

Postemergence Herbicides for Corn Production

The following herbicides are used to control established weeds after corn emergence. Products used primarily as soil-applied treatments but labeled for post uses also are listed in the previous section (Atrazine, Prowl).

Trade Name	Common Name	Formulation	Rate/Range
Accent	nicosulfuron	75 DF	0.33-0.66 oz/A

Mode of Action

ALS

Application Timing

Broadcast on corn up to 20 inches tall or exhibiting 6 or fewer leaf collars, whichever is more restrictive. For corn 20 to 36 inches tall, apply with drop nozzles. Do not apply to corn taller than 36 inches or exhibiting 10 collars. Apply to actively growing weeds within the recommended growth stage.

Recommended Spray Additives

Nonionic surfactant-0.25% v/v; or crop oil concentrate-1% v/v; or methylated seed oil-0.5% v/v. UAN (2-4 qt/A) or ammonium sulfate (2-4 lb/A) may be used along with a surfactant or COC. The use of MSO adjuvants should refer to the restrictions of tank-mix herbicide partners.

Comments

- Do not use if crop was treated with Counter 15 G or if Counter 20 CR was applied in furrow or at cultivation. Iowa State University does not recommend use if corn was treated previously with Counter.
- Do not tank mix with Basagran, Laddok, or 2,4-D.
- The need for a spray additive with Accent may increase the potential for crop injury when tank mixing with other products that do not recommend an additive.
- May be used on field corn and silage corn, high lysine, waxy, white, or other food grade hybrids. May be used on seed corn and popcorn if tolerance of the inbred or hybrid has been established. May be used on selected varieties of sweet corn for processing.
- Alfalfa, red clover, potatoes, sunflowers, and canola can be planted 10 months after Accent application.
- Accent may be applied aerially.
- Poor spray coverage from broadcast applications may occur when corn is taller than 8 to 12 inches, resulting in reduced weed control.
- Accent requires the use of a crop oil concentrate and nitrogen fertilizer for control of woolly cupgrass.
- Accent may interact with ALS herbicides applied previously to soybeans and to corn, thus increasing the potential for injury.

Trade Name	Common Name	Rate/Range
Accent Gold	6.5% nicosulfuron + 6.5% rimsulfuron + 51.7% clopyralid + 19.1% flumetsulam	2.9 oz/A
Accent Gold WDG	5.4% nicosulfuron + 5.4% rimsulfuron + 51.4% clopyralid salt + 15.9% flumetsulam	3.5 oz/A

Mode of Action–Accent Gold

ALS + ALS + Auxin + ALS

Application Timing

Apply to field corn up to 12 inches tall, up to and including 5 leaf collars, whichever is the most restrictive. Apply to actively growing weeds within the recommended growth stage.

Recommended Spray Additive

Crop oil concentrate-1% (v/v) with liquid nitrogen fertilizer (28% N at 2 to 4 qt/A or 10-34-0 or 11-37-0 at 1 to 2 qt/A) or with spray grade ammonium sulfate at 2 to 4 lbs/A.

Comments

- Apply only to field corn with greater than 88 days relative maturity.
- Do not use when soils have been treated with Counter or Thimet insecticide unless Clearfield corn has been planted.
- Apply spray mixture within 4 hours of mixing or refer to label for tank buffer recommendations.
- Thoroughly clean application equipment after use to avoid crop injury. Refer to label for cleaning instructions.

Trade Name	Common Name	Formulation	Rate/Range
Aim/Avalanche	carfentazone-ethyl	2EW	0.5 to 1.9 oz/A

Mode of Action

PPO

Application Timing

Apply to corn postemergence up to the 8 leaf collar stage and when weeds are 1 to 4 inches tall. Aim/Avalanche is also labeled for use as a burn-down application to control existing weeds prior to planting. Refer to the label for specific recommendations and restrictions.

Recommended Spray Additives

Nonionic surfactant -0.25% v/v. Crop oil concentrate-may be used under dry conditions; will increase risk of leaf speckling.

Comments

- Do not apply when wind speed is greater than 10 mph.
- May be used on field corn, silage corn, seed corn, sweet corn, and popcorn.
- Injury to corn can occur with certain herbicide combinations and adjuvants.
- Do not apply more than 1.9 oz Aim/Avalanche per season.

Trade Name	Common Name	Formulation	Rate/Range
Banvel	dicamba DMA salt	4 SC	0.5 to 1 pt/A
Clarity	dicamba DGA salt	4 SC	8 to 16 oz/A
Oracle	dicamba DMA salt	4 SC	0.5 to 1 pt/A
Sterling	dicamba DMA salt	4 SC	0.5 to 1 pt/A

Mode of Action

Auxin

Application Timing

Banvel/Oracle/Sterling

Apply 1 pt/A from corn emergence to the 5th true leaf; apply 0.5 pt/A to 8- to 36-inch tall corn or 15 days before tassel emergence, whichever comes first.

Application Timing

Clarity

Apply 16 oz/A from corn emergence to the 5th true leaf or 8-inch corn, whichever comes first. Apply 8 oz/A to 8- to 36-inch tall corn or 15 days before tassel emergence, whichever comes first. Post-directed applications can be made on corn up to 12 inches tall when tank mixed with Accent or Beacon.

Recommended Spray Additives

Banvel/Oracle/Sterling

A surfactant may be added to improve control of wild mustard, common sunflower, or velvetleaf when weeds are more than 5 inches tall or under drought stress.

Clarity

Add UAN at 0.5 to 1.0 gal/A or AMS at 2.5 lb/A to Clarity to improve velvetleaf control.

