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Pest & Crop Newsletter

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PURDUE UNIVERSITY | Extension - Entomology

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Armyworm Pheromone Trap Report – 2024

(John Obermeyer)

County/Cooperator	Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8	Wk 9	Wk 10	Wk 11
Dubois/SIPAC Ag Center	0	8	41	101	81	18	5	32	37	32	20
Jennings/SEPAC Ag Center	1	8	58	137	60	18	4	6	1	3	14
Knox/SWPAC Ag Center	0	0	41	31	13	8	11	9	2	16	12
LaPorte/Pinney Ag Center	0	44	51	65	33	14	35	9	6	4	7
Lawrence/Feldun Ag Center	4	125	248	103	69	86	46	49	82	159	103
Randolph/DPAC Ag Center	0	0	25	90	84	0	0	10	0	0	0
Tippecanoe/ACRE	0	4	37	27	68	30	8	3	2	15	1
Whitley/NEPAC Ag Center	0	0	62	179	381	150	76	139	32	55	32

Wk 1 = 4/1-4/3/24; Wk 2 = 4/4-4/10/24; Wk 3 = 4/11-4/17/24; Wk 4 = 4/18-4/24/24; Wk 5 = 4/25-5/1/24; Wk 6 = 5/2-5/8/24; Wk 7 = 5/9-5/15/24; Wk 8 = 5/16-5/22/24; Wk 9 = 5/23-5/29/24; Wk 10 = 5/30-6/5/24; Wk 11 = 6/6-6/12/24

Foliar Disease Scouting Tips: What To Look For In Corn

(Darcy Telenko)

Tar spot confirmed and active in Indiana this week

Corn growth stages are quite variable across Indiana but a number of areas with early planted corn about waist high. We just scouted our research plots in northern Indiana at the Pinney Purdue Ag Center and **have found tar spot in our first planted corn April 45 which is at V4/V5 and at another site where the corn is V7**. Active tar spot has also been found in Iowa and Kansas which means that we need to start to monitoring for disease in Indiana to make an informed decision if a fungicide is necessary as the crop reaches reproductive stages. Recent weather may have made conditions conducive for foliar diseases, therefore it is now time to start to **get out and scout that lower canopy**. As a reminder for disease to occur, three things need to be present **1. Pathogen, 2. Host, and 3. Favorable Environment.** The major diseases we monitor in Indiana such as gray leaf spot, northern corn leaf blight, southern rust and tar spot all might start to make an appearance (figure 1 and 2).

Figure 1. Tar spot stromata found in lower leaf, June 10, 2024. (*Photo Credit: Morgan Goodnight, Purdue University*)

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.

Tar spot continues to be a concern this season. Tar spot may be hard to find early Figure 2 shows examples on how small the initial tar spot lesions (stromata) will be. Previously, we usually find the stromata in fully-expanded leaves knee to hip height in the canopy. We will continue to monitor for disease and keep you updated. Again, the recent favorable weather has helped to promote tar spot.

I would like to make a few recommendations when using the Tarspotter App once corn is at V8.

- If you have a **history of the tar spot** it is time to keep an eye out and make an informed management decision.
- **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.
- Use the App initially to tell you **to get out and scout** – we have time to apply fungicides if we find tar spot in the lower canopy. We don't want to apply fungicides before **growth stages of V8.**
- 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 between VT to R3**. You just need to be scouting for those early lesions to help inform your decision making.
- But, don't wait too long, if significant disease develops in the upper canopy, then a fungicide application may be too late at that time.

