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2014 Weed Control Recommendations for Kentucky Grain Crops

Jonathan D. Green
University of Kentucky, jdgreen@uky.edu

James R. Martin
University of Kentucky, james.martin@uky.edu

COOPERATIVE EXTENSION SERVICE
UNIVERSITY OF KENTUCKY COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENT, LEXINGTON, KY, 40546

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UNIVERSITY OF KENTUCKY
College of Agriculture, Food and Environment

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J.D. Green and Jim Martin, Department of Plant and Soil Sciences

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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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), soluable granules (SG), water dispersible granules (WDG), wettable powders (WP), flowables (F), or micro-encapuslated (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
Atrazine
Balance
Authority MTZ
Brawl II ATZ
Breakfree
Breakfree ATZ
Buctril/Atrazine
Bullet
Callisto Xtra
Charger Max ATZ
Cinch ATZ
Confidence Xtra
Corvus
Degree Xtra
Expert
Firestorm
FulTime
Gramoxone
Guardsman Max
Harness
Harness Xtra
Intrro
Keystone
Lexar EZ
Lumax EZ
Marksman
Metal II AT
Micro-Tech
Milo-Pro
Parallel Plus
Parazone
Prequel
Radius
Simazat
Stalwart XTRA
Trizmet II
Volley
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
*Atrazine
Anthem
Anthem ATZ*
Authority
Authority Assist
Authority MTZ
Authority XL
Balance
*Bicep II Magnum
Boundary
*Brawl II ATZ
Breakfree
*Breakfree ATZ
*Buctril/Atrazine
*Bullet
Callisto
*Callisto Xtra
Charger Max
*Charger Max ATZ
Cinch
*Cinch ATZ
Confidence
*Confidence Xtra
Corvus
Define
Degree
Degree Xtra
Dual II Magnum
*Expert
Extreme
Fierce
FirstRate
Flexstar
*FulTime
Gangster
Glory
*Guardsman Max
Halex GT
Harness
*Harness Xtra
Hornet WDG
Instigate
*Keystone
Laudis
*Lexar EZ
*Lumax EZ
*Marksman
Matador
*Medal II AT
Micro-Tech
OpTill
Outlook
Parallel
*Parallel Plus
Phoenix
Prequel
*Princep
Pursuit
Python
Radius
Realm Q
Scepter
Sencor
Sequence
Sharpen
*Simazat
Status
Storm
SureStart
TopNotch
TripleFLEX
*Trizmet II
UltraBlazer
Valor
Verdict
Volley
*Volley ATZ
Warrant
Zemax
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 sythetase inhibitors, pigment inhibitors (carotenoid biosynthesis and 4-HPPDs), cell membrane disruptors (photosystem I and PPO inhibitiors), 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) * **Dinitroanalines**	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, occassionally 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, Lasso, Intrro, Outlook, Define	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)
- Audit (thifensulfuron + tribenuron)
- Basis (rimsulfuron + thifensulfuron)
- Basis Blend (rimsulfuron + thifensulfuron)
- Beacon (primisulfuron)
- 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 (thifensulforon+tribenuron)
- HarmonyExtra(thifensulforon+tribenuron)
- Harmony SG (thifensulfuron)
- LeadOff (rimsulfuron + thifensulfuron)
- Nic-IT (nicosulfuron)
- Osprey (mesosulfuron)
- Permit (halosulfuron)
- PowerFlex (pyroxsulam)
- Pursuit (imazethapyr)
- Python (flumetsulam)
- Raptor (imazamox)
- Resolve SG (rimsulfuron)
- Resolve Q (rimsulfuron + thifensulfuron)
- Scepter (imazaquin)
- Solida (rimsulfron)
- Spirit (prosulfuron + primisulfuron)
- Steadfast Q (rimsulfuron + nicosulfuron)
- Synchrony (chlorimuron+ thifensulfuron)

MEDIUM RISK

Photosythesis 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)
- Cadet (fluthiacet-methyl)
- Cobra (lactofen)
- Flexstar (fomesafen)
- Marvel (fluthiacet+fomesafen)
- Outflank, Panther (flumioxazin)
- Phoenix (lactofen)
- Reflex (fomesafen)
- Resource (flumicloric)
- Ringside, Rumble (fomesafen)
- Sharpen (salflufenacil)
- Spartan Charge (sulfentrazone+carfentrazone)
- Stellar (lactofen + flumicloric)
- Ultra Blazer (aciflurofen)
- Valor, Emcompass (flumioxazin)
- Vida (pyraflufen)

(Photosystem I) [Group 22]
- Firestorm (paraquat)
- Gramoxone (paraquat)

Carotenoid Biosynthesis
(Pigment Inhibiitor) [Group 13]
- Command (clomazone)

4-HPPDs
(Pigment Inhibiitor) [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, Clarity (dicamba)
- Butoxone 175 (2,4-DB)
- Butyrac 200 (2,4-DB)
- 2,4-D [*various products*]
- Oracle, Sterling (dicamba)
- 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
(Nitrogren Metabolism) [Group 10]
- Ignite (glufosinate)
- Liberty (glufosinate)

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)
- Intrro, Micro-Tech (alachlor)
- Outlook, Establish (dimethenamid-P)
- Define (flufenacet)
- Zidua (pyroxasulfone)

Agricultural Herbicides that Contain Two or More Different Modes of Action

ALS Inihibitors [Group 2] *and*
Synthetic Auxins (Growth Regulators) [Group 4]
Hornet WDG (flumetsulam + clopyralid)
NorthStar (primisulfuron + dicamba)
Yukon (halosulfuron + dicamba)

ALS Inihibitors [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)
Cloak (chlorimuron + metribuzin)

ALS Inhibitors [Group 2] *and*
Photosynthesis Inhibitors (PS II) [Group 5] and
Cell Division (shoot growth inhibitors [Group 15]
Matador (imazethapyr + metribuzin + metolachlor)

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]
Authority Assist (imazethapyr + sulfentrazone)
Authority First (chloransulam + sulfentrazone)
Authority Maxx (chloriumuron + sulfentrazone)
Authority XL (chlorimuron + sulfentrazone)
Envive (chlorimuron + thifensulfuron + flumioxazin)
Gangster (chloransulam + flumioxazin)
Guantlet (chloransulam + sulfentrazone)
OpTill (imazethapyr + salflufenacil)
Priority (halosulfuron + carfentrazone)
Sonic (chloransulam + sulfentrazone)
Torment (imazethapyr + fomesafen)
Valor XLT (chlorimuron + flumioxazin)

ALS Inhibitors [Group 2] *and*
4-HPPDs (pigment inhibitors) [Group 27 (28)]
Capreno (thiencarbozone-methyl + tembotrione)
Corvus (thiencarbozone-methyl + isoxaflutole)
Instigate (rimsulfuron + mesotrione)
Prequel (rimsulfuron + isoxaflutole)
Realm Q (rimsulfuron + mesotrione)

Synthetic Auxins (Growth Regulators) [Group 4] *and*
Photosynthesis Inhibitors (PS II) [Group 5]
Marksman (dicamba + atrazine)

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)

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)
Bullet (atrazine + alachlor)
Cinch ATZ (atrazine + S-metolachlor)
Degree Xtra (atrazine + acetochlor)
Domain (metribuzin + flufenacet)
Fultime (atrazine + acetochlor)
Guardsman Max (atrazine + dimethenamid-P)
Harness Xtra (atrazine + acetochlor)
Medal II AT (atrazine + S-metolachlor)
Parallel Plus (atrazine + metolachlor)
Tail Wind (metribuzin + metolachlor)
Trizmet II (atrazine + 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)]
Lexar EZ (atrazine + S-metolachlor + mesotrione)
Lumax EZ (atrazine + S-metolachlor + mesotrione)

Photosynthesis Inhibitors (PS II) [Group 6] *and*
PPO Inhibitors [Group 14]
Storm (bentazon + aciflurofen)

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*
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 (fluthiacet-methyl + pyroxasulfone)
Authority Elite (sulfentrazone + S-metolachlor)
Fierce (flumioxazin + pyroxasulfone)
Prefix (fomesafen + S-metolachlor)
Verdict (saflufenacil + dimethenamid-P)
Vise (fomesafen + metolachlor)

Cell Division (shoot growth inhibitors) [Group 15] *and*
4-HPPDs (pigment inhibitors [Group 27 (28)]
Radius (flufenacet + isoxaflutole)
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, sulfonylurea 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 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.

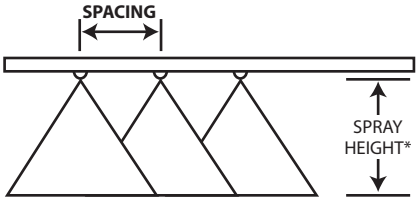
> To make a cleaning solution add one of following to each 50 gallons of water:
> a) 2 quarts of household ammonia, or
> b) 4 pounds of trisodium phosphate cleaner.

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
		60	.12	15	7.3	6.1	5.2	4.6	4.9	4.0	3.5	3.0
80015VS (100 Mesh)	110015VS (100 Mesh)	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
		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
8002VS (50 Mesh)	11002VS (50 Mesh)	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
		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
8003VS (50 Mesh)	11003VS (50 Mesh)	30	.26	33	15.4	12.9	11.0	9.7	10.3	8.6	7.4	6.4
		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
8004VS (50 Mesh)	11004VS (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
		60	.49	63	29	24	21	18.2	19.4	16.2	13.9	12.1
8005VS (50 Mesh)	11005VS (50 Mesh)	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
		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
8006VS (50 Mesh)	11006VS (50 Mesh)	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
		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
8008VS (50 Mesh)	11008VS (50 Mesh)	30	.69	88	41	34	29	26	27	23	19.6	17.2
		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)
Acumen 3.3EC	Group 3	pendimethalin	Tenkoz	corn (field, popcorn), soybean, tobacco
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
Anthem (2.5S)	Group 14 Group 15	fluthiacet-methyl (0.063 lb) + pyroxasulfone (2.087 lb)	FMC	corn (field, popcorn, sweet)
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)
Armezon 2.8SC	Group 27(28)	topramezone	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
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)
Beacon 75DF	Group 2	primisulfuron	Syngenta	corn (field, popcorn)

Herbicides, Formulations, Manufacturers, and Crops

Trade Name*	MOA Group	Active Ingredient	Manufacturer	Crops
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
Bullet 4WDL	Group 15 Group 5	alachlor (2.5 lb) + atrazine (1.5 lb)	Monsanto	corn (field, popcorn), grain sorghum
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 EX 29.5 WDG	Group 2 Group 2	chlorimuron (22.7 %) + tribenuron (6.8%)	DuPont	Soybean
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	Agriliance	corn (all types), grain sorghum, soybean
Charger Max 7.64EC	Group 15	S-metolachlor + (seed safener)	Agriliance	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)	Agriliance	corn (all types), grain sorghum
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

Herbicides, Formulations, Manufacturers, and Crops

Trade Name*	MOA Group	Active Ingredient	Manufacturer	Crops
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
Cloak 75WDG	Group 2 Group 5	chlorimuron (10.7%0 + 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
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
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
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

