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Pest & Crop Newsletter

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In This Issue

Mid-Season Insect Pests In 2025?

(Christian Krupke)

This is the time of year when much of the insect pest management in crops has been completed… early season pests have come and gone and weather conditions are ideal for crops to grow and recover from most minor damage.

Still, there are many producers who add a pyrethroid insecticide with fungicide sprays at R1 in corn or R3 in soybeans. These insecticides are very inexpensive and can supply peace of mind. After all, an "insurance" spray may negate the need for even entering the field to scout for insects, and take care of any emerging problems before they become serious.

However, it's worth asking what pests are actually out there? As covered in previous Pest&Crop articles, that answer has changed a lot over the last couple of decades. For a snapshot of corn entomologists' estimates on 2024 pest prevalence and severity, please check out this article from Crop Protection Network.

A screenshot from this link appears below. You'll note that corn rootworms still rule the roost, in terms of both prevalence and risk to yield. But look more closely at the loss estimates comparing the Great Lakes states (including Indiana), **Table 2,** with the corn-producing states out west, **Table 3**… it's a very different story and over 10X difference in the yield loss estimates. The pest complex is different as well.

Table 2. Estimated corn yield losses due to the five most-significant invertebrates in western corn-growing U.S. states[1] in 2024.

Rank		Invertebrate pest	Total losses (thousands of bushels)
Region	Overall		
1	1	Corn rootworms[2]	318,951.9
2	2	Western bean cutworm	93,527.9
3	3	Corn earworm	46,532.1
4	4	Twospotted spider mite	31,685.4
5	5	Banks grass mite	20,958.1

[1] Colorado, Illinois, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota; and [2] *Diabrotica barberi, D. virgifera virgifera,* and *D. undecimpunctata howardi.*

Table 3. Estimated corn yield losses due to the five most-significant invertebrates in the Great Lakes region of the U.S. and Ontario, Canada[1] in 2024.

Rank		Invertebrate pest	Total losses (thousands of bushels)
Region	Overall		
1	1	Corn rootworms[2]	26,183.4
2	9	Slugs	6,036.4
3	10	Asiatic garden beetle	4,625.2
4	7	Black cutworm	2,368.5
5	11	True armyworm	2,131.0

[1] Indiana, Michigan, New York, Ohio, Wisconsin, and Ontario, Canada; and [2] *Diabrotica barberi, D. virgifera virgifera,* and *D. undecimpunctata howardi.*

Admittedly, this is somewhat anecdotal, and based on the estimates of extension entomologists responding to calls, conducting research/monitoring programs, etc., and these West vs. East differences are a theme that's always been somewhat true. But it seems that this is becoming more pronounced in recent years and opening up opportunities to explore different ways to tackle insect IPM.

With all that in mind, please pay some extra attention to fields in the next week or two as crops reach reproductive stages and start receiving insecticide sprays. What insects are out there? Are they causing defoliation or any other measurable damage? How widespread are the infestations?

I will present a survey on these topics in this space to get your feedback in the coming weeks!

Disease Update In Indiana Corn And Soybean

(Darcy Telenko)

It is important to continue to scout for diseases in both corn and soybeans to make informed management decisions. There is quite a range of conditions across the state with areas that have received rain and the crops look great to areas in northwest Indiana that have abnormally dry to moderately drought conditions (Midwest Drought Monitor). In my scouting rounds and samples submitted to the Purdue Plant Pest Diagnostic Lab (PPDL) this week we continue to find tar spot (very low levels), gray leaf spot, Holcus spot, and common rust in corn. I have seen a little bit of Septoria brown spot on some lower leaves in soybean, but in general soybeans still quite clean in our fields. We continue to add counties with active tar spot in Indiana. The most frequent question I have received is, "Should we make a fungicide application?" My response – What diseases are you finding in your field? What is your hybrid/variety susceptibility, growth stages and field history? Are you irrigating?