Comments

- Banvel/Oracle/Sterling and Clarity are different amine salts of dicamba. The primary difference between formulations is a reduction in the vapor pressure of Clarity, therefore reducing the potential for volatilization.
- Dicamba may be applied preemergence in corn. Potential for crop injury is greater with preemergence applications than with postemergence applications.
- Clarity should be applied at 8 oz/A on coarse-textured soils (both pre and postemergence applications).
- Extreme care must be taken to avoid dicamba drift onto soybeans, gardens, and other nontarget plants.
- Tank mixes with products requiring spray additives will increase the potential for crop injury.
- Do not apply Banvel/Oracle/Sterling if soybeans are growing nearby if: (1) corn is more than 24 inches tall; (2) soybeans are more than 10 inches tall, or (3) soybeans have begun to bloom.
- Improve crop safety by using drop nozzles on corn larger than 6 inches tall.
- Combinations with Accent should be applied with drops after the corn is 8 inches tall. Consider using the low rate of dicamba.
- May be used on ear corn, seed corn, popcorn, and silage corn but not on sweet corn. Do not apply to seed corn or popcorn without first consulting with the seed corn company.
- Do not graze or harvest treated corn prior to milk stage.
- The potential for crop injury (brittleness, buggy whipping) increases as corn exceeds 10 to 12 inches in height.

Trade Name	Common Name	Formulation	Rate/Range
Basagran	bentazon	4 S	1.5 to 2 pt/A

Mode of Action

PSII

Application Timing

Apply when weeds are small and actively growing and before weeds exceed maximum size listed on label.

Recommended Spray Additives

Crop oil concentrate-1 qt/A; or UAN (28% N)-0.5 to 1 gal/A.

Comments–Basagran

- Use UAN when velvetleaf is the primary target weed.
- Corn has good tolerance to Basagran, but occasionally slight leaf speckling occurs.
- May be used on ear corn, silage corn, sweet corn, and popcorn.

Trade Name	Common Name	Rate/Range
Basis 75 DF	50% rimsulfuron + 25% thifensulfuron methyl	1/3 to 1 oz/A

Mode of Action

ALS + ALS

Application Timing–Basis 75 DF

Fall application—May be applied after harvest but before ground freezes to control certain winter annual weeds. Use 1/3 to 2/3 oz/acre when applied in fall.

Preemergence and burndown application—Apply 1/3 to 1/2 oz of Basis preemergence to burndown existing weeds and provide early season residual control of certain weeds.

Postemergence application—Apply to field corn from spike to 2 collar (4 leaf, 6 inch). Apply to actively growing weeds within the recommended growth stage.

Recommended Spray Additives

Nonionic surfactant-0.25% (v/v) with UAN (2 to 4 qt/A), 10-34-0 (1 to 2 qt/A) or AMS (2 to 4 lb/A). Under drought conditions, increase NIS to 0.5% (v/v), or substitute 1 to 2% (v/v) COC for NIS.

Comments

- Application to corn larger than recommended will increase likelihood of crop injury.
- Do not use if crop is treated with Counter 15G or 20CR unless a Clearfield hybrid is planted.
- Do not use on soils with less than 4% organic matter if Counter 20G or Thimet have been applied unless a Clearfield hybrid is planted.
- Combination of Basis with dicamba products has increased the potential for crop injury compared to either product alone.
- Apply only to field corn with greater than 88 days relative maturity.
- Row cultivation approximately two weeks after Basis application normally will be required for full season weed control.
- Tank mixes with products not requiring spray additives may increase the potential for crop injury.
- Basis may interact with ALS herbicides applied previously to soybeans and to corn, thus increasing the potential for injury.
- Basis may be applied early preplant or preemergence to control emerged weeds and provide early season residual control.

Trade Name	Common Name	Rate/Range
Basis Gold	1.34% nicosulfuron + 1.34% rimsulfuron + 82.4% atrazine	14 oz/A

Mode of Action

ALS + ALS + PSII

Application Timing

Apply to field corn up to 12 inches tall up to and including 6 leaf collars, whichever is most restrictive. Apply to actively growing weeds within the recommended growth stage.

Recommended Spray Additives

Crop oil concentrate-1% v/v with liquid nitrogen fertilizer (28-0-0 at 2 qt/A or 10-34-0 at 1 qt/A) or with spray grade ammonium sulfate at 4 lb/A.

Comments–Basis Gold

- May be used on high oil corn.
- Application to corn larger than recommended will increase the likelihood of crop injury.
- Apply only to field corn with greater than 88 days relative maturity.
- Do not use when soils have been treated with Counter 15G unless Clearfield corn has been planted.
- Do not use on soils with less than 4% organic matter if Counter 20G has been applied unless Clearfield corn has been planted.
- Combinations of Basis Gold with dicamba products may increase the potential for crop injury under stressful conditions.
- Basis Gold is a restricted-use pesticide.

Trade Name	Common Name	Formulation	Rate/Range
Beacon	primisulfuron	75 DF	0.38 to 0.76 oz/A (½ to 1 packet/2 A)

Mode of Action

ALS

Application Timing

Broadcast when corn is 4 to 20 inches tall and when weeds are within recommended range. When corn is 20 inches or more than 6 leaf collars to pretassel, apply with drop nozzles. Do not apply after tassel emergence.

Recommended Spray Additives

Crop oil concentrate-1 to 4 pt/A; or nonionic surfactant-0.25% v/v. UAN (28% N) or AMS. May be used along with a surfactant or COC at 2 to 4 qt/A or 2 to 4 lb/A. A nitrogen source is recommended for improved velvetleaf control.

Comments

- Consult label for restrictions regarding insecticide use.
- May be applied as a split application. Second application should be made when corn is 20 inches tall to pretassel, using post-directed equipment.
- May be used on field corn, silage corn, popcorn, and seed corn if inbreds and popcorn varieties have been determined to be tolerant.
- The tank mix with Accent requires that a herbicide for grass control be applied to the soil previously.
- Spray coverage from broadcast applications may be negatively affected when corn is taller than 8 to 12 inches.
- Tank mixes with products not requiring spray additives may increase the potential for crop injury.
- Beacon may interact with ALS herbicides applied previously to soybeans and to corn, thus increasing the potential for injury.

Trade Name	Common Name	Formulation	Rate/Range
Buctril	bromoxynil	2 EC	1 to 1.5 pt/A
Buctril 4EC		4 EC	½ to ¾ pt/A
Moxy 2EC		2 EC	1 to 2 pt/A
Connect		20 WSP	1.25 to 1.875 lb/A

Mode of Action

PSII

Application Timing

Apply to corn between the 3-leaf stage and prior to tassel emergence. Refer to label for maximum weed size for application.

