JANUARY 2020

AGRONOMY UPDATE

BATTLE RIVER IMPLEMENTS LTD.

PRESCRIPTION HERBICIDE APPLICATIONS REVISITED

In the September 2019 Agronomy Update, I discussed one of the projects that we worked on last season – prescription herbicide spraying.

If you would like the background on how this project was set up, please follow this link for that article.

https://www.briltd.com/fckimages/integrated-solutions/agronomy-update/Agronomy%20Newsletter%20September.pdf

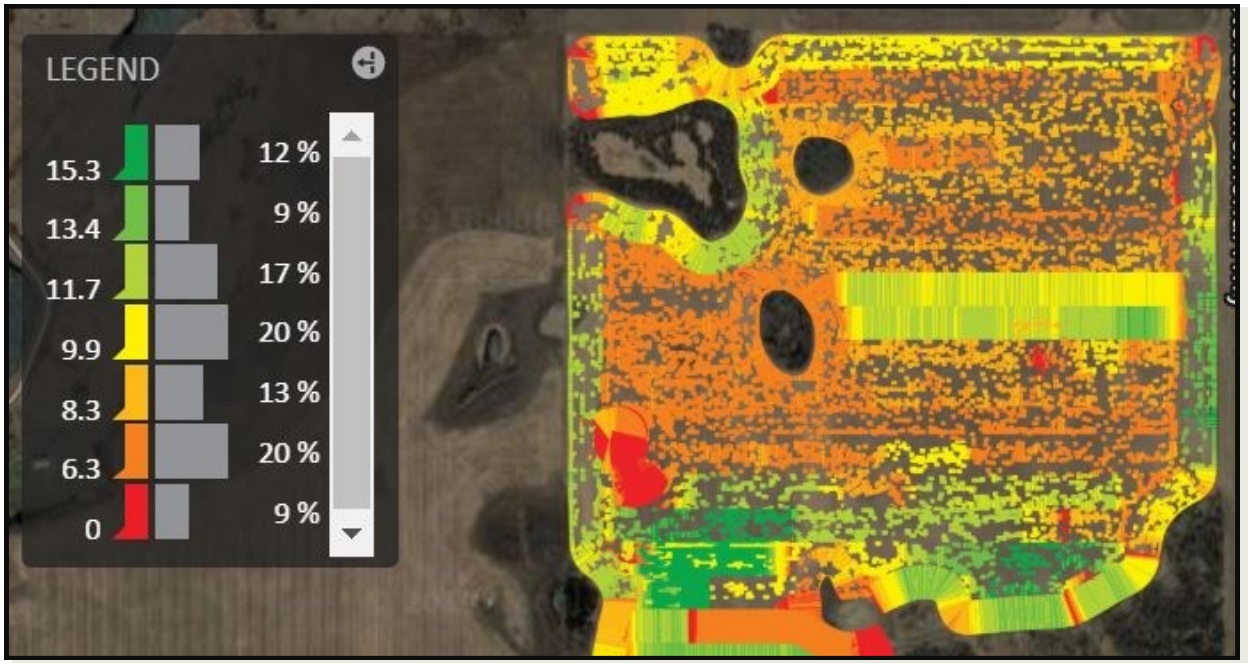
To my mind there are two things we need to figure out to determine if prescription herbicide spraying is economically and agronomically viable for growers. First, is the technology capable of identifying and spraying weeds and achieving a reasonable level of control? The process needs to deliver at least close to comparable weed control to avoid having a negative impact on yield and dockage. Secondly, if you assume weed escapes will be higher with prescription spraying (which seems reasonable), what can we determine about the impact on the weed populations, not just in the year of application, but in subsequent years. I discussed the cost savings we saw from our prescription spraying in the September issue, so I won't go over that again. In this update, I would like to focus more on what we learned about the technology and what we still need to learn.

LET'S TALK ABOUT WHAT WE SAW

With that in mind, let's talk about what we saw as we went through the process. We started by flying the field with a drone about 4 days before spraying. When we showed up on June 14th to spray, we discovered that between the time of flying the field on June 10th and spraying, a flush of volunteer canola had emerged as a response to a 33 mm rain on June 7th. While not uniformly heavy throughout the field, it was something that we had not captured on our flight and there was enough canola popping up that we were concerned about it. The decision was made to go ahead with the prescription, and if the volunteer canola turned out to be an issue we would return to the field in about 10 days to spray it out.

