PURDUE UNIVERSITY Extension - Entomology

Pest&Crop newsletter

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In This Issue

2021 Western Bean Cutworm Pheromone Trap Report

(John Obermeyer)

		WBC Trapped						
		Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7
County	Cooperator	6/17/21-6/23/21	6/24/21-6/30/21	7/1/21-7/7/21	7/8/21-7/14/21	7/15/21-7/21/21	7/22/21-7/28/21	7/29/21-8/4/21
Adams	Roe/Mercer Landmark	0	0	0				
Allen	Anderson/NICK	0	0	0				
Allen	Gynn/Southwind Farms	0	0	0				
Allen	Kneubuhler/G&K Concepts	0	0	0				
Bartholomew	Bush/Pioneer Hybrids	0	0	0				
Boone	Emanuel/Boone Co. CES	0	0	0				
Clay	Mace/Ceres Solutions/Brazil	0	0					
Clay	Fritz/Ceres Solutions/Clay City	0	0	0				
Clinton	Emanuel/Boone Co. CES	0	0	1				
Dubois	Eck/Dubois Co. CES	0	0	0				
Elkhart	Kauffman/Crop Tech Inc.	0	0	2				
Fayette	Schelle/Falmouth Farm Supply Inc.	0	0	0				
Fountain	Mroczkiewicz/Syngenta	1	1	8				
Hamilton	Campbell/Beck's Hybrids	0	0	0				
Hancock	Gordon/Koppert Biological Systems	0	0	0				
Hendricks	Nicholson/Nicholson Consulting	0	0					
Hendricks	Tucker/Bayer	0	0	0				
Howard	Shanks/Clinton Co. CES	0	0					
Jasper	Overstreet/Jasper Co. CES	0	2	6				
Jasper	Ritter/Dairyland Seeds	0	2	68				
Jay	Boyer/Davis PAC	0	0	0				
Jay	Liechty/G&K Concepts	0	0	0				
Jay	Shrack/Ran-Del Agri Services	0	0	0				
Jennings	Bauerle/SEPAC	0	0	0				
Knox	Clinkenbeard/Ceres Solutions/Freelandville	0	0	0				
Kosciusko	Jenkins/Ceres Solutions/Mentone	3	0	30				
Lake	Kleine/Rose Acre Farms	0	0	1				
Lake	Moyer/Dekalb Hybrids/Shelby	0	2	9				
Lake	Moyer/Dekalb Hybrids/Scheider	0	1	13				
LaPorte	Rocke/Agri-Mgmt. Solutions	1	1	16				
Marshall	Harrell/Harrell Ag Services	0	1					
Miami	Early/Pioneer Hybrids	0	1	10				
Montgomery	Delp/Nicholson Consulting	0	0	0				
Newton	Moyer/Dekalb Hybrids/Lake Village	0	0	19				
Porter	Tragesser/PPAC	0	1	1				
Posey	Schmitz/Posey Co. CES	0	0					
Pulaski	Capouch/M&R Ag Services/Medaryville	1	0	0				
Pulaski	Leman/Ceres Solutions	1	0	4				
Putnam	Nicholson/Nicholson Consulting	0	1	0				
Randolph	Boyer/DPAC	0	0	0				
Rush	Schelle/Falmouth Farm Supply Inc.	0	0	0				
Shelby	Fisher/Shelby County Coop	0	0	0				
Starke	Capouch/M&R Ag Services/Monterey	3	4	42				
Starke	Capouch/M&R Ag Services, San Pierre	3	0	17				
St. Joseph	Carbiener/Breman	0	0	2				
St. Joseph	Deutscher/Helena Agri-Enterprises, Trap 1	0	0	0				
St. Joseph	Deutscher/Helena Agri-Enterprises, Trap 2	0	0	0				
Sullivan	McCullough/Ceres Solutions/Farmersburg	9	0	0				
Tippecanoe	Bower/Ceres Solutions	2	6	60				
Tippecanoe	Nagel/Ceres Solutions	0	0	0				
Tippecanoe	Obermeyer/Purdue Entomology	0	1	0				
Tippecanoe	Westerfeld/Bayer Research Farm	0	0	0				
Tipton	Campbell/Beck's Hybrids	0	0	0				
Vermillion	Lynch/Ceres Solutions/Clinton	0	0	0				
White	Foley/ConAgra	0	1	0				

* = Intensive Capture...this occurs when 9 or more moths are caught over a 2-night period

Time To Scout For Diseases In Field Crops: What To Look For In Corn Yes, We Have Found Active Tar Spot In Indiana.

