PURDUE UNIVERSITY | Extension ENTOMOLOGY

Pest&Crop newsletter

Issue: 2020.9
May 29, 2020

Purdue Cooperative Extension Service and USDA-NIFA Extension IPM Grant

This work is supported in part by Extension Implementation Grant 2017-70006-27140/ IND011460G4-1013877 from the USDA National Institute of Food and Agriculture.

In This Issue

June 20th Is The Cutoff Date For Dicamba Applications In Xtend Soybean Fields In Indiana

(Marcelo Zimmer) & *(Bill Johnson)*

We are less than a month away from the cutoff date for approved dicamba product applications in Xtend soybean. We have received several calls recently about the possibility of an extension of this cutoff date in areas of the state that have been hammered by rainfall events and soybean planting dates are delayed.

Dicamba injury on susceptible soybeans. (*Photo Credit: Cade Hayden*)

It is safe to say that the Office of the Indiana State Chemist is very unlikely to change the cutoff date. The reasons for this include the following: First, a large percentage of the off-target movement events in Indiana in 2017, 2018, and 2019 can be traced back to late June and early July applications. Secondly, in 2019 the state of Illinois instituted a dicamba cutoff date, and then delayed the cutoff date because of wet weather. The result was record numbers of off-target movement events attributed to late June and early July applications. For these reasons, it is not reasonable to expect an extension of the cutoff date for Indiana, and those affected by excessive rains and delayed field operations need to start figuring out what plan B is for these fields.

We hate to say we told you so, but this topic has been covered extensively since this application restriction was announced last winter. The normal spring in the eastern cornbelt is characterized as wet and

delayed field operations occur every year in some part of the state unless we have a drought. We repeatedly informed our growers and input provider audiences that one should be prepared for a wet spring and the inability to apply dicamba after June 20th. So, here is a review for those that are in various stages of soybean planting or management of fields that are yet to be planted.

For those fields that have not been planted yet:

- Use a full rate of a residual herbicide that reduces the pressure on the postemergence (POST) herbicide program. Pay particular attention to fields that have waterhemp, and Palmer amaranth and use a preemergence (PRE) residual program that has a group 14 or pyroxasulfone plus another active ingredient that works on ALS and glyphosate-resistant waterhemp or Palmer amaranth.
- Start clean: Don't plant green into live weed infestations and expect to be able to spray your way out of a mess.
- Plant a soybean variety that has herbicide resistance traits that allow you to use herbicides that don't have cutoff dates determined by a calendar for control of glyphosate and/or PPO resistant weeds if you think you will have to spray after June 20th.
- For weeds that escape residual herbicides, make timely POST herbicide applications on small weeds and include another layer of a residual herbicide if you have waterhemp or Palmer amaranth.
- Lactofen and fomesafen can also be sprayed POST in those fields where waterhemp and Palmer amaranth populations are still susceptible to PPO-inhibiting herbicides. Lactofen has no rotational restrictions to corn. Fomesafen has a 10 month rotational interval to corn and herbicide carryover may occur for late season applications. Therefore, fomesafen should not be sprayed into the month of July or later if rotating to corn the following growing season.

For fields that have been planted to Xtend soybean varieties:

- As soon as you see some weed emergence, spray your POST treatment so you have time for a follow up treatment before the cutoff date.
- Use a residual with your POST treatment if you have waterhemp or Palmer amaranth.
- Fill in the drowned out areas of the field so you have the crop canopy to compete with weed emergence throughout the summer.
- Lactofen and fomesafen can also be sprayed POST in those fields where waterhemp and Palmer amaranth populations are still susceptible to PPO-inhibiting herbicides. Fomesafen should not be sprayed into the month of July or later if rotating to corn the following growing season due to carryover concerns.

Irrigation Management To Reduce Cost And Foliar Disease

(Marty Chilvers, Michigan State University) & *(Darcy Telenko)*

A number of foliar diseases can impact corn production in both Indiana and Michigan. They included gray leaf spot, northern corn leaf blight, southern rust and now tar spot. Environmental conditions, particularly moisture, during the growing season will play a big role in the risk of foliar disease development in a field. Irrigation can confound this. Therefore we want to review some of the factors you should consider when making disease management decisions. These include understanding the disease triangle, water management and leaf wetness influence on foliar disease, factors to consider when to apply a fungicide, and finally a review of what we've learned so far on how to best manage tar spot.