Comments–Buctril

- Use of spray additives or liquid fertilizer required in certain tank mixes may cause excessive leaf burn.
- May be used on field corn or popcorn.
- May be applied aerially.
- Buctril Gel is a gelatinous mixture packaged in water-soluble bags.
- Connect will be positioned on seed corn and may have less foliar burn than other bromoxynil formulations.

Trade Name	Common Name	Rate/Range
Buctril + Atrazine	1.0 lb bromoxynil + 2.0 lb atrazine/gal	1½ to 3 pt/A
Moxy + Atrazine	1.0 lb bromoxynil + 2.0 lb atrazine/gal	1½ to 3 pt/A

Mode of Action

PSII + PSII

Application Timing–Moxy + Atrazine

Apply to corn between the 3-leaf stage and 12-inches tall. See label for specific weed heights.

Recommended Spray Additives

Surfactants, crop oil concentrates, or liquid fertilizers may be used as spray additives. The use of an additive may cause excessive leaf burn.

Comments

- See remarks under Atrazine and Buctril.
- Buctril + Atrazine is a restricted-use pesticide.
- Moxy + Atrazine is a restricted-use pesticide.
- May be used on field corn and popcorn. Determine tolerance of inbred lines prior to application to seed corn.
- Follow all atrazine surface water and groundwater warning statements and restrictions.

Trade Name	Common Name	Formulation	Rate/Range
Callisto	mesotrione	4 lb/gal	3 fl. oz/A

Mode of Action

Bleacher (HPPD inhibitor)

Application Timing

Apply 3 oz/A to postemergence corn up to 30 inches tall or up to the 8-leaf stage of corn growth.

Recommended Spray Additive

Always include 1% v/v crop oil concentrate and either 2.5% UAN or 8.5 lb/100 gal AMS. Do not use methylated seed oils.

Comments

- Do not apply to popcorn, sweet corn, or Indian corn.
- Do not apply when weather conditions may cause drift to non-target areas. The label prohibits applications when wind speed is greater than 10 mph.
- Do not apply Callisto on fields treated with Lumax or Camix in the season.
- Do not exceed 7.7 oz of Callisto per season.
- Severe corn injury and yield loss may occur if Callisto is applied to corn previously treated with Counter or Lorsban.

Comments–Callisto, continued

- Do not use crop oil concentrate as an additive when tank-mixing with Liberty.
- Severe corn injury and yield loss may occur if Callisto is applied in a tank mix with any organophosphate or carbamate insecticide.
- Severe corn injury and yield loss may occur if any organophosphate or carbamate insecticide is applied foliar postemergence within 7 days before or after a Callisto application.
- Do not cultivate within 7 days of a Callisto application.
- Do not tank mix with emulsifiable concentrate grass herbicides (Dual, Harness, etc.).
- Aerial applications are allowed.
- Do not harvest or graze treated fields for 45 days after application.
- Callisto is cleared for preemergence applications. See remarks in Pre section.

Trade Name	Common Name	Rate/Range
Celebrity	69.3% dicamba + 7.5% nicosulfuron	6.67 oz/A

Mode of Action

auxin + ALS

Application Timing–Celebrity

Apply early postemergence when weeds are at stage listed on label. Drop nozzles should be used for field corn that is 20 to 36 inches tall.

Recommended Spray Additives

Nonionic surfactant-1 to 2 qt per 100 gallons, plus UAN-2 to 4 qt/A.

Comments

- Do not tank mix with OP insecticides or bentazon (Basagran, Laddok).
- Do not apply to corn that is taller than 36 inches or has 10 or more collars (V10 growth stage).
- May be used on field, seed, and popcorn.
- May be applied aerially.
- The potential for crop injury (brittleness, buggy whipping) increases as corn exceeds 10 to 12 inches in height.

Trade Name	Common Name	Rate/Range
Celebrity Plus	46.6% dicamba + 18.1% diflufenzopyr + 10.6% nicosulfuron	4.7 oz/A

Mode of Action

Auxin + auxin transport inhibitor + ALS

Application Timing

Apply when weeds are actively growing and corn is 4 to 24 inches tall.

Recommended Spray Additives

Nonionic surfactant-1 to 2 qt per 100 gallons, plus UAN-2 to 4 qt/A.

Comments

- See label restrictions for insecticide use.
- Poor weed control or crop injury may result if applied to plants under stress due to lack of moisture, hail, flooding, herbicide injury, mechanical injury, or widely fluctuating temperatures.

Comments—Celebrity Plus, continued

- May be used on field corn (including high lysine, waxy, white).
- Do not apply bentazon (Basagran, Laddok) or OP insecticides 7 days before or 3 days after applying Celebrity Plus.
- The potential for crop injury (brittleness, buggy whipping) increases as corn exceeds 10 to 12 inches in height.

Trade Name	Common Name	Rate/Range
Distinct	55% dicamba + 21.4% diflufenzopyr	4 to 6 oz/A

Mode of Action

Auxin + auxin transport inhibitor

Application Timing

Apply when weeds are young and actively growing and when corn is V1 to V4 stage. Do not apply to V5 or larger corn.

Recommended Spray Additives

Nonionic surfactant -1 qt per 100 gallons, plus 5 qt UAN per 100 gal or 2.5 lb/A AMS.

Comments

- The label recommends avoiding tank mixes with other growth regulator herbicides (2,4-D, dicamba, etc.).
- May be used on field corn grown for grain or silage and popcorn.
- Do not apply in tank mix with Lorsban, Ambush, or Warrior.
- Tankmixes with EC formulations of acetamide herbicides (e.g. Outlook) are not recommended after corn emergence due to the potential for crop injury.
- The potential for crop injury (brittleness, buggy whipping) increases as corn exceeds 10 to 12 inches in height.
- When using AMS, be sure that the Distinct is completely dissolved before adding the AMS.

Trade Name	Common Name	Formulation	Rate/Range
Equip	30 % foramsulfuron + 2% iodosulfuron methyl + safener	32% WDG	1.5 oz/A

Mode of action

ALS + ALS

Application timing

Apply when weeds are young and actively growing and when corn is 0-12 inches in height or from the VE to V4 stage.

