

Pest & Crop newsletter

Purdue Cooperative Extension Service and USDA-NIFA Extension IPM Grant

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Soil Residual Herbicides And Establishment Of Cover Crops In The Fall

(Marcelo Zimmer) & (Bill Johnson)

Indiana growers have shown increased interest in utilizing cover crops in our corn and soybean production systems over the last decade.

Concurrently, there has also been increased utilization of soil residual herbicides to help manage herbicide-resistant weeds such as marestail (horseweed), waterhemp, and giant ragweed in our corn and soybean production systems. Soil residual herbicides can remain active in the soil for a period of weeks to months after application. The length of time a residual herbicide remains biologically active in the soil is influenced by soil texture, soil pH, organic matter, rainfall, and temperature. Since these factors will vary from field to field, definitive time intervals of residual herbicide activity can be difficult to predict.



Red clover stand in 2019 cover crop trials. (Photo Credit: Connor Hodgskiss)

The use of residual herbicides in our corn and soybean production systems may interfere with establishment of fall seeded cover crops under certain conditions. Unfortunately, many of the species being used for cover crops were not evaluated for herbicide carryover when

field research was conducted to support EPA's approved herbicide labels. As a result, data are lacking regarding rotational intervals of many residual herbicides for the establishment of many cover crop species.

About 5 years ago, we conducted experiments designed to evaluate the impact of commonly used residual herbicides on the establishment of many cover crop species. In addition, our colleagues in adjacent states have been conducting similar research and we feel like we have a better handle on this topic now than we did seven years ago. As was mentioned above, predicting herbicide persistence is complicated because so many different factors can influence herbicide dissipation in the soil.

As a general rule, residual herbicides that have activity on grass weeds can interfere with the establishment of some grass cover crop species, especially the smaller seeded ryegrass species. Residual herbicides from group 2 (ALS), group 5 (triazine), group 14 (PPO), or group 27 (bleacher) can interfere with the establishment of some of the broad leaf cover crop species.

More specifically we have learned the following:

◦ Corn herbicides

- Pyroxasulfone (Zidua) and metolachlor (Dual, etc) can hinder annual ryegrass establishment.
- Atrazine or simazine at > 1 lb/A will be problematic for legumes and mustards unless lots of rainfall occurs after application.

- < 0.75 lb/A may allow for good establishment of most legume cover crops, mustards, and annual ryegrass.
- Atrazine < 1 lb/A can allow cereal grain establishment. We have observed cereal rye survival with atrazine rates as high as 1.5 lb ai/A if we have near normal precipitation patterns.

- Mesotrione (Callisto, Lumax, Lexar etc.), flumetsulam (Python) and clopyralid (Stinger, Hornet, SureStart) can be problematic for legumes and mustards like canola and forage radish.

◦ Soybean herbicides

- Chlorimuron (Classic, Canopy, Cloak, etc.), imazethapyr (Pursuit), and fomesafen (Reflex, etc.) could be a problem for fall seeded legume or mustard covers including radish. However, establishment of cereal grains should be OK.

It is important to remember that herbicide application timing greatly influences the risk of carryover interfering with cover crop establishment. In general, herbicides applied at planting have a lower risk of interfering with cover crop establishment than herbicides applied postemergence later in the year. An example would be fomesafen, which can be applied both preemergence and postemergence in soybean. Fomesafen applied postemergence in late June is more likely to interfere with cover crop establishment than fomesafen applied at planting in April or May. We can use the knowledge we have about herbicide interactions with specific cover crops to assess risk of certain herbicide programs interfering with cover crop establishment.

However, it is important to prioritize controlling weeds in your cash crop rather than dropping certain herbicides from your program to ensure successful cover crop establishment.

