

Getting The Most From Roundup

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Roundup (Glyphosate) is a systemic herbicide that is widely used in fruit production in Michigan. In order for Glyphosate to be effective it needs to be absorbed into the plant. In soft water Glyphosate has no problems in being absorbed, however; in hard water Glyphosate will be "tied up" and not be absorbed as readily. This is known as "hard water antagonism". Hard water contains high concentrations of the soluble salts, calcium (Ca⁺⁺) and magnesium (Mg⁺⁺). When these are present in your spray water the Glyphosate, which is negatively charged, will combine with them to form Glyphosate-Magnesium and Glyphosate-Calcium compounds. These compounds are not as easily absorbed by the plant and the result is poor uptake and poor weed control.

So how can growers increase the efficacy of their Glyphosate treatments? A common practice has been to add a surfactant to the spray tank, this allows the Glyphosate spray solution to spread across the leaf surface better and the result is greater absorption into the leaf. Some Glyphosate products now have the surfactant in them such as "Roundup Ultra". Roundup Ultra does not solve the hard water antagonism problem by the addition of a surfactant though, as the surfactant alone does not address this problem.

The hard water problem is best solved by adding 17 pounds of ammonium sulfate per 100 gallons to the spray water before the Glyphosate is added. The addition of this compound to the spray water does two things. First, the sulfate ions tie up the calcium and magnesium ions by forming conjugate salts and secondly, some of the Glyphosate ends up as a Glyphosate-Ammonium compound which some species of weeds preferentially absorb into their leaf tissue over Glyphosate alone. Urea - Ammonium Nitrate (28% liquid nitrogen) will also improve the efficacy of Glyphosate, but not as well as the Ammonium sulfate.

Reduced gallons of spray solution per acre will also have the effect of increasing the efficacy of the Glyphosate. Fewer gallons of water equals fewer calcium and magnesium ions to tie up the Glyphosate.

So, if you have had less than ideal performance from your glyphosate product and you think your water is on the hard side, then consider addressing the problem using ammonium sulfate.

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Please send any comments or suggestions regarding this site to:

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