Recommended Spray Additives

Methylated or ethylated seed oil at 1.5 pt/A plus 1.5-2.0 qt/A of UAN or 1.5-3.0 lb/A of AMS

Comments

- Equip includes a safener to reduce the risk of crop injury; however, crop injury may occur when corn is stressed by other factors.
- Use only on field corn, including hi-lysine, white, and high oil corn.
- Do not apply to hybrids classified as sensitive by seed companies.
- Do not make more than one application of Equip per season.
- Do not apply to soils with pH greater than 8.5
- Use not recommended on fields treated with Counter (15G or 20CR), Dyfonate, or Thimet.
- Do not make a foliar application of an OP insecticide within 7 days of an Equip application.
- Do not apply to hybrids classified as sensitive by seed companies.
- Iodosulfuron is a persistent compound; see label for rotational crop restrictions. Soybeans have an 8-month rotation interval.

Trade Name	Common Name	Rate/Range
Exceed 57 WG	28.5% prosulfuron + 28.5% primisulfuron	0.8 to 1 oz/A

Mode of Action

ALS + ALS

Application Timing

Apply to corn 4 to 30 inches in height. Use drop nozzles when corn exceeds 20 inches or 6 leaf collars.

Recommended Spray Additives

Crop oil concentrate or nonionic surfactant is recommended. AMS or 28% N may be added. Refer to the Exceed label for specific recommendations.

Comments—Exceed 75WG

- Soybean rotation when soil pH is below 7.8: North of I-80, 18 months; South of I-80, 10 months for STS soybean varieties or 18 months for other soybean varieties.
- Consult label for restrictions regarding insecticide use.
- Exceed may be applied directly to popcorn. Test selectivity on seed and popcorn before treating large acreages. Seed corn can be treated between 4 to 20 inches (6 or fewer leaf collars). Drop nozzles must be used when inbred corn is 20 to 30 inches tall.
- Prosulfuron is more persistent in areas of reduced summer rainfall or with high pH soils. Some soybean injury has occurred the following year on high pH soils or in areas with low summer rainfall.
- STS soybeans have a greater tolerance to prosulfuron and may reduce the likelihood and severity of carryover injury. STS soybeans may still be damaged by prosulfuron.
- Exceed may be applied aerially.
- Exceed may interact with ALS herbicides applied previously to soybeans and to corn, thus increasing the potential for injury.
- Tank mixes with products not recommending spray additives may increase the potential for crop injury.

Trade Name	Common Name	Rate/Range
Hornet WDG	18.5% flumetsulam + 60% clopyralid salt	2 to 5 oz/A

Mode of Action

ALS + auxin

Application Timing

Apply Hornet WDG postemergence to corn from spike to 20 inches tall or through the V6 growth stage, whichever occurs first. Directed application with drop nozzles may be made to corn 20 to 36 inches tall.

Recommended Spray Additives

Nonionic surfactant at 0.25% v/v; or crop oil concentrate at 1% v/v; or methylated seed oil at 1% v/v. Under extremely dry conditions, include 2.5% v/v 28% N with a surfactant for improved control.

Comments

- A postemergence application of Hornet may follow a soil application of Hornet WDG. Do not exceed 0.07 lb/A flumetsulam per year.
- Apply at least 85 days before harvest.

Comments–Hornet, continued

- Do not apply to sweet corn or popcorn.
- Hornet WDG is registered for corn grown for seed production. Refer to the recommendations from the seed company.
- Do not use Hornet WDG if Counter or Thimet have been applied.
- Flumetsulam may interact with ALS herbicides applied previously and ALS herbicides applied postemergence to corn the current year, thus increasing the potential for injury.
- The Hornet WDG label suggests that if another ALS herbicide was applied the previous year, apply Hornet WDG only if the rotational restrictions applicable to corn have been met.
- Do not tank mix Hornet WDG with foliar organophosphate insecticides. Allow a 10-day interval between OP insecticide and Hornet applications.
- Do not apply through irrigation equipment. A supplemental label allows aerial applications in Iowa.
- For control of Canada thistle in conservation tillage systems, delay application until thistles are 4 to 8 inches in height.

Trade Name	Common Name	Rate/Range
Laddok S12	2.5 lb bentazon + 2.5 lb atrazine/gal	1.33 to 2.33 pt/A

Mode of Action

PSII + PSII

Application Timing

Apply when weeds are small and actively growing and before weeds reach the maximum size listed on label. Do not apply after corn exceeds 12 inches in height.

Recommended Spray Additives

UAN-5% v/v (1 gal/A maximum), or AMS-2.5 lb/A; or COC-1.25% v/v (1 qt/A maximum), or Dash HC-0.625% v/v (1 pt/A maximum).

Comments

- Laddok is a restricted-use pesticide.
- May be used on field corn, sweet corn, popcorn, and corn grown for seed or silage.
- Do not cultivate within 5 days before or after application.
- Follow all atrazine surface water and groundwater warning statements and restrictions.

Trade Name	Common Name	Formulation	Rate/Range
Liberty	glufosinate	1.67 S	32 oz/A

Mode of Action

GS

Application Timing

Apply postemergence broadcast or directed with drop nozzles to corn from emergence until corn is 24 inches tall or in the V7 (7 leaf collars) stage, whichever comes first. Apply Liberty as a directed spray with drop nozzles when corn is 24 to 36 inches.

Recommended Spray Additives

A fine-feed grade or spray grade ammonium sulfate at 3 lb/A must be added. Do not substitute 28% N or other fertilizer additives or use surfactants, crop oil concentrates, or methylated seed oils.

