

# Herbicide “Applications” Learned from 2015 - Nate Firle

Target Weed, Weather, Water, Herbicide, and Application are major contributing factors affecting our herbicide program’s performance. We have plenty of challenges making herbicide decisions from year to year due to the weather factor, let alone the others involved. In this article, I have laid out some learning points from 2015 to help us make better decisions for 2016.

**Scout Early and Often** - 2015 early weed scouting yielded what we thought was little to no weed pressure, only some along borders, causing a lot of borders and target areas to be sprayed, re-entering 5-10 days later to spray the remainder of the field. My method of scouting is look early and often. When we see weed pressure along borders or in pockets, it is better to spray the entire field rather than target areas. (See figure 1). When you see weeds, spray the field!



Figure 1. Picture of a MN Soybean field 42 days after first application were only the border was sprayed. Border was sprayed with only one post emerge application of glyphosate the entire year. Inside the border (were weeds are present) was sprayed 2 times with post emerge application of glyphosate.

**Spray Weeds Young** - Naturally dying plants have Plasmolyzed cells, meaning water moves out of cells. Mature plants have Turgid cells, meaning water is held in the plant cells. Growing plants have Flaccid cells, meaning water flows through cells (See figure 2). Applying herbicide solutions to growing plants allows for faster movement and wider range of effectiveness within the plant.

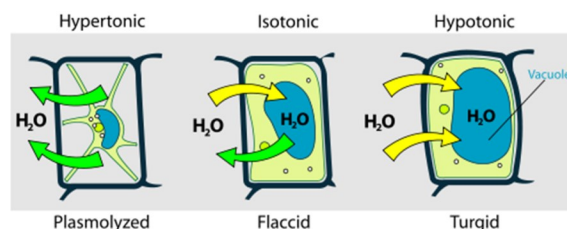


Figure 2. 3 stages of cells during the life span of a plant

**Water Conditioner/Adjuvants** - pH is the measure of Hydrogen (potential Hydrogen). Hydrogen holds an important role in moving water against nature, down through the leaves. Hydrogen, and what is molecularly attached to it, moves through plant with less resistance than salts while holding the same charge. Thus, the lower the pH, the higher amount of Hydrogen, the higher amount of molecular mobility. Lowering pH increases the effectiveness of most herbicides.

**Water Volume** - Knowing that weather is a factor on timing of application, growth stage will also determine the amount of product to be used. Herbicide labels require more product on larger weeds. We also found over the past 3 years that more water per acre will assist the performance depending of size of weed. Larger the weed, more water needed. Think of 30 droplets of solution on a 2 inch ragweed vs. 30 droplets on a 20 inch ragweed. Higher water volumes were found the most effective when solution is near a 5.5 pH.

**SUMMARY** - Scout early, spray early, use water conditioners that soften water and lower solution pH, use adjuvants that assist plant penetration for molecular mobility, and make sure you are applying enough product per acre.

Figure 3. On July 14th, 15th and 16th (above is the weather summary of these 3 days), I measured the per day growth of water hemp in central MN. The weed started at 6 inches, and ended at 21 inches 3 days later, 5 inches per day!

Date	Field Weather History									
	Temperature (F)			Wind (MPH)			Rainfall (IN)		Grower Degree Days (F)	
	Max	Min	Avg	Max	Min	Avg	Daily	Accru	Daily	Accru
07-14-2015	86.2	65.4	76.9	16.4	0.4	7.0	0.11	0.11	26.0	26.0
07-15-2015	84.4	63.7	75.2	9.7	2.3	5.6	0.0	0.11	24.0	50.0
07-16-2015	82.7	65.8	75.0	10.7	2.8	6.8	0.0	0.11	24.0	74.0