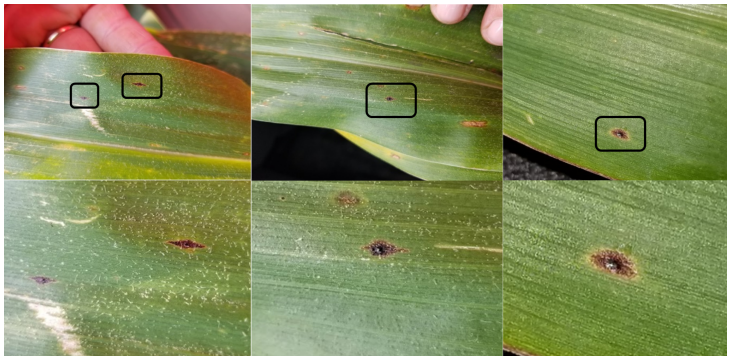

Figure 2. Examples of corn leaves infected by tar spot. The spots (stroma, in black squares) will be embedded in the leaf, raised (bumpy to the touch), and will not rub/wash off. In addition, they may be surround by a slight halo. (*Photo Credits: Darcy Telenko, Purdue University*)

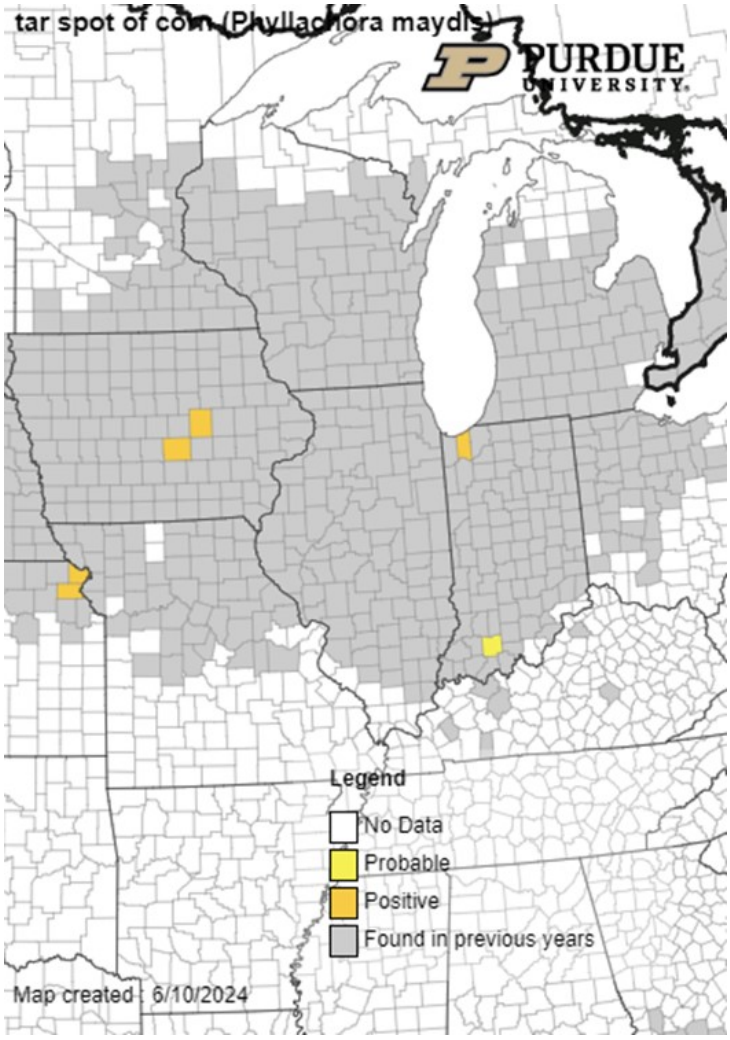

Figure 3. Tar spot map for June 10, 2043 (source https://corn.ipmpipe.org/).

When should I be putting out a fungicide?

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 is active in your field and corn is at least nearing VT/R1 (tassel/silk) or even R2 (blister). Scouting will be especially important if the recent rains we have seen continue.

We are working hard to try to understand this new disease to minimize losses. The good news is that there are a number of fungicides are highly efficacious against tar spot here in Indiana when applied from tassel (VT) to R3 (milk). I would recommend picking a product with multiple modes of action. The national Corn Disease Working Group has developed a very useful fungicide efficacy table for corn diseases (see link).

https://cropprotectionnetwork.org/publications/fungicide-efficacy-for-control-of-corn-diseases

We will continue keeping a close eye on tar spot.
Please help us track tar spot and southern rust, contact me if you suspect a field has tar spot and/or send a sample to the Purdue PPDL for confirmation. Research funding from the Indiana Corn Marketing Council is supporting sample processing, therefore there will be no charge for corn tar spot or southern rust samples submitted to the clinic.