Herbicides, Formulations, Manufacturers, and Crops

Trade Name*	MOA Group	Active Ingredient	Manufacturer	Crops
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	Group 14 Group 15	flumioxazin (33.5%) + pyroxasulfone (42.5%)	Valent	corn (field), 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
FulTime 4CS	Group 15 Group 5	acetochlor (2.4 lb) + atrazine (1.6 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
Gangster V 51DG GangsterFR 84DG [co-pack]	Group 14 Group 2	flumioxazin & cloransulam	Valent	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
Glyfos 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
Guardsman 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

Herbicides, Formulations, Manufacturers, and Crops

Trade Name*	MOA Group	Active Ingredient	Manufacturer	Crops
Harmony Extra SG (TotalSol) 50DF	Group 2 Group 2	thifensulfuron (33.33%) + tribenuron (16.67%)	DuPont	wheat, barley, oats, corn(field), grain sorghum, soybean, fallow
Harmony SG (TotalSol) 50DF	Group 2	thifensulfuron (50%)	DuPont	wheat, barley, oats, corn (field), grain sorghum, soybean, fallow
Harness 7E	Group 15	acetochlor + MON13900 (safener)	Monsanto	corn (field, popcorn)
Harness Xtra 5.6L	Group 15 Group 5	acetochlor (3.1 lb) + atrazine (2.5 lb) + MON13900 (safener)	Monsanto	corn (field, popcorn)
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)
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
Intrro 4E	Group 15	alachlor	Monsanto	grain sorghum, soybean
Keystone 5.25L	Group 15 Group 5	acetochlor (3.0 lb) + atrazine (2.25 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
Lightning 70DG	Group 2 Group 2	imazethapyr (52.5%) + imazapyr (17.5%)	BASF	corn (CLEARFIELD hybrids)
Liberty 280SL	Group 10	glufosinate-ammonium (2.34 lb)	Bayer CropScience	corn (field), soybean [*LibertyLink*]
Linex 4L	Group 7	linuron (4 lb)	DuPont	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 Group2	metolachlor (4.01 lb) + metribuzin (0.56 lb) + imazethapyr (0.13)	Loveland	soybean
MCPA	Group 4	MCPA	(various)	small grains

Herbicides, Formulations, Manufacturers, and Crops

Trade Name*	MOA Group	Active Ingredient	Manufacturer	Crops
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)
Micro-Tech 4WDL	Group 15	Alachlor	Monsanto	corn (field, popcorn), grain sorghum, soybean
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)
Nimble 75DF	Group 2 Group 2	thifensulfuron (50%) + tribenuron (25%)	Cheminova	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
Panther	Group 14	flumioxazin (51%)	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 3 SL	Group 22	paraquat	Makhteshim Agan	corn (field, popcorn), grain sorghum, soybean, wheat, barley
Pendant 3.3EC	Group 3	pendimethalin	Winfield Solutions	corn (field, popcorn), soybean, tobacco
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

Herbicides, Formulations, Manufacturers, and Crops

Trade Name*	MOA Group	Active Ingredient	Manufacturer	Crops
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_2O 3.8L	Group 3	pendimethalin	BASF	corn (field, popcorn), soybean, tobacco, wheat
Pruvin	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
RealmQ 38.8 WDG	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[*LibertyLink*]; also tree & nut crops
Report Extra 75DF	Group 2 Group 2	chlorsulfuron (62.5%) + metsulfuron-methyl (12.5%)	Cheminova	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
Rhythm 1.88L	Group 14	fomesafen	Cheminova	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
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
Scepter 70DG	Group 2	imazaquin	BASF	soybean
Section 2EC	Group 1	clethodim	Agriliance	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)

Herbicides, Formulations, Manufacturers, and Crops

Trade Name*	MOA Group	Active Ingredient	Manufacturer	Crops
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
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%)	Cheminova	corn (field)
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)
Stalwart 8EC	Group 15	metolachlor	Sipcam Agro	soybean
Starane 1.5EC	Group 4	fluroxypyr	Dow AgroScience	corn (field), grain sorghum, small grains
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)	Agriliance	corn, grain sorghum, wheat, barley, oats
Storm 4S	Group 6 Group 14	bentazon (2.67 lb) + acifluorfen (1.33 lb)	United Phosphorus	soybean
SureStart 4.25SE	Group 15 Group 2 Group4	acetochlor (3.75 lb) + flumetsulam (0.12 lb) + clopyralid (0.38 lb) + dichlormid (safener)	Dow AgroSciences	corn (field, silage)
Surpass 6.4EC	Group 15	acetochlor + dichlormid (safener)	Dow AgroSciences	corn (field, popcorn, sweet)
Synchrony XP 28.4DF	Group 2 Group 2	chlorimuron (21.5%) + thifensulfuron (6.9%)	DuPont	soybean (STS varieties)
Tail Wind 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)	Cheminova	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
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

Herbicides, Formulations, Manufacturers, and Crops

Trade Name*	MOA Group	Active Ingredient	Manufacturer	Crops
Touchdown HiTech [5 lb ae/gal]	Group 9	glyphosate (potassium salt)	Syngenta	corn (field, popcorn), grain sorghum, soybean, wheat, barley
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	Group 15 Group 2 Group 4	acetochlor (3.75 lb) + flumetsulam (0.12 lb) + clopyralid (0.38 lb)	Monsanto	corn (field, silage)
Trizmet II	Group 5 Group 15	atrazine (3.1 lb) + metolachlor (2.4 lb)	Drexel	corn (all types), grain sorghum
Treflan 4L or Treflan HFP	Group 3	trifluralin	UAP Loveland Dow AgriSciences	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 5.25L	Group 15 Group 5	acetochlor (3.0 lb) + atrazine (2.25 lb)	TENKOZ	corn (field, popcorn)
Volunteer 2EC	Group 1	clethodim	TENKOZ	soybean
Warrant 3CS	Group 15	acetochlor (3 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	Group 15	pyroxasulfone (85%)	BASF	corn (field, popcorn, sweet), 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
Honcho / Honcho Plus	IPA	Yes	24 oz	32 oz (2 pt)	3 pt
Hoss Ultra	!PA	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 **atrazin**e (i.e. AAtrex, Anthem ATZ, Bicep II Magnum, Brawl II ATZ, Breakfree NXT ATZ, Bullet, Callisto Xtra, Cinch ATZ, Charger Max ATZ, Confidence Xtra, Degree Xtra, Expert, FulTime, Guardsman Max, Harness Xtra, Keystone, Lexar EZ, Lumax EZ, Marksman, Metal II AT, Parallel Plus, Simazat, Sterling Plus, Stratos, Trizmet II, Volley ATZ, 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.

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 20 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 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 anytime following application provided the combined maximum label rate has not been exceeded (consult label).

SELECT MAX (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

	Rate/A	[2,4-D acid equivalentl
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 preplant or preemergence to corn for control of emerged broadleaf weeds. *Apply 7 to 14 days before planting corn or 3 to 5 days 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.

	Rate/A	(dicamba)
DICAMBA [eg. **BANVEL, CLARITY, STERLING BLUE, VISION, etc.**]	0.5 to 1 pt/A	[0.25 to 0.5 lb ai/A]

Weeds Controlled: For control of annual and perennial broadleaf weeds including dandelion, annual fleabane, 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 3 to 50 GPA with ground equipment.
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, Bicep II Magnum, Bullet, Define, Degree, Degree Xtra, Dual II Magnum, Epic, FieldMaster, FulTime, Glyphosate, Gramoxone, Guardsman, Harness, Harness Xtra, Hornet, Keystone, Outlook, Princep, Roundup, TopNotch, Touchdown. Tank mixes with 2,4-D should be applied 7 to 14 days prior to planting 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 21 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).

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GRAMOXONE SL 2.0	Rate/A	(paraquat)
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	Rate/A	(paraquat)
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 marestail, 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	[thifensulfuruon-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 postemergence. 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).

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: 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.

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: Appy 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 22 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, Micro-Tech, 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

BALANCE FLEXX 5 fl.oz/A (isoxaflutole 0.078 lb ai/A)

NOTE: Apply BALANCDE 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 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 (continued)

Additives: When BALANCE 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 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 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, Bullet, 2,4-D, Degree, Degree Xtra, Dual II Magnum, Frontier, FulTime, Glyphosate, Gramoxone, Guardsman, Harness, Harness Xtra, Ignite 280 SL, Keystone, Micro-Tech, 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.

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 22 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 nightsade, 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 rimisulfuron + 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 rimisulfuron (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
CRUSHER 1.0 oz/A (rimsulfuron:thifensulfuron-methyl 0.016:0.016 lb ai/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 rimisulfuron + 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 rimisulfuron (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; conventional soybeans after 1 month; winter cereals (wheat) after 3 months; or alfalfa, canola, popcorn, sweet corn, red clover, sorghum, and tobacco after 10 months following a LEADOFF or CRUSHER 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, marestail (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.

SEQUENCE

	Rate/A	(S-metolachlor:glyphosate)
SEQUENCE	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 permable 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	Clvoer, 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)	**8**	**9**	**8**	0	0	0	0	**8**	0	0	0	7	**8**	7	**8**	0	6	0	0	**9**	7	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	-	-	**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	-	**-**	**-**	-	4	-	**-**
Liberty[3]	-	-	-	-	-	-	3	**8**	5	-	7*	**9**	6	7	-	**8**	7	**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	-	**-**	2	2	0	7	5	5	7	**2**	6	0	0	**8**	**8**	**8**	-	**8**	5	**-**
Verdict	4	6	5	**0**	0	2	-	**-**	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 21 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 Herbicides[1]

	Barnyardgrass	Broadleaf Signalgrass	Crabgrass	Fall Panicum	Foxtail	Johnsongrass (seedling)	Johnsongrass (rhizome)	Shattercane (Wild Cane)	Yellow Nutsedge	Black Nightshade	Burcucumber	Cocklebur	Lambsquarters	Marestail (Horseweed)	Morningglory	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**	0	6	0	4	5	0	**8**	1
Atrazine	6	4	5	3	6	0	0	0	5	**9**	7	**9**	**9**	**7**	**8**	**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	**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**	7	6	**9**	7	**9**	1
Corvus	**8**	7	**8**	**8**	**8**	6	0	6	4	**9**	7	6	**9**	8	6	**9**	-	**8**	6	-	**8**	**9**	**8**	2
Degree Xtra/HarnessXtra/FulTime/ Breakfree NXT ATZ / Keystone	**8**	7	**8**	**8**	**9**	5	0	5	7	**9**	5	**8**	**9**	7	7	**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	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]	**-**	-	**8**	**8**	**8**	-	-	-	-	**8**	-	**-**	**8**	**8**	7	**9**	**-**	**8**	-	-	**-**	7	**9**	2
Guardsman MAX	**8**	7	**8**	**8**	**9**	5	0	5	7	**9**	6	**8**	**9**	7	7	**9**	**9**	**9**	7	6	**9**	7	**9**	1
Instigate	**8**	6	6	7	**9**	-	-	-	-	**8**	-	7	**8**	-	6	**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 (**PRE only**)	**8**	7	**8**	**8**	**9**	5	0	5	7	**9**	6	7	**9**	8	7	**9**	7	**8**	7	5	**9**	**9**	**9**	2
Lumax EZ (**PRE only**)	**8**	7	**8**	**8**	**9**	5	0	5	7	**9**	6	7	**9**	7	6	**9**	6	**8**	7	5	**9**	**9**	**9**	2
Outlook	**8**	7	**8**	**8**	**9**	5	0	5	7	**8**	0	0	6	0	0	**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**	7	7	**9**	**8**	**9**	0
Prowl (**PRE only**)	**8**	7	**8**	**8**	**9**	6	2	6	0	0	0	0	**8**	0	2	**8**	2	0	0	0	6	6	7	2
Sharpen	**2**	-	**2**	2	**2**	0	0	2	-	**8**	-	**8**	**8**	8	8	**8**	**-**	**8**	8	-	**8**	8	**8**	-
SureStart[4] / TripleFLEX[4]	**8**	7	**8**	7	**9**	5	0	5	6	**8**	3	**8**	**9**	-	7	**9**	**8**	**8**	6	6	**8**	7	**8**	1
Verdict[4]	**8**	7	**8**	**8**	**9**	5	0	5	7	**8**	-	**8**	**8**	**8**	**8**	**9**	**8**	**9**	**8**	-	**9**	**8**	**9**	1
Valor SX	7	2	6	5	7	2	0	3	2	**8**	5	4	**9**	8	7	**8**	**8**	**8**	5	4	5	7	**8**	1
Zemax (**PRE only**)	**8**	7	**8**	**8**	**9**	5	0	5	7	**9**	-	7	**9**	7	6	**9**	6	7	6	5	**9**	**9**	**9**	2
Zidua	**8**	7	**8**	**8**	**9**	5	0	-	-	**8**	-	-	6	5	-	**8**	6	7	-	-	-	-	**8**	1

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. 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.*

[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.*

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

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

Preemergence or Preplant Incorporate

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; 2) preemergence surface applied in conventional tillage; or 3) shallowly incorporated (surface blended) usually within the upper 1 to 2 inches of soil in conventional tillage. Preemergence surface applied treatments need rainfall to move the herbicide into the soil for preemergence control of weeds.

