

Sprayer Clean-out Guidelines:

Avoiding crop injury due to contamination

Crop injury due to contaminated sprayers is a continuing problem in Iowa. This problem can be avoided by ensuring that sprayers are properly cleaned between tank loads.

When determining the correct clean-out procedure, it is important to consider the product's mode of action, carrier, and additives. They all have an impact on what cleaning solutions to use and potential damage to sensitive crops.

Rinsate disposal

Clean the sprayer in an area that will not contaminate water supplies, streams, or crops and in an area inaccessible to children, pets, and livestock. Pay particular attention to sensitive vegetation that is in the runoff area. The best method for rinsate disposal is in the field in a manner consistent with the product's label. The easiest way to do this is to have rinse water available in the field, either on the sprayer or support vehicle.

Tank-cleaning agents

A tank-cleaning agent's function is to penetrate, loosen, and dissolve pesticide residues and then to remove them through dilution. In some cases, the agent will provide deactivation or decomposition of the herbicide.

- Commercial tank cleaners are recommended on many product labels and help remove water and oil soluble herbicides.
- Household ammonia, a commonly recommended cleaning agent, is effective at penetrating and loosening deposits and residues in the spraying system. Although ammonia does not decompose herbicides, it increases the solubility of some herbicides by raising the pH.
- Chlorine bleach can decompose residues of most sulfonyleurea and other herbicides into inactive compounds. However, some tank-mix partners may inhibit the decomposition. Care must be used with chlorine bleach. Chlorine bleach can combine with fertilizers containing ammonia to produce dangerous chlorine gas, which is irritating to the eyes, nose, throat, and lungs. Also, rinsate containing chlorine bleach is not labeled for application to cropland.
- Kerosene or fuel oil should be used to remove oil-based herbicide formulations such as 2,4-D esters. Following the oil rinse, the system should be cleaned with detergent or ammonia.

Surfactants and fertilizer additives

When switching from a growth regulator herbicide (2,4-D, Banvel, or Stinger) to a postemergence application in soybeans, special care should be taken if the application involves surfactants or fertilizer additives. Such materials are particularly adept at removing these herbicides from poly tanks, hoses, strainers, etc. It is recommended that a

small amount of fertilizer or crop oil be flushed through the system before the application.

General cleaning guidelines

To avoid drying and hardening of pesticide residues, and potential corrosion and damage to equipment, clean the sprayer immediately following an application. If you are continuing with the same pesticide the next day, flushing with water is sufficient. However, if you are switching products or crops, a more thorough cleaning is required.

Be sure to clean the entire sprayer system, not just the tank. Operate the pump and flush the cleaning solution through all hoses, strainers, screens, nozzles, and the boom. Small amounts of residue left in these areas can be sufficient to cause serious damage to a sensitive crop.

Most injury occurs when switching between crops. The following procedure is recommended when there are no specific cleaning requirements given on the label.

1. Drain the sprayer tank and lines and rinse tank, boom, and lines with water for a minimum of 5 minutes.
2. Fill the tank with clean water and one of the following cleaning solutions per 100 gallons of water:
 - 1 gallon household ammonia
 - 8 pounds trisodium phosphate cleaner detergent
 - commercial tank cleaner (follow instructions)Flush the solutions through the entire sprayer system. For growth regulator herbicides, let the solution stand overnight. Add more water to fill tank and agitate solution for at least 15 minutes and flush through the nozzles. Drain the tank.
3. Remove the nozzles, screens, and strainers and clean them separately in a bucket of cleaning agent and water.
4. Rinse the entire system with clean water.

Consult the label

This publication provides general guidelines for cleaning your sprayer, but it is important to remember that the best source of information is the pesticide label. Consult labels for the products that were previously in the tank, and for the products that will be used for the next application.

Prepared by Brent A. Pringnitz, extension program specialist. Adapted from materials provided by the University of Missouri.

Common chemical and trade names are used in this publication. The use of trade names is for clarity by the reader. Inclusion of a trade name does not imply endorsement of that particular brand of herbicide and exclusion does not imply non-approval.

Recommended procedures for specific products (as directed on the product label). Follow all label directions & refer to the latest herbicide label available.

