1 pt/A) from emergence through 5th leaf stage or until corn reaches 8" tall, whichever occurs first; Apply 8 oz/A when corn is from 8" to 36" tall, if 6th true leaf is emerging from whorl, or 15 days before tassel emergence. | 4 hours |
| DiFlexx | NIS, COC, MSO + UAN or AMS may be added (consult label) | Broadcast apply 8 to 16 oz/A from spike through V6 (6 leaf collars) or 36" tall, whichever occurs first. Directed applications may be made from V7-V10 crop growth stage (7 to 10 collars), up to 36" tall, or 15 days before tassel emergence, whichever occurs first. | 4 hours |
| Expert (RR-corn) 3 | generally not required (may include AMS) | Apply from emergence until the corn reaches 12 inches tall. | 2 hours |
| Halex GT (GT-corn) 3 | NIS plus AMS | Corn emergence up to 30" height or the 8-leaf (V8) growth stage. | ** |
| Impact | MSO or COC plus UAN or AMS | May be applied anytime after corn emergence up to 45 days prior to harvest. | 1 hour |
| Laudis | MSO or COC plus UAN or AMS | Corn emergence up to the V8 growth stage (exhibits 8 collars) | 1 hour |
| Liberty (LL-corn) ³ | Add AMS | Apply from emergence until corn is 24" tall or V-7 stage (exhibits 7 developed collars), whichever comes first. For corn 24" to 36" tall, apply only with drop nozzles. | 4 hours |
| Permit | NIS or COC (may add 28% Liq N) | Apply from the spike through layby stage of field corn. | 4 hours |
| Realm Q | COC or NIS plus UAN (27-32%) or AMS | Apply to corn up to 20" tall. Do not apply to corn taller than 20" or exhibiting 7 or more leaf collars. | ** |
| Resolve Q | NIS plus UAN (28-32%) or AMS | Apply postemergence to corn that is up to 20" tall. Do not apply to corn taller than 20" or exhibiting 7 or more leaf collars. | ** |
| Roundup and other GLYPHOSATE products (RR-corn) 3 | Adjuvant requirements vary with product used | Apply broadcast over-the-top from corn emergence through V8 corn stage or 30 inches, whichever occurs first. For "Roundup Ready 2 Corn" and other hybrids designated as Glyphosate Tolerant drop nozzles can be used to direct applications on corn 30 to 48 inches. | ** |
| Spirit | COC or NIS (may include 28% to 34% Liquid Nitrogen) | Apply to corn between 4" to 24" tall; Drop nozzles recommended when corn is >20" tall or exhibits more than 6 collars (V6), whichever comes first. Applications to popcorn are more restrictive. | 4 hours |
| Status | NIS, COC, or MSO plus UAN (28-34%) or AMS | Apply from 4-inch tall (V2) to 36-inch tall (V10) corn. Do not apply if corn is more than 36", or within 15 days before tassel emergence. | 4 hours |
| Steadfast Q | COC, MSO, or NIS plus UAN or AMS | Apply to corn up to 20" tall. Do not apply to corn >20" tall or exhibiting 6 or more leaf collars (V6), whichever is more restrictive. | 4 hours |
| Zemax | NIS or COC (may include Liquid N) | Apply after emergence until corn reaches 30 inches or up to 8-leaf stage of corn growth | ** |

¹COC - Crop Oil Concentrate; NIS - Non-Ionic Surfactant (at least 80% active ingredient); AMS - Ammonium Sulfate; UAN - Urea Ammonium Nitrate (28% to 32% nitrogen fertilizer); MSO - Methylated Seed Oil; ESO - Ethylated Seed Oil

²A "**" indicates no specific time period on label for rainfastness, 6 to 8 hours of rain-free period is suggested.

³Apply only on selected field corn hybrids which have GENETIC resistance/tolerance to Liberty Link (LL-corn); or to Roundup Ready and Glyphosate-Tolerant (RR-corn or GT-corn).

Timing of Herbicides Relative to Corn Growth Stages



Relative corn growth stages of development (eg. V6 indicates 6 leaf collars are visible).

¹ Soil active herbicides which must be applied before weeds emerge.

² Apply only on selected field corn hybrids which have GENETIC resistance/tolerance to Liberty Link (LL-corn) or to Roundup Ready (RR-corn).

³ Use drop nozzles for directed applications on corn designated as "Roundup Ready Corn 2" hybrids.

POSTEMERGENCE

ACCENT Q (nicosulfuron)

| | |
|---|------------------------------|
| ACCENT Q (54.5 WDG) 0.9 oz/A or NIC-IT (2L) 2 fl.oz/A | (nicosulfuron 0.031 lb ai/A) |
| + | + |
| CROP OIL CONCENTRATE [1% v/v] 2 pt/25 gal or MODIFIED SEED OIL (MSO) [0.5% v/v] 1 pt/25 gal or SURFACTANT (Non-Ionic 80%) 0.5 pt to 1 pt/25 gal | (additive) |
| + | + |
| AMMONIUM NITROGEN FERTILIZER (28% to 32% UAN) 2 qt/A | (additive) |
| Or | |
| AMMONIUM SULFATE 2 lb/A | |

Weeds Controlled: Barnyardgrass, broadleaf signalgrass, foxtails, johnsongrass, pigweeds, shattercane.

Crop Stage: ACCENT Q and NIC-IT are labeled for use on field corn grown for grain or silage. Consult label for specific use directions on field corn grown for seed and use on popcorn and sweet corn. When applied alone ACCENT Q (nicosulfuron) can be broadcast on field corn up to 20 inches tall or that exhibits 6 or fewer collars (V6 growth stage). Use drop nozzles for a post-directed application on corn between 20 to 36 inches tall. DO NOT APPLY to corn that is taller than 36 inches or that has developed 10 or more collars (V10), whichever is the most restrictive. When tank mixed with other herbicides consult the label for maximum crop growth stage.

General Comments: ACCENT Q contains 54.5 lb ai of nicosulfuron per lb of product plus isoxadifen (a crop safener); NIC-IT (2L) contains 2.0 lb ai per gallon. Optimum size for control of johnsongrass and shattercane is when plants are 4 to 12 inches tall. Johnsongrass arising from rhizomes should be 8 to 18 inches tall when treated. For use to control other weeds, apply when weeds are less than 4 inches in height. Sequential applications may be used to control late flushes of weeds or regrowth of perennial grasses such as rhizome johnsongrass. Apply in a spray volume of at least 10 gallons per acre. The combined dosage for two applications for ACCENT Q cannot exceed 1.8 oz/A (consult label for NIC-IT). Before applying ACCENT Q (nicosulfuron) consult the soil insecticide interaction information on the label to ensure that it is compatible with any insecticides previously applied to the corn. For example, applications to corn previously treated with "Counter", "Lorsban", or "Thimet" may cause unacceptable crop injury. Also, consult label directions before applying ACCENT Q (nicosulfuron) with foliar applied insecticides or other foliar herbicides. Consider planting a MDM/MCD virus tolerant corn variety in fields where rhizome johnsongrass has overwintered. The likelihood of corn injury may increase if applied at improper stage of growth or when corn is under stress due to drought, diseases, insect damage, or nutrient deficiency.

Environmental Statements: Avoid direct spray drift to nearby crops or vegetation.

Rain Delay: Allow 4 hours between application and expected rainfall.

Rotation Restrictions: Rotational crops which may be planted include soybean 15 days; wheat, barley or rye 4 months following application (consult label for cereal crops when using NIC-IT); and alfalfa or red clover 10 months following application. Sorghum may be planted after 10 months if soil pH is 7.5 or less. For all other crops, the rotation interval is 10 months where soil pH is 6.5 or less, and 18 months where soil pH is greater than 6.5.

Harvest & Forage Restrictions: Wait 30 days after application before utilizing treated corn for grain, forage feed or grazing.

Tank Mixtures: On field corn the following tank mixtures may be used – Atrazine, Bicep II Magnum, Callisto, Cinch, Cinch ATZ, dicamba (eg. Clarity), Dual II Magnum, Exceed, Impact, Lexar, Lumax, Marksman, Northstar, Outlook, Prowl, Surpass EC [Consult label for any precautions and maximum application rates of all products before tank mixing]. When tank mixed with other herbicides consult the label for crop growth stage, rates, and use of adjuvants. DO NOT tank mix nicosulfuron products with Basagran, Laddok or certain insecticides as severe crop injury may occur. DO NOT tank mix with 2,4-D since poor control of grasses may occur.

CALLISTO

| | | | |
|---|-----------------|---|----------------------------|
| CALLISTO 4SC | 3 fl. oz/A | | (mesotrione 0.094 lb ai/A) |
| | | + | |
| Crop Oil Concentrate (1% v/v) | 1 qt/25 gal | | (additive) |
| | | + | |
| Urea Ammonium Nitrate [28-0-0] (2.5% v/v) | 2.5 qt/25gal or | | (additive) |
| Ammonium Sulfate | 8.5 lb/100 gal | | |

Weeds Controlled: Black nightshade, cocklebur, lambsquarters, pigweeds, giant ragweed, smartweed, velvetleaf.
Crop Stage: CALLISTO is labeled for use on field corn and corn grown for silage. For applications on yellow popcorn and sweet corn consult label for use of adjuvants. Broadcast on corn up to 30 inches tall or up to the 8-leaf stage of corn growth.

General Comments: CALLISTO 4SC contains 4 lb ai mesotrione per gal. Do not use Methylated Seed Oils or MSO blend adjuvants as a spray additive. When applied with other products consult Callisto label or other supplemental labels for permitted uses of adjuvant additives. For postemergence control apply CALLISTO when broadleaf weeds are less than 5 inches tall and actively growing. When applying take necessary precautions to reduce the potential for spray drift. Do not apply CALLISTO if the corn crop was treated with Counter or Lorsban insecticide. Do not make foliar postemergence applications in a tank mixture with any organophosphate or carbamate type insecticides and consult label directions before applying CALLISTO as a sequential with foliar insecticides. Do not make more than two applications of CALLISTO per season and do not exceed 3 oz/A per application. The total amount per season of mesotrione may not exceed 0.24 lb ai/A applied as CALLISTO (7.7 fl.oz./A) or from all other mesotrione containing products, including Lexar, Lumax, and Camix.

Environmental Statements: CALLISTO has a SURFACE WATER advisory statement on the label.

Rain Delay: 1 hour.

Rotation Restrictions: Corn (all types), sorghum, and oats may be replanted immediately. Small grains may be planted 120 days (4 months) after CALLISTO application. Soybeans, canola, tobacco, alfalfa, and sunflowers may be planted back the following season, but not less than 10 months after application. Red clover and most other rotational crops may be planted 18 months after application.

Harvest & Forage Restrictions: Do not harvest for forage, grain, or stover within 45 days of application.

Tank Mixtures: Accent, Atrazine, Basis, Buctril, Glyphosate, Ignite, Steadfast, Stout. DO NOT apply postemergence in a tank mixture with an emulsifiable concentrate grass herbicide or injury may occur. Soil-residual herbicides include Axiom, Define, Bicep II Magnum, Degree, Degree Xtra, Dual II Magnum, FulTime, Guardsman Max, Harness, Harness Xtra, Keystone, Outlook, Surpass EC, Prowl, Topnotch. Burndown herbicides include 2,4-D, Expert, Gramoxone, Roundup brands, and Touchdown brands.

**CALLISTO GT
(Glyphosate Tolerant Corn Hybrids ONLY)**

| | | | |
|----------------------------|---------------------|---|---|
| CALLISTO GT | 2 pt/A | | [glyphosate:mesotrione (1.0:0.095 lb ai/A)] |
| | | + | |
| SURFACTANT (Non-Ionic 80%) | 1 to 2 qt/100 gal | | (additive) |
| | | + | |
| Ammonium Sulfate | 8.5 - 17 lb/100 gal | | |

Weeds Controlled: Barnyardgrass, black nightshade, broadleaf signalgrass, burcucumber, cocklebur, crabgrass, fall panicum, foxtails, johnsongrass, lambsquarters, pigweed, giant ragweed, shattercane, sicklepod, smartweed, velvetleaf, waterhemp. Consult label for specific weed species.

Crop Stage: Use only on selected CORN HYBRIDS which are designated with Glyphosate Tolerance or the Roundup Ready gene. Apply from corn emergence up to 30 inches in height or the 8-leaf growth stage.

General Comments: CALLISTO GT is a pre-package mixture containing glyphosate + mesotrione [3.8+0.38 lb ae/gal]. Apply with Non-Ionic Surfactant plus Ammonium Sulfate. Crop Oil Concentrate at 1% v/v may be substituted for NIS; however, use of Ammonium Nitrate (UAN) or other suspension fertilizers is not recommended and will result in crop injury. For control of emerged annual grasses and broadleaf weeds less than 4 inches tall. Do not apply more than 2 pt/A of CALLISTO GT per growing season or apply more than 0.24 lb of mesotrione (eg. Callisto) per year. Severe corn injury could result if CALLISTO GT is applied when corn has been treated with soil-applied organo-phosphate insecticides (eg. Counter, Lorsban) or foliar applied organophosphate or carbamate insecticides or if tank mixed with emulsifiable concentrate grass herbicides.

Environmental Statements: Do not apply directly to water or areas where surface water is present.

Rain Delay: Rainfall soon after application may reduce effectiveness.

Rotation Restrictions: Corn and grain sorghum may be replanted immediately; barley, rye, and winter wheat 4 months after application; or alfalfa, canola, soybeans, and tobacco may be planted 10 months after application. Other crops not listed by the label may be planted 18 months after application.

Harvest & Forage Restrictions: To avoid possible illegal residues, do not graze or feed forage from treated areas for 45 days following application or do not harvest forage, grain, or stover within 45 after application.

Tank Mixtures: Atrazine, Buctril, Clarity, Status, Northstar.

54 Corn

CALLISTO XTRA

| | | |
|---|----------------------|--|
| CALLISTO XTRA (3.7L) | 20 to 24 fl. oz/A | [mesotrione:atrazine (0.078:0.5 to 0.094:0.6 lb ai/A)] |
| | + | + |
| Crop Oil Concentrate (1% v/v) | 1 qt/25 gal or | |
| Surfactant [Non-Ionic] (0.25% v/v) | 0.5 pt/25 gal | (additive) |
| | + | + |
| Urea Ammonium Nitrate [28-0-0] (2.5% v/v) | 2.5 qt/25gal | |
| | Or | (additive) |
| Ammonium Sulfate | 8.5 to 17 lb/100 gal | |

Weeds Controlled: Black nightshade, cocklebur, lambsquarters, Palmer amaranth, pigweed, common ragweed, giant ragweed, smartweed, velvetleaf, waterhemp.

Crop Stage: CALLISTO XTRA is labeled for use on field corn and corn grown for silage. For applications on yellow popcorn and sweet corn consult label for use of adjuvants. Apply to corn after crop emergence but before corn exceeds 12" in height.

General Comments: CALLISTO XTRA is a premixture of mesotrione + atrazine [0.5 + 3.2 lb ai per gal]. Do not use Methylated Seed Oils or MSO blend adjuvants as a spray additive. For postemergence weed control apply when weeds are less than 5" in height. Use the higher rate for increased residual control and for susceptible weeds 5-10" tall. When applying take necessary precautions to reduce the potential for spray drift. Do not apply CALLISTO XTRA if the corn crop was treated with Counter or Lorsban insecticide. Do not make foliar postemergence applications in a tank mixture with any organophosphate or carbamate type insecticides and consult label directions before applying as a sequential with foliar insecticides. The total amount per season of mesotrione (i.e. applied as Callisto, Camix, Lexar, or Lumax) may not exceed 0.24 lb ai/A or do not exceed 2.5 lb ai/A of atrazine containing products.

Environmental Statements: CALLISTO EXTRA is a RESTRICTED-USE pesticide and contains GROUND and SURFACE WATER ADVISORY statements on the label. [NOTE: See page 23 for PRECAUTIONS on use of atrazine containing products near ground or surface water].

Rain Delay: None indicated on the label.

Rotation Restrictions: Corn (all types) and sorghum (grain) may be replanted immediately. Alfalfa, barley, canola, soybeans, tobacco, and wheat may be planted back the following spring after application. Other rotational crops may require an 18 month rotational interval.

Harvest & Forage Restrictions: Do not graze or harvest for forage or grain within 60 days of application.

Tank Mixtures: Accent Q, atrazine, Basis, Buctril, Clarity, Ignite 280SL, glyphosate (Roundup, Touchdown, etc.), Northstar, Require Q, Resolve Q, Status, Steadfast, Steadfast Q, Steadfast ATZ, and Stout. DO NOT apply postemergence in a tank mixture with an emulsifiable concentrate grass herbicide, unless specified by the label, or injury may occur. Soil-residual herbicides include products such as Bicep II Magnum.

CAPRENO

| | | |
|----------------------------|---------------------------|--|
| CAPRENO (3.45SC) | 3 fl.oz/A | [thiencarbazone:tembotrione (0.013:0.068 lb ai/A)] |
| | + | + |
| Crop Oil Concentrate (COC) | 1 gal/100 gal | (additive) |
| | + | + |
| Ammonium Nitrate [UAN] | 1.5 qt/A OR | (additive) |
| Ammonium Sulfate [AMS] | 8.5 lb/100 gal (1.5 lb/A) | |

Weeds Controlled: Barnyardgrass, cocklebur, fall panicum, foxtail, johnsongrass (seedling), lambsquarters, black nightshade, Palmer amaranth, pigweeds, common ragweed, shattercane, smartweed, velvetleaf, waterhemp.

Crop Stage: CAPRENO is labeled for use on field corn grown for grain or silage, popcorn, and sweet corn. Broadcast apply to corn from 1 leaf collar (V1) through the 6-leaf collar stage (V6) stage of growth. Use directed applications on corn that is from V6 through V7 growth stage.

General Comments: CAPRENO is a premixture of thiencarbazone-methyl + tembotrione [0.57 + 2.88 lb ai per gal]. For postemergence control of broadleaf weeds <6" tall and selected grasses. Consult label for maximum height of grasses. When applying take necessary precautions to reduce the potential for spray drift. Do not apply CAPRENO if the corn crop was treated with soil-applied Lorsban, Counter, Dyfonate, Thimet, or any other organophosphate insecticides. Do not make foliar postemergence applications within 7 days of any organophosphate or carbamate type insecticides and consult label directions before applying CAPRENO with other soil-applied or foliar insecticides. Do not apply with liquid fertilizers as the primary spray carrier. Do not exceed a total of 6 fl.oz/A per growing season.

Environmental Statements: Do not apply directly to water, or to areas where surface water is present.

Rain Delay: 1 hour.

Rotation Restrictions: Field corn (yellow dent) may be replanted immediately. Wheat may be planted 4 months after CAPRENO application; barley, soybean, white corn, and sorghum after 10 months; or alfalfa, canola, and oats after 18 months. Most other rotational crops may be planted 18 months after application with completion of a successful field bioassay. Consult label for additional restrictions if precipitation is limited or soil pH is 7.5 or above.

Harvest & Forage Restrictions: Do not graze or harvest corn forage for at least 45 days after application.

Tank Mixtures: Atrazine, Buctril, Ignite 280SL, and glyphosate products.

2,4-D

2,4-D AMINE 0.5 to 1 pt/A or
2,4-D ESTER 0.5 to 0.75 pt/A
[4 lb ai/gal formulation]

(2,4-D Amine 0.25 to 0.5 lb ai/A) or
(2,4-D Ester 0.25 to 0.375 lb ai/A)

Weeds Controlled: Cocklebur, common ragweed, giant ragweed, lambsquarters, morningglories, Palmer amaranth, pigweed, prickly sida, smartweed, velvetleaf, waterhemp.

Crop Stage: Make broadcast applications before corn exceeds 8 inches tall. Use only DIRECTED applications when corn is from 8 inches to tassel emergence.

Preharvest: May be used at higher application rates when applied as a preharvest treatment [consult label]. Apply after hard dough or denting stage of growth.

General Comments: Several 2,4-D ESTER and 2,4-D AMINE products are available (formulations vary from 3 to 6 lb ai of 2,4-D per gal). Adjust rates accordingly for other product formulations (consult individual product labels for specific rates). Additives are generally not recommended for postemergence applications, except in tank mixtures with other products (consult individual product labels). Crop injury may occur when using higher rates or if applied during periods of rapid growth. Brittleness of corn may result in broken stalks if windstorms or cultivation follow within a week after application.

Environmental Statements: Be cautious about applications of 2,4-D near sensitive broadleaf crops such as tobacco, soybean, grapes, vegetables or ornamental plantings to avoid potential injury caused by spray drift. Do not apply when air temperatures are above 85 F.

Rain Delay: None indicated on label; 4 to 6 hours suggested.

Rotation Restrictions: None indicated on label following normal growth and harvest of corn.

Harvest & Forage Restrictions: A 7 day waiting period is generally indicated on most 2,4-D labels before utilizing corn for forage or feed.

Tank Mixtures: Consult label.

DICAMBA

Dicamba 4S 8 to 16 oz/A (0.5 to 1 pt/A)
[eg. BANVEL, CLARITY, DIFLEXX, STERLING BLUE, VISION, etc.]

(dicamba 0.25 to 0.5 lb ai/A)

Weeds Controlled: Black nightshade, cocklebur, common ragweed, giant ragweed, jimsonweed, lambsquarters, morningglories, Palmer amaranth, pigweed, prickly sida, sicklepod, smartweed, velvetleaf, waterhemp.

Crop Stage: Apply 8 to 16 oz/A (0.5 to 1 pt/A) as a broadcast spray from corn emergence through 5th leaf stage or until corn is 8 inches tall, whichever comes first. Apply at a maximum of 8 oz/A (0.5 pt/A), if 6th true leaf is emerging from whorl, when corn size reaches 8 to 36 inches tall, or up to 15 days before tassel emergence, whichever comes first. Consult DIFLEXX label for crop growth stages and application rates. Use DIRECTED spray applications when 1) corn leaves prevent proper weed coverage, 2) sensitive crops are growing nearby, or 3) tank mixing with 2,4-D.

General Comments: CLARITY 4S and STERLING BLUE contain 4 lb ae/gal of the diglycolamine salt of dicamba; DIFLEXX 4SC contains 4 lb ae/gal of the diglycolamine salt of dicamba plus a safener (cyprosulfamide). BANVEL contains 4 lb ae/gal of the dimethylamine salt of dicamba; and VISION contains 3.8 lb dicamba acid. Additives are generally not required when applied alone, but a Surfactant, Crop Oil Concentrate, or Liquid Fertilizer (UAN or AMS) may be added to tank mixes with other herbicides or to improve weed control. Consult label for use of crop oil concentrate as an additive. Avoid applications to crops under stress due to environmental conditions or other factors.

Environmental Statements: Some crops such as tobacco, soybeans, grapes, vegetables, and ornamental plants can be extremely susceptible to DICAMBA spray drift and vapors. Do not apply where sensitive crops are growing nearby, if winds over 5 MPH and are moving in the direction of sensitive crops, or if air temperatures on the day of application will exceed 85 degrees.

Rain Delay: None indicated on label for BANVEL; 4 hours for CLARITY, DIFLEXX, STERLING BLUE, and VISION.

Rotation Restrictions: Any rotational crop may be planted following normal growth and harvest of corn. However, for between crop or post harvest applications delay planting soybeans a minimum of 30 days per each pint/acre of DICAMBA applied and delay planting wheat 20 days per pint of DICAMBA treated per acre. Any rotational crop may be planted at 120 days or more following application. For barley, oat, wheat, and other grass seedlings, wait at least 15 days per 8 oz/A of the dicamba product applied.

Harvest & Forage Restrictions: Do not graze or harvest DICAMBA treated corn for dairy or beef feed until the crop has reached the ensilage (milk) stage or late in maturity, except corn treated with DIFLEXX can be harvested for forage 45 days after application.

Tank Mixtures: Accent, Atrazine, Buctril, Glyphosate (RR-corn), Hornet, Liberty (LL-corn), Permit, Spirit. Tank mixtures with other products containing DICAMBA must not exceed a combined rate of 0.5 lb of dicamba per acre. DICAMBA plus 2,4-D (0.25 pt/A) may be applied as a DIRECTED treatment using drop nozzles in corn (apply when corn is at least 8 inches tall, but less than 36 inches in height or until 15 days before tassel emergence). Consult label for tank mixes with soil applied herbicides.

GLYPHOSATE¹

(Glyphosate-Tolerant Corn Hybrids ONLY)

The information below provides guidelines for postemergence applications of GLYPHOSATE on corn hybrids designated as “Roundup Ready Corn 2”, “Roundup Ready Corn”, “Agrisure GT”, or GT-corn hybrids. The maximum corn growth stage for postemergence treatments and the labeled application rates for use on Glyphosate-Tolerant (GT) corn hybrids may depend on the genetic event of the corn hybrid planted and the specific glyphosate product used. Consult your seed dealer for specific guidelines for corn tolerance. Dry Ammonium Sulfate at 1 to 2% by weight (8.5 to 17 lb/100 gal) may be included with glyphosate to improve weed control. Some Glyphosate products do not need additional surfactant; but some products require addition of a non-ionic surfactant. **ALWAYS CONSULT THE PRODUCT LABEL FOR SPECIFIC DIRECTIONS.**

| | | | |
|---|---|--|---|
| Glyphosate, Roundup Original, and similar Glyphosate products¹ | | | |
| [3 lb ae/gal formulation] (4 lb ai/gal) | 1.5 up to 2 pt/A* (24 to 32 fl.oz/A) | [glyphosate 0.56 to 0.75 ae/A] (0.75 to 1.0 lb ai/A) | Roundup Ready Corn and GT-corn hybrids ^{^*} |
| * NOTE: For certain glyphosate products up to 3 pt/A may be made with single in-season applications and/or drop nozzles may be used when corn height is 30 to 40 inches (consult specific product label for details). | | | |
| Buccaneer 5 | | | |
| [3.75 lb ae/gal formulation] | 1.25 to 1.6 pt/A (20 to 26 fl.oz/A) | [glyphosate 0.58 to 0.75 lb ae/A] | Roundup Ready Corn or other GT-corn hybrids [^] |
| Duramax / Durango DMA | | | |
| [4 lb ae/gal formulation] (5.4 lb ai/gal) | 1.12 to 2.25 pt/A (18 to 37.5 fl.oz/A) | [glyphosate 0.56 to 1.15 lb ae/A] (0.75 to 1.5 lb ai/A) | Roundup Ready Corn 2 [#] |
| | 1.12 to 1.5 pt/A (18 to 24 fl.oz/A) | [glyphosate 0.56 to 0.75 lb ae/A] (0.75 to 1.0 lb ai/A) | Roundup Ready Corn [^] |
| Touchdown Total | | | |
| [4.17 lb ae/gal formulation] | 1.1 to 2.2 pt/A (17 to 35 fl.oz/A) | [glyphosate 0.55 to 1.15 lb ae/A] | GT-corn hybrids including “Agrisure GT” and “Roundup Ready Corn” [#] |
| Roundup PowerMAX / Roundup WeatherMAX | | | |
| [4.5 lb ae/gal formulation] (5.5 lb ai/gal) | 1 to 2 pt/A (16 to 32 fl.oz/A) | [glyphosate 0.56 to 1.12 lb ae/A] (0.69 to 1.375 lb ai/A) | Roundup Ready Corn 2 [#] |
| Touchdown HiTech | | | |
| [5 lb ae/gal formulation] | 0.88 to 1.88 pt/A (14 to 30 fl.oz/A) | [glyphosate 0.56 to 1.17 lb ae/A] | GT-corn hybrids including “Agrisure GT” and “Roundup Ready Corn” [#] |
| CROP GROWTH STAGE: USE ONLY ON SELECTED FIELD CORN HYBRIDS DESIGNATED AS GLYPHOSATE-TOLERANT. | | | |
| [^] May be applied on “Roundup Ready Corn” or other designated GT-corn hybrids from emergence through V8 growth stage or until corn reaches 30 inches, whichever comes first. | | | |
| [#] Apply as a broadcast treatment over-the-top of Glyphosate-Tolerant corn hybrids from corn emergence through the V8 growth stage or until corn reaches 30 inches, whichever comes first. On corn hybrids designated as “Roundup Ready Corn 2” and/or with certain glyphosate products drop nozzles may be used when corn height is 30 to 48 inches. | | | |

¹ Glyphosate is available in various formulations. **SEE PAGE 22 FOR A DETAILED LIST OF GLYPHOSATE PRODUCTS.** The concentration of glyphosate may be expressed as the **acid equivalent** which is based on the parent acid of glyphosate or expressed as **active ingredient** which is based on the parent acid plus the salt in the formulated product. Comparing glyphosate rates based on acid equivalents is usually the most logical way to evaluate products on equal terms.

GLYPHOSATE (continued)

Weeds Controlled: Barnyardgrass, black nightshade, broadleaf signalgrass, burcucumber, cocklebur, crabgrass, fall panicum, foxtails, jimsonweed, johnsongrass (seed and rhizomes), lambsquarters, pigweed, giant ragweed, shattercane, sicklepod, smartweed, velvetleaf. Consult label for specific troublesome weed species and their recommended growth stages.

General Comments: Observe label for recommendations for control of specific troublesome weed species. A sequential application may be needed to control regrowth on new weed flushes. For optimum control of perennials, apply when broadleaf plants are in the early bud to flowering stage and when grasses are in the boot to seedhead stage.

Maximum Use Rates: The following table indicates the maximum rate of product for various glyphosate formulations for a single in-crop application and the total combined rate for sequential applications to Roundup Ready corn or other GT-corn hybrids.

| Glyphosate Formulation (acid equivalent) | Maximum Rate Preplant Before Crop Emergence | Maximum Rate for Single In-Crop Application | Combined Total of Multiple In-Crop Applications | Maximum Use Rate for Pre-Harvest Application | Combined Season Total for All Applications |
|--|---|---|---|--|--|
| Glyphosate, Roundup, etc. (3 lb ae/gal) | 5 qt/A | 2 pt/A [GT-hybrid] | 2 qt/A [GT-hybrid] | 1 qt/A | 8 qt/A |
| | | 3 pt/A [RR-2 hybrid] | 3 qt/A [RR-2 hybrid] | | |
| Buccaneer 5 (3.75 lb ae/gal) | 4 qt/A | 1.6 pt/A | 3.2 pt/A | 1.6 pt/A | 6.5 qt/A |
| Duramax Durango DMA (4 lb ae/gal) | 3.75 qt | 1.5 pt/A [GT-hybrid] | 1.5 qt/A [GT-hybrid] | 0.75 qt/A (1.5 pt/A) | 6 qt/A |
| | | 2.25 pt/A [RR-2 hybrid] | 2.25 qt/A [RR-2 hybrid] | | |
| Touchdown Total (4.17 lb ae/gal) | 3.6 qt/A | 35 oz/A | 70 oz/A | 24 oz/A | 5.75 qt/A |
| Roundup PowerMAX, Roundup WeatherMAX (4.5 lb ae/gal) | 3.3 qt/A | 32 oz/A (2 pt/A) [RR-2 hybrid] | 64 oz/A (2 qt/A) [RR-2 hybrid] | 22 oz/A | 5.3 qt/A |
| Touchdown Hi-Tech (5 lb ae/gal) | 3 qt/A | 30 oz/A | 1.8 qt/A | 20 oz/A | 4.8 qt/A |

PREHARVEST USE: Apply after maximum kernel fill is complete and the crop is physiologically mature (black layer formation) with 35 percent grain moisture or less. Allow a minimum of 7 days between application and corn grain harvest.

Environmental Statements: Take precautions to prevent spray particle drift to desirable plants.

Rain Delay: Rainfall soon after application may reduce effectiveness. Some labels indicate 6 hours.

Rotation Restrictions: Any crop may be planted following normal growth and harvest of corn. Wait at least 30 days before planting crops not listed on the label.

Harvest & Forage Restrictions: Allow a minimum of 50 days between application and harvest of corn forage.

Tank Mixtures: Consult label of Glyphosate product used for tank mixtures with other herbicide or insecticide products.

58 Corn

EXPERT (Glyphosate Tolerant Corn Hybrids ONLY)

EXPERT 3 to 3.75 qt/A [S-metolachlor:atrazine:glyphosate (1.3:1.6:0.75 to 1.6:2.0:0.94 lb ai/A)]

Weeds Controlled: Barnyardgrass, broadleaf signalgrass, burcucumber, cocklebur, crabgrass, fall panicum, foxtails, jimsonweed, johnsongrass, lambsquarters, pigweeds, common ragweed, giant ragweed, shattercane, smartweed, velvetleaf.

Crop Stage: Use only on selected FIELD CORN HYBRIDS which are designated with Glyphosate Tolerance or the Roundup Ready gene. Apply from seedling emergence of corn until 12 inches in height.

General Comments: EXPERT is a pre-package mixture containing S-metolachlor + atrazine + glyphosate (isopropylamine salt) [1.74+2.14+1.0 lb ai/gal]. Additional surfactants are not required with EXPERT; however, Liquid fertilizer as carriers are not recommended for use over-the-top of Roundup Ready corn. Addition of dry Ammonium Sulfate at 1 to 2% by weight (8.5 to 17 lb/100 gallons of water) may increase performance on emerged weeds under adverse growing conditions. For control of annual grasses and broadleaf weeds and for suppression of certain perennial weed species. Make only one in-season application.

Environmental Statements: EXPERT is a RESTRICTED-USE pesticide and contains GROUND and SURFACE WATER ADVISORY statements on the label. [NOTE: See page 23 for PRECAUTIONS on use of atrazine containing products near ground or surface water].

Rain Delay: Apply a minimum of 2 hours before expected rainfall.

Rotation Restrictions: Corn, sorghum (milo), or soybeans may be planted the year following application. If applied after June 10, do not rotate with crops other than corn or sorghum next year. Do not plant tobacco, vegetables, or small-seeded legumes the year following application.

Harvest & Forage Restrictions: To avoid possible illegal residues, do not graze or feed forage from treated areas for 60 days following application.

Tank Mixtures: If additional weed control is needed apply an appropriate herbicide labeled for control of that species. Do not apply EXPERT in tank mixture with any other products after crop emergence.

HALEX GT (Glyphosate Tolerant Corn Hybrids ONLY)

| | | |
|----------------------------|---------------------|---|
| HALEX GT | 3.6 to 4 pt/A | [S-metolachlor:glyphosate:mesotrione (0.9:0.9:0.094 to 1.0:1.0:0.1 lb ai/A)] |
| | + | + |
| SURFACTANT (Non-Ionic 80%) | 1 to 2 qt/100 gal | |
| | + | (additive) |
| Ammonium Sulfate | 8.5 - 17 lb/100 gal | |

Weeds Controlled: Barnyardgrass, black nightshade, broadleaf signalgrass, burcucumber, cocklebur, crabgrass, fall panicum, foxtails, johnsongrass, lambsquarters, pigweed, giant ragweed, annual ryegrass, shattercane, sicklepod, smartweed, velvetleaf. Consult label for specific weed species.

Crop Stage: Use only on selected CORN HYBRIDS which are designated with Glyphosate Tolerance or the Roundup Ready gene. Apply from corn emergence up to 30 inches in height or the 8-leaf growth stage.

General Comments: HALEX GT is a pre-package mixture containing S-metolachlor + glyphosate + mesotrione [2.09+2.09+0.209 lb ai/gal]. Apply with Non-Ionic Surfactant plus Ammonium Sulfate. The use of Ammonium Nitrate (UAN) or other suspension fertilizers is not recommended and will result in crop injury. For control of emerged annual grasses and broadleaf weeds and for residual control of weeds. Do not apply more than 4 pt/A of HALEX GT per growing season or do not apply with CALLISTO during the same season.

Environmental Statements: HALEX GT contains ground and surface water advisory statements on the label.

Rain Delay: Rainfall soon after application may reduce effectiveness.

Rotation Restrictions: Corn and grain sorghum may be replanted immediately; barley, rye, and winter wheat may be planted 120 days after application; or alfalfa, soybeans, and tobacco may be planted 10 months after application. Red clover and other crops not listed by the label may be planted 18 months after application.

Harvest & Forage Restrictions: To avoid possible illegal residues, do not graze or feed forage from treated areas for 60 days following application or do not harvest forage, grain, or stover within 45 after application.

Tank Mixtures: Atrazine.

IMPACT or ARMEZON

| | | |
|---------------------------|-------------------------|--------------------------------------|
| IMPACT or ARMEZON 2.8SC | 05. to 1.0 fl. oz/A | (topramezone 0.011 to 0.022 lb ae/A) |
| | + | + |
| Metylated Seed Oil or COC | 1 to 1.5 gal/100 gal | (additive) |
| | + | + |
| UAN [28-34%] or 10-34-0 | 1.25 to 2.5 gal/100 gal | (additive) |
| | Or | |
| Ammonium Sulfate | 8.5 lb/100 gal | |

Weeds Controlled: Black nightshade, cocklebur, lambsquarters, Palmer amaranth, pigweed, smartweed, velvetleaf, waterhemp.

Crop Stage: Labeled for use on field corn grown for grain or silage, popcorn, and sweet corn. Apply after corn emergence up to 45 days prior to corn harvest.

General Comments: IMPACT or ARMEZON 2.8SC contain 2.8 lb ae topramezone per gal. For most applications apply at 0.75 fl. oz/A when susceptible weeds are 2 to 8 inches and actively growing (consult supplemental label for use of 0.5 fl.oz/A rate or for use of 1.0 fl.oz/A on certain weeds). When applying take necessary precautions to reduce the potential for spray drift. Do not exceed a total of 1.0 fl.oz/A (0.022 tropramezone/A) per season.

Environmental Statements: Do not apply directly to water, or areas where surface water is present.

Rain Delay: 1 hour.

Rotation Restrictions: Corn (all types field, sweet, and popcorn) may be replanted immediately. Small grains (wheat, barley, oats, and rye) may be planted 3 months after application; alfalfa, sorghum, and soybeans after 9 months. Red clover, tobacco, and most other rotational crops may be planted 18 months after application.

Harvest & Forage Restrictions: Do not graze or harvest for forage at least 45 days after application.

Tank Mixtures: Accent, Aim, Atrazine, Buctril, Clarity, 2,4-D, Glyphosate, Hornet, Ignite, Lightning, Marksman, Option, Permit, Require Q, Resolve Q, Status, Steadfast, Stout. May also be tank mixed with soil residual herbicides such as Bicep II Magnum, Degree Xtra, Dual II Magnum, Guardsman Max, Harness Xtra, Keystone, and Prowl. ARMEZON or IMPACT may be tank mixed with products containing isoxaflutole (e.g. Balance Pro) if isoxaflutole rate does not exceed 0.0625 lb ai/A.

LAUDIS

| | | |
|---------------------------------|---------------------------|-----------------------------|
| LAUDIS | 3 fl.oz/A | (tembotrione 0.082 lb ai/A) |
| | + | + |
| Metylated Seed Oil (MSO) or COC | 1 gal/100 gal | (additive) |
| | + | + |
| Ammonium Nitrate [UAN] | 1.5 qt/A OR | (additive) |
| Ammonium Sulfate [AMS] | 8.5 lb/100 gal (1.5 lb/A) | |

Weeds Controlled: Cocklebur, lambsquarters, black nightshade, Palmer amaranth, pigweed, giant ragweed, velvetleaf, waterhemp.

Crop Stage: LAUDIS is labeled for use on field corn grown for grain or silage, popcorn, and sweet corn. Apply from corn emergence up to the V8 stage of growth (V7 stage for sweet corn)

General Comments: LAUDIS contains 3.5 lb ai tembotrione per gal. For postemergence control apply LAUDIS when susceptible broadleaf weeds are <6 inches and actively growing. Consult label for maximum height of grasses. When applying take necessary precautions to reduce the potential for spray drift. LAUDIS may be used with foliar applied insecticides registered for use in corn. Do not apply LAUDIS with liquid fertilizers as the primary spray carrier. Do not exceed a total of 6 fl.oz/A per growing season (3 fl.oz/A for sweet corn).

Environmental Statements: Do not apply directly to water, or to areas where surface water is present.

Rain Delay: 1 hour.

Rotation Restrictions: Corn may be replanted immediately. Small grains may be planted 4 months after LAUDIS application; soybean after 8 months; or alfalfa, canola, and sorghum after 10 months. Most other rotational crops may be planted 18 months after application with completion of a successful field bioassay.

Harvest & Forage Restrictions: Do not graze or harvest corn forage for at least 45 days after application.

Tank Mixtures: Tank mixing with atrazine can improve performance on some weeds. Other products include Accent, Buctril, Glyphosate, Ignite 280SL, Option, Steadfast, Stout. LAUDIS may be tank mixed with soil residual herbicides such as Define SC. May also be tank mixed with foliar insecticides labeled for corn.

60 Corn

LIBERTY (Liberty Link Hybrids ONLY)

LIBERTY 280SL 22 fl.oz/A (glufosinate-ammonium 0.40 lb ai/A)
+
Ammonium Sulfate (AMS) 3 lb/A (17 lb/100 gal) (additive)

Weeds Controlled: Burcucumber, cocklebur, giant foxtail, green foxtail, jimsonweed, johnsongrass (seedling), lambsquarters, morningglory, black nightshade, fall panicum, pigweed, common ragweed, giant ragweed, prickly sida, shattercane, smartweed, velvetleaf.

Crop Stage: Use only on selected FIELD CORN HYBRIDS designated as "LibertyLink" or warranted to be resistant to LIBERTY applications (consult label). Apply as a broadcast treatment from emergence until corn is 24" tall or in the V-7 growth stage (exhibits 7 developed collars), whichever comes first. For corn 24" to 36" tall, use drop nozzles to avoid spraying into whorls or leaf axils of corn stalks.