ACETOCHLOR

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	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.

BICEP II MAGNUM or CINCH ATZ

BICEP II MAGNUM 1.6 to 2.1 qt/A or	[S-metolachlor:atrazine (1.0:1.2) to (1.3:1.6) lb ai/A]
CINCH ATZ 1.6 to 2.1 qt/A	
OR	OR
DUAL II MAGNUM or CINCH 1.33 pt/A	(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 22 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 AATREX NINE-O 1.1 to 1.6 lb/A	(atrazine 1 to 1.5 lb ai/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 22 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 CINCH 1.33 to 1.67 pt/A	(S-metolachlor 1.3 to 1.6 lb ai/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.

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 AATREX NINE-O 1.1 to 2.2 lb/A	(atrazine 1 to 2 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 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 course soils and where groundwater is close to the soil surface. [NOTE: See page 22 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 BREAKFREE NXT ATZ (5.6L) 2.3 to 2.4 qt/A	[acetochlor:atrazine (1.78:1.4) to (1.86:1.5) lb ai/A]
OR	OR
HARNESS 7E 1.75 to 2.25 pt/A or BREAKFREE NXT 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 pre-package mixtures containing acetochlor + atrazine [3.1 + 2.5 lb ai/gal] plus MON 13900 (corn safener). Similar products include CONFIDENCE XTRA 5.6L. 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 22 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

KEYSTONE 5.25S 2.4 to 2.8 qt/A or FULTIME 4CS 2.7 to 3.3 qt/A	[acetochlor:atrazine (1.8:1.3) to (2.1:1.6) lb ai/A] [acetochlor:atrazine (1.62:1.1) to (1.98:1.3) 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, or early postemergence. These herbicides 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 (5.25S) is a premixture containing acetochlor + atrazine [3 + 2.25 lb ai/gal] plus dichlormid (corn safener). FULTIME (4CS) is a pre-package mixture containing a micro-encapsulated combination of acetochlor + atrazine [2.4 + 1.6 lb ai/gal] plus dichlormid (corn safener). Similar products include VOLLEY ATZ. Application rate may vary depending on soil texture, percent organic matter, tillage system, time of application, and tank mixture components. Incorporation and higher use rates will improve control of some weeds.
Environmental Statements: KEYSTONE, FULTIME, and VOLLEY ATZ 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 areas having high groundwater tables. [NOTE: See page 22 for PRECAUTIONS on use of atrazine containing products (eg. KEYSTONE, FULTIME, VOLLEY ATZ) 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 applicaton. 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.

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.

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: Appy 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 22 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 1 to 2 lb ai/A)
SIMAZINE 4L 2 to 4 pt/A or SIMAZINE 90DF 1.1 to 2.2 lb/A	

Weeds Controlled: Barnyardgrass, black nightshade, foxtails, lambsquarters, pigweeds, prickly sida, common ragweed, smartweed, velvetleaf.
Crop Stage: Appy 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 22 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 preceed 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 or TRIPLEFLEX

SURESTART 4.25 SE 1.75 pt/A
or [acetochlor:flumetsulam:clopyralid (0.82 :0.03:0.08) lb ai/A]
TRIPLEFLEX 4.25 SE 1.75 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 TRIPLEPLEX are pre-package mixtures containing acetochlor + flumetsulam + clopyralid [3.75 + 0.12 + 0.38 lb ai per lb product] plus dichlormid corn safener. Corn planting depth should be at least 1.5 inches. 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.

ZIDUA

ZIDUA 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 alone before weed emergence 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.
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 10 months, 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, Guardsman Max, Lightning (Clearfield corn only), Outlook, Prowl H20, Sharpen, Status, Verdict.

Preemergence Surface

Apply the following soil-residual herbicide treatments to the soil surface before weeds emerge. Rainfall is needed to move the herbicide into the soil for preemergence control of weeds.

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, marestail (horseweed), smooth pigweed, 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.

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 organphosphate 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 22 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 [S-metolachlor:mesotrione:atrazine (1.68:0.17:0.65)
[use higher rate when OM ≥ 3%) 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 organphosphate 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 22 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 Warrier 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.

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 H20 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 H20.
Tank Mixtures: Atrazine, Banvel, Bicep, Bullet, 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.

PROWL + ATRAZINE

PROWL 3.3E 2.4 to 3.6 pt/A or	(pendimethalin 1 to 1.5 lb ai/A)
PROWL H2O 3 pt/A	(pendimethalin 1.4 lb ai/A)
+	+
ATRAZINE 4L 1 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, black nightshade, cocklebur, common ragweed, crabgrass, fall panicum, foxtails, jimsonweed, lambsquarters, morninglories, 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 22 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.

VALOR SX

VALOR SX 51WDG	2 oz/A [7 to 30 days EPP]	(flumioxazin 0.064 to
	3 oz/A [14 to 30 days EPP]	0.096 lb ai/A)

Weeds Controlled: Black nightshade, lambsquarters, marestail (horseweed), morninglories, smooth pigweed, common ragweed, prickly sida, waterhemp.
Crop Stage: Apply VALOR at 2 oz/A between 7 and 30 days [EPP] prior to planting field corn; apply VALOR at 3 oz/A between 14 to 30 days [EPP] prior to planting field corn. 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.* VALOR can 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. A minimum of 25% of the soil surface should be covered with the residue of the preceding crop and a minimum of ¼ inch of rainfall should occur between application and planting. When applying VALOR, spray equipment must be cleaned each day. Before spraying over-the-top of any crop, clean out tank, hoses, and nozzles with the product known 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 crops that may be planted following VALOR at rates up to 3 oz/A include field corn and sorghum after 1 month; tobacco and wheat after 2 months; barley and rye after 4 months; and alfalfa, clover, oats, and other crops after 10 months (in no-till). A successful soil bioassay is required for other crops not listed. Consult VALOR label when rate is ≤2 oz/A or when soil is tilled.
Harvest & Forage Restrictions: None indicated on the supplemental label.
Tank Mixtures: Tank mix partners for burndown and/or residual control include 2,4-D LVE, atrazine, Basis, dicamba, Express, glyphosate, Hornet, metribuzin, paraquat, Python, Resolve, simazine, and Weedmaster. Do not tank mix with chloroacetamide herbicides such as flufenacet (Axiom), metolachlor (Dual Magnum, etc.), dimethenamid (Frontier, Outlook), alachlor (Lasso), or acetochlor (Surpass, Harness, etc.) since crop injury may result when application is followed by periods of cool, wet weather and should not be used with VALOR herbicide.

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 ≥ 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 organphosphate 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).

Guide to Weed and Crop Response to Postemergence Corn Herbicides[1]

	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	Pigweed, Smooth	Prickly Sida (Teaweed)	Ragweed, Common	Ragweed, Giant	Sicklepod	Smartweed	Velvetleaf	Waterhemp	Crop Repsonse[2]
Accent Q	**8**	**8**	5	7	**8**	**9**	**8**	7	**9**	5	2	7	6	5	2	6	**8**	2	2	2	4	6	5	7	3*
Aim	1	0	1	1	1	1	0	0	1	0	**8**	3	7	**8**	-	7	7	6	6	3	1	6	**9**	7	3
Armezon / Impact	6	3	7	7	7	6	0	-	6	4	**9**	7	**8**	**9**	6	6	**9**	7	7	7	-	7	**9**	**9**	1
Callisto / Zemax[7]	6	6	6 [5]	2	3	0	0	2	0	5	**8**	7	**8**	**9**	6	7	**8**	5	7	**8**	5	**8**	**9**	**8**	2
Callisto Xtra	6	6	6 [5]	2	5	0	0	2	0	5	**9**	7	**9**	**9**	7	**8**	**9**	7	**8**	**8**	6	**9**	**9**	**9**	2
Capreno	**8**	-	7	**8**	**8**	**8**	6	-	**9**	-	**9**	7	**8**	**9**	6	6	**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	**9**	**9**	**8**	**9**	**9**	6	7	**8**	**8**	3
Dicamba [Clarity, etc.]	0	0	0	0	0	0	0	0	0	0	**9**	7	**9**	**9**	**8**	**9**	**9**	**8**	**9**	**9**	7	**9**	**8**	**8**	2
Expert/Sequence (RR-corn)[4]	**9**	**9**	**9**	**9**	**9**	**9+**	**9**	**8**	**9**	6	7	**8**	**9**	**9**	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	**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	**9**	7	7	**8**	**8**	**8**	**9**	**9**	2
Laudis	7	7	7	2	6	7	0	-	7	4	**8**	7	**8**	**8**	6	6	**8**	7	7	**8**	-	**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**	**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	**8**	7	**8**	7	2	7	**8**	**8**	2
Realm Q	7	-	6	7	**8**	**-**	-	-	**9**	-	**8**	-	**9**	**8**	-	6	**9**	-	7	-	-	**9**	**8**	**8**	2*
Resolve Q	7	-	6	7	**8**	**7**	-	-	**9**	-	3	**-**	7	7	-	6	**9**	-	6	4	-	7	**8**	7	2*
Spirit	3	2	3	6	6	**8**	6	5	**9**	5	**8**	**8**	**9**	6	6[#]	6	**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**	**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	**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, Glyfos 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 Herbicides[1]