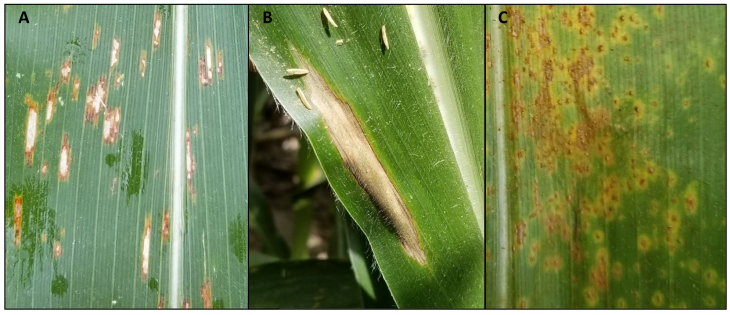

Figure 4. Examples of A- gray leaf spot lesions, B-northern corn leaf blight lesion, and C- southern corn rust pustules on a corn leaf. (*Photo Credits: Darcy Telenko*)

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/department/btny/ppdl/submit-samples/_docs/ppdl-1-w.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, hybrid if known, field zip code or county, and previous crop (see article on Field Crop Disease Samples Needed in Indiana).

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 2024 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://indianafieldcroppathology.com/

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

Field Crop Disease Samples Needed In Indiana

(Darcy Telenko) & *(John Bonkowski)*

The field crop pathology research program is continuing to track the distribution of corn and soybean field diseases in Indiana. We are predominantly interested in the following samples (but always keeping an eye out for others):

Corn: tar spot, southern corn rust, and Curvularia leaf spot

Soybean: red crown rot

In order for an official designation of the field crop disease in a county for tar spot or southern corn rust – myself or the Purdue Plant Pest Diagnostic Lab needs a physical sample. Therefore, we are asking for your help.

Ideally, the Purdue Plant Pest Diagnostic lab would like to receive fresh samples as soon as possible, but I know at this time of the year you may be scouting various field and on the road long hours. Therefore, to encourage you to send samples we are going to give some pointers on how you can collect corn leaf samples and ship them weekly. We do not want them to sit over the weekend so we suggest you ship samples **Monday through Wednesday**.

How to collect disease leaf samples:

Items to have on hand in your truck or car: cooler with ice pack, gallon plastic bags, marker, notebook paper, and newspaper.

1. When scouting a field and you identify a potential sample, please try to grab 4-6 leaves from that field that are exhibiting the symptoms.
2. Take a quick image of the diseased leaf to document (most images will also give you a GPS location if turned on)
3. Document field location (address, county and GPS location), in addition if possible hybrid/variety, other management practices and or field comments. Fill out a sample submission form https://ag.purdue.edu/department/btny/ppdl/submit-samples/ppdl-1-w-20241.pdf
4. If you have multiple samples please try to include as much information as possible to help us distinguish between samples. Label each bag with the field ID and other pertinent information.
5. Either fold or wrap the corn leaves flat in a piece of newspaper (this will keep the sample from molding especially if waiting to send for a few days).
6. Once wrapped in the newspaper you can place in a plastic bag. It is possible to layer leaves from different fields into on bag. *Please note this on the sample bag if it does contain multiple locations.* (See images below).
7. These samples then can be stored in a cool place (cooler with ice packs) or refrigerator until shipped.
8. Make sure to include your contact information in case we have further questions about the sample.
9. Mailing samples: The PPDL is not open on the weekend. Ship early in the week (Monday-Wednesday) using a next day deliver option to make sure you sample gets to us before the For Thursday shipments DO NOT use USPS overnight delivery. Your package may arrive at Purdue's central receiving dock by Friday but will not get to our lab by close of business on Friday. Instead use only UPS or FedEx if shipping on Thursday.