General Comments: LIBERTY contains 2.34 lb ai of glufosinate-ammonium per gal. Do not use a nitrogen solution as a spray carrier or add any other surfactants or crop oils. LIBERTY is a non-selective contact herbicides that controls certain grasses and broadleaf weeds. Good spray coverage is important for optimum control. See label for optimum stages of weed growth and rate at time of application. A second application of LIBERTY or a tank mix with a residual herbicide will be needed to control weeds that have not yet emerged at time of application. Do not apply more than two applications or exceed 44 fl oz/A of LIBERTY per growing season. Avoid applications when corn shows injury from prior herbicide applications or environmental stress. **NOTE: If LIBERTY was used in a burndown application, no post application may be applied to the crop.**

Environmental Statements: Use precautions to avoid spray particle drift to nearby crops or sensitive vegetation.

Rain Delay: 4 hours after application.

Rotation Restrictions: Corn and soybeans may be planted anytime. Wheat, barley, rye, oats, or triticale may be planted 70 days after last application. Minimum waiting period for planting other crops is 180 days (6 months).

Harvest & Forage Restrictions: Allow 60 days following application before harvesting corn for forage and allow 70 days before harvesting corn grain or corn fodder.

Tank Mixtures: Acetochlor (Harness, Degree, Surpass, TopNotch), Aim, Atrazine, Callisto, Camix, 2,4-D, Guardsman Max, Hornet WDG, Impact, Laudis, Lexar, Lumax, metolachlor, S-metolachlor (Dual II Magnum), nicosulfuron (Accent), pendimethalin (Prowl), Permit, Python WDG, Spirit, Status, Yukon. For some products use 1/2 the recommended use rate (consult LIBERTY label for tank mix recommendations).

PERMIT

PERMIT 75DF 0.67 to 1.33 oz/A (halosulfuron 0.032 to 0.063 lb ai/A)
+
SURFACTANT (Non-Ionic 80%) 1 to 2 qt/100 gal or (additive)
CROP OIL CONCENTRATE 1 gal/100 gal

Weeds Controlled: Cocklebur, pigweeds, common ragweed, velvetleaf, yellow nutsedge.

Crop Stage: Apply from the spike through layby stage of field corn.

General Comments: PERMIT 75DG contains 0.75 lb ai halosulfuron per lb product. Apply with Non-Ionic Surfactant or Crop Oil Concentrate. Liquid nitrogen may be included in the spray solution. Apply for postemergence control of yellow nutsedge and certain broadleaf weeds in field corn and grain sorghum (milo). Consult label for optimum stages of weed growth. Two applications of PERMIT are allowed per season with a total amount not to exceed 2.67 oz product per acre. Avoid applications when crop and weeds are under stress due to drought, excessive moisture, diseases, insect damage, or nutrient deficiency.

Rain Delay: 4 hours after application.

Rotation Restrictions: Crops that may be planted include field corn after 1 month, sorghum, wheat, barley, forage grasses after 2 months, popcorn after 3 months; or soybeans and alfalfa after 9 months following PERMIT application.

Harvest & Forage Restrictions: Allow 30 days following PERMIT application before grazing or harvesting for forage or silage.

Tank Mixtures: Accent, Atrazine, Banvel, Beacon, Buctril, Callisto, Clarity, 2,4-D, Glyphosate [various products], Impact, Liberty, Option, Marksman, Status, Steadfast. Consult label for maximum corn heights and use of additives with tank mixtures.

Generic Products: Sandea

REALM Q

| | | |
|--------------------------------------|-------------|---|
| REALM Q | 4 oz/A | [rimsulfuron:mesotrione (0.019:0.08) lb ai/A] |
| | + | + |
| Crop Oil Concentrate (1%) | 1 qt/25 gal | (additive) |
| | + | + |
| Fertilizer Solution [27% or 32% UAN] | 2 qt/A | (additive) |
| or Ammonium Sulfate | 2 lb/A | |

Weeds Controlled: Cocklebur, foxtail, lambsquarters, Palmer amaranth, smooth pigweed, giant ragweed, shattercane, velvetleaf, waterhemp.

Crop Stage: Apply REALM Q to field corn that is up to 20 inches tall. Do not apply to corn taller than 20 inches or exhibiting 7 or more collars, whichever is more restrictive. Do not apply to seed corn, popcorn, or sweet corn. Consult with your seed supplier before applying to any corn hybrids known to be sensitive to ALS-type herbicides.

General Comments: REALM Q contains rimsulfuron + mesotrione [7.5% + 31.25% per lb of product] plus a corn safener (isoxadifen). Nonionic Surfactant or other special adjuvant types can be used in place of Crop Oil Concentrate or if applied with glyphosate additional adjuvant may not be needed (consult label). Apply when weeds are young and actively growing; apply in a minimum spray volume of 15 gal per acre for best performance. Do not apply more than 1 oz/A of rimsulfuron per growing season. DO NOT apply to corn when certain insecticides such as "Counter" or "Lorsban" has been applied. Consult label directions before applying REALM Q with other organophosphate insecticides or foliar herbicides such as "Basagran". The likelihood of corn injury may increase if applied during a prolonged period of cold weather and/or in conjunction with wet soils.

Rainfall Delay: Not indicated on the label.

Rotation Restrictions: Rotational crops which may be planted include field corn anytime; winter wheat after 4 months; or alfalfa, canola, sorghum, soybean, popcorn, sweet corn, and tobacco after 10 months following a REALM Q application (consult label if interval should be extended). Other crops may require an 18 month waiting period.

Harvest & Forage Restrictions: Do not graze, feed forage, grain or fodder (stover) to livestock within 45 days. Do not harvest grain within 70 days.

Tank Mixtures: May be tank mixed with other products registered for use in corn unless these mixtures conflict with the REALM Q label. Specific tank mixes listed include glyphosate (Roundup, etc.) and glufosinate. REALM Q may also be tank mixed with soil-residual herbicides such as Atrazine, Breakfree, Breakfree ATZ, Cinch, Cinch ATZ (consult label for adjuvant selection with tank mixtures).

RESOLVE Q

| | | |
|--------------------------------------|-----------------|--|
| RESOLVE Q | 1.25 oz/A | [rimsulfuron:thifensulfuron (0.014:0.003) lb ai/A] |
| | + | + |
| Crop Oil Concentrate (1%) | 1 gal/100 gal | (additive) |
| or Modified Seed Oil (0.5%) | 0.5 gal/100 gal | |
| | + | + |
| Fertilizer Solution [28% or 32% UAN] | 2 qt/A | (additive) |
| or Ammonium Sulfate | 2 lb/A | |

Weeds Controlled: Foxtail, pigweed, shattercane, velvetleaf.

Crop Stage: Do not apply to seed corn, popcorn, or sweet corn. Consult with your seed supplier before applying to any corn hybrids known to be sensitive to ALS-type herbicides. Apply to field corn that is up to 20 inches tall. Do not apply to corn taller than 20 inches or exhibiting 7 or more collars, whichever is more restrictive.

General Comments: RESOLVE Q is a unit area pack herbicide which contains rimsulfuron + thifensulfuron-methyl [18.4% + 4.0% per lb of product] plus a corn safener (isoxadifen). A nonionic surfactant or special adjuvant types can be used instead of COC or MSO or if applied with glyphosate or glufosinate that contains a built-in adjuvant no additional surfactant needs to be added to the spray tank (consult label). Apply when weeds are young and actively growing (consult label for recommended weed sizes). Apply in a minimum spray volume of 15 gal per acre. Do not apply more than 1.0 oz active ingredient of rimsulfuron from applications of RESOLVE Q or other rimsulfuron containing products. DO NOT apply within 45 days of crop emergence when an organophosphate insecticide (such as Counter) has been applied as a treatment. Consult label directions before applying RESOLVE Q with other organophosphate insecticides or foliar herbicides. The likelihood of corn injury may increase if applied at improper stage of growth or when corn is under stress due to drought, diseases, insect damage, or nutrient deficiency.

Rainfall Delay: Not indicated on the label (6 to 8 hours suggested).

Rotation Restrictions: Rotational crops which may be planted when only 1.25 oz/A has been applied per season include field corn anytime; soybean (including STS-soybean) after 1 month; wheat after 3 months; or sorghum, popcorn, sweet corn, alfalfa, red clover, and tobacco after 10 months following a RESOLVE Q application. Other crops may require an 18 month waiting period. Check label if a maximum 2.5 oz/A rate was applied per season.

Harvest & Forage Restrictions: Do not graze, feed forage, grain or fodder to livestock within 30 days.

Tank Mixtures: May be tank mixed with other products registered for use in corn unless these mixtures conflict with the RESOLVE Q label. Specific tank mixes include glyphosate (eg. Roundup, etc.) glufosinate (eg. Liberty), or Impact + atrazine. RESOLVE Q may also be tank mixed with soil-residual herbicides such as Breakfree, Breakfree ATZ, Cinch, Cinch ATZ, Lexar, Lumax, and Prequel.

62 Corn

SEQUENCE (Glyphosate Tolerant Corn Hybrids ONLY)

SEQUENCE 2.5 pt/A

[S-metolachlor:glyphosate (0.94:0.7 lb ai/A)]

Weeds Controlled: Barnyardgrass, broadleaf signalgrass, burcucumber, cocklebur, crabgrass, fall panicum, foxtails, jimsonweed, johnsongrass, lambsquarters, pigweeds, common ragweed, giant ragweed, shattercane, smartweed, velvetleaf.

Crop Stage: Use only on selected field corn hybrids which are designated with Glyphosate Tolerance or the Roundup Ready gene. Apply from seedling emergence of corn until 30 inches in height.

General Comments: SEQUENCE 4.25L contains S-metolachlor + glyphosate [3.0+2.25 lb ai/gal]. For control of annual grasses and broadleaf weeds and for suppression of certain perennial weed species. Do not exceed 5 pt/A of SEQUENCE per season. Consult label for maximum use rates when tank mixed with Dual Magnum or glyphosate.

Environmental Statements: SEQUENCE has GROUNDWATER ADVISORY statements on the label. Do not use on very permeable soil or where ground water is close to the soil surface.

Rain Delay: Rainfall soon application may reduce control of emerged weeds.

Rotation Restrictions: Corn, sorghum (with Concep treated seed), and soybean may be planted immediately; alfalfa after 4 months; wheat, barley, rye, and oats after 4.5 months; clover after 9 months; and tobacco in the spring following application.

Harvest & Forage Restrictions: Make postemergence applications at least 50 days before harvest. Do not graze or feed forage from treated areas for 30 days following application.

Tank Mixtures: When applied postemergence SEQUENCE may be applied in a tank mixture with the following herbicide products - Atrazine, Bicep II Magnum, Callisto, Clarity, 2,4-D, Dual Magnum, Lexar, Lumax, Touchdown or the following insecticides – Karate, Warrior.

SPIRIT

SPIRIT 57DF 1 oz/A

[prosulfuron:primisulfuron (0.009:0.027) lb ai/A]

+
CROP OIL CONCENTRATE 1 qt/A or
SURFACTANT (Non-Ionic 80%) 0.5 pt/25 gal

+
(additive)

Weeds Controlled: Burcucumber, cocklebur, jimsonweed, black nightshade, Palmer amaranth, pigweed, common ragweed, giant ragweed, johnsongraas (seedling), shattercane, smartweed.

Crop Stage: SPIRIT is labeled for use on field corn grown for grain or silage, including white corn. Some corn hybrids are classified as "potentially susceptible" to SPIRIT (consult seed dealer or chemical supplier for a listing of sensitive hybrids). Consult the label for use on field corn grown for seed and popcorn. DO NOT apply to sweet corn or ornamental corn. Apply to field corn which is between 4 to 24 inches tall. Applications made after field corn is 20 inches tall or exhibits more than 6 collars (V6), whichever comes first, should be directed using drop nozzles to help achieve optimum spray coverage of weeds and avoid potential injury. Applications to popcorn are more restrictive. When tank mixed with other herbicides consult the labels for maximum crop growth stage and rates for application.

General Comments: SPIRIT 57DF contains prosulfuron + primisulfuron [14.2% + 42.8% per lb product]. Liquid Nitrogen or Ammonium Sulfate may be included in tank mixes for enhanced control of some weed species. SPIRIT is recommended for postemergence control of broadleaf weeds, but also controls seedling johnsongrass and shattercane. Consult label for recommended size of weeds for optimum control. DO NOT apply SPIRIT to "normal" or Imidazolinone-Tolerant (IT) corn hybrids when an organophosphate insecticide (such as COUNTER 15G) is applied at planting or as a foliar treatment. If an Imidazolinone-Resistant (IR or IMR) corn hybrid is planted, an organophosphate insecticide (including COUNTER) can be applied at any time. When other foliar herbicides are used, see label directions before applying SPIRIT. Consider planting a virus tolerant corn variety in fields where johnsongrass has over-wintered. The likelihood of corn injury may increase if applied at improper stage of growth or when corn is under stress due to drought, diseases, insect damage, or nutrient deficiency.

Rain Delay: 4 hours before expected rainfall.

Rotation Restrictions: If soil pH is below 7.8, crops which may be planted include wheat, barley, or rye after 3 months; popcorn or sweet corn after 8 months; soybeans, sorghum, forage grasses, or tobacco after 10 months; and alfalfa or clovers after 18 months following treatment. If soil pH is 7.8 or above, the rotation interval for sensitive broadleaf crops may be longer (consult label).

Do not apply SPIRIT after June 30 if soybeans will be planted next season. STS-soybean varieties should be considered if soil degradation processes has been slowed down by adverse environmental conditions. Other rotational crops not listed on the label should not be planted within 18 months after application.

Harvest & Forage Restrictions: Do not harvest corn for grain within 60 days after treatment. Do not harvest for silage within 40 days and wait 30 days after application before utilizing treated corn for grazing or forage feed.

Tank Mixtures: Accent, Atrazine, Banvel, Beacon, Buctril, Clarity, 2,4-D, Glyphosate products [glyphosate tolerant corn], Marksman, Stout. When SPIRIT is tank mixed with other herbicides consult the label for crop growth stage, rates, and use of additives. DO NOT tank mix SPIRIT with some insecticides, as severe crop injury can result, or tank mix with Poast or Poast Plus, as grass control may be reduced.

STATUS

| | | |
|----------------------------|-----------------|--|
| STATUS 56WG | 5 to 10 oz/A | [diflufenzopyr:dicamba (0.05:0.125) to (0.1:0.25) lb ai/A] |
| | + | + |
| SURFACTANT (Non-Ionic 80%) | 1 qt/100 gal | |
| or CROP OIL CONCENTRATE | 1 to 2 pt/A | (additive) |
| or METYLATED SEED OIL | 1 to 2 pt/A | |
| | + | + |
| FERTILIZER SOLUTION | 5 qt/100 gal | |
| (28% to 34% UAN) or AMS | (17 lb/100 gal) | (additive) |

Weeds Controlled: Cocklebur, jimsonweed, lambsquarters, morningglory, black nightshade, pigweed, common ragweed, giant ragweed, prickly sida, sicklepod, smartweed, velvetleaf.

Crop Stage: Apply STATUS from 4-inch tall (V2) to 36-inch tall (V10) corn.

General Comments: STATUS 56WG contains diflufenzopyr + dicamba (0.16 lb + 0.4 lb ae per lb product) + isoxadifen (crop safener). Apply with an adjuvant (NIS, COC, or MSO) plus a liquid fertilizer solution (UAN or AMS). STATUS primarily provides control of broadleaf weeds. For optimum results apply to actively growing weeds and use thorough spray coverage. Crop tolerance may be affected if corn is growing under stress conditions. Allow a minimum of 15 days between sequential applications of STATUS. Do not apply more than a total of 12.5 oz/A of STATUS per acre per season.

Environmental Statements: STATUS has Ground and Surface Water Advisory statements on the label. Avoid applications when conditions favor spray drift or when sensitive crops such as tobacco, soybeans, ornamentals, or vegetable crops are growing nearby.

Rain Delay: 4 hours before expected rainfall.

Rotation Restrictions: Do not plant any crop within 120 days after last application with the following exceptions. If at least 1 inch of rainfall occurs following application of STATUS at ≤ 5 oz/A, crops such as alfalfa, cereal grain crops, grain sorghum, and soybeans may be planted 30 days after the rainfall event. If crop failure occurs, corn can be replanted within 7 or more days after application of STATUS .

Harvest & Forage Restrictions: Do not apply within 32 days of forage harvest or within 72 days of harvest for corn grain or stover.

Tank Mixtures: STATUS may be applied sequentially or in tank mixes with other corn herbicides except with the following limitations: 1) avoid tank mixes with plant growth regulating herbicides that contain dicamba, 2,4-D, or clopyralid, 2) avoid tank mixes with emulsifiable concentrate (EC) formulations of chloracetamide herbicides [eg. Dual II Magnum, Harness, Outlook, Surpass, etc.], 3) avoid foliar-applied tank-mixes with Lorsban insecticide (consult label).

STEADFAST Q

| | | |
|--------------------------------------|-----------------|--|
| STEADFAST Q | 1.5 oz/A | [nicosulfuron:rimsulfuron (0.024:0.012) lb ai/A] |
| | + | + |
| Crop Oil Concentrate (1% v/v) | 1 qt /25 gal or | |
| Modified Seed Oil (MSO) [0.5% v/v] | 1 pt/25 gal | (additive) |
| or Non-Ionic Surfactant (25% v/v) | 1 qt/100 gal | |
| | + | + |
| Fertilizer Solution [28% or 32% UAN] | 2 qt/A | (additive) |
| or Ammonium Sulfate | 2 lb/A | |

Weeds Controlled: Barnyardgrass, broadleaf signalgrass, foxtails, johnsongrass (seedling), pigweeds, shattercane.

Crop Stage: Apply STEADFAST Q to field corn hybrids with a relative maturity rating of 77 days or more. Do not apply to seed corn, popcorn, or sweet corn. Apply STEADFAST Q as a broadcast treatment to field corn up to 20 inches tall. Do not apply to corn taller than 20 inches or exhibiting 6 or more collars, whichever is more restrictive. For applications to corn hybrids with 77 to 88 days of Relative Maturity and for tank mixtures containing atrazine, Exceed, and Spirit apply before corn exceeds 12" tall.

General Comments: STEADFAST Q is a prepackage mixture containing nicosulfuron+rimsulfuron [25.2%+12.5% per lb of product plus isoxadefin (corn safener)]. Apply when weeds are young and actively growing (consult label for recommended weed sizes). Apply in a minimum spray volume of 15 gal per acre. Do not make more than one application per cropping season. DO NOT apply STEADFAST Q to corn when a soil insecticide such as 'Counter' has been applied at planting or as a layby treatment. Consult label directions before applying STEADFAST with other organophosphate insecticides or foliar herbicides. The likelihood of corn injury may increase if applied at improper stage of growth or when corn is under stress due to drought, diseases, insect damage, or nutrient deficiency.

Rain Delay: Allow 4 hours.

(next page)

64 Corn

STEADFAST Q (continued)

Rotation Restrictions: Rotational crops which may be planted include soybean after 15 days (0.5 month); wheat, barley, oats, and rye after 4 months; popcorn, sweet corn, sorghum (pH<7.5), alfalfa, and clover 10 months following a STEADFAST Q application. If soil pH<6.5, do not plant other rotational crops not listed within 10 months after application; when soil pH>6.5 wait 18 months.

Harvest & Forage Restrictions: Wait 30 days after application before utilizing corn as forage, hay, or grazing.

Tank Mixtures: Atrazine, Callisto, dicamba (Clarity), Distinct, Exceed, Marksman, Spirit, (see label for application limitations to corn >12" tall for some tank mixtures). STEADFAST Q may also be tank mixed with Cinch, Dual II Magnum, Lumax, Outlook, and Prowl for preemergence grass control (apply before corn exceeds maximum height of preemergence grass herbicide label). DO NOT tank mix STEADFAST Q with Basagran, Laddok or some organophosphate insecticides, such as Lorsban, malathion, or parathion as severe crop injury may occur. DO NOT tank mix with 2,4-D since poor control of grasses may occur.

ZEMAX

ZEMAX 2 to 2.4 qt/A

[S-metolachlor:mesotrione (1.67:0.17) to (2.0:0.2) lb ai/A]

[use higher rate when OM \geq 3%]

+

Non-Ionic Surfactant (0.25% v/v) 1 qt/100 gal
or Crop Oil Concentrate (1% v/v) 1 gal/100 gal

+(additive)

Weeds Controlled: Cocklebur, lambsquarters, black nightshade, pigweeds, common ragweed, giant ragweed, smartweed, velvetleaf, waterhemp.

Crop Stage: ZEMAX may be applied postemergence after emergence until corn plants reach 30 inches tall (up to 8-leaf stage of corn growth). May also be applied early preplant (up to 14 days prior to planting) or preemergence.

General Comments: ZEMAX contain S-metolachlor + mesotrione [3.34 + 0.33 lb ai/gal]. A nitrogen based adjuvant (AMS or UAN) may also be used but can result in an increased risk of temporary crop injury. Do not use methylated seed oil (MSO) when applied to emerged corn. Do not apply more than 2.4 qt/A of ZEMAX per growing season. Do not apply postemergence to corn that has received an at-plant application of "Counter" or other organophosphate insecticide. Consult label before use with other organophosphate or carbamate insecticides.

Environmental Statements: ZEMAX contains GROUND and SURFACE WATER advisory statements on the label. Do not use on very permeable soils or where groundwater is close to the soil surface or where the potential exists to enter surface water.

Rain Delay: None indicated on label.

Rotation Restrictions: Corn (all types) and sorghum [seed safener] may be replanted anytime; soybeans the spring following application; and wheat, barley, oats or rye may be planted 4½ months after ZEMAX application. Rotational interval 18 months for other crops.

Harvest & Forage Restrictions: Do not graze, feed, or harvest corn for forage, grain or stover within 45 days after postemergence application.

Tank Mixtures: Atrazine, Princep, 2,4-D, Gramoxone, Roundup brands, Touchdown brands, and Warrior II insecticide. Early postemergence tank mixtures include Atrazine, Accent Q, Basis, Ignite (LL-corn), Northstar, Resolve Q, Roundup brands (RR-corn), Spirit, Status, Steadfast Q, Touchdown brands (RR-corn).

PREHARVEST or HARVEST AID

GLYPHOSATE

Glyphosate products labeled for preharvest use in corn are listed below. SEE PAGE 22 FOR A DETAILED LIST OF GLYPHOSATE PRODUCTS. Always consult the product label for specific directions.

| | | |
|---|---------------------------|---|
| GLYPHOSATE [3 lb ae/gal formulation]* (4 lb ai/gal) | 2 pt/A (32 fl.oz/A) | [glyphosate 0.75 lb ae/A] (1.0 lb ai/A) |
| Example products: Roundup Original and several other GLYPHOSATE products (SEE page 21) . | | |
| GLYPHOSATE [3.75 lb ae/gal formulation]* | 1.6 pt/A (26 fl.oz/A) | [glyphosate 0.75 lb ae/A] |
| Example product: Buccaneer 5 | | |
| GLYPHOSATE [4 lb ae/gal formulation]* (5.4 lb ai/gal) | 1.5 pt/A (24 fl.oz/A) | [glyphosate 0.75 lb ae/A] (1.0 lb ai/A) |
| Example product: Duramax, Durango DMA, Gly Star 5 | | |
| GLYPHOSATE [4.17 lb ae/gal formulation]* | 1.5 pt/A (24 fl.oz/A) | [glyphosate 0.75 lb ae/A] |
| Example product: Touchdown Total | | |
| GLYPHOSATE [4.5 lb ae/gal formulation]* (5.5 lb ai/gal) | 1.38 pt/A (22 fl.oz/A) | [glyphosate 0.77 lb ae/A] (0.95 lb ai/A) |
| Example products: Roundup PowerMAX, Roundup WeatherMAX. | | |
| GLYPHOSATE [5 lb ae/gal formulation]* | 1.25 pt/A (20 fl.oz/A) | [glyphosate 0.78 lb ae/A] |
| Example products: Touchdown HiTech | | |

***Additives:** Recommendations for use of non-ionic surfactants will vary depending on the Glyphosate product. Dry Ammonium Sulfate at 1 to 2% by weight (8.5 to 17 lb/100 gal) or an equivalent rate of liquid Ammonium Sulfate is recommended to improve weed control.

Weeds Controlled: For control of many annual and perennial grasses and broadleaf weeds, including some vines which may interfere with crop harvest.

General Comments: Higher application rates may be used with certain glyphosate products on non-Roundup Ready corn hybrids (consult label). Apply using either aerial or ground spray equipment. Make application at 35% or less grain moisture. Ensure that maximum kernel fill is complete and the corn is physiologically mature (i.e. black layer formed). Allow 7 days between application and harvest.

2,4-D AMINE or ESTER

2,4-D AMINE 1.5 to 2 pt/A or
2,4-D ESTER 1 to 2 pt/A
[4 lb ai/gal formulations]

(2,4-D 0.75 to 1 lb ai/A) or
(2,4-D 0.5 to 1 lb ai/A)

Weeds Controlled: Cocklebur, jimsonweed, common ragweed, velvetleaf and vines that interfere with crop harvest.

Crop Stage: As a preharvest treatment apply after hard dough or denting stage.

PARAQUAT

GRAMOXONE SL 2.0 1.2 to 2 pt/A
FIRESTORM or PARAZONE 3S 0.8 to 1.3 pt/A

(paraquat 0.3 to 0.5 lb ai/A)

Weeds Controlled: For dessication of broadleaf weeds and grasses.

Crop Stage: Make one application at least 7 days prior to harvest. Apply after the corn is mature and black layer has formed at the base of the kernels.

Additives: Apply with a Non-Ionic Surfactant at 0.25% v/v (1 to 2 pt/100 gal).

General Comments: GRAMOXONE INTEON and FIRESTORM are RESTRICTED-USE pesticides due to acute toxicity. Apply as a spray solution in a minimum of 20 gallons of water per acre.

Environmental Statements: Avoid spray particle drift to nearby crops and other sensitive vegetation.

Rain Delay: 15 to 30 minutes following application.

Rotation Restrictions: Any crop may be planted following normal corn growth and harvest.

Harvest & Forage Restrictions: 7 days.

POSTHARVEST APPLICATIONS

GLYPHOSATE

Glyphosate products labeled for Between Crop or Postharvest use in corn are listed below. SEE PAGE 22 FOR A DETAILED LIST OF GLYPHOSATE PRODUCTS. Always consult the product label for specific directions.

| | | |
|---|------------------|---|
| GLYPHOSATE [3 lb ae/gal formulation]* (4 lb ai/gal) | 2 to 5 qt/A | [glyphosate 1.5 to 3.75 lb ae/A] (2 to 5 lb ai/A) |
| Example products: Roundup Original, and several other GLYPHOSATE products (SEE page 21). | | |
| GLYPHOSATE [4 lb ae/gal formulation]* (5.4 lb ai/gal) | 1.5 to 3.75 qt/A | [glyphosate 1.5 to 3.75 lb ae/A] (2 to 5 lb ai/A) |
| Example product: Duramax, Durango DMA, | | |
| GLYPHOSATE [4.17 lb ae/gal formulation]* | 1.6 to 3.6 qt/A | [glyphosate 1.7 to 3.7 lb ae/A] |
| Example product: Touchdown Total | | |
| GLYPHOSATE [4.5 lb ae/gal formulation]* (5.5 lb ai/gal) | 1.5 to 3.3 qt/A | [glyphosate 1.7 to 3.7 lb ae/A] (2 to 4.5 lb ai/A) |
| Example products: Roundup PowerMAX, Roundup WeatherMAX. | | |
| GLYPHOSATE [5 lb ae/gal formulation]* | 1.33 to 3 qt/A | [glyphosate 1.7 to 3.75 lb ae/A] |
| Example products: Touchdown HiTech | | |

***Additives:** Recommendations for use of non-ionic surfactants will vary depending on the Glyphosate product. Dry Ammonium Sulfate at 1 to 2% by weight (8.5 to 17 lb/100 gal) or an equivalent rate of liquid Ammonium Sulfate is recommended to improve weed control.

Weeds Controlled: Bindweeds, Canada thistle, honeyvine milkweed, johnsongrass, trumpetcreeper and other problem broadleaf weeds.

REMARKS: Rates depend on weed species present and their density. The higher rate is recommended when GLYPHOSATE is applied alone. GLYPHOSATE can also be tank mixed with DICAMBA at 0.25 lb ai/A (eg. CLARITY 0.5 pt/A) or 2,4-D at 0.5 lb ai/A (1 pt/A). Apply to actively growing weeds; therefore, allow sufficient time for weed regrowth after crop harvest. Do not disturb treated areas for at least 7 days following application. Avoid applications after plants have been exposed to a hard killing frost. Vines are best controlled when in or beyond full bloom stage.

DICAMBA

DICAMBA 4S 4 to 32 oz/A (0.5 to 2 pt/A or (dicamba 0.25 to 1 lb ai/A)
[eg. BANVEL, CLARITY, DIFLEXX, STERLING BLUE, VISION, etc.]

Weeds Controlled: Bindweeds, honeyvine milkweed, trumpetcreeper and other problem broadleaf weeds.

REMARKS: Rates depend on weed species present and their density. Dicamba can be tank mixed with 2,4-D (1 to 4 pt/A) Apply to actively growing weeds after crop harvest and before a killing frost. Vines are best controlled when in or beyond full bloom stage. Do not disturb treated areas for at least 7 days following application. Consult DICAMBA product label for crop rotation guidelines and other specific information.

GRAIN SORGHUM

See page 23 for PRECAUTIONS on use of atrazine containing products near ground and surface water. See comments in the corn section for detailed information on each of the herbicides listed below such as application methods and crop rotation restrictions.

Preemergence

ATRAZINE 4L 1.6 to 2 qt/A or (atrazine 1.6 to 2 lb ai/A)
 AATREX NINE-O 1.8 to 2.2 lb/A

Weeds Controlled: Black nightshade, cocklebur, common ragweed, giant ragweed, jimsonweed, lambsquarters, morningglories, pigweeds, prickly sida, smartweed, velvetleaf.

Remarks: In case of crop failure, sorghum may be replanted into soil previously treated with ATRAZINE. Do not make a second ATRAZINE application or injury may occur.

CALLISTO 6.0 to 6.4 fl. oz/A (mesotrione 0.18 to 0.20 lb ai/A)

Weeds Controlled: Black nightshade, cocklebur, jimsonweed, lambsquarters, pigweeds, smartweed, velvetleaf.

Remarks: Except for grain sorghum and sweet sorghum do not use CALLISTO in the production of other types of sorghums such as forage sorghums or sudangrass. Can be applied preemergence or as a pre-plant non-incorporated treatment up to 21 days before planting sorghum. Applying CALLISTO more than 7 days (but not more than 21 days) prior to planting will reduce the risk of crop injury. If emerged weeds are present at the time of the preemergence application, use a nonionic surfactant (NIS) at 0.25% v/v or crop oil concentrate (COC) at 1% v/v (UAN or AMS can also be added to the spray solution). Do not apply CALLISTO to emerged sorghum or severe crop injury may occur. In case of crop failure, corn, sorghum, or pearl millet may be replanted into soil previously treated with CALLISTO. Do not make a second application or injury may occur.

LEXAR EZ 3 qt/A [S-metolachlor:mesotrione;atrazine 1.3:0.17:1.3 lb ai/A]
 OR
 LUMAX EZ 2.7 qt/A [S-metolachlor:mesotrione;atrazine 1.7:0.17:0.5 lb ai/A]

Weeds Controlled: Barnyardgrass, black nightshade, crabgrass, fall panicum, foxtails, lambsquarters, pigweeds, prickly sida, common ragweed, smartweed, velvetleaf.

Remarks: Use Concep III treated sorghum seed. Apply LEXAR EZ or LUMAX EZ as a broadcast non-incorporated treatment up to 21 days before planting and up through planting but prior to sorghum emergence. Applying more than 7 days (but not more than 21 days) prior to planting will reduce the risk of crop injury. May also be applied as a split application to grain sorghum, but cannot exceed the maximum rate of 3 qt/A of LEXAR EZ or 2.7 qt/A of LUMAX EZ. If emerged weeds are present at the time of the preemergence application use a nonionic surfactant (NIS) at 0.25% v/v or crop oil concentrate (COC) at 1% v/v (a spray grade of UAN or AMS can also be added to the spray solution). Do not apply LEXAR EZ or LUMAX EZ to emerged sorghum or severe crop injury may occur. Do not use for production of other sorghums such as forage sorghum, sweet sorghum, or sudangrass. In case of crop failure, corn or grain sorghum (Concep treated) may be replanted immediately, but do not reapply LEXAR EZ, LUMAX EZ, or ZEMAX.

68 Grain Sorghum

SHARPEN 1 to 2 fl.oz/A

(sallufenacil 0.022 to 0.044 lb ai/A)

Weeds Controlled: Cocklebur, marestail (horseweed), morningglory, giant ragweed, and velvetleaf.

Remarks: Apply preplant or preemergence to grain sorghum for broadleaf weed control. Can also be applied prior to sorghum emergence as a burndown treated on emerged weeds (consult label for use of MSO plus AMS or UAN as additives). Do not apply SHARPEN after sorghum emergence or severe crop injury will occur. To avoid potential injury to sensitive hybrids consult with your local seed supplier. Do not apply when an at-planting application of an organophosphate or carbamate insecticide has been used. Sorghum can be harvested for forage, fed, or grazed 70 days or more after application. Tank mixtures include Atrazine, Clarity, Glyphosate (eg. Roundup), Guardsman Max, or Outlook.

ZEMAX 2 qt/A

[S-metolachlor:mesotrione 1.67:0.165 lb ai/A]

Weeds Controlled: Barnyardgrass, crabgrass, fall panicum, foxtails, black nightshade, lambsquarters, pigweeds, smartweed, velvetleaf, waterhemp.

Remarks: Use Concep III treated sorghum seed. Apply ZEMAX preplant non-incorporated (up to 21 days before planting) up through preemergence of grain sorghum. Applying more than 7 days (but not more than 21 days) prior to sorghum planting will reduce the risk of crop injury. ZEMAX may also be applied as a split application to grain sorghum, but cannot exceed the maximum rate of 2 qt/A. If emerged weeds are present at the time of the preemergence application use a nonionic surfactant (NIS) at 0.25% v/v or crop oil concentrate (COC) at 1% v/v (a spray grade of UAN or AMS can also be added to the spray solution). Do not apply ZEMAX to emerged sorghum or severe crop injury may occur. Do not use for production of other sorghums such as forage sorghum, sweet sorghum, or sudangrass. In case of crop failure, corn or grain sorghum (Concep treated) may be replanted immediately, but do not reapply Lexar, Lumax, or Zemax.

Preplant Incorporate or Preemergence

DUAL II MAGNUM or CINCH 1.33 to 1.67 pt/A

(S-metolachlor 1.3 to 1.6 lb ai/A)

Weeds Controlled: Black nightshade, crabgrass, fall panicum, foxtails, pigweeds, yellow nutsedge.

Remarks: Use CONCEP treated sorghum seed.

BICEP II MAGNUM or CINCH ATZ 1.6 qt/A

(S-metolachlor:atrazine 1.0:1.2 lb ai/A)

OR

OR

DUAL II MAGNUM or CINCH 1 pt/A

(S-metolachlor 1.0 lb ai/A)

+

+

AATREX 4L 1.2 qt/A or

(atrazine 1.2 lb ai/A)

AATREX NINE-O 1.3 lb/A

Weeds Controlled: Black nightshade, cocklebur, common ragweed, crabgrass, fall panicum, foxtails, jimsonweed, lambsquarters, morningglories, pigweeds, prickly sida, smartweed.

Remarks: Use CONCEP or SCREEN treated sorghum seed.

OUTLOOK 6E 14 to 20 oz/A

(dimethenamid-P 0.66 to 0.94 lb ai/A)

Weeds Controlled: Barnyardgrass, crabgrass, fall panicum, foxtails, black nightshade, pigweed.

Remarks: Use sorghum seed treated with a seed safener.

Grain Sorghum 69

| | |
|--------------------------------|---|
| GUARDSMAN MAX 5E 3 to 4.6 pt/A | [dimethenamid-P:atrazine (0.6:1.2) to (0.98:1.9) lb ai/A] |
| OR | OR |
| OUTLOOK 6E 14 to 20 oz/A | (dimethenamid-P 0.66 to 0.94 lb ai/A) |
| + | + |
| ATRAZINE 4L 1 to 2 qt/A or | (atrazine 1 to 2 lb ai/A) |
| AATREX NINE-O 1.1 to 2.2 lb/A | |

Weeds Controlled: Barnyardgrass, black nightshade, cocklebur, common ragweed, crabgrass, fall panicum, foxtails, jimsonweed, lambsquarters, morningglory, pigweed, prickly sida, smartweed.

Remarks: Use sorghum seed treated with a seed safener such as SCREEN or CONCEP.

| | |
|-----------------------------|---|
| DEGREE XTRA 2.0 to 3.7 qt/A | [acetochlor:atrazine (1.35:0.67 to 2.5:1.24 lb ai/A)] |
|-----------------------------|---|

Weeds Controlled: Barnyardgrass, crabgrass, fall panicum, foxtails, black nightshade, lambsquarters, pigweed, prickly sida, common ragweed, smartweed.

Remarks: Use sorghum seed treated with a seed safener. Apply preplant incorporated, preemergence surface, or postemergence before crop exceeds 11 inches in height (5 to 6 leaf stage). For grain sorghum forage, allow 60-day preharvest interval.

| | |
|------------------------------|---------------------------------|
| MILO-PRO 4L 0.75 to 1.2 qt/A | (propazine 0.75 to 1.2 lb ai/A) |
|------------------------------|---------------------------------|

Weeds Controlled: Lambsquarters, morningglories, pigweeds, ragweed, smartweed, velvetleaf.

Remarks: Shallow incorporate (less than 2 inches deep) or apply preemergence at planting before weeds and sorghum emerges. If replanting is necessary, sorghum may be planted into soil previously treated with propazine; however, an additional application is prohibited. Do not apply more than one application per crop growing season. Do not rotate to small grain crops less than 120 days after application. Corn may be planted 12 months after treatment; other crops may require an 18 month waiting period after treatment. Do not apply within 70 days of harvest for sorghum forage or within 90 days of harvest for grain sorghum or sorghum stover. Not registered for use on sweet sorghum.

70 Grain Sorghum

No Tillage

NOTE: *These treatments include foliar herbicides to kill existing vegetation at or prior to planting and soil residual herbicides for preemergence control of annual grasses and broadleaf weeds. These may be applied either before or after planting but before crop emergence. Depending on the amount of vegetation present and the herbicides used apply in 20 to 40 gallons of liquid per acre. Consult the herbicide labels for specific directions.*

| | |
|---|---|
| GUARDSMAN MAX 5E 3 to 4.6 pt/A | [dimethenamid-P:atrazine (0.6:1.2) to (0.98:1.9) lb ai/A] |
| OR | OR |
| OUTLOOK 6E 14 to 20 oz/A | (dimethenamid-P 0.66 to 0.94 lb ai/A) |
| + | + |
| ATRAZINE 4L 1 to 2 qt/A or | (atrazine 1 to 2 lb ai/A) |
| AATREX NINE-O 1.1 to 2.2 lb/A | |
| + | + |
| GRAMOXONE 2S 2 to 4 pt/A or | (paraquat 0.28 to 1.0 lb ai/A) or |
| FIRESTORM or PARAZONE 3S 1.3 to 2.7 pt/A | (paraquat 0.47 to 1.0 lb ai/A) |
| with NON-IONIC SURFACTANT | |
| OR | OR |
| ROUNDUP PowerMAX 2 pt/A or | |
| GLYPHOSATE [4 lb ai/gal (3 lb ae/gal)] 3 pt/A | (glyphosate 1.5 lb ai/A) |

Weeds Controlled: Barnyardgrass, black nightshade, cocklebur, common ragweed, crabgrass, fall panicum, foxtails, jimsonweed, lambsquarters, morningglory, pigweed, prickly sida, smartweed.

Remarks: Use sorghum seed treated with a seed safener.

| | |
|---|---|
| BICEP II MAGNUM or CINCH ATZ 1.8 to 2.1 qt/A | [S-metolachlor:atrazine (1.1:1.4) to (1.3:1.6) lb ai/A] |
| OR | OR |
| DUAL II MAGNUM or CINCH 1.5 pt/A | (S-metolachlor 1.4 lb ai/A) |
| + | + |
| AATREX 4L 1.5 to 1.8 qt/A or | (atrazine 1.5 to 1.8 lb ai/A) |
| AATREX NINE-O 1.7 to 2 lb/A | |
| + | + |
| GRAMOXONE 2S 2 to 4 pt/A or | (paraquat 0.28 to 1.0 lb ai/A) or |
| FIRESTORM or PARAZONE 3S 1.3 to 2.7 pt/A | (paraquat 0.47 to 1.0 lb ai/A) |
| with NON-IONIC SURFACTANT | |
| OR | OR |
| ROUNDUP PowerMAX 2 pt/A or | |
| GLYPHOSATE [4 lb ai/gal (3 lb ae/gal)] 3 pt/A | (glyphosate 1.5 lb ai/A) |

Weeds Controlled: Black nightshade, cocklebur, common ragweed, crabgrass, fall panicum, foxtails, jimsonweed, lambsquarters, morningglories, pigweeds, prickly sida, smartweed.

Remarks: Use CONCEP or SCREEN treated sorghum seed.

| | |
|------------------------------|--|
| EXPERT 4.88L 3 qt/A | [S-metolachlor:atrazine:glyphosate (1.3:1.6:0.75) lb ai/A] |
| OR | OR |
| SEQUENCE 5.25L 3.5 pt/A | [S-metolachlor:glyphosate (1.3:1.0) lb ai/A] |
| + | + |
| AATREX 4L 1.5 to 1.8 qt/A or | (atrazine 1.5 to 1.8 lb ai/A) |
| AATREX NINE-O 1.7 to 2 lb/A | |

Weeds Controlled: Barnyardgrass, cocklebur, common ragweed, crabgrass, fall panicum, foxtails, jimsonweed, lambsquarters, morningglory, black nightshade, pigweed, prickly sida, smartweed.

