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Pest&Crop newsletter

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In This Issue

Some Cutworms Out And About, Still Too Early For Black Cutworm

(Christian Krupke) & (John Obermeyer)

- Many species of cutworms feed on corn and soybean if it's available.
- Black cutworm is the most damaging species but is a migrant into the state, slow to develop in these cool temperatures.
- The dingy, variegated, and claybacked cutworm species all overwinter as partially grown larvae.
- The dingy and variegated cutworms are mainly leaf feeders, whereas the claybacked will also cut plants.
- Seed treatments are not effective against these other species, because of their large size when feeding.

We have been impressed with the number of black cutworm moths captured by our pheromone trap cooperators, see "Black Cutworm Adult Pheromone Trap Report." Though we are wary of the potential impact these larvae could have on the slow emerging corn crop, we know that heat units for insect development have been slow in coming during this cool spring. Many cutworm species look alike and identification is often confusing. Historically, the black cutworm is our most common species damaging the crop, which is why most assume it the culprit when damage is found.

Black cutworm do not overwinter in the Midwest, which is why we monitor their arrival each spring with pheromone traps. Once they arrive in large numbers (also called "intensive captures") we begin predicting their development and subsequent damage with heat unit accumulations. We received multiple intensive captures on, and around, April 8 and have begun tracking their development (see accompanying map). Those females looked for broadleaf weeds to lay eggs in early April and those larvae have hatched, but since then, not much has happened. There have not been sufficient heat units accumulated this spring for black cutworm to get 1/2 to 3/4 inches long – the size when they begin to cut plants (300 accumulated heat units). So, if you are finding cutworm damage on emerged corn (or any plant, for that matter) at this time, there is another cutworm species to blame…that being one of the dingy, variegated, and/or claybacked cutworms.

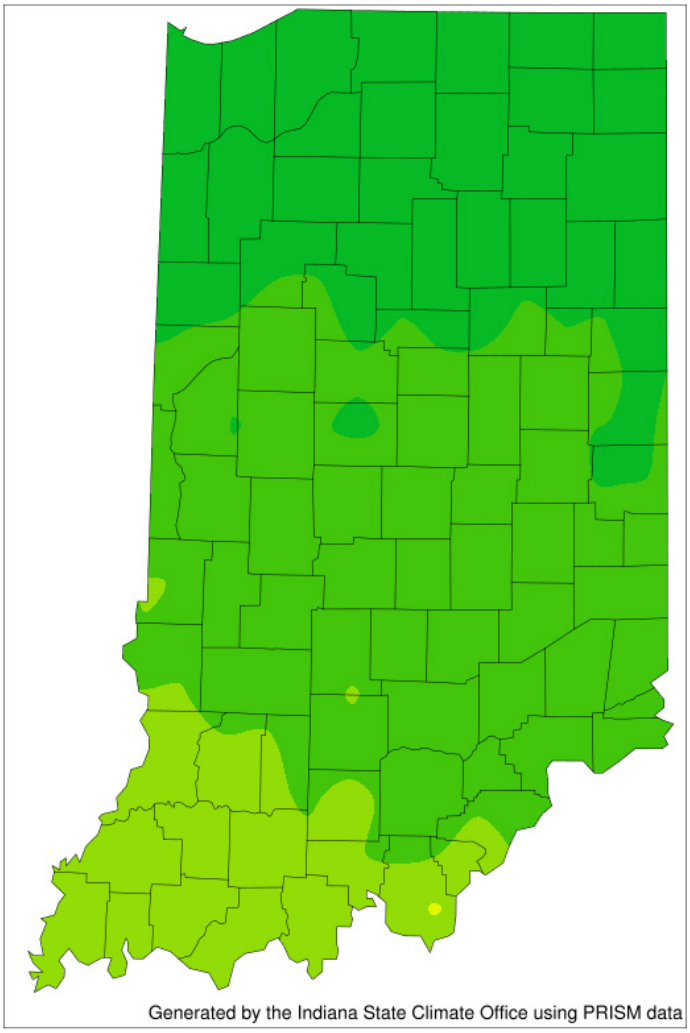
Cutworms are the larvae of noctuid moths, a huge family with over 11,000 species worldwide and some are important pests. The dingy, variegated, and claybacked cutworm species all overwinter in Indiana as partially-grown larvae. They are not specialist feeders, and actively feed on a wide range of plants. Late in the growing season, as cold weather moves in, the larvae cease feeding and become dormant under mats of plants (e.g., chickweed) during the winter months. As temperatures begin to increase in the early spring, they resume feeding. They can complete develop on these weeds, but often these plants are killed by spring herbicide applications, forcing them to move to alternate food sources. If available, this could include the emerging crop. Because these larvae are about ¾ to 1 inch in length at this time of year, they aren't deterred much by the low concentrations of insecticidal seed treatments in above-ground plant tissues. Therefore, depending on density of worms and the rate of the crop's growth and development, damage can be quite significant.