A fungicide application can be effective at reducing disease and protecting yield, but there are a number of factors that need to be considered:

1. Field history/previous crop – what diseases have been an issue in previous years?
2. Amount of disease present in the field – what diseases are you finding? Where are they in the canopy? Is the disease active in your county or surrounding counties? What growth stage is the crop?
3. Hybrid/variety susceptibility to diseases
4. Current weather conditions and disease risk models on Crop

Protection Network (https://cropprotectionnetwork.org/crop-disease-forecasting). This website now hosts all the models (tar spot (Fig 1), white mold (Sporecaster) (Fig 2), frogeye leaf spot, and gray leaf spot), so it's a one stop shop. I suggest book marking it on your favorite device and you can return to track the disease risks on your farm.

5. The value of the crop and cost of fungicide application. Guest what we have a few tools to help with these as well.

    1. **Fungicide efficacy tool** (https://cropprotectionnetwork.org/fungicide-efficacy-tool) – will search all the fungicide efficacy tables based on crop and disease of concern.
    2. **Corn Fungicide ROI Calculator** (https://cropprotectionnetwork.org/fungicide-efficacy-tool) – calculate the potential return on investment (ROI) for corn fungicide application based on university uniform corn fungicide trials conducted in the United States and Canada.
    3. *Hot of the Press!* **White Mold ROI Calculator** (https://cropprotectionnetwork.org/white-mold-roi-calculator) calculate the potential ROI for using white mold specific products on your farm based on university uniform white mold trials.

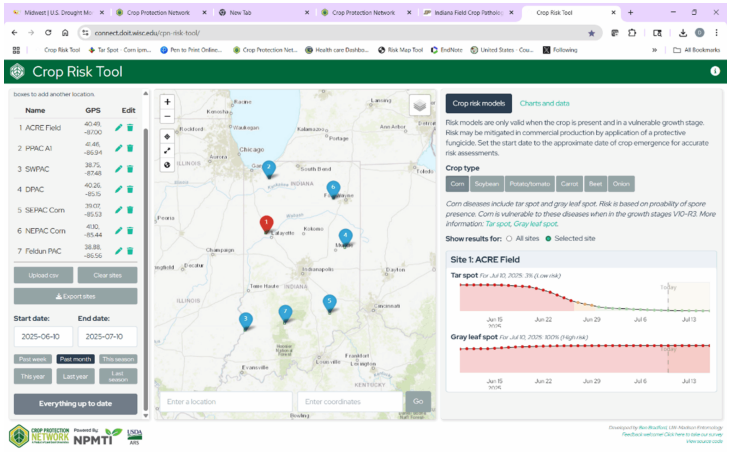

Figure 1. Crop risk tool for corn (at growth stage V10-R3). This is my site 1 located at the Purdue ACRE farm in West Lafayette. Disease risk for tar spot is now low at this site, whereas gray leaf spot risk is high. I would suggest continuing to scout the field to see if either disease can be detected in the lower canopy. We do have gray leaf spot on some of the lower leaves, but no tar spot at this site.