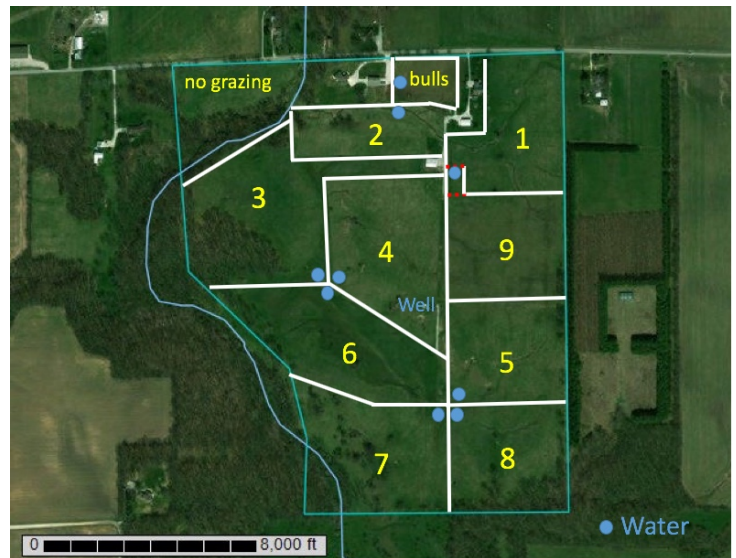
This summarizes our current knowledge on establishment of cover crops following the use of residual herbicides. The final two things to mention is that if you have questions about specific situations, one way to address the residual herbicide left in a field is to do a bioassay. Simply collect soil from the area you would like to seed the cover crop into and an area with a similar soil type, but no herbicide residue, and plant seed from the cover crop you would like to use. Observe growth for 3 weeks and if the plants look the same in the untreated and treated soil, you should be safe to plant to desired crop. Another consideration if you do not have time to do a bioassay is to plant a cover crop mixture. Cover crop establishment may be more reliable when mixtures of grass and broadleaf species are purchased and planted. Residual herbicides may interfere with establishment of some species in the mix but have no effect on other species. The use of mixtures may allow one more protection from complete failure due to excessive herbicide residues in the soil. It would be important however to make sure that at least one or two of the species in the mixture is tolerant to the herbicides used in a specific field.

The following video from The Ohio State University also addresses herbicide carryover concerns on cover crop establishment:

Now Is The Time To Stockpile Forage For Late Fall And Early Winter Grazing

(Keith Johnson) & (Ron Lemenager, Extension Beef Specialist)

What does the word “stockpile” mean to you? Our understanding of the meaning is to “store away for future use.” We are old enough to remember that “stockpile” had the connotation of the Soviet Union and the United States manufacturing and storing bombs.



Rotational grazing a pasture permits stockpiling forage for grazing in the late fall and early winter. (Photo Credit: Keith Johnson)

Not a happy thought and thankfully the product stored was never used. More recently because of Covid-19, some families were stockpiling toilet paper. Some may have thought that the most-right word was hoarding! Within forage-livestock agriculture, the word stockpiling refers to growing forage in the pasture that can be used at a later time.



Late August is an excellent time to apply nitrogen for stockpiling forage growth. A blended fertilizer of nitrogen, phosphorus, and potassium can be applied if recommended by a soil test. (Photo Credit: Keith Johnson)

A properly managed rotational stocking system allows this to happen. Livestock can graze other paddocks (cells) in the late summer and early fall while approximately one-fourth of the acreage is restricted from the livestock so the pasture can grow forage to be grazed in the late fall and possibly the early winter. The following video provides some useful tips about stockpiling forage.

[Stockpiling pasture for the winter](#) from [Phil Reid](#) on [Vimeo](#).

YouTube version will be available at [BeefTips.info](#) by early next week if closed captioning is desired.

Warmer Temperatures Expected After This Week

(Beth Hall)

This past week has been so enjoyable temperature- and humidity-wise that it was easy to hope that it was going to stay this way for several more weeks. But alas, these good times are coming to an end. The national Climate Prediction Center is indicating significant probabilities of above-normal temperatures at least through August 30th (Figure 1). After that, the climate models simply could not form a reliable consensus on whether temperatures are expected to be above or below normal. The good news, however, is that normal temperatures continue to cool as we move away from summer, so what may be defined as “above normal” may not be all that miserable.

