

Nitrogen Applied Last Fall & Under Water/ Early Season Weed Competition in Corn 4.3.2009 04/03/09 1:29:15 PM

Nitrogen Applied Last Fall/ Weed Competition in Corn 4.3.09

This week's newsletter is about early season weed competition in corn. However, lately, I have been getting quite a few growers asking about what is going to happen to the nitrogen that was applied last fall and has recently been under water. I wasn't exactly sure about the right answer to this question, so I emailed Dave Franzen from NDSU. Here is his answer:

"Your bare soil temps were under 50 degrees after about 10/19 and freeze-up followed about three weeks later. If the growers indeed waited until after about the 19th, their N is still mostly nitrate, even with the temps tickling 32 degrees now. If they were early birds and started putting N on about 10/1, I would be concerned. There probably will be little time for soil testing preplant, but in row crops it might be possible to take an early side-dress soil test and see what the status is and then make a side-dress decision. Soil will be wet of course, so any N in nitrate form will easily denitrify during our early spring prep weather. Small grain crops can be stream-barred if necessary early in the season. Plant analysis (whole plants up to 5- leaf stage in most crops) can also be a good indicator."

Critical Period of Weed Competition

According to NDSU, the critical period of weed competition is how long weeds can compete with crops before affecting yield. There are generally two critical periods to be concerned about. The first, is when the weeds emerge at the same time as the crop. The second critical period is when the weeds emerge after the crop is up. Usually the most damaging critical period to yield is the when weeds emerge with the crop. Therefore, this article will primarily address the first critical period for weed control

The chart below is from a study from the University of Wisconsin. This study looks at the effects of early season weed control at different weed heights with a total POST (no PRE's used) herbicide program. The weed height at herbicide time was analyzed versus the yield loss. All of the weeds that emerged later were controlled so this study would only show the yield loss from early weed competition.

Table 1. Corn yield and dollars lost are based on 150bu/a at \$2/bu.

Weed Height (inches)	Days Delayed (%)	Corn Yield (% of weed free)	Yield Lost (bu/a)	Dollars Lost (\$/a)
2	-	101	0	0
4	+5	97	4.5	9
6	+9	93	10.5	21
9	+13	91	13.5	27
12	+15	79	31.5	63

Sources: S. Gower, M. Loux, J. Cardina, and others. 2003. Effect of postemergence glyphosate application timing on weed control and grain yield in glyphosate resistant corn: Results of a 2-yr multistate study. *Weed Technology* 17:821-828.

Weed Density also plays a big role in yield loss due to weeds. The more weeds in the field, the shorter the weeds will be before they start to cause damage to yield. The less weeds in a field, the taller the weeds can be before causing yield damage.

Monsanto did a study in 1998 on the critical period of competition in Round-up Ready Corn. This was a multi-state study with 22 sites. Monsanto found that critical periods could have height anywhere from 4 to 12 inches depending on the weed density. This is a wide range when critical periods can occur! If this is the case, when should the weeds be controlled in corn?

The best policy is not to let weeds get beyond 2-3" tall. The easiest way to accomplish this is by using a PRE herbicide program of some kind. This way weeds can be stopped before they have an opportunity to get started.

Residual Herbicides on Corn

As stated in the above article, controlling weeds in a timely manner in corn is extremely important to prevent yield loss. As displayed by the chart in that article, those yield losses can be costly. One issue that corn producers face is trying to control weeds during the critical period in a timely fashion. This is true of Round-up Ready corn as well Conventional Corn. Many years, farmers are planting soybeans during that critical period, or end up faced with wet conditions that prevent anyone from getting across their field. By using a residual herbicide at planting time, we should gain flexibility by extending the length of time until the critical period for weed control is reached. Also, if we run into the type of wet conditions that prevent us from getting into the field during that critical period, at least we have been proactive in a weed control program and have been able achieve some weed control.

There are many residual herbicide options with different costs and different application methods. Pre-emerge (PRE) application is made after the corn has been planted but is not emerging through the soil surface. It is usually wise to try to time this application before a rain. A ½ inch of rain is usually the minimum requirement for moisture for activation. It is usually best if that rain occurs within 4 days of application.

Impregnation is when the chemical has been placed on the fertilizer at the fertilizer plant, which, in turn is applied and worked into the soil. In order to ensure an even application, there must be at least 200lbs of fertilizer used.

A pre-plant incorporated (PPI) application is sprayed onto the soil before planting and then the ground is worked with tillage. It is important to make sure that the chemical does not get incorporated too deep or the chemical will not be effective on weeds. For example, the Harness and Harness Extra labels say not to incorporate any deeper than 4" and incorporation at 1-2" is best. The Outlook label says no deeper than 1-2". This means shallow incorporation, possibly by a harrow, is best. However, whenever making tillage decisions concerning a pre-plant incorporate application, consult with an agronomist about the proper incorporation methods for specific residual herbicides.

An early post emergence (EPOST) application is made when the crop has just emerged and the weeds are small. The corn size should be no greater than 2" tall. Many of these residual herbicides can be tank mixed with glyphosate during this application. This can be used as a one pass program because the residual will take care of weeds that have yet to emerge, and the glyphosate will take care of weeds that have already emerged. The key to success with this early post emerge program is to make sure that the application is made early!

The most difficult part of implementing a residual herbicide program is figuring out how to fit it into an already busy spring routine. As you can see, there are many types of application and there are a number of residual products on the market. If you are interested in implementing a residual herbicide program into your corn operation, stop by and visit with an agronomist. They will help you figure out which program and product is right for you and your operation.

For More Information:

<http://web1.msue.msu.edu/iac/434/WeedCompetitioninRoundupReadySoyCorn.pdf>

<http://www.ag.iastate.edu/farms/08reports/Northern/EarlySeasonWeed.pdf>