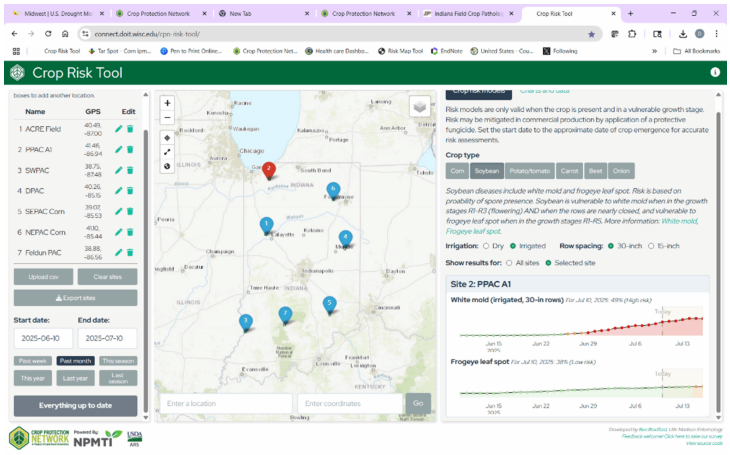

Figure 2. Crop risk tool for soybean (at growth stage flowering for white mold, R1-R5 for frogeye). This is my site at Pinney Purdue Ag Center Farm in Wanatah, IN. Looking at the tool in which our soybeans have been irrigated and planted in 30-inch row spacing the white mold risk is now high if soybeans are flowering – this model does indicate then we probably should think about applying a white mold targeted fungicide. The frogeye risk is still low, but we will keep and eye on it to see if it changes as the model looks to be slowly moving to a higher risk.

Tar Spot: Tar spot continues to be on everyone's mind. We continue to add new counties where active tar spot lesions have been found in Indiana (Figure 3). We have confirmed active tar spot in 14 counties thus far this year. Tar spot had previously been found in all 92 Indiana counties. Many of these tar spot detections have required intensive scouting, but as the disease progresses it will be easier to find as the number of spots increase and it moves up the canopy. We will continue to monitor and update as the season continues.

See our publication on details for fungicide timing and applications for tar spot:

Multi-state Fungicide Efficacy Trials to Manage Tar Spot and Improve Economic Returns in Corn in the United States and Canada https://doi.org/10.31274/cpn-20240904-0.

We continue to research best management practices for tar spot to minimize losses. The good news is that we found a number of fungicides are highly efficacious against tar spot when applied from tassel (VT) to milk (R3). 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 links above). We will continue keeping a close eye on tar spot. Please contact me if you suspect a field has tar spot please or send a sample to the Purdue PPDL for confirmation.

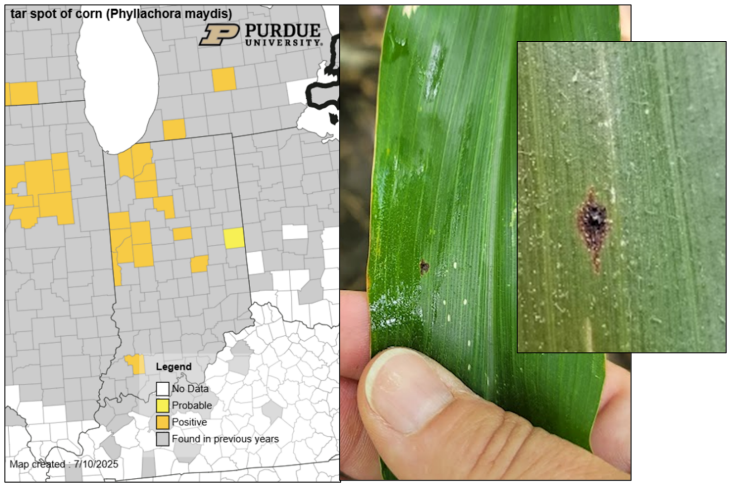

Figure 3. Tar spot map as of July 10, 2025. An example of a tar spot lesion on corn in lower canopy. High resolution of the stroma formed on the leaf. (*Photo Credit:*

Darcy Telenko)

Southern Rust has not been officially confirmed in Indiana yet, but there is now one report in Missouri (Figure 4). I suspect southern rust may be found in southern Indiana where spores settled after moving on weather systems from the south. **We need your help** – if you are out scouting please let us know if you find any suspect samples and send to the Purdue Plant Pest Diagnostic Lab. We need a physical sample in order to confirm southern rust.
https://ag.purdue.edu/btny/ppdl/Pages/Submit-A-Sample.aspx