(Darcy Telenko)

Early planted corn in Indiana is reaching mid- to late-vegetative stages and some tasseling in the south. Therefore, it is time to start monitoring for diseases to make an informed decision if a fungicide is necessary. As a reminder for disease to occur, three things need to be present 1. Virulent Pathogen, 2. Susceptible Host, and 3. Favorable Environment. **Recent rains have made conditions conducive for many of the foliar diseases** in corn therefore it is now time to **get out and scout**. The major diseases we monitor in Indiana such as gray leaf spot, northern corn leaf blight, northern corn leaf spot, and tar spot all might start to make an appearance (figure 1 and 2). This week we have found a low incidence of tar spot, gray leaf spot, northern corn leaf blight, and common rust in the lower canopy.

A few questions to think about when scouting and looking for disease:

1. What is the disease history in the field? How much residue is still present? (What happened in previous years?)
2. What growth stage is the field? Early planting vs. late
3. Is irrigation being applied? How much and how often? If water is being applied, it can change the environmental conditions and disease risk in a field.

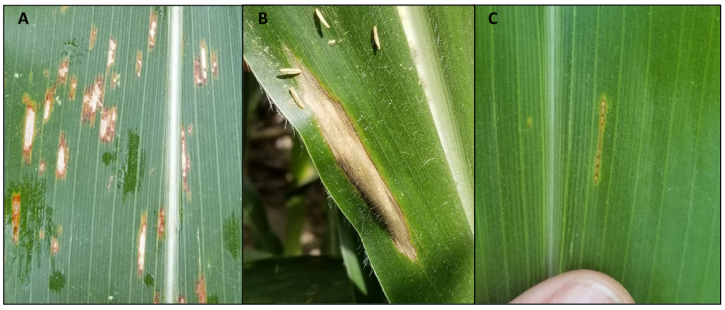


Figure 1. Examples of A- gray leaf spot, B-northern corn leaf blight, and C-northern corn leaf spot lesions on a corn leaf. (*Photo Credit: Darcy Telenko*)

Tar spot of corn continues to be a concern this season after the localized epidemics we have experienced last few years in Indiana. In our scouting rounds this week, we did find tar spot at a low incidence in our field trial locations. The disease is just starting and the wet conditions last week probably kicked it off. The fields were located in Porter and LaPorte Counties in Indiana (see map Figure 3). Michigan has also had positive confirmations in Allegen and Eaton Counties and Iowa in Muscantine County. In the Indiana fields, the corn was between V5 and V8, had a history of tar spot. The disease was found in some of the lowest leaves in the canopy. We will continue to monitor the disease progression in these fields and will provide updates on any significant spread in the field or increases in disease severity. Again, the recent rains have favored tar spot. See the forecast from the Tarspotter App all of Indiana was red last week, whereas as of today, July 6, 2021, most of the state is still at high risk except in southeast Indiana (Figure 4). If you have a history of the disease it is time to keep an eye out and make

an informed management decision (Figure 4).

Figure 2. Corn leaves infected by tar spot. Infection can range from mild to severe on a leaf. The spots will be raised (bumpy to the touch) and will not rub off. In addition, they may be surround by a tan or brown halo, and high severity can lead to a rapid blighting of the leaf. (*Photo Credit: Darcy Telenko*)