	Bindweed, Field	Dandelion	Dogbane, Hemp	Horsenettle	Milkweed, Common	Milkweed, Honeyvine	Pokeweed, Common	Thistle, Canada	Thistle, Musk	Trumpetcreeper
Accent Q / NIC-IT	3	7	6	3	6	6	4	5	2	2
Callisto	-	7	5	6	-	6	7	6	-	-
Callisto Xtra	-	7	5	7	-	6	7	6	-	-
Capreno	-	6	-	-	-	-	6	5	-	-
2,4-D	5	7	5	4	4	4	5	5	7	-
Dicamba [Clarity, Banvel, 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	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
Armezon or Impact	0.75 fl.oz	4”	3"[1]	3”	3"[1]	3"[2]	4"[1]	X	X	4"[1]	X
Capreno	3 fl.oz	5”	5”	3”	5”	3”	5”	X	X	12”	X
Halex GT	3.6 - 4 pt	4”	4”	4”	4”	4”	4”	4”	X	4”	4”
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	0.75 oz / 1.5 oz	4"	2"	1"	4"	4"	12"	12"	4"	6"	2"[1] /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	Pigweed	Prickly Sida	Ragweed, Common	Ragweed, Giant	Sicklepod	Smartweed	Velvetleaf	Waterhemp
Accent Q	0.67 oz	X	3"	X	X	X	3"	4"	X	X	X	X	4"	X	X
Aim	0.5 oz	4"	X	4"[1]	4"	X	3 lf	4"	X	X	X	X	4"[1]	24"	2"
Armezon / Impact	0.75 fl.oz	6"	6"	8"	6"	6"	6"[1]	6"	3"	6"	8"	X	3"	8"	6"
Callisto	3 oz	5"	X	5"	5"	5"[1]	5"[1]	5"	X	5"[1]	5"	X	5"	5"	2"
Callisto Xtra	20 fl.oz	5"	2"	5"	5"	5"	2"	5"	2"	3"	3"	X	5"	5"	3"
	24 fl.oz	10"	10"	10"	10"	5"/10"[1]	5"/10"[1]	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"[1]	<6"	<6"	<6"[1]	<6"	<6"	<6"
Halex GT	3.6–4 pt	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"
Laudis	3 fl.oz	<6"	<6"[1]	<6"	<6"	<6"	<6"[1]	<6"	X	<6"	<6"	<6"[1]	<6"	<6"	<6"
Liberty (LL-corn)	22 oz	6"	6"	6"	4"	X[1]	6"	3"	4"	6"	6"	4"	6"	3"	4"
Permit	0.67 oz	X	3"[1]	9"	2"[1]	X	X	3"	X	9"	3"	X	2"	9"[2]	X
	1.33 oz	X	12"[1]	14"	2"[1]	X	3"[1]	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"	X	<5"	<5"	<5"
Resolve Q	1.25 oz	X	X	3"[1]	3"	X	3"[1]	3"	X	3"[1]	X	X	3"[1]	3"[1]	X
GLYPHOSATE 4S (RR-corn)	1.5 pt	12"	6"	18"	8"	6"	2"	18"	2"	6"	4"	2"	6"	3"	X
	2 pt	12"	12"	24"	12"	12"	4"	24"	3"	8"	6"	4"	8"	4"	6"
Roundup PowerMAX	16 oz	4"	6"	18"	6"	6"	X	12"	2"	6"	6"	2"	X	X	X
(RR-corn)	22 oz	6"	12"	24"	12"	12"	3"	18"	4"	12"	12"	4"	6"	6"	6"
Spirit	1 oz	5"	6"	8"	3"	1-6"	4"[1]	4"	3"[1]	9"	9"	3"	6"	6"[2]	4"
Steadfast Q	0.75 oz/ 1.5 oz	X	4"	4"[1]	2"[1] /4"[1]	X	4"	4"	X	X	X	X	2"/4"[1]	4"[1]	2"
Zemax	2.0 qt	<3"	X	<3"	<3"	<3"	<3" [1]	<3"	<3" [1]	<3"	<3"	X	<3"	<3"	<3"

NOTE: 2,4-D, 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.

Corn Growth Stages, Adjuvants, and Rain-Free Periods

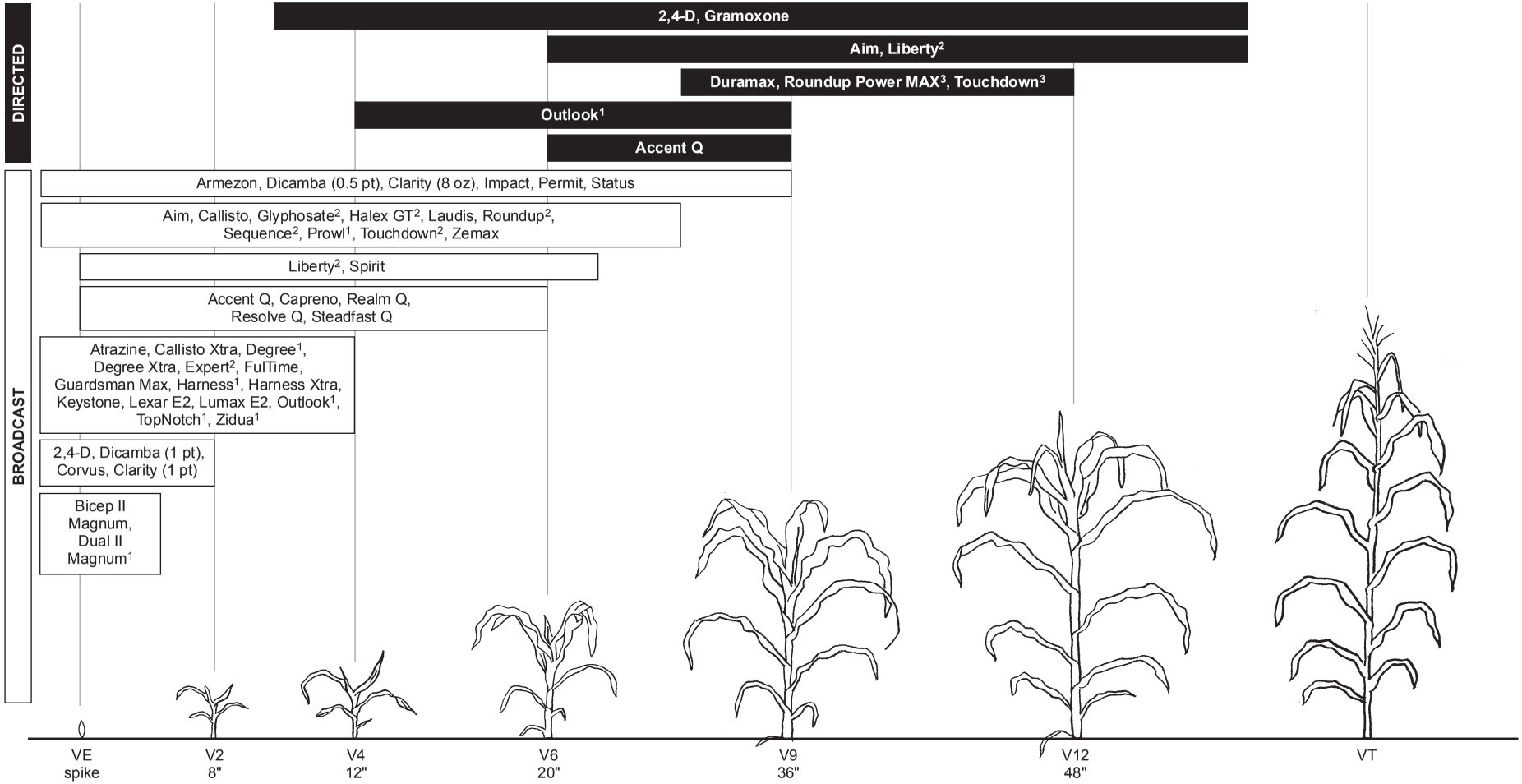
Herbicide	Adjuvant[1]	Crop Stage	Rainfast[2]
Accent Q or Nic-It	COC, MSO, or NIS plus UAN or AMS	Broadcast up to 20" tall corn or that exhibits 6 or fewer collars (V6); Use only drop nozzles for corn between 20“ to 36" tall. Do not apply to corn that exceeds 36" tall or that has 10 or more collars (V10).	4 hours
Aim	NIS	Apply from prior to planting up to 14-leaf collar growth stage. Use directed applications to corn greater than V8 growth stage for better weed coverage.	6 to 8 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 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
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	**

[1]COC - 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

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

[3]Apply 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.

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
Aim	**L**	-	**L**	**L**	**L**	**L**	**L**	NL	**L**	**L**	**L**	**L**	**L**
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 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
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.

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 Or AMMONIUM SULFATE 2 lb/A	(additive)

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.

AIM

AIM 1.9EW or AIM 2EC	0.5 to 1.0 fl.oz/A	(carfentrazone 0.008 to 0.016 lb ai/A)
	+	+
SURFACTANT (Non-Ionic 80%)	0.5 pt/25 gal	(additive)

Weeds Controlled: Black nightshade, lambsquarters, velvetleaf.
Crop Stage: For use on field corn, seed corn, and popcorn. Apply from prior to planting up to 14-leaf collar growth stage. Use directed applications to corn greater than V8 growth stage for better weed coverage.
General Comments: AIM EW contains 1.9 lb ai carfentrazone per gal; AIM EC contains 2.0 lb ai carfentrazone per gal. It is a contact herbicide with little or no residual activity. For best results apply to actively growing weeds up to 2 to 4 inches tall and rosettes less than 3 inches across; velvetleaf may be treated up to 36 inches. The applicaton of AIM to corn may result in temporary crop response such as speckling or necrosis of the leaves. When tank mixing AIM with other products, be sure to add AIM to the spray tank water first. Under dry conditions the use of crop oil concentrate may improve weed control; however, the use of crop oil may increase crop response. Do not apply more than 2 fl.oz/A (0.031 lb ai/A) of AIM per acre per season.
Environmental Statements: Avoid direct spray drift to nearby crops or vegetation.
Rain Delay: Avoid application within 6 to 8 hours of rainfall.
Rotation Restrictions: Following an application of AIM crops such as corn, soybeans, grain sorghum, wheat, barley, oats, tobacco and other registered crops may be planted at any time. All non-registered crops may be planted after 12 months.
Harvest & Forage Restrictions: Preharvest interval is 14-leaf collars.
Tank Mixtures: Accent, Accent Gold, Atrazine, Banvel, Basis, Basis Gold, Beacon, Callisto, Clarity, 2,4-D (amine), Equip, Exceed, Hornet, Liberty, Marksman, NorthStar, Option, Permit, Glyphosate products (eg. Roundup), Spirit, Steadfast, Sterling, Touchdown. When tank mixing follow corn height limits of tank mix partner if more restrictive and use the adjuvant recommended on the tank mix partner label of certain products (consult label).

ARMEZON or IMPACT

ARMEZON or IMPACT 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, pigweeds, 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 prior to corn harvest.
General Comments: ARMEZON or IMPACT 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 topramezone/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.

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 XTRA

CALLISTO XTRA (3.7L) 20 to 24 fl. oz/A	[mesotrione:atrazine (0.078.0.5 to 0.94:0.6 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, pigweeds, common ragweed, giant ragweed, smartweed, velvetleaf.
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 22 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, glyhosate (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, pigweeds, common ragweed, shattercane, smartweed, velvetleaf.
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 organophosate 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 Amine 0.25 to 0.5 lb ai/A) or
2,4-D ESTER 0.5 to 0.75 pt/A	(2,4-D Ester 0.25 to 0.375 lb ai/A)
[4 lb ai/gal formulation]	

Weeds Controlled: Cocklebur, common ragweed, giant ragweed, lambsquarters, morninglories, pigweeds, prickly sida, smartweed, velvetleaf.
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) (dicamba 0.25 to 0.5 lb ai/A)
[eg. BANVEL, CLARITY, STERLING BLUE, VISION, etc.]