Disease triangle

There are three parts to the disease triangle which influence the amount of disease that will develop in a crop canopy. These include the presence of a 1) virulent pathogen, 2) susceptible host, and 3) favorable environmental conditions (Fig 1 a). Each plant disease has its own set of individualized factors that contribute to the disease triangle and determine the risk and impact on yield. For example, tar spot of corn – the pathogen, *Phyllachora maydis*, may either overwinter on diseased tissue (pathogen is present in a field) or move with weather systems. Figure 1 gives an example of how if the pathogen, host or environment factor becomes unfavorable then the amount of disease that will develop is decreased. Factors such as reduced initial inoculum (Fig1-B), host resistance (Fig1-C) or lack of leaf moisture (environment) (Fig 1-D) all can lead to the decreased risk of foliar diseases. And if one or more factors are combined risk can further be decreased (Fig 1-E).

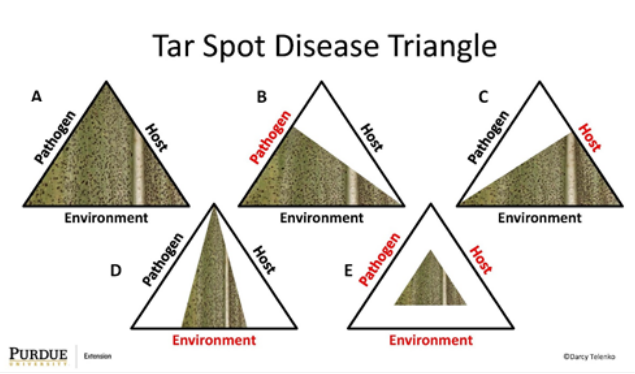

Figure 1. Tar spot disease triangle showing how A. the pathogen, host and environment can influence the amount of disease that may develop in crop canopy. B. Reduced disease potential if initial pathogen inoculum is decreased in a field. C. Reduced disease potential if host plant has improved resistance to the pathogen. D. Reduced disease risk if environmental conditions are not favorable for disease development. E. Reduced disease risk if all three factors are minimized.

Water management and leaf wetness

Leaf wetness is a major driver of disease development. Fungal diseases require moisture to produce spores and to infect the plant. Differences between years in rainfall patterns often drive disease onset and severity. For example, most of the great lakes region saw regular rainfall during the 2018 growing season this resulted in early onset of tar spot and a significant epidemic. Compare that with 2019, which saw a much slower onset and build up of tar spot, due in large part to the dry late July and August that was experienced in the region. Irrigation obviously provides additional leaf wetness events that can drive diseases including tar spot. In 2018, we had multiple accounts of irrigation contributing to disease development and driving 50bu/A yield losses, as compared to non-irrigated sections. Conversely we had an interesting example in 2019, where it was clear that irrigation was driving tar spot disease, however due to the much drier growing season, irrigation was necessary to maximize yield potential. In addition, we have several anecdotes of frequent light irrigation events driving tar spot development. Producers should try to minimize leaf

wetness by avoiding frequent light irrigation and watering appropriately. Work is also currently being conducted to examine the impact of the timing of irrigation and how this might be manipulated to minimize leaf wetness. For example to maximize disease pressure in our fungicide disease screening trials, we may irrigate in the early evening hours to try and promote a prolonged leaf wetness throughout the night.

Decision making for applying a fungicide

Fungicides are a great tool to have in your disease management toolbox. They can be effective at reducing disease and protecting yield, but there are a number of factors that should be considered before pulling the trigger.

1. **Disease risk in the field** – is there a history of a particular disease causing a problem? What was the previous crop?
2. **Current disease activity** – while scouting is the disease active in the lower canopy, is there indications that the disease is spreading (ex. southern rust tracking map https://corn.ipmpipe.org/southerncornrust/)
3. **Weather conditions** – will there be favorable environmental conditions for the disease to continue to develop? Is there a lot of rain and moisture to encourage many of our foliar diseases? Are there tools that can help predict risk?
4. **Return on investment** – will the yield protected by a fungicide cover additional costs of the application?

Okay you've made the decision that you want to apply a fungicide – now what?

The Corn Disease Working Group has developed ratings for how well fungicides control major diseases of corn in the United States. This table is annually updated based on field testing of products. We pulled some of the information for reference in Table 1. The full document is found in the resources section on the Crop Protection Network website (https://cropprotectionnetwork.org/resources/publications)

We highly recommend leaving check strips to determine your ROI from fungicide applications, the results might be surprising.