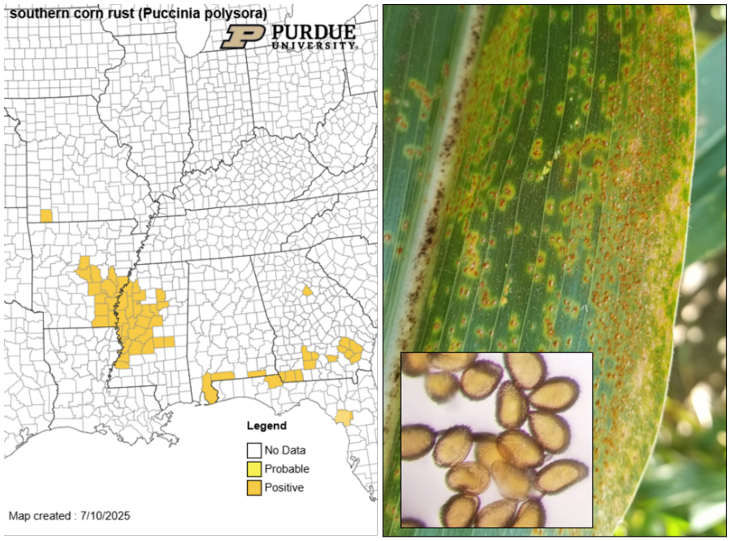

Figure 4. Distribution of southern rust in U.S. on July 11, 2024, orange counties are positive and yellow counties are probable (https://corn.ipmpipe.org/southerncornrust/) and an example of southern rust pustules on a corn leaf and diagnostic spores. (*Photo Credits: Darcy Telenko and John Bonkowski*)

Southern rust pustules generally tend to occur on the upper surface of the leaf, and produce chlorotic symptoms on the underside of the leaf. These pustules rupture the leaf surface and are orange to tan in color. They are circular to oval in shape. We are also seeing some common rust as well and both diseases could be present on a leaf. There are a few characteristics to use to try to distinguish southern rust from common rust. Common rust will form pustules on both sides of the leaf. In addition, common rust pustules tend to be spread out across the leaf, and less densely clustered. Common rust pustules have a brick red to brown coloration and may be more elongated than southern rust pustules.

Check out the southern rust publication for more images of southern rust and other diseases that might mimic it. This publication also has good information on determining when a fungicide application will be beneficial. The publication is at following link:
https://cropprotectionnetwork.org/publications/an-overview-of-southern-rust

Each year the rust spores (urediniospores) travel on air currents from tropical regions to fields in Indiana. Short periods of leaf wetness are required for infection by both rust fungi. Morning dews in Indiana can provide the six hours of moisture required for infection and disease development. Generally, southern rust prefers warmer temperatures — with infection occurring between 77-82°F.

As a reminder the field history, disease activity, hybrid susceptibility, weather conditions, the value of corn and soybean, and cost of fungicide application are factors that should be considered in making a decision to apply a foliar fungicide. Several fungicides are available to help manage these foliar diseases with a recommended application occurring at late vegetative stages through R1 in corn, R1-R3 in soybean for white mold, and R3 in soybean for frogeye leaf spot.

Resources:

- Fungicide efficacy table for corn diseases: https://cropprotectionnetwork.org/publications/fungicide-efficacy-for-control-of-corn-diseases
- Fungicide efficacy table for soybean foliar diseases: https://cropprotectionnetwork.org/publications/fungicide-efficacy-for-control-of-soybean-foliar-diseases
- Purdue Field Crop Pathology website for current updates https://indianafieldcroppathology.com/

As a reminder due to the need to monitor soybean and corn diseases in Indiana, there will be **no charge for Indiana growers to submit samples to the PPDL for diagnostic confirmation**. This service is made possible through checkoff funded research supported by the Indiana Corn Marketing Council and Indiana Soybean Alliance. Please feel free to contact me (dtelenko@purdue.edu) or the PPDL (ppdl-samples@purdue.edu) with any major disease issues you may have this season.