Weeds Controlled: Black nightshade, cocklebur, common ragweed, giant ragweed, jimsonweed, lambsquarters, morningglories, pigweeds, prickly sida, sicklepod, smartweed, velvetleaf.
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 (1 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. 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; 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 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, 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 treated corn for dairy or beef feed until the crop has reached the ensilage (milk) stage or late in maturity.
Tank Mixtures: Accent, Atrazine, Beacon, Buctril, Exceed, Hornet, Liberty (LL-corn), Permit, Roundup Ultra (RR-corn), Spirit. Tank mixtures with other products containing DICAMBA (e.g. Marksman, etc.) 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.

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 22 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.

GLYPHOSATE[1]
(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 products[1]			
[*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 formualtion*]	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 formualtion*]	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 formualtion*]	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 21 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.

Glyhosate 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] 3 pt/A [RR-2 hybrid]	2 qt/A [GT-hybrid] 3 qt/A [RR-2 hybrid]	1 qt/A	8 qt/A
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] --- 2.25 pt/A [RR-2 hybrid]	1.5 qt/A [GT-hybrid] --- 2.25 qt/A [RR-2 hybrid]	0.75 qt/A (1.5 pt/A)	6 qt/A
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.

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.

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, pigweeds, giant ragweed, velvetleaf.
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.

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.

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 or Ammonium Sulfate 2 lb/A	(additive)

Weeds Controlled: Cocklebur, foxtail, lambsquarters, pigweeds, giant ragweeed, 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 conjuction with wet soils.
Rainfall Delay: Not indicated on the label.
Rotation Restrictions: Rotational crops which may be planted include field corn anytime; wheat after 4 months; or alfalfa, canola, sorghum, soybean, popcorn, and sweet corn after 10 months following a REALM Q application. Other crops may require an 18 month waiting period. Consult label if a mesotrione-containing herbicide was applied preemergence followed by REALM Q.
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 miiixtures 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.

RESOLVE Q

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

Weeds Controlled: Foxtail, pigweeds, 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 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.

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 permable 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, Warrier.

SPIRIT

SPIRIT 57DF 1 oz/A [prosulfuron:primisulfuron (0.009:0.027) lb ai/A]
+ +
CROP OIL CONCENTRATE 1 qt/A or (additive)
SURFACTANT (Non-Ionic 80%) 0.5 pt/25 gal

Weeds Controlled: Burcucumber, cocklebur, jimsonweed, black nightshade, pigweeds, 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 [glypohsate 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 or METYLATED SEED OIL 1 to 2 pt/A	(additive)
+	+
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

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 or Non-Ionic Surfactant (25% v/v) 1 qt/100 gal	(additive)
+	+
Fertilizer Solution [28% or 32% UAN] 2 qt/A or Ammonium Sulfate 2 lb/A	(additive)

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.

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 [use higher rate when OM ≥ 3%]	[S-metolachlor:mesotrione (1.67:0.17) to (2.0:0.2) lb ai/A]
+	+
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 organphosphate 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 internval 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 21 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 formualtion*]*	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 formualtion*]*	1.5 pt/A (24 fl.oz/A)	[glyphosate 0.75 lb ae/A]
Example product: Touchdown Total		
GLYPHOSATE [*4.5 lb ae/gal formualtion*]* (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 formualtion*]*	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 0.75 to 1 lb ai/A) or
2,4-D ESTER 1 to 2 pt/A (2,4-D 0.5 to 1 lb ai/A)
[4 lb ai/gal formulations]

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 21 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 formualtion*]*	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 formualtion*]* (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 formualtion*]*	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 64 oz/A (0.5 to 4 pt/A or (dicamba 0.25 to 2 lb ai/A)
[eg. BANVEL, CLARITY, 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 22 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 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.

SHARPEN 1 to 2 fl.oz/A (salflufenacil 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 premergence 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, morninglories, pigweeds, prickly sida, smartweed.

Remarks: Use CONCEP or SCREEN treated sorghum seed.

MICRO-TECH or INTRRO 2 to 2.75 qt/A (alachlor 2 to 2.75 lb ai/A)

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

Remarks: Use SCREEN (flurazole) treated sorghum seed.

BULLET 4WDL 3 to 3.5 qt/A	[alachlor:atrazine (1.9:1.1) to (2.3:1.4 lb ai/A)]
OR	OR
MICRO-TECH or INTRRO 2 to 2.75 qt/A	(alachlor 2 to 2.75 lb ai/A)
+	+
AATREX 4L 1 to 1.5 qt/A	(atrazine 1 to 1.5 lb/A)
AATREX NINE-O 1.1 to 1.67 lb/A	

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

Remarks: Use 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.

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.

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.*

BULLET 3 to 3.75 qt/A	[alachlor:atrazine (1.9:1.1) to (2.3:1.4 lb ai/A)]
OR	OR
MICRO-TECH 2.25 qt/A	(alachlor 2.25 lb ai/A)
+	+
AATREX 4L 1 to 1.5 qt/A	(atrazine 1 to 1.5 lb/A)
AATREX NINE-O 1.1 to 1.67 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 with NON-IONIC SURFACTANT	(paraquat 0.47 to 1.0 lb ai/A)

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

Remarks: Use SCREEN treated sorghum seed.

INTRRO 2.25 qt/A	(alachlor 2.25 lb ai/A)
+	+
ATRAZINE 4L 1 to 1.5 qt/A	(atrazine 1 to 1.5 lb/A)
ATRAZINE 90DF 1.1 to 1.67 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 with NON-IONIC SURFACTANT	(paraquat 0.47 to 1.0 lb ai/A)
OR	OR
ROUNDUP PowerMAX 2 pt/A or	
GLYPHOSATE 3 pt/A [4 lb ai/gal (*3 lb ae/gal*)]	(glyphosate 1.5 lb ai/A)

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

Remarks: Apply ONLY to grain sorghum seed that has been treated with a seed protectant or safener such as SCREEN or CONCEP.

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 with NON-IONIC SURFACTANT	(paraquat 0.47 to 1.0 lb ai/A)
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 with NON-IONIC SURFACTANT	(paraquat 0.47 to 1.0 lb ai/A)
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, morninglories, 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.

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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, morninglories, 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 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

	Herbicide Rate Based on Height of Annual Weeds		
PARAQUAT	1 to 3" weeds	3 to 6" weeds	6" weeds
GRAMOXONE SL 2.0 or FIRESTORM 3S, PARAZONE 3S, PARAQUAT CONCENRATE 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: 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 marestail, 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(marestail). 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)

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) (075 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 21**

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 (marestail), 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. Rage D-Tech is a premix of 2.4-D ester + carfentrazone. The preplant interval for Rage D-Tech is 7 days for 8 to 16 oz of product/A and 14 days for rates 17 to 24 oz of product/A.
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 (marestail). 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.

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-anitfoam 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 LIBERY 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: LIBERTYmay be tank mixed with labeled rates of other herbicides, provided other products are labeled for burndown applications to soybean. No specific products are listed for burndown tank mixes.

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)

Additives: When CANOPY is 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: 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 if soil pH exceeds 7.0.CANOPY will provide some "burndown" of existing broadleaf weeds up to 3" and small annual grasses up to 1" tall when applied preemergence to soybean. 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 $\leq$ 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.
Harvest & Forage Restrictions: Do not graze treated fields or harvest for forage.
Tank Mixtures with CANOPY: alachlor, metolachlor, pendimathalin, 2,4-D LVE, glyphosate, or paraquat
Generic Formulation: Cloak is similar to CANOPY. Follow label for rates & preplant intervals.

CANOPY EX 29.5 DG	Rate/A *	(chlorimuron:tribenuron)
	1.1 to 3.3 oz/A	[(0.016:0.005) to (0.047:0.014 lb ai/A)]

*When using application rates >1.65 to 3.3 oz/A, apply where soil pH $\leq$ 7.0. There are no pH restrictions for lower application rates.

Additives: Crop Oil Concentrate at 1 gal/100 gal of spray mixture. If tank mix partner precludes use of crop oil concentrate, use non-ionic surfactant at 1 qt/100 gal of spray mixture.
Weeds Controlled: Chickweed, giant ragweed, henbit. Include 2,4-D LVE for optimum burndown control of horseweed (marestail), wild garlic, lambsquarters and certain other weed species.
Timing: Apply as an early preplant treatment in the fall or spring. The minimum interval between spring application and soybean planting is 7 days for rates 1.1 to 2.2 oz/A, or 14 days for rates > 2.2 up to 3.3 oz/A. For optimum control apply when annual weeds are up to 3 inches and perennial weeds are up to 6 inches in height or diameter.
General Comments: Soybean stunting may develop if excessive rainfall occurs after application but before plant emergence. CANOPY EX provides burndown and preemergence control of certain weeds. Apply CANOPY EX at 1.5 to 3.3 oz/A in order to achieve acceptable preemergence weed control through normal planting date. CANOPY EX will not provide season-long preemergence control of annual grasses and broadleaf weeds.
Environmental Statements: Do not mix/load, or use within 50 feet of all wells including abandoned wells, drainage wells and sinkholes.
Rain Delay: 2 hours
Rotation Restrictions: When CANOPY EX rate exceeds 1.65 oz/A, the rotation intervals are 4 months for cereal grains and pasture grasses, 10 months for alfalfa, field corn, sorghum, and transplanted tobacco (or 9 months for field corn if chlorimuron rate $\leq$ 0.64 oz/A) and 18 or 30 months for certain other crops. Consult CANOPY EX label when rate is 1.1 to 1.65 oz/A or if chlorimuron is sequentially applied after August 1.
Harvest & Forage Restrictions: Allow 14 days after application before grazing or feeding forage or hay.
Tank Mixtures with CANOPY: 2,4-D LVE, Gramoxone Extra, glyphosate.
Generic Formulation: Cloak EX is similar to CANOPY EX. Follow label for rates & preplant intervals.

ENVIVE 41.3 DG 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 ≤ 7.0. There are no pH restrictions for 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. Include 2,4-D LVE for optimum burndown control of horseweed (marestail), wild garlic, and certain other weed species. Preemergence control of chickweed, cocklebur, lambsquarters, hophornbeam copperleaf, dandelion, henbit, marestail, nightshade, pigweed, prickly sida, morningglories, common ragweed, giant ragweed, smartweed, velvetleaf.
Timing: 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: Where soil pH is <7, the rotation intervals are 4 months for barley, wheat, 10 months for field corn, popcorn, sorghum, and transplanted tobacco; 12 months for alfalfa and clover, and 18 months for certain other crops. Consult ENVIVE label where soil pH is ≥ 7.
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 use VALOR or ENCOMPASS where flufenacet (Define), alachlor (Micro-Tech), metolachlor (Dual), or dimethenamid (Outlook) are applied or injury may occur.

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.