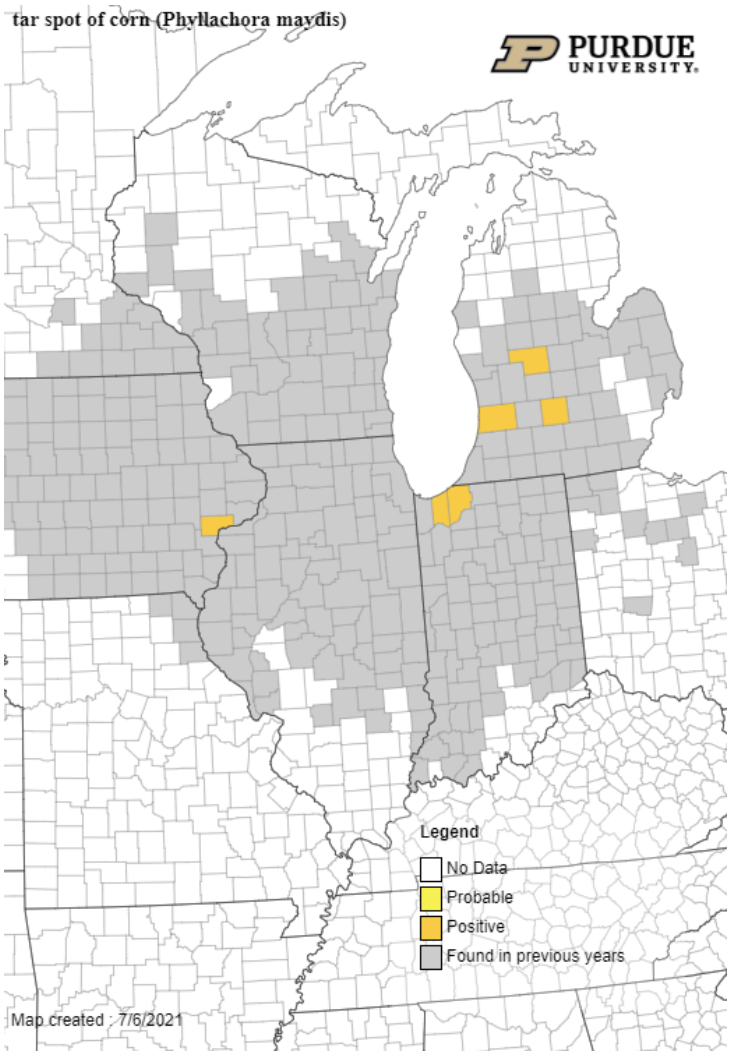


Figure 3. Tar spot map for July 6, 2021. Source: EddMaps at https://corn.ipmpipe.org/tarspot/

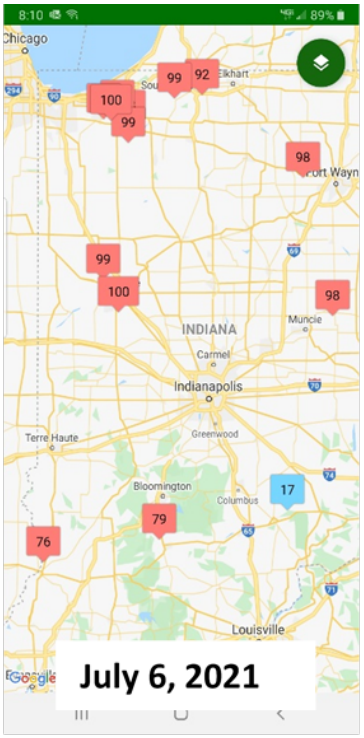


Figure 4. Tarspotter App forecast from July 6, 2021. Red color indicates favorable environmental conditions for tar spot if corn at V8 or larger, blue color indicates unfavorable environmental conditions for tar spot. Source: Tarspotter App v. 0.52 Smith, D., et al. ©2021 Board of Regents of the University of Wisconsin System.

After hearing this news we know the next question – should I be putting out a fungicide?

Research has shown the best return on investment in making a fungicide application in corn occurs when the fungal diseases are active in the corn canopy. Most of our corn sites across the state are quite clean and disease pressure is minimal, so far this season. It is important to keep scouting, especially after last week's rain.

Based on our recent research, to minimize the impact of tar spot on crop yield we need to be protecting the ear leaf and above until the corn reaches black layer. In our fungicide timing trials applications made at VT/R1 (tassel /silk) did a good job controlling tar spot, but we did see that once the fungicide ran out of steam (3-week window) tar spot began to pick up. A **well-timed, informed fungicide application** will be important to reduced disease severity when it is needed, and we recommend holding off until the diseases become active in your field and corn is at least at V8 or nearing VT/R1 (tassel/silk) or even R2 (blister) if we move back to drier conditions. Scouting will be especially important if the recent rains we have seen continue.

