

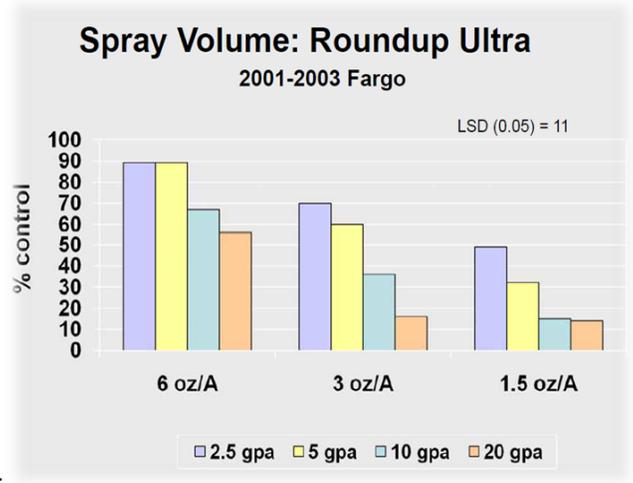


ISSUE 08 - May 2012  
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# Getting the Most Out of Your Glyphosate

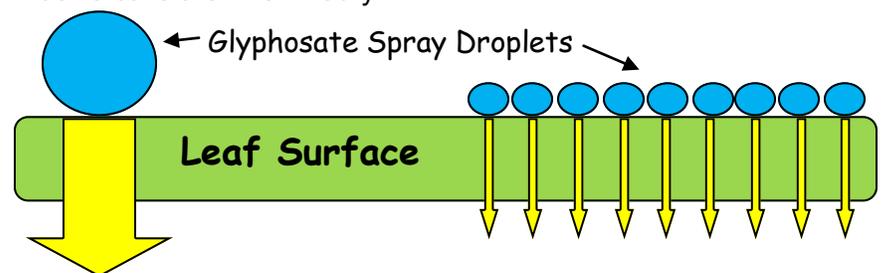
There is no doubt most of us are used to the cliché, “If a little is good, more is better,” For years you have been preached to about the benefits of higher water volumes used in conjunction with agricultural herbicides to help achieve better coverage, increased activity, less injury, etc.. While this remains true with most other herbicides, Dr. Rich Zollinger, Extension Weed Scientist at NDSU, has shown multiple times that when it comes to glyphosate applications, the concept is actually turned completely upside down; “LESS water is BETTER”...

Looking at the chart to the right, varying levels of glyphosate (6 / 3 / 1.5 oz/A) were evaluated for the level of weed control provided when applied at different water volumes (2.5 / 5 / 10 / 20 gpa). The 3-yr study consistently revealed that across each different glyphosate rate, the lower the water volume the better the weed control. Although this might seem counter-intuitive and a little confusing, these results make a lot more sense if you look the application methodology broken down to a single droplet.



As you already know, lower water volumes produce bigger spray droplets, which in the case of glyphosate is a good thing because this practice results in increased adsorption of the herbicide into the target plant. The idea is that a bigger spray droplet will leave a “pile” deposit on the leaf surface. Dr. Zollinger explains it best with what he calls the Pile Theory:

Glyphosate is more phytotoxic when applied in one concentrated drop (pile) than in nine dilute drops of equal size. This simple observation is why you should try to keep your applied water volumes towards the lower end of the labeled range.



With the above in mind, you should consider nozzle configurations that deliver 10 - 15 gal/acre that produce medium to coarse droplet sizes at pressures between 25 - 40 psi. Flat fan nozzles seem to work the best for this targeted droplet size (i.e. Turbo TeeJet 11004 or 11005) and growers should avoid flood type nozzles for this type of application on their sugarbeets. Avoid applicator speeds of > 12 mph – these high ground speeds can create a vortex effect & disrupt the spray pattern resulting in a sub-par performance from the herbicide.

The maximum amount of glyphosate that can be used from sugarbeet emergence to the 8-leaf stage in the Roundup Ready Sugarbeet System is currently limited to 1.96 lb ae/A with the maximum amount for a single application in the same growth stage limited to 1.125 lb ae/A. With resistant weeds already identified within the Minn-Dak Growing area, **know these limits and make sure to use them.** For example, if your 1st application was 0.835 ae/A, then make sure your 2nd application is 1.125 ae/A (0.835+1.125=1.96). Similarly, if your 1st application was 0.98 ae/A, then make sure your 2nd is also 0.98 ae/A (0.98+0.98=1.96). Whatever the combination - Max it Out!!!

This Glyphosate data, along with much more information, can be found in the 2012 North Dakota Weed Control Guide

## Glyphosate Do's and Don'ts...

### The To Do's:

**Do** use the correct rates – reducing application rates only encourages the development of resistant weeds. The small savings up front will cost you **BIG TIME** in the long run...

**Do** apply glyphosate to small actively growing plants – the 1<sup>st</sup> application should be applied when weeds are cotyledons and certainly before the weeds reach 2" in height

**Do** use the lowest water volume (gpa) allowed – Low water volumes produce bigger spray droplets which results in better adsorption.

**Do** apply glyphosate when the humidity is high – Since glyphosate is highly water soluble, its activity increases during humid conditions when the additional air moisture hydrates the plant cuticles

**Do** apply glyphosate between 8 am and 8 pm

**Do** practice good drift management techniques

**Do** add NIS to glyphosate (label permitting) – this will help improve control on hard-to-wet species such as common lambsquarter

**Do** add AMS to glyphosate at 8.5 to 17 lbs/100 gal – AMS enhances glyphosate adsorption and translocation and helps deactivate antagonistic hard water salts.

### The Not To Do's:

**Do not** mix glyphosate with oil adjuvants – they typically antagonize glyphosate

**Do not** apply glyphosate when there is dew on the leaves – this may reduce weed control

**Do not** apply glyphosate within 30 days of harvest.

**Do not** cultivate within 2-3 days after a glyphosate application. Glyphosate absorption into most weeds species is pretty slow and this delay in tillage will help increase the herbicide's effectiveness.

**Do not** apply glyphosate during colder temperatures (< 65° F) as it may delay and/or reduce weed control

**Do not** use glyphosate with contact herbicides as this may antagonize the glyphosate and reduce weed control.

**Do not** apply glyphosate during dusty conditions. Dust inactivates glyphosate and careful consideration is needed for boom/nozzle placement.

**Do not** apply the 2<sup>nd</sup> application of glyphosate within 10 days of the 1<sup>st</sup> application.

## Keep an Eye Out for Bolters...

As you run across your beet acreage in the next couple of weeks, be on the lookout for bolting sugarbeets - especially as the canopy gets closer to row closure. Bolting sugarbeets are often mistaken for



The Early Stage of a Bolting Sugarbeet

a pigweed or lambsquarter at a distance. All fields planted to Roundup Ready Sugarbeets must be monitored for bolters at least once every 4 weeks with records of the inspection documented and filed in your binder. Keep in mind that fields planted to beets in 2011 must also be monitored (and documented) for volunteer beets at least twice during the 2012 growing season. In either situation, if a bolter and/or volunteer beet is found remember to use the three R's: **REMOVE - RECORD - REPORT**. Remove the bolter(s) from the field, record the number of bolter(s) and their location in your binder and report the bolter(s) to Minn-Dak within 48 hours.