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78 Soybean

LEADOFF	1.5 oz/A	[rimsulfuron:thifensulfuron] (0.0156 : 0.0156 lb ai/A)

Weeds Controlled: Common chickweed, curly dock, dandelion, henbit, marestail, wild garlic, lambsquarters. The addition of 2,4-D ester, glyphosate, paraquat, or glufosinate with LEADOFF will enhance burndown control of such weeds as marestail (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 control. When mixing with glyphosate or glufosinate that contain a built-in adjuvant system, no additional surfactant is needed.
Timing: Apply early preplant in the fall or spring but no later than **30** days before planting soybean.
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 trifoliate..
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-metolachor 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 spring at 1 oz/A as an early preplant or preemerence treatment. Allow a minimum of 14 days preplant for 1.5 oz/A rate. SHARPEN may be applied in the fall at 1 to 2 oz/A.
General Comments: When applied 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 when soybean reach cracking stage. Do not apply SHARPEN as a tankmix or sequential application within 30 days of other PPO inhibitor herbicides (e.g. sulfentrazone or flumioxazin) because crop injury may occur. PPO inhibitor 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)
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, glyphosate.

SPARTAN ADVANCE 3.56F 57 to 70 fl oz/A (sulfentrazone 0.25 to 0.31 lb ai/A) (glyphosate 1.34 to 1.64 lb ae/A)

Additives: Non-ionic surfactant at 2 qt/100 gal.
Weeds Controlled: Burndown control of annual fleabane, barnyardgrass, brome spp., chickweed, common ragweed, crabgrass, fall panicum, giant foxtail, giant ragweed, henbit, johnsongrass (seedling), lambsquarters, mustards, rye, smartweed, volunteer corn (except glyphosate resistant), wheat.
Soil-residual control of Black nightshade, lambsquarters, morninglories, pigweeds.
Crop Stage: Early preplant in the fall or in spring prior to planting or up to 3 days after planting. Do not apply after crop seed germination.
General Comments: Soybean varieties vary in tolerance to sulfentrazone. Consult local seed supplier for varietal tolerance information. Use higher rates for soils with pH less than 7.0 and lower rates for pH greater than 7.0.
Environmental Statements: SPARTAN ADVANCE 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: No information on label.
Rotation Restrictions: Soybean and tobacco may be planted any time after application. Rotational crops that may be planted after SPARTAN include wheat, barley, or rye after 4 months; sorghum after 10 months (18 months for sorghum if rate > 57.6 oz/A); and alfalfa after 12 months following application. Other crops may require a 12-month interval and a successful field bioassay.
Harvest & Forage Restrictions: Do not harvest forage for livestock feed.
Tank Mixtures: Aim or Rage D-Tech.

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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 (marestail), 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 preemerence 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 ≤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 ≤ 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 Herbicides[1]

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	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	**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**	-	-	-	**9**	-	-	-	-	-	**-**	**-**	-	-	-	-	-	-	-	**8**	-
2,4-D Ester[3]	6	**8**	5	0	0	0	0	7	0	0	5	7	4	6	4	**8**	**8**	**8**	7	0	0	0	0	0	0	**8**	-	5	**9**	**9**	6
Envive	-	-	-	-	-	-	-	-	-	-	**-**	**8**	**-**	-	**-**	**8**	**-**	-	-	-	-	-	-	-	-	**-**	-	-	**9**	**9**	**-**
FirstShot	-	-	-	-	-	0	0	7	0	0	**9**	-	**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	-	-	-	-	-	0	0	7	0	0	**9**	**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	7	-	5	-	-	**-**	-	6	1	**-**	**8**	7	7	7	7	**8**	**8**	**-**	6	**-**	**-**	**-**	**-**	**-**	**-**	**8**	-	-	**-**	**8**	**-**
Spartan Advance	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**
Verdict	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 21 for list of glyphosate products.

3 Unacceptable injury may occur when 2,4-D is applied preplant to soybean. Delay planting soybean 7 to 30 days after application depending on rate of 2,4-D Ester. Consult label for rate of product.

4 Environmental stress conditions such as cool temperatures and cloudy weather may limit burndown weed control with Liberty.

* There may be populations of marestail that 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]
Authority Assist	6	-	7	6	7	2	0	-	7	**8**	0	6	**8**	**-**	**9**	**9**	**8**	**9**	7	6	5	-	**8**	**8**	**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	7	2	0	-	7	**8**	0	6	**8**	**8**	**9**	**9**	**8**	**9**	**9**	**8**	5	-	**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**	6	**9**	5	**8**	**9**	**9**	**8**	6	7	**9**	7	**8**	2
Canopy	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**	-	**9**	**-**	**8**	**9**	**8**	**9**	**8**	**8**	**8**	**8**	**9**	7	4	**9**	**8**	**8**	2
Fierce	-	**-**	**8**	-	-	**-**	**-**	**-**	-	**8**	**-**	**-**	**-**	**8**	**8**	7	**9**	**9**	**8**	**8**	-	-	**-**	7	**9**	2
Gangster	7	**-**	6	5	7	**-**	**-**	**3**	2	**9**	**-**	**8**	**9**	**9**	**9**	**8**	**8**	**9**	**8**	**9**	7	4	**9**	**8**	**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	**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	0	0	0	0	0	0	0	0	0	7	0	6	-	**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
Spartan Charge	7	-	7	6	7	2	0	-	7	**8**	0	6	-	7	**9**	**9**	**8**	**9**	7	6	5	-	7	7	**8**	2
Treflan (**PPI only**)	**9**	**8**	**9**	**9**	**9**	**8**	3	**8**	0	0	0	0	0	**-**	**8**	2	**8**	**9**	0	3	0	0	3	2	**-**	1
Valor SX or Encompass	7	**-**	6	5	7	**-**	**-**	**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**	**-**	4	**9**	**9**	**9**	**8**	**8**	**8**	**8**	**8**	5	4	5	7	**8**	2
Zidua	**8**	**8**	**8**	**8**	**9**	4	6		-	**8**	**-**	-	**-**	6	7	6	**8**	**8**	7	6	-	-	-	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

AUTHORITY ASSIST

AUTHORITY ASSIST 4 L 8 to 10 fl oz/A (sulfentrazone : imazethapyr) [(0.21:0.042) to (0.26:0.052 lb ai/A)]

Weeds Controlled: Black nightshade, lambsquarters, morningglories, smooth pigweed, smartweed, velvetleaf, waterhemp.
Incorporation and use of high rate may improve control of yellow nutsedge.
Crop Stage: May be applied in the fall or spring (early preplant 30-45 days prior to planting); 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 AUTHORITY ASSIST and may be injured. Consult label for other comments regarding crop injury.
Environmental Statements: AUTHORITY ASSIST has GROUND and SURFACE WATER ADVISORY statements on the label.
Rain Delay: None.
Rotation Restrictions: Rotational crops that may be planted after AUTHORITY ASSIST include wheat, after 4 months; field corn after 10 months (18 months for popcorn); tobacco and barley after 9.5 months; alfalfa after 12 months; and sorghum after 18 months after application. Consult label for reduced intervals for Clearfield corn.
Harvest & Forage Restrictions: Do graze or harvest forage or hay.
Tank Mixtures: None specified on AUTHORITY ASSIST 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, marestail (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 marestail use 6.45 to 8 oz/A
Crop Stage: May be applied preplant incorporated or preemergence. For burndown plus residual control of marestail (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.
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, marestail (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 70 DG (sulfentrazone : chlorimuron)
- Full Rate 6.5 oz/A to 7.5 oz/A [(0.25:0.031) to (0.29:0.036 lb ai/A)]

Weeds Controlled (Full rate): Black nightshade, cocklebur, lambsquarters, marestail (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.
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, sorghum and tobacco after 10 months; alfalfa after 12 months. Certain other crops may require 18 or 36 months interval. Consult label for when soil pH >6.8 or when using the reduced rate program.
Harvest & Forage Restrictions: Do not feed treated forage or hay to livestock.
Tank Mixtures: Rage D-Tech, glyphosate, glufosinate, paraquat.

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.

BOUNDARY (continued)

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

CANOPY	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)

Additives: When CANOPY is 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, marestail (horseweed), morningglory, prickly lettuce, marestail, mustards, pennycress, smooth pigweed, prickly sida, common ragweed, giant ragweed, sicklepod, smartweed, velvetleaf. The addition of 2,4-D LVE is required for burndown of marestail, lambsquarters, and wild garlic.
Crop Stage: CANOPY may be applied preplant incorporated, 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 if soil pH exceeds 7.0. CANOPY will provide some "burndown" of existing broadleaf weeds up to 3" and small annual grasses up to 2" tall when applied preemergence to soybean. 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: CANOPY has GROUND WATER ADVISORY statements on the label. 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.
Harvest & Forage Restrictions: Do not graze treated fields or harvest for forage or hay.
Tank Mixtures with CANOPY: alachlor, metolachlor, pendimethalin, 2,4-D LVE, glyphosate, or paraquat
Generic Formulations: Cloak is similar to CANOPY. Follow label for rates & preplant intervals.

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 trifoliate 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 41.3 DG 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. There are no pH restrictions for 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. Include 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, morninglories, 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: Where soil pH is <7, the rotation intervals are 4 months for barley, wheat, 10 months for field corn, popcorn, sorghum, and transplanted tobacco; 12 months for alfalfa and clover, and 18 months for certain other crops. Consult ENVIVE label where soil pH is $\geq$ 7.
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 use VALOR or ENCOMPASS where flufenacet (Define), alachlor (Micro-Tech), metolachlor (Dual), or dimethenamid (Outlook) are applied or injury may occur.

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: Large crabgrass, black nightshade, common ragweed, 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 ADVISORYstatements
Rain Delay: 1 hour
Rotation Restrictions: The rotational interval when using up to 3 oz of Fierce/A is 4 months for wheat,30 days for conventional till field corn, 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), alachlor (Micro-Tech), metolachlor (Dual), or dimethenamid (Outlook) are applied or injury may occur.

GANGSTER

GANGSTER (co-pack) 1.8 to 3.6 oz/A

Gangster FR	*0.5 to 1 Water Sol Packet/A*	cloransulam 0.016 to 0.032 lb ai/A
Gangster V	*1.5 to 3 oz/A*	flumioxazin 0.048 to 0.096 lb ai/A

Weeds Controlled: Black nightshade, cocklebur, common ragweed, hophornbeam copperleaf, lambsquarters, marestail (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. Spray equipment must be cleaned each day. Spray equipment must be cleaned each day. To enhance removal of herbicide residue from spray system, use a tank cleaner such as All Clear.
Environmental Statements: Cloransulan has the potential to occur in ground water.
Rain Delay: 2 hours
Rotation Restrictions: Rotational crops that may be planted following GANGSTER include wheat after 3 months; field corn, popcorn, and sorghum after 9 months; transplanted tobacco after 10 months (consult label for rate and requirement for field bioassay for tobacco). A 30-month interval and a successful soil bioassay are required for alfalfa and certain other crops.
Harvest & Forage Restrictions: Do not feed treated forage or hay to livestock.
Tank Mixtures:

METRIBUZIN 75DF

METRIBUZIN 75DF 0.5 lb/A [metribuzin 0.38 lb ai/A)

Weeds Controlled: Common ragweed, hophornbeam copperleaf, lambsquarters, marestail (horseweed), smooth pigweed, prickly sida, smartweed.
Crop Stage: May be applied preplant incorporated, preemergence, or post directed after soybeans are 8 inches 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 trifoliate 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

PREFIX 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. For Postemergence applications use 2-2.33 pt/A from cracking through third trifoliate stage.
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 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: 2,4-D LVE, Gramoxone Inteon, glyphosate. (May be mixed with glyphosate for post applications to RR soybean.)

PROWL

PROWL 3.3E 1.8 to 3 pt/A (pendimethalin 0.74 to 1.24 lb ai/A)
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.