Comments–Liberty

- Use only on corn hybrids designated Liberty Link or warranted by AgrEvo to be resistant to Liberty.
- Up to two applications may be made during a growing season; do not exceed 62 oz/A per year.
- Thorough spray coverage is important for optimum performance. Flat fan nozzles (80 or 110-degree) are recommended with a minimum of 15 gpa and 30 to 60 PSI. With dense plant canopy, 20 to 40 gpa should be applied to ensure thorough spray coverage.
- Do not apply Liberty within 60 days of harvesting corn forage or 70 days of harvesting corn grain and corn fodder.
- Do not apply at ground speeds exceeding 12 mph.
- Use a minimum of 45 PSI with Turbo Teejet spray tips to ensure thorough spray coverage.
- A cultivation may be made at least 5 days before a Liberty application or 5 or more days after a Liberty application.
- Do not apply Liberty through irrigation systems.
- Do not apply Liberty to corn showing stress from previous herbicides or the environment.

Trade Name	Common Name	Rate/Range
Liberty ATZ	1.0 lb/gal glufosinate + 3.3 lb/gal atrazine	32 to 40 oz/A

Mode of Action

GS + PSII

Application Timing

Apply postemergence to corn from emergence until corn is 12 inches tall. Refer to label for size recommendations on specific weeds.

Recommended Spray Additives

A fine-feed grade or spray grade ammonium sulfate at 3 lb/A must be added. Do not substitute 28% N or other fertilizer additives or use surfactants, crop oil concentrates, or methylated seed oils.

Comments

- Use only on corn hybrids designated Liberty Link or warranted by AgrEvo to be resistant to Liberty ATZ.
- Do not apply more than one application of Liberty ATZ during a growing season. However, retreatment with Liberty is allowed.
- Thorough spray coverage is important for optimum performance. Flat fan nozzles (80 to 110 degree) are recommended with a minimum of 15 gpa and 30 to 60 PSI. With dense plant canopy, 20 to 40 gpa should be applied to ensure thorough spray coverage.
- Do not apply Liberty ATZ within 60 days of harvesting corn forage or 70 days of harvesting corn grain and corn fodder.
- Do not apply at ground speeds exceeding 12 mph.
- Use a minimum of 45 PSI with Turbo Teejet spray tips to ensure thorough spray coverage.
- A cultivation may be made at least 5 days before a Liberty ATZ application or 5 or more days after a Liberty ATZ application.
- Antifoams or drift control agents may be added as needed.
- Do not apply Liberty ATZ through irrigation systems.
- Do not apply Liberty ATZ to corn showing stress from previous herbicides or the environment.
- Liberty ATZ is a restricted-use pesticide.
- Follow atrazine surface water and groundwater warning statements and restrictions.

Trade Name	Common Name	Rate/Range
Lightning 70DF	52.5 % imazethapyr + 17.5% imazapyr	1.28 oz/A

Mode of Action

ALS + ALS

Application Timing

Apply postemergence when corn and weeds are actively growing. For optimal weed control, apply before weeds exceed 4 inch height and before corn is 12 inches tall.

Recommended Spray Additives

Include nonionic surfactant (0.25% v/v-1 qt/100 gal spray solution) and a nitrogen based fertilizer (28% N or 10-34-0) at a rate of 1 to 2 qt/A. An organo-silicone surfactant may be used in place of a nonionic surfactant.

Comments–Lightning 70DF

- Use only with Clearfield hybrids.
- Do not harvest or graze treated corn or fodder for at least 45 days after application.
- There are no restrictions for soil insecticides with Clearfield hybrids.
- Do not use liquid fertilizer as a carrier.
- For maximum weed control, cultivate 7 to 10 days following Lightning application.
- Do not apply through any type of irrigation system.
- Do not apply directly to water or to areas where surface water is present.
- There should be an interval of at least 45 days between the application of Lightning and harvest.

Trade Name	Common Name	Rate/Range
Marksman 3.2 F	1.1 lb dicamba + 2.1 lb atrazine/gal	2 to 3.5 pt/A
Stratos	1.1 lb dicamba + 2.1 lb atrazine/gal	2 to 3.5 pt/A
Sterling Plus	1.1 lb dicamba + 2.1 lb atrazine/gal	2 to 3.5 pt/A

Mode of Action

Auxin + PSII

Application Timing

Apply from corn emergence through the fifth leaf stage but before corn reaches 8 inches in height.

Recommended Spray Additives

A nonionic surfactant may be used to improve control of drought-stressed weeds. UAN (0.5 to 1 gal/A) or AMS (2 to 2.5 lb/A) can also be used to improve weed control.

Comments

- Marksman/Stratos/Sterling Plus may be applied preemergence in corn. Potential for crop injury is greater with preemergence applications than with postemergence applications.
- Marksman/Stratos/Sterling Plus is a restricted-use pesticide.
- Tank mixes with products requiring spray additives may increase the likelihood of crop injury.
- May be used on field, seed, popcorn, and silage corn. Do not apply to seed corn without verifying selectivity on your inbred lines.
- Follow atrazine surface water and groundwater warning statements and restrictions.
- UAN may be included at rate of 0.5 to 1.0 gal/A.

Trade Name	Common Name	Rate/Range
NorthStar	7.5 % primisulfuron + 43.9% dicamba	5 oz/A

Mode of Action

ALS + auxin

Application Timing

Apply postemergence when corn is between 4 and 20 inches tall. Apply to corn when 4 to 12 inches tall for best results. Directed applications with drop nozzles may be applied when corn is 20 to 36 inches tall.

Recommended Spray Additives

Nonionic surfactant at 0.25% or crop oil concentrate at 1 to 4 pt/A. Do not use COC on corn greater than 12 inches tall. UAN (2-4 qt/A) or AMS (2-4 lb/A) may be used in combination with the NIS or COC.

Comments

- May be applied broadcast to field corn or as directed application to field corn grown for seed or popcorn.
- Apply to 4- to 12-inch corn for best results.
- Do not apply OP insecticides within 10 days before or 7 days after a NorthStar application.
- Do not apply NorthStar if corn was treated with Counter 15G or with an in-furrow application of Counter CR.
- Do not apply when soybeans are growing nearby if: (1) corn is more than 24 inches tall, (2) soybeans are more than 10 inches tall, or (3) if soybeans have begun to bloom.
- The potential for crop injury (brittleness, buggy whipping) increases as corn exceeds 10 to 12 inches in height.