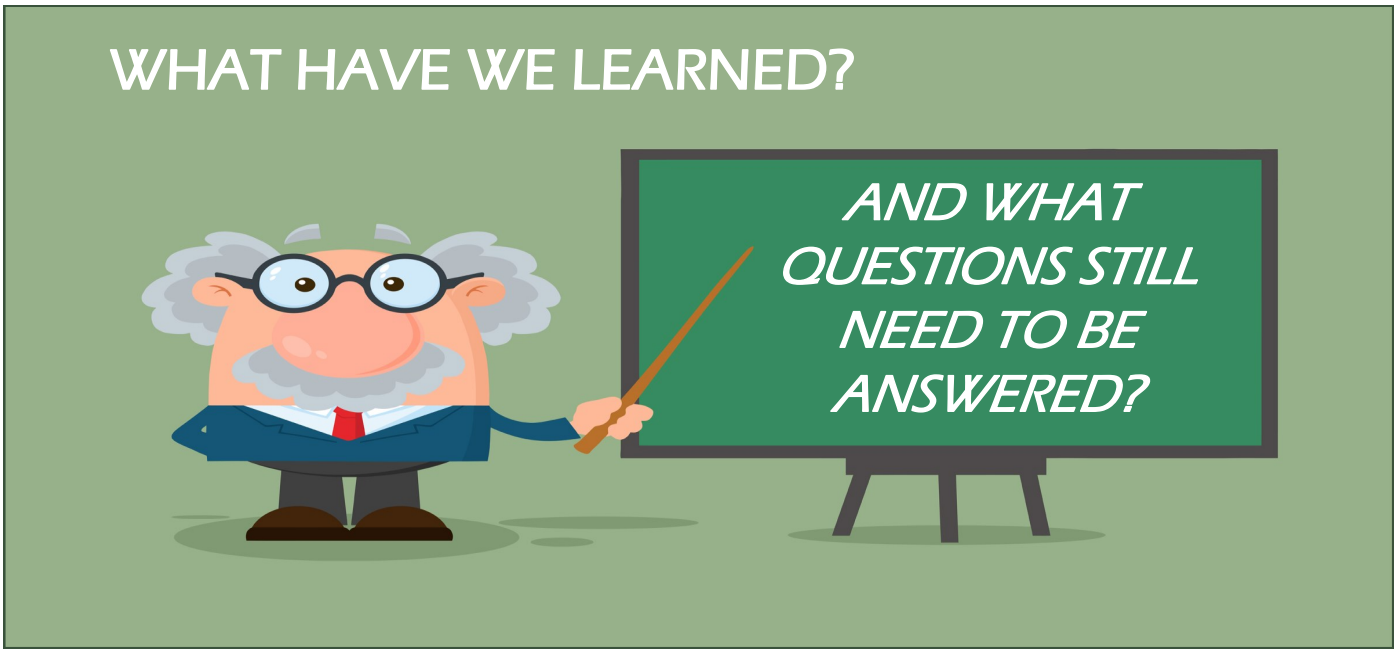
WE MADE OUR SECOND DISCOVERY

While we knew that the prescription needed high water volumes to make it work (target rate of 8.5 gal/acre), we quickly learned it also needed slower speeds. We started off at our usual spraying speed of 14 mph, but found that the ExactApply Sprayer could not adjust to the rapid pressure changes at that speed. As you can see by the screenshot below which tracks the application speed, we did the headland and a few runs along the south side of the field at high speed, and then adjusted down to 8 mph, which fixed the problem. The strip sprayed as higher speed in the center is the check strip.



Follow up field scouting showed that our weed control was inconsistent where our speed was excessive. The Lady's Thumb shown here is a good example of what I mean. These two pictures were taken within 10 ft of each other in the SE part of the field, where speeds varied from 13.5 to 15 mph

Lady's Thumb 4 days after treatment



We found similar issues with cleavers, volunteer canola and wild buckwheat wherever our speed exceeded 8 mph. Interestingly, the emerging flush of volunteer canola that had us so concerned on the day of application turned out to be a non-issue wherever the prescription was properly applied.

At harvest, the wheat was bagged, with the prescription being harvested first so we could ensure it could be identified from the remainder of the field when it was hauled to the elevator. Most of the prescription sprayed area had the same dockage as the rest of the field – about 0.57%. Where we tried prescription spraying with high speed, dockage climbed to 1.0%. There did not seem to be any correlation between how the herbicide was applied and what the final yield was.

So overall, it seems that prescription spraying has good potential, but we still have questions we need to answer.

First, how effective is the technology in identifying wild oats in cereals? Due to a past issue with wild oats, the field was treated with Avadex in the fall of 2018, so we had no way to determine this in 2019. In the September newsletter, I indicated that we would be growing peas in 2020. Since that time the decision has been made to go back to wheat again. So while Avadex was applied again in the fall, we did leave about 6 acres of the field untreated in 2 separate strips, which should be enough to give us an idea on how effective the process is in identifying wild oats in a cereal crop.

The second thing I would like to do is get a better grasp on what is happening with weed escapes. Are escape levels higher than when we do a traditional application; if so, how much higher? What about "hard to kill" weeds that may have lower control levels with a particular herbicide? Do we consistently get sufficient coverage to get acceptable control? While there didn't seem to be a difference in overall dockage levels, visually it seemed that control was better on some weed species than on others. Also, what impact does prescription spraying have on the weed population in the following year? Weed counts done prior to the 2020 herbicide application may give us some of these answers. As a follow-up, these geolocated positions where I do the counts will be revisited after herbicide application to determine the exact level of control vs. traditional application.

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Reducing herbicide use by up to 50%, reasons to get excited about technology

Finally, we have already talked to Sentera, who is our partner on this project about tightening up the processing time it takes to get the prescriptions from the drone to the sprayer. As we saw in 2019, 4 days between flying and spraying can see some large changes in the field conditions. We would also like to get a better handle on how crop staging affects the accuracy of the technology. We know the program works best when we have more bare ground to offer a better contrast for the weeds, but how large can the crop be before the prescription is no longer accurate?

In conclusion, I would like to say that while we still have several details to work out with this system, the initial results are very encouraging. And when you consider we are looking at reducing herbicide use by up to 50%, there are plenty of reasons to get excited about this technology!

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