Tank Cleaning/Rinsing Concerns

(it starts with loading/mixing)

What is the cause?

What are the Solutions?

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4 Ways that Product Can Get In the Wrong Place

1. Drift
2. Volatility
3. Wrong Field
4. Tank Contamination

Why contamination issues?

- 15 years of Glyphosate use – easy
- Tank cleanout consisted of H20
- Triple Rinse became a thing of the past
- Tank Cleaners – what are those?
- Why do I need an Eductor?
- Do I need Ammonia, Bleach, Tank Cleaner, Water?
  - Wasn’t an issue – in many area

Proper mixing and loading procedures

•Always add products to the tank in the mixing order specified by the label.
If no sequence is indicated, use the order shown below. Each product should be thoroughly dispersed or dissolved before subsequent products are added.

Recommended mixing order

1. **Solid formulations** (such as DuPont™ TotalSol® soluble granules, wettable powders, dry flowables, water dispersible granules, etc.)
2. **Liquid suspension concentrates**
3. **Liquid soluble concentrates**
4. **Emulsifiable concentrates**
5. **Surfactants**
6. **Liquid fertilizers**
7. **Anti-drift additives**

Dry formulations which are sprayed in a liquid fertilizer may need to be preslurried or dissolved in water before adding to the liquid fertilizer.

Label Contents

Directions for Use:
Product Application and Equipment Use

- Labeled or permitted uses; Application timing, method, and use rates; Pests controlled or suppressed
- **Spray equipment use and drift management**
- Sprayer cleanup
- For a given product and label, instructions can vary by application site type

SPRAY EQUIPMENT

For specific application equipment, refer to the manufacturer's instructions for additional information on GPA, pressure, speed, nozzle types and arrangements, nozzle heights above the target canopy, etc.

Be sure to calibrate air or ground equipment properly before application. Select a spray volume and delivery system that will ensure thorough coverage and a uniform spray pattern with minimum drift. Use higher spray volumes to obtain better coverage when crop canopy is dense. Avoid swath overlapping, and shut off spray booms while starting, turning, slowing, or stopping, to avoid injury to the crop.

Do not make applications using equipment and/or spray volumes or during weather conditions that might cause spray to drift onto nontarget sites. For additional information on spray drift refer to Spray Drift Management section of label.

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After Spraying HARMONY® EXTRA SG and Before Spraying Crops Other Than Wheat, Barley, Triticale and Oat

To avoid subsequent injury to desirable crops, thoroughly clean all mixing and spray equipment immediately following applications of HARMONY® EXTRA SG as follows:

1. Empty the tank and drain the sump completely.
2. Spray the tank walls with clean water using a minimum volume of 10% of the tank volume. Circulate the water through the lines, including all by-pass lines, for at least two minutes. Flush the boom well and empty the sprayer. Completely drain the sump.
3. Repeat step 2.
4. Remove the nozzles and screens and clean separately in a bucket containing water.

The rinsate solution may be applied to the crop(s) specified on this label. Do not exceed the maximum-labeled use rate. If cleaners are used, consult the cleaner label for rinsate disposal instructions. If no instructions are given, dispose of the rinsate on site or at an approved waste disposal facility.

Chemical buildup is released later

- ***Clay based herbicides*** *{heavier than water}*
  - **Corn: atrazine (pre-mixes)**
  - **Soybeans: Authority, Enlite, Valor, Sonic, Sencor (metribuzin)**
  - **Over Night is a problem - - - over several days is bigger problem**
- ***Auxin herbicides*** *{absorbed into rubber/poly & visible on soybeans}*
- ***Then Post-emerge - - - previous chemical is released***
  - **Glyphosate (Roundup) is a good tank cleaner, the longer the better**
  - **Osmosis takes product throughout spray boom**
- ***Where is Product hung-up in sprayer system?***
  - **No-drip nozzles**
  - **T- Barb nozzle body leaves a dead space at end of line**
  - **Filler line, screen line (anywhere that sits low)**
  - **No agitation points (behind baffles, lips)**

Dilution is the Solution to Pollution

- ***Fresh water flush at shut down*** *{every night}*
  - **Removes 90-99% of material**
  - **Lower concentrated products less apt to settle**
  - **Lower concentrated product more likely to re-suspend**
- ***Thorough Cleaning Between "seasons"***
  - **Is any product that I've been spraying capable of injury to the next field?**
  - **End Caps – most visible problem sight**
  - **Remember to also clean nozzle diaphragm & screens**
  - **Look for areas that hang low or do not receive continuous agitation**

Issues and Concerns

- Herbicides active at low rates-small amounts
- Proper tank cleaning takes time – time is money!
- Taking shortcuts during tank cleaning
- Not following recommended cleaning directions on label
- Additives can be “good tank cleaners”
- Re-Introduction of dry products in market
- Increase in post applications with multiple modes of action
- Increase in “auxin” products – Dicamba, 2.4-D
- Multiple Modes of Actions = Multiple products= Multiple formulations

Where are the chemicals?

- Tanks - baffles, top, irregular surfaces, tank lining (poly)
- Sumps- Empty the sump!
- Hoses – cracks in hoses, sags
- Valves
- Eductor
- Booms – 90’ boom can hold up to 35 gallons of product
- Screens, filters, strainers
- End Caps

Dilute, Dislodge and Dispose

- Select cleaning agent based on herbicide
- Labels – “The Label is The Law”- specific cleaning recommendations
- Tank Cleaners – Read the label, follow the label
- Triple Rinse = Triple Rinse
- 15 minutes recirculation = 15 minutes (not 5 or 10)
- Remove/Clean – strainers, screens- don’t forget nozzle screens
- Open ALL valves
- Drain to lowest point on sprayer

Removing Residue

- Empty Sprayer and booms – every night
  - Herbicides settle in tank, penetrate rubber hoses – more difficult to remove
- Rinse in the filed – rinse and clean in the field
- Remove all Strainers/Screens – when changing to different herbicides
  - Remove before adding tank cleaner to reduce residue/Second set of screens
- Remove and clean end caps, nozzles etc.
- Rinse second time with clean water
- Add tank cleaner
- Final flush

Tank Cleaners

- How long do I leave in tank, how much to use?
  - Refer to label- the longer the better (some Rec overnight)
- Most commercial tank cleaners are better than other options:
  - Ammonia, Bleach, Detergents
- Select based on herbicide and formulation
- Need to penetrate – dissolve/remove with rinsate
- Many commercial tank cleaners will deactivate and solubilize

Examples-Specific Herbicide - Cleanup

- *Dicamba – 1)* 1 qt. Ammonia/25 gallon water, circulate 15-20 minutes, leave several hours (prefer overnight) *2)* Flush system *3)* Flush system 2 more times
- *SU Products- 1)* Drain the tank *2)* flush system with clean water for 5 minutes *3)* Partially fill tank, add 1 gallon Ammonia/100 gal water, finish filling tank and allow to agitate/circulate for 15 minutes *4)* repeat step 3 *5)* thoroughly rinse with clean water for at least 5 minutes
- *Liberty* – Thoroughly triple rinse sprayer and use commercial tank cleaner
- Remove nozzles, strainers, screens in all applications