If you suspect tar spot in your fields, please consider submitting samples for confirmation. We are still documenting the disease in Indiana, similar to last few years. Research funding from the Indiana Corn Marketing Council is supporting sample processing, therefore there will be no charge for corn tar spot samples submitted to the clinic.

What to look for: Small, black, raised spots (circular or oval) develop on infected plants, and may appear on one or both sides of the leaves, leaf sheaths, and husks. Spots may be found on both healthy (green) and dying (brown) tissue. Sometime, the black spots may be surrounded by a tan or brown halo; this is especially obvious on healthy leaves (see Figure 2).

I want to ask before you submit a sample you do a quick and dirty

"scratch test" to see if you can rub the spot off the leaf, especially if you have leaves with just a few small spots. I have been successful in detecting these false spots by using my nail to scratch as the suspect lesion. This is a quick way to check, but as always if you are unsure send an image or the sample to the Purdue Plant Pest Diagnostic Lab. Please collect several leaves showing the symptoms and send them with a PPDL form https://ag.purdue.edu/btny/ppdl/Documents/Forms/PPDL-Form_13MAY15FILLABLE.pdf.

Please wrap the leaves in newspaper, ship in a large envelope, and ship early in the week. If you are sending samples from multiple locations please label them and provide the date collected, variety of corn, field zip code or county, and previous crop.

Mail to: Plant and Pest Diagnostic Laboratory, LSPS-Room 116, Purdue University, 915 W. State Street, West Lafayette, Indiana 47907-2054.

The lab is operating and the building is open. If dropping off a sample is more convenient than shipping, please call or email the lab prior to stopping by Phone – 765-494-7071 or Email – ppdl-samples@purdue.edu.

In addition, the 2021 tar spot and southern rust maps are live that will be updated when a positive county confirmation is detected. If you are interested in up-to-date information on the current detection of these diseases, the maps are available on the front page of our Extension website https://extension.purdue.edu/fieldcroppathology/ or at https://corn.ipmpipe.org/

If you have any question please contact Darcy Telenko (dtelenko@purdue.edu/764-496-5168) or PPDL (ppdl-samples@purdue.edu/765-494-7071)

Irrigation Update 7-7-2021

(Lyndon Kelley (MSU/Purdue Extension Irrigation Educator))

What a change a couple weeks of rain can make...Rains over the last 3 week have refilled the water holding capacity for most fields. Expect producers to start irrigating when the accumulated rainfall deficit from the crop water removal after subtracting the rainfall totals is 1.5 -2.5" of soil moisture reserve. Irrigators with irrigation capacity less than crop removal should start sooner than irrigators with adequate irrigation capacity allowing them to drain the water reserve down for a few days before starting.

With a predicted **Ref ET of 1.4" for the week,** the water use by corn at V-10 is 1.1" and V-14 is 1.5" for the week. Soybeans water use at V-3 will use 0.9"water and soybean approaching R-1 will use 1.4" For more information on Irrigation scheduling see: https://www.canr.msu.edu/uploads/235/67987/resources/SoilWaterBalanceSheet.03.05.15.pdf

https://www.canr.msu.edu/irrigation/upoads/files/FS03-IrrigationSchedulingTools07.19.pdf

I have had several questions about replacing N loss to heavy rains or adding N where side dress was missed or inadequate. **Fertigation** is an excellent way to add N when needed but is limited to only the irrigated section of the field and at least enough water removal since the last soil profile filling rain to allow for the fertigation application to be held in the root zone. For more information: https://www.canr.msu.edu/uploads/235/67987/FactSheets/12_NitrogenApplicationWithIrrigationFact_Sheet.pdf

Fungicides through irrigation (Chemigation) many producers are planning to apply fungicide through irrigation center pivots during mid to late July and beyond. Please help make sure adequate backflow protection is in place and the producers are aware of the chemigation label requirements. Please look for "Chemigation –short narrated" as a power, point for more info. https://www.canr.msu.edu/irrigation/

Please help me advertise a Six Session Irrigation webinar series that starts Tuesday (July 7 from 12-1:00 pm.)

