

Pest & Crop newsletter

Purdue Cooperative Extension Service and USDA-NIFA Extension IPM Grant

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What Leads To A Black Cutworm Infestation?

(Christian Krupke) & (John Obermeyer)

Many factors (many of them unpredictable) determine an insect outbreak. As we take the wait-and-see approach toward planting and subsequent insect infestations, let's discuss a few of the variables:

Insect dispersal is the phenomenon by which insects move from one place to another. The distance that they can move is quite variable among species. Black cutworm moths, on their own power, can fly no further than a few miles. They are often caught up in wind currents of developing storms in southern regions of the United States and carried to the Midwest. They are then deposited back to ground level as storms pass through. Predicting the location and intensity of a spring thunderstorm is difficult, as is the prediction of locations and intensities of infestations of cutworms and other migratory pests. This is where pheromone trapping comes in: with the help of our loyal cooperators throughout the state we can keep an eye on the "arrival rate" and know when to start scouting. For example, following major storm activity in the state April 1 of this year, our trappers throughout the state captured a significant number of moths.

Although many adult insects don't feed, abundant and consistent food sources are necessary for many insect larvae (caterpillars, grubs etc.) to survive. Black cutworm female moths, laden with eggs, cue onto healthy, green plants for egg-laying soon after their arrival. As mentioned last week, winter annual weeds in crop fields are very attractive egg-laying sites. When these weeds are terminated after eggs have been deposited, surviving larvae are very limited in mobility, and will feed upon anything within reach. This is when damage to the crop can happen. Although in preference tests, corn and soybean are not their favorite foods, this is far preferable to starving.

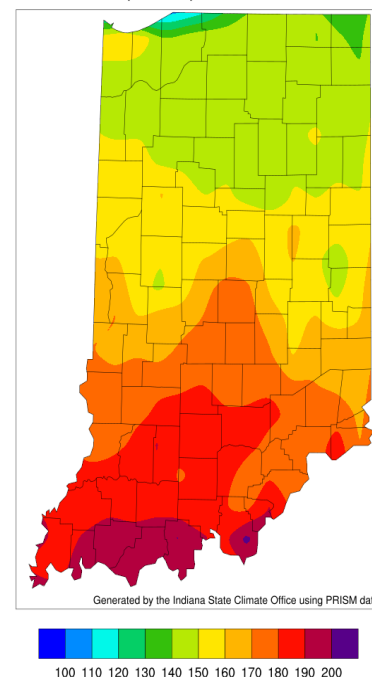
Temperature dictates all insect activity, rate of development, and reproduction. Insects are "cold-blooded" and they require an external heat source, meaning their behaviors are very strongly linked to changes in temperature. The temperature above which an insect grows and develops is called a developmental threshold. The minimum threshold for black cutworm has been established at 50°F. At

temperatures lower than this (quite common during springtime in Indiana) they remain inactive until conditions become favorable. Though adults and larvae can freeze to death, short periods below freezing are not sufficient to kill them - freezing to death is not typically a large source of mortality at this time of year. At approximately 300 accumulated heat units (50°F base), black cutworm larvae are large enough to cut corn seedlings. From our first major influx of moths (April 1), heat unit accumulations have reached nearly 200 in extreme southern Indiana (see accompanying contour map). That said, with current and future warming temperatures, it won't be long!

In predicting insect infestations, timing is everything. There are other variables to consider, but timing of when and how all these factors (migration, food availability, development temps) "collide" ultimately determines the infestation. Hopefully this gives a clearer understanding of why cutworm outbreaks, although serious when they occur, are few and far between and often don't get far enough for producers to notice.

Growing Degree Day (50 F / 86 F) Accumulation

April 1 - April 19, 2023



From April 1, our first major black cutworm capture, this map shows accumulated degree days at 50-degree base. 300 accumulated degree days signals the need for scouting in high-risk emerging fields.



