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April 12, 2018

# Pest&Crop newsletter

**Purdue Cooperative Extension Service and USDA-NIFA Extension IPM Grant**

## In This Issue

- [Black Cutworm Adult Pheromone Trap Report](#)
- [Snowy, Cold Conditions Start the 2018 Moth Trapping Season](#)
- [Armyworm Pheromone Trap Report](#)
- [Insect Survival in Cold and/or Saturated Conditions: Chill and Don't Breathe](#)

- [Total Precipitation April 5 – April 11, 2018](#)
- [Total Precipitation March 29-April 4, 2018](#)
- [What Will a Successful Year Look Like for Dicamba Users?](#)
- [Best Guesses on March Flood Effects on Soil Biology and Soil Structure](#)
- [A Systems Approach for U.S. Soybean](#)
- [Purdue Extension Field Crop Specialists](#)

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

# Black Cutworm Adult Pheromone Trap Report

County	Cooperator	BCW Trapped						
		Wk 1 3/29/18-4/4/18	Wk 2 4/5/18-4/11/18	Wk 3 4/12/18-4/18/18	Wk 4 4/19/18-4/25/18	Wk 5 4/26/18-5/2/18	Wk 6 5/3/18-5/9/18	Wk 7 5/10/18-5/16/18
Adams	Mrs. Anderson's/2nd Grade School/Decatur		0	0	4			
Adams	Roe/Mercer Landmark	0	0	0	0			
Allen	Anderson/Syngenta	0	0	0	0			
Allen	Gynn/Southwind Farms	0	0	0	0			
Allen	Kneubuhler/G&K Concepts	0	0	0	1			
Bartholomew	Bush/Pioneer Hybrids	0	1	2	2			
Clay	Bower/Ceres Solutions/Clay City	0	0	0	0			
Clay	Bower/Ceres Solutions/Bowling Green	0	0	0	0			
Clay	Bower/Ceres Solutions/Brazil	0	0	4	2			
Clinton	Emanuel/Boone Co. CES	0	0	6	0			
Clinton	Foster/Rossville	0	0	0	0			
Daviess	Venard/Venard Agri-Consulting/Washington	1	2	2	0			
Daviess	Venard/Venard Agri-Consulting/Elnora	0	0	2	1			
DeKalb	Hoffman/ATA Solutions		0	0				
Dubois	Eck/Dubois Co. CES	0	0	0	3			
Elkhart	Kauffman/Crop Tech Inc.	0	0	0	1			
Fayette	Schelle/Falmouth Farm Supply Inc.	0	0	5	17			
Fountain	Mroczkiewicz/Syngenta	0	0	0	7			
Fulton	Ranstead/Ceres Solutions/Rochester		0	0	0			
Fulton	Jenkins/Ceres Solutions/Talma	0	0	0	0			
Greene	Venard/Venard Agri-Consulting/Newberry	1	4	5	0			
Hamilton	Campbell/Beck's Hybrids	0	0	0	4			
Hendricks	Nicholson/Nicholson Consulting	0	0	0	0			
Jasper	Overstreet/Jasper Co. CES	0	0					
Jasper	Ritter/Brodbeck Seeds	0	0	0				
Jay	Boyer/Davis PAC	0	0	0				
Jay	Shrack/Ran-Del Agri Services	0	0	4	2			
Jay	Temple/Jay Co. CES/Redkey	0	0	3	1			
Jay	Temple/Jay Co. CES/Pennville	0	0	3	1			
Jennings	Bauerle/SEPAC	0	1	0	3			
Knox	Bower/Ceres Solutions/Freelandville	0	0	0	0			
Knox	Bower/Ceres Solutions/Vincennes	0	0	0	0			
Kosciusko	Klotz/Etna Green	0	0	0	0			
Lake	Kleine	0	0	2	3			
Lake	Moyer/Dekalb Hybrids/Shelby	0	0	0	0			