Each session will have a presentation on:

- Irrigated crops Management, (Dr. Camberato is talking on mid-season irrigated corn N fertilization decisions tomorrow)
- A presentation for new or prospective new irrigators
- An irrigation update from one of the many crop industry dependent on irrigation.
- An irrigation related question and answer time – please forward irrigation related questions to me. Kelleyl@msu.edu

The registration site below will get producer to future irrigation webinars in the series and to recording of past webinars. Event Summary for Irrigation Webinar Series | ANR Events Management System (msu.edu)

Water... it there to use but not abuse...

Environmental Conditions Affect Time To Safe Hay Baling

(Keith Johnson)

Environmental conditions that exist when forages are ready to be harvested influences the amount of hours that it takes to get to a safe baling moisture. A growing forage will have 75 to 80 percent moisture. A moisture content of 20 percent is considered a safe baling moisture for small rectangular bales and will be slightly less for large round bales and large rectangular bales. The following tables are from the Purdue Forage Field Guide (Purdue publication ID-317) and provide useful information regarding the effects temperature, relative humidity, and soil moisture condition have on the time it takes from cutting to baling. When relative humidity is 90 percent, cut hay will never get to a safe baling moisture content of less than 20 percent moisture regardless of temperature (Table 1). With a relative humidity of 70 percent or less, the higher the temperature the lower the predicted moisture will be for hay in storage, although a 70°F temperature at 70 percent relative humidity will not achieve a safe baling or storage moisture level.

Effects of soil moisture condition and solar radiation on the number of hours to achieve 20 percent moisture alfalfa are found in Table 2. This research indicates that the number of hours when conditions are cloudy with wet soil moisture are approximately three times longer than when sunny and dry soil conditions occur.

It is critical that environmental conditions be considered when making dry hay. Haymaking conditions are likely to never be the same within a harvest season.

Table 1. Predicted Final Moisture Content of Baled Hay

	Relative Humidity (%)			
Temperature (°F)	**30**	**50**	**70**	**90**
70	10	13	21	39
80	8	12	20	38
85	7	10	18	37
95	5	8	18	36

Table 2. Predicted Hours to Dry Alfalfa from 80% to 20% Moisture

		Air Temperature (°F)				
Sun[1]	**Soil Condition**[2]	**50**	**60**	**70**	**80**	**90**
Cloudy	Wet	44	41	38	35	33
Cloudy	Dry	36	34	31	29	27
Sunny	Wet	16	16	15	15	15
Sunny	Dry	14	13	13	12	12

[1]Cloudy = 100 Btu/hr-ft^2 solar radiation. Sunny = 280 Btu/hr-ft^2 solar radiation.
[2]Wet soil = 20% moisture content. Dry soil = 9% moisture content.
Source: Silage and Hay Preservation (Natural Resource, Agriculture, and Engineering Service publication NRAES-5)

Raking hay into a windrow before baling occurs. (*Photo Credit: Keith Johnson*)

Soybean's Wet Feet: Recovery Or Rescue?

(Shaun Casteel)

Early in June we were discussing the possibility of drought intensifying causing issues with stand establishment and early rooting and nodule development. However, we caught enough spotty showers to get through that brief scare. Over the past several weeks we have gone to the other end of the spectrum in many places across Indiana with rain events of 2+ inches and total accumulations of 6 to 8 inches (Figure 1), which was 50 to 75% more than we typically get. Again, much of this precipitation came within short periods over the last few weeks. Then, the sky let loose of additional buckets of rain on July 8th.