Ship sample to: Plant and Pest Diagnostic Laboratory
LSPS-Room 116, Purdue University
915 Mitch Daniels Blvd.

Figure 1. An easy way to send corn or soybean leaves to the Purdue Plant Pest Diagnostic Lab (PPDL), lay the leaf sample flat between a few pages of newspaper, fold, place in plastic bag, and place in a small box to send to the clinic.

It's Not Easy Being Green. The Many Colors Of Early Season Corn.

(Dan Quinn)

Purple Corn: purple corn symptoms (Image 1) are caused by the accumulation of a purple pigment in the corn leaves known as **anthocyanin.** Corn leaves produce sugars by photosynthesis and these sugars are typically metabolized to generate energy for further plant growth. However, when cool temperatures cause plant growth to slow or root development is restricted, these sugars tend to accumulate in the leaf and trigger anthocyanin pigment formation (e.g., purple leaf color). Purple corn can also occur from a genetic response to bright, sunny days and cool nights (Nielsen, 2000). In addition, hybrid genetics can play a role in whether or not a corn plant produces anthocyanin. This symptom often disappears with warmer temperatures and yield losses should be minimal to none.

Image 1: Purple corn leaf symptoms observed on V2 corn in Northern Indiana in 2021 caused by the build up of anthocyanin in the corn leaves due to cool temperatures.

Note: *This symptom is often confused with phosphorus deficiency of corn. So, before you get the fertilizer spreader out once these symptoms occur, pay attention to your soil test levels and to the corn as temperatures become warmer and if these symptoms begin to disappear.*

Yellow-Green Corn: cool temperatures and/or poor root/stand establishment can also cause corn to appear ugly yellow-green instead of that dark, beautiful green we are all looking for. Up until corn reaches the V3 growth stage (3 visibly collared leaves), the energy and nutrition of the seedlings are dependent on the kernel reserves. Once corn gets beyond the V3 growth stage, seedlings begin to transition to being dependent on the nodal root system. During this transition, when poor growing conditions occur this causes insufficient photosynthesis, slowed nodal root development, and poor plant nutrient uptake. Therefore, corn plants appear an ugly yellow-green. However, with more sunshine and higher temperatures, these symptoms are often resolved.

Rapid-Growth Syndrome: rapid growth syndrome often occurs when corn enters the V5 to V6 growth stage and is caused when the corn leaves fail to unfurl properly from the whorl. This often happens after drastic temperature changes, needed rainfall, root establishment, and an acceleration in plant growth. A common symptom is the whorl often becomes tightly wrapped and twisted on the plants. In addition, leaves that were trapped in the whorl will often emerge with a very noticeable bright yellow color (Image 2).

Image 2: Bright yellow leaves present in corn experiencing rapid growth syndrome in 2024.

Striped Corn: the presence of yellow and "striped" corn, specifically on the upper leaves of the plant, has been observed in multiple areas across Indiana in 2024 (Image 3). This symptom is largely caused by nutrient deficiencies, with the most common nutrient deficiency being sulfur.

Image 3: Upper leaf yellowing and striping occurring in V4 corn in Central Indiana following a rye cover crop in 2024.

Silver Corn: corn that has experienced cool, calm, and clear nights can cause radiational heat loss from corn leaves, thus causing minor leaf surface damage (Nielsen, 2021). This minor chilling injury can result in a silver or gray leaf surface often known as "silver leaf syndrome".

Image 4: Silver corn leaf symptoms observed on V4 corn in central Indiana in 2023. (*Photo Credit: Rachel Stevens*)

White Corn: white or "bleached" corn leaves are often blamed on herbicide damage, specifically the pigment inhibitors herbicides (e.g., group 13 and 27). However, young corn that has been under environmental stress such as cool and cloudy weather, which can cause poor root development, can cause a white appearance (Hager and McGlamery, 1997). These symptoms have been observed previously on corn that has had significant root burn caused by a spring anhydrous application. Frost damage can also cause the bleaching of corn leaves. Furthermore, single, white corn plants within a field can be genetic mutants, although this is a rare occurrence.