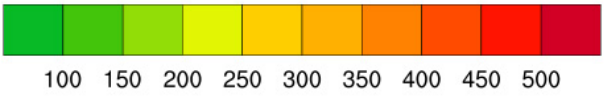
The dingy and variegated cutworms are primarily leaf feeders and will rarely cut plants, and if they do, the cutting is above ground level. Because a corn plant up to the 5-leaf stage can withstand severe defoliation without a yield loss, treatment for these cutworms is rarely justified. However, the claybacked cutworm's damage is a mix of leaf feeding and plant cutting so black cutworm thresholds should be observed. To add to the confusion, other species of cutworms may be encountered feeding on crops as well. The sandhill cutworm, as its name implies, is found on sandy knolls. Sandhill and the glassy cutworms tend to be a perennial threat in specific environments, most producers that have experience with them are quite aware of their destructive abilities.

Identification of these cutworm species is a little tricky and requires a pretty good understanding of morphological characteristics of immature insects, a course taught in Entomology. In short, while using a 10X magnifying lens, carefully analyze the skin texture of the worm. If it is considerably "bumpy," it is most likely a black cutworm. The other cutworm species have smooth skin. Species identification can usually be confirmed by sending us quality, in-focus pictures, especially of the dorsal, i.e., top, of the cutworms. Happy Scouting!

Heat Units (Base 50)

April 8 - May 13





Black cutworm cut plants about 300 heat unit accumulations (base 50).

Comparison of black (left) and dingy (right) cutworm skin texture, about 10X magnification.

2020 Black Cutworm Pheromone Trap Report

(John Obermeyer)