Remarks: Use CONCEP or SCREEN treated sorghum seed.

Postemergence

AIM EW 0.5 fl.oz/A (carfentrazone 0.008 lb ai/A)
 +
 SURFACTANT (Non-Ionic 80%) 0.5 pt/25 gal (additive)

Weeds Controlled: Black nightshade, lambsquarters, morningglories, velvetleaf.

REMARKS: Apply from prior to planting up to 6 leaf collar growth stage of grain sorghum. When weeds are under stress or are larger, higher use rates of AIM at 0.6 to 1 oz/A may be made with directed spray equipment or hooded sprayers.

BASAGRAN 4S 1.5 to 2 pt/A (bentazon 0.75 to 1 lb ai/A)

Weeds Controlled: Cocklebur, giant ragweed, jimsonweed, prickly sida, smartweed, velvetleaf, yellow nutsedge.

Remarks: BROADCAST. Maximum weed control is obtained when applied to small weeds (seed label for specific weed sizes). Do not apply to grain sorghum that is heading or blooming. For best control of certain weed species oil concentrate should be added according to label directions.

BUCTRIL 2EC 1 to 1.5 pt/A (bromoxynil 0.25 to 0.38 lb ai/A)

Weeds Controlled: Black nightshade, cocklebur, common ragweed, jimsonweed, lambsquarters, smartweed, velvetleaf.

Remarks: BROADCAST. Observe label for specific rates and growth stages of crop and weeds. Do not cut for feed or graze within days of application.

2,4-D AMINE 1 pt/A (2,4-D 0.5 lb ai/A)
 [4 lb ai/gal formulation]

Weeds Controlled: Black nightshade, cocklebur, common ragweed, giant ragweed, lambsquarters, morningglories, pigweeds, prickly sida, velvetleaf.

Remarks: BROADCAST or DIRECTED. Apply when sorghum is 6 to 15 inches tall. USE DIRECTED applications when sorghum is 8 to 15" tall. Do not apply during flowering or early dough stage.

DICAMBA 4S 8 oz/A (0.5 pt/A) (dicamba 0.25 lb ai/A)
 [ie. BANVEL, CLARITY, STERLING BLUE, VISION, etc.]

Weeds Controlled: Black nightshade, cocklebur, common ragweed, giant ragweed, jimsonweed, lambsquarters, morningglories, pigweeds, prickly sida, smartweed, velvetleaf.

Remarks: BROADCAST or DIRECTED. Apply after sorghum is in the 3-leaf stage and before it is 15 inches tall. Use drop nozzles if sorghum is taller than 8 inches. For optimum results, apply when sorghum is in the 3-leaf to 5-leaf stage and weeds are small (less than 3 inches). Do not graze or feed treated sorghum as forage or silage prior to mature grain stage.

STARANE 1.5E 0.67 pt/A (fluroxypyr 0.125 lb ai/A)

Weeds Controlled: Cocklebur, common ragweed, morningglory, velvetleaf.

Remarks: BROADCAST or DIRECTED. Apply as a broadcast treatment when grain sorghum is from the 3-leaf through the 7-leaf growth stage. Use drop nozzles and directed spray from the 8-leaf stage to boot stage. Do not apply after the boot stage. An adjuvant may be added for improved weed control. Do not allow livestock to graze or harvest forage within 40 days of application. Do not apply within 70 days of harvesting grain or stover.

72 Grain Sorghum

PERMIT 75DF 0.67 oz/A (halosulfuron 0.032 lb ai/A)
+
NON-IONIC SURFACTANT 1 to 2 qt/100 gal (additive)
or CROP OIL CONCENTRATE 4 qt/100 gal

Weeds Controlled: Cocklebur, common ragweed, pigweed, velvetleaf, yellow nutsedge.

Remarks: BROADCAST. Apply PERMIT to crop after 2-leaf stage but before grain head emergence. Observe label for size of specific weed species. Do not cut for feed or graze within 30 days after application. Rotational crops which may be planted include wheat after 3 months, soybeans after 10 months following application.

WEEDMASTER 1 pt/A [dicamba:2,4-D (0.125:0.36 lb ai/A)]

Weeds Controlled: Black nightshade, cocklebur, common ragweed, giant ragweed, jimsonweed, lambsquarters, morningglories, pigweeds, prickly sida, smartweed, velvetleaf.

Remarks: BROADCAST. Apply to sorghum in the 3–5 leaf stage (4 to 8" tall). For optimum results apply when weeds are small (less than 3" tall). Under periods of rapid growth temporary leaning or rolling of leaves may occur. Sorghum growing under conditions of stress may be sensitive to injury.

YUKON 67.5 WDG 4 to 6 oz/A [halosulfuron:dicamba (0.031:138) to (0.05:21) lb ai/A]
+
NON-IONIC SURFACTANT 1 to 2 qt/100 gal (additive)
or CROP OIL CONCENTRATE 4 qt/100 gal

Weeds Controlled: Black nightshade, cocklebur, jimsonweed, lambsquarters, morningglory, pigweeds, common ragweed, giant ragweed, smartweed, velvetleaf, yellow nutsedge.

Remarks: BROADCAST or DIRECTED. Apply YUKON to crop from the 2-leaf stage through 15 inch tall sorghum. **Use drop nozzles if sorghum is taller than 8 inches.** Observe label for size of specific weed species. Do not graze or feed treated sorghum forage or silage prior to mature grain stage. Rotational crops which may be planted include field corn after 1 month; wheat, rye, oats, sorghums, and forage grasses after 2 months; or soybeans, alfalfa, and clovers after 9 months following application.

GRAMOXONE SL 2.0 1 to 2 pt/A (paraquat 0.25 to 0.5 lb ai/A)
OR
FIRESTORM or PARAZONE 3SL 0.7 to 1.3 pt/A (paraquat 0.28 to 0.47 lb ai/A)
+
NON-IONIC SURFACTANT 1 to 2 qt/100 gal

Weeds Controlled: Many small annual grasses and broadleaf weeds.

Remarks: DIRECTED. Apply when sorghum is at least 12 inches tall and naturally standing. Direct spray to lower 3 inches of the sorghum plant using nozzles mounted on skid shoes, oiling shoes, fenders, or cultivators with gauge wheels. Do not exceed 30 psi when spraying.

SOYBEAN

NO TILLAGE

Herbicides used in no-till soybeans include foliar-applied herbicides (often called a "burndown" herbicides) to control emerged weeds and soil-residual herbicides for preemergence weed control. Some herbicides are capable of providing both burndown control of small weeds as well as preemergence control.

No-till soybean herbicide treatments are usually applied as spring-applied Early Preplant (normally 15 to 30 days ahead of planting) or as Preemergence (to the crop) at the time of planting. Fall-applied Early Preplant treatments are occasionally used in no-till to manage cool-season species and generally do not control weeds that emerge after soybean planting.

Early preplant programs may require a sequential herbicide treatment applied at or after planting to provide additional length of weed control. Tillage after application may reduce effectiveness of the herbicide treatments.

Preplant Foliar "Burndown" Herbicides for No-Tillage Soybeans

| PARAQUAT | Herbicide Rate Based on Height of Annual Weeds | | |
|---|--|-------------------------------|----------------------------|
| | 1 to 3" weeds | 3 to 6" weeds | 6" weeds |
| GRAMOXONE SL 2.0 | 2 to 2.5 pt/A | 2.5 to 3 pt/A | 3 to 4 pt/A |
| or | or | or | or |
| FIRESTORM 3S, PARAZONE 3S, PARAQUAT CONCENTRATE 3S | 1.3 to 1.7 pt/A | 1.7 to 2.0 pt/A | 2.0 to 2.7 pt/A |
| <i>(paraquat cation lb/A)</i> | <i>(0.5 to 0.63 lb ai/A)</i> | <i>(0.63 to 0.75 lb ai/A)</i> | <i>(0.75 to 1 lb ai/A)</i> |

Additives: Non-ionic surfactant at 1 to 2 pt/100 gal of spray mixture or Crop Oil Concentrate at 4 qt/100 gal.

Weeds Controlled: Many small annuals including chickweed, crabgrass, giant foxtail, henbit.

Spray Volume: Apply in 10 to 20 gal of clean water or complete clear liquid fertilizers per acre. Do not use suspension type fertilizers. A spray volume of more than 20 GPA may be needed if weeds exceed 6 inches in height.

General Comments: Paraquat containing products are classified as Restricted-Use Pesticide. Apply before, during, or after planting but before crop emergence. Regrowth may occur from perennial grasses and broadleaf weeds, legume sods, or perennial grass sods. Annuals such as marestalk, prickly lettuce, smartweed, and giant ragweed may not be controlled. Applying with 2,4-D ester (7 to 30 days early preplant) or Canopy may be needed for improved control of horseweed(marestalk). Grass cover crops such as wheat may not be effectively controlled between tillering and boot stage of growth. Split applications may improve control of fescue, orchardgrass, or ryegrass. Do not exceed 6 pt/A of GRAMOXONE SL or 4 pt/A of FIRESTORM, PARAZONE, or PARAQUAT CONCENTRATE per season.

Environmental Statements: Drift of spray can desiccate green tissue and result in injury to non-target plants which may render them unfit for sale, use, or consumption.

Rain Delay: 15-30 minutes for GRAMOXONE SL; 30 minutes for FIRESTORM, PARAZONE, or PARAQUAT CONCENTRATE..

Rotation Restrictions: All rotational crops may be planted immediately after last application.

Harvest & Forage Restrictions: Do not graze or use for forage before R3 (early pod stage).

Tank Mixtures GRAMOXONE SL: Canopy, Command, Dual Magnum, Dual II Magnum, FirstRate, Harmony Extra, Prowl, Scepter, Turbo, 2,4-D ester (7 to 30 days EPP).

Tank Mixtures FIRESTORM, PARAZONE, and PARAQUAT CONCENTRATE: Canopy, Dual Magnum, Harmony Extra, Prowl, Scepter, Turbo, 2,4-D ester (7 to 30 days EPP)

74 Soybean

GLYPHOSATE

Listed below are examples of glyphosate formulations and approximate rates for most burndown applications in no-tillage soybeans. The specific rate of product will vary depending on glyphosate formulation and size and species of weeds.

| Glyphosate formulation ¹ | Annuals <6" tall | Annuals >6" tall |
|--|---|--|
| Glyphosate 4, Roundup Original, other products (3 lb ae/gal) | 1.5 to 2 pt/A (24 to 32 fl oz/A) (0.56 to 0.75 lb ae/A) | 2 to 3 pt/A (32 to 48 fl oz/A) (0.75 to 1.13 lb ae/A) |
| Buccaneer 5 (3.75 lb ae/gal) | 1.2 to 2 pt/A (19 to 32 oz/A) (0.56 to 0.94 lb ae/A) | 1.75 to 2.5pt/A (28 to 40 oz/A) (0.82 to 1.17 lb ae/A) |
| Glyphomax XRT (4 lb ae/gal) | 1.13 to 1.5 pt/A (18 to 24 fl oz/A) (0.56 to 0.75 lb ae/A) | 1.5 to 2.25pt/A (24 to 36 oz/A) (0.75 to 1.13 lb ae/A) |
| Touchdown Total (4.17 lb ae/gal) | 1.1 to 4.3 pt/A (17 to 69 oz/A) (0.57 to 2.24 lb ae) | 1.5 to 5.8 pt/A (24 to 93 oz/A) (0.78 to 3.02 lb ae) |
| Roundup WeatherMAX Roundup PowerMAX (4.5 lb ae/gal) | 1 to 1.4 pt/A (16 to 22 fl oz/A) (0.56 to 0.77 lb ae/A) | 1.4 to 2 pt/A (22 to 32 fl oz/A) (0.77 to 1.13 lb ae/A) |
| Touchdown Hi-Tech (5 lb ae/gal) | 0.9 to 2.25 pt (14 to 36 oz/A) (0.54 to 1.4 lb ae/A) | 1.25 to 3 pt (20 to 48 oz/A) (0.78 to 1.88 lb ae/A) |

¹ For a detailed list of glyphosate products see page 22

Additives: For products that require a surfactant, a non-ionic surfactant at 0.25% v/v is often used. Consult the herbicide product label to verify if a surfactant is needed and the type and rate of surfactant to include. Dry Ammonium Sulfate at 1 to 2% by weight (8.5 to 17 lb/100 gal) or an equivalent amount of AMS in a liquid formulation may improve glyphosate activity under certain conditions such as dry weather, or when mixed in hard water or with certain herbicides, or applied to certain weed species.

Annual Weeds Controlled: Annual fleabane, barnyardgrass, brome spp., chickweed, common ragweed, crabgrass, fall panicum, giant foxtail, giant ragweed, henbit, johnsongrass (seedling), lambsquarters, mustards, prickly lettuce, rye, smartweed, volunteer corn (except glyphosate resistant), wheat.

Perennial Weeds: CONSULT LABEL FOR GLYPHOSATE RATE FOR SPECIFIC PERENNIAL WEED SPECIES. Best control of perennial weeds is usually achieved when treated at late growth stages (approaching maturity) and when soil moisture is adequate for active plant growth. At normal application times for no-till soybeans, perennial weeds may not be at the proper growth stage. Control may be reduced if plants are mowed or grazed and not allowed to regrow to recommended growth stage. Perennial weeds may require multiple applications for optimum control.

Spray Volume: Apply in 10 to 20 gallons of clean water/A when mixing with other herbicides. A spray volume of 3 to 10 gallons of water/A is often recommended when glyphosate is used alone at reduced labeled rates for certain annual weed species.

General Comments: Apply before, during, or after planting but before crop emergence. Glyphosate is a translocated herbicide. Reduced control may occur if mixed with such products as Micro-Tech. Management programs that rely on repeated use of glyphosate alone without herbicides of other sites of action may lead to the development of populations of glyphosate-resistant biotypes of weeds. Applying with 2,4-D ester (7 to 30 days early preplant) or products containing chlorimuron or cloransulam may be needed for improved control of horseweed(marestail).

Environmental Statements: Take precautions to avoid spray drift to desirable plants.

Rain Delay: Rainfall soon after application may reduce effectiveness. Some labels indicate 6 hrs.

Rotation Restrictions: There are no rotational restrictions following normal use of glyphosate. Wait at least 30 days before planting of crops not listed on the label.

Harvest & Forage Restrictions: Do not harvest or graze treated vegetation for 8 weeks after application.

Tank Mixtures: Consult label for specific tank mixes.

| 2,4-D ESTER | Rate/A | (2,4-D) |
|---------------|---------------|-----------------------|
| Small Annuals | 0.5 to 1 pt/A | (0.25 to 0.5 lb ai/A) |
| Large Annuals | 1 to 2 pt/A | (0.5 to 1 lb ai/A) |

(NOTE: Application rates based on 4 lb ai/gal)

Additives: Normally not required with 2,4-D, however, certain tank-mix partners may require an additive.

Weeds Controlled: Common ragweed, dandelion, giant ragweed, hairy vetch, horseweed (marestalk), lambsquarters, mustards, prickly lettuce.

Timing: A restrictive interval between application of 2,4-D and soybean planting is required. The interval for most 2,4-D Ester formulations is 7 days for rates up to 0.5 lb ai/A, and 30 days for rates >0.5 lb to 1.0 lb ai/A. The restrictive interval for rates applied up to 1 lb ai/A may be less than 30 days for some 2,4-D ester products (examples of products include Weedone 650, E-99, and Salvo). Consult specific product label for details.

Spray Volume: Apply in a minimum of 10 to 15 gal of water per acre. Check label for use with liquid fertilizer.

General Comments: Not all 2,4-D products are labeled for use prior to planting soybeans (consult product label). Unacceptable crop injury may occur when 2,4-D is applied as a pre-plant treatment to soybean. Plant soybean seed at least 1 ½ to 2 inches deep. Adjust planter press wheels to ensure that soybean seed are completely covered with soil. Applying with paraquat or glyphosate may improve control of horseweed (marestalk). Do not exceed 1 lb ai/A/season.

Environmental Statements: Drift of 2,4-D spray or vapor can injure nearby susceptible plants.

Rain Delay: No information on label.

Rotation Restrictions: Do not replant fields treated with 2,4-D in the same growing season with crops other than those labeled for 2,4-D preplant use.

Harvest & Forage Restrictions: Do not cut soybeans for feed or graze fields treated with a 2,4-D pre-plant application. Do not harvest or graze treated cover crops.

Tank Mixtures: Gramoxone Extra, Roundup, Prowl, Scepter. Always check product labels for directions and other registered tank mixtures.

CLARITY 4S

4 to 16 oz/A

dicamba 0.125 to 0.5 lb ae/A

Weeds Controlled: Annual fleabane, marestalk (horseweed), prickly lettuce, musk thistle, giant ragweed, vetch.

Additives: Adjuvants such as crop oil concentrate, nonionic surfactant, Ammonium Sulfate (AMS), or liquid Urea Ammonium Nitrogen (UAN) may be included. Consult label.

Timing: *Apply only as an early preplant treatment in the spring.* Following application of dicamba and a minimum accumulation of 1 inch of rain or irrigation, allow a waiting interval of 14 days for <8 fluid oz/A and 28 days for 16 fluid oz/A. Do not exceed 16 fl oz of Clarity/A in spring applications prior to planting soybeans.

Spray Volume: Keep spray volume at or above 20 GPA and pressure at or below 20 psi. Use coarse sprays to limit the risk of drift to nearby sensitive species.

General Comments: Consult label for specific guidelines when used as a preplant treatment on soybean.

Rain Delay: 4 hours

Tank Mixtures for Clarity: Glyphosate, 2,4-D, Outlook, Dual Magnum.

Generic Formulations: Clash, Detonate, Sterling Blue, Strut, Vision

76 Soybean

LIBERTY 280 SL

29 to 36 fl oz/A

glufosinate 0.53 to 0.66 lb ai/A

Weeds Controlled: Chickweed, marestail (horseweed), giant foxtail, crabgrass, johnsongrass (seedling), lambsquarters, common ragweed, giant ragweed, smartweed, vetch.

Additives: If foaming occurs a silicone-antifoam based agent may be added. Ammonium sulfate may improve control of weeds that are stressed.

Timing: Apply preplant or prior to crop emergence of any conventional or transgenic soybean varieties. When LIBERTY is used as a burndown, an additional application LIBERTY may be used as an in-season application at 22 to 29 fl oz/A overtop soybean varieties designated as "LibertyLink".

Spray Volume: A minimum of 15 GPA. For dense weed canopies use 20 to 40 GPA. Do not use nozzles or pressures that result in coarse sprays.

General Comments: Weed control may be reduced when applied to weeds stressed from drought or cool temperatures. Heavy dew or fog may reduce weed control. Also, applications should be made between dawn and 2 hours before sunset to avoid potential reduction in control of lambsquarters and velvetleaf. The cumulative rate over the total season rate should not exceed 65 oz/A for soybean.

Rain Delay: 4 hours.

Rotation Restrictions: Rotational crops that may be planted are corn or soybeans anytime, small grains 70 days, and other crops 180 days after application.

Harvest & Forage Restrictions: Do not apply within 70 days of harvesting soybean seed. Do not graze treated fields or harvest for forage or hay.

Tank Mixtures: LIBERTY may be tank mixed with labeled rates of other herbicides provided other products are labeled for burndown applications. No specific products are listed for burndown tank mixes.

Generic Formulations: Cheetah, Forfeit, and Rely 280 are labeled for burndown before planting conventional or transgenic varieties. These products may also be applied overtop Liberty Link Soybeans.

Preplant Foliar "Burndown" plus Residual Herbicides for No-tillage Soybeans

CANOPY 75DG

Rate/A

chlorimuron:metribuzin

Burndown Control

3 to 4 oz/A

(0.02:0.12) - (0.03:0.16 lb ai/A)

Burndown & Residual Control

6 to 8 oz/A

(0.04:0.24) - (0.053:0.32 lb ai/A)

CANOPY BLEND 58.3% DG

Rate/A

chlorimuron:metribuzin

Burndown Control

3.9 to 5.15 oz/A

(0.02:0.12) - (0.03:0.16 lb ai/A)

Burndown & Residual Control

7.75 to 10.3 oz/A

(0.04:0.24) - (0.053:0.32 lb ai/A)

Additives: When used as a "burndown", add Crop Oil Concentrate at 1% (1 gal/100 gal) or Non-Ionic Surfactant at 0.25% (1 qt/100 gal).

Weeds Controlled: Burcucumber, chickweed, cocklebur, henbit, hophornbeam copperleaf, lambsquarters, morningglory, prickly lettuce, marestail, mustards, pennycress, pigweed, prickly sida, common ragweed, giant ragweed, sicklepod, smartweed, velvetleaf. The addition of 2,4-D LVE is required for burndown of marestail.

Timing: May be applied preemergence or early preplant in the fall or spring up to 45 days prior to planting.

General Comments: Soybean injury may occur if soil pH is greater than 7.5. Do not exceed 3.5 oz/A CANOPY DF or 4.5 oz/A of CANOPY BLEND if soil pH exceeds 7.0. Treatments will provide some "burndown" of existing broadleaf weeds up to 3" and small annual grasses up to 1" tall. For added postemergence control, apply with 2,4-D, paraquat, or glyphosate. Soybean stunting may occur under certain environmental conditions. Sprayer equipment should be thoroughly cleaned before spraying other crops.

Environmental Statements: The use of metribuzin on permeable soils may result in ground water contamination.

Rain Delay: Rainfast after 1 hour.

Rotation Restrictions: If soil pH is 7.0 or less and the CANOPY rate is less than 10 oz/A, rotational crops which may be planted include wheat or barley after 4 months; or alfalfa, tobacco, grain sorghum, field corn or popcorn after 10 months (9 months for corn if rate is \leq 6 oz/A following treatment). Other crops require a minimum 18 month interval. Consult label for rotation restrictions if pH is greater than 7.0, CANOPY rate exceeds 10 oz/A, or when other long-residual herbicides are used during the same season. Over application can result in injury to rotational crops. When using CANOPY BLEND, consult label for rotation restrictions.

Harvest & Forage Restrictions: Do not graze treated fields or harvest for forage.

Tank Mixtures with CANOPY or CANOPY BLEND: metolachlor, pendimethalin, 2,4-D LVE, glyphosate, or paraquat

Generic Formulation: Cloak is similar to CANOPY. Follow label for rates and preplant intervals.

78 Soybean

FLEXSTAR GT 3.5 (2.8L) 3.5 to 5.3 pt/A (fomesafen: glyphosate)
[(0.25 lb ai/A:0.99lb ae/A) to (0.371 lb ai/A:1.48 lb ae/A)]

Additives: An adjuvant is already included with FLEXSTAR GT and minimizes the need for additional adjuvants. Under certain conditions the addition of one or more of the following may improve control: AMS at 8.5 to 17 lb/100 gal; Crop Oil Concentrate or Methylated Seed oil at 2 to 4 qt/100 gal; or Non Ionic Surfactant at 1 to 2 pt/100 gal.

Weeds Controlled: Burndown control of barnyardgrass, chickweed, common ragweed, crabgrass, fall panicum, giant foxtail, giant ragweed, henbit, johnsongrass (seedling), lambsquarters, mustards, Palmer amaranth, rye, smartweed, volunteer corn (except glyphosate resistant), waterhemp, wheat. Preemergence control of lambsquarters, black nightshade, pigweed, common ragweed.

Timing: Apply as a preplant or preemergence burndown or postemergence over-the-top in glyphosate tolerant soybean.

General Comments: Follow label directions for herbicide rates and optimum stages of weed growth. Do not exceed a maximum of 0.375 lb ai of fomesafen in alternate years.

Environmental Statements: Contamination of groundwater may occur when used on permeable soils.

Rain Delay: Heavy rainfall after application may reduce performance.

Rotation Restrictions: Rotational crops that may be planted are wheat or barley after 4 months; or corn after 10 months (12 months for popcorn) following treatment. Other crops may be planted 18 months after treatment.

Harvest & Forage Restrictions: Do not apply within 45 days of harvest. Do not apply within 45 days of harvest. Treated soybean plants should not be grazed or harvested for forage or hay.

Tank Mixtures for Preplant or Preemergence Applications: 2,4-D, and glyphosate.

LEADOFF

1.5 oz/A

[rimsulfuron:thifensulfuron]
(0.0156 : 0.0156 lb ai/A)

Weeds Controlled: Common chickweed, curly dock, dandelion, henbit, wild garlic, lambsquarters. The addition of 2,4-D ester, glyphosate, paraquat, or glufosinate with LEADOFF will enhance burndown control of such weeds as marestalk (horseweed).

Additives: Apply with a nonionic surfactant at 0.25 % v/v (1 qt/100 gal spray solution); or with a petroleum based crop oil concentrate at 1-2% v/v (1-2 gal/100 gal of spray solution); or MSO at 0.5% v/v (0.5 gal/100 gal). An ammonium nitrogen fertilizer or a high quality, sprayable grade of ammonium sulfate may be added to enhance weed control. When mixing with glyphosate or glufosinate that contain a built-in adjuvant system, no additional surfactant is needed.

Timing: When using soybeans without BOLT technology, apply LEADOFF at 1.5 oz/A early preplant in the fall or spring but no later than **30** days before planting soybean. Allow 60 days when applying >1.5 to 2 oz/A. When planting soybeans with BOLT technology, LEADOFF may be at 1.5 to 2.7 oz/A 0 days or more prior to planting.

Spray Volume: A minimum of 10 to 15 GPA.

General Comments: Crop injury may occur during periods of cold weather and/or wet soils, LEADOFF will not control weeds that are resistant to ALS-inhibitor herbicides.

Rotation Restrictions: When LEADOFF is applied at 1.5 oz/A, the rotational interval is 1 month for soybean, 3 months for winter cereals, 10 months for alfalfa, sorghum, and tobacco. Corn may be planted anytime.

Harvest & Forage Restrictions: Do not graze, feed forage, or grain within 30 days of application.

Tank Mixtures: LEADOFF tank mixtures include 2,4-D ester, glyphosate, paraquat, and glufosinate. Consult other labels for approved tankmix partners.

SEQUENCE 5.25 L

3.5 to 4 pt/A

(glyphosate:S-metolachlor)

[(1:1.3) to (1.13:1.5 lb /A)]

Additives: Dry Ammonium Sulfate (AMS) at 1 to 2% by weight (8.5 to 17 lb/100 gal) may improve activity during dry weather, or when mixed in hard water or with certain herbicides, or applied to certain weed species.

Annual Weeds Controlled: Annual fleabane, barnyardgrass, brome spp., chickweed, common ragweed, crabgrass, fall panicum, giant foxtail, giant ragweed, henbit, johnsongrass (seedlings), lambsquarters, mustards, prickly lettuce, rye, smartweed, volunteer corn (except glyphosate resistant), wheat

Perennials: CONSULT LABEL FOR SPECIFIC PERENNIAL WEED SPECIES. Best control of perennial weeds is usually achieved at late growth stages approaching maturity and when soil moisture is adequate for active plant growth. Perennial weeds may not be at the proper growth stage during normal application times for no-till soybeans. Control may be reduced if plants are mowed or grazed and not allowed to regrow to recommended growth stage. Perennial weeds may require multiple applications of glyphosate for control.

Timing: Apply up to 30 days before, during, or after planting but before crop emergence. Can also be applied postemergence overtop Roundup Ready soybean from cracking up through third trifoliolate..

Spray Volume: Apply in 10 to 40 gallons of clean water/A

General Comments: Glyphosate is a translocated herbicide that controls emerged weeds, whereas, S-metolachlor is a soil-residual herbicide that controls weeds prior to emergence. Rainfall soon after application may reduce control of emerged weeds. Management programs that rely on repeated use of glyphosate alone for burndown control without herbicides of other modes of action may lead to the development of populations of glyphosate-resistant biotypes of weeds. Do not apply products with S-metolachlor or metolachlor after soybean emergence if SEQUENCE is applied preemergence. Do not exceed 4 pt/A of SEQUENCE per year.

Environmental Statements: SEQUENCE has GROUND and SURFACE WATER ADVISORY statements on the label. This product should not be mixed or loaded within 50 feet of any wells, sink holes, perennial or intermittent streams and rivers, and natural or impounded lakes and reservoirs, unless an impervious pad is used. Avoid drift of spray as this can result in injury to non-target plants.

Rain Delay: Rainfall soon after application may reduce effectiveness.

Rotation Restrictions: Rotational crops that may be planted include corn or sorghum (with Concep treated seed) immediately; alfalfa after 4 months; wheat, barley, rye, or oats after 4.5 months; clover after 9 months; and tobacco in the spring following treatment.

Harvest & Forage Restrictions: For preplant or preemergence applications, do not feed for forage or hay for 30 days after treatment. For post applications in RR soybean, do not harvest grain for 90 days after treatment and do not graze or feed forage or hay.

Tank Mixtures: Authority, Boundary, Canopy, Command, Dual II Magnum, FirstRate, Prowl, Scepter, 2,4-D.

SHARPEN 2.85S 1 to 1.5 fl oz/A

(saflufenacil 0.022 to 0.033 lb ai/A)

Additives: For optimum burndown activity use a Methylated Seed Oil (MSO) at 1 gal/100 gal. Also include Ammonium Sulfate (AMS) 8.5 to 17 lb/100gal or Urea Ammonium Nitrate (UAN) at 1.25 to 2.5 gal/100 gal. Use AMS when mixing with glyphosate containing herbicides. Do not use surfactants as a substitute for MSO or poor broadleaf control will occur.

Weeds Controlled: Burndown control of common chickweed, horseweed (marestail), prickly lettuce, giant ragweed. Suppression of established dandelion. Soil-residual control of common chickweed, pigweed, and giant ragweed, and prickly sida.

Crop Stage: SHARPEN may be applied in the fall or spring.

General Comments: Applications may be made as an early preplant or preemergence when Sharpen is used at a rate of 1 oz/A. Allow a minimum preplant interval of 14 days for 1.5 oz/A rate and 30 days for 2 oz/A rate. A more restrictive preplant interval will be required if Sharpen is applied with other Group 14 (PPO Inhibitor) herbicides (such as sulentrazone or flumioxazin) or when applied to coarse textured soils with \leq 2% organic matter. Cover seed with soil to avoid washing and concentration of herbicide in seed zone. Do not apply when soybean reach cracking stage. Group 14 herbicides labeled for post treatments may be used 14 days after soybean emergence. Do not exceed a maximum cumulative rate of 4 oz/A (0.089 lb ai/A of saflufenacil). Sequential applications of Sharpen must be separated by at least 30 days.

Environmental Statements: SHARPEN has GROUND and SURFACE WATER ADVISORY statements on the label.

Rain Delay: 1 hour.

Rotation Restrictions: When SHARPEN is applied at 1 oz/A field corn, popcorn, grain sorghum, small grains and soybean may be planted anytime (allow 30 days for soybean with coarse soil texture and \leq 2% OM.) Allow a 4-month rotational interval for other crops.

Harvest & Forage Restrictions: Do not harvest forage or graze for at least 65 days after application.

Tank Mixtures: Extreme, Prowl, Pursuit, Scepter, Verdict, Zidua, glyphosate.

80 Soybean

VERDICT 5.57EC 5 to 7.5 fl oz/A

(saflufenacil: dimethenamid
0.022: 0.195 lb ai/A to 0.033:0.29 lb ai/A)

Additives: For optimum burndown activity use a Methylated Seed Oil (MSO) 1 gal/100 gal. Also include Ammonium Sulfate (AMS) 8.5 to 17 lb/100gal or Urea Ammonium Nitrate (UAN) at 1.25 to 2.5 gal/100 gal. Use AMS when mixing with glyphosate containing herbicides. Do not use surfactants as a substitute for MSO or poor broadleaf control will occur.

Weeds Controlled: Burndown control of common chickweed, horseweed (marestalk), prickly lettuce, giant ragweed. Soil-residual control of common chickweed, pigweed, giant ragweed, and prickly sida.

Crop Stage: VERDICT may be applied in the spring at 5 oz/A as an early preplant or preemergence treatment. Allow a minimum of 14 days preplant for 7.5 oz/A rate. Allow a minimum of 30 days preplant for 10 oz/A rate Verdict may be applied in the fall at 5 to 15 oz/A.

General Comments: When applying 5 to 7.5 oz/A rate to coarse texture soils with $\leq 2\%$ organic matter, allow a minimum interval of 30 days after applications before planting soybean. Cover seed with soil to avoid washing and concentration of herbicide in seed zone. Do not apply VERDICT as a tankmix or sequential application within 30 days (44 days for Verdict at 10 oz/A rate) of other PPO inhibitor herbicides (e.g. sulfentrazone or flumioxazin) because crop injury may occur. PPO inhibitor herbicides labeled for postemergence treatments may be applied 14 days after soybean emergence. Do not exceed a maximum cumulative rate of 20 oz/A (0.089 lb ai/A of saflufenacil)

Environmental Statements: Verdict has GROUND and SURFACE WATER ADVISORY statements on the label.

Rain Delay: 1 hour.

Rotation Restrictions: When Verdict is applied at 5 oz/A, field corn, popcorn, grain sorghum, or soybean may be replanted immediately after crop failure (allow 30 days for soybean with coarse soil texture and $\leq 2\%$ OM). Observe the label when the Verdict rate exceeds 5 oz/A. Fall seeded cereal crops may be planted 4 months after treatment. There are no rotational crop restrictions the spring following the previous year's application.

Harvest & Forage Restrictions: Do not harvest forage or graze treated plants to livestock.

Tank Mixtures: Optill, Sharpen, glyphosate.

NO-TILL SOYBEAN

Relative Response of Cover Crops and Weeds to Burndown Herbicides¹

| HERBICIDE | COVER CROPS | | | | | | | | | COOL SEASON WEEDS | | | | | | | | | WARM SEASON WEEDS | | | | | | | | | | | | | |
|--------------------------------|-------------|-------------|---------------|--------------|--------------|-----|------------------|-------|-------|-------------------|-----------|-----------|-------------|----------|--------------|----------------------------|------------------|-----------------------|-------------------|--------------|---------------|-----------|----------------|--------------|-------------------------|------------------------|---------------|-----------------|----------|-----------------|----------------|-----------|
| | Alfalfa | Clover, Red | Clover, White | Fescue, Tall | Orchardgrass | Rye | Ryegrass, Annual | Vetch | Wheat | Brome spp. | Chickweed | Dandelion | Dock, Curly | Fleabane | Garlic, Wild | Henbit / Purple Deadnettle | Lettuce, Prickly | Horseweed (Marestail) | Mustard spp. | Musk Thistle | Barnyardgrass | Crabgrass | Foxtail, Giant | Fall Panicum | Johnsongrass (seedling) | Johnsongrass (rhizome) | Lambsquarters | Yellow Nutsedge | Pokeweed | Ragweed, Common | Ragweed, Giant | Smartweed |
| Paraquat | 3 | 7 | 5 | 5 | 3 | 7 | 6 | 7 | 7 | 7 | 9 | 4 | 2 | 6 | 7 | 8 | 5 | 4 | 6 | 3 | 7 | 9 | 9 | 6 | 7 | 3 | 6 | 4 | 4 | 7 | 7 | 5 |
| Glyphosate ² | 6 | 6 | 5 | 7 | 6 | 8 | 7 | 6 | 9 | 9 | 9 | 6 | 4 | 8 | - | 8 | 8 | 8* | 8 | 6 | 8 | 9 | 9 | 8 | 9 | 8 | 9 | 6 | 6 | 9 | 9 | 8 |
| Canopy | 4 | - | - | - | - | 3 | - | 6 | 3 | 6 | 9 | - | - | - | 8 | 9 | 8 | 8 | - | 3 | 5 | 5 | 3 | 5 | 3 | 9 | 7 | - | 9 | 8 | 7 | |
| Canopy EX | - | - | - | - | - | - | - | - | - | - | 9 | 7 | 5 | 8 | 7 | 9 | 9 | - | - | - | - | - | - | - | - | - | - | - | - | 8 | - | |
| 2,4-D Ester ³ | 6 | 8 | 5 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 5 | 7 | 4 | 6 | 7 | 4 | 8 | 8 | 8 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | - | 5 | 9 | 9 | 6 |
| Dicamba (Clarity) ³ | 8 | 9 | 8 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 7 | 8 | 7 | 8 | 6 | 6 | 9 | 8 | 7 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | - | - | 6 | 9 | 9 | - |
| Envive | - | - | - | - | - | - | - | - | - | - | - | 8 | - | - | - | - | 8 | - | - | - | - | - | - | - | - | - | - | - | 9 | 9 | - | |
| FirstShot / HarmonyExtra | - | - | - | - | - | 0 | 0 | 7 | 0 | 0 | 9 | - | 8 | - | 8 | 8 | - | 7 | - | 0 | 0 | 0 | 0 | 0 | 0 | 8 | - | - | 6 | 4 | - | |
| Flexstar GT | 6 | 6 | 5 | 7 | 6 | 8 | 7 | 6 | 9 | 9 | 9 | 6 | 4 | 8 | - | 8 | 8 | 8* | 8 | 6 | 8 | 9 | 9 | 8 | 9 | 8 | 9 | 6 | 6 | 9 | 9 | 8 |
| LeadOff ³ | - | - | - | - | - | 0 | 0 | 7 | 0 | 0 | 9 | 8 | 8 | - | 8 | 8 | - | - | - | 0 | 0 | 0 | 0 | 0 | 0 | 8 | - | - | 6 | 4 | - | |
| Liberty ⁴ | - | - | - | - | - | - | 3 | 8 | 5 | - | 9 | 6 | 7 | - | - | 7 | - | 8 | - | 7 | 7 | 8 | 8 | 8 | - | 8 | - | - | 9 | 8 | 9 | |
| Sequence | 6 | 6 | 5 | 7 | 6 | 8 | 7 | 6 | 9 | 9 | 9 | 6 | 4 | 8 | - | 8 | 8 | 8* | 8 | 6 | 8 | 9 | 9 | 8 | 9 | 7 | 9 | 6 | 6 | 9 | 9 | 8 |
| Sharpen ³ | 7 | - | 5 | - | - | - | - | 6 | 1 | - | 8 | 7 | 7 | 7 | - | 7 | 8 | 8 | - | 6 | - | - | - | - | - | - | 8 | - | - | - | 8 | - |
| Verdict ³ | 7 | - | 5 | - | - | - | - | 6 | 1 | - | 8 | 7 | 7 | 7 | - | 7 | 8 | 8 | - | 6 | - | - | - | - | - | - | 8 | - | - | - | 8 | - |

GOOD= 8-9

FAIR = 6-7

POOR = 5 or less

- Insufficient Data

1 Information presented in this table is the relative burndown response of emerged plants to herbicides applied at normal rates for no-till soybeans. This information generally does not reflect soil residual effects of the herbicides. The relative response values are based on a numerical scale from 0 to 9 and compare effectiveness of herbicides to control a particular cover crop or weed species. A herbicide may perform better or worse than indicated in the table due to weed size, environmental conditions or when tank mixed with other herbicides. This table should be used only as a guide. If a farmer is achieving satisfactory results under his conditions, he should not necessarily change products as a result of information in this table.

2 See page 22 for list of glyphosate products.

3 Consult label for preplant interval requirements to limit the risk for soybean injury.

4 Environmental stress conditions such as cool temperatures and cloudy weather may limit burndown weed control with Liberty.

* Populations of marestail are resistant to glyphosate.