Image 5: Corn at the V2 growth stage exhibiting symptoms of white corn leaves caused by stressful early-season conditions in 2021. (*Photo Credit: Emma Spurgeon*)

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Baleage Practices For Success

(Keith Johnson)

Taking large round and large rectangular bales and wrapping them with white plastic to make bale silage (baleage) has become a common practice. A major reason for its adoption is to increase the chances of making quality forage when rainy weather does not permit making dry hay.

Proper fermentation is critical to reduce the disease chances of botulism and listeriosis. The toxins cannot form if the silage pH is less than 4.5. A contributing factor to the concern is a high ash content from soil contamination with harvest procedures.

The following are guidelines to successfully make and use baleage.

- **Crop quality** – Good fermentation is dependent upon a supply of readily fermentable carbohydrates. Overly mature forage will have less nonstructural carbohydrate.
- **Moisture content** – The best range of moisture content for proper fermentation is 50 to 60 percent. Uncut forage will be around 75 percent moisture. Generally the crop needs to wilt 6 to 24 hours to reach ideal moisture content to make baleage. Wilting time will be dependent upon crop type, yield, swath density and environmental conditions at harvest.
- **Reduce soil contamination** – During the tedding and raking procedures, set the equipment to reduce soil contamination in the swath and windrow.
- **Bale density** – A dense, tight bale improves fermentation as less pore space will be occupied by air. Proper fermentation requires an anaerobic environment.
- **Bale shape** – Bales should have similar outer dimensions so fewer air pockets result.
- **Time between baling and wrapping** – Bales should be wrapped as soon as possible after baling, ideally within 4 hours.
- **Bale binding** – Use plastic or untreated sisal twine, or plastic net wrapping to bind the individual bales at baling. Avoid treated sisal twine.
- **Plastic** – Tightly wrap each bale with six to eight layers of good-quality, 1-mil-thick plastic that is resistant to sunlight.
- **Storage** – Place the bales on a well-drained site. Inspect the bales often for the presence of holes in the plastic. Holes should be covered with ultraviolet light-protected plastic tape that can be purchased from the plastic provider. Do not use duct tape. Storing individually wrapped bales on end reduces holes caused by raptors, if a problem, since there is more overlap of wraps on the ends of the bale.
- **Feeding** – Utilize the bales within a year to reduce storage loss. Unwrap plastic on the baleage just prior to feeding to the livestock.

Following these guidelines should improve fermentation and baleage quality. When quality analyses are being done at a forage quality laboratory, it is advised to get a pH measurement, too, to determine whether excellent fermentation was achieved.

An in-line bale wrapper applies ultraviolet-light resistant plastic wrap to round bales so fermentation can occur. (Photo Credit: Keith Johnson)

Overgrazing Perennial Pastures During Hot And Dry Weather Has Long Term Consequences – Don't Do It

(Keith Johnson)

What a weather transition has occurred in the last month! Hay harvest, and corn and soybean planting were extended because of rain that seemed to be happening every third to fourth day. In West Lafayette, there was a record low of 37 degrees F early in

the week for that date; now we have a string of many days over 90 degrees F without rain projected to happen.

If plants could cry out, they would yell “Stop” when overgrazing begins to occur. Note the visible manure in the upper center and the crushed aluminum can in the lower center of the photograph. If the pasture was properly grazed, the manure and aluminum can would not have been visible at the distance that the photograph was taken. (Picture Credit: Keith Johnson)

Little rain and high temperature are not conducive to good cool-season grass growth. Pastures grazed by livestock, to what appears to be a golf putting green, is not healthy for the forages in the pasture. Grazing height of cool-season grasses to less than 4 inches does not permit the grass to recover by accumulating reserves for root and herbage growth. The pasture should not look like a hayfield that has just been mowed.

You likely were told to clean up all the food on your plate when you were a child sitting at the kitchen or dining room table. That was a good recommendation to reduce food waste and to make sure the dollars earned by your parent or guardian were not “thrown in the trash”.

