

IMPACT[®]

Herbicide



TECHNICAL INFORMATION AND USE GUIDE

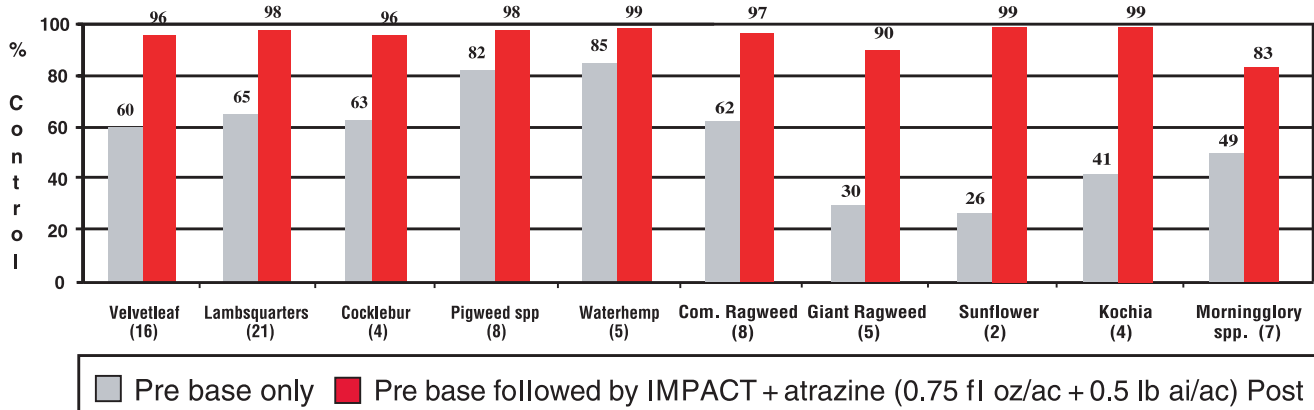
FIELD CORN (Grain, Silage and Seed),
SWEET CORN (Kernel, Ear and Seed)
POPCORN (Kernel, Ear and Seed)

Please refer to label for additional
precaution statements and directions for use.

IMPACT[®]

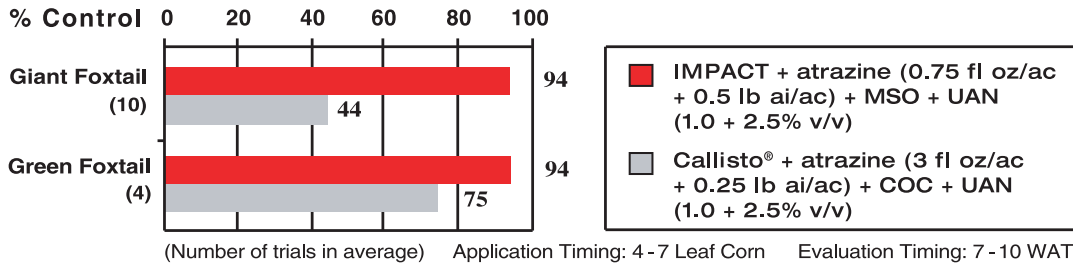
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IMPACT — Broadleaf Control in a Two-Pass Program — University Trials Postemergence Use Following Pre Residual Treatments



Adjuvants: IMPACT with MSO + UAN 1.0 + 2.5% v/v Post Application Timing: 3-6 Leaf Corn Evaluation Timing: 5-10 WAT (Number of trials in average)
Pre Base Treatments: Outlook, Dual II Magnum, Bicep Lite II Magnum or Guardsman at 0.67-1X rates

IMPACT offers GrassAssist™ — Post Applications With No Pre Base Treatment



WEEDS CONTROLLED BY IMPACT HERBICIDE

IMPACT at 0.75 fluid ounce per acre will control or suppress the weeds listed, including ALS, glyphosate and triazine tough to control or resistant biotypes. For best performance it is recommended that IMPACT be applied in a tank mix with atrazine at 0.25 to 1.5 lb ai/ac.