Lake	Moyer/Dekalb Hybrids/Scheider	0	0	4	0
LaPorte	Rocke/Agri-Mgmt. Solutions/Wanatah	0	0	0	1
Marshall	Harrell/Harrell Ag Services/Trap 1	0	0	0	0
Marshall	Harrell/Harrell Ag Services/Trap 2	0	0	0	0
Marshall	Klotz/SR 10 & SR 331		0	0	0
Marshall	Miller/Ceres Solutions		0	0	8
Miami	Early/Pioneer Hybrids	0	0	0	1
Montgomery	Delp/Nicholson Consulting	0	0	0	2
Newton	Moyer/Dekalb Hybrids/Lake Village	0	0	2	0
Porter	Leuck/PPAC	0	0		0
Posey	Schmitz/Posey Co. CES/Cynthiana	0	0	0	
Posey	Schmitz/Posey Co. CES/St. Phillips W.	0	0	0	
Pulaski	Capouch/M&R Ag Services				0
Pulaski	Leman/Ceres Solutions	0	0	0	3
Putnam	Nicholson/Nicholson Consulting	0	0	1	8
Randolph	Boyer/DPAC	0	0	0	4
Rush	Schelle/Falmouth Farm Supply Inc.	1	0	3	2
Shelby	Fisher/Shelby County Co-op	0	0	0	
Shelby	Simpson/Simpson Farms				2
Starke	Capouch/M&R Ag Services				
St. Joseph	Barry/Helena				0
St. Joseph	Carbiener	0	0	0	
Sullivan	Bower/Ceres Solutions/Farmersburg	0	0	0	0
Sullivan	Bower/Ceres Solutions/Sullivan	0	2	4	2
Tippecanoe	Bower/Ceres Solutions/Lafayette	0	0	0	1
Tippecanoe	Nagel/Ceres Solutions	0	0	3	17
Tippecanoe	Obermeyer/Purdue	0	0	0	1
Tippecanoe	Ensign/Hoy Monsanto Research Farm	0	0	0	
Tipton	Campbell/Beck's Hybrids	0	3	0	1
Vermillion	Bower/Ceres Solutions/Clinton	0	0	0	0
Wabash	Enyeart/Ceres Solutions	0	0		1
Whitley	Boyer, Richards/NEPAC/Schrader	-	0	0	2
Whitley	Boyer, Richards/NEPAC/Kyler Farm	-	0	1	0

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

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# Snowy, Cold Conditions Start the 2018 Moth Trapping Season

**Author: John Obermeyer**

The ultimate April Fool's joke, many areas of Indiana were greeted to several inches of snow. This on top of the continued cool, wet weather that we have had for weeks. Though black cutworm and/or armyworms moths may be present in the state, they are certainly hanging low until the conditions improve. Fortunately for us, our fearsome trappers shall trudge through the snow and mud, hopefully not floods, to monitor these traps for weeks to come. Look for upcoming trap reports in future issues of the *Pest&Crop*.



John Obermeyer's black cutworm bucket trap, morning of April 2, Tippecanoe County.



Jeff Boyer's, DPAC superintendent, armyworm Hartstack trap, Randolph County  
(Photo by Jeff Boyer).

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# Armyworm Pheromone Trap Report

## Armyworm Pheromone Trap Report

County/Cooperator	Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8
Dubois/SIPAC Ag Center	0	0	11	3				
Jennings/SEPAC Ag Center	0	0	2	5				
Knox/SWPAC Ag Center	0	27	44	45				

LaPorte/Pinney Ag Center	0	0	3	3
Lawrence/Feldun Ag Center	0	28	89	144
Randolph/Davis Ag Center	0	0	273	80
Tippecanoe/Meigs	0	0	1	5
Whitley/NEPAC Ag Center		0	22	22

Wk 1 = 3/29/18 - 4/4/18; Wk 2 = 4/5/18-4/10/18; Wk 3 = 4/11/18-4/18/18; Wk 4 = 4/19/19=4/25/18

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# Insect Survival in Cold and/or Saturated Conditions: Chill and Don't Breathe

**Author:** *Christian Krupke and John Obermeyer*

After the very cold conditions of early January, a very common question received (and this is the case every year after a cold spell) was: “will the cold kill the insects?” And more recently, our attention has turned to the saturated soil conditions, “will that drown the insects?” The answer for both is (as always): “It depends, but probably not.” Most of our long-term established pests (rootworms, grubs, wireworms, corn borers, etc.) have been here for decades, and their populations have experienced these extremes in the past, so its unlikely that their populations will suffer much.



Grub that has succumbed to WET and WARM soils.

Overwintering insects utilize various behavioral and physiological mechanisms to keep them from dying during the long winter months. Survival tactics include, but are not limited to: lowering metabolic rates, reducing water content in essential tissues, and finding protected microenvironments. Consider the table below, which summarizes temperatures from the past five winters. All data were taken at the Agronomy Center for Research and Extension (ACRE), not far from the main Purdue campus. Looking at the second column from the left, we see the average air (or ambient) temperatures were lower this past winter than those of the past few. Still in our memory was the “polar vortex” winter of 2013/2014, that was COLD!