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

PYTHON 80WDG 1 to 1.33 oz/A (flumetsulam 0.05 to 0.067 lb ai/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.
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 has GROUND 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.
Rain Delay: None.
Rotation Restrictions: Soybeans and field corn may be planted anytime following PYTHON 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.

SPARTAN CHARGE

SPARTAN CHARGE 3.5 L 8.5 fl oz/A (sulfentrazone :carfentrazone 0.23:0.23 lb ai/A)

Weeds Controlled: Black nightshade, lambsquarters, morningglories, Palmer amaranth, smooth, pigweed, waterhemp. Incorporation and use of high rate may improve control of yellow nutsedge.
Crop Stage: May be applied preplant burndown, early preplant, & preemergence before soybeans emerge.
General Comments: Do not apply when there are visible signs of cracking of soil from soybean emergence. Soybean varieties vary in tolerance to sulfentrazone. Consult local seed supplier for varietal tolerance information.
Environmental Statements: SPARTAN CHARGE 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: Soybean and tobacco may be planted any time after application. Rotational crops that may be planted after SPARTAN CHARGE include wheat, barley, or rye after 4 months; field corn 4 months or sorghum after 10 months (18 months for sorghum if rate > 10.5 oz/A); and alfalfa and popcorn after 12 months following application. Other crops may require a 12-month interval and a successful bioassay.
Harvest & Forage Restrictions: No information listed on the label.
Tank Mixtures: glyphosate, glufosinate, or paraquat.

TREFLAN

TREFLAN 4HPF 1.5 to 2 pt/A (trifluralin 0.75 to 1.0 lb ai/A)

Weeds Controlled: Barnyardgrass, broadleaf signalgrass, crabgrass, fall panicum, foxtails, johnsongrass (seedling), lambsquarters, palmer amaranth, smooth pigweed, shattercane,
Crop Stage: Must be applied preplant incorporated within 24 hours after application in the top 2 to 3 inches of soil.
General Comments: Use the high rate for improved control of pigweeds, fall panicum, seedling johnsongrass and shattercane.
Environmental Statements: Do not apply in a manner which will directly expose lakes, streams, or ponds.
Rain Delay: None
Rotation Restrictions: When applied at the single rate, allow a 12-month rotation interval for grain sorghum, oats, and forage grasses. Other rotational crops may be planted following normal soybean growth and harvest.
Harvest & Forage Restrictions: No information listed on the label.
Tank Mixtures: Consult label.

VALOR SX or ENCOMPASS

VALOR SX 51WDG 2 to 2.5 oz/A
or (flumioxazin 0.064 to 0.080 lb ai/A)
ENCOMPASS 51 WDG 2 to 2.5 oz/A

Weeds Controlled: Black nightshade, common ragweed, hophornbeam copperleaf, lambsquarters, marestail (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 (eg. VALOR, ENCOMPASS) have the potential to runoff to surface water and adjacent land.
Rain Delay: 1 hour

VALOR SX or ENCOMPASS (continued)

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 or ENCOMPASS where flufenacet (Define), alachlor (Micro-Tech), metolachlor (Dual), or dimethenamid (Outlook) are applied or injury may occur.
Generic Products: OUTFLANK, PANTHER

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, marestail (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 (eg. Dual II magnum, Outlook, Intrro) may result in crop injury.

ZIDUA

ZIDUA 85 WDG 2 to 3 oz/A (pyroxasulfone 0.106 to 0.159 lb ai/A)

Weeds Controlled: Barnyardgrass, Broadleaf signlgrass, 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-trifoliate to third-trifoliate leaf stage. Do not apply from emergence (at-cracking) through unifoliate 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 4 months for wheat (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 Herbicides[1]

	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
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 / Amplify	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	**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**	**9**	**8**	**9**	**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**	**9**	**8**	7	**9**	**8**	**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 Sulfonylurea Tolerant (STS-soybean) or Liberty Link (LL-soybean). Consult label for directions.

5 Examples of specific glyphosate products are listed on page 20.

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 Herbicides[1]

	Bindweed, Field	Dandelion	Dogbane, Hemp	Horsenettle	Milkweed, Common	Milkweed, Honeyvine	Morningglory, Bigroot	Pokeweed, Common	Thistle, Canada	Trumpetcreeper
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 I**n-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 trumpetcreeper 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 trumpetcreeper.

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 trumpetcreeper.

MAXIMUM WEED SIZE LABELED FOR POSTEMERGENCE HERBICIDE APPLICATIONS

Herbicide	Rate	Barnyardgrass	Broadleaf Signalgrass	Crabgrass	Fall Panicum	Foxtai (Giant)	Johnsongrass (seedling)	Johnsongrass (rhizome)	Shattercane (Wildcane)	Volunteer Corn	Volunteer Wheat
ARROW 2 EC	4 to 6 oz	X	X	X	X	X	X	X	X	12”	X
	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]	—	—	—
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	6 oz	X	X	X	X	X	8”	X	X	X	X
	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	Pigweed	Prickly Sida	Ragweed, Common	Ragweed, Giant (Horseweed)	Sicklepod	Smartweed	Velvetleaf	Waterhemp	Yellow Nutsedge
CLASSIC	0.5 oz	X	X	6"	X	3"	X	2"	X	2" *	X	X	X	2"	2"	X	X	3"
	0.75 oz	X	6"	12"	X	6"	X	4"	X	4" *	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	X	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)** POWERMAX[1] (4.5 lb ae/gal)	16oz	4"	6"	18"	2"	6" *	6"	X	12" *	12"	2"	6" *	6"	2"	X	X	X	X
	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 — = 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.

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]
Classic	NIS or COC + (Liq N / AMS optional)	After first trifoliate 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 trifoliate 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.	1 hour
Flexstar GT	AMS, NIS , COC, or MSO optional	Do not apply within 45 days.	*** [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 trifoliate 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 trifoliate 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	Adjuvant[1]	Crop Stage (Timing of Application)[2]	Rain Delay[3]
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)	Up to 3rd trifoliate and before 90 days of 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)	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 trifoliate for Roundup Ready soybean	*** [4]
Synchrony XP	COC + Liq N (Consult label for using NIS for certain mixes)	After first trifoliate 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
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	
or	(additive)
CROP OIL CONCENTRATE 8 pt/100 gal	
+	+
28% UAN (4 to 8 pt/A) or AMS (2 to 4 lb/A) [may be included with surfactant or crop oil for certain weed species.]	(additive)

Weeds Controlled: Burcucumber, cocklebur, smooth pigweed, sicklepod.
Crop Stage: After first trifoliate 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.

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 [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]	(additive)
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 (Consult PHOENIX label for other additives)	(additive)

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- trifoliate 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 trifoliate 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 $\leq$ 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).

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 or CROP OIL CONCENTRATE 1 to 2 pt/25 gal [28% liquid N may be included with surfactant or crop oil]	(additive)

Weeds Controlled: Black nightshade, cocklebur, common ragweed, giant ragweed, hophornbeam copperleaf, morninglories, 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: Dawn, Reflex, Rhythm. Ringside, Rumble

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	(additive)
or SURFACTANT (NIS 75%)	1 to 2 qt/100 gal	
[28% UAN 1 gal/A) may be included with surfactant or crop oil]		

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] [(0.09:0.026 lb ai/A) to (0.188:0.053) lb ai/A]
+	+
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.

HARMONY SG (with TotalSol)

HARMONY SG 50DF 0.125 oz/A (⅛ 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 trifoliate 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.

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 21.**

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 ($\leq$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.

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), lambsquarters, marestail (horseweed),morninglories, palmer amaranth, smooth pigweed, prickly sida, shattercane, smartweed, velvetleaf, waterhemp. Consult label for weed size.
Crop Stage: Apply from emergence up to but not including bloom growth stage.
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-anitfoam based agent may be added.
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.

POAST or POAST PLUS

POAST 1.5E **POAST PLUS** 1E	1.0 to 1.5 pt/A or 1.5 to 2.25 pt/A	(sethoxydim 0.18 to 0.28 lb ai/A)
	+	+
CROP OIL CONCENTRATE DASH HC	2 pt/A or 1 pt/A	(additive)

[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 postemergence form cracking through third trifoliate stage of soybeans. 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.
Generic Formulation: Vise

PURSUIT

PURSUIT 2S 4 oz/A or **PURSUIT** 70 DG 1.44 oz/A [One 2.8 oz soluble bag per 2 acres]	(imazethapyr 0.063 lb ai/A)
+	+
SURFACTANT (NON-IONIC 80%) 1 qt/100 gal or CROP OIL CONCENTRATE 1.25 gal/100 gal or METHYLATED SEED OIL 1 gal/100 gal	(additive)
+	+
FERTILIZER SOLUTION [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]	(additive)

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.

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 SURFACTANT (NON-IONIC 80%) 1 qt/100 gal	(additive)
+	+
FERTILIZER SOLUTION [28 to 32% NITROGEN or 10-34-0 at 2.5 gal/100gal or AMS at 12 to 15 lb/100gal]	(additive)

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) (Consult labels for using non-ionic surfactant for certain tank mixes)	(additive)
+	+
[28% UAN (1 to 2 qt/A) or AMS (2.5 lb/A) may included with crop oil or surfactant.]	(additive)

Weeds Controlled: Common ragweed, velvetleaf.
Crop Stage: 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.

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 trifoliate.
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 ($\leq$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: Postemergnce after first trifoliate 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.
Rotation Restrictions: When SYPCHRONY 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	(acifluourfen 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, morninglories, smooth pigweed, smartweed, waterhenp.
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

PRODUCT	RATE		ADDITIVES COC.		NIS
ARROW [1]	0.65 oz	+	1.3 oz	or	0.3 oz
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

COMMENTS

[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.

GLYPHOSATE

GLYPHOSATE FORMULATION [3]	RATE
3 lb ae /gal	0.64 to 2.56 oz
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

COMMENTS

[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 21 for list of glyphosate products.

PARAQUAT

PRODUCT	R ATE	SURFACTANT
GRAMOXONE	0.33 to 0.67 oz	0.33 to 0.5 oz
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

COMMENTS

Thoroughly wet foliage but not to the point of runoff. Do not use around home gardens, schools, recreational areas, golf courses, or playgrounds.

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 21 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 INTEON.
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 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 gains. 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 to1.2 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 21.**		

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.

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), 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.
Generic formulations approved for wheat: Outflank

Preemergence Herbicides for Ryegrass

Axiom, Finesse, and Prowl H2O provide soil-residual suppression or control of Italian ryegrass. Emerged ryegrass is not affected by Prowl H2O; 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.
*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.			

