

Agronomy Newsletter: Winter 2022

From the desk of Alex Emehiser

Topics:

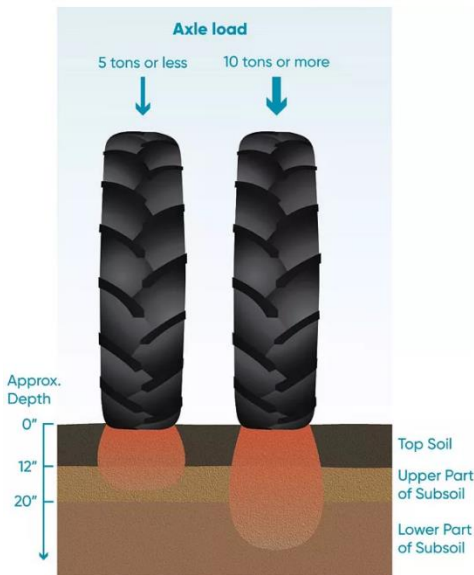
- Freeze Thaw Cycle and Compaction
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We hope you are all having a great winter, and we are looking forward to spring. Seed treating and delivery season will be right around the corner! As always, reach out with any questions you have regarding agronomy topics, or pre-planting information.

- Dane and Alex

Freeze Thaw Cycle and Compaction

The wet weather last fall during harvest forced many to be in the fields in less than optimal conditions. As a result, we have a lot of compaction from combine and grain cart tracks, with the worst areas on end rows and field edges where trucks were loaded. There has been a lot of discussion with the recent cold weather about freeze thaw cycles and how they can alleviate compaction. While there is scientific evidence that freeze thaw can reduce compaction, it is not a cure all as some people may believe. In severely compacted areas and places where ruts or deep tracks happened, we can't expect the frost to completely remedy the problems. I will discuss some of the details below as to how much relief we can expect.



It is well known that compaction depth and severity increases as soil moisture and axle loads increase. The picture to the left illustrates the depth difference as axle loads increased to 10 tons or more. Thinking back about many field operations, an averaged size grain cart with 800 bushels would have over 40,000 lbs. in just the grain alone. Pair this with high soil moisture and there is no doubt compaction reaching into the subsoil in some areas of the field.

Freeze thaw can only affect compaction as deep as the frost line reaches, and for the greatest effect there needs to be repeated freeze thaw cycles. While we have had some very cold weather with deep freeze, we have not had many cycles of freezing and thawing. Recent reports have

said that the frost line has reached 12+” in many fields around the area. We can definitely expect some alleviation of compaction, specifically surface compaction (top 3-6”). A recent study in a Montana clay soil showed that after repeated freeze thaw cycles over one winter, compaction was reduced by 73% at 0-4” depth, 68% at 4-8” depth, and 59% at 8-12” depth. This aligns with what I would expect to see as we enter spring, with the most improvement coming on the surface soil in areas with less severe compaction. However, don’t expect all of the mistakes made last fall to be completely remedied come spring.

Fertilizer Considerations and High Prices

As always, a new year brings new challenges. Fertilizer prices have skyrocketed over the last several months putting farmers in a tough spot for the coming growing season. Coming off of near record yields for corn, beans, and wheat, we are having to make the choice of replenishing nutrient levels in the soil or cutting costs to keep the budget down. There are several things to think about when considering whether to cut fertilizer applications back for the upcoming year.

Fertilizer Waste

Soil pH	Nitrogen	Phosphate	Potash	Fertilizer Wasted
4.5	30%	23%	33%	71%
5.0	53%	34%	52%	53%
5.5	77%	48%	77%	32%
6.0	89%	52%	100%	20%
7.0	100%	100%	100%	0%

- Correcting soil pH is the most important thing to do before applying fertilizer. Having your pH in the optimal range (6.5-7) will give you the largest ROI on your fertilizer investment. The chart above shows how much fertilizer is wasted (tied up or immobilized) in soil below the optimal pH. Phosphorous is affected the most due to immobilization by aluminum at low pH levels.
- Prioritize fields with the lowest nutrient levels for application. Fields with low nutrient levels will give the largest ROI with added nutrients.
- High bean yields remove large amounts of soil Potassium (1.3 lbs/bushel). Consider that a 70 bu/acre soybean crop removes more than a 300 bu/acre corn crop. Soybeans after soybeans can end up being costly when considering the need to replace nutrients removed down the road.
- Consider Nitrogen forms, placement, and timing to optimize applications and reduce waste or lost nitrogen. Split applications with the majority of nitrogen applied around the time the plant needs it most will make the best use of the fertilizer. Also, nitrogen stabilizers could be a sound investment to protect the high priced inputs.
- Fertilizer replacement cut from this year will have to be replaced eventually, and with uncertain prices in the future it may be less economical to apply in future years. With commodity prices high at the moment, now may not be the time to dig a hole when it comes to fertilizer replacement.