The more telling number appears in the next column, where the average temperatures at a 4” soil depth appear. Looking at this

number, we see that the winter was not as harsh just a few inches below the surface. Note that the temperature swings are lower in the soil. This is important because insects typically do not overwinter above-ground – seeking shelter and safety from the elements and predators below ground instead. This subjects them to much less variation in temperatures –soil takes longer to warm up and cool down than the air does. Depending upon snow cover, which can provide even more of a buffer, temperatures in the soil will remain remarkably constant and often warmer than the air as the snow provides some insulation.

## Average Winter Temperatures (ACRE), West Lafayette, Indiana

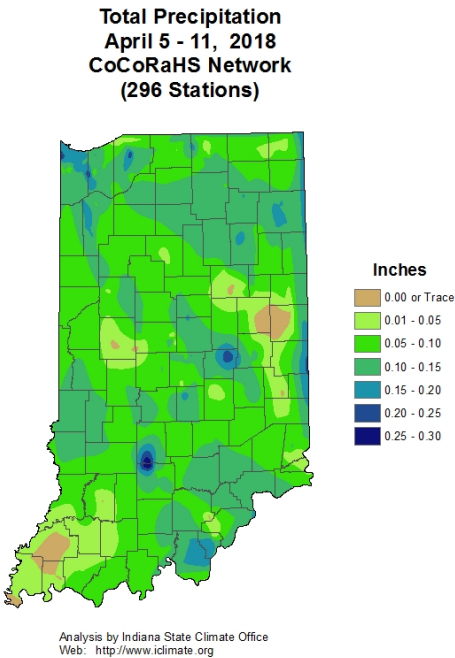
Winter (Dec. – Feb.)	Avg. Ambient Temp. (F)	Avg. 4” Bare Soil Temp (F)
17/18	28	34
16/17	33	37
15/16	33	35
14/15	26	31
13/14	22	29

For ground dwelling insects subjected to the deluge of rain storms these last many weeks, they will likely do just fine. At temperatures below 40°F, insect respiration rates are very low – essentially zero. So even in saturated conditions, insects are able to “hold their breath” for long periods of time, as long as soils are cool. On the other hand, when soils warm (spring and summer) and insects increase their metabolic rates, they are subject to drowning and/or starvation. This is particularly true for larval insect stages, such as caterpillars and beetle grubs. We have experienced this in past years when heavy rains saturated soils during the time of corn rootworm egg hatch in late May to early June. Newly hatched larvae require oxygen as they move in the soil profile searching for corn roots. They are also “blinded” as their ability to detect root volatiles is greatly diminished in water-logged soils. In these conditions, it is death by drowning or starvation. It can be a cruel world out there! Sad!

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# Total Precipitation April 5 – April 11, 2018

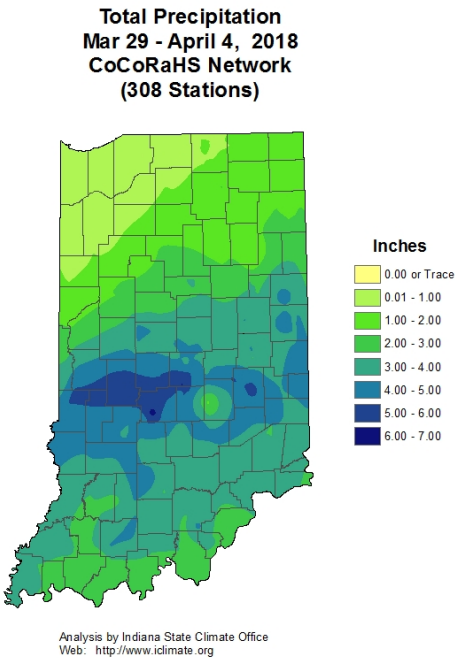
Total Precipitation April 5-April 11, 2018



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# Total Precipitation March 29-April 4, 2018



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# What Will a Successful Year Look Like for Dicamba Users?

**Author: Jeff Burbrink, Extension Educator Elkhart County**

Like many of my co-workers across the Corn Belt, I spent a great deal of time this winter talking to growers about dicamba. Dicamba has been with us since the 1960s, but has been given a new life thanks to plant scientists who have bred dicamba tolerant soybeans, a herbicide that in the past has been known to knock the leaves right off the plants.