		BCW Trapped						
		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
County	**Cooperator**							
Adams	Roe/Mercer Landmark	12	17*	15*	19*	44*	10	
Allen	Anderson/NICK	1	1	1	5		1	
Allen	Gynn/Southwind Farms	2	3	0	6	15	1	
Allen	Kneubuhler/G&K Concepts	6	2	4	9	28*	2	
Bartholomew	Bush/Pioneer Hybrids	6	28*	39*	28*	14	9	
Clay	Mace/Ceres Solutions/Brazil	2	2	4	3	1	0	
Clay	Fitz/Ceres Solutions/Clay City	0	4	3	10	15*	4	
Clinton	Emanuel/Boone Co. CES	26*	18	28*	72*	39*	13	
Dubois	Eck/Dubois Co. CES	1	13	18*	16*	30*	16	
Elkhart	Kauffman/Crop Tech	7	12	5	10	14*	3	
Fayette	Schelle/Falmouth Farm Supply Inc.	46*	23	25	15	40*	39*	
Fountain	Mroczkiewicz/Syngenta	0	8	3	4	6	11	
Fulton	Jenkins/Ceres Solutions/Talma	0	0	1	2	5	1	
Hamilton	Campbell/Beck's Hybrids	15	10	16	23*	11	11	
Hendricks	Nicholson/Nicholson Consulting	0	8	3	5	32*	7	
Hendricks	Tucker/Bayer		28*	15*		19	12	
Howard	Shanks/Clinton Co. CES		2	0	1	1	0	
Jasper	Overstreet/Jasper Co. CES	0	0	0	4	1	3	
Jasper	Ritter/Dairyland Seeds	12	11	12	2	1		
Jay	Boyer/Davis PAC	19*	28*	16*	28*	54*	15*	
Jay	Shrack/Ran-Del Agri Services	19*	20	20*	36*	60*	4	
Jennings	Bauerle/SEPAC	16	29*	17	82*	58*	5	
Knox	Clinkenbeard/Ceres Solutions/Freelandville	0	0	0	0	0	0	
Knox	Butler/Ceres Solutions/Vincennes	0	0	0	6			
Lake	Kleine/Rose Acre Farms	60*	35*	26*	38*	28*	23*	
Lake	Moyer/Dekalb Hybrids/Shelby	4	22*	6	8	15	4	
Lake	Moyer/Dekalb Hybrids/Scheider	5	21*	6	10	11	18	
LaPorte	Rocke/Agri-Mgmt. Solutions	6	9	23*	14	8	13	
Marshall	Harrell/Harrell Ag Services							
Miami	Early/Pioneer Hybrids	0	7	2	7	4	3	
Montgomery	Delp/Nicholson Consulting	2	18*	33*	51*	46*	0	
Newton	Moyer/Dekalb Hybrids/Lake Village	0	4	4	1	1	3	
Porter	Tragesser/PPAC		1	0	6	6	4	
Posey	Schmitz/Posey Co. CES	1	5	2	0	0	1	
Pulaski	Capouch/M&R Ag Services			4	11		48*	
Pulaski	Leman/Ceres Solutions	31*	28	38*	32*	7	6	
Putnam	Nicholson/Nicholson Consulting	8	9	5	5	11		
Randolph	Boyer/DPAC	13*	13	11*	8	15	12*	
Rush	Schelle/Falmouth Farm Supply Inc.	1	3	15	6	4	1	
Shelby	Fisher/Shelby County Co-op		0	7	21*	15	4	
Shelby	Simpson/Simpson Farms	0	32*	37*	65*	99*	43*	
Stark	Capouch/M&R Ag Services							
St. Joseph	Carbiener, Breman	9	0	11				
St. Joseph	Deutscher/Helena Agri-Enterprises	2	19	1	48*			
Sullivan	Baxley/Ceres Solutions/Sullivan	0	8		11	10		
Sullivan	McCullough/Ceres Solutions/Farmersburg	0	0	10*	14*	26*	15*	
Tippecanoe	Bower/Ceres Solutions	3	6	14*	29*	14*	14*	
Tippecanoe	Nagel/Ceres Solutions	36*	38*	86*	88*	50*	57*	
Tippecanoe	Obermeyer/Purdue Entomology	0	0	2	30*	27*	17	
Tippecanoe	Westerfeld/Bayer Research Farm	0	2	6	13	9*	11	
Tipton	Campbell/Beck's Hybrids	0	6	8	19	7	15	
Vermillion	Lynch/Ceres Solutions/Clinton	0	0	0	0	0	0	

		BCW Trapped						
		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
County	**Cooperator**							
White	Foley/ConAgra	5	1	4	5	4	9	
Whitley	Richards/NEPAC/Schrader		7		28		52	
Whitley	Richards/NEPAC/Kyler		13		40		100	

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

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				
Jennings/SEPAC Ag Center	60	75	11	15	35	46				
Knox/SWPAC Ag Center	1162	308	56	168	64	11				
LaPorte/Pinney Ag Center	115	65	0	21	455	176				
Lawrence/Feldun Ag Center	974	347	57	741	753	416				
Randolph/Davis Ag Center	117	207	16	51	15	18				
Tippecanoe/Meigs	225	wind dmg.	6	54	151	221				
Whitley/NEPAC Ag Center		9		38		214				

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

Quackgrass Control In Agronomic Crops

(Marcelo Zimmer) & *(Bill Johnson)*

Quackgrass (*Elymus repens*) is a cool-season perennial grass, generally found in vacant fields or along roadsides that are not regularly mowed. It is a common weed problem in turf, where this sod-forming grass spreads vigorously by rhizomes (Figure 1), producing allelophatic compounds and forming dense patches that can crowd out desirable grasses (Figure 2). Quackgrass can also be found in agronomic crops such as corn, soybean, and alfalfa. If you go back through historical records of crop production challenges in Indiana and much of the northern and eastern corn-belt, quackgrass is mentioned frequently as one of the top 5 most challenging weeds to control. With the introduction of the postemergence grass herbicides in soybeans in the 80's, POST grass corn herbicides in the late 80's and the Roundup Ready technology in the mid 1990's, quackgrass control was rarely mentioned as a problematic weed. However, this spring we have received multiple phone calls with questions about quackgrass control in row crops. So we thought this might be a good time to review what we know about quackgrass. This article provides information on the biology and control of quackgrass in corn and soybean.