Trade Name	Common Name	Formulation	Rate/Range
Option	35% foramsulfuron + isoxadifen-ethyl (safener)	35WG	1.5 oz/A

Mode of Action

ALS

Application Timing

Broadcast apply to corn through the V6 stage of development. Do not apply broadcast to V7 or larger corn. For V7 or V8 stage corn, apply with drop nozzles. Apply to actively growing weeds within the recommended growth stage.

Recommended Spray Additives

Methylated or ethylated seed oil at 1.5 pt/A and UAN at 1.5 qt/A or AMS at 1.5 lb/A.

Comments

- Do not use if corn was previously treated with Counter insecticide.
- The use of NIS, COC, COC/MSO blends or refined vegetable oils will result in unacceptable weed control. UAN or AMS must be included.
- Option is rainfast within 2 hours of application.
- Option may be applied at 1.75 oz/A as a rescue treatment to control/suppress weeds beyond labeled size.
- Corn may be replanted 7 days after Option application, soybeans may be replanted 14 days after application, and all other crops may be planted 60 days after application.
- Do not make more than 2 applications of Option per growing season.
- Option may be applied to field corn, corn grown for silage, high lysine corn, waxy corn, white corn, and other food grade hybrids. DO NOT use on sweet corn or popcorn.
- Isoxadifen is a broad-spectrum corn safener and may enhance the degradation of other herbicides.

Trade Name	Common Name	Formulation	Rate/Range
Permit	halosulfuron	75 WDG	$\frac{2}{3}$ to 1 $\frac{1}{2}$ oz/A

Mode of Action

ALS

Application Timing

Apply over the top or with drop nozzles from spike through layby stage.

Recommended Spray Additives

Nonionic surfactant-0.25% to 0.5% v/v or COC-1%. UAN-4% v/v may be used along with surfactant or COC.

Comments

- May be applied preemergence (1.3 to 2.0 oz/A) if Clearfield corn is planted.
- Permit may interact with ALS herbicides applied previously to soybeans and to corn, thus increasing the potential for injury.
- Tank mixes with products not recommending spray additives may increase the potential for crop injury.

Trade Name	Common Name	Formulation	Rate/Range
Pursuit	imazethapyr	2 AS	4 oz/A

Mode of Action

ALS

Application Timing

Apply postemergence when weeds are actively growing but before the 3-inch stage of growth, unless otherwise indicated on the label, and before corn exceeds the 8-leaf stage. Apply prior to 45 days before harvest.

Recommended Spray Additives

Nonionic surfactant-Apply 0.25% v/v.; or crop oil concentrate-1% (v/v), or methylated seed oil-1% (v/v), and include 1 to 2 qt/A nitrogen-based liquid fertilizer or 2.5 lb/A ammonium sulfate.

Comments

- Pursuit may be applied preplant incorporated or preemergence up to 45 days before planting. Incorporation improves consistency of soil-applied treatments.
- Apply only to Clearfield hybrids.
- Do not graze or feed treated corn, forage, silage, fodder, or grain for at least 45 days after Pursuit applications.
- Make only one application of Pursuit per growing season.
- Do not use crop oil concentrates for Pursuit applied in combination with Buctril.
- If IT corn hybrids are treated with Counter 15G soil insecticide, do not apply Pursuit plus Accent.
- Grass control activity for Pursuit may be reduced when applied in combination with atrazine, Buctril, Banvel, Basagran, Clarity, or Marksman.
- Refer to specific labels for restrictions.

Trade Name	Common Name	Rate/Range
ReadyMaster ATZ	2 lb glyphosate + 2 lb atrazine	1.5 to 2 qt/A

Mode of Action

EPSPS + PSII

Application Timing

Apply postemergence from corn emergence until corn is 12 inches tall.

Comments

- Apply to Roundup Ready corn hybrids only.
- Do not graze or feed forage or silage following a sequential in-crop application of this product followed by glyphosate on Roundup Ready corn.
- Do not apply aerially.
- Maintain appropriate buffer zones to prevent injury to adjacent desirable vegetation.
- ReadyMaster ATZ is a restricted-use pesticide.

Trade Name	Common Name	Formulation	Rate/Range
Resource	flumiclorac	0.86 EC	4 to 8 oz/A

Mode of Action

PPO

Application Timing

Apply postemergence to corn at the 2- through 10-leaf stage.

Recommended Spray Additives

When used alone, apply with COC (1 to 2 pt/A). The addition of AMS (2.5 lb/A) is recommended. When used in tank mixes, may be applied with COC, nonionic surfactant, and UAN. See label for specific recommendations.

Comments

- Do not use on popcorn or sweet corn.
- Do not apply Resource during periods when weeds or corn are under stress.
- Do not graze or use as feed less than 28 days after application.
- Do not apply more than 6 oz/A of Resource in a single broadcast application.
- Do not apply more than 8 oz/A of Resource during the growing season.
- Use drop nozzles if Resource is applied at 8 oz/A.
- Apply Resource plus Roundup Ultra/glyphosate to RR corn hybrids only.
- Apply Resource plus Poast Plus to SR corn hybrids only.
- Apply Resource plus Liberty to Liberty Link hybrids only.

Trade Name	Common Name	Formulation	Rate/Range
Roundup Ultra	glyphosate	3SL	24 to 32 oz/A
Roundup UltraMax		4SL	20 to 26 oz/A
Roundup UltraDry		65DG	9.5 to 28.8 oz/A
Roundup WEATHERMAX		5.5SL	16 to 22 oz/A
Glyphomax/Glyphomax Plus		3SL	24 to 32 oz/A
Touchdown IQ		3SL	24 to 32 oz/A
Cornerstone		3SL	24 to 32 oz/A
Cornerstone Plus		3SL	24 to 32 oz/A
Various			

Mode of Action

EPSPS

Application Timing

Postemergence to RR Corn—Approved glyphosate products may be applied from emergence until Roundup Ready® corn is 30 inches or at the V8 growth stage, whichever is more restrictive. Apply 24 to 32 oz/A per application of 3 lb ae/gal formulations with a maximum of 64 oz/A glyphosate per season excluding preemergence and pre-harvest applications. Rates for Roundup WeatherMax are 16 to 22 oz/A. Rates for Cornerstone and Cornerstone Plus on Roundup Ready 2 corn are a maximum of 48 oz or a combined season total of 96 oz. A maximum season total of 64 oz of Cornerstone or Cornerstone Plus can be applied to Roundup Ready® corn.

