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In This Issue

Armyworm Pheromone Trap Report – 2021

(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	13									
Jennings/SEPAC Ag Center	0	1									
Knox/SWPAC Ag Center	0	6									
LaPorte/Pinney Ag Center	27	50									
Lawrence/Feldun Ag Center	14	62									
Randolph/Davis Ag Center	0	0									
Tippecanoe/Meigs	1	0									
Whitley/NEPAC Ag Center	0	0									

Wk 1 = 4/1/21-4/7/21; Wk 2 = 4/8/21-4/14/21; Wk 3 = 4/15/21-4/21/21; Wk 4 = 4/22/21-4/28/21; Wk 5 = 4/29/21-5/5/21; Wk 6 = 5/6/21-5/12/21; Wk 7 = 5/13/21-5/19/21; Wk 8 = 5/20/21 – 5/26/21; Wk 9 = 5/27/21-6/2/21; Wk 10 = 6/3/21-6/9/21; Wk 11 = 6/10/21-6/16/21

2021 Black Cutworm Pheromone Trap Report

(John Obermeyer)

		BCW Trapped							
County	Cooperator	Wk 1 4/1/21-4/7/21	Wk 2 4/8/21-4/14/21	Wk 3 4/15/21-4/21/21	Wk 4 4/22/21-4/28/21	Wk 5 4/29/21-5/5/21	Wk 6 5/6/21-5/12/21	Wk 7 5/13/21-5/19/21
Adams	Roe/Mercer Landmark	5	15					
Allen	Anderson/NICK	0	1					
Allen	Gynn/Southwind Farms	0	0					
Allen	Kneubuhler/G&K Concepts	0	0					
Bartholomew	Bush/Pioneer Hybrids	0	21*					
Boone	Emanuel/Boone Co. CES	1	1					
Clay	Mace/Ceres Solutions/Brazil	6	7					
Clay	Fritz/Ceres Solutions/Clay City	0	3					
Clinton	Emanuel/Boone Co. CES	1	12					
Dubois	Eck/Dubois Co. CES	0	7					
Elkhart	Kauffman/Crop Tech	2						
Fayette	Schelle/Falmouth Farm Supply Inc.	12	23*					
Fountain	Mroczkiewicz/Syngenta	2	15*					
Hamilton	Campbell/Beck's Hybrids	5	17*					
Hendricks	Nicholson/Nicholson Consulting	0	1					
Hendricks	Tucker/Bayer	–	–					
Howard	Shanks/Clinton Co. CES	0	0					
Jasper	Overstreet/Jasper Co. CES	0	0					
Jasper	Ritter/Dairyland Seeds	0	0					
Jay	Boyer/Davis PAC	0	29*					
Jay	Liechty/G&K Concepts	2	13					
Jay	Shrack/Ran-Del Agri Services	1	16					
Jennings	Bauerle/SEPAC	0	22*					
Knox	Clinkenbeard/Ceres Solutions/Westphalia	0	0					
Knox	Gretencord/Ceres Solutions/Fritchton	0	5					
Knox	Butler/Ceres Solutions/Vincennes	0						
Kosciusko	Jenkins/Ceres Solutions/Mentone	0	0					
Lake	Kleine/Rose Acre Farms	3	22*					
Lake	Moyer/Dekalb Hybrids/Shelby	0	7					
Lake	Moyer/Dekalb Hybrids/Scheider	1	7					
LaPorte	Deutscher/Helena	0	4					
LaPorte	Rocke/Agri-Mgmt. Solutions	1	2					
Marshall	Harrell/Harrell Ag Services	0	0					
Miami	Early/Pioneer Hybrids	0	0					
Montgomery	Delp/Nicholson Consulting	2						
Newton	Moyer/Dekalb Hybrids/Lake Village	1	5					
Porter	Tragesser/PPAC	0	3					
Posey	Schmitz/Posey Co. CES	–	2					
Pulaski	Capouch & Chaffins/M&R Ag Services		4					
Pulaski	Leman/Ceres Solutions/Francesville	3	5					
Putnam	Nicholson/Nicholson Consulting	0	7					
Randolph	Boyer/DPAC	0	2					
Rush	Schelle/Falmouth Farm Supply Inc.	0	14*					
Shelby	Fisher/Shelby County Co-op							
Shelby	Simpson/Simpson Farms	0						
Stark	Capouch & Chaffins/M&R Ag Services, NW		0					
Stark	Capouch & Chaffins/M&R Ag Services, SE		0					
St. Joseph	Battles/Mishawaka							
St. Joseph	Carbiener, Breman	2	2					
St. Joseph	Deutscher/Helena Agri-Enterprises	0	3					
Sullivan	Baxley/Ceres Solutions/New Lebanon	0						
Sullivan	McCullough/Ceres Solutions/Farmersburg	0	0					
Tippecanoe	Bower/Ceres Solutions/Lafayette	2	0					
Tippecanoe	Nagel/Ceres Solutions/W. Lafayette	4	22*					
Tippecanoe	Obermeyer/Purdue Entomology/ACRE	1	5					
Tippecanoe	Westerfeld/Bayer Research Farm/W. Lafayette	0	3					
Tipton	Campbell/Beck's Hybrids	4	10					
Vermillion	Lynch/Ceres Solutions/Clinton	0	0					
White	Foley/ConAgra/Brookston	3	3					
Whitley	Boyer/NEPAC/Schrader	0	6					
Whitley	Boyer/NEPAC/Kyler	–	–					

