

Tips to Keep Roundup Ready® Technology Working in Your Sugarbeet Fields

Strategies to Combat Resistant Weeds

- Scout fields to identify escapes.
- Tank mix herbicides with multiple MOA (Modes Of Action). Rotate different MOA in consecutive years.
- Rotate crops to enable different MOA.
- Use labor and mechanical weed control.
- Prevent weed seed production.

What You Can Do

- Keep small grains in your rotation.
- Use Pre-Emerge Herbicides in Rotational Crops (corn, soybeans, dry beans).
- Tank-mix other herbicides with Glyphosate/Roundup.
- Use various crop technology traits
 - Corn: RR/ Glufosinate (Liberty Link) / 2,4-D choline (Enlist)
 - Soybeans: RR/ 2,4-D choline (Enlist)/ Dicamba (Xtend)/Glufosinate (Liberty Link)



Pre-Emerge & Post Herbicide Options in Corn

| Pre-Emerge Herbicides for Corn | Site of Action | Formulation | Sugarbeet Rotation Restrictions | Common Ragweed Control | Kochia Control | Lambsquarter Control | Redroot Pigweed Control | Waterhemp Control |
|-------------------------------------|----------------|-------------|---------------------------------|------------------------|----------------|----------------------|-------------------------|-------------------|
| Dicamba | 4 | SL | NCS | G/E | G/E | E | E | G/E |
| Verdict (Sharpen + Outlook) | 14,15 | EC | NCS | G/E | E | E | E | E |
| Sharpen | 14 | SC | 4-9 mo.* | G/E | E | E | G/E | G/E |
| Resicore (Stinger+Warrant+Callisto) | 4,15,27 | SC | 18 mo. | E | G | E | E | G/E |

| Post Tank Mix Options for Corn | Site of Action | Formulation | Sugarbeet Rotation Restrictions | Common Ragweed Control | Kochia Control | Lambsquarter Control | Redroot Pigweed Control | Waterhemp Control |
|--|----------------|-------------|---------------------------------|------------------------|----------------|----------------------|-------------------------|-------------------|
| Status | 4,19 | WDG | 4 mo. | E | G/E | G/E | G/E | G/E |
| Laudis + atrazine @ 0.38 lb ai | 27,5 | SC | 10 mo | E | E | E | E | E |
| Impact/Armezon + atrazine @ 0.38 lb ai | 27,5 | SC | 18 mo. | E | E | E | E | G/E |
| Armezon Pro + atrazine @ 0.38 lb ai | 15,27,5 | SC | 18 mo. | E | E | E | E | E |
| Callisto Xtra | 5, 27 | SC | 18 mo. | F | E | E | E | E |
| Halex GT | 9, 15,27 | SC | 18 mo. | E | E | E | E | G/E |

Pre-Emerge & Post Herbicide Options in Soybeans

| Pre-Emerge Herbicides for Soybeans | Site of Action | Formulation | Sugarbeet Rotation Restrictions | Common Ragweed Control | Kochia Control | Lambsquarter Control | Redroot Pigweed Control | Waterhemp Control |
|------------------------------------|----------------|-------------|---------------------------------|------------------------|----------------|----------------------|-------------------------|-------------------|
| Verdict (Sharpen + Outlook) | 14,15 | EC | NCS | P/F | P | F/G | G | F/G |
| Valor SX / Valor EZ | 14 | WDG/SL | 4-18 mo.* | P/F | F/G | F/E | G/E | G |
| Zidua / Zidua SC | 15 | WDG/SC | 12-15 mo* | P/F | F | F/E | G/E | G/E |
| Fierce (Valor + Zidua) | 14,15 | WDG | 15 mo. | F/G | F/E | F/G | G/E | G/E |
| Boundary (Sencor + Dual) | 5,15 | EC | 18 mo | P/F | F/G | G | G/E | G/E |
| Metribuzin | 5 | DF/SL | 18 mo. | P/F | F/G | P/G | G/E | F/G |

| Post Tank Mix Options for Soybeans | Site of Action | Formulation | Sugarbeet Rotation Restrictions | Common Ragweed Control | Kochia Control | Lambsquarter Control | Redroot Pigweed Control | Waterhemp Control |
|------------------------------------|----------------|-------------|---------------------------------|------------------------|----------------|----------------------|-------------------------|-------------------|
| Cadet | 14 | EC | NR | N | P/F | F/G | F/G | P-G |
| Cobra | 14 | EC | NCS | P/E | P/F | N | G/E | P/G |
| Ultra Blazer | 14 | EC | NCS | N/F | P/G | N | E | P/E |
| Flexstar | 14 | EC | 18 mo. | P/E | G/E | P/F | E | P/E |

NCS = Next Cropping Season; NR = No Restrictions

* = Rotation Restriction dependent on rate used and/or soil characteristics and/or environment. See product label for specifics.

EC= Emulsifiable Concentrate; SC= Suspension Concentrate; SL= Soluble Liquid; WDG= Water Dispersible Granule; DF= Dry Flowable

*See 2022 NDSU Weed Control Guide for additional information

*Control Ratings are based on 2022 NDSU Weed Control Guide

* This sheet is not a substitute for reading the product label

General Pesticide Tank Mixing Order

****Read product labels for specific mixing instructions.****

To help manage Roundup resistance, it is important to tank mix other pesticides with different modes of action. Use this as a guide to make sure tank mixing of pesticides is done in the correct order based on the product's formulation to avoid any problems in the tank and booms as well as to maintain product efficacy.

Always have water circulating in sprayer tank to ensure continuous agitation. Always give time to every component to dissolve in the water. Adjuvants are added in the same sequence as pesticides, that is, ammonium sulfate is a soluble powder, oil adjuvants are emulsifiable concentrates, and most surfactants are solutions. Within each group, usually add the pesticide before the adjuvant.

1. Fill the tank 50% with water
2. Buffer agent, pH adjusters
3. Water Dispersible Granules – Soluble Powder
4. Wettable Powder (pre-slurry)
5. Suspension Concentrate (SC) – Flowable Concentrate
6. Emulsifiable Concentrate (EC)
7. Crop Oil
8. Soluble Liquid (SL) – Glyphosate
9. Surfactant
10. Top off tank with water
11. Spray as soon as possible



General Sprayer Cleaning Guidelines

****Read product labels for specific sprayer cleaning instructions.****

When tank mixing pesticides with different modes of action for resistance management, it is critical to effectively clean the sprayer when switching between crops to avoid crop injury.

1. Clean sprayer as soon as possible after use. Dried material is difficult to remove. Residues build up over time and trap additional residues.
2. Drain the tank and all herbicide solution. Rinse down the inside and outside walls of the tank and flush out the booms and nozzles.
3. Fill the tank half full of water (preferably warm) and add tank cleaners recommended on the herbicide label (commercial tank cleaner, detergent or ammonia).
4. Circulate for a few minutes and flush out some of the solution through the boom and nozzles (open boom end caps/valves).
5. Allow the remainder of the solution to stand in the tank for the period of time recommended for the herbicide (overnight is desirable).
6. Pump the remaining solution through the boom and nozzles (open boom end caps/valves).
7. With clean water flush out the tank, lines, boom and nozzles once more (open boom end caps/valves).
8. Remove and clean strainers, nozzle tips and screens and in-line screens.

It may be advantageous to have separate nozzle tips, screens and in-line screens for each crop that the sprayer is being used in.