SOYBEANS

Guide to Weed and Crop Response to Soil-Applied Herbicides ¹

| | Barnyardgrass | Broadleaf Signalgrass | Crabgrass | Fall Panicum | Foxtail | Johnsongrass (seedling) | Johnsongrass (rhizome) | Shattercane | Yellow Nutsedge | Black Nightshade | Burcucumber | Cocklebur | Copperleaf, Hophornbeam | Horseweed (Marestail) | Lambsquarters | Morningglory | Palmer amaranth | Pigweed, Smooth | Sida, Prickly | Ragweed, Common | Ragweed, Giant (Horseweed) | Sicklepod | Smartweed | Velvetleaf | Waterhemp | Crop Response ² |
|-------------------------------|---------------|-----------------------|-----------|--------------|---------|-------------------------|------------------------|-------------|-----------------|------------------|-------------|-----------|-------------------------|-----------------------|---------------|--------------|-----------------|-----------------|---------------|-----------------|----------------------------|-----------|-----------|------------|-----------|----------------------------|
| Anthem Maxx | 8 | 6 | 9 | 8 | 9 | 5 | 0 | - | 5 | 8 | - | 0 | - | - | 8 | - | 8 | 9 | - | 7 | 0 | 0 | - | 7 | 8 | 2 |
| Authority Elite / Broadaxe XC | 9 | - | 9 | 9 | 9 | 6 | 0 | 5 | 8 | 8 | - | 6 | 7 | - | 9 | 9 | 8 | 9 | 8 | 6 | 5 | - | 8 | 6 | 8 | 2 |
| Authority First / Sonic | - | - | 7 | 6 | 7 | 2 | 0 | - | 7 | 8 | 0 | 9 | 8 | 9 | 9 | 9 | 8 | 9 | 7 | 9 | 9 | - | 8 | 9 | 8 | 2 |
| Authority MTZ | 6 | 6 | 6 | 6 | 7 | 2 | 0 | - | 7 | 8 | 0 | 6 | 8 | 8 | 9 | 9 | 8 | 9 | 9 | 8 | 5 | 7 | 8 | 7 | 8 | 2 |
| Authority XL | 6 | 6 | 6 | 6 | 6 | 5 | 0 | 4 | 8 | 8 | 7 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 8 | 9 | 8 | 5 | 9 | 9 | 9 | 2 |
| Boundary | 8 | 7 | 9 | 9 | 9 | 5 | 0 | 5 | 6 | 7 | 2 | 6 | 8 | 8 | 9 | 5 | 8 | 9 | 9 | 8 | 6 | 7 | 9 | 7 | 8 | 2 |
| Canopy / Canopy Blend | 6 | 5 | 6 | 6 | 6 | 5 | 0 | 2 | 2 | 5 | 8 | 9 | 8 | 9 | 9 | 8 | 7 | 9 | 9 | 9 | 8 | 8 | 9 | 8 | 6 | 2 |
| Command 3ME (PRE only) | 9 | 9 | 9 | 9 | 9 | 7 | 2 | 6 | 3 | 5 | 0 | 6 | 2 | - | 8 | 0 | 3 | 6 | 8 | 8 | 6 | 0 | 7 | 9 | 5 | 0 |
| Dual II Magnum / Cinch | 8 | 7 | 9 | 9 | 9 | 5 | 0 | 4 | 7 | 8 | 0 | 0 | 4 | - | 6 | 0 | 7 | 8 | 3 | 5 | 0 | 3 | 6 | 2 | 7 | 0 |
| Envive | 7 | - | 6 | 5 | 7 | - | - | 3 | 7 | 9 | - | 8 | 9 | 8 | 9 | 8 | 8 | 8 | 8 | 9 | 7 | 4 | 9 | 8 | 8 | 2 |
| Fierce | 8 | 8 | 8 | 8 | 8 | 8 | 3 | 6 | 5 | 8 | - | 5 | 8 | 8 | 8 | 7 | 9 | 9 | 8 | 8 | - | 7 | 5 | 7 | 9 | 3 |
| Fierce XLT | 8 | - | 8 | 8 | 8 | - | - | - | - | 9 | 6 | 8 | 8 | 8 | 9 | 8 | 9 | 9 | 8 | 9 | 7 | - | 9 | 8 | 9 | 2 |
| Intimidator | 8 | 8 | 9 | 8 | 8 | 6 | 0 | - | 8 | 9 | - | 5 | 9 | 6 | 7 | 7 | 9 | 9 | 9 | 8 | - | 7 | 9 | 6 | 8 | 2 |
| Metribuzin | 6 | 5 | 6 | 6 | 6 | 5 | 0 | 2 | 2 | 2 | 2 | 6 | 8 | 8 | 9 | 5 | 7 | 9 | 9 | 8 | 6 | 7 | 9 | 7 | 7 | 2 |
| Outlook | 8 | 7 | 9 | 9 | 9 | 5 | 0 | 4 | 7 | 8 | 0 | 0 | 4 | - | 7 | 0 | 7 | 8 | 0 | 5 | 0 | 2 | 5 | 0 | 7 | 0 |
| Prefix / Statement | 9 | 9 | 9 | 9 | 9 | 5 | 1 | 2 | 6 | 8 | - | 3 | 5 | 4 | 7 | 4 | 8 | 8 | 8 | 8 | 6 | - | 8 | 6 | 8 | 2 |
| Prowl | 8 | 7 | 9 | 8 | 9 | 8 | 2 | 5 | 0 | 0 | 0 | 0 | 0 | - | 8 | 2 | 7 | 8 | 0 | 2 | 0 | 0 | 6 | 6 | 7 | 2 |
| Python / Accolade | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 6 | 7 | 9 | 9 | 5 | 7 | 9 | 8 | 7 | 5 | 6 | 8 | 7 | 7 | 1 |
| Scepter | 6 | 5 | 5 | 5 | 6 | 6 | 2 | 5 | 2 | 7 | 6 | 9 | 4 | 6 | 9 | 6 | 3 | 9 | 9 | 9 | 7 | 7 | 9 | 6 | 3 | 2 |
| Surveil | 7 | - | 6 | 5 | 7 | - | - | 3 | 2 | 9 | - | 8 | 9 | 9 | 9 | 8 | 8 | 9 | 8 | 9 | 7 | 4 | 9 | 8 | 8 | 2 |
| Trivence | - | - | - | - | - | - | - | - | - | 9 | 6 | 8 | - | 9 | 9 | 8 | 9 | 9 | - | 9 | 7 | | 9 | 8 | 9 | 2 |
| Valor SX or Encompass | 7 | 5 | 6 | 5 | 7 | 5 | - | 3 | 2 | 8 | - | 4 | 9 | 8 | 9 | 8 | 8 | 8 | 8 | 8 | 5 | 4 | 5 | 7 | 8 | 2 |
| Valor XLT | 7 | 2 | 6 | 5 | 7 | - | 3 | 3 | 2 | 8 | 6 | 4 | 9 | 9 | 9 | 8 | 8 | 8 | 8 | 8 | 5 | 4 | 5 | 7 | 8 | 2 |
| Warrant Ultra | 8 | - | 8 | 8 | 8 | - | - | - | 7 | 8 | - | - | - | - | 8 | - | 9 | 9 | - | 8 | - | - | - | - | 8 | 2 |
| Zidua | 8 | 8 | 8 | 8 | 9 | 4 | 6 | - | 4 | 8 | - | 0 | 4 | 6 | 7 | 6 | 8 | 8 | 7 | 6 | 0 | 4 | 5 | 6 | 8 | 1 |

GOOD = 8 - 9 FAIR = 6 - 7 POOR = 5 or Less - =Insufficient Data Available

¹ This table should be used only as a guide. The relative response value is based on a numerical scale from 0-9 comparing the effectiveness of herbicides to a particular weed. Under certain weather or environmental conditions, a herbicide may perform better or worse than indicated in the table. Response may be less in no-tillage than in conventional tillage. If a farmer is getting satisfactory results under his conditions, he should not necessarily change products as a result of the information in the table.

² A rating of 3 or less will not result in a crop yield loss under normal conditions. Certain soybean varieties vary in their injury response to a herbicide treatment.

SOIL APPLIED HERBICIDES

ANTHEM MAXX

ANTHEM MAXX 4.3 SC 2.5 to 4.75 oz/A (pyroxasulfone:fluthiacet)
 [(0.081:0.0024) to (0.155: 0.047) lb ai/A]]

Weeds Controlled: Barnyardgrass, black nightshade, crabgrass, fall panicum, foxtails, go, lambsquarters, Palmer amaranth, smooth pigweed waterhemp,

Crop Stage: May be applied early preplant, preplant, preemergence, or early postemergence from planting through third trifoliolate.

General Comments: Soybeans should be planted at least one inch deep. The maximum cumulative rate for most soils is 0.186 lb ai /A pyroxasulfone and 0.006 lb ai fluthiacet per 12-month cropping season.

Environmental Statements: ANTHEM MAXX has GROUND and SURFACE WATER ADVISORY statements on the label.

Rain Delay: 1 hour. Do not irrigate within 4 hours of a post application.

Rotation Restrictions: Corn or soybeans may be planted any time after application. Rotational crops that may be planted after ANTHEM MAXX include wheat after 4 months, barley and grain sorghum after 11 months; alfalfa after 10 months. For certain other crops allow a 18-month interval.

Harvest & Forage Restrictions: Apply no later than 60 days before harvest. Do graze or harvest forage or hay.

Tank Mixtures: Aim, 2,4-D, glyphosate, paraquat, glufosinate, Sharpen, or Verdict,

AUTHORITY ELITE or BROADAXE XC

AUTHORITY ELITE 7L 25-32 fl oz/A (sulfentrazone:S-metolachlor)
 or [(0.137:1.23) to (0.175:1.58) lb ai/A)]
BROADAXE XC 7L 25-32 floz/A

Weeds Controlled: Barnyard grass, crabgrass, fall panicum, foxtails, black nightshade, lambsquarters, morningglories, Palmer amaranth, smooth pigweed., prickly sida, smartweed, waterhemp. Incorporation and use of high rate may improve control of yellow nutsedge.

Crop Stage: May be applied preplant surface in spring; preplant incorporated; or preemergence up to 3 days after planting but before crop seed germinate. Soybean injury may occur if applied near or after crop emergence.

General Comments: A limited number of soybean varieties are susceptible to sulfentrazone and may be injured. Consult label for other comments regarding crop injury. When other herbicides with these ingredients are also used, do not exceed 0.375 lb ai sulfentrazone/A or 2.387 lb ai S-metolachlor/A per season.

Environmental Statements: AUTHORITY ELITE and BROADAXE XC has GROUND and SURFACE WATER ADVISORY statements on the label.

Rain Delay: None.

Rotation Restrictions: Rotational crops that may be planted after AUTHORITY ELITE include wheat or barley, after 4 ½ months; field corn and tobacco after 10 months (18 months for popcorn); 12 months for alfalfa. For certain other crops allow a 12-month interval and a bioassay.

Harvest & Forage Restrictions: Do graze or harvest forage or hay for 30 days after treatment..

Tank Mixtures: None specified on the label.

AUTHORITY FIRST or SONIC

AUTHORITY FIRST 70 DG 6.45 oz/A
 or (sulfentrazone:cloransulam 0.25:0.032 lb ai/A)
SONIC 70 DG 6.45 oz/A

Weeds Controlled: Black nightshade, cocklebur, lambsquarters, marestalk (horseweed), morningglories, common ragweed, giant ragweed, smooth pigweed, smartweed, velvetleaf, waterhemp. Incorporation and use of high rate may improve control of yellow nutsedge. For burndown and residual control of marestalk use 6.45 to 8 oz/A

Crop Stage: May be applied preplant incorporated or preemergence. For burndown plus residual control of marestalk (not ALS resistant biotypes) apply AUTHORITY FIRST or SONIC at 6.45 to 8 oz/A plus surfactant or crop oil concentrate plus AMS.

General Comments: Do not exceed 8 oz of AUTHORITY FIRST or SONIC per acre per season. When applying AUTHORITY FIRST or SONIC followed by post application of Authority, do not exceed a cumulative rate of 0.055 lb ai of cloransulam per acre per season.

84 Soybean

AUTHORITY FIRST or SONIC (continued)

Environmental Statements: AUTHORITY FIRST and SONIC have GROUND and SURFACE WATER ADVISORY statements on the label.

Rain Delay: None.

Rotation Restrictions: Rotational crops include wheat after 4 months; field corn or popcorn after 10 months (18 months if organic matter is < 1.5% and soil pH > 7.0); alfalfa, barley, rye, or sorghum after 12 months after application. Tobacco requires a 30-month interval and a successful field bioassay.

Harvest & Forage Restrictions: Do not harvest soybeans for 65 days after application. Do not feed treated forage or hay.

Tank Mixtures: AUTHORITY FIRST or SONIC: Aim, 2,4-D, glyphosate, paraquat.

AUTHORITY MTZ

AUTHORITY MTZ 45 DG 14 to 18 oz/A

(sulfentrazone : metribuzin)
[(0.158:0.24) to (0.2:0.3 lb ai/A)]

Weeds Controlled: Black nightshade, hophornbeam copperleaf, lambsquarters, marestalk (horseweed), morningglories, common ragweed, palmer amaranth, smooth pigweed, smartweed, waterhemp. Incorporation and use of high rate may improve control of yellow nutsedge.

Crop Stage: May be applied in the fall or in the spring (early preplant 30-45 days prior to planting); preplant incorporated; or preemergence up to 3 days after planting but before crop seed germinate.

General Comments: AUTHORITY MTZ is a Restricted Use Pesticide. A limited number of soybean varieties are susceptible to AUTHORITY MTZ and may be injured. Consult label for other comments regarding crop injury.

Environmental Statements: AUTHORITY MTZ has GROUND and SURFACE WATER ADVISORY statements on the label. This product should not be mixed or loaded within 50 feet of any wells, sink holes, perennial or intermittent streams, rivers, and natural or impounded lakes and reservoirs, unless an impervious pad is used.

Rain Delay: None.

Rotation Restrictions: Rotational crops that may be planted after AUTHORITY MTZ include wheat, and barley, after 4 months; field corn or popcorn after 10 months; alfalfa and tobacco after 12 months; and sorghum after 18 months after application. Consult label for reduced intervals for corn & sorghum.

Harvest & Forage Restrictions: Do graze or harvest forage or hay.

Tank Mixtures: None specified on AUTHORITY MTZ label.

AUTHORITY XL

AUTHORITY XL 70DG 6.5 oz/A to 7.5 oz/A

(sulfentrazone : chlorimuron)
[(0.25:0.032) to (0.29:0.036 lb ai/A)]

Weeds Controlled: Black nightshade, cocklebur, lambsquarters, marestalk (horseweed), morningglories, prickly sida, common ragweed, giant ragweed, smooth pigweed, smartweed, velvetleaf. Incorporation and use of high rate may improve control of yellow nutsedge.

Crop Stage: May be applied in the fall or in the spring; preplant incorporated; or preemergence up to 3 days after planting but before crop seed germinate.

General Comments: A limited number of soybean varieties are susceptible to AUTHORITY XL and may be injured. Consult label for other comments regarding crop injury. Authority Maxx is a similar premix, yet it provides a lower concentration of chlorimuron, compared to AUTHORITY XL.

Environmental Statements: AUTHORITY XL has GROUND and SURFACE WATER ADVISORY statements on the label.

Rain Delay: 1 hour.

Rotation Restrictions: For soils with a pH < 6.8 rotational crops that may be planted after AUTHORITY XL include wheat, barley after 4 months; field corn, popcorn, and tobacco after 10 months; alfalfa after 12 months. For sorghum allow 18 months (10 months if rate is 6.4 oz/A). Certain other crops may require 18 or 36 months interval. Consult AUTHORITY XL label when: 1) soil pH >6.8; 2) when using the reduced rate program; 3) or when a successful field bioassay is required.

Harvest & Forage Restrictions: Do not feed treated forage or hay to livestock.

Tank Mixtures: Glyphosate, glufosinate, paraquat, 2,4-D

BOUNDARY**BOUNDARY 6.5EC** 2.1 to 3.0 pt/A[S-metolachlor : metribuzin]
[(1.38:0.33) to (1.97:0.47) lb ai/A]**Weeds Controlled:** Barnyardgrass, common ragweed, crabgrass, fall panicum, foxtails, hophornbeam copperleaf, lambsquarters, smooth pigweed, prickly sida, smartweed, waterhemp.**Crop Stage:** May be applied preplant incorporated or preemergence. BOUNDARY may be applied up to 30 days before no-till plantings.**General Comments:** Seed should be planted at least 1.5 inches deep. When soil pH > 7.0, apply 1.5 pt/A rate only.**Environmental Statements:** BOUNDARY has GROUND and SURFACE WATER ADVISORY statements on the label. This product should not be mixed or loaded within 50 feet of any wells, sink holes, perennial or intermittent streams, rivers, and natural or impounded lakes and reservoirs, unless an impervious pad is used.**Rain Delay:** None.**Rotation Restrictions:** Alfalfa, winter wheat, and barley may be planted 4.5 months, or corn after 8 months following BOUNDARY treatments. Other crops may require a 12-month rotational interval. Cover crops may be planted any time but stand reductions may occur. Do not graze or harvest cover crops for feed or food.**Harvest & Forage Restrictions:** Wait 40 days after application before grazing or feeding soybean forage.**Tank Mixtures:** Canopy, Canopy XL, Command 3ME, FirstRate, Gramoxone Extra, Prowl, Python, Scepter, Roundup Ultra, Touchdown, 2,4-D (LVE).**Generic Formulation:** Tailwind**CANOPY 75DG**

Rate/A

chlorimuron:metribuzin

Burndown Control

3 to 4 oz/A

(0.02:0.12) - (0.03:0.16 lb ai/A)

Burndown & Residual Control

6 to 8 oz/A

(0.04:0.24) - (0.053:0.32 lb ai/A)

CANOPY BLEND 58.3% DG

Rate/A

chlorimuron:metribuzin

Burndown Control

3.9 to 5.15 oz/A

(0.02:0.12) - (0.03:0.16 lb ai/A)

Burndown & Residual Control

7.75 to 10.3 oz/A

(0.04:0.24) - (0.053:0.32 lb ai/A)

Additives: When used as a "burndown", add Crop Oil Concentrate at 1% (1 gal/ 100 gal) or Non-Ionic Surfactant at 0.25% (1 qt/100 gal).**Weeds Controlled:** Burcucumber, chickweed, cocklebur, henbit, hophornbeam copperleaf, lambsquarters, morningglory, prickly lettuce, marestalk, mustards, pennycress, pigweed, prickly sida, common ragweed, giant ragweed, sicklepod, smartweed, velvetleaf. The addition of 2,4-D LVE is required for burndown of marestalk.**Timing:** CANOPY may be applied preemergence or early preplant in the fall or spring up to 45 days prior to planting.**General Comments:** Soybean injury may occur if soil pH is greater than 7.5. Do not exceed 3.5 oz/A CANOPY DF or 4.5 oz/A of CANOPY BLEND if soil pH exceeds 7.0. Treatments will provide some "burndown" of existing broadleaf weeds up to 3" and small annual grasses up to 1" tall. For added postemergence control, apply with 2,4-D, paraquat, or glyphosate. Soybean stunting may occur under certain environmental conditions. Sprayer equipment should be thoroughly cleaned before spraying other crops.**Environmental Statements:** The use of metribuzin on permeable soils may result to ground water contamination.**Rain Delay:** Rainfast after 1 hour.**Rotation Restrictions:** If soil pH is 7.0 or less and the CANOPY rate is less than 10 oz/A, rotational crops which may be planted include wheat or barley after 4 months; or alfalfa, tobacco, grain sorghum, field corn or popcorn after 10 months (9 months for corn if rate is ≤ 6 oz/A following treatment). Other crops require a minimum 18 month interval. Consult label for rotation restrictions if pH is greater than 7.0, CANOPY rate exceeds 10 oz/A, or when other long-residual herbicides are used during the same season. Over application can result in injury to rotational crops. When using CANOPY BLEND, consult label for rotation restrictions.**Harvest & Forage Restrictions:** Do not graze treated fields or harvest for forage.**Tank Mixtures with CANOPY or CANOPY BLEND:** metolachlor, pendimethalin, 2,4-D LVE, glyphosate, or paraquat**Generic Formulation:** Cloak is similar to CANOPY. Follow label for rates & preplant intervals.

86 Soybean

COMMAND

COMMAND 3ME 2 to 2.67 pt/A (clomazone 0.75 to 1 lb ai/A)

Weeds Controlled: Barnyardgrass, broadleaf signalgrass, common ragweed, crabgrass, fall panicum, foxtails, lambsquarters, prickly sida, velvetleaf.

Crop Stage: COMMAND 3 ME may be used as preemergence surface applied treatment from 30 days from planting to just prior to crop emergence.

General Comments: In cases where additional seedbed preparation is needed following Command 3ME application, avoid moving herbicide deeper than 1.5 to 2 inches.

Environmental Statements: Drift of spray particles or vapors can cause foliar whitening or yellowing of desirable vegetation such as shrubs, flowers, fruits, vegetables, and other sensitive plants. A nontreated buffer zone of at least 1,200 feet is required between COMMAND treated fields and general areas such as adjacent towns, subdivisions, and areas used for vegetable, fruit, nursery, and greenhouse production.

Rain Delay: None.

Rotation Restrictions: Soybeans and tobacco may be planted any time. Rotational crops that may be planted after COMMAND include field corn, popcorn, or grain sorghum after 9 months; or wheat after 12 months; or other crops after 16 months after treatment. Cover crops may be planted anytime, but stand reduction may occur. Do not harvest cover crops for food or feed when planted less than 9 months after treatment. Consult label for additional crop rotation restrictions. Application to soils with pH \leq 5.9 or when extremely dry conditions occur 4 months after application, may result in injury to rotational crops.

Harvest & Forage Restrictions: Do not use treated plants for feed or forage.

Tank Mixtures: Canopy, Prowl, Scepter.

DUAL II MAGNUM (S-metolachlor)

DUAL II MAGNUM 1.33 to 1.67 pt/A (S-metolachlor 1.27 to 1.6 lb ai/A)

or

CINCH 1.33 to 1.67 pt/A

Weeds Controlled: Barnyardgrass, black nightshade, crabgrass, fall panicum, foxtails, smooth pigweed, Incorporation and use of high rate may improve control of yellow nutsedge.

Crop Stage: DUAL II MAGNUM and CINCH may be applied preplant incorporated or preemergence for control of annual grasses and certain broadleaf weeds. They may be applied within 30 days before planting. Postemergence treatments may be applied 1 to 1.33 pt/A before weeds emerge through 3 trifoliolate soybean.

General Comments: Similar products include Brawl II, Charger Basic, Cinch, Parallel, Parallel PCS and Stalwart. BRAWL II, CHARGER BASIC, DUAL II MAGNUM, CINCH, MEDAL and MEDAL II contain 7.64 lb ai S-metolachlor per gal. PARALLEL contains 7.8 lb ai metolachlor. Me-Too-Lachlor, Parallel PCS and Stalwart contain 8 lb ai metolachlor per gal.

Environmental Statements: These products have GROUND and SURFACE WATER ADVISORY statements on the label. They should not be mixed or loaded within 50 feet of any wells, sink holes, perennial or intermittent streams, rivers, and natural or impounded lakes and reservoirs, unless an impervious pad is used.

Rain Delay: None.

Rotation Restrictions: Field corn, popcorn, or grain sorghum (use CONCEP treated seed) or soybeans may be planted anytime following application. Small grains may be planted 4 ½ months, alfalfa 4 months, or clover 9 months after application. Plant other crops in the spring following treatment.

Harvest & Forage Restrictions: No restrictions except when Dual II Magnum is applied postemergence allow a minimum of 90 days before harvest. Do not graze or feed forage or hay to livestock.

Tank Mixtures DUAL II MAGNUM: Canopy, Command 4E, Gramoxone MAX, Roundup, Scepter.

Tank Mixtures CINCH: Scepter, Command 4E, Gramoxone, Touchdown, or Roundup UltraMax

ENVIVE

ENVIVE 2.5 to 5.3 oz/A *

(chlorimuron 0.014 to 0.03 lb ai/A)
(thifensulfuron 0.0045 to 0.0096 lb ai/A)
(flumioxazin 0.046 lb ai/A to 0.097 lb ai/A)* Use >4 to 5.3 oz/A where soil pH \leq 7.0. No pH restrictions for rates at 2.5 to 4 oz/A**Additives:** Crop Oil Concentrate at 1 gal/100 gal of spray mixture. If tank mix partner prohibits use of crop oil concentrate, use non-ionic surfactant at 1 qt/100 gal of spray mixture.**Weeds Controlled:** Burndown control of dandelion, prickly lettuce, common ragweed, giant ragweed. Add 2,4-D LVE for optimum burndown control of horseweed (marestail), wild garlic, and certain other weed species. Preemergence control of black nightshade, cocklebur, dandelion, hophornbeam copperleaf, lambsquarters, marestail, morningglories, Palmer amaranth, smooth pigweed, prickly sida, common ragweed, smartweed, velvetleaf, waterhemp**Crop Stage:** Apply as an early preplant treatment in the fall or spring up to 3 days after planting but before crop emergence. For optimum control apply when annual broadleaf weeds are up to 3 inches and perennial broadleaf weeds are up to 6 inches in height or diameter.**General Comments:** Do not exceed 4 oz/A where soil pH >7. Soybean stunting may develop if excessive rainfall occurs after application and for a short period after crop emergence. Risk of injury can be minimized by not using on poorly drained soils, planting seed at least 1.5 inches deep, and covering seed with soil.**Environmental Statements:** Do not mix/load, or use within 50 feet of all wells including abandoned wells, drainage wells and sinkholes.**Rain Delay:** 1 hour**Rotation Restrictions:** Follow the label for herbicide rate relative to soil pH. The rotation intervals are 4 months for barley, wheat, 10 months for alfalfa, transplanted tobacco, field corn, popcorn, (8 months for field corn if chlorimuron rate does not exceed 0.375 oz ai/A), and 12 months for sorghum and clover.**Harvest & Forage Restrictions:** Do not graze treated fields or harvest for forage or hay.**Tank Mixtures:** 2,4-D LVE, Express, glyphosate, metribuzin, paraquat, pendimethalin, Do not tank mix ENVIVE with acetochlor (Warrant), flufenacet (Define), metolachlor (Dual), or dimethenamide (Outlook) within 14 days of soybean planting unless soybeans are planted under no-till or minimum till on wheat stubble or no-till field corn stubble.

FIERCE

FIERCE 76 DG 3 to 3.75 oz/A

(flumioxazin:pyroxasulfone)
[(0.063:0.08) to (0.078:0.1 lb ai/A)]**Weeds Controlled:** Barnyardgrass, broadleaf signalgrass, large crabgrass, fall panicum, foxtails, seedling johnsongrass, black nightshade, common ragweed, hophornbeam copperleaf, lambsquarters, marestail (horseweed), Palmer amaranth, smooth pigweed, prickly sida, waterhemp.**Crop Stage:** May be applied in the fall or in the spring up to 3 days after planting but before crop emerges. Do not apply if soybeans are cracking.**General Comments:** When used for burndown control, consult label for use of additives. Crop injury may occur if treated soil is splashed onto newly emerged plants. Spray equipment must be cleaned each day. To enhance removal of herbicide residue from spray system, use a tank cleaner such as Valent Tank Cleaner.**Environmental Statements:** Fierce label has GROUNDWATER AND SURFACE WATER ADVISORY statements**Rain Delay:** 1 hour**Rotation Restrictions:** The rotational interval when using up to 3 oz of Fierce/A is 1 month for wheat, 30 days for conventional till field corn (7 days for reduced-till corn), 10 months for alfalfa, and 18 months for other crops. Consult label when Fierce rate is 3 oz/A.**Harvest & Forage Restrictions:** Do not graze or feed treated forage or hay to livestock.**Tank Mixtures:** Extreme, Gangster, metribuzin, FirstRate, pendimethalin, Python, Scepter, Valor, Valor XLT Command, glyphosate, 2,4-D LVE, Ignite, dicamba. Do not use FIERCE where flufenacet (Axiom), (Micro-Tech), metolachlor (Dual), or dimethenamid (Outlook) are applied or injury may occur.

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FIERCE XLT

FIERCE XLT 62.41 DG 3.75 to 4.5 oz/A

(chlorimuron:flumioxazin:pyroxasulfone)
[(0.0156:0.0575:0.073 lb ai/A) to
(0.0187:0.069:0.088 lb ai/A)]

Weeds Controlled: Barnyardgrass, large crabgrass, fall panicum, foxtails, black nightshade, common ragweed, hophornbeam copperleaf, lambsquarters, marestalk (horseweed), Palmer amaranth, smooth pigweed, prickly sida, smartweed, velvetleaf, waterhemp.

Crop Stage: May be applied in the fall or in the spring up to 3 days after planting but before crop emerges. Do not apply if soybeans are cracking.

General Comments: When used for burndown control, consult label for use of additives. Crop injury may occur if treated soil is splashed onto newly emerged plants. Spray equipment must be cleaned each day. To enhance removal of herbicide residue from spray system, use a tank cleaner such as Valent Tank Cleaner.

Environmental Statements: Fierce XLT label has GROUNDWATER AND SURFACE WATER ADVISORY statements.

Rain Delay: 1 hour

Rotation Restrictions: The rotational interval when soil pH is < 7.0 is 10 months for field corn, 18 months for alfalfa, barley, clover rye, and sorghum. Consult label when soil pH is 7.0 or greater.

Harvest & Forage Restrictions: Do not graze or feed treated forage or hay to livestock.

Tank Mixtures: Do not tank mix FIERCE XLT with chloroacetamide products such as flufenacet (Axiom), metolachlor (Dual), or dimethenamid (Outlook) are applied or injury may occur.

INTIMIDATOR

INTIMIDATOR 2.8 to 4.48 pt/A

(S-metolachlor:metribuzin:fomesafen)
[1.19:0.26:0.23 lb ai/A] to [1.9:0.42:0.38 lb ai /A]

Weeds Controlled: Barnyardgrass, broadleaf signalgrass, crabgrass, fall panicum, foxtails, yellow nutsedge, black nightshade, hophornbeam copperleaf, palmer amaranth, smooth pigweed, prickly sida, common ragweed, smartweed, waterhemp. Incorporation and higher use rates may improve control of yellow nutsedge.

Crop Stage: Preplant incorporated, preplant surface up to 30 days before planting or preemergence surface before soybean emergence.

General Comments: Do not exceed a maximum of 4.48 pt/A pre use season. When using other herbicides with these ingredients, do not exceed a cumulative rate 2.5 lb/A metolachlor or S-metolachlor; or 0.375 lb fomesafen per acre in alternate years.

Environmental Statements: INTIMIDATOR has ground and surface water advisory statements on the label. It should not be mixed or loaded within 50 feet of wells, sinkholes, perennial intermittent streams, rivers, and natural impounded lakes and reservoirs, unless an impervious pad is used.

Rain Delay: None.

Rotation Restrictions: Rotational crops include wheat or barley after 4.5 months, field corn after 10 months, (popcorn after 12 months). Other crops require an interval of 18 months.

Harvest & Forage Restrictions: Do not graze or harvest for soybean forage or hay. Do not graze rotated small grains or harvest forage or straw for livestock. Make post applications at least 90 days before harvest.

Tank Mixtures: 2,4-D LVE, Gramoxone Inteon, glyphosate, Canopy, FirstRate, Command, Python

METRIBUZIN 75DF

METRIBUZIN 75DF 0.5 lb/A

[metribuzin 0.38 lb ai/A]

Weeds Controlled: Common ragweed, hophornbeam copperleaf, lambsquarters, marestalk (horseweed), smooth pigweed, prickly sida, smartweed.

Crop Stage: May be applied preplant incorporated, preemergence, or post directed after soybeans are 8" tall.

General Comments: Seed should be planted at least 1 ½ inches deep.

Environmental Statements: METRIBUZIN has a GROUNDWATER ADVISORY statement on the label.

Rain Delay: None.

Rotation Restrictions: Alfalfa, corn, wheat, barley, and forage grasses may be planted 4 months after METRIBUZIN treatments are applied to soybeans. Before planting grain sorghum or tobacco, wait 12 months after application. Cover crops may be planted any time but stand reductions may occur. Do not graze or harvest cover crops for feed or food.

Harvest & Forage Restrictions: When METRIBUZIN is soil-applied, wait 40 days before utilizing treated soybean plants for forage, feed, or grazing. For POST-DIRECTED applications of METRIBUZIN, wait 70 days after application before harvesting grain or utilizing treated soybean plants (dry vines) as a forage crop. Do not use green vines for feed.

Tank Mixtures: Consult specific metribuzin product labels.

Generic Formulations: DIMETRIC, GLORY, METRI DF, METRIBUZIN 75, and TRICOR DF are examples of products containing the active ingredient metribuzin and are similar to SENCOR (a former brand name product.)

OUTLOOK

OUTLOOK 6EC 14 to 21 oz/A or (dimethenamid-P 0.66 to 0.98 lb ai/A)

Weeds Controlled: Barnyardgrass, black nightshade, crabgrass, fall panicum, foxtails, smooth pigweed. Incorporation and use of high rate may improve control of some weeds.

Crop Stage: Apply preplant incorporated or preemergence for control of annual grasses and certain broadleaf weeds. OUTLOOK may be applied up to 30 days before planting and may also be applied postemergence from first to third trifoliolate soybeans and before weeds emerge.

General Comments: ESTABLISH is another dimethenamid-P containing product. Incorporation and higher use rates will improve control of certain weeds.

Environmental Statements: OUTLOOK may have the potential to contaminate groundwater and surface water. This product should not be mixed or loaded within 50 feet of any wells, sink holes, perennial or intermittent streams, rivers, and natural or impounded lakes and reservoirs, unless an impervious pad is used.

Rain Delay: None.

Rotation Restrictions: Soybean, corn, or grain sorghum (with seed safener) may be planted immediately after application. Allow a 4-month rotational interval for fall-seeded small grains. Other rotational crops may be planted the following spring.

Harvest & Forage Restrictions: Do not use treated plants for feed or forage.

Tank Mixtures: Authority, Canopy, Command, Extreme, FirstRate, glyphosate, Gramoxone Extra, Scepter, or Touchdown. Consult label for approved combinations after soybean emergence.

PREFIX

PREFIX5.29 L 2.25 to 2.75 pt/A (S-metolachlor:fomesafen 1.22 : 0.27 to 1.49:0.33 lb ai/A)

Weeds Controlled: Barnyardgrass, black nightshade, crabgrass, fall panicum, foxtails, palmer amaranth, smooth pigweed, waterhemp. Incorporation and higher use rates may improve control of yellow nutsedge.

Crop Stage: PREFIX may be applied early preplant (up to 15 days before planting), preplant incorporated or preemergence for control of annual grasses and certain broadleaf weeds. PREFIX may be applied early postemergence at least 90 days before harvest to soybeans at 2-2.33 pt/A.

General Comments: Do not exceed a maximum of 0.375 lb ai of fomesafen in alternate years. Do not exceed 2.48 lb ai metolachlor per year.

Environmental Statements: PREFIX ground and surface water advisory statements on the label. It should not be mixed or loaded within 50 feet of wells, sinkholes, perennial intermittent streams, rivers, and natural impounded lakes and reservoirs, unless an impervious pad is used.

Rain Delay: None.

Rotation Restrictions: Rotational crops include wheat or barley after 4.5 months, corn after 10 months, (popcorn after 12 months when rate \geq 2 pt/A). Other crops require an interval of 18 months.

Harvest & Forage Restrictions: Do not graze or harvest for soybean forage or hay. Do not graze rotated small grains or harvest forage or straw for livestock. Make post applications at least 90 days before harvest.

Tank Mixtures: 2,4-D LVE, Gramoxone Inteon, glyphosate. (May be mixed with glyphosate for post applications to RR soybean.)

Generic Formulations: Statement and Vise

PROWL

PROWL 3.3E 1.8 to 3 pt/A (pendimethalin 0.74 to 1.24 lb ai/A)

or

or

PROWL H2O 3.8 L 2 to 2.5 pt/A (pendimethalin 0.95 to 1.19 lb ai/A)

Weeds Controlled: Barnyardgrass, crabgrass, fall panicum, foxtails, johnsongrass (seedling), lambsquarters, smooth pigweed.

Crop Stage: Early preplant in the fall or spring (up to 15 days prior to planting) or preemergence or preplant incorporated for control of annual grasses and certain broadleaf weeds. Apply preplant incorporated and at the higher recommended rate to reduce competition from harder-to-control weeds.

General Comments: The rate for preemergence applications at planting up through 2 days after planting should not exceed 2.4 pt/A for Prowl 3.3 EC or 2 pt/A for Prowl H2O. Lodging from "brittleness" of soybean stems may occur with preemergence applications of Prowl in conventional tillage.

Environmental Statements: None.

Rain Delay: None.

90 Soybean

PROWL (continued)

Rotation Restrictions: Soybean or tobacco may be planted any time. Any rotational crop may be planted the year following application. Allow a 10-months interval following spring applications of Prowl H2O for sorghum (milo) or perennial grasses. Wheat or barley may be planted 4 months days after application. Allow a 12-months interval for wheat if less than 12" of rain occurs between application and planting rotational crop. Observe label when pendimethalin rate exceeds 2 lb ai/A.

Harvest & Forage Restrictions: Pendimethalin treated soybean plants may be used as a forage crop. Do not apply PROWL H2O within 85 days of grain harvest.

Tank Mixtures with PROWL 3.3 EC or PENDIMAX 3.3: Canopy, Command 4EC, Gramoxone Extra, Roundup, Scepter, Sencor, 2,4-D.

Generic Formulations: Acumen, Pendant, Stealth are other pendimethalin containing products.

PYTHON or ACCOLADE

PYTHON 80WDG 1 to 1.33 oz/A (flumetsulam 0.05 to 0.067 lb ai/A)

or

ACCOLADE 80WDG 1 to 1.33 oz/A

Weeds Controlled: lambsquarters, marestail (horseweed), smooth pigweed, prickly sida, smartweed.

Crop Stage: Apply preemergence or preplant incorporated. In addition, PYTHON may be applied up to 30 days before planting in no tillage. Consult label for using 0.125 oz/A for postemergence control of teaweed.

General Comments: Do not apply: 1) where soil pH exceeds 7.8 as this may result in crop injury, or 2) where soil pH < 5.9 and organic matter > 5% or reduced weed control will result. The cumulative amount of flumetsulam per year should not exceed 0.07 lb ai / A.

Environmental Statements: PYTHON and ACCOLADE have GROUND WATER ADVISORY statements on the label. This herbicide should not be mixed or loaded within 50 feet of any wells, sink holes, perennial or intermittent streams and rivers, and natural or impounded lakes and reservoirs, unless an impervious pad is used.

Rain Delay: 6 hours

Rotation Restrictions: Soybeans and field corn may be planted anytime following PYTHON or ACCOLADE application. Rotational crops which may be planted include alfalfa, wheat, barley, or rye after 4 months; forage grasses, tobacco, or popcorn after 9 months; or grain sorghum 12 months after application. Other crops require a minimum 26-month interval and a successful field bioassay before planting.

Harvest & Forage Restrictions: Do not harvest within 85 days after application. Do not use or graze forage from PYTHON treated fields.

Tank Mixtures: 2,4-D, Glyphomax, Glyphomax Plus, Gramoxone Extra, Roundup UltraMAX, Touchdown.

SCEPTER

SCEPTER 70DG 2.8 oz/A (imazaquin 0.123 lb ai/A)

Weeds Controlled: Cocklebur, common ragweed, lambsquarters, smooth pigweed, prickly sida, smartweed. Apply as a preplant incorporated treatment for optimum control of such weeds as black nightshade, burcucumber and giant ragweed.

Crop Stage: May be applied preplant incorporated, preemergence, (up to 45 days before planting) or postemergence up to 90 days before harvest.

General Comments: Internode shortening of soybean plants may be observed with SCEPTER.

Environmental Statements: SCEPTER use on permeable soils may result in ground water contamination.

Rain Delay: None.

Rotation Restrictions: Rotational crops which may be planted include wheat after 3 months; field corn or tobacco 9.5 months; or barley, or grain sorghum 11 months following treatment. Do not plant other rotational crops within 18 months after application. Consult label for rotation restrictions when other long-residual herbicides are used during the same season; for sequential SCEPTER applications; or when soil conditions are dry after application.

Harvest & Forage Restrictions: Do not harvest within 90 days after SCEPTER application. Do not use treated plants for feed or forage.

Tank Mixtures: Dual, Frontier, Gramoxone, Prowl, Roundup, Roundup Ultra, Sencor, Touchdown, 2,4-D.

SURVEIL

SURVEIL 48% WG 3.5 to 4.2 oz/A

cloransulam 0.026 to 0.032 lb ai/A

flumioxazin 0.079 to 0.095 lb ai/A

Weeds Controlled: Black nightshade, cocklebur, common ragweed, hophornbeam copperleaf, lambsquarters, marehail (horseweed), morningglories, smooth pigweed, prickly sida, smartweed, velvetleaf, waterhemp.

Crop Stage: May be applied in the fall or in the spring up to 3 days after planting but before crop emerges.

General Comments: When used for burndown control, consult label for use of additives. DO NOT INCORPORATE. Plant seed at least 1.5 inches deep and completely cover seed with soil. Crop injury may occur in poorly drained soils and under cool wet conditions. Crop injury may also occur if treated soil is splashed onto newly emerged plants. Do not tank-mix SURVEIL with group 15 herbicides such as acetochlor, flufenacet, metolachlor, dimethenamide, or pyroxasulfone, within 14 days of planting soybeans unless soybeans are planted no-till or minimum till into wheat or corn stubble. The risk of soybean injury may increase if applications are followed by prolonged periods of cool wet weather. Spray equipment must be cleaned each day. To enhance removal of herbicide residue from spray system, use a tank cleaner such as All Clear or Valent Tank Cleaner.

Environmental Statements: Cloransulam has the potential to occur in ground water.

Rain Delay: 2 hours

Rotation Restrictions: Rotational crops that may be planted following SURVEIL include wheat after 3 months; field corn, popcorn, and sorghum after 9 months, 10 months for alfalfa. Transplanted tobacco requires a 30-month interval and a successful field bioassay. Consult label for requirements for a 10-month interval for tobacco.

Harvest & Forage Restrictions: Do not feed treated forage or hay to livestock.

Tank Mixtures: glyphosate, paraquat, 2,4-D LVE, Liberty, dicamba, pendimethalin

TRIVENCE

TRIVENCE 61.3WDG 6 to 9 oz/A

chlorimuron, flumioxazin, metribuzin
(0.014:0.048:0.167 to 0.022:0.072:0.25 lb ai/A)

Weeds Controlled: Black nightshade, cocklebur, marehail, lambsquarters, morningglory, palmer amaranth, smooth pigweed, common ragweed, smartweed, velvetleaf, waterhemp,

Crop Stage: Fall through spring up to 3 days after planting. Do not apply at cracking or after soybean emergence.

General Comments: Excessive rainfall in a short period following emergence of soybean may cause leaf burn, crinkling and defoliation of lower leaves. Excessive rain and cool cloudy weather during the growing season may cause temporary stunting. The use of TRIVENCE in same field treated with flufenacet, metolachlor, dimethenamid may result in severe crop injury when applications are followed by prolonged periods of cool wet weather. When using TRIVENCE with these other herbicides allow a minimum of 14 days prior to planting in no-till and reduced till soybeans

Environmental Statements: TRIVENCE has ground water Advisory statements on the label.

Rain Delay: 1 hour

Rotation Restrictions: Soybeans may be planted immediately, The rotation interval is 4 months for wheat and barley, 10 months for field corn and alfalfa, 12 months for forage grasses, and 18 months for tobacco and certain other crops.

Harvest & Forage Restrictions: Do not feed treated forage or hay to livestock.

Tank Mixtures: Assure II, Express, dicamba, glyphosate, glufosinate, paraquat, saflufenacil, or 2,4-D LVE.