Guide to the Relative Response of Weeds and Crop to Herbicides[1]

	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

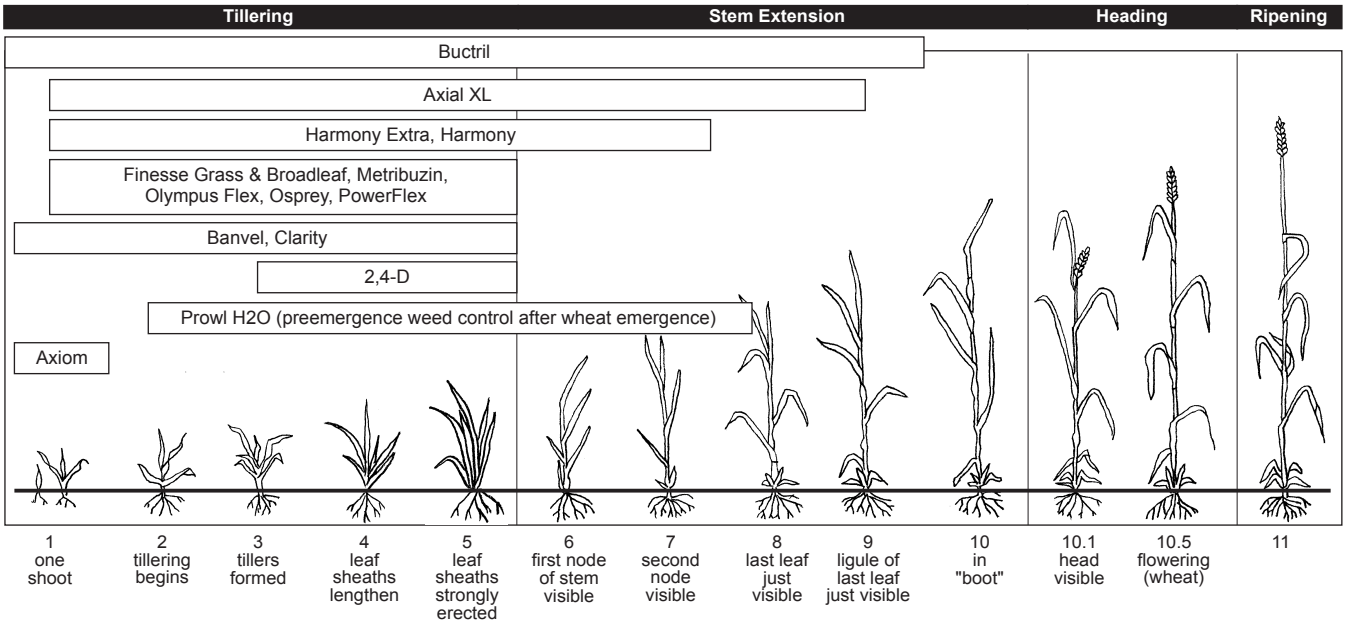
G = Good F = Fair P = Poor N = No Control - = No Information Available

[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.

Timing of Postemergence Herbicides Relative to Wheat Growth Stages



Feekes scale of wheat development.

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 corps 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 $\leq$ 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 (ESTER) 0.5 to 1.0 pt/A*
[* Rates based on 4 lb/gal formulation]

2,4-D 0.5 to 0.75 lb ai/A) or
(2,4-D 0.25 to 0.5 lb ai/A)

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.

FINESSE GRASS & BROADLEAF

Finesse Grass & Broadleaf 0.75 to 0.9 oz/A
+
Non-ionic Surfactant (2 qt/100 gal)

[28% UAN (2 qt/A) or AMS (2 lb/A) may be included with non-ionic surfactant]

(chlorsulfuron + flucarbazone)
(0.012:0.022 to 0.014:0.026 lb ai/A)
+
Additive

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 40^0F. 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 $\leq$ 7.9; 6 months for STS soybean; or 14 months for field corn where soil pH is $\leq$ 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 pertinent 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 $\geq$ 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.)

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) or
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: Filed 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.

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)	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. **Weeds Controlled:** Annual fleabane, barnyardgrass, brome spp., chickweed, common ragweed, crabgrass, fall panicum, giant foxtail, giant ragweed, johnsongrass (seedling), lambsquarters, marestail, mustards, prickly lettuce, smartweed, and other weed species.
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 21.**

Waiting Period or Limitations Before Utilizing Herbicide Treated Corn for Grazing or Forage Feed[1]

Herbicide	Grazing	Forage (silage, hay, etc.)
Accent Q/ NIC-IT	30 days	30 days
Armezon	45 days	45 days
Atrazine	60 days	60 days
Aim	Past 14-leaf collars	Past 14-leaf collars
Balance	45 days	45 days
Bicep II Magnum	60 days	60 days
Bullet	60 days	60 days
Callisto	45 days	45 days
Callisto Xtra	60 days	60 days
Capreno	45 days	45 days
Cinch ATZ	60 days	60 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
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.)
Guardsman 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 Prowl H20	None 21 days	None 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 Feed[1]

Herbicide	Harvested Grain	Forage (silage, hay, etc.)
Assure II	80 days; Do not apply after pod set	Do not feed
Authority First	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	---	Do not feed
Canopy EX	---	14 days
Classic	60 days before maturity	Do not feed
Cobra	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
Encompass	----	Do not feed
Envive	---	Do not feed
Express TotalSol	---	Do not feed
Fierce	---	Do not feed
FirstRate ≤ 0.3 oz/A > 0.3 oz/A	65 days 70 days	14 days 25 days
FirstShot	---	Do not feed
Flexstar / Flexstar GT	45 days	Do not feed
Fusion	Apply before bloom	Do not feed
Fusilade DX	60 days	60 days
Gangster	---	Do not feed
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
Harmony Extra	---	Do not feed
Harmony SG	60 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
Phoenix	45 days (Do not apply later than R6 stage or full seed)	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	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
Sonic	65 days	Do not feed
Spartan Charge	---	---
Spartan Advance	---	Do not feed
Synchrony XP	60 days before maturity	Do not feed
Treflan	---	*None
Ultra Blazer	50 days	Do not feed
Valor SX	----	Do not feed
Valor XLT	----	Do not feed
Verdict	----	Do not feed
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. ****Consult label for cereal crops when applying NIC-IT
Aim	0	0	0	0	12	0	0	Crops not registered on the label may be planted after 12 months following application.
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 Assist	10*	18	0	4**	12	40	9.5	*Allow 4 months for Clearfield hybrids and 18 months for popcorn. ** Allow 9.5 months for barley.
Authority First	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. ***Alfalfa 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								Use these intervals when rates are 6.5 to 7.5 oz/A. Consult label when rates are 3.2 to 4 oz/A regardless of pH. Crops with intervals > 12 months are a result of crop injury concerns. The crops should be planted with a successful bioassay. * Corn includes grain, silage, popcorn.
pH< 6.8	10*	10	0	4	12	36	10	
pH>6.8	18*	18	0	4	18	36	18	
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.
Basis	0	12	1*	3	10	18	18	*The rotation interval is 30 days for 0.5oz/A rate and 15 days If 0.33 oz/A rate.
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.
Buctril	1	1	1	1	1	1	1	Do not plant rotational crops within 30 days after application.
Bullet	0	0*	S	2F	2F	2F	2S	*Use CONCEP or SCREEN treated sorghum seed.
Butyrac 200	-	-	0	-	-	-	-	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	
Callisto	0	0	10	4*	10	18	10	*Small grains may be planted 120 days after application.
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. Cloak is a similar product with the same restrictions.
(pH > 7.0 & rate > 3.5 oz/A)	18	18	0	4	18	30	18	
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. * Field corn may be planted after 9 months if total chlorimuron rate does not exceed 0.64 oz/A. **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.
Rate 1.1 to 1.65 oz/A	8	9	7d	3	9	3	9	
Rate > 1.65 oz/A	10*	10	14d**	4	10	4	10	
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
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.
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 after application 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.

Crop Replanting and Rotation Guide*

Herbicide	Minimum Waiting Period (months) For Replant or Rotation Crops[1] Corn (field)	Grain Sorghum	Soybean	Wheat & Barley	Alfalfa	Forage Grasses	Tobacco	Remarks
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 afer 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.
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) (pH ≥ 7.0)	10 18	10 18	0 0	4 4	12 18	18 30	10 18	Do not exceed 4 oz/A where composite soil pH exceeds 7.0.
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 anytime 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. 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.
Fierce	30d*	18	0	4**	18	18	18	*Allow 30 days for conventional till corn or 7 days for minimum and no-till corn following 3 oz/A rate. Consult label when rate exceeds 3 oz/A. **Allow 18 months for other crops including 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

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	
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 ctops. ***Allow a 6-month interval for STS soybean, Non-STS soybeans require a field bioassay.
FirstRate	9	9	0	3*	9	30*	30*	*Rotation to tobacco (if FirstRate rate > 0.3 oz/A), barley, forage grasses, or other crops requires a 30 month interval and a successful field bioassay. If FirstRate rate is 0.3 oz/A transplanted tobacco requires only a 10-month rotation interval.
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	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.
Gangster	9	9	0	3*	30*	30*	30*	*Allow 30 months and conduct a successful field bioassay for barley, alfalfa, forage grasses. **Tobacco requires 30-month interval and field bioassay if FirstRate rate >3 oz/A; but only 10-month interval if rate ≤ 3 oz.A.
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 Inteon is approved for applications made prior to transplanting tobacco. Consult supplemental label.
Guardsman Max	0	0*	S	2F	2S	2S	2S	*Use herbicide safener treated sorghum seed.
Halex GT	0	0*	10	4	4	18	10	*Use herbicide safener treated sorghum seed.
Harness	0	S	S	F*	2S*	2F*	S	*Wheat can be planted following normal crop harvest. Label prohibits follow crop planting to barley, alfalfa, forage grasses and other crops.
Harness Xtra	0	S	S*	2F	2S*	2S*	2S*	*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.
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.

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	
Keystone	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	10*	*Rotation period is for 1.5 oz/A maximum use rate; 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 Dimetrtic 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 meribuzin 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.
Micro-Tech	0	0*	0	-	-	-	-	*Use Screen treated sorghum seed.
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 conductiong a filed 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.
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 bio-assay. * 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.

Crop Replanting and Rotation Guide*

Herbicide	Minimum Waiting Period (months) For Replant or Rotation Crops[1] Corn (field)	Grain Sorghum	Soybean	Wheat & Barley	Alfalfa	Forage Grasses	Tobacco	Remarks
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 ≤ 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	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	18	If REALM Q is applied following a mesotrione-containing herbicide, only corn (all types) or grain sorghum may be applied the following year. *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.
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.

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	
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**	*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.
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.
Spartan Advance	12*	10**	0	4	12	12*	0	*Corn, forage grasses and certain crops require an interval of 12 months and a successful field bioassay. **For sorghum allow 118 month interval if rate >57.6 fl oz/A
Spartan Charge	4*	10**	0	4	12	12***	0	* Allow 12 months for popcorn and sweet corn. ** Allow 18 months for sorghum for rates >10.2 fl oz.A *** Allow 12 months and a successful bioassay for other crops
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.

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								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.
0.375 oz/A	9*	9	0	3	9	3**	9	
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	-	
Treflan	-	12	0	-	-	12	-	When applied at the double rate, do not plant rotational crops not labeled for preplant incorporated Treflan until the second season following application.
Ultra Blazer	100days	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								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.
≤ 2oz/A **	30d	30d	0	7d*	4**	4**	30d	
Valor XLT								Do not use on soils with a pH >7.6.
Soil pH < 7.0	10	10	0	4	12	18	10	
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.
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	18	0	4*	10	18	18	Waiting period based on applying Zidua at 1 to 3 oz/A. *For barley and other small grains allow 11 months.

[1]Numerical 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

***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
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.

CHEMTREC (24 hour) Pesticide Emergency Hotline (800) 424-9300

EXPOSURE:

If you have a person who has been exposed to a particular pesticide, be prepared to provide a physician with specific details and emergency information on the product label.

Kentucky Regional Poison Control Center
State (800) 222-1222
Metro Louisville (502) 589-8222

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