Product	Initial Rinse	Second Rinse	Final Rinse
2,4-D, Banvel, Clarity	Completely drain spray system and flush with clean water. Fill tank with water and 1 qt household ammonia/25 gallons water. Operate pump to circulate solution through boom and nozzles for 15-20 minutes, let stand for several hours – preferably overnight. Flush ammonia solution from tank and through boom. For ester formulations, rinse tank with kerosene or fuel oil first, followed by an ammonia rinse.	Remove nozzles and screens and flush system with tank full of clean water.	Rinse system with water.
Stinger	Rinse and flush equipment thoroughly with water.	Fill tank with water and 1 qt household ammonia/25 gallons water. Operate pump for 15-20 minutes to circulate solution through boom and nozzles, let stand for several hours – preferably overnight. Flush ammonia solution from tank through boom.	Rinse system with clean water, circulating through boom. Nozzles and screens should be removed and cleaned separately.
Scorpion III, Hornet	Drain tank and flush tank, hoses, and boom with clean water for 10 minutes.	Fill tank with water and recirculate for 15 minutes, flushing through hoses, boom, and nozzles. Drain tank. Remove nozzles and screens and clean separately.	If sprayer is to be used on crops other than field corn, repeat the previous step.
Beacon, Exceed, Peak, Permit	One gallon household ammonia/50 gallons water (100 gal. for Permit). Start agitation and circulate for 15 minutes. Do not use chlorine-based cleaners. Dispose of rinsate in approved manner.	Repeat previous step.	Remove screens and clean separately.
Accent, Assure, Basis, Basis Gold, Concert	Drain and flush tank, hoses, and boom with clean water for minimum of 5 minutes. Fill tank with solution of 1 gallon household ammonia/100 gallons water. Circulate for 15 minutes, flushing all lines. Drain tank.	Fill tank with solution of 1 gallon household ammonia/100 gallons water. Circulate for 15 minutes, flushing all lines. Drain tank. Remove and clean all nozzles, screens, and filter.	Thoroughly rinse tank with clean water for minimum of 5 minutes, flushing through hoses and boom.
Canopy, Authority Broadleaf, Cover, Pinnacle, Classic	Drain and flush tank, hoses, and boom with clean water for minimum of 5 minutes. Fill tank with water and one of the cleaning solutions listed on label. Circulate for 15 minutes, flushing all lines. Drain tank.	Remove nozzles and screens and clean separately in a bucket containing cleaning solution. Fill tank with water and one of the cleaning solutions listed on label. Circulate for 15 minutes, flushing all lines. Drain tank.	Thoroughly rinse tank with clean water for minimum of 5 minutes, flushing through hoses and boom.
Liberty	Thoroughly rinse sprayer by using a commercial tank cleaner before using in crops not labeled LIBERTY-LINK.	Rinse with clean water.	Rinse with clean water.
Poast, Poast Plus, Prestige	Hose down inside and outside of equipment. Fill spray tank half full of water and operate sprayer until rinse water has been purged.	Refill tank with water and add one of following/100 gallons water: 1 gallon ammonia, 1 pint household detergent, commercial tank cleaner. Operate pump and circulate solution for 5–10 minutes. Discharge small amount through boom & nozzles. Let stand for 24 hours. Flush lines & drain tank.	Remove nozzles and screens and flush the system with two more tankfuls of water.
Pursuit, Lightning, Scepter,	Thoroughly clean and rinse equipment with water before using equipment to apply other products.		
Sencor, Lexone, Turbo	Rinse spray tank and refill with water and a heavy-duty detergent at the rate of 1 cup per 20 gallons of water. Recycle solution through equipment for 5 minutes and spray through boom.	Repeat previous step TWICE .	Fill spray tank with clean water, recycle for 5 minutes and spray out.
Shotgun	Clean tank immediately after use and rinse with water and a commercial tank cleaner.		
Command	Thoroughly hose down the inside walls of the tank with a quantity of water equal to 1/8 of total tank capacity and operate pump to circulate through sprayer for 15 minutes. Drain tank and dispose of rinsate in approved manner.	Remove nozzle tips, screens, and line filter and wash in pail of warm, soapy water. Rinse and replace. Repeat previous step.	Consult label for proper use and disposal of rinsate.

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