92 Soybean

VALOR SX

VALOR SX 51WDG 2 to 2.5 oz/A

(flumioxazin 0.064 to 0.080 lb ai/A)

Weeds Controlled: Black nightshade, common ragweed, hophornbeam copperleaf, lambsquarters, marestalk (horseweed), morningglories, palmer amaranth, smooth pigweed, prickly sida, waterhemp.

Crop Stage: May be applied for preemergence and for burndown control before soybeans emerge.

General Comments: When used for burndown control, consult label for use of additives. DO NOT INCORPORATE. Plant seed at least 1.5 inches deep and completely cover seed with soil. Crop injury may occur in poorly drained soils and under cool wet conditions. Crop injury may also occur if treated soil is splashed onto newly emerged plants. No-till planters that incorporate soil during planting may limit the length of weed control in the spring. Spray equipment must be cleaned each day. To enhance removal of herbicide residue from spray system, use a tank cleaner such as Valent Tank Cleaner.

Environmental Statements: Flumioxazin products (e.g. VALOR, ENCOMPASS) have the potential to runoff to surface water and adjacent land.

Rain Delay: 1 hour

Rotation Restrictions: Soybeans may be planted immediately. Rotational intervals for other crops that may be planted following VALOR at rates up to 2 oz/A include: 7 days for no-till wheat; 7 to 14 days for no-till field corn depending on herbicide rate, residue cover, and rainfall; 30 days for conventional field corn, sorghum, and tobacco and a minimum of 1 inch rainfall. Allow 3 months for barley. For alfalfa, clover, and other crops not listed, allow 4 months if soil is tilled before planting and 8 months for no-tillage. A successful soil bioassay is required for other crops not listed. Consult VALOR label when rate is up to 3 oz/A.

Harvest & Forage Restrictions: Do not feed treated forage or hay to livestock.

Tank Mixtures: Command, metribuzin, FirstRate, glyphosate, paraquat, pendimethalin, Python, Scepter, 2,4-D LVE, Weedmaster. Do not use VALOR where flufenacet (Define), metolachlor (Dual), or dimethenamid (Outlook) are applied or injury may occur.

Generic Products: OUTFLANK, PANTHER, PANTHER SC ENCOMPASS, ROWEL

VALOR XLT

VALOR XLT 40.3WDG 3 to 4 oz/A

(flumioxazin:chlorimuron (0.056:0.019 to 0.075:0.026 lb ai/A))

Weeds Controlled: Black nightshade, common ragweed, hophornbeam copperleaf, lambsquarters, marestalk (horseweed), morningglories, palmer amaranth, smooth pigweed, prickly sida, waterhemp.

Crop Stage: May be applied in the fall or spring for preemergence and for burndown control before soybeans emerge.

General Comments: When used for burndown control, consult label for use of additives. Plant seed at least 1.5 inches deep and completely cover seed with soil. Crop injury may occur in poorly drained soils and under cool wet conditions. Spray equipment must be cleaned each day. To enhance removal of herbicide residue from spray system, use a tank cleaner such as Valent Tank Cleaner. Do not use on soils with a composite pH greater than 7.6.

Environmental Statements: Do not apply where runoff is likely to occur.

Rain Delay: 1 hour

Rotation Restrictions: Rotational crops that may be planted where soil pH is less than 7.0 are wheat or barley after 4 months, field corn, popcorn, sorghum, or tobacco after 10 months, or alfalfa after 12 months after application. Other crops require 18 months. Consult label when soil pH \geq 7.0.

Harvest & Forage Restrictions: Do not feed treated forage or hay to livestock.

Tank mixtures: 2,4-D LVE, Express, glyphosate, Harmony GT, linuron, metribuzin, paraquat, pendimethalin, or Command. Tank mixes with chloroacetamide containing products (e.g. Dual II magnum, Outlook, Intro) may result in crop injury.

Generic Products: ROWEL FX

WARRANT ULTRA

WARRANT ULTRA 3.45L 48 to 65 oz/A (acetochlor:fomesafen)
[(1.06:0.236) to (1.43:0.32) lb ai /A]

Weeds Controlled: Barnyardgrass, crabgrass, fall panicum, black nightshade, lambsquarters, Palmer amaranth, smooth pigweed, common ragweed, waterhemp.

Crop Stage: Preplant, at-planting, and preemergence.. Warrant Ultra may also be applied postemergence before R2 growth stage. For optimum postemergence control, apply to soybean at V2 to V3. growth stage.

General Comments: Do not exceed a maximum of 0.375 lb ai /A of fomesafen in alternate years.

Environmental Statements: Warrant Ultra has GROUND WATER AND SURFACE WATER ADVISORY statements on the label.

Rain Delay: 1 hour for postemergence applications.

Rotation Restrictions: Rotational crops that may be planted include wheat, barley, rye, oats after 4 months, corn after 10 months, popcorn after 12 months, alfalfa and grain sorghum after 18 months after application..

Harvest & Forage Restrictions: Do not apply within 45 days of harvest. .Do not graze or feed treated crop following a postemergence application.

Tank Mixtures: Prowl, metribuzin, imazethapyr, 2,4-D, Gramoxone Inteon, Roundup

ZIDUA

ZIDUA 85 WDG 2 to 3 oz/A (pyroxasulfone 0.106 to 0.159 lb ai/A)

Weeds Controlled: Barnyardgrass, Broadleaf signalgrass, crabgrass, fall panicum, foxtails, black nightshade, Palmer amaranth, smooth pigweed, waterhemp.

Crop Stage: May be applied in the fall or in the spring preplant surface up to 14 days before planting, preplant incorporated, preemergence, or early postemergence at first-trifoliolate to third-trifoliolate leaf stage. Do not apply from emergence (at-cracking) through unifoliolate stage.

General Comments: Do not apply more than one application in the spring. The maximum cumulative rate of Zidua for all soils other than coarse texture is 3.5 oz/A.

Environmental Statements: Zidua label has GROUNDWATER AND SURFACE WATER ADVISORY statements.

Rain Delay: None

Rotation Restrictions: The rotational interval when using 1 to 3 oz of Zidua/A is up to 4 months for wheat depending on rate of Zidua (11 months for other small grains), 10 months for alfalfa, and 18 months for other crops. Corn and soybean may be planted immediately. Consult label when using other rates of Zidua.

Harvest & Forage Restrictions: No information on label.

Tank Mixtures: Extreme, Outlook, Prowl, Pursuit, Raptor, Scepter, Sharpen, Verdict, glyphosate.

Guide to Weed and Crop Response to Postemergence Herbicides¹

| | Barnyardgrass | Broadleaf Signalgrass | Crabgrass | Fall Panicum | Foxtail | Johnsongrass (seedling) | Johnsongrass (rhizome) | Shattercane (Wild Cane) | Volunteer Corn ⁶ | Yellow Nutsedge | Black Nightshade | Burcucumber | Cocklebur | Copperleaf, Hophornbeam | Horseweed (Marestail) | Lambsquarters | Morningglory | Palmer amaranth | Pigweed, Smooth | Prickly sida (Teaweed) | Ragweed, Common | Ragweed, Giant (Horseweed) | Sicklepod | Smartweed | Velvetleaf | Waterhemp | Crop Response ² |
|--|---------------|-----------------------|-----------|--------------|---------|-------------------------|------------------------|-------------------------|-----------------------------|-----------------|------------------|-------------|-----------|-------------------------|-----------------------|---------------|--------------|-----------------|-----------------|------------------------|-----------------|----------------------------|-----------|-----------|------------|-----------|----------------------------|
| Assure II | 8 | 8 | 8 | 9 | 9 | 9 | 8 | 9 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Blazer Ultra | 2 | 2 | 4 | 5 | 7 | 6 | 0 | 6 | 4 | 2 | 9 | 6 | 7 | 8 | 4 | 5 | 8 | 7 | 8 | 2 | 9 | 8 | 1 | 9 | 6 | 8 | 2 |
| Classic | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 7 | 5 | 8 | 9 | 4 | 7* | 3 | 7 | 4* | 8* | 3 | 7 | 7 | 8 | 7 | 7 | 4* | 1 |
| Cheetah Max (LL-soybean) ⁴ | 6 | - | 8 | 8 | 8 | 8 | 6 | 8 | 7 | - | 9 | 8 | 9 | - | - | 8 | 9 | 8 | 9 | 8 | 9 | 9 | - | 9 | 9 | 8 | 2 |
| Cobra / Phoenix ³ | 2 | 2 | 2 | 2 | 3 | 5 | 0 | 4 | 2 | 2 | 9 | 7 | 8 | 9 | 5 | 6 | 7 | - | 8 | 6 | 9 | 8 | 1 | 7 | 7 | 8 | 3 |
| Extreme (RR-soybean) ⁴ | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 7 | 8 | 8 | 9 | - | 7* | 8 | 7 | - | 9 | 7 | 8* | 8 | 8 | 8 | 8 | - | 1 |
| FirstRate | 1 | 0 | 1 | 0 | 2 | 2 | 0 | 3 | 2 | 3 | 3 | - | 9 | - | 8* | 3 | 8 | 3 | 4 | 4 | 9 | 9 | 7 | 8 | 9 | 5 | 1 |
| Flexstar | 0 | 0 | 3 | 3 | 5 | 5 | 0 | 4 | 2 | 2 | 8 | 6 | 8 | 8 | 5 | 5 | 8 | 8 | 9 | 2 | 8 | 8 | 1 | 8 | 7 | 8 | 1 |
| Flexstar GT (RR-soybean) ⁴ | 9 | 9 | 9 | 9 | 9 | 9 | 7 | 9 | 9 | 6 | 8 | - | 9 | 8 | 7* | 8 | 8 | 9 | 9 | 7 | 8 | 8 | 9 | 8 | 8 | 9 | 1 |
| Fusilade DX | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Fusion | 8 | 9 | 9 | 9 | 9 | 9 | 8 | 9 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Glyphosate (RR-soybean) ^{4,5} | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 6 | 8 | 8 | 9 | 7 | 7* | 8 | 7 | 7* | 9 | 7 | 7* | 8* | 9 | 8 | 8 | 7* | 0 |
| Harmony SG | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 1 | 7 | - | - | 8 | 5 | - | 8* | 4 | 6 | 4 | - | 8 | 8 | 5 | 1 |
| Liberty (LL-soybean) ⁴ | 7 | 7 | 7 | 8 | 9 | 8 | 5 | 8 | 7 | 5 | 9 | 7 | 9 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 9 | 8 | 7 | 9 | 8 | 0 |
| Poast / Poast Plus | 9 | 9 | 9 | 9 | 9 | 9 | 7 | 9 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Prefix | 3 | 3 | 3 | - | - | 3 | - | - | - | 7 | 8 | - | 8 | 8 | - | - | 8 | 8 | 9 | 2 | 6 | - | 9 | 7 | - | 9 | 1 |
| Pursuit | 6 | 6 | 7 | 6 | 8 | 8 | 5 | 8 | 5 | 4 | 8 | 4 | 9 | 2 | - | 6 | 7 | 3 | 9* | 6 | 7 | 8 | 0 | 8 | 8 | 5 | 1 |
| Raptor | 8 | 7 | 7 | 7 | 9 | 8 | 6 | 9 | 7 | 5 | 9 | 6 | 8 | 2 | - | 8 | 8 | 5 | 9* | 6 | 7 | 8 | 0 | 9 | 8 | 5 | 2 |
| Resource | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 | 7 | - | - | 6 | 6 | 7 | 7 | 7 | 8 | 7 | - | 5 | 9 | 7 | 2 |
| Scepter | 1 | 1 | 1 | 2 | 2 | 5 | 0 | 2 | 5 | 3 | 6 | 0 | 9 | 1 | - | 3 | 2 | 3 | 9* | 1 | 5 | 3 | 5 | 6 | 4 | 5 | 1 |
| Select MAX /Select , etc. | 9 | 9 | 9 | 9 | 9 | 9 | 8 | 9 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sequence (RR-soybean) | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 6 | 8 | 8 | 9 | 7 | 7* | 8 | 7 | - | 9 | 7 | 7* | 8 | 9 | 8 | 8 | - | 0 |
| Synchrony XP ⁴ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 6 | 5 | 8 | 9 | - | 7* | 8 | 6 | - | 8* | 4 | 7 | 6 | 8 | 8 | 8 | - | 1 |

EXCELLENT = 9+ GOOD = 8-9 FAIR = 6-7 POOR = 5 OR LESS - INSUFFICIENT DATA

¹ This table should be used only as a guide. The relative response value is based on a numerical scale from 0-9 comparing the effectiveness of herbicides to a particular weed. Under certain weather or environmental conditions, a herbicide may perform better or worse than indicated in the table. If a farmer is getting satisfactory results under his conditions, he should not necessarily change products as a result of the information in the table.

² A rating of 3 or less will not result in a crop yield loss under normal conditions. Certain soybean varieties vary in their injury response to a herbicide treatment.

³ Crop response and velvetleaf control may be less with Phoenix than with Cobra.

⁴ Apply only to selected soybean cultivars designated with GENETIC resistance /tolerance to Roundup Ready (RR-soybean) or Sulfonyleurea Tolerant (STS-soybean) or Liberty Link (LL-soybean). Consult label for directions.

⁵ Examples of specific glyphosate products are listed on page 22.

⁶ Control of volunteer plants from previous herbicide-resistant corn hybrids may NOT be successful depending on source of herbicide tolerance.

* Will not control biotypes resistant to the class of chemistry associated with this herbicide.

Response of Perennial Broadleaves to Postemergence Soybean Herbicides¹

| | Bindweed, Field | Dandelion | Dogbane, Hemp | Horsenettle | Milkweed, Common | Milkweed, Honeyvine | Morningglory, Bigroot | Pokeweed, Common | Thistle, Canada | Trumpet creeper |
|--------------------------------------|-----------------|-----------|---------------|-------------|------------------|---------------------|-----------------------|------------------|-----------------|-----------------|
| Basagran ² | 5 | - | - | 5 | - | - | - | - | 8 | - |
| Cobra ³ | 6 | - | - | 6 | 6 | 6 | 5 | - | 6 | 5 |
| Extreme ⁴ | 7 | 8 | 7 | 7 | 7 | 7 | 5 | 7 | 8 | 7 |
| Flexstar or Flexstar GT ⁵ | 6 | - | - | 6 | - | 6 | - | - | 6 | 5 |
| Glyphosate (RR-soybean) ⁶ | 7 | 8 | 7 | 7 | 7 | 7 | 5 | 8 | 8 | 7 |
| Pursuit ⁷ | - | - | - | 7 | - | - | - | - | 6 | - |
| Raptor ⁸ | 6 | - | - | - | - | - | - | 6 | 7 | - |
| Synchrony (STS soybean) ⁹ | 7 | - | - | 5 | 7 | 7 | - | 6 | 7 | - |
| Ultra Blazer ¹⁰ | 6 | - | - | 6 | 6 | - | 5 | - | 6 | 5 |

GOOD = 8 - 9 FAIR = 6 - 7 POOR = 5 or less - Insufficient Data

1 In-season herbicide treatments for perennial broadleaf weeds usually provide only partial control or suppression. The response value indicated is based on a numerical scale from 0 to 9 comparing the relative effectiveness of the herbicides listed to a particular weed. Under certain weather or environmental conditions, a herbicide may perform better or worse than indicated in the table. **Therefore, this table should be used only as a guide for selecting treatments to deal with problem weeds.**

2 Apply Basagran at 2 to 3 pt/A for field bindweed. For Canada thistle apply 2 pt/A when plants are 8" to bud stage and apply a second application 7 to 10 days later if regrowth occurs. Do not exceed a total maximum seasonal rate of 4 pt/A. Include oil concentrate (1 to 2 pt/A), or 28% solution of UAN (4 to 8 pt/A), or AMS (2.5 lbs/A).

3 Apply Cobra (12.5 oz/A) or Phoenix (12.5 oz/A). Use crop oil concentrate at 4 pt/100 gal with Cobra or 1 pt/A with Phoenix for Canada thistle, bigroot morningglory, common milkweed, climbing milkweed, swamp smartweed, and trumpet creeper with a maximum of 6 leaves.

4 Apply Extreme (3 pt/A) + NIS (1 pt/100 gal) + AMS (8.5 to 17lb/100gal) only to on selected soybean cultivars designated as Roundup Ready or glyphosate resistant.

5 Apply Flexstar (1.5 pt/A) or + NIS (0.5 to 1 pt/25 gal) or crop oil concentrate (1 to 2 pt/25 gal) + 28% liquid N (2.5 qt/25gal) for field bindweed, honeyvine milkweed, and trumpet creeper.

6 Apply glyphosate 3L (32 to 64 oz/A); glyphosate 3.75 L (26 to 52 oz/A); glyphosate 4 L (24 to 48 oz/A); glyphosate 4.17 L (23 to 46 oz/A); or glyphosate 4.5 L (21 to 42 oz/A); or 5 L (19 to 38 oz/A) **only on selected soybean cultivars designated as Roundup Ready or glyphosate resistant.** Consult herbicide label for use of surfactant and AMS as additives. See page 20 for examples of GLYPHOSATE products.

7 Apply Pursuit DG (1.44 oz/A) + Crop Oil Conc. (1.25 gal/100 gal) or NIS (1 qt/100 gal) + 28% Liquid N (1.25 to 2.5 gal/100 gal). Apply up to 3" tall Canada thistle.

8 Apply Raptor (5 oz/A) + Crop Oil Conc. (1 to 2 gal/100 gal) + NIS (1 qt/100 gal) + 28% Liquid N (2.5 gal/100 gal). Apply up to 4" tall field bindweed or 5" tall Canada thistle.

9 Apply Synchrony XP (0.75 oz/A) or Synchrony STS (0.5 oz/A) + Crop Oil Conc. (1 gal/100 gal) + Liquid N (2 qt/A) only to cultivars designated as STS. Apply up to 6" tall common milkweed, up to 4" tall dandelion, up to 6" tall common pokeweed, and up to 4" tall Canada thistle.

10 Apply Ultra Blazer (1.5pt/A) + NIS (1 to 2 pt/100 gal) for field bindweed, common milkweed, climbing milkweed, and trumpet creeper.

MAXIMUM WEED SIZE LABELED FOR POSTEMERGENCE HERBICIDE APPLICATIONS

| Herbicide | Rate | Barnyardgrass | Broadleaf Signalgrass | Crabgrass | Fall Panicum | Foxtail (Giant) | Johnsongrass (seedling) | Johnsongrass (rhizome) | Shattercane (Wildcane) | Volunteer Corn | Volunteer Wheat |
|---|-------------|---------------|-----------------------|-----------------|--------------|-----------------|-------------------------|-------------------------|------------------------|------------------|-----------------|
| ARROW 2 EC | 6 to 8 oz | 8" | 6" | 6" | 8" | 12" | 10" | X | 18" | 24" | 6" |
| | 8 to 16 oz | — | — | — | — | — | — | 24" ² | — | — | — |
| ASSURE II 0.88E | 5 oz | X | X | X | X | 4" | 8" | X | 12" | 18" | X |
| | 8 oz | 6" | X | 6" ¹ | 6" | 8" | — | X | — | 30" | 6" |
| | 10 oz | — | 6" | — | — | — | — | 24" ² | — | — | — |
| CHEETAH MAX | 26 oz | 3" | - | 3" | 3" | 6" | 3" | - | 6" | 10" | 4" |
| | 34oz | 5" | - | 5" | 5" | 12" | 5" | - | 8" | 12" | 5" |
| EXTREME | 3 pt | 6" | 8" | 12" | 12" | 18" | 12" | 12" | 18" | 20" | 18" |
| FLEXSTAR GT (RR Soybean) | 3 pt | 6" | 8" | 12" | 6" | 18" | 12" | X | 12" | 24" ³ | 18" |
| | 4.5 pt | 12" | 10" | — | 10" | — | 18" | X | 16" | — | — |
| FUSILADE DX 2E | 8 oz | X | X | X | X | X | — | X | 12" | 24" | 6" |
| | 12 oz | 3" | 4" | 2" | 6" | 6" | — | 18" | — | — | — |
| FUSION 2.56E | 6 oz | X | X | X | X | — | 8" | X | 12" | 24" | X |
| | 8 oz | 4" | 2" | 4" | 6" | 8" | — | X | — | — | 6" |
| | 12 oz | — | 4" | — | — | — | — | 18" | — | — | — |
| GLYPHOSATE ⁵ (3 lb ae/gal) (RR Soybean) | 24 oz | 3" | 3" | 6" | 4" | 12" | 12" | X | 12" | 12" ³ | 6" |
| | 32 oz | 6" | 6" | 12" | 6" | 20" | 18" | Boot Stage ⁶ | 20" | 20" | 12" |
| | 48 oz | 9" | 9" | — | 12" | — | 24" | — | — | — | 18" |
| LIBERTY 280 SL | 22 oz | 3" | 3" | 3" | 3" | 6" | 3" | X | 6" | 10" ³ | 4" |
| | 29 oz | 5" | 5" | 5" | 5" | 12" | 5" | X | 8" | 12" | 5" |
| POAST | 1 pt | 8" | 8" | 6" | 8" | 8" | 8" | — | 18" | 20" ³ | X |
| | 1.5 pt | — | — | — | — | — | — | 20" ²⁻⁴ | — | — | 4" |
| PURSUIT 2S | 4 oz | 3" | 8" | 3" | X | 6" | 8" | X | 8" | X | X |
| RAPTOR 1S | 5 oz | 5" | 5" | X | 6" | 6" | 8" | X | 8" | 8" ³ | 4" |
| ROUNDUP POWERMAX ⁵ (4.5 lb ae/gal) (RR Soybean) | 16 oz | 3" | 3" | 6" | 4" | 12" | 12" | X | 12" | 12" ³ | 6" |
| | 22 oz | 6" | 6" | 12" | 6" | 20" | 18" | Boot Stage ⁶ | 20" | 20" | 12" |
| | 32 oz | 9" | 9" | — | 12" | — | 24" | — | — | — | 18" |
| SELECT MAX 0.97 EC ⁷ | 6 to 12 oz | X | X | X | X | X | X | X | X | 12" | X |
| | 9 to 16 oz | 8" | 6" | 6" | 8" | 12" | 10" | X | 18" | 24" | 6" |
| | 12 to 32 oz | — | — | — | — | — | — | 24" | — | 36" | — |
| SEQUENCE | 2.5 pt | 6" | 6" | 12" | 6" | 18" | 18" | X | 18" | 18" ³ | 18" |
| | 3.5 pt | 12" | 12" | — | 18" | — | — | Boot Stage ⁶ | — | — | — |

X = Not labeled for control — = same height as indicated above

1 Maximum length of lateral growth for crabgrass.

2 Two applications may be necessary for acceptable control. Consult the label for specific weed height, timing of application, treating regrowth, and tank mixtures with other herbicides.

3 Control of volunteer plants from previous herbicide-resistant corn hybrids may NOT be successful depending on source of herbicide tolerance.

4 Maximum height for rhizome johnsongrass is 25" in conventional tillage or 20" for no-tillage.

5 Consult labels of other glyphosate products for rates for specific weed species.

6 Rate of glyphosate for rhizome johnsongrass control may vary depending on tillage system.

7 Use the high rate under heavy grass pressure and/or when grasses are at the maximum height.

| Herbicide | Rate | Black Nightshade | Burcucumber | Cocklebur | Copperleaf | Horseweed (Marestail) | Lambsquarters | Morningglory | Palmer amaranth | Smooth Pigweed | Prickly Sida | Ragweed, Common | Ragweed, Giant (Horseweed) | Sicklepod | Smartweed | Velvetleaf | Waterhemp | Yellow Nutsedge |
|---|-----------|------------------|-------------|-----------|------------|-----------------------|---------------|--------------|-----------------|----------------|--------------|-----------------|----------------------------|-----------|-----------|------------|-----------|-----------------|
| CHEETAH MAX | 26 oz | 6" | 6" | 6" | 4" | X | 4" | 6" | X | 3" | 4" | 6" | 6" | 4" | 6" | 3" | X | X |
| | 34 oz | 8" | 10" | 14" | 6" | 12" | 6" | 8" | 4" | 4" | 5" | 10" | 12" | 6" | 14" | 4" | 5" | X |
| CLASSIC | 0.5 oz | X | X | 6" | X | 3" | X | 2" | X | X | X | X | X | 2" | 2" | X | X | 3" |
| | 0.75 oz | X | 6" | 12" | X | 6" | X | 4" | X | X | X | 4" | 6" | 4" | 4" | 6" | X | 4" |
| COBRA | 12.5 oz | 6 LF | 4 LF | 6 LF | 6 LF | X | X | 2 LF | 6 LF | 6 LF | 4 LF | 8 LF | 6 LF | X | X | X | 6 LF | X |
| EXTREME | 3 pt | 12" | 12" | 18" | 2" | 12" * | 8" | 4" | 12" * | 18" | 2" | 9" * | 9" | 3" | 6" | 5" | 12" * | X |
| FIRSTRATE | 0.3 oz | X | X | 10" | X | 6" | X | 4" | X | X | X | 8" | 10" | <2" | 6" | 6" | X | X |
| FLEXSTAR | 1 pt | 4 LF | X | 4 LF | 4 LF | X | X | 3 LF | 4 LF | 4 LF | X | 4 LF | 4 LF | X | 4 LF | 2 LF | 2 LF | X |
| | 1.5 pt | 6 LF | X | 8 LF | 6 LF | X | X | 5 LF | 6 LF | 6 LF | 4 LF | 8 LF | 8 LF | X | 6 LF | 4 LF | 6 LF | X |
| FLEXSTAR GT | 3 pt | 4" | X | 4" | 2" | X | 4" | 3" | 1" | 4" | 2" | 4" | 4" | 2" | 4" | 4" | 2" | X |
| | 4.5 pt | 8" | X | 8" | 4" | X | 10" | 4" | 3" | 6" | 4" | 6" | 8" | 4" | 8" | 8" | 4" | X |
| GLYPHOSATE ¹ (3 lb ae/gal) (RR Soybean) | 24 oz | 4" | 6" | 18" | 2" | 6" * | 6" | X | 12" * | 12" | 2" | 6" * | 6" | 2" | X | X | X | X |
| | 32 oz | 6" | 12" | 24" | 4" | 12" * | 12" | 3" | 18" * | 18" | 4" | 12" * | 12" | 4" | 6" | 6" | 6" * | X |
| | 48 oz | 12" | 18" | 36" | 6" | 18" * | 20" | 6" | 24" * | 24" | 6" | 18" * | 18" | 8" | 9" | 12" | 12" * | X |
| HARMONY SG | 0.125 oz | X | X | X | X | X | 4" | X | 4" * | 8" * | X | X | X | X | 6" | 6" | X | X |
| LIBERTY 280 SL | 22 oz | 6" | 6" | 6" | 4" | X | 4" | 6" | 3" | 3" | 4" | 6" | 6" | 4" | 6" | 3" | 4" | X |
| | 29 oz | 8" | 10" | 14" | 6" | 6-12" | 6" | 8" | 4" | 4" | 5" | 10" | 12" | 6" | 14" | 4" | 5" | X |
| PHOENIX | 12.5 oz | 3" | X | 2" | 2" | X | X | X | 2" | 4" | 2" | 6" | 4" | X | X | X | 6" | X |
| PURSUIT 2S | 4 oz | 3" | X | 8" | X | X | X | 2" | X | 8" * | X | X | X | X | 3" | 3" | X | X |
| RAPTOR 1S | 5 oz | 5" | X | 8" | X | X | 5" | 4" | 4" * | 8" * | X | 5" | 5" | X | 5" | 8" | X | X |
| RESOURCE 0.86E | 4 oz | X | X | X | X | X | X | X | X | X | X | X | X | X | X | 6LF | X | X |
| | 8 oz | X | X | X | X | X | X | X | X | 4 LF | 4 LF | 6 LF | X | X | X | 10LF | X | X |
| ROUNDUP (RR Soybean) | 16oz | 4" | 6" | 18" | 2" | 6" * | 6" | X | 12" * | 12" | 2" | 6" * | 6" | 2" | X | X | X | X |
| POWERMAX ¹ (4.5 lb ae/gal) | 22 oz | 6" | 12" | 24" | 4" | 12" * | 12" | 3" | 18" * | 18" | 4" | 12" * | 12" | 4" | 6" | 6" | 6" * | X |
| | 32 oz | 12" | 18" | 36" | 6" | 18" * | 20" | 6" | 24" * | 24" | 6" | 18" * | 18" | 8" | 9" | 12" | 12" * | X |
| SCEPTER 70DG | 1.4 oz | X | X | 8" | X | X | X | X | X | 4" * | X | X | X | X | X | X | X | X |
| | 2.8 oz | X | X | 12" | X | X | X | X | 6" * | 12" * | X | X | X | X | X | X | X | X |
| SEQUENCE | 2.5 pt | 6" | 12" | 18" | 3" | 12" * | — | 3" | X | 12" | 3" | 12" * | 12" | 3" | 6" | 6" | 6" * | X |
| | 3.5 pt | 12" | — | — | — | 18" * | 18" | 6" | X | 18" | 6" | 18" * | 18" | 6" | 12" | 12" | 12" * | X |
| SYNCHRONY XP | 0.75 oz/A | X | 3" | 8" | X | 5" * | 4" | 3" | 8" * | 8" * | X | 4" | 4" | 3" | 8" | 8" | X | 3" |
| ULTRA BLAZER | 1.5 pt | 2" | X | 2" | 4" | X | X | 4" | 4" | 4" | X | 3" | 3" | X | 6" | X | 4" | X |

X = Not labeled for control

— = Same height as indicated above

* May not effectively control certain biotypes due to herbicide resistance.

¹ Consult labels of other glyphosate products for rates recommended for specific weed species.

98 Soybean

POSTEMERGENCE HERBICIDES IN SOYBEANS, ADJUVANTS, CROP GROWTH STAGES, AND RAIN-FREE PERIODS

| Herbicides | Adjuvant ¹ | Crop Stage (Timing of Application) ² | Rain Delay ³ |
|--|---|---|-------------------------|
| Assure II | COC or NIS + (Liquid N or AMS optional) | Before pod set and 80 days prior to harvest. | 1 hour |
| Butyrac 200 (2,4-DB) | NIS or COC can enhance injury and may be prohibited | Do not apply within 60 days of harvest. Other limitations may apply if mixed with other herbicides. | ** 3 |
| Cheetah Max | AMS Optional | From emergence up to but not including bloom stage. Do not apply within 70 days of harvest. | 4 hours |
| Classic | NIS or COC + (Liq N / AMS optional) | After first trifoliolate leaf has expanded but 60 days before maturity. | 1 hour |
| Cobra | COC or NIS (Liq N optional) | Normally when plants are in the one to two trifoliolate leaf stage; Do not apply within 45 days before harvest or after stage R6 (full seed). | 30 min. |
| Extreme | NIS + AMS | Before bloom and prior to 85 days of harvest. | 1 hour |
| FirstRate | NIS or COC + Liq N | Before 50% flowering stage & 65 days before harvest for 0.3 oz/A rate | 2 hours |
| Flexstar | NIS or COC + (Liq N optional) | Do not apply within 45 days of harvest. | 1 hour |
| Flexstar GT | AMS, NIS , COC, or MSO optional | Do not apply within 45 days of harvest. | *** 4 |
| Fusilade EX | COC or NIS + (Liq N optional) | 24 oz/A before bloom stage. 6 oz/A after bloom 60 days before harvest | 1 hour |
| Fusion | COC or NIS + (Liq N or AMS optional) | Before bloom stage. | 1 hour |
| Glyphosate (Post Broadcast) (Spot Treat) (Preharvest) | NIS varies with product used. (AMS is optional) | Cracking throughout flowering. Before initial pod set. After pods have set and lost green color. | *** 4 |
| Firestorm or Parazone (Directed) (Preharvest) | NIS or COC NIS or COC | ≥ 8- inch tall soybean plants. Consult label. | 30 min. |
| Gramoxone Inteon (Directed) (Preharvest) | NIS or COC NIS or COC | ≥ 8- inch tall soybean plants. Consult label. | 15 - 30 min. |
| Harmony SG | NIS or COC + Liq N | After first trifoliolate leaf has expanded until 60 days before harvest | ** 3 |
| Liberty 280SL | ----- | After emergence up to but NOT including bloom stage and 70 days before harvest. | 4 hours |
| Phoenix | NIS | Normally when plants are in the one to two trifoliolate leaf stage; Do not apply within 45 days before harvest or after stage R6 (full seed). | 2 hours |

**POSTEMERGENCE HERBICIDES IN SOYBEANS, ADJUVANTS,
CROP GROWTH STAGES, AND RAIN-FREE PERIODS**

| Herbicides | Adjuvant¹ | Crop Stage (Timing of Application)² | Rain Delay³ |
|--|---|--|-------------------------------|
| Poast | COC or DASH (Liq. N optional) | Do not apply within 75 days of harvest. | 1 hour |
| Poast Plus | COC or DASH (Liq. N optional) | Do not apply within 75 days of harvest. | 1 hour |
| Pursuit | NIS or COC + Liq N or AMS | Before bloom stage and prior to 85 days of harvest. | 1 hour |
| Prefix | (Consult label) | Apply at least 90 days before harvest | --- |
| Raptor | NIS or MSO+Liq N (COC for certain situations) | Before bloom stage. | 1 hour |
| Resource | COC + (Liq N optional) (Consult label for using NIS for certain mixes) | Do not apply within 60 days of harvest. | 1 hour |
| Scepter | NIS or COC | From emergence until 90 days before harvest. | --- |
| Select MAX & other clethodim products | NIS or COC (Consult label for using AMS) | Do not apply within 60 days of harvest. | 1 hour |
| Sequence | AMS | From cracking through 3rd trifoliolate for Roundup Ready soybean | *** 4 |
| Synchrony XP | COC + Liq N (Consult label for using NIS for certain mixes) | After first trifoliolate has expanded until 60 days before harvest. | 1 hour |
| Ultra Blazer | NIS (Consult label for using Liq N, AMS, and /or COC for certain mixes) | Do not apply within 50 days of harvest. | 4 hours |

¹ COC = Crop Oil Concentrate; NIS = Non-Ionic Surfactant (at least 80% active ingredient); Liq N generally involves Urea Ammonium Nitrate or UAN (28% to 32% nitrogen fertilizer) or 10-34-0. Consult label for specific type of adjuvant and rate.

² This information is based on optimum crop growth stage and/or preharvest interval for grain.

³ **Rainfall soon after application may reduce effectiveness. Do not apply if weather conditions are favorable for rain.

⁴ *** A heavy rainfall soon after application of glyphosate may reduce effectiveness. Some product labels indicate that if rainfall occurs within 6 hours after treatment, the effectiveness may be reduced. A heavy rainfall within 2 hours after application may wash chemical off the foliage and thus requiring another treatment.

POSTEMERGENCE TANK MIXTURES LABELED FOR SOYBEANS

| | ULTRABLAZER | BUTYRAC | CLASSIC | COBRA | FIRSTRATE | FLEXSTAR | FLEXSTAR GT | GLYPHOSATE ** | PREFIX | LIBERTY | PURSUIT | RAPTOR | RESOURCE | SCEPTER | SEQUENCE | SYNCHRONY |
|--------------|-------------|---------|---------|-------|-----------|----------|-------------|---------------|--------|---------|---------|--------|----------|---------|----------|-----------|
| ARROW | NL | NL | L | L | L | L | NL | L | NL | L | L | L | L | X | NL | L |
| ASSURE II* | L | NL | L | L | L | L | NL | L | NL | L | L | NL | L | X | NL | L |
| ULTRA BLAZER | - | L | L | NL | L | NL | NL | L | NL | L | L | L | L | L | NL | L |
| CLASSIC | L | L | - | L | L | L | NL | L | NL | L | NL | L | L | X | NL | NL |
| CHEETAH MAX | NL | NL | NL | NL | NL | NL | NL | NL | NL | NL | NL | NL | NL | NL | NL | NL |
| COBRA | NL | L | L | - | L | NL | NL | L | NL | L | L | NL | L | L | NL | L |
| EXTREME | NL | NL | NL | NL | NL | NL | NL | NL | NL | NL | NL | X | NL | NL | NL | NL |
| FIRSTRATE | L | NL | L | L | - | L | NL | L | NL | L | L | L | L | NL | NL | L |
| FLEXSTAR | NL | L | L | NL | L | - | NL | L | NL | L | L | L | L | L | NL | L |
| FUSION* | L | NL | L | L | L | L | L | L | NL | L | L | NL | L | L | L | L |
| FUSILADE DX | L | NL | L | L | NL | L | L | L | NL | L | L | NL | L | NL | L | NL |
| GLYPHOSATE** | L | L | L | L | L | L | L | - | L | NL | L | L | L | L | L | L |
| HARMONY SG | NL | NL | L | NL | NL | L | NL | L | NL | NL | L | NL | L | NL | NL | L |
| LIBERTY | L | NL | L | L | L | L | NL | NL | NL | - | L | L | L | NL | NL | L |
| PHOENIX | NL | L | L | NL | L | NL | NL | L | NL | L | L | L | L | L | NL | L |
| POAST PLUS* | L | NL | L | L | L | L | NL | L | NL | L | L | L | L | X | NL | L |
| PREFIX | NL | NL | NL | NL | NL | NL | NL | L | NL | NL | NL | NL | NL | NL | NL | NL |
| PURSUIT | L | L | X | L | L | L | NL | L | NL | L | - | X | L | L | NL | NL |
| RAPTOR | L | NL | L | NL | L | L | NL | L | NL | L | X | - | L | X | NL | NL |
| RESOURCE | L | NL | L | L | L | L | NL | L | NL | L | L | L | - | L | NL | L |
| SCEPTER | L | NL | X | L | NL | L | NL | L | NL | NL | L | X | L | - | NL | NL |
| SECTION | L | NL | L | L | L | L | NL | L | NL | L | L | L | L | NL | NL | L |
| SELECT MAX* | NL | NL | L | L | L | L | NL | L | NL | L | L | L | L | X | NL | L |
| SEQUENCE | NL | NL | NL | NL | NL | NL | NL | L | NL | NL | NL | NL | NL | NL | - | NL |
| SYNCHRONY | L | L | NL | L | L | L | NL | L | NL | L | NL | X | L | NL | NL | - |
| VOLUNTEER* | L | NL | L | L | L | L | NL | L | NL | L | L | L | L | X | NL | L |

*For optimum control of rhizome johnsongrass, shattercane, volunteer corn, or certain other grasses apply these post-grass herbicides as sequential applications to avoid herbicide antagonism.

** Information on tank mixing products containing glyphosate with other postemergence herbicides was combined across several labels; consequently more tank mixtures are represented in this table than indicated on a specific label. Consult label(s) of specific glyphosate product and tank mix partner for approved combinations.

L = Labeled tank mixture. Consult labels for use of additives.

NL = Not a labeled tank mixture. Consult labels for precautions or restriction that may limit mixing with chemicals not indicated on the label.

X = Do not tank mix these products since severe crop injury, herbicide carryover, or herbicide antagonism may occur.

POSTEMERGENCE

ASSURE II

| | |
|--|-------------------------------------|
| ASSURE II 0.88E 5 to 12 oz/A | (quizalofop 0.034 to 0.083 lb ai/A) |
| + | + |
| OIL CONCENTRATE 8 pt/100 gal | (additive) |
| or | or |
| SURFACTANT (NON-IONIC 80%) 2 pt/100 gal | (additive) |
| + | + |
| [28% UAN (2 to 4 qt/A) or AMS (2 to 4 lb/A) may be included with surfactant or crop oil] | (additive) |

Weeds Controlled: Barnyardgrass, broadleaf signalgrass, crabgrass, fall panicum, foxtails, johnsongrass, shattercane, volunteer corn.

Crop Stage: Before pod set and 80 days prior to harvest.

General Comments: Follow label directions for herbicide rate and stages of weed growth for optimum results. For volunteer corn (including RR and LL corn) control apply 4 oz/A for plants up to 12" tall; 5 oz/A for plants up to 18" tall; use 8 oz/A for plants 18 to 30" tall.

Environmental Statements: None

Rain Delay: 1 hour.

Rotation Restrictions: Do not plant other crops within 120 days after last application.

Harvest & Forage Restrictions: Apply no later than 80 days before harvest. Do not use treated soybean plants for feed or forage.

Tank Mixtures: Basagran, Classic, Flexstar, Harmony GT, Pursuit, or Synchrony. Also, glyphosate in glyphosate-resistant soybean. When using ASSURE II tank mixes or as a sequential treatment, follow label directions.

Generic Formulations: Targa

CLASSIC

| | |
|---|--------------------------------------|
| CLASSIC 25DF 0.5 to 0.75 oz/A | (chlorimuron 0.008 to 0.012 lb ai/A) |
| + | + |
| SURFACTANT (NON-IONIC 60%) 2 pt/100 gal | (additive) |
| or | |
| CROP OIL CONCENTRATE 8 pt/100 gal | |
| + | + |
| 28% UAN (4 to 8 pt/A) or AMS (2 to 4 lb/A) | (additive) |
| [may be included with surfactant or crop oil for certain weed species.] | |

Weeds Controlled: Burcucumber, cocklebur, smooth pigweed, sicklepod.

Crop Stage: After first trifoliolate leaf has expanded but no later than 60 days before maturity.

General Comments: Follow label directions for herbicide rate and stages of weed growth for optimum results.

Environmental Statements: Do not mix, load, or use within 50 ft of wells including abandoned wells, drainage wells, and sink holes.

Rain Delay: 1 hour.

Rotation Restrictions: Crops which may be planted after CLASSIC include wheat or barley after 3 months; corn after 8 months; popcorn, sorghum, tobacco, alfalfa or clover after 9 months following treatment. If applied after August 1, extend recrop interval 2 months for alfalfa, clover, corn, popcorn, sorghum, or tobacco. Consult labels when other chlorimuron containing products (i.e. CANOPY), imazaquin (i.e. SCEPTER, etc.), or imazethapyr (i.e. PURSUIT) are applied the same year.