Preharvest application—Apply 2 pt Roundup Ultra, Touchdown, or equivalent rate of other glyphosate products after corn has reached physiological maturity (black layer) but at least 7 days before harvest.

Recommended Spray Additives

AMS may be included if weeds are under stress or hard water is used as carrier. Certain glyphosate products recommend the use of a nonionic surfactant. Refer to specific glyphosate label and follow manufacturer's recommendations. Roundup Ultra Max and Roundup Weather Max do not require additional surfactants or additives, as specified by the label.

Comments

- Use only on Roundup Ready® corn hybrids.
- Specific recommendations may vary among glyphosate products. Two postemergence applications of Roundup products can be made during the growing season. Do not exceed 2 qt/A Roundup Ultra/Touchdown or 44 oz of Roundup WeatherMax with postemergence applications per season.
- Hybrids designated as Roundup Ready® corn 2 allow a maximum single postemergence application rate of 32 oz and a combined total of 2 qt WeatherMax per acre applied postemergence.
- Do not apply aerially.
- Take appropriate precautions to minimize off-target movement of spray droplets.
- The timing and rates of glyphosate used for annual weeds will not be optimal for most perennial weeds.
- Glyphosate may be applied in combination with residual herbicides listed on the label before weeds exceed 4 inches in height.
- Do not graze, harvest, or feed corn forage or silage following sequential in-crop applications. Grazing after harvest is permitted.
- Equivalent rates of different concentration formulations of glyphosate

Roundup Original (3 lb ae/gal)	Roundup Ultramax (4 lb ae/gal)	Roundup WeatherMax (4.5 lb ae/gal)
24 oz	20 oz	16 oz
32 oz	26 oz	22 oz
40 oz	32 oz	27 oz

Trade Name	Common Name	Formulation	Rate/Range
Sencor	metribuzin	75 DF	1 to 3 oz/A

Mode of Action

PSII

Application Timing

Apply after corn emergence to actively growing weeds and before weeds reach maximum height specified on label.

Recommended Spray Additives

UAN or a surfactant may be added to tank mixes with Sencor and Basagran. Include a surfactant and UAN with Pursuit.

Comments

- Sencor must be used in combination with one of the registered products.
- Do not use on corn grown for seed.
- Do not graze treated area or feed treated forage to livestock.
- Sencor 75 DF can be applied at 2 to 4 oz/A Roundup or Gramoxone Extra for burndown of weeds before, during, or after planting but before crop emergence.

Trade Name	Common Name	Formulation	Rate/Range
Shotgun	2.25 lb atrazine + 1.0 lb a.e. 2,4-D LVE	3.25F	2 to 3 pt/A

Mode of Action

PSII + auxin

Application Timing

Preplant—Apply approximately 7 to 14 days before planting.

Preemergence—Apply after planting but before corn emerges.

Postemergence—Apply from spike to 5-leaf stage of corn but before corn exceeds 12 inches in height.

Comments

- Do not apply in combination with Accent.
- 2 pt Shotgun contains 0.25 lb a.e. 2,4-D LVE, the equivalent of ½ pt of a 4 lb/gal 2,4-D product.
- Shotgun is a restricted-use pesticide.

Trade Name	Common Name	Rate/Range
Spirit 57 WG	14.2% prosulfuron + 42.8% primisulfuron	1 oz/A

Mode of Action

ALS + ALS

Application Timing

Apply to corn that is 4 to 24 inches tall. Use drop nozzles when corn exceeds 20 inches or more than 6 leaf collars. Do not apply after June 30 if south of I-80 and rotating to soybeans.

Recommended Spray Additives

Crop oil concentrates or nonionic surfactants should always be used. AMS or 28% N may be added.

Comment

- Soybean rotation for soils with a pH lower than 7.8: south of I-80, rotate to soybeans after 10 months; north of I-80, rotate to soybeans after 18 months.

Trade Name	Common Name	Rate/Range
Steadfast 75DF	50% nicosulfuron + 25% rimsulfuron	0.75 oz/A

Mode of Action

ALS + ALS

Application Timing

Apply to corn that is up to 20 inches tall, up to and including 6 leaf collars, whichever is most restrictive.

Recommended Spray Additives

Include either a crop oil concentrate at 1% v/v, a nonionic surfactant at 0.25 – 0.5% v/v, or methylated seed oil (MSO) - 0.5% v/v. In addition, include an ammonium nitrogen fertilizer: UAN at 2 qt/A; 10-34-0 at 1 qt/A; AMS at 2 lb/A. Refer to restrictions included in the tank-mix partner when using MSO with Steadfast.

Comments

- Do not apply to field corn grown for seed, to popcorn, or to sweet corn.
- Do not make more than one application of Steadfast per cropping season.
- Do not tank mix with 2,4-D, Basagran or Laddok.
- Do not tank mix with organophosphate insecticides or apply insecticide within seven days before or three days after the application of Steadfast.
- Steadfast may interact with soil insecticides. See label for restrictions following application of Counter, Dyfonate, Lorsban or Thimet.
- When dicamba products are included with Steadfast, do not apply after corn has exceeded 12 inches in height or is V5 (5 leaf collars).
- Alfalfa, red clover, potatoes, sunflowers, and canola can be planted 10 months after Steadfast application.

Trade Name	Common Name	Rate/Range
Steadfast ATZ	2.7% nicosulfuron + 1.3% rimsulfuron + 85.3% atrazine	14 oz/A

Mode of Action

ALS + ALS + PSII

Application Timing

Apply to corn that is up to 12 inches tall or through 6 leaf collars, whichever is more restrictive.

Recommended Spray Additives

Include either a crop oil concentrate at 1% v/v, a nonionic surfactant at 0.25 – 0.5% v/v, or methylated seed oil (MSO) 0.5% v/v. In addition, include an ammonium nitrogen fertilizer: UAN at 2 qt/A; 10-34-0 at 1 qt/A; AMS at 2 lb/A.