Managing tar spot

Tar spot is a disease of corn previously reported in Central and Latin America. In 2015 tar spot was found for the first time in the US, in the states of Indiana and Illinois. Since then a significant epidemic was observed in 2018, with continued spread in 2019, the disease has now been confirmed in nine states including Florida.

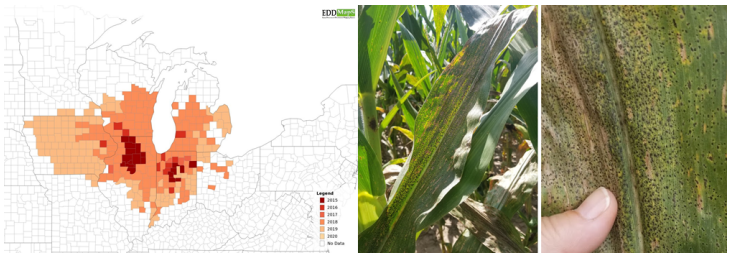

Figure 2. Tar spot spread by year from 2015 until 2019 and tar spot symptoms on corn leaf.
(*Image Credits: EddMaps https://maps.eddmaps.org/ and Darcy Telenko*)

As the name suggests the disease appears and feels like flecks of black tar on the leaves, which cannot be rubbed off the leaf. These small (1/16") black spots are the fungal fruiting structure, which are capable of releasing spores to infect new corn plants. The fungus *Phyllachora maydis* is the only pathogen associated with this disease that has been confirmed in the US. In Mexico, an additional fungal species is suspected of causing fish-eye symptoms, which is seen as dead leaf material around the black spots. We see the fish-eye symptoms in the US, however, to date, we have not found any secondary species associated with these symptoms. In fields with severe disease the corn will often appear frosted, will senesce early and may lodge. Aside from the impact on grain yield and test weight we have also observed the impact of this disease on silage quality. When severe the disease results in corn that is too dry for silage production, and it reduces silage quality by reducing the digestible component and energy value of the feed. Thankfully, there are no associated mycotoxins with this disease. A challenging aspect of tar spot is the rapid progression of disease. In some fields the first signs of disease were observed in early July, with widespread symptoms at the start of August that led to complete senescence at the field level by early September.

As with the management of any disease, the selection of hybrids with good disease resistance packages is essential. However, as tar spot is so new to North America none of our material has previously been screened and bred for this disease. An assessment was made on the impact of tar spot on corn hybrids which can be found here: https://cropprotectionnetwork.org/resources/features/how-tar-spot-of-corn-impacted-hybrid-yields-during-the-2018-midwest-epidemic. It was found that no hybrids were immune; however, there were differences with some hybrids being more resistant than others. With every 10% increase in tar spot severity we noted a 5 bu/A yield loss. Additional screening of hybrids and inbreds will be necessary to identify and incorporate sources of resistance into available hybrid varieties. It is recommended that farmers talk to their seed salespeople for any updates. With little information it would be best to spread risk by planting a few different hybrids. Planting corn on corn may increase the risk of developing tar spot, however even fields under a soybean-corn rotation have been significantly impacted, most likely as the spores are readily dispersed on the wind and capable of moving some significant distance.

Although fungicides help in managing tar spot do not expect 100% control. Fungicide timing is critical for maximizing tar spot disease management. At this point we will have to see what weather conditions and disease pressure is like in 2020. The pathogen is capable of overwintering on infested residue, so in areas where the disease is becoming established there will be a greater availability of disease inoculum to initiate disease. Scouting fields will be essential to stay ahead of this disease. In some situations, it may make economic sense to make two fungicide applications, or possibly hold that VT/R1 application to slightly later in the season. We are working with collaborators to develop fungicide spray forecasting models.

In order to track tar spot this coming season we would like to hear from you. Especially if you observe tar spot in counties that have not been confirmed to date, please send a picture of diseased leaves to us directly at email: chilvers@msu.edu, dtelenko@purdue.edu or Twitter: @MartinChilvers1, @DTelenko

For more information on tar spot and other diseases see www.cropprotectionetwork.org

Hemp Is In The Ground And Pests Are Flying Around

(Marguerite Bolt, mbolt@purdue.edu)

Growers around the state have begun to plant hemp. Both direct

seeding and transplanting is taking place and will continue into June.

It's important to remember hemp does not do well in flooded conditions and growers should avoid planting when heavy rains are in the immediate forecast. Growers should plant hemp after rain, not before. When there are wet conditions, the incidence of damping off increases.

