



Update

Happy new year! 2020 was a great cropping year and hopefully 2021 will be even better. Just like much of 2020, winter 2021 meeting season has looked much different for us at Rock River. Normally we attend and also host chemical and dairy meetings in our “off” season. Due to the Covid/state protocols Rock River does not plan on having any meetings this winter. We will instead try to cover that material in our monthly newsletters. This month, we will be focusing on waterhemp and its herbicide resistance.

While our climate and growing season isn’t always conducive to growing huge crops, we do get several benefits from our harsh winters. Specifically, the cold helps suppress insect pressure and also many diseases. The short summer we have allows us to be behind the southern states in the fight against resistant waterhemp plants. The long summers in the south allows waterhemp to germinate about 10 months out of the year. It has slowly crept north from our southern neighbors since its’ first outbreak in Missouri in 2005.

So how did we get here? This problem stems from applicators using single modes of action (MOA) to kill pests. MOA is a functional or anatomical change resulting from the exposure of a living organism to a substance. By only using one MOA at a time, waterhemp did not take long to find a way to overcome that single change.

Why is the problem so bad and so sudden? Waterhemp is a dieocious plant, meaning there are male and female plants that cross pollinate. Cross pollination leads to fast genetic resistance because there is a constant reshuffling of genes which leads to new genetic traits being expressed. Once the genetic trait of roundup resistance was expressed, the weeds were able to take off where only roundup was applied in the herbicide pass. Rapid seed production and the amount of seed produced on each plant makes waterhemp incredibly challenging control.

What can we do to control waterhemp? First off, use several MOA’s and do not rely heavily on one MOA. Part of the problem stemming from 2005 was the heavy reliance on Roundup alone at reduced rates. Roundup now has very little to no effect on waterhemp. Using multiple effective modes of action throughout the growing season is the only way we will stay in front of the battle against all types of weed and insect resistance.

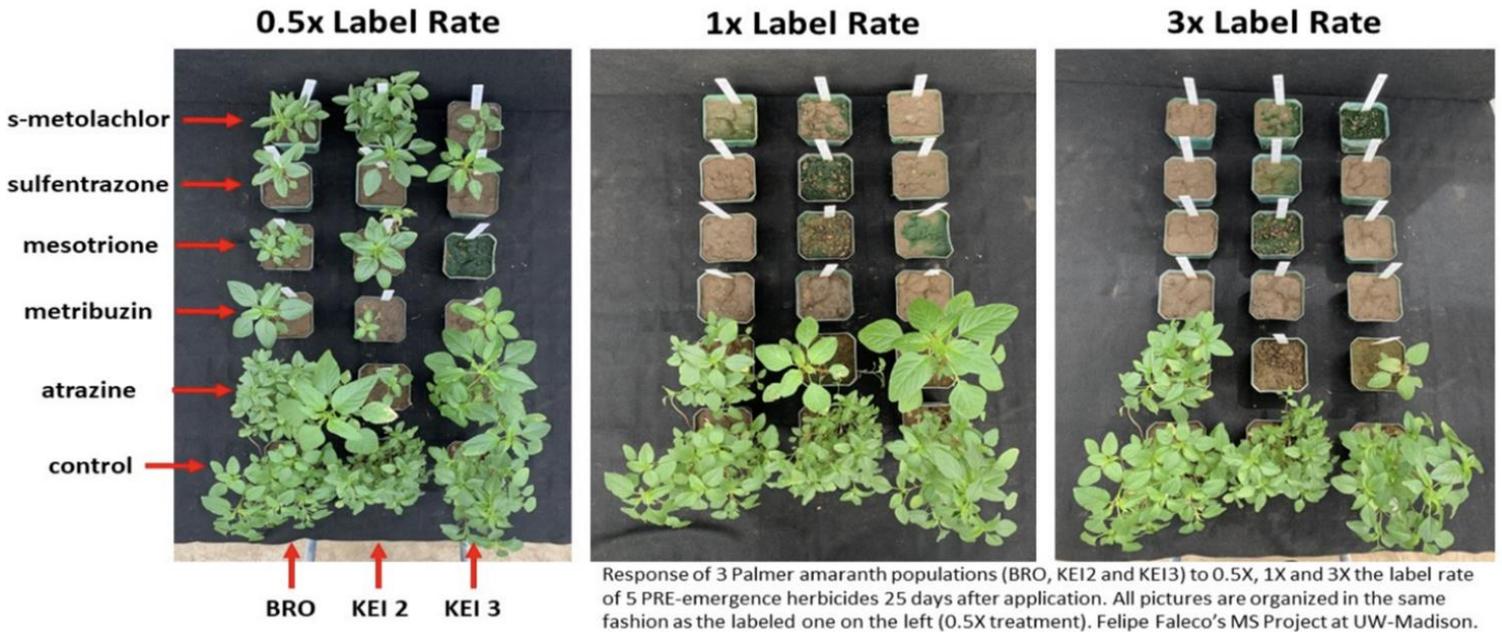
So far, Wisconsin has ALS (Group 2), glyphosate (Group 9), and PPO (Group 14) waterhemp resistance confirmed. The chart below shows the number of samples submitted and the amount of resistance found in Wisconsin for Group 2 and Group 9 populations.

Treatment	Population Screened	Resistant Populations	% Resistant Populations
1x Glyphosate	86	82	95
3x Glyphosate	86	60	70
1x Imazethapyr(Pursuit)	86	79	96
3x Imazethapyr	86	75	91

Rock River tries to stay away from recommending using any of these chemicals alone in a chemical program. Using chemicals pre in soybeans that are only allowed pre emerge (Prowl, Valor, Sonic, Metribuzin) is a great start to a soybean chemical program.



Waterhemp also gained resistance because “cut rates” or not full rates of chemicals were being used. Using a full rate allows for the most amount of killing agent (MOA) to be applied to that plant at one time. Doing so makes all of the plants overcome more than they can handle rather than applying just enough to kill most of the plants. This concept also applies to residual chemistries like Dual. Below is a great picture of why rates matter!



Dual (Metolachlor) has been around for a long time but not all forms of Dual are equal. Metolachlor is comprised of two isomer pairs, an S-isomer pair and an R-isomer pair at a 1:1 ratio (50% each). Older forms of metolachlor herbicide brands contain only the racemic (1:1 ratio) metolachlor. **The S-isomer pair is 6x more active on weeds than the R-isomer pair.** S-metolachlor has more of the S-isomer pair in each pound due to a selective manufacturing process, i.e., a 7.3:1 ratio is achieved (88% S and 12% R), making it more active than racemic metolachlor. Rock River only sells an S-isomer product (Brawl II) because we believe full rates of only the most effective forms of Dual available should be used for weed control in order to preserve this critically important chemistry for years to come.

Herbicide	Grass Incrediant	Label Rate(pt/Ac)	Label rate needed to match S-metalachlor
Dual Magnum	S-metolachlor	1.33	1.33
Dual 2	Old metolachlor	2.0(no longer registered)	2
Stalwart C	Old metolachlor	1.33	2
Me-To-Lachlor 2	Old metolachlor	1.33	2
Parallel	Old metolachlor	1.33	2