BROADLEAF WEEDS

- Palmer Amaranth
 - Powell Amaranth
 - Burcucumber
 - Carpetweed
 - Common Chickweed
 - Common Cocklebur
 - Common Lambsquarters
 - Common Mallow
 - Dandelion*
 - Hairy Galinsoga
 - Horseweed (Marestail)
 - Jimsonweed
 - Kochia
 - Venice Mallow*
 - Morningglory sp.*
 - Mustard sp.
 - Nightshade - Black, E. Black, Hairy
 - Pigweeds - Redroot, Smooth, Tumble and Prostrate
 - Prickly Lettuce
 - Common Ragweed
 - Giant Ragweed
 - Shepardspurse
 - Prickly Sida
 - Pennsylvania Smartweed
 - Ladysthumb
 - Sunflower - Wild and Volunteer
 - Canada Thistle*
 - Russian Thistle
 - Velvetleaf
 - Waterhemp - Common and Tall
- *partial control

ANNUAL GRASS WEEDS

- Barnyardgrass
- Large Crabgrass
- Smooth Crabgrass
- Giant Foxtail
- Goosegrass
- Green Foxtail
- Yellow Foxtail*
- Seedling Johnsongrass*
- Shattercane*
- Fall Panicum*
- Wild-Proso Millet
- Broadleaf Signalgrass*
- Woolly Cupgrass*

*partial control



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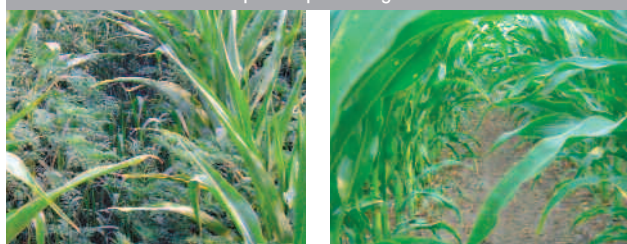
IMPACT Use Programs

IMPACT is a postemergence herbicide for control of emerged broadleaf and grass weeds in field corn, sweet corn and popcorn. **IMPACT** fits a variety of use programs including those highlighted below. See product labels for all uses and tank-mix options.

Two-Pass Sequential Use - Conventional Corn

Use **IMPACT** with low rates of atrazine following a preemergence applied residual herbicide(s) such as Dual II Magnum[®], Outlook[®], Harness[®], Bicep II Magnum[®], Guardsman Max[®], Harness[®] Xtra, Balance[®] Pro, etc.

Postemergence application following Bicep Lite II Magnum at 1.5 qts/ac- preemergence



No postemergence treatment

IMPACT at 0.75 fl oz/ac + atrazine 0.5 lb ai/ac + MSO + UAN

Postemergence - Conventional Corn

Use **IMPACT** with post applied ALS inhibitor herbicides such as Accent[®], Option[®], Steadfast[®] or Stout[™] to provide a full spectrum of weed control including ALS resistant weeds.

Postemergence application with MSO and UAN



Steadfast at 0.75 oz/ac + atrazine at 0.5 lb ai/ac

IMPACT at 0.5 fl oz/ac + Steadfast at 0.75 oz/ac + atrazine at 0.5 lb ai/ac

Early Postemergence with Residual Herbicides - Conventional Corn

Use **IMPACT** in early postemergence applications with residual herbicides such as Dual II Magnum, Outlook, Guardsman Max, atrazine, Prowl H2O[®], etc. for added burndown of emerged broadleaf and grass weeds.

Early postemergence application with MSO + UAN



Outlook at 16 fl oz/ac + atrazine at 1.0 lb ai/ac

IMPACT at 0.75 fl oz/ac + Outlook at 16 fl oz/ac + atrazine at 1.0 lb ai/ac

Postemergence - Roundup Ready[®] Corn

Use **IMPACT** with glyphosate (all brands) to maintain exceptional corn safety while providing control of and/or reducing selection pressure for those species becoming tough to control with glyphosate.

Postemergence application following Dual II Magnum at 1.33 pt/ac - preemergence



Roundup WeatherMax[®] at 22 fl oz/ac + AMS

IMPACT at 0.5 fl oz/ac + Roundup WeatherMax at 22 fl oz/ac + atrazine at 0.5 lb ai/ac + AMS

IMPACT Application Guidelines



- Apply from anytime after corn emergence up to 45 days prior to harvest.
- Apply when weeds are actively growing before they compete with corn for available moisture, light and nutrients.

