

# SINATE® HERBICIDE TECHNICAL BULLETIN

## Registered Corn Types

**SINATE® Herbicide** is labeled for use on glufosinate tolerant field corn (grain and silage) and sweet corn containing LibertyLink® traits.

## Product Formulation

Soluble Liquid (SL) containing:

- 0.1 lb ai/gal topramezone acid.
- 2.47 lb ai/gal of glufosinate-ammonium.

## Mode of Action and Behavior in Plants/Soil

- **Topramezone:** 4-Hydroxyphenylpyruvate dioxygenase (HPPD) enzyme inhibition (HRAC group 27) mode of action, is non-volatile with selective, systemic, foliar activity and limited residual soil activity.
- **Glufosinate:** Glutamine biosynthesis inhibition (HRAC group 10) mode of action, is a non-selective, non-volatile, non-residual, foliar contact herbicide with limited translocation requiring thorough coverage.

## Use Rates Evaluated in Field Testing

- LibertyLink Field Corn: 21 to 28 fl oz/A.
- LibertyLink Sweet Corn: 21 fl oz/A.
- Maximum cumulative amounts per treated acre per year are 28 fl oz/A per growing season year for LibertyLink field corn and 21 fl oz/A for LibertyLink sweet corn.

### SINATE Use Rate Equivalency

SINATE Rate (fl oz/A)	Topramezone		Glufosinate	
	lb ai/A	fl oz/A <sup>1</sup>	lb ai/A	fl oz/A <sup>2</sup>
21	0.016	0.75	0.41	22.2
24	0.019	0.86	0.46	25.3
28	0.022	1.00	0.54	29.6

<sup>1</sup>Impact® 2.8SC rate containing equivalent amount of active ingredient

<sup>2</sup>glufosinate 280SL rate containing equivalent amount of active ingredient

## Crop Stage at Application

- **LibertyLink Field Corn:** Emergence up to 24 inches tall/V7 stage of growth. Use drop nozzles for corn 24 to 36 inches tall.
- **LibertyLink Sweet Corn:** Emergence up to V6 stage of growth.

## Weed Stage at Application

Research has shown effective control when applied to weeds less than 3 inches tall.

## Crop Tolerance

Research has shown LibertyLink corn is tolerant to this product applied at use rates evaluated with adjuvants listed under “tank additives”.

## Tank Additives – Adjuvants and Nitrogen Fertilizer

Research has shown that the following adjuvants optimize **SINATE** weed control activity.

- Methylated Seed Oil (MSO) at 1% v/v (1 gal/100 gal) + Ammonium Sulfate (AMS) at 3 lb/A.
- High Surfactant Methylated Oil Concentrate (HSMOC) at 0.5 to 0.75% v/v (2 to 3 qt/100 gal) + AMS at 3 lb/A.
- A liquid AMS product containing approximately 3.4 lb of AMS/gal at 7 pts/A may be used in place of dry AMS.

**SINATE** does not contain the active surfactant in Liberty® 280 SL herbicide which makes adjuvant selection and use critical for maximum herbicide efficacy. Research has shown that MSO or HSMOC adjuvants plus AMS is required to optimize herbicide activity of both active ingredients in **SINATE**.

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## Application Information

- Ground application – 15 gal/A minimum using nozzle type, spray pressure and water volume to deliver medium sized droplets (250 to 400 microns) to **thoroughly** cover target weeds.
- Aerial applications – apply at 10 gal/A.
- Applications made between dawn and 2 hours before sunset and in high humidity, bright sunlight and warm temperatures optimize **SINATE** activity.

## Application Timing

Research has shown that this product controls small emerged grass and broadleaf weeds, up to 3 inches in height optimal, when applied in sunlight, temperature and humidity conditions that enhance crop growth. High spray volume, small weeds and high humidity after application optimize glufosinate activity more than other environmental and application factors. This product can be applied in a 2-pass program following residual herbicides unless prohibited by any product label.

## Tank Mixtures

**SINATE** may be tank-mixed or applied sequentially with any pesticide registered for use on LibertyLink corn, unless prohibited by label, to enhance pest spectrum or residual control. Tank-mix partners must be used in accordance with the label restrictions and precautions. No label dosage rates may be exceeded.

- Tank mixtures with atrazine at 0.25 to 0.5 lb/A are recommended for enhanced postemergence spectrum and 1.0 to 2.0 lb/A for extended residual weed control.
- A group 15 herbicide, such as acetochlor, will provide increased residual control of grass and broadleaf weeds.

## Broadleaf Weeds Controlled or Partially Controlled (in addition to those listed on Impact® Herbicide label)

Florida beggarweed, black medic, Texas blueweed, wild buckwheat, buffalobur, catchweed bedstraw (cleavers), hophornbean copperleaf, volunteer cotton, tropic croton, woolly croton, devil's-claw, eclipta, annual fleabane, small flower galinsoga, cutleaf geranium, cutleaf groundcherry, hempnettle,

Carolina horsenettle (suppression), knotweed, ladysthumb, hairy nightshade, pennycress, puncturevine, common purslane, coffee senna, hemp sesbania, sicklepod, smellmelon, annual sowthistle, small soybean (non-LibertyLink), prostrate spurge, spotted spurge and bristly starbur.

## Grass Weeds Controlled or Partially Controlled (in addition to those listed on Impact Herbicide label)

Annual bluegrass, volunteer corn (non-LibertyLink), bristly foxtail, robust purple foxtail, junglerice, proso millet, wild oat, red rice, field sandbur (suppression), sprangletop, sorghum, stinkgrass, wheat, barley (suppression) and witchgrass.

## Herbicide Resistance

- Waterhemp and Palmer amaranth to group 27 (HPPD) herbicides.
- Italian ryegrass to group 10 (glufosinate) herbicide.
- If group 10 or 27 resistant weeds are present, always include a second effective herbicide to control these resistant species.
- Avoid applying a group 10 or 27 herbicide to the same field in consecutive years.

## Crop Rotation Restrictions – Rotational Cropping Intervals

- All corn types – 0 months (immediate).
- Wheat, barley, oat, rye, grass, rice – 3 months.
- Alfalfa, cotton, peanut, potato, sorghum, soybean, sunflower – 9 months.
- Canola, dry edible beans\*, flax, green bean\*, pea\*, sugarbeet\* – 9 months at 21 fl oz/A and 18 months at 28 fl oz/A.

*\*Refer to the product label for additional rate and geographical restrictions.*

## Rainfast:

A minimum period of 4 hours is needed between application and rainfall for maximum activity.

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