

REMOVING FLUMIOXAZIN RESIDUES from Spray Equipment after using VALOR® 500 WG

VALOR – A double-edged sword

One of VALOR's most valuable attributes as a herbicide is its low water solubility, which gives it a high degree of rainfastness, prevents lateral movement or leaching after application, and causes it to remain in the surface layer of the soil profile where it controls emerging weeds.

This attribute, however, has an implication for sprayer cleanout. Flumioxazin, the active ingredient in VALOR, has a water solubility of only 1.8 ppm¹. This means that only a very small fraction of the VALOR added to the spray tank actually goes into **solution** and gets broken down via hydrolysis – a process often accelerated by the addition of ammonium hydroxide (household ammonia), for example, which serves to increase the pH of the mixture. The majority of the VALOR goes into **suspension**, which simply means that it can come out of suspension again to settle in the spray system as the carrier (water) dries or drains from it. With most Group G herbicides, it is therefore better to think of the cleanout process as "removing residues from spray equipment", rather than "spray tank cleanout".

Examples of areas in a typical spray rig where herbicide residues can become trapped:



Inside or in the walls of hoses. This picture shows pendimethalin residue trapped inside an aging hose.

1. Comparative solubility in water of other common Group G herbicides are:
22 ppm (Carfentrazone/Hammer®); 2100 ppm (Saflufenacil /Sharpen®);
0.1 ppm (oxyfluorfen/Goal®)



Inside diaphragms. This problem is particularly common for air-assisted sprayers.



In end caps, typically at the end of a hose or boom.



Recommendations for removal of VALOR residues from spray equipment

Spray equipment, including mixing vessels and nurse tanks, must be cleaned each day following VALOR application. After VALOR is applied, the following steps must be used to clean the spray equipment:

1 Completely drain the spray tank, rinse the sprayer thoroughly, including the inside and outside of the tank and all in-line screens.

2 Fill the spray tank with clean water and flush all hoses, booms, screens and nozzles.

3 Top off tank, add 1 litre of 3% household ammonia for every 100 litres of water, circulate through sprayer for five minutes, and then flush all hoses, booms, screens and nozzles for a minimum of 15 minutes. If diaphragms are being used on the spray boom, loosen diaphragms before flushing the spray system, allowing cleaning solution to spray through the open diaphragm. If spray lines have any end caps, they must be loosened before flushing the system, allowing cleaning solution to spray through the loosened caps.

4 Drain tank completely.

5 Add enough clean water to the spray tank to allow all hoses, booms, screens and nozzles to be flushed for 2 minutes.

6 Remove all nozzles and screens and rinse them in clean water.

To enhance removal of VALOR from the spray system, add a tank cleaner such as All Clear™ DS or Kleenup™ Granular **in place of ammonia**. Follow the instructions on the product label for these products. All-Clear – DS has very clear and detailed instructions on how to achieve effective decontamination. They can be viewed on the AgNova website here: <http://www.agnova.com.au/content/custom/products/downloads/All-Clear-flowchart-AgNote.pdf>

These multipurpose decontaminants have the following advantages over household ammonia:

- They raise the pH to 12, which is higher than ammonia
- They dissolve residual flumioxazin to a much higher degree than ammonia, so there is more flumioxazin in solution which can be broken down via hydrolysis under high pH

- They contain no less than three common industrial cleaning agents (chlorine, sodium carbonate and sodium hydroxide)
- Some of them contain a blue tracer dye, which makes it easy to identify those parts of the spray equipment that have not been cleaned, or prevent accidental breakdown of the following product by residual chlorine in the system



Safety directions:
Kleenup Granular is Class 8 corrosive products. Always wear protective clothing and eyewear as directed by the respective product label when handling these products, and adhere to all safety directions.

Spray equipment, including all tanks, hoses, booms, screens and nozzles, should be thoroughly cleaned before it is used to apply post emergence pesticides.

Equipment with VALOR residue remaining in the system may result in crop injury to the subsequently treated crop.



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