Figure 1. Quackgrass rhizomes. (*Photo Credit: Dr. Aaron Patton*)

Figure 2. Quackgrass patch. (*Photo Credit: Dr. Aaron Patton*)

Biology and Identification

Quackgrass is a perennial weed and reproduces by seed and by rhizomes (Figure 1). Quackgrass likes cool weather and is usually up and growing vigorously in April in Indiana. Quackgrass can be easily differentiated from other grasses due to the presence of clasping auricles (Figure 3) and the production of underground vegetative structures such as rhizomes. The rhizomes facilitate the spread of quackgrass throughout the field, but it also reproduces by seeds (Figure 4). Seed production generally begins around June.

Figure 3. Clasping auricles on quackgrass. (*Photo Credit: Dr. Aaron Patton*)

Figure 4. Quackgrass seedhead. (*Photo Credit: Dr. Aaron Patton*)

Control

Tillage is not an effective practice for quackgrass control unless aggressive tillage is supplemented with herbicides, as any type of soil disturbance near a quackgrass patch will break up rhizomes and spread them out over a larger area of the field. Therefore, systemic herbicides that can translocate to the rhizomes are the most effective tools for control of quackgrass in row crops. In corn, herbicides such as glyphosate (Roundup PowerMax) and nicosulfuron (Accent) applied POST provide excellent quackgrass control. Atrazine applied PRE in corn can also suppress quackgrass growing from seed. In soybeans, glyphosate and ACCase inhibitor herbicides (group 1) such as clethodim (Select MAX), fluazifop (Fusilade DX), and quizalofop (Assure II) result in excellent quackgrass control. It is important to note that quackgrass plants will need to be actively growing at the time of herbicide application for the herbicides to reach the rhizomes. Additionally, multiple herbicide applications may be required to completely eliminate quackgrass from a field.

References

Patton and Law (2020) Quackgrass. https://turf.purdue.edu/quackgrass/?cat=52 Accessed on May 12, 2020.

First Frost, Next Seedling Blight?

(Bob Nielsen) & *(Darcy Telenko)*

While corn planting progress is way ahead of the miserable 2019 planting season, Indiana's corn crop has already experienced more than its fair share of misery. Most of April and the first half of May was cooler than normal across much of the state and, consequently, corn planted early April through early May has germinated, emerged, and developed very slowly. Emergence in many of those fields was a 3+ week ordeal because sub-optimal soil temperatures. Corn planted the first week of April is today barely at the two-leaf collar stage (V2) of development!

The second blow came in the form of a combined frost and literal freeze event on 9 May across much of the state. Air temperatures that Saturday morning dropped to lethal mid to high 20s F as far south as Butlerville in Jennings County. The bad news is that the combined frost / freeze event killed much, if not all, of the exposed above-ground plant tissue in many fields that had emerged before Saturday. The good news is that the potentially lethal temperatures did not penetrate the soil and so the all-important growing points of the young corn plants escaped mostly unscathed because they were still positioned below the soil surface.

The third blow, if you can call it that, came in the form of cooler than normal temperatures for the 3+ days following the frost / freeze event that slowed the visible recovery from the whorls of the damaged plants. Consequently, it was difficult to determine these past few days which plants or fields were truly "okay" and which were on "death's bed" and might require replanting. A return to warmer weather beginning Wednesday will hasten that recovery and by this weekend, assessment of the recovery potential of damaged fields will be much easier.

The POTENTIAL fourth blow to this year's corn crop MAY come in the form of the development of seedling diseases, partly because fungicidal seed treatments on corn that was planted 3 to 5 weeks ago have probably deteriorated by now and yet, because of the cooler than normal temperatures during those same 3 to 5 weeks, initial development of the plants and their permanent root system (the "nodal" roots) is not established well enough for the plants to have "weaned" themselves from reliance on the stored energy reserves in the kernels. Damage to kernels or the connecting mesocotyls in corn that is VE (emergence) to V3 (three leaf collars) is usually lethal to young corn plants.