Consider this – If the soil in the pasture is the plate and the forages growing in the soil is the food on the plate to be eaten, having livestock, analogous to the child at the table, grazing the soil bare of vegetation is a concern. Grazing every grass blade is not the objective with proper grazing management and it should not be like the clean plate after your meal.

The figure that follows is from “Forages Volume 1 – an introduction to grassland agriculture”. This is an excellent illustration of what happens to root biomass and vegetative regrowth when overgrazing occurs and time is not allowed for plant recovery.

Fig 2.8. Root development of grasses with *(A)* no defoliation, *(B)* moderate defoliation, and *(C)* close, continuous defoliation. Root development depends on photosynthate produced by the leaf area, and leaf area depends on water and nutrients (especially nitrogen) that are absorbed from the soil. (Adapted from Walton 1983.)

If the illustration doesn’t convince you of the negative consequences of overgrazing, the University of Kentucky Forage website time lapse video simulating orchardgrass response differences to intensity of vegetation removal should provide insight. Within the information shown by clicking on the link http://forages.ca.uky.edu/grazing, review the “UK Orchardgrass” box found on the left middle side of the page. Keep the video content in your mind when you leave some residual growth in the pasture. You are doing the right thing!

Information found within the link https://www.extension.purdue.edu/extmedia/ID/ID-528-W.pdf provides a checklist of ideas that should be considered to feed beef cattle during dry weather. While the emphasis is on beef cattle, there are many components of the publication that have value for all livestock species. *Review the information in the publication now so a plan can be developed if it needs to be put into action.* Doing nothing, is not a wise plan.

Win With Forages During National Forage Week Celebrations

(Elise Koning)

West Lafayette– Water quality, recreation, livestock, and food security will all be in the spotlight next week with the celebration of National Forage Week June 16-22.

Hoosiers are invited to celebrate with the Indiana Forage Council by participating in forage-related activities and entering to win a $100, $75, or $50 gift card from Rural King.

Each day of National Forage Week, the Indiana Forage Council will post a photo challenge that relates to grasses, legumes, and other plants on its Facebook page. Take a picture of your activity that completes each challenge and upload your photo to the comments by 11:59 p.m. that day, and you’ll be entered to win.

National Forage Week recognizes the vital importance of forage systems in sustaining our environment, economy, and food

security.

Forage systems encompass a diverse array of grasses, legumes, and other plants, and connect many aspects of our lives. By managing healthy forages, we contribute to a healthy ecosystem:

- When forages cover a landscape, soil erosion is minimal, and water quality is improved.
- Thriving forages provide nutrition essential for optimal livestock health and performance.
- The end products of meat, milk and fiber provide necessities for a growing population.
- Forages offer a beneficial habitat to wildlife.
- Because legumes produce nitrogen, the addition of nitrogen fertilizer to enhance grass growth is not necessary on a field with legumes and grasses growing together.
- Someday, high-fiber forages could be converted to a fuel resource.

For more information on the contest and to enter to win, visit the Indiana Forage Council Facebook page.

Press Release Writer:
Elise Koning elise.koning@outlook.com

About the Indiana Forage Council:

The Indiana Forage Council promotes forage production, research, management, utilization, and marketing. We host professional events across the state and, along with the American Forage and Grassland Council, provide competitions and professional development opportunities for our members. For more information about the Indiana Forage Council, visit indianaforage.wordpress.com.

Properly grazed pasture provides many benefits to the public. (*Photo Credit: Keith Johnson*)

Drying Out & Heating Up

(Jacob Dolinger)

Meteorological spring (March-May) roared to a close on May 31, and the data is in—it was the 26th wettest on record in 130 years of records, with 14.28 inches of precipitation statewide, over 1.5 inches above normal. At the local level, Fort Wayne had its 4th wettest meteorological spring on record, with 15.93 inches of rain. South Bend had its 25th wettest on record with 12.10 inches of precipitation, and Indianapolis came in at 24th with 15.5 inches. Any drought conditions are long gone!

The wetter pattern has calmed down, though. The National Weather Service's Climate Prediction Center (NWS CPC) is predicting near normal precipitation for the entire Hoosier State through June 25, and equal chances for above or below normal precipitation through the beginning of July.