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

Soil Moisture & Corn Seed Depth

(Bob Nielsen)

Uniformly adequate soil moisture at seeding depth is important for assuring rapid and uniform germination of a newly planted corn crop. Take time to assess soil moisture at your selected seed depth on the day of planting. If soil moisture is not available or unevenly available at your normal seeding depth, then consider planting deeper than normal if soil moisture is available at those deeper settings.

Choice of seeding depth for corn is often paid scant attention by growers during the rush of planting their crop. Human nature being what it is, we tend to simply leave the planter's depth control setting at the same position as it was in previous years. While it is true that a seeding depth of 1.5 to 2 inches is a fairly all-purpose range that works well in most situations, certain conditions merit more attention to seeding depth, the most common factor being soil moisture.

Imbibition of soil moisture by the newly planted seed occurs with the first 24 to 48 hours after planting (Nielsen, 2020a). Therefore, adequate soil moisture at seed depth (not too wet, not too dry) during those first 48 hours helps ensure rapid germination of the seed. If the soil at seed depth is excessively dry, the seed will remain inert until moisture is replenished. If soil moisture is excessive at the seed depth (e.g., saturated), the seeds may die and rot. Equally important is whether soil moisture at seed depth is spatially uniformly acceptable because uneven moisture at seed depth will cause uneven germination and subsequent emergence of the crop.

Many areas of the state are already on the dry side as we approach the serious start of corn planting in 2021. Indeed, large areas of the northern third of Indiana are rated as D0 (abnormally dry) or D1 (moderate drought) drought status by the U.S. Drought Monitor as of Apr 6.

Therein lies the potential challenge over the next few weeks in choosing the proper seeding depth because soil moisture near the surface is already borderline adequate for seed germination in some fields. Usual or excessive spring tillage will further dry out the surface few inches, especially on sunny, warm days. Planting corn at the usual 1.5 to 2 inch seeding depth may place seed into soil too dry for germination or (even worse) into soil that is unevenly moist that will result in uneven germination and emergence.

If rainfall remains a scarce commodity over the coming weeks, growers should assess soil moisture at seed depth in every field they plant. There will be situations where a 2-inch seeding depth will not provide uniformly adequate soil moisture for seed imbibition and germination. There will be situations where growers should place seed deeper to minimize the risks of uneven germination.

How deep can you "chase" soil moisture in planting corn? First of all, recognize that corn is physiologically capable of emerging from seeding depths far greater than that which today's planters can place seed, because of the innate ability of the seedling mesocotyl to elongate during the emergence process (Nielsen, 2020b).

The risk/benefit of deeper seed placement is influenced by the depth where adequate soil moisture is spatially uniform, soil temperature at seed depth, and the short term (6-10 day) weather forecast for rainfall and temperature. A combination of 1) adequate soil temperature today, 2) inadequate or variable soil moisture at 2 inches, and 3) little to no rainfall expected in the next week or two represents a planting situation that warrants choosing a seed depth deeper than 2 inches. So, if soil moisture at 2 inches is inadequate or spatially uneven, but soil moisture at 3 inches is both adequate and spatially uniform, AND the short term weather forecast is dry, then I would not hesitate changing the planter depth setting to 3 inches (or whatever setting results in the seed actually being placed at 3 inches).

Hold on…. I can already hear the nay-sayers worrying about deep planting in soils that are prone to developing dense surface crusts following intense rainfall events that then interfere with seedling emergence and result in seedlings leafing out underground. My opinion is that the consequence of surface crusting is mostly influenced by the timing of the development of the crust relative to the timing of the emergence process and less so by the depth of seeding. In other words, a dense surface crust can impede penetration of the seedling coleopile whether the seed was planted 1.5 inches deep or 3 inches deep if the crust develops shortly after planting.

Farmers who have the means to irrigate corn have an alternative to changing seed depth when seedbed moisture is not adequate. They can apply small amounts of irrigation water to moisten the upper 6 inches of soil after planting and, if necessary, continue to apply water to ensure adequate soil moisture during the initial development of the nodal root system. For more on this, see this article by Lyndon Kelley, Purdue / Michigan State Extension Irrigation Specialist.