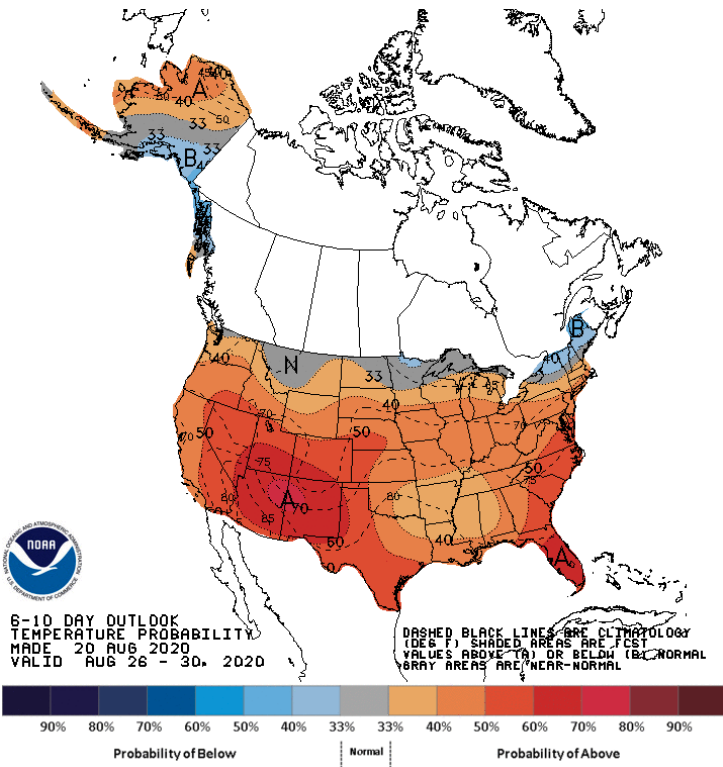


Figure 1. The national Climate Prediction Center's climate outlook for August 26-30, 3030 indicating the probability of above-normal temperatures.

Abnormally dry conditions continue in northern Indiana in contrast to the southern half of the state that is still clinging to the moisture received from rain events over a week ago. Unfortunately, there is not a lot of rainfall predicted over the next seven days (Figure 2), so anticipate conditions to continue drying, particularly with above-normal temperatures enhancing those evapotranspiration rates!

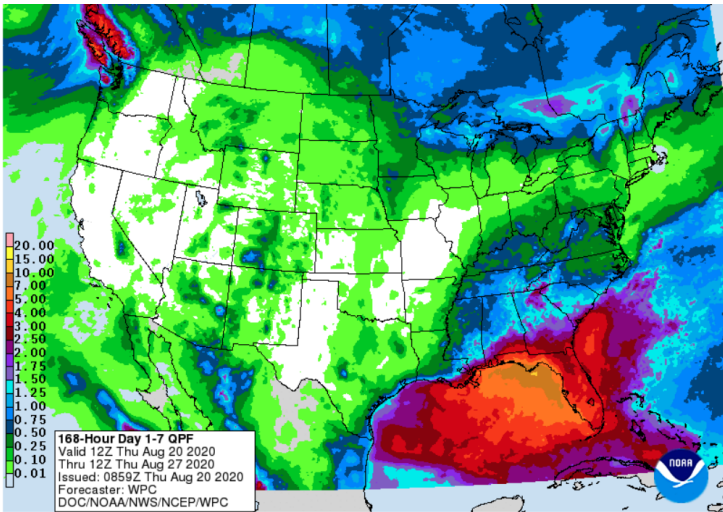


Figure 2. The National Weather Service's 7-day accumulated precipitation forecast for August 20-27, 2020.