Harvest & Forage Restrictions: Apply no later than 60 days before soybean maturity. Do not use treated plants for feed or forage.

Tank Mixtures: Assure II, Ultra Blazer, Cobra, FirstRate, Flexstar, Harmony GT, Phoenix. Also, glyphosate herbicides for Roundup Ready soybeans.

102 Soybean

CHEETAH MAX (LibertyLink Varieties ONLY)

CHEETAH MAX 3L 26 to 34 fl oz/A [(glufosinate:fomesafen)
(0.4:0.2) to (0.53:0.265) lb ai/A]

Weeds Controlled: Black nightshade, burcucumber, cocklebur, common ragweed, crabgrass, fall panicum, foxtails, giant ragweed, johnsongrass (seedling), hophornbeam copperleaf, lambsquarters, marestail (horseweed), morningglories, palmer amaranth, smooth pigweed, prickly sida, shattercane, smartweed, velvetleaf, waterhemp. Consult label for weed size.

Crop Stage: Apply postemergence only in LibertyLink soybeans from emergence up to but not including bloom growth stage. Preplant surface or preemergence applications may be made prior to the emergence of conventional or transgenic soybean varieties.

General Comments: **Apply only overtop soybean varieties designated as "LibertyLink"**. On soybeans do not exceed 42 oz of CHEETAH MAX/A per application. A Cumulative maximum of 48 oz of CHEETAH MAX/A (0.375 lb ai /A of fomesafen) may be applied per year in alternate years. Heavy dew or fog may reduce weed control. Also, applications should be made between dawn and 2 hours before sunset to avoid reduced control of lambsquarters and velvetleaf. Ammonium sulfate may be added at 3 lbs/A. When temperatures exceed 85F, reduce AMS rate to 1.5 lb/A. If foaming occurs a silicone-antifoam based agent may be added. Use nozzles and pressures that generate MEDIUM spray droplets.

Environmental Statements: Cheetah Max has GROUNDWATER and SURFACE WATER statements on the label.

Rain Delay: 4 hrs

Rotation Restrictions: Soybean may be planted anytime. Allow a minimum interval of 4 months for wheat and barley, 10 months for corn (12 months for popcorn for 32 oz/A rate), 18 months for alfalfa or sorghum and certain other crops..

Harvest & Forage Restrictions: Do not apply within 70 days of harvest. Do not graze or cut for hay.

Tank Mixtures: Consult label.

COBRA or PHOENIX

COBRA 2L 12.5 oz/A (lactofen 0.2 lb ai/A)
+ +
CROP OIL CONCENTRATE 1 to 2 pt/A or
SURFACTANT (NON-IONIC) 2 pt/100 gal (additive)
[NOTE: Crop oil concentrate is the preferred additive over a wide range of conditions, but may enhance crop response. Consult label for adjuvant recommendations based on relative humidity]

Liquid Nitrogen fertilizer 1 qt/A or Ammonium Sulfate 2.5 lb/A
may also be included as additives

or or
PHOENIX 2 EC 12.5 oz/A (lactofen 0.2 lb ai/A)
+ +
SURFACTANT (NON-IONIC) 1 to 2 pt/100 gal (additive)
(Consult PHOENIX label for other additives)

Weeds Controlled: Black nightshade, cocklebur, common ragweed, giant ragweed, hophornbeam copperleaf, smooth pigweed, waterhemp.

Crop Stage: Normally applied when plants are in the 1- to 2- trifoliolate leaf stage; Do not apply within 45 days before harvest or after stage R6 (full seed)

General Comments: Follow label directions for herbicide rates and optimum stages of weed growth. Do not apply to soybeans under stress.

Environmental Statements: Lactofen has characteristics similar to other chemicals detected in groundwater.

Rain Delay: 30 minutes for COBRA. 2 hours for PHOENIX.

Rotation Restrictions: No rotational crop restrictions indicated on herbicide label.

Harvest & Forage Restrictions: Do not apply later than 45 days before harvest or after stage R6 (full seed). Do not use treated soybean plants for feed or forage.

Tank Mixtures with COBRA: Assure II, Basagran, Classic, 2,4-DB, FirstRate, Pursuit, Scepter, or Select. Also, Roundup Ultra for Roundup Ready soybeans, or Synchrony for STS soybeans only).

Tank Mixtures with PHOENIX: Basagran, Classic, 2,4-DB, FirstRate, Harmony GT, Pursuit, Raptor, Resource, Scepter, or Select. Also, glyphosate (RR-soybeans), or Synchrony (STS soybeans only).

EXTREME

| | |
|--|---|
| EXTREME 2.17L 3 pt/A | (imazethapyr : glyphosate 0.064:0.75 lb ai/A) |
| + | + |
| SURFACTANT (NON-IONIC 80%) 1 pt/100 gal or | (additive) |
| + | + |
| AMS 8.5 to 17 lb/A | (additive) |

Weeds Controlled: Barnyardgrass, black nightshade, broadleaf signalgrass, burcucumber, cocklebur, common ragweed, crabgrass, fall panicum, foxtails, giant ragweed, johnsongrass (seed and rhizomes), lambsquarters, smooth pigweed, shattercane, sicklepod, smartweed, velvetleaf, volunteer corn.

Crop Stage: Before bloom and prior to 85 days of harvest.

General Comments: Apply EXTREME only OVER-THE-TOP OF SOYBEAN VARIETIES DESIGNATED AS "ROUNDUP READY" (glyphosate resistant). Follow label directions for maximum stages of weed growth. EXTREME may also be applied preplant or preemergence for burndown weed control.

Environmental Statements: The EXTREME label has GROUNDWATER ADVISORY statements.

Rain Delay: 1 hour.

Rotation Restrictions: Rotational crops that may be planted include wheat after 3 months; alfalfa, barley, or rye after 4 months; or susceptible field corn hybrids after 8.5 months; or tobacco after 9.5 months; or popcorn, sweet corn, sorghum, and oats after 18 months following EXTREME application. Other crops may require a minimum of 40 months and a successful field bioassay before planting. Over application may result in injury to rotational crops.

Harvest & Forage Restrictions: Do not harvest within 85 days after application. Do not use treated plants for feed or forage.

Tank Mixtures: None.

Generic Formulation: ThunderMaster

FIRSTRATE

| | |
|--|-----------------------------|
| FIRSTRATE 84 WDG 0.3 oz/A or [one 0.6 oz water soluble packet per 2 acres.] | (cloransulam 0.016 lb ai/A) |
| + | + |
| SURFACTANT (NON-IONIC 1 to 2 pt/100 gal or | (additive) |
| + | + |
| 28% UAN 2.5 gal/100 gal or AMS 2 lb/A (8.5 to 17 lb/100gal) [consult label for use of crop oil conc.(1.2 gal/100 gal) with UAN] | (additive) |

Weeds Controlled: Cocklebur, morningglory, common ragweed, giant ragweed, smartweed, velvetleaf.

Crop Stage: Before 50% flowering stage. Application prior to emergence of first trifoliolate leaf may cause temporary yellowing.

General Comments: Consult label for optimum stages of weed growth. FIRSTRATE may be applied postemergence up to 0.6 oz/A for heavy weed infestations or added residual control. Do not exceed 1.05 oz/A in a single season. If soil application is made, no more than 0.3 oz/A may be applied postemergence.

Environmental Statements: FIRSTRATE should not be mixed or loaded within 50 feet of any wells, sink holes, perennial or intermittent streams and rivers, and natural or impounded lakes and reservoirs, unless an impervious pad is used.

Rain Delay: 2 hours.

Rotation Restrictions: Rotational crops that may be planted are wheat after 4 months; or alfalfa, field corn, popcorn, or sorghum after 9 months following treatment. For transplanted tobacco allow 18 months if herbicide rate > 0.3 oz/A and allow 10 months if herbicide rate ≤ 0.3 oz/A. For other crops allow an 18-month rotational interval.

Harvest & Forage Restrictions: Do not apply FIRSTRATE within 65 days of harvest. Do not harvest for forage or hay for 14 days after treatment. When FIRSTRATE postemergence rate exceeds 0.3 oz/A, the preharvest interval is 70 days for soybean harvest, and 25 days for forage or hay.

Tank Mixtures: Assure II, Basagran, Blazer, Classic, Cobra, Flexstar, Fusion, Poast Plus, Pursuit, Raptor, Resource, Select. Also, glyphosate (glyphosate tolerant soybeans), or Synchrony (STS soybeans only).

104 Soybean

FLEXSTAR

FLEXSTAR 1.88L 1 to 1.5 pt/A (fomesafen 0.235 to 0.35 lb ai/A)
+
SURFACTANT (NON-IONIC 80%) 0.5 to 1 pt/25 gal (additive)
or CROP OIL CONCENTRATE 1 to 2 pt/25 gal
[28% liquid N may be included with surfactant
or crop oil]

Weeds Controlled: Black nightshade, cocklebur, common ragweed, giant ragweed, hophornbeam copperleaf, morningglories, palmer amaranth, smartweed, smooth pigweed, waterhemp.

Crop Stage: Prior to 45 days before harvest.

General Comments: Follow label directions for herbicide rates and optimum stages of weed growth. Do not exceed a maximum of 0.375 lb ai of fomesafen in alternate years.

Environmental Statements: Contamination of groundwater may occur when used on permeable soils.

Rain Delay: 1 hour.

Rotation Restrictions: Rotational crops that may be planted are wheat or barley after 4 months; or corn after 10 months (12 months for popcorn) following treatment. Other crops may be planted 18 months after treatment.

Harvest & Forage Restrictions: Do not apply within 45 days of harvest. Treated soybean plants or rotated small grain crops should not be grazed or harvested for forage or straw.

Tank Mixtures for FLEXSTAR: Assure II, Basagran, Butyrac 200, Classic, FirstRate, Fusion, Harmony GT, Poast, Poast Plus, Pursuit, Raptor, Resource, Scepter, or Select. Also, glyphosate in Roundup Ready soybeans or Synchrony STS in STS soybeans only.

Generic Formulations: Andross 1.88, Battle Star, Dawn, Reflex, Rhythm. Ringside, Rumble, Shafen, Shafen Star, Statement

FLEXSTAR GT

FLEXSTAR GT 3.5 (2.8L) 3.5 to 5.3 pt/A (fomesafen : glyphosate)
[(0.25 lb ai/A:0.99lb ae/A) to (0.371 lb ai/A:1.48 lb ae/A)]

An adjuvant is already included with FLEXSTAR GT and minimizes the need for additional adjuvants. Under certain conditions the addition of one or more of the following may improve control: AMS at 8.5 to 17 lb/100 gal; Crop Oil Concentrate or Methylated Seed oil at 2 to 4 qt/100 gal; Non Ionic Surfactant at 1 to 2 qt/100gal.

Weeds Controlled: Black nightshade, barnyardgrass broadleaf signalgrass, cocklebur, common ragweed, crabgrass, fall panicum, giant foxtail, giant ragweed, hophornbeam copperleaf, johnsongrass (seedling), lambsquarters, morningglories, palmer amaranth, smooth pigweed, sicklepod, shattercane, smartweed, volunteer corn (except glyphosate resistant), velvetleaf, waterhemp.

Crop Stage: Preplant or preemergence burndown or postemergence (glyphosate tolerant soybean) prior to 45 days before harvest.

General Comments for Glyphosate Tolerant Soybean Only. Follow label directions for herbicide rates and optimum stages of weed growth. Do not exceed a maximum of 0.375 lb ai of fomesafen in alternate years.

Environmental Statements: Contamination of groundwater may occur when used on permeable soils.

Rain Delay: Heavy rainfall after application may reduce performance.

Rotation Restrictions: Rotational crops that may be planted are wheat or barley after 4 months; or corn after 10 months (12 months for popcorn) following treatment. Other crops may be planted 18 months after treatment.

Harvest & Forage Restrictions: Do not apply within 45 days of harvest. Treated soybean plants should not be grazed or harvested for forage or hay.

Tank Mixtures for Postemergence Applications: Fusilade DX, Fusion, glyphosate.

FUSILADE DX

| | |
|---|---|
| FUSILADE DX 2E 6 to 12 oz/A | [fluazifop-P-butyl (0.093 to 0.188 lb ai/A] |
| + | + |
| CROP OIL CONCENTRATE 0.5 to 1 gal/100 gal or SURFACTANT (NIS 75%) 1 to 2 qt/100 gal [28% UAN 1 gal/A) may be included with surfactant or crop oil] | (additive) |

Weeds Controlled: Barnyardgrass, broadleaf signalgrass, crabgrass, fall panicum, foxtails, johnsongrass, shattercane, volunteer corn.

Crop Stage: Use up to 24 fl oz/A pre bloom to soybean and up to 6 fl oz/A from bloom through post bloom (R1 growth stage or later). Do not harvest for 60 days after application.

General Comments: Follow label directions for herbicide rate and stages of weed growth for optimum results.

Environmental Statements: FUSILADE DX has GROUNDWATER and SURFACE WATER statements on the label.

Rain Delay: 1 hour.

Rotation Restrictions: Do not plant rotational grass crops such as corn, sorghum, or small grains within 60 days after last application.

Harvest & Forage Restrictions: Do not harvest for 60 days after last application.

Tank Mixtures: Basagran, Ultra Blazer, Classic, Flexstar, Pursuit. Also glyphosate for RR soybeans only. When using FUSILADE DX in tank mixtures or as a sequential application with other herbicides, follow specific directions on the labels.

FUSION

| | |
|---|---|
| FUSION 2.56E 6 to 12 oz/A | [fluazifop-P-butyl:fenoxaprop-P- ethyl] |
| + | + |
| CROP OIL CONCENTRATE 1 to 2 pt/25 gal or SURFACTANT (NIS 75%) 0.5 to 1 pt/25 gal [28% UAN (4 qt/25 gal) or AMS (4 lb/A) may be included with surfactant or crop oil] | (additive) |

Weeds Controlled: Barnyardgrass, broadleaf signalgrass, crabgrass, fall panicum, foxtails, johnsongrass, shattercane, volunteer corn.

Crop Stage: Before bloom stage.

General Comments: Follow label directions for herbicide rate and stages of weed growth.

Environmental Statements: None.

Rain Delay: 1 hour.

Rotation Restrictions: Do not plant rotational grass crops such as corn, sorghum, or small grains within 60 days after last application.

Harvest & Forage Restrictions: Apply FUSION before soybean bloom. Do not graze or harvest treated fields for forage or hay.

Tank Mixtures: Basagran, Blazer, Classic, Cobra, FirstRate, Flexstar, Pursuit, Scepter, Storm. Also Touchdown 5 for RR soybeans or Synchrony in STS soybeans only. When using FUSION in tank mixtures or as a sequential application with other herbicides, follow specific directions on the labels.

GLYPHOSATE

GLYPHOSATE is available in various formulations. The concentration of glyphosate may be expressed as acid equivalent which is based on the parent acid of glyphosate or expressed as active ingredient which is based on the acid plus the salt. Comparing glyphosate rates based on acid equivalents is a common method for evaluating products on equal terms. Some of the different types of formulations of glyphosate available and their application rates in a single application are shown below. Examples of specific glyphosate products are listed on **page 22**.

| GLYPHOSATE FORMULATION | PRODUCT RATE / A | ACID EQUIVALENT / A |
|--|---|------------------------|
| GLYPHOSATE (3 lb ae/gal formulation) | 2 to 4 pt/A (32 to 64 fl oz/A) | (0.75 to 1.5 lb ae/A) |
| Example of products: Roundup Original and other glyphosate products | | |
| GLYPHOSATE (3.75 lb ae/gal formulation) | 1.6 to 3.2 pt/A (26 to 51.2 fl oz/A) | (0.76 to 1.5 lb ae/A) |
| Example of products: Buccaneer 5 | | |
| GLYPHOSATE (4 lb ae/gal formulation) | 1.5 to 3 pt/A (24 to 48 fl oz/A) | (0.75 to 1.5 lb ae/A) |
| Example of products: Duramax, Durango DMA | | |
| GLYPHOSATE (4.17 lb ae/gal formulation) | 1.5 to 3 pt/A (24 to 48 fl oz/A) | (0.78 to 1.56 lb ae/A) |
| Example of products: Touchdown Total | | |
| GLYPHOSATE (4.5 lb ae/gal formulation) | 1.38 to 2.75 pt/A (22 to 44 fl oz/A) | (0.77 to 1.55 lb ae/A) |
| Example of products: Roundup Power MAX, Roundup WeatherMAX | | |
| GLYPHOSATE (5 lb ae/gal formulation) | 1.25 to 2.5 pt/A (20 to 40 fl oz/A) | (0.78 to 1.56 lb ae/A) |
| Example of products: Touchdown Hi-Tech | | |

Additives: For products that require a surfactant, a non-ionic surfactant at 0.25% v/v is often used. Consult the herbicide product label to verify if a surfactant is needed and the type and rate of surfactant to include. Certain surfactants may cause necrosis, chlorosis, or speckling of leaves. Dry Ammonium Sulfate at 1 to 2% by weight (8.5 to 17 lb/100 gal) or an equivalent amount of AMS in liquid formulation may improve glyphosate activity during dry weather, or when mixed in hard water or with certain herbicides, or applied to certain weed species.

Weeds Controlled: Barnyardgrass, black nightshade, broadleaf signalgrass, burcucumber, cocklebur, crabgrass, fall panicum, foxtails, giant ragweed, johnsongrass (seed and rhizomes), lambsquarters, smooth pigweed, shattercane, sicklepod, smartweed, velvetleaf, volunteer corn (except glyphosate tolerant). Consult label for specific troublesome weed species and growth stages.

Crop Stage: Applications may be made to soybeans from the cracking stage through full flowering stage (R2). R2 ends when a pod 5 millimeters (3/16") long appears at one of the four uppermost nodes on the main stem with a fully expanded leaf.

General Comments: Apply glyphosate only OVER-THE-TOP OF SOYBEAN VARIETIES DESIGNATED WITH THE "ROUNDUP READY" GENE. For optimum control of most weed species, plant soybeans in narrow rows (≤ 15 inches). The general recommended rates for glyphosate are 0.75 lb ae/A for annuals and 0.75 to 1.5 lb ae/A for perennials. A sequential application may be needed to control regrowth or new weed flushes. For optimum control of perennials, apply when broadleaf plants are in the early bud to flowering stage and when grasses are in the boot to seedhead stage. Consult label for rate for specific weeds. The repeated use of glyphosate alone without other herbicides may lead to selection of glyphosate-resistant populations of weeds. The following table summarizes the maximum rate of product for various glyphosate formulations for different applications for weed management in soybeans. Consult label for total combined rate when applied during flowering.

GLYPHOSATE (continued)

| Glyphosate Formulation (acid equivalent) | Maximum Rate Preplant Before Crop Emergence | Maximum Rate For Single In-crop Application* | Combined Total of Multiple In-crop Applications | Maximum Use Rate Preharvest Application | Combined Season Total for All Applications |
|--|---|--|---|---|--|
| Roundup Original (3 lb ae/gal) | 5 qt/A | 2 qt/A | 3 qt/A | 1 qt/A | 8 qt/A |
| Buccaneer 5 (3.75 lb ae/gal) | 4 qt/A | 1.6 qt/A | 2.4 qt/A | 0.8 qt/A | 6.5 qt/A |
| Duramax (4 lb ae/gal) | 3.75 qt/A | 1.5 qt/A | 2.25 qt/A | 24 oz/A | 6 qt/A |
| Touchdown Total (4.17 lb ae/gal) | 3.6 qt/A | 48 oz/A | 2.2 qt/A | 24 oz/A | 5.8 qt/A |
| Roundup WeatherMAX (4.5 lb ae/gal) | 3.3 qt/A | 44 oz/A | 64 oz/A | 22 oz/A | 5.3 qt/A |
| Touchdown Hi-Tech (5 lb ae/gal) | 3 qt/A | 40 oz/A | 1.8 qt/A | 20 oz/A | 4.8 qt/A |

*Some product labels require a reduced rate of glyphosate when applied during flowering. Consult label.

Environmental Statements: Take precautions to avoid spray drift to desirable plants.

Rain Delay: Rainfall soon after application may reduce effectiveness. Some labels indicate 6 hrs.

Rotation Restrictions: There are no rotational restrictions following normal use of glyphosate. Wait at least 30 days before planting of crops not listed on the label.

Harvest & Forage Restrictions: Do not harvest within 14 days after treatment. Consult label for use of treated plants for feed or forage.

Tank Mixtures: Consult specific glyphosate label.

HARMONY SG (with TotalSol)

| | |
|--|---------------------------------|
| HARMONY SG 50DF 0.125 oz/A ($\frac{1}{8}$ oz/A) | (thifensulfuron 0.0039 lb ai/A) |
| + | + |
| SURFACTANT (NONIONIC 50%) 1 to 2 pt/100gal | (additive) |
| + | + |
| 28% UAN (4 to 8 pt/A) or AMS (2 to 4 lb/A) (Consult label for use of oil concentrate) | (additive) |

Weeds Controlled: Lambsquarters, smooth pigweed, smartweed, velvetleaf.

Crop Stage: After first trifoliolate has expanded and until 60 days before harvest.

General Comments: HARASS is a similar product applied at the rate of 0.083 oz/A. HARMONY SG at 0.125 oz/A to 0.5 oz/A; or HARASS at 0.083 to 0.33 oz/A may be used only in soybeans with **STS trait**.

Environmental Statements: None.

Rain Delay: Several hours of dry weather are needed for absorption.

Rotation Restrictions: Wheat, barley, oats, soybean, field corn, or grain sorghum may be replanted anytime after application. Other crops may be planted 45 days after HARMONY SG application.

Harvest & Forage Restrictions: Apply no later than 60 days before harvest. Do not use treated soybean plants for feed or forage. Harvested straw may be used for bedding and/or feed.

Tank Mixtures with Harmony SG: Assure II, Basagran or glyphosate in RR soybean. Do not mix with Poast Plus.

108 Soybean

LIBERTY 280 SL (LibertyLink Varieties ONLY)

Liberty 2.34L 22 oz/A to 36 oz/A (glufosinate ammonium 0.4 to 0.65 lb ai/A)

Weeds Controlled: Black nightshade, cocklebur, common ragweed, fall panicum, foxtails, giant ragweed, johnsongrass (seedling), hophornbeam copperleaf, lambsquarters, marestalk (horseweed), morningglories, Palmer amaranth, smooth pigweed, prickly sida, shattercane, smartweed, velvetleaf, waterhemp. Consult label for weed size.

Crop Stage: Apply postemergence only in LibertyLink soybeans from emergence up to but not including bloom growth stage. Preplant surface or preemergence applications may be made prior to the emergence of conventional or transgenic soybean varieties.

General Comments: **Apply only overtop soybean varieties designated as "LibertyLink"**. A second application of LIBERTY or a tank mix application with a residual herbicide will be needed to control weeds not yet emerged at time of application. When using sequential treatments apply the first treatment of LIBERTY at 22 to 36 fl oz/A and the second treatment at 22 to 29 fl oz/A. Do not exceed 36 fl oz/A as a single application or a total of 65 oz/A per season including the burndown treatment. Heavy dew or fog may reduce weed control. Also, applications should be made between dawn and 2 hours before sunset to avoid reduced control of lambsquarters and velvetleaf. Ammonium sulfate may improve control of weeds that are stressed. If foaming occurs a silicone-antifoam based agent may be added. Use nozzles and pressures that generate MEDIUM spray droplets.

Environmental Statements: Use precautions to avoid drift of spray to nearby crops or sensitive plants.

Rain Delay: 4 hrs

Rotation Restrictions: Corn or soybean may be planted anytime. Allow a minimum interval of 70 days after application for wheat, barley, and oats and 180 days for other crops.

Harvest & Forage Restrictions: Do not apply within 70 days of harvest. Do not graze or cut for hay.

Tank Mixtures: Assure II, Classic, clethodim, Cobra, FirstRate, Flexstar, Fusion, Phoenix, Poast Plus, Pursuit, Raptor, Reflex, Resource, SelectMax, Synchrony XP and Ultra Blazer.

Generic Formulations: Cheetah, Forfeit, and Rely 280 may be applied overtop LibertyLink Soybeans. They are also labeled for burndown treatments before planting conventional or transgenic varieties.

POAST or POAST PLUS

POAST 1.5E 1.0 to 1.5 pt/A or (sethoxydim 0.18 to 0.28 lb ai/A)

POAST PLUS 1E 1.5 to 2.25 pt/A

+

+

CROP OIL CONCENTRATE 2 pt/A or

(additive)

DASH HC 1 pt/A

[28% UAN (2 to 4 qt/A) or AMS (2.5 lb/A) may also be included to improve control of certain species.]

Weeds Controlled: Barnyardgrass, broadleaf signalgrass, crabgrass, fall panicum, foxtails, johnsongrass, shattercane, volunteer corn.

Crop Stage: Do not apply within 75 days of harvest.

General Comments: Follow label directions for rates and stages of weed growth for optimum results.

Environmental Statements: None.

Rain Delay: 1 hour.

Rotation Restrictions: Do not plant any other crop to be harvested for 30 days after application unless POAST or POAST PLUS are registered for that crop.

Harvest & Forage Restrictions: Do not apply within 75 days of harvest. Do not graze or feed ensilage from treated soybean plants to livestock. Soybean hay may be fed.

Tank Mixtures: Basagran, Blazer, Classic, Cobra, FirstRate, Flexstar, Pursuit, Raptor, Resource, or Storm. Also, glyphosate (e.g. Roundup) in Roundup Ready soybeans only or Synchrony in STS soybeans only. When using POAST in tank mixes or sequential applications with other herbicides, follow specific directions on label.

PREFIX

PREFIX 2.0 to 2.33 pt/A (S-metolachlor:fomesafen 1.09 : 0.238 to 1.26:0.28 lb ai/A)
 +
 Nonionic surfactant (25% v/v) (additive)

Weeds Controlled: Black nightshade, Palmer amaranth, smooth pigweed, waterhemp.

Crop Stage: PREFIX may be applied early postemergence at least 90 days before harvest. It may also be applied early preplant (up to 15 days before planting), preplant incorporated or preemergence for control of annual grasses and certain broadleaf weeds.

General Comments: Do not exceed 2.33 pt of Prefix/A in a single post application. Do not exceed a maximum of 0.375 lb ai of fomesafen in alternate years. Do not apply PREFIX postemergence if S-metolachlor was applied preemergence.

Environmental Statements: PREFIX has ground and surface water advisory statements on the label. It should not be mixed or loaded within 50 feet of wells, sinkholes, perennial intermittent streams, rivers, and natural impounded lakes and reservoirs, unless an impervious pad is used.

Rain Delay: None.

Rotation Restrictions: Rotational crops include wheat or barley after 4.5 months, corn after 10 months, (popcorn after 12 months when rate \geq 2 pt/A). Other crops require an interval of 18 months.

Harvest & Forage Restrictions: Do not graze or harvest for soybean forage or hay. Do not graze rotated small grains or harvest forage or straw for livestock. Make post applications at least 90 days before harvest.

Tank Mixtures: May be mixed with glyphosate for post applications to RR soybean.

PURSUIT

PURSUIT 2S 4 oz/A or (imazethapyr 0.063 lb ai/A)
PURSUIT 70 DG 1.44 oz/A
 [One 2.8 oz soluble bag per 2 acres]

+
 SURFACTANT (NON-IONIC 80%) 1 qt/100 gal or (additive)
 CROP OIL CONCENTRATE 1.25 gal/100 gal or
 METHYLATED SEED OIL 1 gal/100 gal

+
 FERTILIZER SOLUTION (additive)
 [28 to 32% NITROGEN or 10-34-0 at 1.25 to 2.5 gal/100 gal
 or AMS 12 to 15 lb/100 gal]

Weeds Controlled: Black nightshade, cocklebur, foxtails, giant ragweed, johnsongrass (seedling), smooth pigweed, shattercane, smartweed, velvetleaf.

Crop Stage: Apply PURSUIT any time prior to soybean bloom and 85 days before harvest.

General Comments: Follow label directions for optimum stages of weed growth. Make only one PURSUIT application per growing season.

Environmental Statements: PURSUIT has GROUND WATER advisory statements on the label. It should not be mixed or loaded within 50 feet of any wells, sink holes, perennial or intermittent streams, rivers, and natural or impounded lakes and reservoirs, unless an impervious pad is used.

Rain Delay: 1 hour.

Rotation Restrictions: Rotational crops that may be planted include wheat after 3 months, alfalfa, barley, or rye after 4 months; susceptible field corn hybrids after 8.5 months (Clearfield corn may be planted immediately); tobacco after 9.5 months; or popcorn, sweet corn, sorghum, and oats after 18 months following PURSUIT application. Other crops may require a minimum of 40 months and a successful field bioassay before planting. Consult label for rotation restrictions when other long-residual herbicides are used during the same season. Only rotational crops harvested at maturity may be used for feed or food.

Harvest & Forage Restrictions: Do not harvest within 85 days after PURSUIT application. Do not use treated plants for feed or forage.

Tank Mixtures: Basagran, Ultra Blazer, Cobra, FirstRate, Flexstar, Glyphosate, Harmony GT, Poast Plus, Scepter, or Storm.

110 Soybean

RAPTOR

| | | |
|--|-----------------------|--------------------------|
| RAPTOR 1S | 5 oz/A | (imazamox 0.039 lb ai/A) |
| | + | + |
| METHYLATED SEED OIL | 1 to 2 gal/100 gal or | |
| CROP OIL CONCENTRATE | 1 to 2 gal/100 gal or | (additive) |
| SURFACTANT (NON-IONIC 80%) | 1 qt/100 gal | |
| | + | + |
| FERTILIZER SOLUTION | | (additive) |
| [28 to 32% NITROGEN or 10-34-0 at 2.5 gal/100gal | | |
| or AMS at 12 to 15 lb/100gal] | | |

Weeds Controlled: Barnyardgrass, black nightshade, cocklebur, foxtails, giant ragweed, johnsongrass (seedling), lambsquarters, morningglories, smooth pigweed, shattercane, smartweed, velvetleaf...

Crop Stage: Before bloom stage.

General Comments: Follow label for herbicide rates and optimum stages of weed growth. Do not apply RAPTOR more than once per season.

Environmental Statements: None.

Rain Delay: 1 hour.

Rotation Restrictions: Rotational crops that may be planted are Clearfield wheat anytime; alfalfa and non-Clearfield wheat after 3 months; barley or rye after 4 months; or Clearfield and susceptible corn (field or pop) after 8.5 months; or grain sorghum, or tobacco 9 months following treatment. Other crops may be planted 18 months after treatment. Consult label if certain long-residual herbicides have been used.

Harvest & Forage Restrictions: Apply before soybean bloom.

Tank Mixtures: Ultra Blazer, Classic, FirstRate. Also glyphosate (for RR soybeans only). Do not tank mix with Extreme.

RESOURCE

| | | |
|--|-------------|---|
| RESOURCE 0.86E | 4 to 8 oz/A | (flumiclorac pentyl 0.027 to 0.054 lb ai/A) |
| | + | + |
| CROP OIL CONCENTRATE (1 qt/A) | | (additive) |
| (Consult labels for using non-ionic surfactant | | |
| for certain tank mixes) | | |
| | + | + |
| [28% UAN (1 to 2 qt/A) or AMS (2.5 lb/A) may | | (additive) |
| included with crop oil or surfactant.] | | |

Weeds Controlled: Common ragweed, velvetleaf.

Crop Stage: Do not apply within 60 days of harvest.

General Comments: Follow label directions for herbicide rates and optimum stages of weed growth. Soybean leaves open at the time of application may show some burn or spotting. Do not exceed 12 oz/A in a single application or a cumulative amount of 16 oz/A in a season.

Environmental Statements: Do not allow spray drift to food or forage crops that might be damaged and rendered unfit for sale or use for consumption.

Rain Delay: 1 hour.

Rotation Restrictions: Do not rotate to crops other than soybeans or field corn within 30 days after the last application

Harvest & Forage Restrictions: Do not apply within 60 days of harvest. Do not feed treated forage.

Tank Mixtures: Assure II, Basagran, Blazer, Classic, Cobra, FirstRate, Flexstar, Fusion, Harmony GT, Poast, Poast Plus, Pursuit, Raptor, Scepter, Select, Storm. Also, glyphosate in Roundup Ready soybeans or Synchrony in STS soybeans only.

SCEPTER

| | |
|--|------------------------------------|
| SCEPTER 70DG 1.4 to 2.8 oz/A [One 5.6 oz soluble bag per 4 to 2 acres] | (imazaquin 0.061 to 0.123 lb ai/A) |
| + | + |
| SURFACTANT (NON-IONIC 80%) (2 pt/100 gal) | (additive) |
| or | or |
| CROP OIL CONCENTRATE (Consult COC label for rate) | (additive) |

Weeds Controlled: Cocklebur, smooth pigweed.

Crop Stage: From emergence until 90 days before harvest.

General Comments: When applied POSTEMERGENCE consult label for optimum stages of weed growth. Internode shortening of soybean plants may occur.

Environmental Statements: The use of SCEPTER on permeable soils may result in ground water contamination.

Rain Delay: None indicated on SCEPTER label.

Rotation Restrictions: Rotational crops which may be planted include wheat after 3 months; field corn, or tobacco after 9.5 months; or barley, or grain sorghum 11 months following treatment. Do not plant other rotational crops within 18 months after application. Consult label for rotation restrictions when other long-residual herbicides are used during the same season, for sequential SCEPTER applications, or when soil conditions are dry after application.

Harvest & Forage Restrictions: Do not harvest within 90 days after application. Do not use treated plants for feed or forage.

Tank Mixtures: None.

SELECT MAX

| | |
|--|---------------------------|
| SELECT MAX 0.97 EC 9 to 32 oz/A | (clethodim 0.068 to 0.24) |
| + | + |
| NONIONIC SURFACTANT 0.25% v/v or | (additive) |
| CROP OIL CONCENTRATE 1 qt/A | |

[Consult label for use of AMS for certain weeds such as rhizome johnsongrass or volunteer corn and use of non-ionic surfactant with glyphosate combinations.]

Weeds Controlled: Barnyardgrass, broadleaf signalgrass, crabgrass, fall panicum, foxtails, johnsongrass, shattercane, volunteer corn.

Crop Stage: Do not apply within 60 days of harvest.

General Comments: When using for volunteer corn apply at 6 to 12 oz/A for plants up to 12 inches tall; use 9 to 14 oz/A SELECT MAX when plants are up to 24 inches tall; use 12 to 16 oz/A when plants are up to 36 inches tall.

Environmental Statements: None.

Rain Delay: 1 hour.

Rotation Restrictions: Do not plant for 30 days after applying SELECT MAX, unless clethodim is registered for that crop.

Harvest & Forage Restrictions: Apply no later than 60 days before harvest. Do not use treated soybean plants for feed or forage.

Tank Mixtures for Select MAX: COBRA, FIRSTRATE, FLEXSTAR, HARMONY GT, PHOENIX, PURSUIT, RAPTOR, RESOURCE. Also glyphosate for RR soybean or SYNCHRONY (STS soybeans only). Consult other clethodim containing products for approved tank mix combinations.

Generic Formulations: Other clethodim containing products include ARROW, INTENSITY, INTENSITY ONE, SECTION, SHADOW, TRIGGER, VOLUNTEER. Consult label for rate and recommended additive.

112 Soybean

SEQUENCE

SEQUENCE 5.25L 2.5 to 3.5 pt/A

(glyphosate:S-metolachlor)
(0.7:0.94 to 1.0:1.3 lb ai/A)

Dry Ammonium Sulfate at 1 to 2% by weight (8.5 to 17 lb/100 gal) may be used as an additive to improve glyphosate activity during dry weather, when mixed in hard water or with certain herbicides, or for certain weed species.

Annual Weeds Controlled: Annual fleabane, barnyardgrass, black nightshade, brome spp., burcucumber, chickweed, cocklebur, common ragweed, crabgrass, fall panicum, giant foxtail, giant ragweed, henbit, johnsongrass (seedlings), lambsquarters, mustards, prickly lettuce, rye, sicklepod, smartweed, smooth pigweed, volunteer corn (except glyphosate resistant), velvetleaf, wheat

Perennials: FOR SPECIFIC PERENNIAL WEED SPECIES CONSULT LABEL. Best control of perennials is usually achieved at late growth stages approaching maturity and when soil moisture is adequate for active plant growth. Perennial weeds may not be at the proper growth stage during normal application times for no-till soybeans. Control may be reduced if plants are mowed or grazed and not allowed to regrow to recommended growth stage. Perennial weeds may require multiple applications of glyphosate for optimum control.

Crop Stage: Applications may be made preplant, preemergence, all soybeans or postemergence to Roundup Ready soybeans from the cracking stage through third trifoliolate.

General Comments: Apply SEQUENCE only OVER-THE-TOP OF SOYBEAN VARIETIES DESIGNATED WITH THE "ROUNDUP READY" GENE. Glyphosate is a translocated herbicide that controls emerged weeds, whereas, S-metolachlor is a soil-residual herbicide that controls weeds prior to emergence. For optimum control of most weed species, plant soybeans in narrow rows (≤ 15 inches). Consult label for rate for specific weeds. When applied postemergence, do not exceed 3.5 pt/A per season. Do not apply products with S-metolachlor or metolachlor after soybean emergence if SEQUENCE is applied preemergence.

Environmental Statements: SEQUENCE has GROUND and SURFACE WATER ADVISORY statements on the label. This product should not be mixed or loaded within 50 feet of any wells, sink holes, perennial or intermittent streams, rivers, and natural or impounded lakes and reservoirs, unless an impervious pad is used. Avoid drift of spray as this can result in injury to non-target plants.

Rain Delay: Rainfall soon after application may reduce control of emerged weeds.

Rotation Restrictions: Rotational crops that may be planted include corn or sorghum (with Concep treated seed) immediately; alfalfa after 4 months; wheat, barley, rye, or oats after 4.5 months; clover after 9 months; and tobacco in the spring following treatment.

Harvest & Forage Restrictions: For preplant or preemergence applications, do not feed for forage or hay for 30 days after treatment. For post applications in RR soybean, do not harvest grain for 90 days after treatment and do not graze or feed forage or hay.

Tank Mixtures: Dual Magnum, Fusion, Touchdown Hi-Tech, Touchdown Total.

SYNCHRONY XP

SYNCHRONY XP 0.75 oz/A

(chlorimuron:thifensulfuron
0.01:0.003 lb ai/A)

+
CROP OIL CONCENTRATE 8 pt/100 gal
[Consult label for using nonionic surfactant]

+
(additive)

+
28% UAN 4 to 8 pt/A or
AMS 2 to 4 lb/A

+
(additive)

Weeds Controlled: Burcucumber, cocklebur, lambsquarters, smooth pigweed, sicklepod, smartweed, velvetleaf.

Crop Stage: Postemergence after first trifoliolate has expanded until 60 days before harvest. May also be applied PRE, PPI or Burndown prior to soybean emergence.

General Comments: SYNCHRONY XP at 0.75 oz/A must be applied only to STS soybeans purchased from an authorized seed dealer; otherwise, severe crop injury and/or yield loss may occur. Applications may be made to non-STs soybeans when using the reduced rate of SYNCHRONY XP is 0.375 oz/A. Follow label directions for herbicide rate and stage of weed growth for optimum results.

Environmental Statements: None.

Rain Delay: 1 hour.

SYNCHRONY XP (continued)

Rotation Restrictions: When SYNCHRONY is applied at 0.75 oz/A and soil pH is < 7.0, rotational crops which may be planted include wheat, barley, fescue, or ryegrass after 3 months; field corn or alfalfa after 9 months; and popcorn, sorghum or tobacco, after 15 months following treatment. Consult label when maximum rate for SYNCHRONY XP is 0.375 oz/A; or when SYNCHRONY XP is applied alone or followed by Classic after August 1. Follow the most restrictive label when SYNCHRONY is used the same season with other long-residual herbicides.

Harvest & Forage Restrictions: Apply no later than 60 days before soybean maturity. Do not use treated plants for feed or forage.

Tank Mixtures: Assure II, Ultra Blazer, Cobra, FirstRate, Flexstar, Harmony GT. Also, glyphosate for Roundup Ready soybean.

ULTRA BLAZER

ULTRA BLAZER 2L 1.5 pt/A

(acifluorfen 0.38 lb ai/A)

+

+

SURFACTANT (NON-IONIC 80%) 1 to 2 pt/100 gal
[Consult label for using 28% UAN (4 to 8 pt/A),
AMS (2.5 lb/A) or Crop Oil Concentrate (1 to 2 pt/A).]

(additive)

Weeds Controlled: Black nightshade, common ragweed, hophornbeam copperleaf, giant ragweed, morningglories, smooth pigweed, smartweed, waterhemp.

Crop Stage: Do not apply within 50 days of harvest.

General Comments: Follow label directions for optimum stages of weed growth

Environmental Statements: ULTRA BLAZER has a GROUND WATER advisory statement on the label.

Rain Delay: 4 hours.

Rotation Restrictions: In case of crop failure only soybean may be immediately replanted. Allow a minimum rotational interval of 40 days for small grains and 100 days for other crops.

Harvest & Forage Restrictions: Do not apply within 50 days of harvest. Do not use treated soybean plants for feed or forage.

Tank Mixtures: Assure II, Basagran, Classic, 2,4-DB, FirstRate, Fusion, Poast, Poast Plus, Pursuit, Raptor, Resource, Scepter, Select, (glyphosate for Roundup Ready Soybean), or (Synchrony for STS soybean).