Predicting Soybean Growth Stages In A Year Of Extremes

(Shaun Casteel)

We live in a life of averages. GasBuddy, a crowd-sourced app, reported the highest national average price of gas was $3.70 in 2024. It also reported the top 10% of stations averaged $4.07 while the lowest 10% of stations averaged $2.46 per gallon in 2024. We can follow similar extremes in the highs and the lows of most anything – the cost of eggs, fertilizer prices, trucks (don't get me started), weather, and so on. Indiana has an average rainfall of 40.6 inches each year with about 37 inches in northern Indiana and 47 inches in southern Indiana. This range of averages are based on 30 years of weather data, yet they do not describe the season that we are currently experiencing. I think the best way to use averages is as a benchmark for comparison.

For instance, southern Indiana experienced a very wet spring (Fig. 1) that delayed the planting progress for weeks to more than a month depending on the area. Let alone, our friends in Kentucky who have already received a year's worth of rainfall (see dark blue on the map). Even this interpolated map averages across the landscape making it seem like north-central and east-central Indiana are right on track for normal rainfall, when we know that areas have been wet most of the spring with small windows of planting in late May to June.

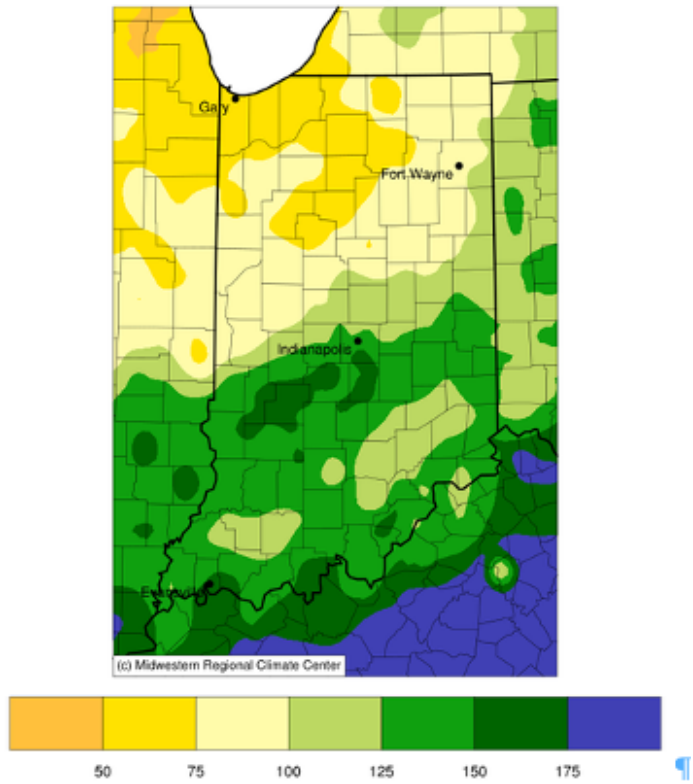

Figure 1. Indiana rainfall accumulated from April 1 through May 31, 2025 reported as percent of 30-year average (1991-2020, mrcc.purdue.edu).

The other side of this extreme (and the map) is west-central and northwest Indiana (Fig. 1). Dry spring conditions allowed for advanced planting progress with the hopes of great yield potential. If we are to look at the planting progress of soybean at the state level, Indiana appeared to be a near-normal or average pace (Fig. 2). Clearly, we know that we have a season of extremes in weather from over 20 inches of rain since April to drought conditions in northwest Indiana (D0-D1 for 23% of the state, droughtmonitor.unl.edu).

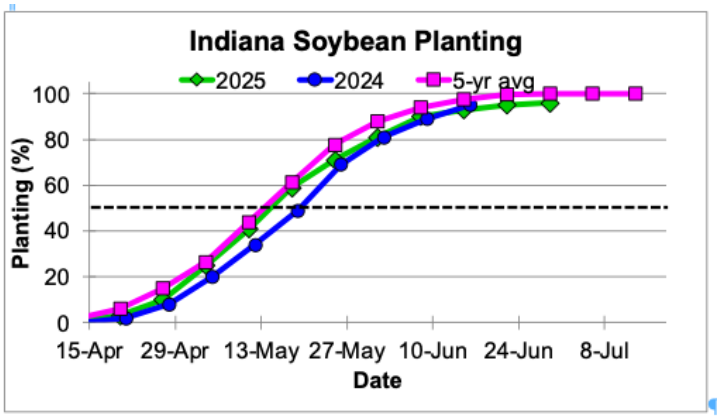

Figure 2. Indiana soybean planting progress in 2025, 2024, and 5-year average (adapted from USDA-NASS).