Black cutworm 2nd and 3rd instar larvae on a penny. 3rd instar, and larger, larvae can leaf feed on corn seedlings and begin cutting.

2023 Black Cutworm Pheromone Trap Report

(John Obermeyer)

County	Cooperator	BCW Trapped					
		Wk 1 4/1/23- 4/5/23	Wk 2 4/6/23- 4/12/23	Wk 3 4/13/23- 4/19/23	Wk 4 4/20/23- 4/26/23	Wk 5 4/27/23- 5/3/23	Wk 6 5/4/23- 5/10/23
Adams	Roe/Mercer	3	9*	5			
Allen	Landmark/Decatur						
Allen	Anderson/Indigoag/Churubusco	0	1	0			
Allen	Gynn/Southwind Farms/Ft. Wayne	1	2	3			
Allen	Kneubuhler/G&K Concepts/Harlan	61*	50*	26*			
Bartholomew	Bush/Top Crop	0	0	4			
Benton	Alliance/Columbus						
Benton	Nally/Dairyland Seeds/Remington	1	11	21*			
Clay	Mace/Ceres	4	1	0			
Clay	Solutions/Brazil						
Clay	Fritz/Ceres Solutions/Clay City	5	0	3			
Clinton	Emanuel/Frankfort	19*	11	12			
Daviess	Brackney/Daviess Co.	1					
Dubois	CES/Montgomery						
Dubois	Eck/Dubois Co. CES/Jasper	14	21*	12			
Elkhart	Kauffman/Crop	5	30*	8			
Fountain	Tech/Millersburg						
Fountain	Mroczkiewicz/Syngenta/Attica	39*	21*	47*			
Hamilton	Campbell/Beck's Hybrids	54*	37*	22*			
Hendricks	Nicholson/Nicholson						
Hendricks	Consulting/Danville		5	10			
Hendricks	Tucker/Bayer/Brownsburg			21*			
Howard	Shanks/Clinton Co. CES/Kokomo	0	2	5			
Jasper	Overstreet/Jasper Co. CES/Rensselaer	65*	3	4			
Jasper	Ritter/Dairyland						
Jasper	Seeds/McCoysburg	0	9	10			
Jay	Boyer/Davis PAC/Powers	2	2	10			
Jay	Shrack/Ran-Del Co.	37*	21*	37*			
Jennings	Alliance/Parker City						
Jennings	Bauerle/SEPAC/Butterville	42*	8	5			
Knox	Clinkenbeard/Ceres						
Knox	Solutions/Edwardsport	0	5	8			
Knox	Edwards/Ceres						
Knox	Solutions/Fritchton	1	4	3			
Kosciusko	Jenkins/Ceres	13	24*	24*			
Lake	Solutions/Mentone						
Lake	Kleine/Rose Acre	151*	94*	52*			
Lake	Farms/Cedar Lake						
Lake	Moyer/Dekalb	5	16	19*			
Lake	Hybrids/Shelby						
Lake	Moyer/Dekalb	0	1	9			
LaPorte	Hybrids/Schneider						
LaPorte	Rocke/Agri-Mgmt.	26*	27*	27*			
LaPorte	Solutions/Wanatah						
Miami	Early/Pioneer						
Miami	Hybrids/Macy	0	7				