Soybean spraying.

The main focus of these talks was how to use this product in a manner that can reduce potential for drift and volatilization to non-targeted plants. The manufacturers and regulatory agencies have laid out specific rules that users must follow. The rules, which included a combination of dicamba-specific training and in-field methods, are being implemented to reduce issues. The trainings are done, the rules are in place. Over the next few months, we will see what the results are.

My hope is that dicamba users take this seriously. We need this product in our toolbox for some of the herbicide resistant weeds that have popped up the past few years. If we have too many issues, the product will be taken away.

It is unrealistic to believe there will not be some problems. Dicamba has properties that can lead to drift even when the applicator follows all the rules. The regulatory agencies understand that. What they do not want to see are situations when applicators blatantly ignore the rules on the label.

For instance, after one of our training sessions this winter, I was approached by a man whose neighbor had used an older version of dicamba on his dicamba-tolerant beans last summer. This version of dicamba, while less expensive, is much more volatile than the new version. Predictably, it drifted off target, knocking the leaves off numerous non-tolerant soybean fields in the neighborhood.

It is precisely this type of behavior that will cause us to lose this product. In some states, this type of illegal application caused problems so wide spread, it pitted farmer against farmer, and in one case, a farmer was murdered during a heated argument! Not only that, when dicamba hits that many acres of off-target soybeans, you can bet there were many other non-target plants in fields, greenhouses and backyards that got whacked by this fellow's illegal application. It becomes a public relations nightmare for farmers in general, not just the offending applicator.

It is my hope we have a good summer, especially when it comes to dicamba applications. A bullet list for success includes:

- Apply the product in a timely fashion: when weeds are 4 inches or less in height.
- Wind speed and direction will be checked at boom height before each application.
- Applications will be avoided when the wind is blowing more than 10 mph, and less than 3 mph.
- Buffer areas of 110 or 220 feet will be observed with every application of dicamba.
- No applications of dicamba will be made when the wind is blowing towards a sensitive crop.
- Farmers will be talking to neighbors about the crops in neighboring fields. Are those dicamba tolerant beans? What's in the greenhouse?
- No applications of dicamba will be made when the forecast calls for rain more than 51% of the time.
- Spray tanks and hoses will be emptied of dicamba solution before moving to the next task
- Do not tank mix dicamba with anything not on the label. Acidifying products like AMS and UAN are known to increase the volatility of dicamba.

For more information about dicamba, I suggest visiting the Indiana State Chemist Office site at <http://www.oisc.purdue.edu/pesticide/dicamba.html>.

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# Best Guesses on March Flood Effects on Soil Biology and Soil Structure

**Authors: Eileen Kladvko, Ron Turco, Tony Vyn, and Jim Camberato – Agronomy Dept, Purdue University**



Flooded soil in March of 2018 (photo credit: Alex Leman)

Recent widespread flooding for weeks in northern Indiana has prompted questions and concerns about the potential negative effects on soil biology and other soil properties. In contrast to flooding events during the summer, flooded soils in late winter would be expected to have relatively little impact. Soils are still cold and soil biological activity is still at a low level. Typically it is difficult to detect respiration from cold soils, as microbial activity is shut down for the winter. This means that respiration by the soil organisms was at a low level anyway, and the oxygen demand from the organisms would be low. Even if oxygen was depleted in some fields, the organisms haven't really "woken up" from their winter naps, and the negative effects should be minimal. It is also important to remember that microbial populations in soil exceed 100 million cells per gram of soil. It is extremely difficult to completely remove or reduce this population as soil organisms have various resting stages, spores, etc., that can withstand harsh conditions for prolonged periods and then regrow again when conditions improve. Microbial populations in soils are composed of 1000s of different types of bacteria and fungi. These will have a range of abilities that are functional across a spectrum of soil conditions. What is active in summer may be different from what is active in fall or under wet conditions. As soils dry out and warm up, the structure of the population will shift in response to conditional changes. Earthworms are mostly also still in their winter resting stage, and cocoons would be able to tolerate the flooded conditions and hatch out after conditions become more beneficial.