The 2025 soybean crop is variable to say the least. Last week, I walked fields that are entering R3 (first pod with 12 trifoliate nodes) to those that are V4 (4 trifoliates) to discussing with farmers when to stop trying to plant soybeans.

Most people have the appreciation that the indeterminate soybeans we grow in the Midwest respond to photoperiod, but they also respond to heat units (thermal energy, growing degree days or GDDs, etc). The catch is that soybeans have a sliding scale of influence depending on maturity group and planting date. The vegetative growth (e.g., trifoliate nodes, branches, internodes) and reproductive development (e.g., flowers, pods, seeds) are usually reduced as planting is delayed and/or maturity group is shortened.

Please use Table 1 to loosely predict when your fields will reach R1 and R8 maturity based on planting date x maturity group combinations. On average (remember there is a range and the time will be reduced as planting is delayed and/or maturity group is shorten), the duration of reproductive stages are approximately:

- R1 (first bloom) ~5 days
- R2 (full bloom) ~10 days
- R3 (first pod) ~10 days
- R4 (full pod) ~10 days
- R5 (first seed) ~15 days
- R6 (full seed) ~20 days

			CALENDAR DATE TO REACH:			DAYS AFTER PLANTING TO REACH:		
Planted	Variety		Emerge (VE)	Bloom (R1)	Maturity (R8)	Emerge(VE)	Bloom (R1)	Maturity (R8)
4/20	2.8	2.9	5/2	6/11	9/8	13	53	141
	3.3	3.4	5/2	6/14	9/14	13	55	147
	3.7	3.8	5/3	6/14	9/16	14	56	149
5/22	2.8	2.9	5/28	6/26	9/17	6	35	118
	3.3	3.4	5/27	6/27	9/20	6	37	121
	3.7	3.8	5/27	6/27	9/23	6	37	125
6/3	2.8	2.9	6/10	7/7	9/23	7	35	112
	3.3	3.4	6/10	7/12	9/25	7	40	115
	3.7	3.8	6/10	7/13	9/30	7	40	119
6/13	2.8	2.9	6/19	7/20	9/28	6	38	107
	3.3	3.4	6/19	7/23	10/3	6	40	112
	3.7	3.8	6/19	7/21	10/8	6	39	118
6/29	2.8	2.9	7/5	8/2	10/10	6	34	104
	3.3	3.4	7/5	8/5	10/12	6	37	105
	3.7	3.8	7/5	8/4	10/15	6	37	109

Table 1. Planting date and variety (maturity group) effect on the time to emerge (VE), bloom (R1), and to mature (R8) at West Lafayette. Heat map created within each growth stage column based on calendar date (green = earlier in the year, red = later in the year). The heat map can be used as a guide to match up the planting date and varietal maturity under "normal" growing conditions (2016 trial).

More Heat On The Way

(Beth Hall)

One heat wave down, more to come. It is summer, though, so aside from expecting plenty of hot days, the things to be more concerned about is reference (or potential) evapotranspiration (ET) significantly exceeding precipitation that would ultimately cause drought-related impacts. The National Weather Service provides a 7-day forecasted reference ET product as well as a 7-day forecast for total precipitation amounts. From these resources, it looks like across Indiana, approximately 1.5" of water is expected to be lost over the next 7 days and anywhere from 0.10" to up to 1.5" of precipitation will be received (Figure 1). This implies a water deficit for most areas – which is not unusual throughout Indiana summers. The concern comes when that deficit becomes much greater than normal.

Figure 1. Total precipitation amounts forecasted for July 3-10, 2025.