Montgomery	Delp/Nicholson	13		19*
Newton	Consulting/Waynetown			
Newton	Moyer/Dekalb	2	4	6
Perry	Hybrids/Lake Village			
Perry	Lorenz/Lorenz	0	6	1
Perry	Farms/Rome 1			
Perry	Lorenz/Lorenz	0	0	0
Perry	Farms/Rome 2			
Porter	Boyer/PPAC/Wanatah	16*	39*	27*
Posey	Schmitz/Purdue CCS/			
Posey	Blairsville	0	4	
Posey	Schmitz/Posey Co.			
Posey	CES/Cynthiana	0	1	
Pulaski	Leman/Ceres		44*	28*
Putnam	Solutions/Francesville			
Putnam	Nicholson/Nicholson	15*	5	19*
Putnam	Consulting/Greencastle			
Randolph	Boyer/DPAC/Farmland	5	9	18*
Rush	Schelle/Falmouth Farm			
Rush	Supply/Carthage		0	5
Scott	Tom Springstun/Scott Co.	0	1	5
Scott	CES/Scottsburg			
Shelby	Fisher/Shelby County			
Shelby	Coop/Shelbyville		0	3
St. Joseph	Carbiener/Breman	0	25*	
Sullivan	McCullough/Ceres	2	3	7
Sullivan	Solutions/Farmersburg			
Sullivan	McCullough/Ceres		0	5
Sullivan	Solutions/Dugger			
Tippecanoe	Bower/Ceres	33*	53*	28*
Tippecanoe	Solutions/Lafayette			
Tippecanoe	Nagel/Ceres Solutions/W.	17*	36*	42*
Tippecanoe	Lafayette			
Tippecanoe	Obermeyer/Purdue	19*	31	55*
Tippecanoe	Entomology/ACRE			
Tippecanoe	Westerfeld/Bayer			
Tippecanoe	Research Farm/W.	15*	6	20*
Tippecanoe	Lafayette			
Tipton	Campbell/Beck's Hybrids	2	1	9
Vigo	Lynch/Ceres			
Vigo	Solutions/Clinton	2	1	0
Whitley	Emley/NEPAC/Schrader	74*	76*	58*
Whitley	Emley/NEPAC/Kyler	32*	15	5

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

Armyworm Pheromone Trap Report - 2023

(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	80	56								
Jennings/SEPAC Ag Center	21	20	39								
Knox/SWPAC Ag Center	37	242	46								
LaPorte/Pinney Ag Center	60	296	216								
Lawrence/Feldun Ag Center	159	99	197								
Randolph/Davis Ag Center	57	0	0								
Tippecanoe/Meigs	36	56	51								
Whitley/NEPAC Ag Center	0	259	179								

Wk 1 = 4/1/23-4/5/23; Wk 2 = 4/6/23-4/12/23; Wk 3 = 4/13/23-4/19/23; Wk 4 = 4/20/23-4/26/23; Wk 5 = 4/27/23-5/3/23; Wk 6 = 5/4/23-5/10/23; Wk 7 = 5/11/23-5/17/23; Wk 8 = 5/18/23 - 5/24/23; Wk 9 = 5/25/23-5/31/23; Wk 10 = 6/1/23-6/7/23; Wk 11 = 6/8/23-6/14/23

Herbicide Update For Hemp

(Marguerite Bolt, mbolt@purdue.edu)

Hemp producers struggle to manage weeds and have very few herbicide options available, with no conventional herbicides registered for use prior to April 2023. The Environmental Protection Agency (EPA) has established the first pesticide tolerance in hemp and it is for the herbicide ethalfluralin ([Final Rule](#)).

Ethalfluralin, registered under the trade name Sonalan® HFP Herbicide

(EPA Reg. No. 10163-356) is used for the control of annual grasses and broadleaf weeds. This product can be applied before planting or after planting but before hemp has emerged. The product needs to be incorporated mechanically or with irrigation. Application rate depends on soil type, with an application rate of 1.5-3 pints per acre. Lower rates should be used in coarse soils. Applicants need to have the supplemental label when applying this product. The supplemental label can be found [here](#) and can be used through May 1st, 2026. When using a supplemental label, all applicable directions, restrictions, and precautions on the container label must be followed.

Because ethalfluralin has not been tested on all hemp varieties or on all soil types, it is recommended to test the product on a small area first. There are also restrictions that hemp growers need to be aware of. This product should not be applied to soils that are wet and subject to prolonged flooding and no more than one application per year can be made. Additional restrictions and use information can be found on the supplemental label [here](#).