Cool (or warm) and wet conditions will increase the risk of seedling disease and root rot in corn. A number of soilborne fungi can infect corn seed and seedlings, including *Fusarium, Pythium, Diplodia, Penicillium, and Rhizoctonia*. These may cause a damping-off or root rot. Fungicide seed treatments have been shown to help mitigate cold stress and protect against soilborne fungi. Initial symptoms of seed and seedling diseases include rotten seeds, dead or yellowed emerging seedlings, stunted or uneven growth, reduced vigor, and root rot. Root rot may also lead to poorly filled ears or wilting. Low-lying areas with poor drainage are most at risk. It is important to identify the underlying disease causes to make sure of appropriate selection of seed treatments in a field for following years. The diagnosis of seedling injuries can be difficult in the field as many abiotic (non-living) issues can mimic pathogen infection leading to similar symptoms. These include cold injury, flooding, crusting, herbicide injury and soil compaction. Plant samples can be sent to the Purdue Plant Pest Diagnostic lab (https://ag.purdue.edu/btny/ppdl/Pages/default.aspx) for determination if the underlying issue is a soilborne pathogen or abiotic issue.

Now is the time to scout fields to determine if you have any frost or seedling blight issues. If damage is severe and considerable stand loss has occurred in a field, replant considerations may need to be taken – but it is important to get out and dig up your plants to determine.

Related reading:

Anonymous. 2019. Root Rots of Corn. Crop Protection Network. https://cropprotectionnetwork.org/resources/articles/diseases/root-rots-of-corn [URL accessed May 2020].

Nielsen, R.L. (Bob). 2020. Assessing Frost / Cold Temperature Injury to Young Corn. Corny News Network, Purdue Agronomy Extension. http://www.kingcorn.org/news/timeless/FrostedCorn.html [URL accessed May 2020].

Nielsen, R.L. (Bob). 2020. Corn Replant Considerations. Corny News Network, Purdue Agronomy Extension. http://www.kingcorn.org/news/timeless/CornReplant.html [URL accessed May 2020].

Nielsen, R.L. (Bob). 2020. Root Development in Young Corn. Corny News Network, Purdue Agronomy Extension. http://www.kingcorn.org/news/timeless/Roots.html [URL accessed May 2020].

Seedling blight symptoms in corn. Note the shriveled, discolored mesocotyl and lower crown of the stunted (soon to be dead) V2 plant. (*Photo Credit: Bob Nielsen*)

Figure 2. Cold injury on corn seedling. (*Photo Credit: Darcy Telenko*)

VIDEO: Assessing Freeze Damage To Soybean Seedlings

(Shaun Casteel) & *(John Obermeyer)*

When a freeze occurs early in the spring after soybean fields have been planted, damage is dependent on many variables, especially the growth stage. Damage is possible to soybean not yet emerged from the soil, but one should probably wait 2 weeks before an assessment is made. The more immediate concern are the plants that had already emerged with hypocotyl and growing point exposed to freezing temperatures. This video shows, and describes, the various degrees of damage seen on soybean seedlings, potential for recovery, and the possible needs for replanting. A soybean stand above 70,000 plants per acre (normal + those that will recover) usually do not need to be replanted or overseeded.

Purdue Crop Chat Episode 5, Reaction To Weekend Freeze And Upcoming Wet Forecast

(Bob Nielsen) & *(Shaun Casteel)*

On the latest Purdue Crop Chat podcast found here and on iTunes, Purdue Extension Corn Specialist Dr. Bob Nielsen and Soybean Specialist Dr. Shaun Casteel talk about the impact of the frost event over the weekend and if replanting will be necessary.

Nielsen and Casteel are joined by state climatologist Dr. Beth Hall and Extension forage specialist Dr. Keith Johnson on this Purdue Crop Chat. Hall discusses the record-breaking nature of this past weekend's freeze and a very wet forecast ahead while Johnson talks about making wheat into forage based on freeze damage.

