

Quality of Pesticide Spray Water

Most producers are looking for ways to reduce the number of pesticide applications while maintaining a good level of pest control. Improperly applied pesticides can lead to an increase in the number of applications resulting in more product used, yield losses and more time required by the producer.

There are many reasons for ineffective pesticide applications: improper product selection, improper application rates, problems with sprayer output, improper time of application or unforeseen weather events. An often overlooked factor that can affect pesticide performance is the quality of the spray water.

Spray Water pH: Pesticides generally perform best in slightly acidic spray solutions (pH < 7). If a water source has a pH > 7.0 then product performance can be negatively affected. However, there are exceptions, and products like sulfonylurea herbicides Accent™, Ally™ and Spartan™, for example, can be degraded by acidic water (pH < 7) if they are left in the spray tank. For this reason, among many others, it is important to read product labels thoroughly before applying a new product. It is also important not to leave mixed spray solution in the sprayer for extended periods of time.

General guidelines for pesticide degradation due to spray water pH are:

- Spray water pH – (3.5 – 6.0) – Apply mixed spray volume within 12 hours
- Spray water pH – (6.1 – 7.0) – Apply mixed spray volume within 1 – 2 hours to prevent significant inactivation of the pesticide
- Spray water pH – (>7.0) – A buffer agent (ie. LI 700) should be added to prevent quick pesticide inactivation. (Contact your local agri chemical dealer for a list of available and appropriate buffering agents).

Test water pH by purchasing easy to use pH strips from your local drug store or chemical supply dealer.

Suspended Particles in Water: “dirty water”, or water that has suspended soil particles and organic matter, can also greatly influence the performance of some pesticides. Products like diquat, paraquat and glyphosate can be inactivated by suspended soil particles, especially if they are left in the spray tank for an hour or more. Quite often, water sources like ponds or rivers with heavy siltation, can cause this problem. A similar effect occurs when the target plants are covered with dust or a lot of dust is kicked up during the application process. It is important to select clean water sources, filter if necessary and screen all water entering the spray tank.

Hard Water / Total Dissolved Solids: the dissolved mineral content in water will also affect many pesticides, especially salt formulated herbicides. Water containing calcium (Ca) and magnesium (Mg) can reduce the effectiveness of glyphosate and 2,4-D amine. Also, levels of bicarbonate (HCO₃) > 500 ppm can affect the performance of grass herbicides like Achieve™ and Poast™.

It has been shown that really hard water (600 ppm – calcium carbonate concentration) can almost completely deactivate 2,4-D amine, when applied at a low rates.

Ways to Reduce Affect of Poor Water Quality:

1. Have water sources tested for suitability for spraying pesticides
Find a new water source if practical
2. Reduce water volumes to the minimum required for good coverage.
3. Refer to product label for water volume specifications.
4. Only add pesticides to the spray tank if you plan to spray immediately
5. Use the high label rate of pesticide when hard water is a concern
 - Check product label to see if ammonium sulfate fertilizer (21-0-0-24) can be applied with the pesticide to counteract hard water (glyphosate)
 - Non-ionic surfactants may also be added to counteract hard water (ie. Agral 90)
6. Do not use water where iron is shown to occur as a precipitate may form, which could clog equipment.
7. Filter water from sources that have suspended soil and organic material

Water can be tested for pH and hardness at: Quality Evaluation Branch – Water testing Harlow Institute, NSDAF, PO Box 550, Truro, NS, B2N 5E3 or at a private lab in your area.

For more information, please contact:
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