Return To Below-Normal Precipitation, Variable Temperatures, And Enhanced Freeze Risk

(Austin Pearson)

Through the first 18 days of April, temperatures ran 5.5°F above normal statewide (Figure 1). The largest deviations occurred in central and northern Indiana. Despite the wet start to the month, wind, abundant sun, low humidity and reduced precipitation accounted for drying conditions across the state. Statewide, precipitation averaged 69 percent of normal. Surprisingly, tillage, fertilizer and herbicide applications, and planting kicked up a lot of dust and goes to show that it does not take a lot to dry out the upper soil profile. Through April 16, the USDA NASS reported 3 percent of corn and 2 percent of soybeans were planted statewide. Modified Growing Degree Days (MGDDs) continued to run above normal statewide (Figure 2) as a result of the warm temperatures.

Climate Division Data by State between Two Dates
From Midwestern Regional Climate Center

Indiana 4/ 1/2023 to 4/18/2023								
cd	Temperature			prcp	Precipitation			percent
	temp	norm	dev		norm	dev	percent	
1	52.7	46.9	5.8	1.41	2.16	-0.75	65	
2	52.8	46.3	6.4	1.41	2.19	-0.77	65	
3	52.6	45.8	6.7	1.23	2.10	-0.87	59	
4	54.3	49.0	5.3	1.34	2.27	-0.94	59	
5	53.8	48.3	5.5	1.32	2.35	-1.03	56	
6	52.8	47.3	5.5	1.32	2.28	-0.96	58	
7	57.3	52.6	4.7	2.22	2.49	-0.27	89	
8	57.0	51.9	5.1	2.07	2.56	-0.50	81	
9	55.4	50.8	4.6	2.03	2.48	-0.46	82	
State	54.4	48.9	5.5	1.59	2.32	-0.73	69	

Midwestern Regional Climate Center
MRCC Applied Climate System
Generated at:
Wed Apr 19 09:48:36 CDT 2023



Figure 1: Indiana climate division and state temperature, normal temperature, temperature departure from normal, precipitation, normal precipitation, precipitation departure from normal, and percent of mean precipitation for April 1-18, 2023.

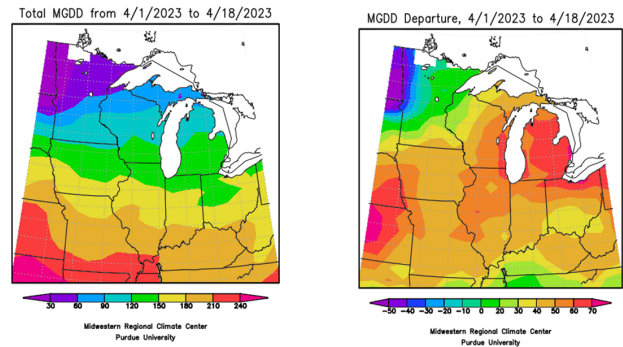
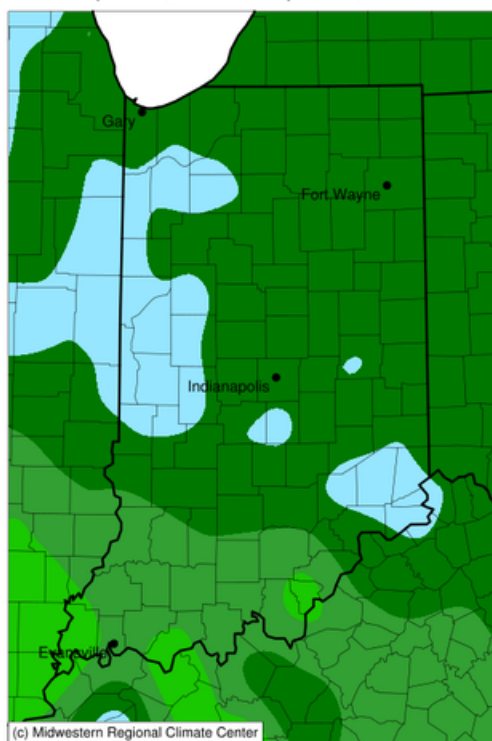


Figure 2: Total Accumulated Midwest Modified Growing Degree Days (MGDDs) April 1-18, 2023 (left) and Total Accumulated MGDDs represented as the departure from the 1991-2020 climatological normal (right).