Timing Of The Hay Harvest

(Keith Johnson)

To make excellent quality hay, the forage needs to be cut at the right growth stage and packaged into a bale at the right moisture content without incidence of rain damage. As forages mature, protein and digestibility concentrations decline. If the forage is harvested too late, dry matter intake by the consuming animal will be less because of high fiber concentration.

Baling hay too wet can result in mold formation, reduced quality and the possibility of spontaneous combustion. When the hay is baled too dry, leaf loss occurs which results in less yield and quality.

The link below is a video about timing the hay harvest.

https://youtu.be/LdQZnNJGpLs

Making quality hay requires awareness of the maturity stage of the grass and legume, and weather conditions. Top forage-livestock producers make timing the hay harvest a management priority.

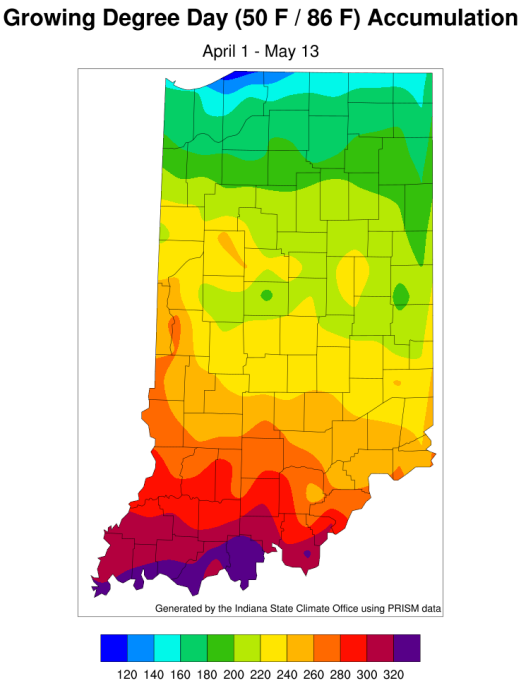
A successful hay harvest requires close attention to weather conditions. A red sky as nightfall occurs is a good omen that a dry day lies ahead. You just hope for several dry days in a row!

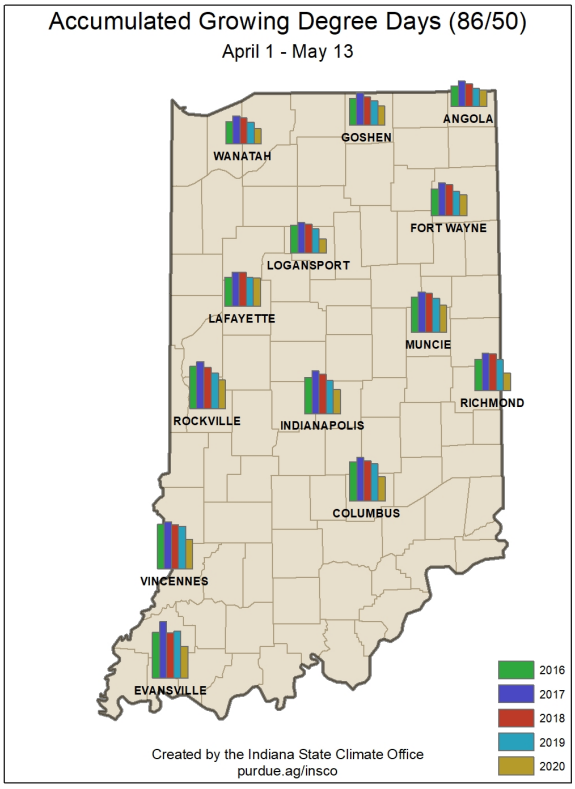
Warm Temperatures Should Help GDD Accumulations

(Beth Hall)

Growing degree day (GDD) accumulations (Figures 1 and 2) have been off to a slow start this season due to unseasonably cool temperatures. For accumulations that began April 1, GDDs are 110-140 units below normal; those that began May 1 are 50-75 units below normal. The greatest departures are in the southern and western counties of Indiana. The good news is the below-normal temperatures should be behind us for a while as the national Climate Prediction Center is indicating a high probability for above-normal temperatures for the rest of May. Drier conditions are expected across the state for the May 19-23 period, but beyond that the climate outlook models are too uncertain.

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.





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