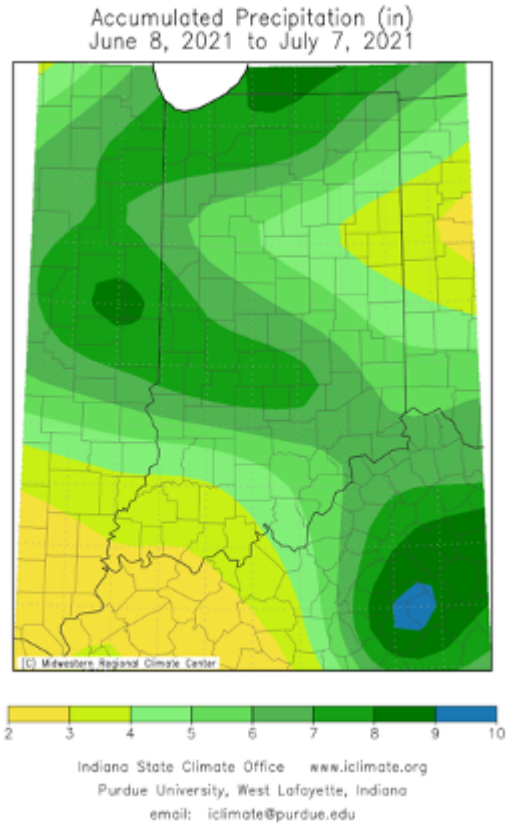


Figure 1. Accumulated precipitation across Indiana from June 8 to July 7, 2021. ww.iclimate.org

Needless to say, many fields of soybean are struggling with wet feet (Figure 2). Chances are you will see the off-green to highlighter green soybeans throughout the fields where the field has been saturated to ponded. Saturated soils will limit oxygen supply to soybean roots and *bradyrhizobia*. Soybeans grow and develop by burning plant energy (photosynthates) with the assistance of oxygen. Thus, soybean (and rhizobia) growth is limited under wet conditions. In fact, nodules can die under prolonged saturation (see video at the end) and limit N supply.

I suggest digging up the plants in these fields to assess if the nodules are white, red, or dead. White nodules are immature, but developing. Red or pinkish interior of the nodules indicates that N fixation has started. Brown to mushy nodules are dead and will not supply N. Young soybeans, V2 to V3, may only have three to five actively-fixing nodules (pink to red interior). Soybeans from V4 and onward should have eight or more actively-fixing nodules with more nodules developing. Nutritional analyses of the most recent mature leaves of soybean will help to pinpoint if N or another nutrient is deficient.

Under normal growing conditions, soybeans accumulate ~10 lb N/acre by V4 then accumulate another ~3 lb N/acre daily until R2 (full bloom). Thus, soybeans normally accumulate another 60 lb N/acre by R2 (full bloom). Nitrogen stress during this period will impact yield.

Figure 2. Field variation of soybean due to saturated and ponded conditions. Off-green to highlighter green soybeans have undergone saturated to ponded conditions to the point of causing root and nodule death. Dark green soybeans would be the more normal areas of growth and development.

We have tried rescue treatments under similar situations in 2015 when we received nearly 20 inches of rain in June up near LaCrosse. We had a uniformly, poor-looking soybeans (Figure 3) that we evaluated 18 treatments to rescue the soybeans that were off-green with compromised root system compared to those soybeans that were normal (Figure 4).

Figure 3. Soybeans (V4) compromised from ~20 inches of rain in June 2015 near LaCrosse, IN.

Figure 4. Soybeans (also V4) that were healthy and not compromised from the same ~20 inches of rain in June 2015 near LaCrosse, IN.

We evaluated N-based treatments; individual foliar sprays of nutrients, fungicides, and growth regulators; and tank mixes of some of those foliar sprays (Figure 5). The N-based treatments were to provide the shot in the arm since we were compromised on nodule and N supply. Urea was applied at 40 and 20 lb of N/ac with no yield effects. Granular AMS (21-0-0-24S) was applied at two different rates 20 and 10 lb N/ac, which were the only treatments to increase yield above the untreated control (UTC) (Figure 5). These are also the only treatments that supplied sulfur (23 and 11.5 lb S/ac, respectively).

Please note this was our first glimpse into soybean response to sulfur (S). In fact, this site has become our S-deficient site to evaluate S management of soybean. Thus, it is difficult to tease out if the rescue treatment for soybeans under saturated conditions was beneficial because of the saturated conditions that compromised root development, nodulation, and N fixation OR if it was beneficial because the field is responsive to sulfur treatments year in and year out.