- For ground application use a minimum of 10 gpa; for dense infestations and/or larger weeds use of higher water volume is recommended.
- Apply using methods that maximize coverage while minimizing off-target movement.
- Apply with spray adjuvants of methylated seed oil (MSO) or crop oil concentrate (COC) plus a nitrogen fertilizer source such as urea ammonium nitrate (UAN), ammonium sulfate (AMS) or ammonium phosphate (10-34-0).

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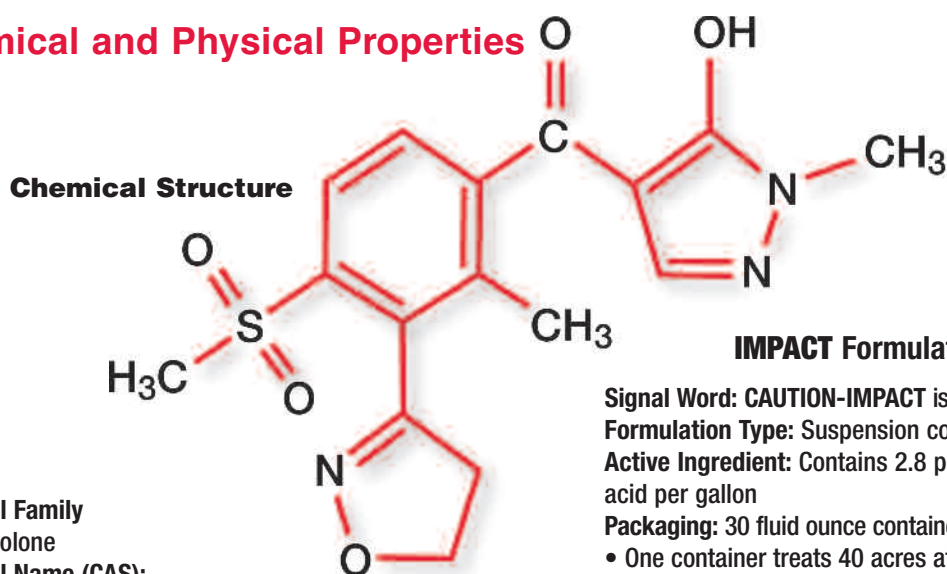
Herbicide

Novel chemistry that offers producers new opportunities and advantages for weed management in field corn, seed corn, sweet corn and popcorn.



Common Name of Active Ingredient
Topramezone

Chemical and Physical Properties



Chemical Family

Pyrazolone

Chemical Name (CAS):

[3-(4,5-dihydro-3-isoxazolyl)-2-methyl-4-(methylsulfonyl)phenyl](5-hydroxy-1-methyl-1H-pyrazol-4-yl)methanone

Molecular Formula

C₁₆H₁₇N₃O₅S

Molecular Mass

363.39

Appearance

White crystalline solid @ 99.8% purity

Density

1.425 g/cc @ 68°F

Melting point

414 °F

Vapor pressure

< 1 x 10⁻¹² Pa @ 77°F (non-volatile)

pKa

4.06 at 68°F

Solubility in water (g/L @ 68°F)

0.98 (pH 5) 15.0 (pH 7) 23.4 (pH 9)

IMPACT Formulated Product

Signal Word: CAUTION-IMPACT is not a restricted use product

Formulation Type: Suspension concentrate (SC)

Active Ingredient: Contains 2.8 pounds topramezone free acid per gallon

Packaging: 30 fluid ounce containers

- One container treats 40 acres at the 0.75 fl oz/ac use rate
- One container treats 60 acres at the 0.5 fl oz/ac use rate

Physical Properties

Specific Gravity: 1.13 @ 68°F

Freezing Point: ~ 25°F

Density: 9.43 lb/gallon

Boiling Point: ~ 212°F

pH: 3.9 (1% @ 68°F)

Flash Point: N/A

Appearance: Gray to beige opaque liquid

Storage: Store product in original container only. Store product in a cool, dry place. If this product has been stored where freezing temperatures have occurred, agitate or mix contents of container well before use.