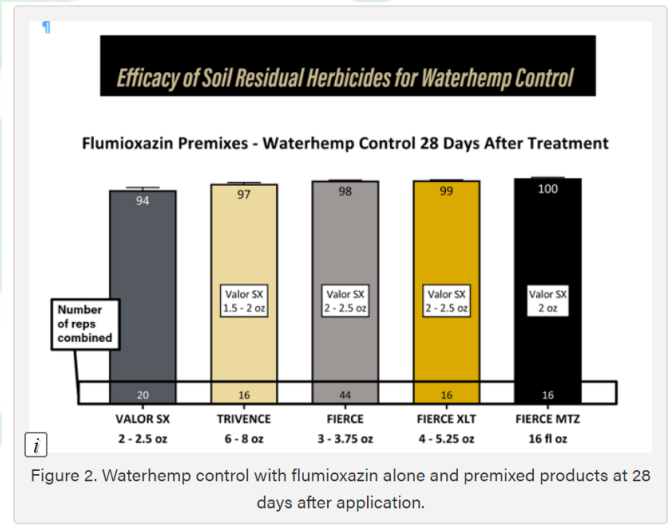
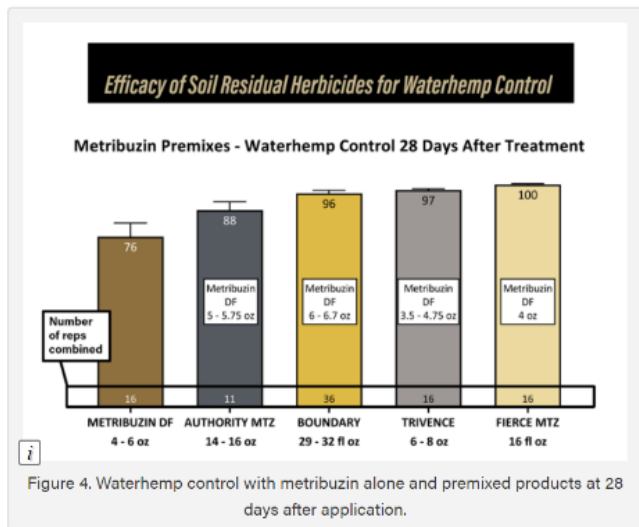
- Whether we apply now, or wait a year or two, the nutrients removed in that time span will still need to be replaced. It could turn out to be more costly to build the soils back up to optimum levels in a few years than it would be to maintain levels where they are now.

These decisions can be very difficult, and ultimately come down to each operations budget, current nutrient levels, and risk tolerance. Hopefully these scenarios can help make a tough decision easier.

Herbicide Programs for Waterhemp Control in Soybeans

It should be no surprise anymore that waterhemp is becoming a bigger and bigger problem each year. In the past year or two, it has surpassed marestail as the major problem weed in our area. Herbicide resistant waterhemp is the main concern, with glyphosate and PPO resistance as the most common. With fewer post-emerge options for control, keeping these weeds from emerging should be the focus. A solid pre-emerge program with multiple effective modes of action should be the basis of a well rounded herbicide program.

Purdue University performed a study this past year testing the effectiveness of different pre-emerge herbicides vs. waterhemp. The two charts below are from the Purdue article showing



the percent control of waterhemp after 28 days. Both metribuzin and flumioxazin are effective vs. waterhemp alone, but when paired together with another one or two more effective modes of action they come near 100% control of waterhemp. Another recommendation to help control waterhemp prior to emergence is by adding an overlapping residual. An example of this would be to come back at an early post-emerge stage with a Group 15 herbicide (Dual for example) to extend the residual window until crop canopy. Our last resort for controlling waterhemp should be our post sprays like 2,4-D and Dicamba. By using a strong residual program, we will keep these post options viable for longer before waterhemp can develop resistance.

Pioneer Stress Testing and Seed Quality

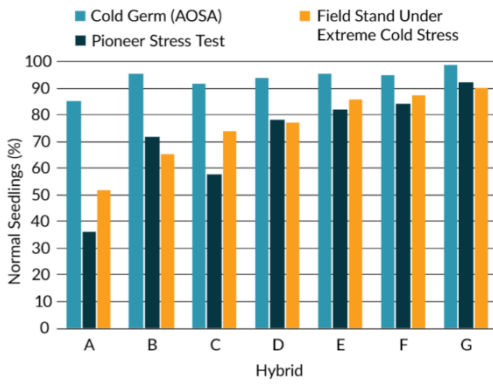


Figure 2. Cold germination test (AOSA protocol) and Pioneer Stress Test results of several hybrids compared to actual field stand establishment under extreme cold stress conditions.

This time every year, we have questions about cold germ for our seed corn. There are several customers who take samples to send to an independent lab to perform cold germ tests. Every batch of seed that Pioneer produces is screened with a proprietary stress test to ensure only the best quality seed goes out to the customers. Pioneer's proprietary Stress Test puts the seed into very tough conditions, forcing the seed into extremely cold water and in an anaerobic state. This is a much tougher test than a standard cold germ test.

The chart to the left shows a sample of different hybrids ran through a standard cold germ test, the Pioneer Stress Test, and planted out into the field into extreme cold conditions. This test validated that the Pioneer Stress Test is more predictive of actual field performance than a standard cold germ test. Notice how the dark blue and orange bars (Pioneer and Field Planted) are more similar in germ % than the light blue (Standard). It is worth noting that a standard cold germ test can be misleading as in Hybrids A, B, and C in the chart. The cold germ test overestimated field performance by anywhere from 20-30% germination. Rest assured if we have cool planting conditions this spring that your Pioneer seed is of the highest quality and will perform in any condition.

Tru-Choice Pre-Pay Program

For anyone interested in taking advantage of the Tru-Choice Pre-Pay chemical program, the deadline to fund the account is February 25th. As a Pioneer customer, **cash pre-pay will give you an additional 15% buying power** on chemicals, and a **deferred pay customer will get an additional 10% buying power**. If you are already using Corteva Chemistry, this program can be a great addition. Contact us if you are interested in taking part in this program.

Product Spotlight: P0859AM **New Advancement**

P0859AM is a new hybrid that we will be testing in all of our plots this upcoming season. It is an exciting new 108 day hybrid that has the potential to be a very versatile product. It is an agronomically sound hybrid that also carries high yield potential and stress tolerance. Over 3 years of IMPACT testing, it carried a **9 bushel yield advantage** over P0720AM.

Strengths:

- Above average stalk strength, staygreen, disease package, tar spot tolerance

Weaknesses:

- Grain Quality and Test Weight