SPOT-TREATMENTS FOR SOYBEANS

| AMOUNT OF PRODUCT PER GALLON OF SPRAY MIXTURE | | | | | |
|---|-------------------|-------------------|----|--|--|
| GRAMINICIDES | | | | | |
| <u>PRODUCT</u> | <u>RATE</u> | <u>ADDITIVES</u> | | | <u>COMMENTS</u> |
| | | <u>COC.</u> | | <u>NIS</u> | |
| ARROW ¹ | 0.65 oz + | 1.3 oz | or | 0.3 oz | ¹ Label directions for application timing; restrictions for preharvest interval; and use of forage for spot treatments are the same as those for broadcast applications for ARROW, ASSURE II, FUSION, SECTION, SELECT, and SELECT MAX. ² Do not apply spot treatments of POAST or POAST PLUS in addition to broadcast treatments. |
| ASSURE II ¹ | 0.5 oz + | 1.25 oz | or | 0.3oz | |
| FUSION ¹ | 0.75 oz + | 1.5 oz | or | 0.5oz | |
| POAST ² | 1.9 oz + | 1.3 oz | | ----- | |
| POAST PLUS ² | 2.9 oz + | 1.3 oz | | ----- | |
| SECTION ¹ | 0.65 oz + | 1.3 oz | or | 0.3 oz | |
| SELECT ¹ | 0.65 oz + | 1.3 oz | or | 0.3 oz | |
| SELECT MAX ¹ | 0.85 oz + | 1.3 oz | or | 0.3 oz | |
| VOLUNTEER ¹ | 0.65 oz + | 1.3 oz | or | 0.3 oz | |
| GLYPHOSATE | | | | | |
| <u>GLYPHOSATE FORMULATION</u> ³ | <u>RATE</u> | | | <u>COMMENTS</u> | |
| 3 lb ae /gal | 0.64 to 2.56 oz | | | ³ Apply GLYPHOSATE products as a spot-treatment before initial pod set of soybean. Susceptible plants in the treated area may be killed or injured. Do not treat more than 10% of the total area to be harvested. Mix the low rate for annuals <6" tall and the high rate for certain hard-to-control perennials. Higher rates may be warranted for certain weeds. Consult label for rates for specific weeds. See Page 22 for list of glyphosate products. | |
| 3.75 lb ae/gal | 0.51 to 2.05 oz | | | | |
| 4 lb ae /gal | 0.48 to 1.92 oz | | | | |
| 4.17 lb ae/gal | 0.46 to 1.84 oz | | | | |
| 4.5 lb ae/gal | 0.42 to 1.7 fl oz | | | | |
| 5 lb ae/gal | 0.38 to 1.53 oz | | | | |
| PARAQUAT | | | | | |
| <u>PRODUCT</u> | <u>RATE</u> | <u>SURFACTANT</u> | | <u>COMMENTS</u> | |
| GRAMOXONE | 0.33 to 0.67 oz | 0.33 to 0.5 oz | | Thoroughly wet foliage but not to the point of runoff. Do not use around home gardens, schools, recreational areas, golf courses, or playgrounds. | |
| FIRESTORM | 0.33 to 0.67 oz | 0.33 to 0.5 oz | | | |
| PARAZONE | 0.33 to 0.67 oz | 0.33 to 0.5 oz | | | |

PREHARVEST

GLYPHOSATE

| | | |
|-------------------------------|---|-----------------------|
| GLYPHOSATE 3 lb ae/gal | Up to 5 or 6 qt/A depending on specific product (for Non Roundup Ready soybean) | (3.75 or 4.5 lb ae/A) |
| | 1qt/A (for Roundup Ready soybean) | (0.75 lb ae/A) |

The above rates are based on 3 lb ae/gal formulation. See page 22 when comparing rates for other formulations. Consult specific label.

Additives: For products that require a surfactant, a non-ionic surfactant at 0.25% v/v is often used. Consult the herbicide product label to verify if a surfactant is needed and the type and rate of surfactant to include. Dry Ammonium Sulfate at 1 to 2% by weight (8.5 to 17 lb/100 gal) may improve glyphosate activity during dry weather, or when mixed in hard water or with certain herbicides, or applied to certain weed species. The equivalent amount of AMS in a liquid formulation may be used.

Weeds Controlled: To suppress growth or kill certain perennial weeds.

Crop Stage: Apply after pods have set and lost all green color.

General Comments: Do not apply to soybean grown for seed production due to potential for reducing germination or seed vigor. Care should be taken to avoid excessive seed shatter loss caused by ground application equipment. Consult label for applications with airplane

Environmental Statements: Take precautions to prevent spray drift to desirable plants.

Rain Delay: Rainfall soon after application may reduce effectiveness. Some labels indicate 6 hrs.

Rotation Restrictions: There are no rotational restrictions following normal use of glyphosate. Wait at least 30 days before planting of crops not listed on the label.

Harvest & Forage Restrictions: Consult specific product label for preharvest intervals.

PARAQUAT

| | | |
|---|-------------------|----------------------------------|
| FIRESTORM 3S or PARAZONE 3S | 5.4 to 10.7 oz/A | |
| | Or | (paraquat 0.126 to 0.25 lb ai/A) |
| GRAMOXONE SL 2.0 | 8 to 16 oz/A | |
| | + | + |
| NONIONIC SURFACTANT | 1 to 2 pt/100 gal | |
| | or | (additive) |
| CROP OIL CONCENTRATE | 4 qt /100 gal | |

Weeds Controlled: For harvest aid and desiccation of green weed foliage.

Crop Stage: Apply to indeterminate varieties when at least 65% of seed pods have a mature brown color or when seed moisture is 30% or less. Apply to determinate varieties when seed are fully developed, at least half of the leaves have dropped, and remaining leaves are turning yellow. Immature soybean will be injured.

General Comments: Mature cocklebur, especially drought stressed plants, may not be completely desiccated

Environmental Statements: Drift of spray can desiccate green tissue and result in injury to non-target plants and render them unfit for sale, use, or consumption.

Rain Delay: 30 minutes for FIRESTORM; 15-30 minutes for GRAMOXONE.

Rotation Restrictions: All rotational crops may be planted after last application.

Harvest & Forage Restrictions: Do not apply within 15 days of harvest. Do not use treated plants for forage or hay.

SMALL GRAINS

WEED MANAGEMENT IN NO-TILLAGE SMALL GRAINS

Cool-season annual weeds such as common chickweed, henbit, and annual ryegrass (Italian) have the potential to emerge in late summer or early fall and gain a competitive advantage over no-tillage small grains. If weeds become established in the fall and are allowed to overwinter, the chances of achieving successful weed control in no-tillage small grains is limited.

Scouting no-tillage small grain fields before planting can help determine if a 'burndown' herbicide is needed. No-tillage treatments include foliar applied herbicides such as glyphosate, or paraquat for 'burndown' control of existing vegetation. The recommended timing of application of no-tillage treatments is before, during, or soon after planting but before crop emergence.

Scouting no-till fields 3 to 4 weeks after planting will determine the presence of problem weeds that emerge with the crop and is especially important if no 'burndown' herbicide is applied. A fall application may be warranted if there is a heavy weed population or if weeds have approached the maximum label size during late fall and before winter. Consider a fall postemergence application of herbicides such as Harmony Extra, Metribuzin (to metribuzin tolerant varieties), or Buctril for cool-season annual broadleaf weeds; Axial, Osprey, PowerFlex, or Finesse Grass and Broadleaf for Italian ryegrass.

Preplant Foliar "Burndown" Herbicides for No-Till Wheat

PARAQUAT

| PRODUCT | Herbicide Rate Based on Height of Annual Weeds | | |
|--|--|--|--|
| | 1 to 3 " weeds | 3 to 6" weeds | 6" weeds |
| GRAMOXONE SL 2.0 GRAMOXONE SL 2S or FIRESTORM 3 S, PARAZONE 3S or PARAQUAT CONCENTRATE 3S | 2 to 2.5 pt/A or 1.3 to 1.7 pt/A | 2.5 to 3 pt/A or 1.7 to 2.0 pt/A | 3 to 4 pt/A or 2.0 to 2.7 pt/A |
| (paraquat cation lb / A) | (0.5 to 0.63 lb ai/A) | (0.63 to 0.75 lb ai/A) | 0.75 to 1 lb ai/A |

Additives: Surfactant at 1 to 2 pt/100 gallons of spray mixture or Crop Oil Conc. at 4 qt/100 gal.

Weeds Controlled: Many small annuals including annual ryegrass (Italian), brome spp., common chickweed, henbit.

Spray Volume: Apply in 10 - 20 gallons of clean water, or complete clear liquid fertilizers per acre. Do not use suspension type fertilizers. A spray volume of more than 20 GPA may be needed if weeds exceed 6" in height. Use a drift control agent if spray volume < 10 GPA.

General Comments: Paraquat containing products are classified as a Restricted Use Pesticide. Apply before, during, or after planting wheat or barley but before crop emergence. Regrowth may occur from perennial grasses and broadleaf weeds, legume sods, or perennial grass sods. Certain annuals such as ryegrass or henbit may not be effectively controlled if plants are well established at the time of application.

Environmental Statements: Drift of spray can desiccate green tissue and result in injury to non-target plants and render them unfit for sale, use, or consumption.

Rain Delay: Rainfastness is and 15-30 minutes for GRAMOXONE INTEON and GRAMOXONE SL and 30 minutes for FIRESTORM, PARAZONE, or PARAQUAT CONCENTRATE.

Rotation Restrictions: All rotational crops may be planted immediately after last application.

Harvest & Forage Restrictions: None.

GLYPHOSATE

Listed below are examples of glyphosate formulations and approximate rates for most burndown applications in no-tillage small grains. The specific rate of product will vary depending on glyphosate formulation and size and species of weeds.

| Glyphosate formulation ¹ | Annuals <6" tall | Annuals >6" tall |
|--|---|---|
| Roundup Original, etc. (3 lb ae/gal) | 1.5 to 2 pt/A (24 to 32 fl oz/A) (0.56 to 0.75 lb ae/A) | 2 to 3 pt/A (32 to 48 fl oz/A) (0.75 to 1.13 lb ae/A) |
| Buccaneer 5 (3.75 lb ae/gal) | 1.2 to 2 pt/A (19 to 32 oz/A) (0.56 to 0.94 lb ae/A) | 1.75 to 2.5 pt/A (28 to 40 oz/A) (0.82 to 1.17 lb ae/A) |
| Duramax (4 lb ae/gal) | 1.13 to 1.5 pt/A (18 to 24 fl oz/A) (0.56 to 0.75 lb ae/A) | 1.5 to 2.25 pt/A (24 to 36 fl oz/A) (0.75 to 1.13 lb ae/A) |
| Touchdown Total (4.17 lb ae/gal) | 1.1 to 1.4 pt/A (17 to 23 oz/A) (0.56 to 0.75 lb ae) | 1.4 to 2.2 pt/A (23 to 35 oz/A) (0.75 to 1.14 lb ae/A) |
| Roundup WeatherMAX (4.5 lb ae/gal) | 1 to 1.4 pt/A (16 to 22 fl oz/A) (0.56 to 0.77 lb ae/A) | 1.4 to 2 pt/A (22 to 32 fl oz/A) (0.77 to 1.13 lb ae/A) |
| Touchdown Hi-Tech (5 lb ae/gal) | 0.9 to 1.2 pt (14 to 19 oz/A) (0.56 to .75 lb ae/A) | 1.2 to 1.8 pt/A (19 to 29 oz/A) (0.75 to 1.13 lb ae/A) |
| ¹ For a detailed list of glyphosate products see page 22. | | |

Additives: For products that require a surfactant, a non-ionic surfactant at 0.25% v/v is often used. Consult the herbicide product label to verify if a surfactant is needed and the type and rate of surfactant to include. Dry Ammonium Sulfate at 1 to 2% by weight (8.5 to 17 lb/100 gal) may improve glyphosate activity during dry weather, or when mixed in hard water or with certain herbicides, or applied to certain weed species.

Weeds Controlled: Annual fleabane, annual ryegrass, (Italian), brome spp., common chickweed, henbit, johnsongrass, mustards, volunteer small grains.

Perennials: CONSULT LABEL FOR GLYPHOSATE RATE FOR SPECIFIC PERENNIAL WEED SPECIES. Best control of perennial weeds is usually achieved when treated at late growth stages (approaching maturity) and when soil moisture is adequate for active plant growth. Control may be reduced if plants are mowed or grazed and not allowed to regrow to recommended growth stage. Perennial weeds may require multiple applications for optimum control.

Spray Volume: A spray volume of 3 to 10 gallons of water/A is often recommended when glyphosate is used alone at reduced labeled rates for certain annual weed species. Consult label when using a volume of 10 to 40 GPA.

General Comments: Apply before, during, or after planting but before crop emergence. Glyphosate is a translocated herbicide. Management programs that rely on repeated use of glyphosate alone without herbicides of other sites of action may lead to the development of populations of glyphosate-resistant biotypes of weeds.

Environmental Statements: Take precautions to avoid spray drift to desirable plants.

Rain Delay: Rain soon after application may reduce effectiveness. Some labels indicate 6 hrs.

Rotation Restrictions: There are no rotational restrictions following normal use of glyphosate. Wait at least 30 days before planting of crops not listed on the label.

Harvest & Forage Restrictions: Do not harvest or feed vegetation for 8 weeks after application.

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Guide to the Relative Response of Weeds and Crop to Herbicides¹

| | Cheat | Downy Brome | Field Brome | Ryegrass, Annual | Common Chickweed | Curly Dock | Henbit | Horseweed (Marestail) | Mustards spp. | Pennycress, Field | Shepherd's-purse | Vetch spp. | Wild Garlic | Crop Response ² |
|---|----------|-------------|-------------|------------------|------------------|------------|----------|-----------------------|---------------|-------------------|------------------|------------|-------------|----------------------------|
| Axial XL | P | - | - | G | N | N | N | N | N | N | N | N | N | 1 |
| 2,4-D | N | N | N | N | P | P | P | F | G | G | G | F | F | 3 |
| Dicamba (Clarity, Banvel, etc) | N | N | N | N | F | F | P | F | F | F | G | G | F | 3 |
| Buctril | N | N | N | N | F | P | F | F | G | G | F | F | P | 2 |
| Finesse Grass & Broadleaf | G | P | G | G | G | G | G | - | - | - | - | - | G | 2 |
| Harmony Extra SG / Nimble / TNT Broadleaf | N | N | N | N | G | G | G | F | G | G | G | F | G | 1 |
| Harmony SG / Harass | N | N | N | N | F | G | F | - | G | G | G | F | G | 1 |
| MCPA | N | N | N | N | P | P | P | F | G | G | G | F | F | 3 |
| Metribuzin ³ | F | - | - | F | G | - | G | G | G | G | G | - | - | 3 |
| Olympus Flex | G | F | G | G | F | - | F | - | - | G | G | - | - | 3 |
| Osprey | F | P | F | G | F | - | F | P | P | - | - | P | N | 3 |
| PowerFlex | - | G | G | G | G | - | F | P | G | G | - | G | F | 3 |

G = Good F = Fair P = Poor N = No Control - = No Information Available

¹ This table should be used only as a guide for comparing the relative effectiveness of herbicides to a particular weed. Under extreme environmental conditions, the herbicides may perform better or worse than indicated in the table. If a farmer is getting satisfactory results under his conditions, he should not necessarily change products as a result of the information in the table.

² Crop Response rating is based on a scale from 0 to 9, with 0 being no injury. A rating of 3 or less will not result in a crop yield loss under normal conditions.

³ Use only wheat or barley varieties recommended on the metribuzin label or CROP INJURY may occur.

Preplant Soil-Residual for No-Till Wheat

VALOR SX 51WDG

VALOR SX 51WDG 2 oz/A

flumioxazin (0.064 lb ai/A)

Weeds Controlled: Marestail (horseweed), common chickweed, henbit

Application Timing: Plant wheat no sooner than 7 days after application.

General Comments: For preplant weed control in only in no-till or minimum tillage wheat where previous crop residue has not been incorporated into the soil. Wheat seed must be planted a minimum of one inch deep. For control of emerged weeds, VALOR must be applied with an appropriate burndown tank mix partner. Treated soil that splashes onto newly emerging crop may result in temporary injury. Do not exceed 2 oz of VALOR / A in a single application or during the growing season. To enhance removal of herbicide residue from spray system, use a tank cleaner such as Valent Tank Cleaner.

Environmental Statements: Valor has the potential to runoff to surface water and adjacent land.

Rain Delay: 1 hour.

Rotation Restrictions: Rotational intervals following VALOR at rates up to 2 oz/A include: 7 days for wheat, 14 days for no-till field corn, and 30 days and one inch of rainfall for conventional till field corn, sorghum, and tobacco. Soybeans may be planted immediately

Harvest & Forage Restrictions: Do not graze until wheat reaches 5 inches in height. Do not harvest within 10 days of application.

Preemergence Herbicides for Ryegrass

Axiom, Finesse, Prowl H2O, Zidua, and Anthem Flex provide soil-residual suppression or control of Italian ryegrass. Emerged ryegrass is not affected by Prowl H2O, Zidua, or Anthem Flex; whereas, Axiom and Finesse may have limited foliar activity on emerged ryegrass plants. As a general rule, these products should be used as a sequential or tank mix partner with foliar-applied herbicides to help provide both preemergence and postemergence control of ryegrass. Depending on the situation, they may also provide an alternative herbicide site of action to help limit the development of herbicide resistant biotypes. Excessive residue from previous crop may limit weed control.

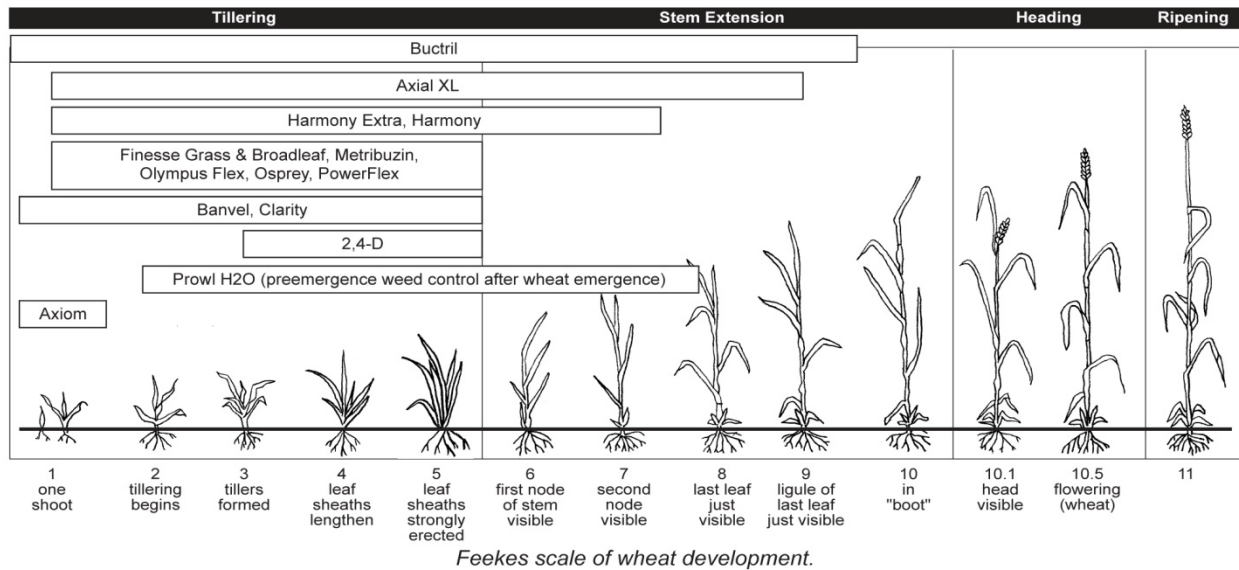
| HERBICIDE* | RATE | TIMING | REMARKS** |
|---|---------------|--|--|
| AXIOM flufenacet (15) metribuzin (5) | 6–10 oz/A | Spike to 2-leaf wheat and preemergence to 1-leaf ryegrass | Some wheat varieties are sensitive to Axiom. Plant wheat 1 to 2 Inches deep. |
| FINESSE or REPORT EXTRA chlorsulfuron (2) metsulfuron (2) | 0.5 oz/A | After planting but before wheat emerges. | Also for control of volunteer corn up to 18" tall. Rotation interval is 6 months for STS soybean and 18 months for field corn, grain sorghum and non-STs soybean. Do not use where soil pH is <5.0 or >7.9. |
| PROWL H2O pendimethalin (3) | 1.5-2.5 pt/A | From 1st-leaf stage of wheat until flag leaf is visible. Emerged ryegrass will not be controlled. | Plant wheat seed at least ½" to 1" deep. Crop injury may occur if applied prior to wheat emergence. Seedbed should be firm and free of clods and trash. |
| ZIDUA pyroxasulfone (15) | 1 - 1.25 oz/A | <u>Delayed Pre</u> When 80% of germinated wheat seed have at least ½ inch long shoot until wheat spiking | Zidua has potential to injure wheat, particularly under environmental stress conditions during seed germination thru seedling emergence. Zidua does not control germinated or emerged weeds. |
| | 1 – 2 oz/A | <u>Early Post</u> When wheat is spiking until 4'th tiller | |
| ANTHEM FLEX pyroxasulfone (15) carfentrazone (14) | 2.75-3.5 oz/A | <u>Delayed Pre</u> When 80% of germinated wheat seed have at least ½ inch long shoot until wheat spiking | Anthem Flex has potential to injure wheat, particularly under environmental stress conditions during seed germination thru seedling emergence. Anthem Flex has some foliar activity on certain weeds species; however, it will not control germinated or emerged Italian ryegrass. |
| | 2.75-3.6 oz/A | <u>Early Post</u> When wheat is spiking until 4'th tiller | |

*Numbers in parenthesis represent groups of different herbicide modes of action. This classification system can aid in the selection of herbicides to limit the development of herbicide resistance.

**Consult labels to achieve optimum results for managing ryegrass and limiting injury to wheat and rotational crops.

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Timing of Postemergence Herbicides Relative to Wheat Growth Stages



POSTEMERGENCE HERBICIDES

AXIAL XL

Axial XL 0.42 EC 16.4 oz/A

(pinoxaden 0.053 lb ai/A)

Weeds Controlled: Annual ryegrass (Italian).

Crop Stage: Apply only one treatment per season from 2-leaf stage to pre-boot stage.

General Comments: For winter wheat and barley. Apply to Italian ryegrass from 1 to 5-leaf stage on main stem. For optimum control apply prior to emergence of 3rd tiller. Use a spray volume of 10 gallons of water per acre. Do not exceed 10 gallons of water/A as reduced grass control may occur. AXIAL XL may not effectively control biotypes of ryegrass that are resistant to ACCase inhibitor herbicides.

Environmental Statements: None.

Rain Delay: 30 minutes.

Rotation Restrictions: There is no waiting interval between application and planting wheat or barley. Most other crops require an interval of 120 days between application and planting.

Harvest & Forage Restrictions: Do not graze or harvest forage for hay for a minimum of 30 days following application. Straw may be fed to livestock 60 days after application. Do not harvest grain for 60 days following application.

Tank Mixtures for Wheat: Buctril, Finesse, Harmony Extra, MCPA ester.

BUCTRIL

BUCTRIL 2EC 1.5 to 2 pt/A

(bromoxynil 0.38 to 0.5 lb ai/A)

Weeds Controlled: Field pennycress, pepperweed, wild mustard, and other broadleaf weeds.**Crop Stage:** Apply from emergence to the boot stage of fall-seeded wheat, barley, rye, triticale, or oats**General Comments:** Legumes not seeded. Consult label for small grains underseeded with alfalfa

Treat emerged weeds up to 4-to 8-leaf stage, or 2 to 4 inches tall or 1 to 2 inches in diameter. Consult label for susceptibility of weed species and rate of herbicide. Do not apply if crop canopy interferes with application as poor control may occur. The cumulative rate should not exceed 2 pt/A.

Environmental Statements: None.**Rain Delay:** No information on label.**Rotation Restrictions:** Do not plant rotational crops within 30 days after application.**Harvest & Forage Restrictions:** Do not graze treated fields for 45 days after treatment.**Tank Mixtures for wheat:** 2,4-D, MCPA, Banvel, Express, Harmony Extra. Consult label for approved tank mixes for barley and other small grains.**CLARITY / BANVEL**

CLARITY 4 S 4 oz/A or

(dicamba 0.125 lb ai/A)

BANVEL 4S 4 oz/A

Weeds Controlled: Shepherd's-purse, vetch spp., and certain other broadleaf weeds.**Crop Stage:** May be applied before, during, or after planting small grains. The risk of injury may be the least when applied after emergence of fall-seeded wheat, barley, or oats and before jointing stage of growth (apply to spring-seeded oats before plants exceed the 5-leaf stage). Treatments made during periods of rapid growth may temporarily result in crop leaning.**General Comments:** Legumes not seeded. For best control apply when broadleaf weeds are in the 2- to 3- leaf stage and rosettes are < 2 inches in across.**Environmental Statements:** Groundwater and surface water protection statements are included on dicamba labels. Dicamba products should not be mixed, loaded, or applied within 50 feet of any wells, sink holes, perennial or intermittent streams, rivers, and natural or impounded lakes and reservoirs, unless an impervious pad is used. Use caution to limit the risk of drift to nearby sensitive plants.**Rain Delay:** 4 hours.**Rotation Restrictions for CLARITY:** Corn may be planted anytime. Other crops may be planted after 120 days following application. Sorghum, soybean, and small grains may have a shorter planting interval. Consult restrictions for other dicamba products.**Harvest & Forage Restrictions:** The restrictive interval for lactating dairy animals following an application rate ≤ 1 pt/A is 7 days for grazing or 37 days for harvesting hay. There are no grazing restrictions for animals other than lactating dairy animals. Animals cannot be removed for slaughter prior to 30 days after applying Banvel or Sterling.**Tank Mixtures for CLARITY for Wheat & Barley:** Buctril, Harmony Extra, MCPA, Sencor, 2,4-D. Consult other dicamba labels for approved tank mixes.**Generic Formulations:** Diablo, Rifle, Sterling, Oracle, Vision.**2,4-D**

2,4-D (AMINE) 1 to 1.5 pt/A* or

2,4-D 0.5 to 0.75 lb ai/A) or

(2,4-D (ESTER) 0.5 to 1.0 pt/A*

(2,4-D 0.25 to 0.5 lb ai/A)

[* Rates based on 4 lb/gal formulation]

Weeds Controlled: Pennycress, pepperweed, shepherd's-purse, wild mustard and other broadleaf weeds.**Crop Stage:** In spring after crop is at full tillered stage (usually 4 to 8" tall) but before it begins to joint. Risk of injury is least when small grains are at fully tillered stage.**General Comments:** Legumes not seeded. For rate to use, follow directions on label of formulation purchased. Wheat is most tolerant followed by rye, barley, and oats.**Environmental Statements:** Drift of 2,4-D spray or vapor can injure nearby susceptible plants.**Rain Delay:** No information on label.**Rotation Restrictions:** Any crop may be planted after 3 months of above freezing soil temperatures following application or until 2,4-D has disappeared. Consult label for preplant applications to corn and soybean.**Harvest & Forage Restrictions:** Do not allow meat animals being finished for slaughter or dairy animals to graze or use for forage within 2 weeks after treatment. Do not feed treated straw if 2,4-D is applied as a preharvest treatment.**Tank Mixtures:** Consult specific label.

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FINESSE GRASS & BROADLEAF

| | |
|--|--|
| Finesse Grass & Broadleaf 0.75 to 0.9 oz/A | (chlorsulfuron + flucarbazone) (0.012:0.022 to 0.014:0.026 lb ai/A) |
| + | + |
| Non-ionic Surfactant (2 qt/100 gal) | Additive |

[28% UAN (2 qt/A) or AMS (2 lb/A) may be included with non-ionic surfactant]

Weeds Controlled: Annual ryegrass (Italian), cheat, field brome, henbit.

Crop Stage: After 2-leaf stage, but prior to jointing.

General Comments: For winter wheat. Apply to Italian ryegrass from 1 leaf to 2 tillers. For optimum control apply prior to emergence of 3rd tiller. Crop injury may occur during cool and/or wet conditions. Applications may be made in winter when daytime temperatures reach 40°F. FINESSE GRASS & BROADLEAF will not control ALS-resistant ryegrass

Environmental Statements: None.

Rain Delay: 1 hour.

Rotation Restrictions: The interval between application and planting rotational crops is 4 months for wheat where soil pH is ≤ 7.9 ; 6 months for STS soybean; or 14 months for field corn where soil pH is ≤ 7.5 . Other crops require a field bioassay.

Harvest & Forage Restrictions: Treated wheat may be grazed anytime; however, for best results apply 5 to 7 days before grazing. Do not harvest grain sooner than 60 days after application.

Tank Mixtures for Wheat: Buctril. Tank mixing with 2,4-D may limit control of weedy grasses.

HARMONY EXTRA SG (with TotalSol)

| | |
|---|---|
| HARMONY EXTRA SG (TotalSol) 50DF 0.45 to 0.9 oz/A | [thifensulfuron:tribenuron (0.009:0.005) to (0.019:0.009) lb ai/A] |
| + | + |
| SURFACTANT (NON-IONIC 80%) 1 to 2 qt/100 gal | (additive) |

Weeds Controlled: Wild garlic, common chickweed, curly dock, field pennycress, henbit, mustards, shepherd's-purse.

Crop Stage: Apply after the 2-leaf stage of wheat, barley, or winter oats but before the flag leaf is visible. Apply to tolerant varieties of spring-seeded oats after the crop is in the 3-leaf stage and before jointing.

General Comments: **Legumes not seeded.** For winter or spring oats do not exceed 0.6 oz/A for Harmony Extra TotalSol and do not apply more than one treatment per season. For wild garlic control, apply to actively growing plants that are less than 12 inches tall with 2 to 4 inches of new growth. Apply to annual broadleaf weeds when plants are past the cotyledon stage and are less than 4 inches tall or across. Injury may occur when crop plants are stressed from adverse environmental conditions.

Environmental Statements: None.

Rain Delay: Several hours of dry weather are needed for absorption into weeds.

Rotation Restrictions: Wheat, barley, and oat may be replanted any time. The minimum interval between application and planting is 7 days for soybean; 14 days for field corn and grain sorghum; and 45 days for other crops.

Harvest & Forage Restrictions for HARMONY EXTRA: Allow at least 45 days between application and harvesting grain. Allow at least 7 days between application and grazing and at least 7 days between application and feeding of forage from treated areas. Allow at least 30 days between application and feeding hay. Harvested straw may be used for bedding and/or feed.

Tank Mixtures for Wheat & Barley: 2,4-D, Express, MCPA, dicamba, bromoxynil. Reduced weed control or increased crop injury may occur with some tank mixes. Consult the label for tank mixtures with liquid nitrogen.

Generic Formulations: AUDIT and NIMBLE, Consult label for recommended rates and other information.

HARMONY SG (with TotalSol)

| | | |
|----------------------------|-------------------|---|
| HARMONY SG 50DF | 0.45 to 0.9 oz/A | thifensulfuron (0.014 to 0.028 lb ai/A) |
| | + | + |
| SURFACTANT (NON-IONIC 80%) | 1 to 2 qt/100 gal | (additive) |

Weeds Controlled: Wild garlic, curly dock, field pennycress, mustards, shepherd's-purse.

Crop Stage: Apply after the 2-leaf stage of wheat, barley, or winter oats but before the flag leaf is visible. Apply to tolerant varieties of spring-seeded oats after the crop is in the 3-leaf stage and before jointing.

General Comments: **Legumes not seeded.** For winter or spring oats do not exceed 0.6 oz/A and do not apply more than one treatment per season. For wild garlic control, apply to actively growing plants that are less than 12 inches tall with 2 to 4 inches of new growth. Injury may occur when crop plants are stressed from adverse environmental conditions.

Environmental Statements: None.

Rain Delay: Several hours of dry weather are needed to absorption.

Rotation Restrictions: Wheat, barley, oat, soybeans, grain sorghum, and field corn may be replanted any time, however, do not plant other crops within 45 days after application.

Harvest & Forage Restrictions for HARMONY SG: Allow at least 7 days between application and grazing and at least 7 days between application and feeding of forage from treated areas. Allow at least 30 days between application and feeding hay. Harvested straw may be used for bedding and/or feed.

Tank Mixtures for Wheat & Barley: 2,4-D, MCPA, dicamba, bromoxynil. Reduced weed control or increased crop injury may occur with some tank mixes. Consult the label for use of adjuvants with tank mixtures and when used with liquid nitrogen.

Generic Formulations: HARASS or THIEF. Consult label for recommended rates and other pertinent information.

METRIBUZIN DF

| | | |
|-----------------|-------------|------------------------------------|
| METRIBUZIN 75DF | 2 to 8 oz/A | (metribuzin 0.094 to 0.38 lb ai/A) |
|-----------------|-------------|------------------------------------|

Weeds Controlled: Common chickweed, henbit, mustards, field pennycress, shepherd's-purse.

Crop Stage: Apply METRIBUZIN DF after crop plants have at least 2 leaves but before jointing. METRIBUZIN DF may be applied to wheat or barley at 2 to 3 oz/A when crop plants have 2 leaves to 2 tillers; or at 4 to 6 oz/A when crop plants have at least 3 to 4 tillers; or at 4 to 8 oz/A when crop plants have more than four tillers. When METRIBUZIN DF rate ≥ 4 oz/A, secondary roots should be developed and greater than 1 inch long; treatments should not be applied before 75 days after planting; and allow at least 2 weeks for crop to recover from winter dormancy before treatment. Crop injury may occur if METRIBUZIN DF is mixed with fertilizer, applied before specified time, seed are planted less than 1 inch deep, or if the crop is stressed by frost or other factors.

General Comments: **Legumes not seeded. Consult label for information on recommended WHEAT or BARLEY VARIETIES.** For optimum control, apply before broadleaf weeds exceed 1 inch in height, or grasses have more than 2 leaves.

Environmental Statements: Metribuzin containing products have a GROUNDWATER ADVISORY statement on the label.

Rain Delay: No information on label.

Rotation Restrictions: Consult label.

Harvest & Forage Restrictions: Do not graze wheat within 14 days or harvest grain within 21 days after last application. Do not graze or harvest barley before crop maturity.

Tank Mixtures for Wheat & Barley: Consult specific metribuzin product label.

Generic Formulations: DIMETRIC, GLORY, METRI DF, METRIBUZIN 75, and TRICOR DF are examples of products containing the active ingredient metribuzin and are similar to SENCOR (a former brand name product.)

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OLYMPUS FLEX

| | |
|--|--|
| OLYMPUS FLEX 11.25 WDG 3 oz/A | (propoxycarbazone : mesosulfuron 0.0127:0.008 lb ai/A) |
| + | + |
| Non-ionic Surfactant (2 qt/100 gal) | Additive |
| + | + |
| 28% UAN (1 to 2 qt/A) or AMS (1.5 to 3 lb/A) | Additive |
| (Consult label for using methylated seed oil or basic blend adjuvants) | |

Weeds Controlled: Annual ryegrass (Italian), cheat, field brome, annual bluegrass, field pennycress, shepherds'-purse.

Crop Stage: Apply only one treatment per season from emergence (fully expanded true leaf) up to the jointing stage of wheat.

General Comments: For wheat only. Apply when grass weeds are at the 1-leaf to 2-tiller stage and before broadleaf weeds exceed 2 inches in diameter. A rate of 3.5 oz/A may be needed for dry conditions, dense weed canopy, or for controlling downy brome. Olympus Flex may not effectively control biotypes of weeds that are resistant to ALS- inhibitor herbicides. Injury may occur when crop plants are stressed from adverse environmental conditions.

Environmental Statements: None.

Rain Delay: Do not apply if rainfall is expected less than 4 hours after treatment.

Rotation Restrictions: The interval between application and planting rotational crops is 5 months for soybean and 9 months for grain sorghum providing cumulative 18" of rain occurs. Conventional corn requires a 12-months interval and a cumulative 24" of rain. A field bioassay is required for other crops or if amount of rainfall is less than recommended. Rotational crops should not be planted on clay or eroded hillsides without conducting a field bioassay.

Harvest & Forage Restrictions: Wheat may be harvested for grain and straw 71 days after application or for forage after 30 days.

Tank Mixtures: Buctril, Harmony Extra, or Harmony. When using other herbicides not listed on the OLYMPUS FLEX label, apply sequentially 7 days prior to or 7 days after OLYMPUS FLEX.

OSPREY

| | |
|--|-------------------------------|
| OSPREY 4.5% WDG 4.75 oz/A | (mesosulfuron 0.0134 lb ai/A) |
| + | + |
| Non-ionic Surfactant (2 qt/100 gal) | Additive |
| + | + |
| 28% UAN (1 to 2 qt/A) or AMS (1.5 to 3 lb/A) | Additive |
| (Consult label for using methylated seed oil or basic blend adjuvants) | |

Weeds Controlled: Annual ryegrass (Italian) and annual bluegrass

Crop Stage: Apply only one treatment per season from emergence up to the jointing stage of wheat

General Comments: For wheat only. Apply when annual ryegrass and annual bluegrass plants have 1-leaf to 2 tillers. Osprey may not effectively control biotypes of ryegrass that are resistant to ALS- inhibitor herbicides. Crop injury may occur when topdressing liquid ammonium nitrogen fertilizer within 14 days of OSPREY application.

Environmental Statements: None.

Rain Delay: Do not apply if rainfall is expected less than 4 hours after treatment.

Rotation Restrictions: The interval between application and planting rotational crops is 7 days for wheat, 30 days for barley, 90 days for soybean, 12 months for corn, and 10 months for other crops.

Harvest & Forage Restrictions: Do not apply within 30 days of harvesting wheat forage and 60 days for hay, grain, and straw.

Tank Mixtures: OSPREY may be tank mixed with Buctril, Harmony Extra, or Harmony. When using other herbicides not listed on the OSPREY label, apply sequentially 5 days prior to or 5 days after OSPREY.

POWERFLEX

| | | |
|--|--------|----------------------------|
| POWERFLEX HL 13% WDG | 2 oz/A | (pyroxsulam 0.016 lb ai/A) |
| | + | + |
| Non-ionic Surfactant (1 to 2 qt/100 gal) | | Additive |
| | + | + |
| 28% UAN (1 to 2 qt/A) or AMS (1.5 to 3 lb/A) | | Additive |
| (Consult label for using crop oil concentrate) | | |

Weeds Controlled: Annual ryegrass (Italian), Carolina geranium, cheat, downy brome, field pennycress, hairy chess, hairy vetch.

Crop Stage: Apply in the fall or spring from 3-leaf to jointing stage of wheat or triticale.

General Comments: For wheat and triticale only. Apply when grassy weeds are 2-leaf to 2-tiller stage and before broadleaf weeds exceed 2 inches tall or 2 inches in diameter. POWERFLEX will not effectively control biotypes of ryegrass that are resistant to ALS-inhibitor herbicides. Crop injury may occur when topdressing liquid ammonium nitrogen fertilizer within 7 days of POWERFLEX application.

Environmental Statements: May contaminate surface water due to runoff from rain water.

Rain Delay: Do not apply if rainfall is expected less than 4 hours after treatment.

Rotation Restrictions: The interval between application and planting rotational crops is 1 month for wheat; 3 months for soybean or grain sorghum when applied in February or later. However, when applied before February, do not plant grain sorghum or soybean before April 30. Allow 9 months for alfalfa, barley, field corn, popcorn, grasses, and 12 months for certain other crops not listed.

Harvest & Forage Restrictions: Do not harvest within 60 days after application. Do not graze treated crop within 7 days or cut for hay within 28 days following application.

Tank Mixtures: Consult label when tank mixing with other herbicides. Do not mix with dicamba or amine formulations of 2,4-D or MCPA as these may limit grass control.

2,4-D or MCPA
(For Wheat Interseeded with Legumes)

| | | |
|-------------------------|----|----------------------|
| 2,4-D (AMINE) 0.5 pt/A* | or | (2,4-D 0.25 lb ai/A) |
| MCPA (AMINE) 1 pt/A** | | (MCPA 0.25 lb ai/A) |

[* 2,4-D rate based on 4 lb/gal formulation]

[** MCPA rate based on 2 lb/gal formulation]

Weeds Controlled: Field pennycress, pepperweed, shepherd's-purse, wild mustard, and other broadleaf weeds.

Crop Stage: In spring just before jointing.

General Comments: Legumes seeded. Use low spray volume to minimize injury to legumes. Small grain and weeds form a canopy to protect legumes from spray. Injury to legumes will likely occur, therefore do not spray unless fields are extremely weedy. Red clover, ladino and lespedeza are injured less than alfalfa, sweet clover, or vetch. MCPA Amine (e.g. MCPA Amine 4 from Tenkoz) may be used if small grains are underseeded with alfalfa, lespedeza, red and white clovers. Do not apply MCPA to small grains underseeded with vetch or sweetclover. Do not apply 2,4-D Amine to small grains underseeded to alfalfa or sweetclover.

Environmental Statements: Drift of 2,4-D spray or vapor can injure nearby susceptible plants.

Rain Delay: No information on label.

Rotation Restrictions: Any crop may be planted after 3 months of above freezing soil temperatures following application of 2,4-D or until 2,4-D has disappeared. Consult label for preplant applications of 2,4-D to corn and soybean. No information on MCPA label/

Harvest & Forage Restrictions: Do not allow dairy animals or meat animals being finished for slaughter to graze or use forage 7 to 14 days after treatment depending on herbicide product. Some labels prohibit feeding treated straw.

Tank Mixtures: None.