Mode of Action

Topramezone, the active ingredient in **IMPACT**, is a systemic herbicide that is absorbed by plant leaves, roots, and shoots. Topramezone inhibits the 4-hydroxyphenyl pyruvate dioxygenase (HPPD) enzyme resulting in disruption of carotenoid synthesis in susceptible weeds. Weeds stop growing soon after application and within days exhibit a bleached appearance followed by necrosis and death.



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In JOINT REVIEW the US Environmental Protection Agency (EPA) and the Canadian Pest Management Regulatory Agency (PMRA) concluded that **IMPACT herbicide**, when used in accordance with the label, does not entail an unacceptable risk of harm to man or the environment.

Toxicology

Acute Studies		Technical Topramezone	IMPACT 2.8SC
Rat	LD ₅₀ oral	>2,000 mg/kg	>2,000 mg/kg
Rat	LD ₅₀ dermal	>2,000 mg/kg	>4,000 mg/kg
Rat	LC ₅₀ inhalation	>5.4 mg/L	>5.8 mg/L
Rabbit	Skin irritation	Not irritating	Not irritating
Rabbit	Eye irritation	Slightly irritating	Slightly irritating
Guinea pig	Skin sensitization	Not sensitizing	Not sensitizing
Ames test		Negative	

Non-Target Organisms

Birds

Acute oral

Bobwhite quail: LD₅₀ >2000 mg/kg
NOEL = 2000 mg/kg

Dietary

Bobwhite quail: LC₅₀ >5000 mg/kg
NOEC = 5302 mg/kg

Mallard duck: LC₅₀ >5000 mg/kg
NOEC = 5080 mg/kg

Fishes

Acute toxicity, static, 96 hr

Rainbow trout: LC₅₀ = 97.4 mg/L

Bluegill sunfish: LC₅₀ = 239 mg/L

ELS, 96 day flow through

Steelhead: NOEC = 3.2 mg/L

Aquatic Organisms

Static, 48 hr

Daphnia magna: EC₅₀ >100 mg/L

Reproduction, semi-static, 21 day

Daphnia magna: NOEC = 48.6 mg/L

Static, 96 hr

Green algae: EC₅₀ = 67.7 mg/L

Earthworms

LC₅₀ >1,000 mg/kg (soil dry weight)

NOEC = 296.3 mg/kg

Honeybees

Acute oral: LD₅₀ = 108 µg/bee

Acute contact: LD₅₀ >100 µg/bee

Behavior in Soil and Soil Systems

Adsorption (range of six US soils)

K_{FOCdes}: 9.7 to 99.0

K_{FOCads}: 22.3 to 172.4

Topramezone is moderately adsorbed and has medium to high mobility in soil.

Soil - Dissipation in field

DT₅₀: 14 days (average of four North

American field trials). Residues were confined mainly to the top layer of soil even though significant water flux occurred through the sampling zone to a depth of 48 inches. Aerobic soil metabolism is one of the routes of degradation/dissipation for this product.

Soil photolysis

DT₅₀: 78 days

Anaerobic aquatic metabolism

DT₅₀: 7.4-8.1 days in water/sediment

systems. Moved rapidly from water to sediment phase and quickly degraded.

Metabolism in water

Hydrolysis: Stable in sterile aqueous solutions.

Aqueous Photolysis: Half-life of 72 days in natural water. Stable under sterile buffer conditions.

IMPACT Herbicide Residue Quantification - Research has determined that when used as recommended, topramezone residues are below the limit of quantification (0.01 ppm) in field corn grain, popcorn grain, and sweet corn kernel and cob, and below 0.05 ppm in forage and stover of all corn types.



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IMPACT Product Features

- Controls a wide spectrum of broadleaf weeds.
- Controls or suppresses growth of many grass weed species.
- Provides exceptional safety for use in all types of corn.
- Provides flexibility in application timing and tank mix options.
- HPPD inhibitor herbicide that provides an effective tool in weed resistance management.
- Low use rate formulated and packaged for convenience in shipping, storage, handling and container disposal.
- Allows flexibility in rotational cropping for major cropping practices. See specific guidelines for crop rotation in Federal and supplemental labels.



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