Agronomy Update | Water Hardness

Water functions as the primary carrier in most herbicide applications, so its physicochemical properties can directly influence spray solution compatibility, active ingredient availability, foliar uptake, and ultimately weed control. Elevated concentrations of hardness cations such as calcium, magnesium, iron, or sodium can antagonize weak-acid herbicides by forming less-available herbicide-cation complexes, while high bicarbonates can further reduce performance and complicate tank mixing for certain actives.

Ask

Is my water hard? Are bicarbonates high? Is pH suitable for this tank mix? Is the water clean enough to avoid tie-up from sediment or organic material?

Impact of glyphosate efficacy applied at 2/3 of label rate with differing total water hardness. Courtesy: Les Henry

Water Conditioners

AMS-based water conditioners are especially important with glyphosate and Group 1 "dim" actives such as clethodim and tralkoxydim, where hard water and bicarbonates can reduce performance. AMS is generally a good fit with Groups 1, 4, 9, 10, and 27 and can often be used at higher rates without crop injury concerns. A product like Keystone Electra WC fits well within a herbicide program.

Tank-mix Order Matters

Add AMS-based conditioners **first** so the water is conditioned before herbicides are added. The table below shows recommended Electra WC rates based on total water hardness.

1. When applying clethodim with water over 500 ppm bicarbonates, use 1% v/v.

Hardness	Electra WC Rate[1]
0-250ppm total hardness	no Electra WC needed
250-400ppm total hardness	add Electra WC at **0.5%**v/v
400-600ppm total hardness	add Electra WC at **1.0%**v/v
600-800ppm total hardness	add Electra WC at **1.5%**v/v
800-1000ppm total hardness	add Electra WC at **2%**v/v
Over 1000ppm total hardness	add Electra WC at **2.5%**v/v
OR **Use Excel 70**	**0.25%**v/v with Electra WC at **0.5%**v/v

[1] v/v = volume to volume

Water quality matters! Ask a local UFA team member about water quality testing.

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