Growers that are currently planting should be on the lookout for seedling diseases and pests. Flea beetles are active in the feral hemp populations and growers could expect to see some damage to their hemp. In addition to flea beetles, I also found my first Eurasian hemp borer for the season. The life history for this pest is murky, so expect to see lots of updates as I monitor populations throughout the summer.

Flea beetles and a Eurasian hemp borer found on feral hemp in Jasper County, May 27th.

Armyworm Pheromone Trap Report – 2020

(John Obermeyer)

County/Cooperator	Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8	Wk 9	Wk 10
Dubois/SIPAC Ag Center	724	84	4	28	108	83	23	20		
Jennings/SEPAC Ag Center	60	75	11	15	35	46	5	9		
Knox/SWPAC Ag Center	1162	308	56	168	64	11	49	129		
LaPorte/Pinney Ag Center	115	65	0	21	455	176	591	1214		
Lawrence/Feldun Ag Center	974	347	57	741	753	416	380	301		
Randolph/Davis Ag Center	117	207	16	51	15	18	104	211		
Tippecanoe/Meigs	225	wind dmg.	6	54	151	221	360	223		
Whitley/NEPAC Ag Center		9		38		214	715	633		

Wk 1 = 4/2/20-4/8/20; Wk 2 = 4/9/20-4/15/20; Wk 3 = 4/16/20-4/22/20; Wk 4 = 4/23/20-4/29/20; Wk 5 = 4/30/20-5/6/20; Wk 6 = 5/7/20-5/13/20; Wk 7 = 5/14/20-5/20/20; Wk 8 = 5/21/20 – 5/27/20; Wk 9 = 5/28/20-6/3/20; Wk 10 = 6/4/20-6/10/20; Wk 11 = 6/11/20-6/17/20

Wet Soils Complicate Summer Temperature Outlooks

(Beth Hall)

On May 21st, the national Climate Prediction Center released the June-July-August summer outlook for temperature and precipitation (Figure 1). While the 3-month precipitation outlook is showing confidence for wetter-than-normal conditions, the temperature outlook has a significant area of "equal chances". This indicates that the predictive models could not reconcile with consistency whether temperatures will be above or below normal. The rest of the country has varying levels of confidence for above-normal temperatures. Therefore, it may be reasonable to assume that the Midwest will also experience above-normal temperatures, but the moderating effect of excess soil moisture may dampen the impact.

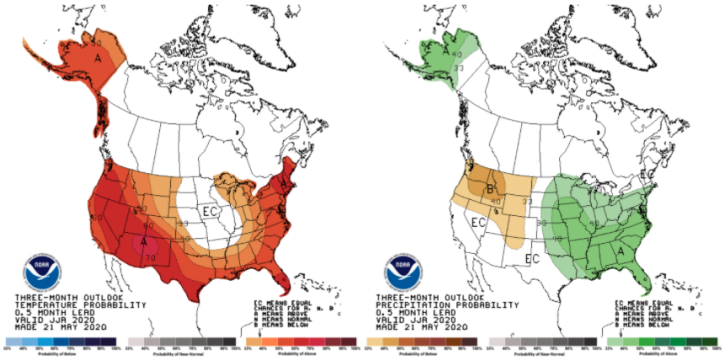

Figure 1. The June-July-August temperature (left) and precipitation (right) outlooks indicating the probabilistic confidence of conditions likely to be above or below normal.

Typical of Indiana springs, day-to-day temperatures seem to be swinging widely from relatively cool conditions to impressively hot conditions. Memorial Day weekend brought in some very warm days with temperatures 10-15 degrees above normal between May 24th and 27th! This helped to boost the modified growing degree-day accumulations (Figure 2), but these accumulations are still 60-180 units below the 1990-2019 period average (Figure 3). The Indiana State Climate Office is now providing daily updated GDD maps (https://ag.purdue.edu/indiana-state-climate/growing-degree-day-climate-maps/) for the state with accumulation start dates of April 1, April 15, and May 1.