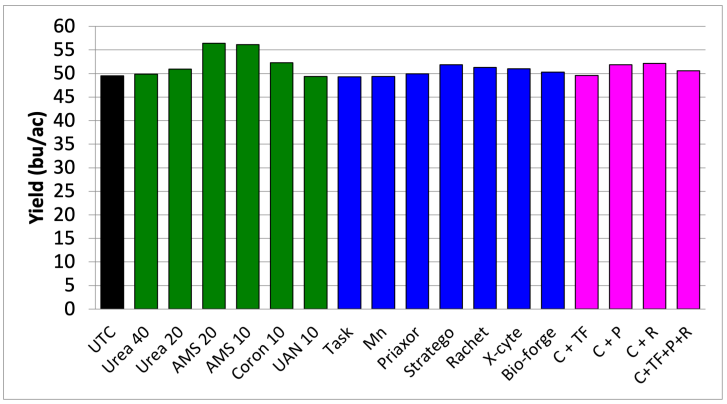


Figure 5. Rescue treatments applied July 2, 2015 to V4 soybeans (uniformly poor and off-green) near LaCrosse, IN. AMS 20 and AMS 10 were the only treatments that increased yield above the UTC.

If you are considering any rescue treatments of soybean, please be sure to assess the root system and nodule activity (or the lack thereof). If you deem a field worthy of rescuing or trying to rescue some of it, I would start with a S and/or N+S based approach to stimulate nodulation (S is needed as a co-factor) and to provide a shot in the arm for the limited N supply until N fixation takes over. It is reasonable to use 10 to 20 lb S/ac from a soluble source like granular AMS or pelletized gypsum. If you use granular AMS, 8.8 to 17.5 lb N/ac would also be supplied. If you would like to increase the N portion applied, I suggest using urea to reach a total of 40 lb N/ac. We do not want to overload the field with N to the point of delaying nodulation and N fixation.

VIDEO: Soybean Assessment After Wet Conditions

(Shaun Casteel) & *(John Obermeyer)*

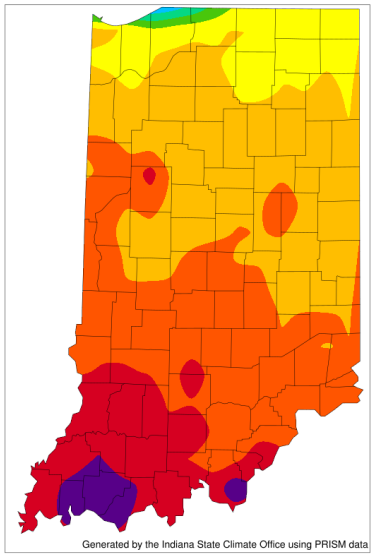
In this video, three different areas of a soybean field that have been subjected to extended periods of saturated soils to flooding are assessed for damage. Primarily, once soils allow foot traffic, one should evaluate the health of the root system and nodules. Root and nodule recovery is possible once soils drain and aerate (oxygen supply for respiration and growth). White roots are indicative of being healthy, whereas dark roots are compromised. Nitrogen-fixing nodules will either be white (new and developing), red (pink and producing N), or dead (hollow and mushy).

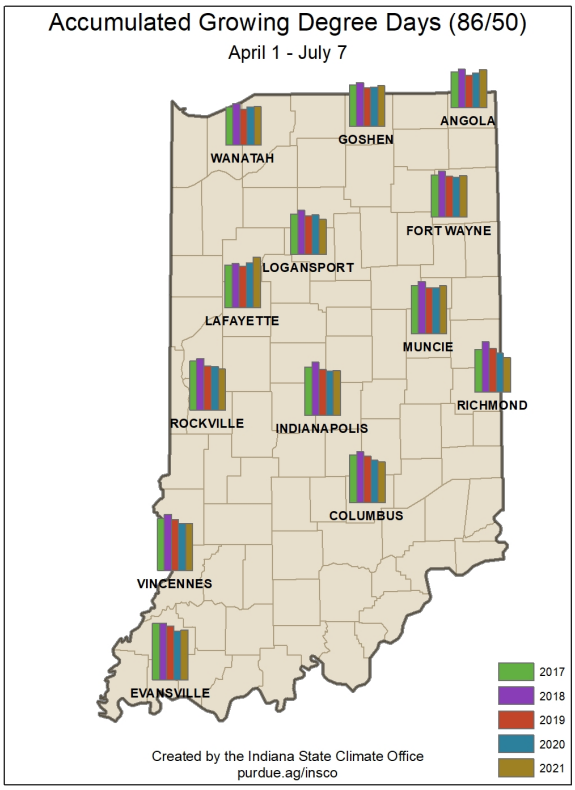
Weather Update: Moisture And Temperature