Nitrogen loss from soil can occur via leaching of nitrate below the rootzone or into tile drainage. Fortunately, in most situations little nitrate-N is present in the soil during winter, because the majority of N applied as anhydrous ammonia or manure in the late fall and early winter or mineralized from crop residues and soil organic matter will likely remain in the ammonium or organic (in the case of manure) forms which are not subject to leaching. The exception to this would be manure applied in summer which would have had ample time and temperature to convert to nitrate and therefore losses of N could be substantial. Nitrate can also be denitrified under flooded conditions by soil microorganisms to gaseous forms of N which are then lost to the atmosphere. However even if nitrate were present, losses via denitrification would be minimal with cold temperatures and limited microbial activity.

The physical conditions of the surface soil may deteriorate from the flood waters, with aggregates breaking down and causing surface crusting and somewhat higher bulk densities. Ideally, cover crops could help reform those aggregates, but that practice doesn't fit at this time of year. Soil freeze/thaw and wetting/drying cycles between the flooding period and the planting period will also help with surface soil structure recovery. We don't recommend deep tillage operations to attempt mechanical restoration of soil structure; deep tillage in spring carries too much risk of smearing wetter soils at depth and in losing soil moisture in dry-weather springs. Shallow strip-till operations can improve seedbed soil quality if crusting persists. For some perspective, remember that our floodplain soils in Indiana are some of our most productive soils, and they flood nearly every year in winter sometime.

Many of the ponds and lakes formed in low-lying sections of Indiana fields are now apparent only by the "stover residue rings" that are left behind. These may need to be moved or carefully burned so as not to interfere with planting operations. Residue rings are often more dominant following fall vertical tillage operations resulting in shorter pieces of unanchored corn stalks that float easily. Flooding prone sections of fields are never the best places to do shallow fall vertical tillage.

Bottom line—probably not worth worrying about the soil biology effects of this past winter's flooding.

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# A Systems Approach for U.S. Soybean

**Author: Osama El-Lissy Deputy Administrator Plant Protection and Quarantine**

In 2016, Chinese officials put in place a new grain import law to keep invasive weeds and other plant pests from entering their country. Last fall, they informed USDA that U.S. grain shipments, particularly soybeans, did not comply with the new law. They specifically cited increased detections of weed seeds.



Reducing Weed Seeds in U.S. Soybean Exports to China

These weed seeds threaten U.S. access to China's grain market. If we do nothing, the United States may lose this valuable market. Consider: Approximately 1 of every 3 bushels of U.S. soybean are shipped to China, making it the United States' largest market for this commodity. In 2017, this export was valued at \$12.4 billion, which is approximately 91% by value of all grains shipped to China.

To maintain access and ensure uninterrupted soybean trade with China, my agency, USDA's Animal and Plant Health Inspection Service (APHIS), has worked with U.S. industry groups and other USDA agencies to

develop a holistic farm-to-export systems approach for reducing foreign material, including weed seeds, in soybean (please see the soybean systems approach infographic). We are currently working with these groups to create broad awareness across the soybean supply chain about this serious issue and the systems approach.

We need your help. U.S. soybean producers are some of the best in the world. But we still need to make sure they have all the tools they need to effectively control weeds during the growing season and minimize weeds seeds in harvested soybeans. We are asking you and the agents in your coverage area to help producers strengthen their integrated weed management programs and further reduce the presence of weed seeds in harvested soybeans, especially for four common weeds: ragweed, pigweed, Johnsongrass, and cocklebur. These weed species represent 80% of all weed seeds detected by China in U.S. soybean. You will find a detailed checklist of recommended weed management practices on the APHIS web site that can help reduce weed seed contamination during planting, throughout the production season, and at harvest.

Soybeans are critical to the U.S. economy. Other countries are already taking steps to reduce weeds seeds in their soybeans. Your efforts to help producers further reduce weed seeds in harvested soybeans will not only ensure that U.S. soybeans continue to meet China's import requirements, they will also enhance their value, making them even more competitive in the global marketplace.

If you have questions or would like additional information about the systems approach or the impact of weed seeds on grain trade, please contact George Galasso, APHIS National Trade Director for Grain by phone at (301) 851-2050 or by email at [George.J.Galasso@aphis.usda.gov](mailto:George.J.Galasso@aphis.usda.gov). For more information about specific recommended weed management practices, please contact Dr. Wendy Jin, APHIS Associate Executive Director by phone at (919) 855-7430 or by email at [Wendy.Jin@aphis.usda.gov](mailto:Wendy.Jin@aphis.usda.gov).

Thank you for your attention to this important issue.

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