Accumulated modified growing degree days (GDDs) continue trying to catch up with previous years (Figures 3 and 4). It will be interesting to see if the warmer temperature for the rest of August will push this year's GDDs ahead of the pack. It is a race I am sure all of us are on the edges of our seats in anticipation of the outcome.

Growing Degree Day (50 F / 86 F) Accumulation April 1 - August 19

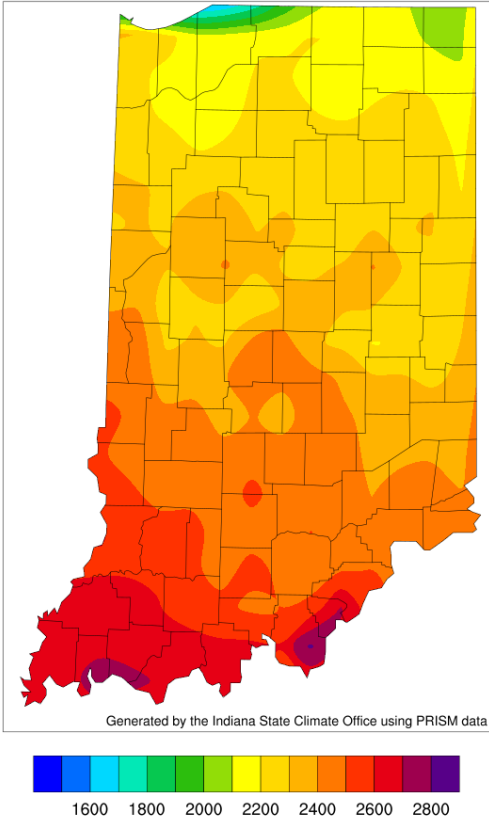
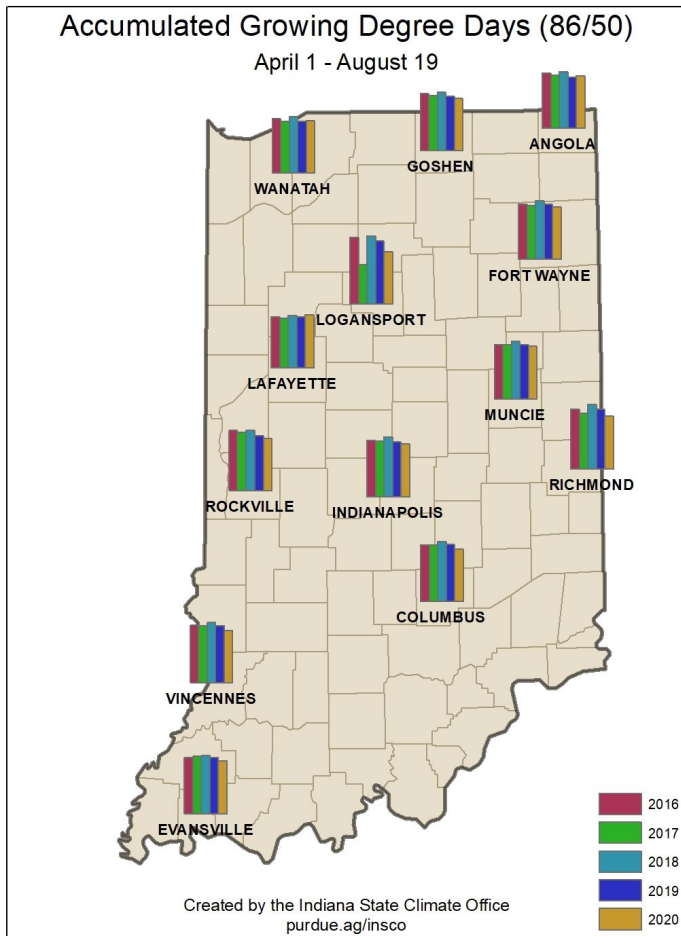


Figure 3. Modified accumulated growing degree-day units for April 1 - August 19, 2020.

Figure 4. Comparison of accumulated modified growing degree days for April 1 through August 19 for 2016 through 2020



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