Even more noteworthy is the degree of confidence in above normal temperatures through much of the rest of June. Through at least June 25, the CPC has almost all of Indiana in an 80-90% chance of above normal temperatures (Figure 1). We're likely staring down many hot and humid days ahead for the rest of June, including heat index values potentially climbing above 100°F. NWS HeatRisk, a new experimental product used to forecast the risk of heat-related impacts, is already predicting moderate heat impacts for Indiana by June 16, and major heat impacts by June 17 (Figure 2). This means people should start making contingency plans for any long duration outdoor activity in the coming days and weeks.

Figure 1: The National Weather Service's Climate Prediction Center's 8-14 day temperature outlook displays high confidence in above normal temperatures for the period June 19-25.

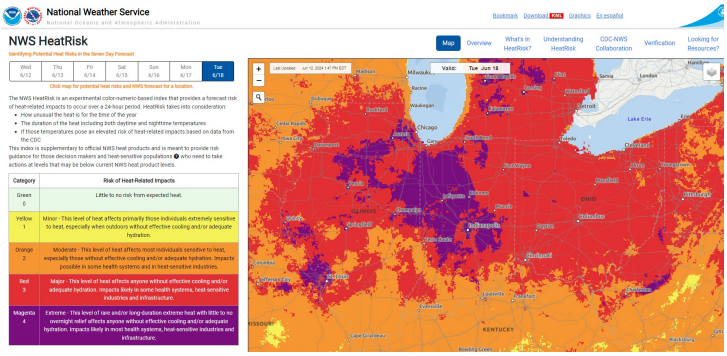

Figure 2: The National Weather Service's experimental HeatRisk product has much of Indiana with the risk of extreme heat on June 17. this means long duration outdoor activity will affect most people negatively.

As temperatures have warmed, growing degree days have also accumulated rapidly, especially since May 1 (Figure 3). GDD accumulations have been above normal statewide for months now, and since just the beginning of May accumulations have been above normal, most notably through central Indiana (Figure 4).

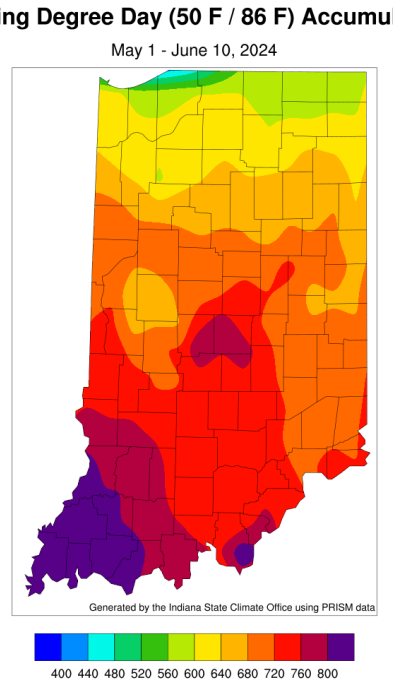

Figure 3: Growing Degree Day Accumulations for May 1-June 10.

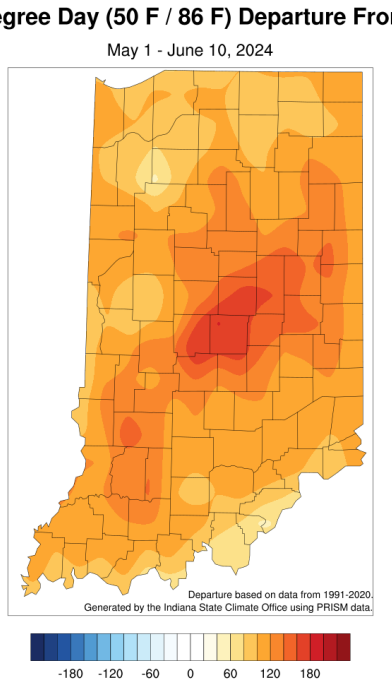

Figure 4: Growing Degree Day Departure from Average for May 1-June 10.

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