Concerning drought, the U.S. Drought Monitor continues to place northwestern Indiana in the Abnormally Dry (D0) category with two isolated areas within that zone in Moderate Drought (D1) (Figure 2). There are two other areas in Indiana that we are keeping an eye on for potential drought development: eastern Indiana around the Adams County area and southern Indiana along the Ohio River near the greater Louisville region. If the 7-day precipitation forecast verifies, then those two areas along with northern Indiana may degrade further regarding abnormal dryness and drought.

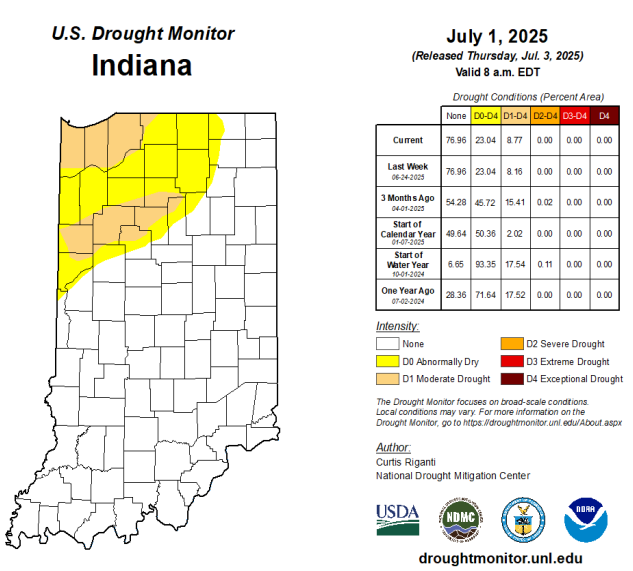

Figure 2. U.S. Drought Monitor status for conditions as of Tuesday, July 1, 2025.

The 3-7-day hazard risk report released by the National Weather Service is indicating the risk for hazardous heat across most all of Indiana this holiday weekend (Figure 3). Keep an eye on other people and animals around you since heat distress often creeps up undetected until it is too late. Be sure to hydrate often and seek shady environments when possible.

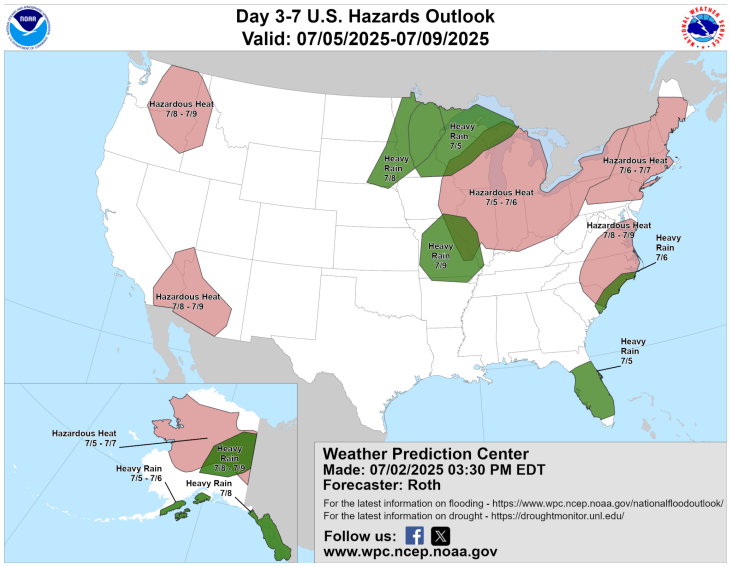

Figure 3. National maps indicating potential weather hazards for July 5-9, 2025.

The 6-to-14-day climate outlooks are indicating temperatures should be near normal with a slight probability of warmer than normal conditions near the end of that period. Climate models are slightly favoring above-normal precipitation throughout the period. Climate outlooks for July (released on June 30th) are strongly favoring above-normal temperatures for the month with very little guidance regarding precipitation.

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