Much of Indiana has been subjected to frost/freeze advisories over the last few days as well. Temperatures fell below freezing in many spots and can confirm that we had patchy frost on multiple occasions. All Indiana vegetation is now susceptible to freeze damage, which has triggered National Weather Service frost/freeze alerts this last week. Most plants are okay for light frosts, but damage can result from prolonged exposure to 28 F or colder temperatures. Parke and Tippecanoe Counties recorded 26 F and 27 F, respectively, on April 18; many other locations experienced lower than 30 F (Figure 3). Rush County recorded a minimum temperature of 27 F on the morning of April 19. Warm temperatures resurged during the afternoon on April 19, but are not expected to last long as cooler temperatures are forecasted to return by the weekend.

Average Minimum Temperature (°F)

April 18, 2023 to April 18, 2023



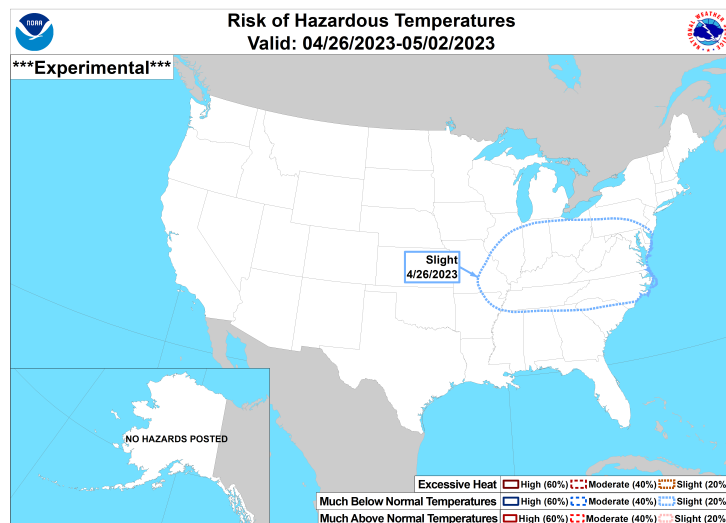
Stations from the following networks used: WBAN, COOP, FAA, GHCN, ThreadEx, CoCoRaHS, WMO, ICAO, NWSLI, Midwestern Regional Climate Center
cli-MATE: MRCC Application Tools Environment
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Figure 3: Average minimum temperatures for Indiana on the morning of April 18, 2023.

the entire state with at least 0.5 inches of precipitation with heaviest amounts in southern Indiana (1.25-2.50 inches). The Climate Prediction Center has high confidence in below-normal temperatures and near-normal precipitation through the end of April. What could this mean for frost/freeze risk? The Climate Prediction Center has already issued a slight risk of much below normal temperatures from April 26-May 2, 2023 (Figure 5), which is indicative of increased freeze risk over. Purdue Extension has a helpful article titled “[Effects of Cold Weather on Horticultural Plants in Indiana](#)” that discusses impact of freeze events on these crops.



Figure 4: NWS Weather Prediction Center 7-day quantitative precipitation forecasts for the continental United States.



Climate Prediction Center

Made: 04/18/2023 3PM EDT

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www.cpc.ncep.noaa.gov

Figure 5: Climate Prediction Center's 8-14-day hazard map depicting a slight risk for much below normal temperatures on April 26, 2023.

Seven-day precipitation forecasts, as of April 19th (Figure 4), blanket

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