

Tank Mixing Sequence Guidelines

General Recommendations

It is recommended that a compatibility test be done prior to mixing any combination of crop protection products.

If using a mixing vat or inductor, make sure there is adequate agitation and a minimum of 15% of the desired finished spray volume carrier in the mixing vessel prior to diluting the crop protection products. If the mixing vessel cannot hold the required minimum volume, open the valve and add the crop protection products in the recommended order.

Mixing Sequence

1. Sulfonylurea Herbicides

**Add before reducing pH, or pre-slurry in 5 gallons of water at pH 8.5-9.5, and add once completely dissolved.*

Use 2-4 oz of household ammonia in 5 gallons of water to raise pH to desired level.

2. Compatibility Agents and Defoamers (*ConvertSM*, *Gundown EliteSM*, *KnockdownSM*)

**Compatibility agents will reduce spray solution pH.*

3. Dry Products

- a. Ammonium sulfate and dry micronutrients
- b. Drift retardants
- c. WP, DF, WDG, SP formulations

4. Liquids

- a. Drift retardants (*DirectSM RS*, *Border Xtra 8L*, *IntactSM*, *Intact Advanced*, *TaragonSM Elite*, *Taragon Xtra*, or *Transport PlusSM*)
- b. Suspo Emulsions (SE)
- c. Aqueous Suspensions (AS)
- d. Flowables (F or FL)
- e. Micro encapsulated (ME)
- f. Suspension concentrates (SC)
- g. Liquid Concentrates (LC)
- h. Emulsifiable concentrates (EC)
- i. Solutions (S or SL), liquid and concentrate suspension fertilizers, chelated micronutrients and growth hormones
- j. Capsule Suspensions (CS)
- k. Adjuvants
 - i. Crop oil concentrates (*VigorSM*)
 - ii. High surfactant oil concentrates (*ExchangeSM*, *Volare DCSM* or *KixytSM*)
 - iii. Methylated seed oils (*MSO UltraSM* or *Persist[®] Ultra*)
 - iv. Oil-based DRT (*NexumSM*)
 - v. Nonionic surfactants (*VertexSM*, *NIS 80:20SM*, *NIS 90:10SM*, *SpeedSM* or *Chem-StikSM*)
 - vi. Water conditioning agents (*DerivaSM*)

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Guarantee

Precision Laboratories is recognized as having the highest level of customer service. We guarantee the integrity and quality of every product we sell and provide 24-hour technical assistance to ensure complete customer satisfaction. Our products are backed by university and independent research, and proven through field-testing by respected agriculture professionals.

Important: Read and follow all label directions before using any product. Additional product and technical information is available on our website; www.precisionlab.com. All products are trademarks or registered trademarks of their respective companies.

Did You Know?

We have a series of online videos that go into more detail about tank mixing sequence and compatibility issues.

Contact Information

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Don't Plug Your Sprayer

Correct Mixing Order and Procedures Increase Productivity, Reduce Risk.

Compatibility problems can cost applicators a lot of time and money — in wasted product, spraying time due to plugged sprayers and even lost customers — when the job isn't done correctly.

The Root of the Problem

Before glyphosate-resistant weeds began to emerge it was not uncommon for applicators to mix water-soluble liquids like glyphosate and surfactant together in an inductor or mixing vat with little or no water, and with little or no problems. But times are changing. More glyphosate-resistant weeds means more tank mixing with tank-mix partners that aren't water-soluble, leading to compatibility problems.

The two leading causes of incompatibility problems are:

- 1) Little or no water to dilute crop protection products when using a mixing vat or inductor cone
- 2) Improper mixing sequence

Mixing Vats and Inductor Cones

Are you creating a new crop protection formulation? When combining undiluted crop protection products and adjuvants in a mixing vat or inductor cone that's what you're doing. These new "combinations" were not formulated to be together, undiluted, so they often begin to gel or salt out quickly. The good news is they usually rinse out of the mixing vat or inductor cone easily. The bad news is you've now transferred the problem to your sprayer, leading to plugged screens, lines and nozzles.

The Mixing Vat Solution

If you're going to use a mixing vat or inductor you have two options to avoid tank mixing problems:

- 1) Add enough water to the mixing vat or inductor cone to dilute your tank mix partners. This is usually no less than 10-15% of the entire volume of the anticipated spray load. Example: 1,000 gallon load requires an inductor cone or mixing vat that can hold 100-150 gallons of water.
- 2) If your mixing vat will not hold the appropriate levels of water, then you should open the valve and add products individually in the proper mixing order. Follow each product with a water rinse before adding the next.

Improper Mixing Sequence

Even a slight change in mixing order makes a huge difference in product efficacy and compatibility. Something as simple as reversing the mixing order between a flowable (F) herbicide, like atrazine, and an emulsifiable concentrate (EC), like 2,4-D, can cause a cottage cheese-type consistency that will plug sprayers. Other mixing errors increase the amount of residue and buildup on the interior sidewalls of the sprayer's tank leading to longer cleanout times and the increased risk of cross contamination.

Fixing the Mixing Sequence

Make sure that you add products in the correct order. Most crop protection product labels state a preferred mixing sequence. If you're still not sure, simply conduct a small compatibility test to verify the mixing order that produces the most stable tank mix. Directions for conducting compatibility tests can be found on crop protection labels. If you want to learn more about proper mixing order, watch the compatibility video on our YouTube channel.



Stable tank mixes form milky emulsions, like those in the container on the left in the photo above. When using liquid nitrogen as a carrier, the addition of compatibility agents, like Convert™, can prevent tank mixes from quickly separating and leaving residues trapped inside the tank. Convert can reduce the risk of cross contamination and lower levels of weed control.

Did You Know?

Get your Compatibility Test Kits from Precision Laboratories. Call our customer service team at (800) 323-6280 to order a kit.

Or, you can download Mix Tank for iPhone and Android, which determines the proper mixing sequence based on the products selected.