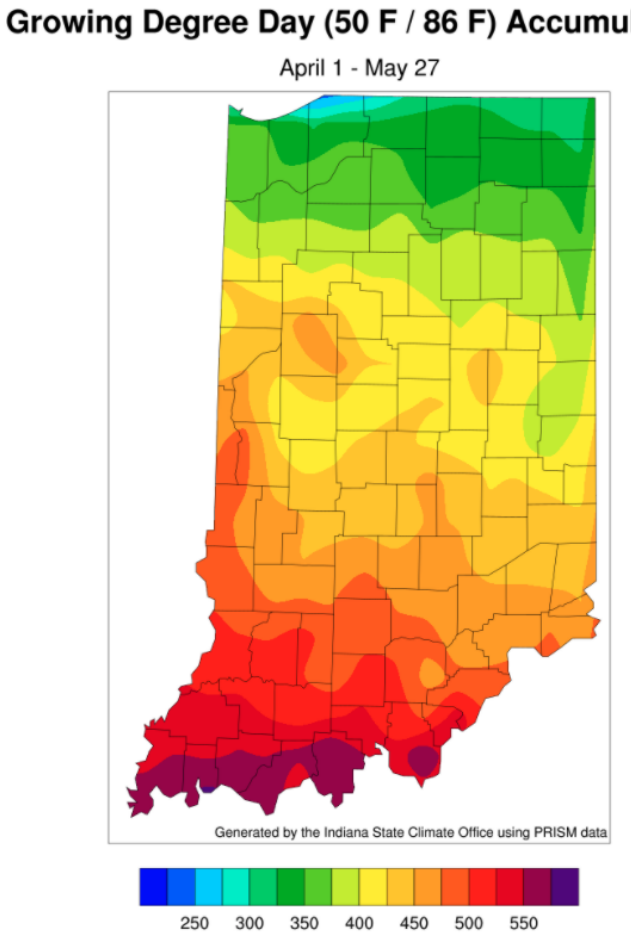

Figure 2. Modified growing degree-day accumulations for April 1 through May 27, 2020.

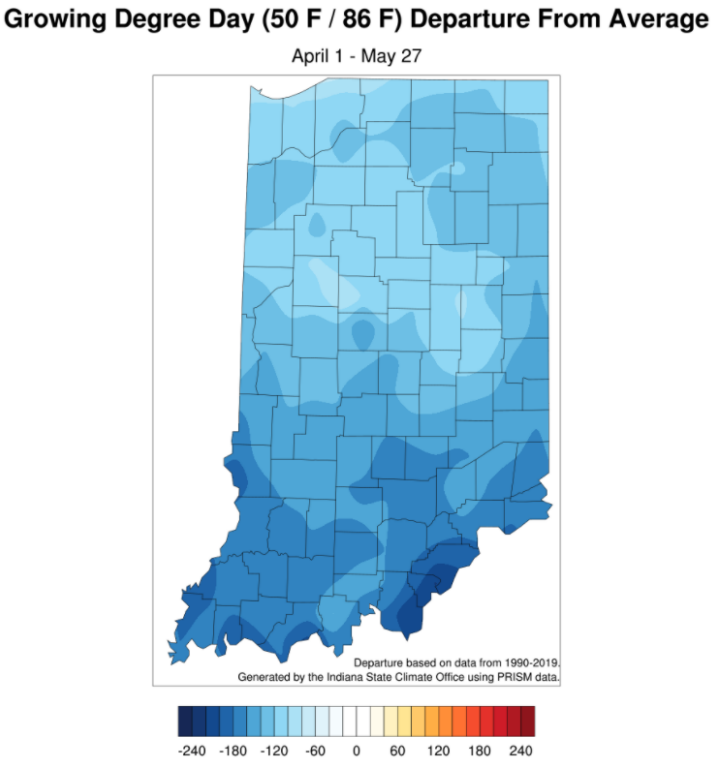

Figure 3. The April 1 through May 27, 2020 modified growing degree-day accumulation departure from the 1990-2019 period average.

It is the policy of the Purdue University that all persons have equal opportunity and access to its educational programs, services, activities, and facilities without regard to race, religion, color, sex, age, national origin or ancestry, marital status, parental status, sexual orientation, disability or status as a veteran. Purdue is an Affirmative Action Institution. This material may be available in alternative formats. 1-888-EXT-INFO Disclaimer: Reference to products in this publication is not intended to be an endorsement to the exclusion of others which may have similar uses. Any person using products listed in this publication assumes full responsibility for their use in accordance with current directions of the manufacturer.

Pest&Crop newsletter © Purdue University - extension.entm.purdue.edu/newsletters/pestandcrop
Editor: Tammy Luck | Department of Entomology, Purdue University, 901 W. State St., West Lafayette, IN 47907