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PREHARVEST

GLYPHOSATE

The following are glyphosate formulations for preharvest applications in wheat (consult label for barley). Glyphosate rate may vary depending on specific product.

| Glyphosate Formulation ¹ | Rate/A | Remarks |
|---|------------------------------|--|
| Roundup, etc... (3 lb ae/gal) | 1 qt/A (0.75 lb ae/A) | <p>Dry Ammonium Sulfate at 1 to 2% by weight (8.5 to 17 lb/100 gal) may be included with glyphosate to improve weed control. Recommendations for use of surfactants will vary depending on product. ALWAYS CONSULT THE PRODUCT LABEL FOR SPECIFIC DIRECTIONS. Apply to wheat after the hard-dough stage of grain (30% or less grain moisture) and at least 7 days before harvest or grazing. Do not treat wheat grown for seed due to possible reduction in germination or vigor. Wheat stubble may be grazed immediately after harvest.</p> <p>Weeds Controlled: Annual fleabane, barnyardgrass, brome spp., chickweed, common ragweed, crabgrass, fall panicum, giant foxtail, giant ragweed, johnsongrass (seedling), lambsquarters, maretail, mustards, prickly lettuce, smartweed, and other weed species.</p> |
| Extra Credit 5 (3.75 lb ae/gal) | 0.8 qt/A (0.75 lb ae/A) | |
| Duramax(4 lb ae/gal) | 24 fl oz/A (0.75 lb ae/A) | |
| Touchdown Total (4.17 lb ae/gal) | 24 fl oz/A (0.78 lb ae/A) | |
| Roundup WeatherMAX Roundup PowerMAX (4.5 lb ae/gal) | 22 fl oz/A (0.77 lb ae/A) | |
| Touchdown Hi-Tech (5 lb ae/gal) | 20 fl oz/A (0.78 lb ae/A) | |

¹ For a detailed list of glyphosate products see page 22.

Waiting Period or Limitations Before Utilizing Herbicide Treated Corn for Grazing or Forage Feed¹

| Herbicide | Grazing | Forage (silage, hay, etc.) |
|--|-------------------------------|-------------------------------|
| Accent Q | 30 days | 30 days |
| Acuron | 45 days | 60 days |
| Anthem ATZ | 60 days | 70 day (fodder) |
| Armezon | 45 days | 45 days |
| Atrazine | 60 days | 60 days |
| Balance | 45 days | 45 days |
| Bicep II Magnum | 60 days | 60 days |
| Callisto | 45 days | 45 days |
| Callisto GT | 45 days | 45 days |
| Callisto Xtra | 60 days | 60 days |
| Capreno | 45 days | 45 days |
| Clarity | Past "milk" stage | Past "milk" stage |
| Corvus | 45 days | 45 days |
| 2,4-D | 7 days | 7 days |
| Define | None | None |
| Degree | None | None |
| Degree Xtra | 60 day | 60 day |
| Dicamba (eg, Clarity) | Past "milk" stage | Past "milk" stage |
| DiFlexx | ----- | 45 days |
| Dual II Magnum / Cinch | 30 days | 30 days |
| Expert (Conventional hybrids) (Roundup Ready corn) | 60 days 30 days | 60 days 30 days |
| Fierce | None | None |
| FulTime | 60 days | 60 days |
| Glyphosate [eg.Roundup] (burndown) (in-crop application) (post-harvest) | 8 weeks 50 days 8 weeks | 8 weeks 50 days 8 weeks |
| Gramoxone (in-crop directed) (preharvest) | None 7 days | None 7 days |

| Herbicide | Grazing | Forage (silage, hay, etc.) |
|--------------------|--------------|-------------------------------|
| Guardman Max | 60 days | 60 days |
| Halex GT | 45 days | 45 days |
| Harness | None | None |
| Harness Xtra | 60 days | 60 days |
| Impact | 45 days | 45 days |
| Instigate | 45 days | 45 days |
| Keystone | 60 days | 60 days |
| Laudis | 45 days | 45 days |
| LeadOff | 30 days | 30 days |
| Lexar EZ | 45 days | 60 days |
| Liberty | 60 days | 60 days |
| Lumax EZ | 45 days | 60 days |
| Outlook | 40 days | 40 days |
| Permit | 30 days | 30 days |
| Princep | Do not graze | --- |
| Prowl | None | None |
| Prowl H20 | 21 days | 21 days |
| Realm Q | 45 days | 45 days |
| Resolve Q | 30 days | 30 days |
| Sequence | 30 days | 30 days |
| Sharpen | 80 days | 80 days |
| Simazat | Do not graze | --- |
| Spirit | 30 days | 40 days |
| Status | ---- | 32 days |
| Steadfast Q | 30 days | 30 days |
| Surpass / TopNotch | None | None |
| Verdict | 80 days | 80 days |
| Zemax | 45 days | 45 days |

¹ This table should be used as guide for herbicide treated corn when utilized for grazing or as a forage crop. Time intervals and limitations are based on the herbicide when used alone. When more than one herbicide has been applied, the most restrictive product should be followed. However, some labeled tank mixtures have more restrictive guidelines. Always refer to the herbicide label(s) for specific information.

Waiting Period or Limitations before Utilizing Herbicide Treated Soybeans for Harvested Grain or Forage Feed¹

| Herbicide | Harvested Grain | Forage (silage, hay, etc.) |
|--|--|--|
| Anthem Maxx | 60 days | Do not feed |
| Assure II | 80 days; Do not apply after pod set | Do not feed |
| Authority Elite & BroadAxe HC | --- | 30 days |
| Authority First / Sonic | 65 days | Do not feed |
| Authority MTZ | --- | Do not feed |
| Authority Assist | --- | Do not feed |
| Authority XL | --- | Do not feed |
| Boundary | ---- | 40 days |
| Butyrac 200 | 60 days | 60 days |
| Canopy/Canopy Blend | --- | Do not feed |
| Canopy EX | --- | 14 days |
| Cheetah Max | 70 | Do not feed |
| Classic | 60 days before maturity | Do not feed |
| Cobra / Phoenix | 45 days (Do not apply later than R6 stage or full seed) | Do not feed |
| Command | --- | Do not feed |
| 2,4-D | --- | Do not feed |
| Dual II Magnum & Cinch | 90 days for post | None for soil applied Do not for post applied |
| Extreme | 85 days (Apply before bloom) | Do not feed |
| Envive | --- | Do not feed |
| Express TotalSol | --- | Do not feed |
| Fierce / Fierce XLT | --- | Do not feed |
| FirstRate ≤ 0.3 oz/A > 0.3 oz/A | 65 days 70 days | 14 days 25 days |
| Flexstar / Flexstar GT | 45 days | Do not feed |
| Fusion | Apply before bloom | Do not feed |
| Fusilade DX | 60 days | 60 days |
| Glyphosate | Consult product label | Consult product label |
| Gramoxone Inteon or Firestorm or Parazone (At planting) (Post Directed) (Harvest Aid) | — — 15 days | Early pod stage Do not feed Do not feed |

| Herbicide | Harvested Grain | Forage (silage, hay, etc.) |
|---|---------------------------------|--|
| HarmonyExtra/FirstShot | --- | Do not feed |
| Harmony SG | 60 days | Do not feed |
| Intimidator | 90 days | Do not feed |
| LeadOff | 30 days | 30 days |
| Liberty | 70 days | Do not feed |
| Metribuzin (Soil-Applied) (Post-Directed) | — 70 days | 40 days* 70 days (dry vines) Do not feed (green vines) |
| Outlook | --- | Do not feed |
| Poast or Poast Plus | 75 days | Soybean hay may be fed (Do not graze or feed silage) |
| Prowl | 85 days | None* |
| Prefix Pre Post | — 90 days | Do not feed Do not feed |
| Pursuit | 85 days (Apply before bloom) | Do not feed |
| Python / Accolade | 85 days | Do not feed |
| Raptor | (Apply before bloom) | None* |
| Resource | 60 days | Do not feed |
| Scepter | 90 days | Do not feed |
| Select MAX, Select, & similar products. | 60 days | Do not feed |
| Sequence (Preplant or Pre) (Post) | --- 90 days | 30 days Do not feed |
| Sharpen | --- | 65 days |
| Surveil | --- | Do not feed |
| Synchrony XP | 60 days before maturity | Do not feed |
| Trivence | --- | Do not feed |
| Ultra Blazer | 50 days | Do not feed |
| Valor SX | ---- | Do not feed |
| Valor XLT | ---- | Do not feed |
| Verdict | ---- | Do not feed |
| Warrant Ultra | 45 days | Do not feed after post |
| Zidua | --- | --- |

*Use as a forage crop may be prohibited when applied in a tank mixture or sequential treatment with other herbicides. ---- No restrictions indicated on herbicide label

¹ This table should be used as guide for herbicide treated soybean when harvested for grain or as a forage crop. Time intervals and limitations are based on the herbicide when used alone.

When more than one herbicide has been applied, the most restrictive product should be followed. However, some labeled tank mixtures have more restrictive guidelines. Always refer to the herbicide label(s) for specific information.

Crop Replanting and Rotation Guide ^{*}

| Herbicide | Minimum Waiting Period (months) For Replant or Rotation Crops ¹ | | | | | | | Remarks |
|--|---|---------------|---------|----------------|---------|----------------|---------|---|
| | Corn (field) | Grain Sorghum | Soybean | Wheat & Barley | Alfalfa | Forage Grasses | Tobacco | |
| Accent Q or Nic-It | 0* | 10** | 0.5 | 4 | 10 | 10*** | 10*** | *Popcorn or sweet corn may be planted 10 months following application. Consult label for sweet corn varieties. **Delay planting sorghum a minimum of 18 months if soil pH >7.5. ***Delay planting forage grasses or tobacco a minimum of 18 months if soil pH >6.5. |
| Acuron | 0 | 10 | 10* | 4 | 18 | 18 | 18 | *If applied after June 1, rotating to crops other than corn may result in crop injury |
| Anthem Maxx | 0 | 11 | 0 | 4* | 10 | 18 | 18 | *Allow 11 months for barley |
| Anthem ATZ | 0 | 18 | S* | 2F** | 18** | 18** | 18** | *Some conditions may prohibit planting soybean until after 18 months (consult label) **Consult label for seeding small grains, small seeded legumes, forage grasses, and tobacco. |
| Anthem Flex | 0 | 18 | 0 | 0* | 10 | 18 | 18 | Consult label for rates exceeding 3.64 oz/A *Allow 11 months for barley. |
| Armezon | 0 | 9 | 9 | 3 | 9 | 18 | 18 | Wait 18 months for crops not listed on the label. |
| Assure II | 4 | 4 | 0 | 4 | 4 | 4 | 4 | Do not rotate to crops other than soybeans within 4 months (120 days) after application. |
| Atrazine | 0 | 0 | S | 2F | 2F | 2F | 2S | If applied after June 10, plant only corn or sorghum the following year, or crop injury may occur. |
| Authority Elite or BroadAxe XC | 10* | 10 | 0 | 4.5 | 12 | 12 | 10 | For other crops allow 12 months and conduct a representative bioassay. *Allow 18 months for popcorn |
| Authority First or Sonic | 10* | 12 | 0 | 4** | 12 | 30*** | 30*** | * Field corn and popcorn require 18 months if soil organic matter ≤1.5% and soil pH ≥ 7.0. ** Barley requires a 12 month rotation interval. ***Forage grasses and tobacco require a successful field bioassay. |
| Authority MTZ | 10* | 18* | 0 | 4 | 12 | 18 | 12 | * For field corn, use a 4-month interval if rate ≤ 14 oz/A. **For sorghum, use a 12 month interval if rate < 20 oz/A. |
| Authority XL or Authority MAXX pH< 6.8 pH>6.8 [full use rates] | 10* | 18** | 0 | 4 | 12 | 36 | 10 | Crops with intervals >12 months are a result of crop injury concerns. These crops should not be planted without a successful bioassay. * Corn includes grain, silage, popcorn. ** Plant sorghum after 10 months when rate <6.4 oz/A. |
| Axial XL | 4 | 4 | 4 | 0 | 4 | 4 | 4 | There is no waiting interval between application and planting wheat or barley. Allow 30 days for leafy and root crops and 120 days for all other crops. |
| Axiom | 0 | 12 | 0 | 0* | 12 | 12 | 12 | *Allow 12 months for barley. Allow 4 months for wheat if Axiom rate exceeds 10 oz/A. |
| Balance | 0 | 6 | 6 | 4* | 10** | 18** | 18** | *Allow 6-month rotation to barley. **With 15 inches of cumulative precipitation from application to planting of rotational crop. |
| Bicep II Magnum | 0 | 0* | S | 2F | 2S | 2F | 2S | If applied after June 10, plant only corn or sorghum the following season. *Use CONCEP or SCREEN treated sorghum seed. |
| Blazer (Ultra) | - | - | 0 | - | - | - | - | In case of crop failure only soybeans may be immediately replanted. No rotational crop restrictions except for an 18 month interval for root crops. |
| Boundary | 8 | 12 | 0 | 4½ | 4½ | 12 | 12 | Cover crops may be planted any time, but do not graze or harvest. |

Crop Replanting and Rotation Guide ^{*}

| Herbicide | Minimum Waiting Period (months) For Replant or Rotation Crops ¹ | | | | | | | Remarks |
|---|---|---------------|---------|----------------|---------|----------------|---------|--|
| | Corn (field) | Grain Sorghum | Soybean | Wheat & Barley | Alfalfa | Forage Grasses | Tobacco | |
| Buctril | 1 | 1 | 1 | 1 | 1 | 1 | 1 | Do not plant rotational crops within 30 days after application. |
| Butyrac 200 | - | - | 0 | - | - | - | - | No restrictions indicated on herbicide label. |
| Callisto | 0 | 0 | 10 | 4* | 10 | 18 | 10 | *Small grains may be planted 120 days after application. |
| Callisto GT | 0 | 0 | 10 | 4 | 10 | 18 | 10 | Other crops not listed may require an 18 month interval |
| Callisto Xtra | 0 | 0 | S | S | S | 18 | S | Other crops not listed may require an 18 month interval |
| Canopy or Cloak (pH ≤ 7.0 & rate < 10 oz/A) | 10* | 10 | 0 | 4 | 10 | 18 | 10 | Soybean injury may occur where soils pH is >7.5. * Allow a 9-month rotational interval for field corn if soil pH is ≤ 7.0 and Canopy rate does not exceed 6 oz/A. |
| (pH > 7.0 & rate > 3.5 oz/A) | 18 | 18 | 0 | 4 | 18 | 30 | 18 | Cloak is a similar product with the same restrictions. |
| Canopy Blend ** | | | | | | | | ** Consult label for rotational intervals for Canopy Blend |
| Canopy EX or Cloak EX | | | | | | | | If sequential application of chlorimuron is made after August 1, extend interval 2 months for alfalfa, clover, corn, popcorn, sorghum, and tobacco. If fall applied, do not begin counting months until normal soybean planting time. |
| Rate 1.1 - 1.65 oz/A | 8 | 9 | 7d | 3 | 9 | 3 | 9 | * Field corn may be planted after 9 months if total chlorimuron rate does not exceed 0.64 oz/A. |
| Rate >1.65 oz/A | 10* | 10 | 14d** | 4 | 10 | 4 | 10 | **Allow 7 days for rates at 1.1 to 2.2 oz/A; or 14 days for rates >2.2 up to 3.3 oz/A. |
| Capreno | 0* | 10** | 10 | 4*** | 18** | 18^ | 18^ | *Yellow dent field corn can be replanted immediately. White corn, sweet corn, and popcorn require a 10 month interval. ** Rotation interval may be longer if precipitation from application to planting is limited and/or soil pH is 7.5 or above (consult label). **Barley requires a 10 month interval. ^Requires completion of a successful field bioassay |
| Cheetah Max | 10 * | 18 | 0 | 4 | 18 | 18 | 18 | * Allow 12 months for popcorn for 32 oz/A rate. |
| Classic | 8* | 9 | 0 | 3 | 9 | 3** | 9 | Consult labels for maximum rate of Classic per season or when imazaquin (Scepter, etc), imazethapyr (Pursuit, etc), or other chlorimuron containing products (Canopy, etc) are applied the same year. If applied after August 1, extend recrop interval 2 months for alfalfa, clover, corn, popcorn, sorghum, and tobacco. *Use a 9-month rotational interval for popcorn. ** A 3 month rotational interval may be used for pasture grasses such as fescue and ryegrass. |
| Cobra | - | - | - | - | - | - | - | No restrictions indicated on herbicide label. |
| Command 3ME | 9 | 9 | 0 | 12* | 16 | 16 | 0 | Injury to rotational crops may occur where soil pH is 5.9 or lower or when conditions are extremely dry 4 months following application. * Rotation interval for barley is 16 months. Cover crops may be planted at any time but stand reduction may occur. Do not harvest cover crops for feed or food if planted within 9 months after application. |
| Corvus | 0 | 17 | 9 | 4* | 17** | 17** | 17** | *Allow 9-month rotation to barley. **With 30 inches of cumulative precipitation from application to planting of rotational crop. Rotational interval may be longer for some crops if soil pH is 7.5 or above. |

Crop Replanting and Rotation Guide ^{*}

| Herbicide | Minimum Waiting Period (months) For Replant or Rotation Crops ¹ | | | | | | | Remarks |
|------------------------------------|---|---------------|---------|----------------|---------|----------------|---------|--|
| | Corn (field) | Grain Sorghum | Soybean | Wheat & Barley | Alfalfa | Forage Grasses | Tobacco | |
| 2,4-D | 7d* | -.** | 1*** | -.** | -.** | -.** | -.** | Do not replant fields treated with 2,4-D in the same season with crops other than those labeled for 2,4-D pre-plant uses. *Wait 7 to 14 days before planting corn. **Not labeled as a pre-plant use in these crops. Wait a minimum of 3 months or until chemical has disappeared from soil. ***Depending on amount used (if <1 lb ai/A), wait a minimum of 7 to 30 days before planting soybeans. Some 2,4-D products require less than 30 days when using a higher rate. |
| Degree | 0 | S | S | 4* | 9 | 2F | S | *Wheat can be planted 4 months after application. Barley, oats, and rye may be planted the following spring. |
| Degree Xtra | 0 | 0* | S | F** | 2S | 2S | S | Do not rotate to crops other than soybeans, corn, sorghum, or tobacco. *Use sorghum seed treated with a safener. **Wheat can be planted; do not plant other small grain crops. |
| Dicamba products | | | | | | | | |
| Banvel Diablo Oracle | 0 | S* | S* | F** | F | F | S | When applying Banvel, Diablo, or Oracle any rotational crop may be planted after normal harvest of treated crop. When applying Clarity, Sterling, or Vision at <24oz/A, any rotational crop may be planted after 120 days. Consult label if herbicide rate exceeds 24 oz/A |
| Clarity Sterling Blue Vision | 0 | 4* | 4* | 4** | 4 | 4** | 4 | *.Consult label for preplant applications rates and timing for sorghum and soybean. ** Apply before, during or after planting small grains when herbicide rate is ≤4 oz/A. However, allow 20 days per pt/A of Banvel, Diablo, or Oracle (1.25 days/1 oz/A) for wheat. When applying Clarity, Sterling, or Vision at ≤24oz/A for wheat, barley & other grasses allow 15 days/8 oz/A. |
| DiFlexx | 0 | 4 | 4 | 4*** | 4 | 4*** | 4 | *** Consult DiFlexx label for a reduced waiting period when planting wheat, barley, oats, and forage grass seedlings. |
| Dual II Magnum or Cinch | 0 | 0* | 0 | 4.5 | 4** | 12 | S | *Use Concep treated sorghum seed. **Clover may be seeded 9 months following application. Observe maximum restrictions before rotating to alfalfa or clover. |
| Envive (pH < 7.0) | 10 | 10 | 0 | 4 | 12 | 18 | 10 | Do not exceed 4 oz/A where composite soil pH exceeds 7.0. |
| (pH ≥ 7.0) | 18 | 18 | 0 | 4 | 18 | 30 | 18 | |
| Expert | 0 | 0* | S | 2F | 2S | 2F | 2S | If applied after June 10, plant only corn or sorghum the following season. *Use CONCEP or SCREEN treated sorghum seed. |
| Express TotalSol | 14d | 14d | 14d | 0 | 45d | 45d | 45d | Wheat, barley, or oats may be planted any time after application. Field corn, grain sorghum, or soybean may be planted 14 days after application. Other crops may be planted 45 days after application, except canola requires a 60 day waiting period. |
| Extreme | 8.5* | 18 | 0 | 3** | 4 | 40*** | 9.5 | Applying herbicides containing chlorimuron (Classic, Canopy, etc.), flumetsulam (Python, etc.) or imazaquin (Scepter, etc.) the same year may result in injury to rotational crops. * Allow an 18-month rotational interval for popcorn. **Allow a 4- month rotational interval for barley. *** Before rotation to forage grasses, a successful field bioassay must be completed after the restrictive interval. |

Crop Replanting and Rotation Guide ^{*}

| Herbicide | Minimum Waiting Period (months) For Replant or Rotation Crops ¹ | | | | | | | Remarks |
|---|---|---------------|---------|----------------|---------|----------------|---------|--|
| | Corn (field) | Grain Sorghum | Soybean | Wheat & Barley | Alfalfa | Forage Grasses | Tobacco | |
| Fierce | 30d* | 18 | 0 | 1** | 10 | 18 | 18 | Consult label when rate exceeds 3 oz/A *Allow 30 days for conventional till corn or 7 days for minimum and no-till corn following 3 oz/A rate. **Allow 11 months for other crops including barley. |
| Fierce XLT (Soil pH <7.0) | 10* | 18 | 0 | 10** | 18 | 18 | 18 | *Includes corn for grain, silage, popcorn. Consult label for seed corn, and sweet corn. |
| (Soil pH ≥ 7.0) | 18 | 18 | 0 | 18 | 18 | 30 | 18 | ** Allow 18 months for barley |
| Finesse or Report Extra | 18 | 18 | 6* | ---** | ---** | ---** | ---** | *Allow 6 months for STS soybean and 18 months for non –STS soybean. **No information on label for these crops |
| Finesse Grass & Broadleaf | 14* | ---** | 6*** | ---** | ---** | ---** | ---** | *Allow a 14-month interval for field corn and soil pH ≤ 7.5 ** A field bioassay must be conducted for popcorn, sorghum, barley, forages grasses & legumes, tobacco, and other crops. ***Allow a 6-month interval for STS soybean, Non-STS soybeans require a field bioassay. |
| FirstRate | 9 | 9 | 0 | 4* | 9 | 18 | 18** | *Allow 12 months for barley. **For transplanted tobacco allow 18 months if herbicide rate is >0.3 oz/A and 10 months if herbicide rate is 0.3 oz/A. |
| FirstShot | 14d | 14d | 7d | 0 | 45d | 45d | 45d | Extend interval 7 days when applied to light textured soils. |
| Flexstar and Flexstar GT | 10* | 18 | 0 | 4** | 18 | 18 | 18 | Do not exceed a maximum of 0.375 lb ai/A fomesafen in alternate years. *Use a 12-month rotation interval for popcorn. **Small grain crops should not be grazed/harvested for forage or straw when using Flexstar. |
| FulTime NXT | 0 | S | S | 15 | 15 | 2F | 15* | Do not apply FulTime after June 10, unless only corn will be planted the following year. *Injury may occur to tobacco because of atrazine carryover. |
| Fusilade DX | 2 | 2 | - | 2 | - | 2 | - | Do not rotate to grass crops within 2 months (60 days) after application. No restrictions indicated for other crops. |
| Fusion | 2 | 2 | - | 2 | - | 2 | - | Do not rotate to grass crops within 2 months (60 days) after application. No restrictions indicated for other crops. |
| Glyphosate, Roundup, and other products | 0 | 0 | 0 | 0 | 0 | 0 | 1 | Wait 30 days (1 month) prior to planting crops not listed on the label. |
| Gramoxone SL | 0 | 0 | 0 | 0 | 0 | 0 | - * | * Gramoxone is approved for applications made prior to transplanting tobacco. Consult supplemental label. |
| Guardsman Max Halex GT | 0 | 0* | S | 2F | 2S | 2S | 2S | *Use herbicide safener treated sorghum seed. |
| Harness | 0 | 0* | 10 | 4 | 10 | 18 | 10 | *Use herbicide safener-treated sorghum seed. |
| Harness Xtra | 0 | S | S* | 2F | 2S* | 2S* | 2S* | *Wheat can be planted following normal crop harvest. Label prohibits follow crop planting to barley, alfalfa, forage grasses and other crops. *If soybeans or other nonlabeled crops are to be planted the following year, there is a possibility of crop injury due to atrazine carryover. |
| Harmony Extra SG with TotalSol | 14d | 14d | 7d | 0 | 45d | 45d | 45d | Nimble is a similar product but requires 45 days for corn, sorghum, soybean and most other crops. |
| Harmony SG | 0 | 0 | 0 | 0 | 45d | 45d | 45d | Most other crops not listed may be planted 45 days after application. Harass is a similar product with same restrictions. |

Crop Replanting and Rotation Guide ^{*}

| Herbicide | Minimum Waiting Period (months) For Replant or Rotation Crops ¹ | | | | | | | Remarks |
|--|---|---------------|---------|----------------|---------|----------------|---------|--|
| | Corn (field) | Grain Sorghum | Soybean | Wheat & Barley | Alfalfa | Forage Grasses | Tobacco | |
| Impact | 0 | 9 | 9 | 3 | 9 | 18 | 18 | Wait 18 months for crops not listed on the label. |
| Instigate | 0* | 10 | 10 | 9 | 10 | 18 | 18 | Wait minimum of 18 months for rotational crops not listed on label. *Wait a minimum of 10 months for popcorn and sweet corn. |
| Intimidator | 10* | 18 | 0 | 4.5** | 18 | 18 | 18 | Do not exceed 0.375 lb ai/A fomesafen in alternate years. *Use a 12-month rotation interval for popcorn. **Small grain crops should not be grazed/harvested for forage or straw. |
| Keystone NXT | 0 | S | S | 15 | 15 | 2F | 15* | Do not apply Keystone after June 10, unless only corn will be planted the following year. *Injury may occur to tobacco because of atrazine carryover. |
| Laudis | 0 | 10 | 8 | 4 | 10 | 18* | 18* | Consult label for other crops and completion of a successful field bioassay. |
| LeadOff | 0 | 10* | 1** | 3** | 10** | 18 | 1.5** | *Rotation period for soybean without BOLT technology applied at 1.5 oz/A maximum use rate; may be longer for higher use rates. Allow 0 days or more prior to planting soybean with BOLT technology. **Rotation period when 1.5 oz/A maximum use rate is applied; waiting period will be longer when maximum use rate is 2.7 oz/A. |
| Lexar EZ | 0 | S | S | S | 18 | 18 | 18 | If applied after June 1, do not rotate to crops other than corn or sorghum the next season. |
| Liberty 280 SL | 0 | 6 | 0 | 70d* | 6 | 6 | 6 | *Allow a 70-day interval for wheat, barley, rye or oats. Allow 180 days (6 months) for other crops. |
| Lumax EZ | 0 | S | S | 4.5 | 18 | 18 | 18 | If applied after June 1, do not rotate to crops other than corn the next season. |
| MCPA | - | - | - | - | - | - | - | No information on the label. |
| Metribuzin DF Metri DF Dimettric DF Sencor DF TriCor | 4* | 18** | 4* | 4*** | 4 | 4 | 18** | Cover crops may be planted any time but stand reductions may occur. Do not graze or harvest cover crops for feed or food. *Metribuzin containing products are registered for preplant and preemergence applications to field corn and soybeans. **Some metribuzin products may allow a 12-month interval for grain sorghum, tobacco and certain other crops. ***Allow a 4-month interval for rotating to wheat or barley when metribuzin is applied to soybean; wait a minimum of 8 months if applied to other crops. |
| Milo-Pro | 12 | 0* | 18 | 4 | 18 | 18 | 18 | *If replanting is necessary, an additional application is prohibited. |
| Olympus Flex | 12* | 9* | 5* | 0** | 24* | ** | ** | Rotational crops should not be planted on clay or eroded hillsides without conducting a field bioassay. *The cumulative rainfall requirement is 24" for conventional corn & alfalfa and 18" for grain sorghum & soybean. **A field bioassay is required for barley, tobacco, forage grasses, and most other crops. Consult label. |
| Osprey | 12 | 10 | 3 | 7 d* | 10 | 10 | 10 | *The rotation interval is 7 days for wheat and 30 days for barley. |
| Outlook | 0 | 0* | 0 | 4 | S | S | S | *Use herbicide safener treated sorghum seed. |
| Permit | 1* | 2 | 9 | 2 | 9 | 2 | 2S | *IR/IMR field corn varieties can be planted anytime. |
| Phoenix | - | - | - | - | - | - | - | No restrictions indicated on herbicide label. |

Crop Replanting and Rotation Guide ^{*}

| Herbicide | Minimum Waiting Period (months) For Replant or Rotation Crops ¹ | | | | | | | Remarks |
|-------------------------------------|---|---------------|---------|----------------|---------|----------------|---------|--|
| | Corn (field) | Grain Sorghum | Soybean | Wheat & Barley | Alfalfa | Forage Grasses | Tobacco | |
| Poast Plus or Poast | 30d | 30d | 0 | 30d | 0 | 30d | 0* | Do not plant other crops to be harvested for 30 days after application unless POAST or POAST PLUS is registered for use in that crop. *Allow 30 days for tobacco for POAST PLUS. |
| PowerFlex | 9 | 3* | 3* | 1** | 9 | 9 | 12 | When soil moisture is abnormally dry, conduct a field bioassay. * When PowerFlex is applied before February, do not plant grain sorghum or soybean before April 30 * Use 9 - month interval for barley and oats. |
| Prefix | 10* | 18 | 0 | 4,5** | 18 | 18 | 18 | * Use a 12 -month interval for popcorn when rate \geq 2 pt/A. ** Small grain crops should not be grazed or harvested for forage or straw for livestock. |
| Princep | 0 | S | S | 2F | 2F | 2F | 2S | If rate exceeds 3 lb ai/A, a crop of corn untreated with Princep should precede the next rotational crop. |
| Prowl 3.3 EC or Prowl H2O | S | 10 | 0 | 4* | S | 10 | 0 | Certain rotational crops require an 18-months interval if rainfall was insufficient to produce a crop. Observe label when pendimethalin rate exceeds 2 lb ai/A. * Allow a 12-month interval for wheat if \leq 12" of rain or irrigation occurs between application and planting. Do not replant back to wheat if initial wheat stand was treated with Prowl H2O. |
| Pursuit | 8.5* | 18 | 0 | 3** | 4 | 40*** | 9.5 | Observe label when applying other herbicides that persist in soil (e.g. chlorimuron, imazaquin, imazethapyr, flumetsulan). Only rotational crops harvested at maturity may be used for feed or food. * Field corn hybrids which possess genetic resistance/tolerance to Pursuit (CLEARFIELD corn) can be planted anytime. Allow an 18-month rotational interval for popcorn. **Allow a 4 month rotational interval for barley. *** Before rotation to forage grasses, a successful field bioassay must be completed after the restrictive interval. |
| Python or Accolade | 0* | 12 | 0 | 4 | 4 | 9 | 9 | A successful field bioassay must be completed for other rotational crops after the 26 mo. restrictive interval. *Use a 9 month interval for popcorn. |
| Raptor | 8.5* | 9 | 0 | 3** | 3 | 18 | 9 | *Allow 8.5 months for both Clearfield and susceptible corn (field & popcorn). **Clearfield wheat may be planted anytime. Use a 3-month interval for non-Clearfield wheat; a 4-month interval for barley and rye; and a 9-month interval for oat. Applying herbicides containing chlorimuron (CLASSIC, etc.), imazaquin (SCEPTER, etc.), imazethapyr (PURSUIT, etc.), or flumetsulam (PYTHON, etc.) the same year as RAPTOR may result in injury to rotational crops. |
| Realm Q | 0 | 10 | 10 | 4* | 10 | 18 | 10 | *Allow a 9 month interval for barley. |
| Resolve Q | 0 | 10 | 1 | 3* | 10** | 18 | 10 | Rotational crop guidelines based on a maximum use rate of 1.25 oz/A per season. Consult label for 2.5 oz/A maximum rate/season. *Barley requires a longer waiting period (consult label). **Extend rotational interval for alfalfa and clover to 18 months if drought conditions prevail. |
| Resource | 0 | 1 | 0 | 1 | 1 | 1 | 1 | Do not rotate to crops other than soybeans or field corn within 30 days after application. |
| Roundup & other Glyphosate products | 0 | 0 | 0 | 0 | 0 | 0 | 1 | Wait 30 days (1 month) prior to planting crops not listed on the label. |

Crop Replanting and Rotation Guide ^{*}

| Herbicide | Minimum Waiting Period (months) For Replant or Rotation Crops ¹ | | | | | | | Remarks |
|---|---|---------------|---------|----------------|---------|----------------|---------|--|
| | Corn (field) | Grain Sorghum | Soybean | Wheat & Barley | Alfalfa | Forage Grasses | Tobacco | |
| Scepter | 9.5* | 11 | 0 | 3** | 18 | 18 | 9.5 | Observe label when applying other herbicides that persist in soil (e.g. chlorimuron, imazaquin, imazethapyr, flumetsulan). Also note restrictions when soil conditions are dry from 2 weeks prior to last application through November 15. ** Rotational interval for barley is 11 months. Wheat or barley as rotational crops must be harvested at maturity in order to be used for feed or food. |
| Select MAX, Select & other clethodim products | 1 | 1 | 0 | 1 | 0 | 1 | 1 | Allow a minimum of 30 days after application before planting crops that are not registered for clethodim use. |
| Sequence | 0 | 0* | 0 | 4 ½ | 4 | - | S | |
| Sharpen | 0 | 0 | 2* | 0 | 6** | 6** | 6** | Rotational intervals vary depending on such factors as saflufencil rate, soil texture, and with other PPO inhibitors. *Applied at 1.0 oz/A rotation interval for soybean is 0 months. **When applied at 1.0 oz/A rotation interval reduced to 4 months for alfalfa, forage grasses, tobacco, and certain other crops. |
| Simazat | 0 | S | S | 2F | 2F | 2F | 2S | Plant only corn or sorghum the following year if applied after June 10 or if rate exceeds 4 pt/A, a crop of corn. Do not plant tobacco or spring-seeded legumes, grasses, or small grains the year following application of this product or injury may occur. |
| Spirit | 1* | 10 | 10** | 3 | 18 | 10 | 10 | Rotational interval may be more restrictive for some crops if severe drought conditions develop or soil pH is 7.8 or greater (consult label). *Field corn designated to be genetic resistant/tolerant (IR or IMR-corn hybrids) can be planted anytime. ** If rotating to soybeans, do not apply SPIRIT to corn after June 30. STS-soybean varieties should be considered if soil degradation processes has been slowed down by adverse environmental conditions. |
| Status | 7d* | 4** | 4** | 4** | 4** | 4 | 4 | Do not plant any crops within 120 days after last application with the following exceptions: *If crop failure, corn can be replanted 7 or more days after application. **May be planted 30 days after rainfall if at least 1 inch of rainfall occurs and less than or equal to 5 oz/A of STATUS was applied. |
| Steadfast Q | 0 | 10* | 15d** | 4 | 10 | 10* | 10* | *Wait 18 months if soil pH>6.5; sorghum 18 months if pH>7.5. **Waiting period for soybeans is 0.5 month (15 days) after application. |
| SureStart | 0 | 12 | S | 4* | S** | 2F | 18 | *Barley, oats, and rye can be planted the following spring. **Wait 18 months after treatment if less than 15 inches of rainfall occurs on soils with <2% organic matter. |
| Surpass | 0 | S | S | 4* | S | 2F | S | *Wheat may be planted after 4 months. Barley, oats, and rye can be planted the spring following application. |
| Surveil | 9 | 9 | 0 | 3* | 10* | 30* | 30* | *Allow 30 months and conduct a successful field bioassay for barley, forage grasses. Tobacco requires 30-month interval and a successful field bioassay; consult label on requirements for a 10-month interval for tobacco. |

Crop Replanting and Rotation Guide ^{*}

| Herbicide | Minimum Waiting Period (months) For Replant or Rotation Crops ¹ | | | | | | | Remarks |
|-----------------------------|---|---------------|---------|----------------|-------------|----------------|-------------|--|
| | Corn (field) | Grain Sorghum | Soybean | Wheat & Barley | Alfalfa | Forage Grasses | Tobacco | |
| Synchrony XP 0.375 oz/A | 9* | 9 | 0 | 3 | 9 | 3** | 9 | For applications of Synchrony alone or followed by Classic after August 1, extend recrop interval 2 months for alfalfa, clover, field corn, popcorn, sorghum or tobacco. Follow the most restrictive label before applying Synchrony with other long-residual herbicides the same season. *For popcorn allow a 9-month interval for 0.375 oz/A or a 15-month interval for 0.75 oz/A. ** Fescue or ryegrass may be seeded following a 3-month interval. |
| 0.75 oz/A (soil pH <7.0) | 9* | 15 | 0 | 3 | 9 | 3** | 15 | |
| TopNotch | 0 | S | S | 4* | S | 2F | S | *Wheat can be planted after 4 months. Barley, oats, and rye can be planted the spring following application. |
| Touchdown | 0 | 0 | 0 | 0 | 0 | 0 | - | |
| Trivence | 9* | 18 | 0 | 4 | 10 | 12 | 18 | * Field corn includes grain, silage, popcorn and seed corn. |
| Ultra Blazer | 100d ays | 100 days | 0 | 40 days | 100 days | 100 days | 100 days | In case of crop failure only soybeans may be immediately replanted. Allow a minimum rotational interval of 40 days for small grains and 100 days for other crops. |
| Valor SX ≤ 2oz/A ** | 30d | 30d | 0 | 7d* | 4** | 4** | 30d | At least 1 inch of rain and 30 days between application and planting is required for field corn (conventional till), sorghum, wheat (conventional till) and tobacco. Allow 7 days for no-till corn providing 25% residue cover and 0.25 inch rain following Valor application at 2 oz/A. *Allow 7 days for no-till wheat and 30 days for barley. ** For alfalfa and other crops not listed allow 4 months if soil is tilled prior to planting and 8 months if no-tilled. ** Consult Valor label for rates up to 3 oz/A. |
| Valor XLT Soil pH < 7.0 | 10 | 10 | 0 | 4 | 12 | 18 | 10 | Do not use on soils with a pH >7.6. |
| Soil pH ≥ 7.0 | 18 | 18 | 0 | 4 | 18 | 30 | 18 | |
| Verdict | 0 | 0 | 0* | 4 | S | S | S | No rotation crop restrictions the spring following the previous year's application. *When planting soybeans observe the label for additional restrictions concerning rate or soil type. |
| Warrant Ultra | 10* | 18 | 0 | 4 | 18 | - | - | Do not exceed a maximum of 0.34 lb ai/A fomesafen in alternate years. *Use a 12-month rotation interval for popcorn. Winter cover crops may not be harvested or grazed for food or animal feed for 18 months. |
| Yukon | 1 | 2 | 9 | 2 | 9 | 2 | - | |
| Zemax | 0 | 0 | S | 4.5 | 18 | 18 | 18 | For all other crops wait 18 months. |
| Zidua | 0 | 10* | 0 | 4** | 10 | 18 | 18 | * Allow 6 months when applied at 1 to 2 oz/A; wait 10 months when applied at 3 oz/A. **Wheat may be planted immediately after 1 oz/A. Allow 1 month for 2 oz/A and 4 months for 3 oz/A. For barley and other small grains allow 11 months. |

¹Numerical values represent time interval (months after application) before replanting or rotating to other crops. Waiting periods designated with a F=the first fall after application; S=the next spring after application; 2F=second fall after application; 2S=second spring after application. A “ - ” indicates no information on label; following normal crop harvest it is unlikely that carryover of herbicide residues to rotational crops would result under normal conditions.

* This table provides information for major agronomic crops in Kentucky and does not include horticultural crops. When more than one herbicide is applied the most restrictive product should be followed. Rotational guidelines may become more restrictive when certain tank mixtures or sequential applications are used. Always consult herbicide label(s) before planting or rotating other crops into treated fields.

NOTES

PESTICIDE RECORD KEEPING*

Farm Name or Unit: _____ Year: _____

| Date and Time of Application | Crop & Location or Description of Site Treated | Size or Acres Treated | Product Name & EPA Registration No. | Total Amount of Product Applied | Restricted-Entry Interval (REI) | Applicator Name & Certification Number |
|------------------------------|--|-----------------------|-------------------------------------|---------------------------------|---------------------------------|--|
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*Record keeping is required for all pesticides. See the introduction section in this guide for a listing of Restricted Use Pesticide products.

PESTICIDE RECORD KEEPING*

Farm Name or Unit: _____ Year: _____

| Date and Time of Application | Crop & Location or Description of Site Treated | Size or Acres Treated | Product Name & EPA Registration No. | Total Amount of Product Applied | Restricted-Entry Interval (REI) | Applicator Name & Certification Number |
|------------------------------|--|-----------------------|-------------------------------------|---------------------------------|---------------------------------|--|
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***Record keeping is required for all pesticides. See the introduction section in this guide for a listing of Restricted Use Pesticide products.**

Pesticide Emergency Telephone Numbers

| Kentucky Department of Agriculture | |
|---|--|
| Division of Environmental Services Frankfort, KY (502) 573-0282 Toll Free 1-866-289-0001 | Pesticide Collection & Disposal Program (800) 205-6543 |

National Pesticide Information Center

(800) 858-7378

<http://npic.orst.edu>

PESTICIDE SPILLS:

Call 911

Be prepared to provide specific information on location, injuries, amount, and type of any materials spilled.

Call (800) 928-2380 or (502) 564-2380

KY Environmental Response Team

Be prepared to provide specific information on location, amount, and type of any materials spilled. You may be instructed to other agencies.

EXPOSURE:

If a person has been exposed to a particular pesticide, be prepared to provide medical professionals with specific details and emergency information found on the product label.

Kentucky Regional Poison Control Center

State (800) 222-1222

Metro Louisville (502) 589-8222