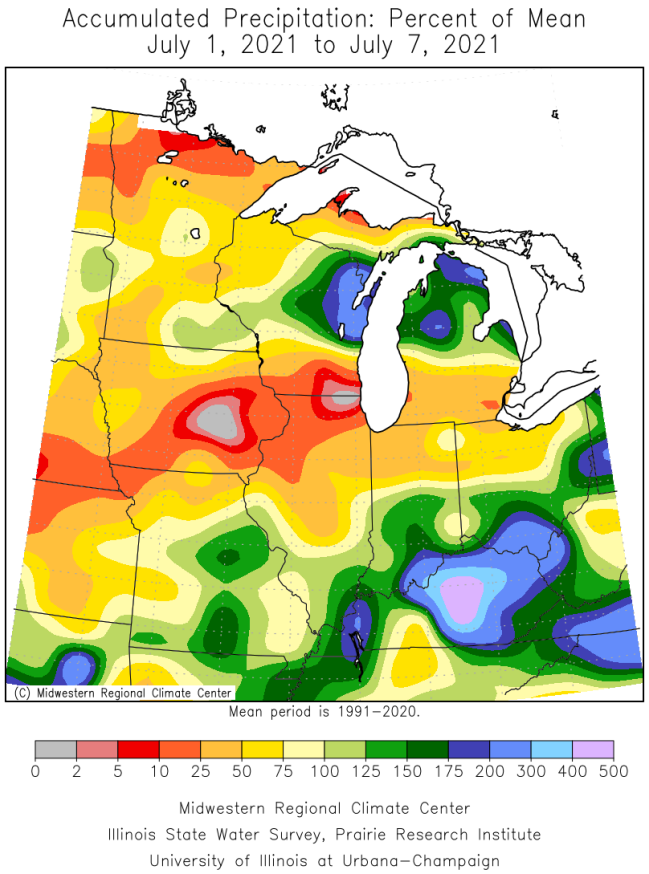
(Beth Hall)

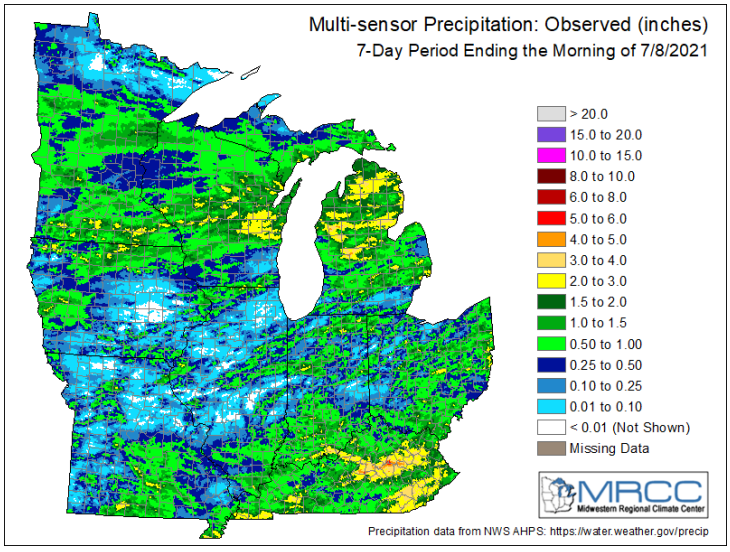
Growing Degree Day (50 F / 86 F) Accumulation

April 1 - July 7, 2021









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Editor: Tammy Luck | Department of Entomology, Purdue University, 901 W. State St., West Lafayette, IN 47907