Comments

- Apply to field corn hybrids with a relative maturity rating of 77 days or more, including food grade, waxy and DuPont High-Oil corn.
- Do not apply to field corn grown for seed, popcorn or sweet corn.
- Label states not to use Steadfast ATZ at less than 14 oz/A.
- Do not tank mix with 2,4-D, Basagran, or Laddok.
- Do not tank mix with organophosphate insecticides or apply insecticide within seven days before or three days after the application of Steadfast.
- Steadfast ATZ may interact with soil insecticides. See label for restrictions following application of Counter, Dyfonate, Lorsban, or Thimet.
- Do not apply aerially.

Trade Name	Common Name	Formulation	Rate/Range
Stinger	clopyralid	3 EC	0.25 to 0.66 pt/A

Mode of Action

Auxin

Application Timing

Apply after emergence until corn is 24 inches in height.

Comments

- Re-treat as necessary, but do not apply more than 0.66 pt/A Stinger per year.
- Do not apply to corn taller than 24 inches in height.
- Do not allow livestock to graze treated areas or harvest treated corn silage as feed within 40 days of the last treatment.
- For control of Canada thistle, apply when a majority of the basal leaves have emerged and thistles are 4 inches in diameter or height but prior to budding.
- Do not cultivate within 14 to 20 days after application for best weed control from Stinger.
- Stinger applied at 0.25 to 0.5 pt/A on weeds up to the 5-leaf stage of development will provide control of common cocklebur, giant ragweed, common ragweed, common sunflower, and Jerusalem artichoke.
- May apply postemergence up to 18 inches tall sweet corn at 10.5 oz/A.

Trade Name	Common Name	Formulation	Rate/Range
2,4-D amine	2,4-D	4 SC	0.5 to 1.0 pt/A
2,4-D LV ester		4 EC	0.3 to 0.67 pt/A
2,4-D LV ester		6 EC	0.3 to 0.5 pt/A

Mode of Action

Auxin

Application Timing

Apply when weeds are small and corn is less than 8 inches tall. If corn is more than 8 inches tall, drop nozzles should be used. Pre-harvest applications of 1 to 2 pt of 4 EC LV ester may be made after denting stage of corn.

Comments

- 2,4-D labels vary; check label of individual products to determine uses.
- Injury is more likely to occur when corn is growing rapidly under high temperature and soil moisture conditions.
- Applications to small corn minimize injury potential.
- Application to larger corn with drop nozzles should be considered mainly as a rescue-type treatment.
- Preplant applications of 2,4-D should be made 7 to 14 days prior to planting. Preemergence applications should be applied 3 to 5 days after planting but before the corn emerges.

Trade Name	Common Name	Formulation	Rate/Range
Treflan HFP	trifluralin	HFP	0.75 to 2 pt/A
Trifluralin 4EC, Trust 4EC, generic brands			0.75 to 2 pt/A

Mode of Action

Microtubule

Application Timing

Apply to corn 8 inches in height or taller and incorporate with cultivation.

Comments

- Do not apply to corn grown for seed, sweet corn, or popcorn.
- Do not apply to corn preplant or preemergence.
- May be applied as a broadcast application or with drop nozzles to improve coverage.
- This treatment improves control of difficult annual grasses, such as woolly cupgrass and shattercane.
- Best results are obtained when all existing weed vegetation is removed with cultivation prior to application.

Trade Name	Common Name	Formulation	Rate/Range
Yukon	12.5% halosulfuron + 55% dicamba	78%WDG	4 - 8 oz

Mode of Action

ALS + auxin

Application Timing–Yukon

Apply to corn spike to 36 inches in height over the top or with drop nozzles.

Recommended Spray Additives

Non-ionic surfactant 0.25% to 0.5% v/v or COC 1%; UAN – 4% v/v may be used with NIS or COC.

Comments

- Corn may be grazed or harvested for feed after the crop reaches ensilage (milk) stage, at least 30 days after foliar application.
- Yukon may interact with ALS herbicides applied previously to soybeans and corn, thus potentially increasing corn injury.
- Applications made after corn is 24 inches should be directed or semi-directed using drop nozzles.
- Do not use liquid nitrogen fertilizer solutions or suspensions as the total carrier because crop injury may occur.
- Up to two applications and a total of 8 oz of Yukon can be applied per growing season. Delay the second application by at least 2 weeks.
- Do not apply Yukon adjacent to sensitive crops when the temperature on the day of application is expected to exceed 85° F.
- Do not apply through any type of irrigation system.
- Avoid disturbing (e.g. cultivating) treated areas for at least 7 days after application.
- Do not apply when environmental conditions favor drift.

Burndown Herbicides for No-till Soybean and Corn Production

The following herbicides are used to control emerged weeds present at the time of corn planting. Neither Gramoxone Extra nor Roundup provide residual weed control. Preemergence products containing triazine herbicides (atrazine, cyanazine, metribuzin) and certain other herbicides may control small weeds present at the time of planting. Fields should be scouted prior to application to determine the type of vegetation present in order to select the appropriate burndown herbicide.

Trade Name	Common Name	Formulation	Rate/Range
Gramoxone Max	paraquat	3 CL	0.75 to 2.7 pt/A

Recommended Spray Additives

Nonionic surfactant-1 to 2 pt/100 gal. Crop oil concentrate-1 gal/100 gal.

Comments

- Gramoxone is a restricted-use pesticide.
- Gramoxone may be tank mixed with most preemergence herbicides.
- It is essential to obtain complete coverage of weeds to obtain good control. Apply before weeds reach 6 inches and follow label recommendations for sprayer setup.
- Application of Gramoxone with a photosynthesis inhibitor herbicide (atrazine, metribuzin, etc.) may improve control of larger weeds.
- Liquid fertilizers containing phosphate will diminish paraquat activity if used as a carrier.
- Gramoxone may be applied preharvest to soybeans; refer to the Gramoxone Extra label.
- Gramoxone may be applied at 13 to 24 oz as a post-directed application. Refer to the label for comments.