



Hey everyone,

Now that the planting season is finished and crops are up, I thought I would send out an update on a few things. There's a few pages worth of material, so I'll split it up into several emails over the next week or so. Dad wanted the first update to be on our spraying program since we made a few changes this season, I'll try keep it brief since the subject can be a little dry. The topic of the next email will be corn, and will hopefully have some more exciting information based on some of the research we're doing.

---

We plan our chemical program far ahead of season with the expectation that changes will need to be made, but generally the core remains the same: We need a burndown to kill cover crop and winter annual weeds, a pre-plant spray for residual herbicides, and a post-emergent spray to kill emerged weeds and apply a residual. Our goal is to use at least 2 different "Modes of Action" per spray pass to help reduce chances of resistance. I also like to incorporate chemical modes of action that are rarely used to switch up the program, since every grower is typically selecting from the same few herbicide families every year. This year, due to a later start to the growing season, we opted for spraying our cover crop burndown and putting down a residual all at the same time, then planting into green cover crop soon after. This went incredibly well and ensured we had enough moisture for good germination before the temps rose and rain stopped. As a result, instead of a burndown pass, waiting for cover crop to die, a pre-plant pass, then a post-emergent pass, there will only be a burndown/residual and a post-emerge pass this season. Not only did we not perform a tillage pass and plant weed seeds, we have a considerable amount of residue to act as a mulch. We have several options for a post-emerge pass and how aggressive we are will depend on weed pressure.

In addition to these developments, we have also decided to install spray boom drop nozzles for post emergence spraying of corn. These will allow us to keep the chemistry out of the corn plant as much as possible and spray only between the corn rows. This is ideal because this year's chemical plan is relatively aggressive due to use of a different mode of action than is typically used locally, and our use of spray adjuvants this year. Spray adjuvants are relatively cheap and are designed to improve the herbicide effectiveness by means of affecting how it spreads on the leaf surface and how quickly it absorbs and moves into the plant.

A few final notes on weed control. My philosophy is that weed control needs to be diverse and economically justifiable and not solely reliant on chemicals. My goal is not to eliminate all weeds, that is generally impractical. Weed presence generally only impacts crop yield for a very short window of time called the "Weed-Free Critical Period." This time span is

very early in the crop's life (until 6 leaves are out on corn, and 3 trifoliates are out on soybeans.) After these stages, most weed presence is purely cosmetic, but despite this, attention needs to be paid towards weed seed production, which heightens risk of herbicide resistance. Ask a local producer what their weed management program is, and I can guarantee that all will first answer with only a chemical plan, and maybe some will mention tillage. In regard to tillage and weed control, it does nothing to the summer annual weeds we struggle with the most, except bury and turn up seeds. These seeds will either germinate later if they are at a reasonable depth, or if deeper, are preserved underground, where they are protected from weather, disease, and predators, and will be re-introduced every time a tillage event occurs. It also promotes residue breakdown, so more bare soil is available for weed germination and kills natural, ground dwelling predators that feed on surface weed seeds and insect pests and are often underestimated in their ability to eat weed seeds. Seeds on the surface are vulnerable to environmental damage, microbial attack and breakdown, and predation, all of which can cause significant seed losses. Buried seeds have a much longer viability period. A diverse approach will always be best from a long-term financial and sustainability standpoint. When the only means of weed control is chemical, weeds will develop resistance much faster than new chemicals can be produced, so there needs to be more solutions.

A good example of this is our wheat crop. At a time when some of our most aggressive summer annuals are be germinating, a full crop is already there, stealing nutrients, moisture, and light. After no herbicide for a year, there are no significant weedy outbreaks, and if all goes as planned, that field will not receive a herbicide application for another approximately 11 months, while promoting rapid weed seed decay and improving soil tilth and health, a claim few area fields can make. Another example would be our fertility program. Broadcasting nutrients encourages weeds. By applying all nutrients with the planter and at sidedress, nutrients are put where the crop needs it, when it needs it, in the amount it needs. This is especially true since nitrogen will be applied variable rate by soil productivity zone this year, more to follow on that topic next update.



If there's any questions, comments, or concerns or if you want more info/references on anything, feel free to email. Thank you!

Frank