Accurately assessing the spatial uniformity of soil moisture at seeding depth throughout an entire field is obviously difficult. There are some innovative planter accessories in the marketplace that purport to be able to assess soil moisture "on the go" via sensors on the seed firmers and subsequently change seeding depth "on the go" based on these data. I have seen no independent data that validates the accuracy or benefits of this technology. Even though it sounds interesting, I question the spatial accuracy of changing planter depth based on a sensor mounted on a seed firmer that is already firming the seed that was just dropped into the furrow.

Bottom Line: Uniformly adequate soil moisture at seeding depth is important for assuring rapid and uniform germination of a newly planted corn crop. Take time to assess soil moisture at your selected seed depth on the day of planting. If soil moisture is not available or unevenly available at your normal seeding depth, then consider planting deeper than normal if soil moisture is available at those deeper settings.

Related reading

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Soil Temperature & Corn Emergence

(Bob Nielsen)

Corn germination and emergence rely heavily on soil temperature. The warmer the soils, the faster emergence occurs. Emergence requires roughly 115 Growing Degree Days (GDDs) accumulated from planting. That GDD estimate is most accurate when GDDs are calculated using soil temperatures rather than air temperatures early in the season. To have corn emerge 10 days after planting, it requires daily average SOIL temperatures of approximately 61-62F. Most of Indiana's soils are not quite at that point yet.

The recent spate of days with unusually warm air temperatures has certainly "added fuel to the fire" for those who are "chomping at the bit" to begin planting corn. Those air temperatures, combined with sunshine and fairly dry surface soils, have indeed resulted in a dramatic warming of the soils in recent days (Fig. 1), with maximum daily SOIL temperatures in some areas in southern Indiana reaching nearly 70F. However, air temperatures began to decline over the weekend, while cloudy weather and rain moved through the state. In response, soil temperatures have also decreased since Friday (Fig. 1) and will likely continue to do so considering the current (Apr 12) 6-10 and 8-14 day cool temperature forecasts from the National Weather Service.

Remember that the pace of germination, emergence, and initial stand establishment of corn relies heavily on temperature……. Specifically, SOIL temperature. The time-honored "rule of thumb" traditionally used as a guide to help determine when it is safe to plant corn is 50F (10C) soil temperature at planting depth. In reality, it is more accurate to think in terms of how many soil-temperature-based Growing Degree Days (GDDs) does it take for corn germination and emergence to occur? The GDD concept is a way of quantifying the accumulation of heat in a way that correlates nicely with the rate of corn development (Nielsen, 2020).

Corn emergence occurs in roughly 115 GDDs after planting, give or take 5 GDDs. If your goal is to achieve corn emergence in, say, 10 days after planting, that translates to the need to accumulate 11-12 GDDs per day FROM PLANTING UNTIL EMERGENCE of the crop. In general terms, that equals 10 days of soil temperatures AVERAGING 61 to 62F per day. That average soil temperature is a far cry from the "rule of thumb" soil temperature of 50F.

The time in April when daily soil-GDD accumulations begin to consistently average 10 or more per day is roughly the second week of April in the southern third of the state, the third week of April in the central part of the state, and the last week of April in the northern third of the state. Coincidently, those timings in April agree nicely with the typical start of serious corn planting in those areas of the state.

Bottom Line: Clearly, we are approaching the time when soils begin to warm consistently, but are still subject to the short-term whims of Mother Nature. Pay attention to SOIL temperature, not AIR temperature when assessing current conditions AND pay attention to the short term (6-10, 8-14 day) temperature forecasts when making decisions about planting in mid-April. The more quickly germination and emergence occur, the more likely emergence and initial seedling development will be uniform and vigorous. Speed of development, uniformity, and health of the plants greatly influence the resilience of the young corn crop to other stresses.

Read On Only If You're Interested

So……. You might be wondering where you can find these estimates of daily GDDs. One source is the Useful to Usable (U2U) Corn GDD Decision Support Tool (https://mrcc.illinois.edu/U2U/gdd). This tool allows you to select your location, the planting date, the relative maturity of the hybrid, etc. It then provides an estimate of accumulated GDDs from planting to today and an estimate of future GDD accumulations based on 30-year historical normals.

This GDD Tool is a great tool…. EXCEPT for the fact that it calculates GDDs based on AIR temperatures, not SOIL temperatures. Once corn develops beyond the V5-V6 stages, that is no problem. However, prior to V5-V6, while the apical meristem (growing point) is below ground, corn plant development responds to soil temperature more than air temperature. Consequently, the GDD Tool estimates often do not agree with soil-based GDD estimates early in the season. In recent days, with unusually warm air temperatures, estimates of daily GDD accumulation with the GDD Tool have ranged as high as 20 GDD per day (Tippecanoe Co, Apr 8), while GDD estimates based on 4-inch soil temperatures obtained from the Indiana State Climate Office were no higher than 8 GDD per day (Purdue Agronomy Farm, Apr 8).

Unfortunately, it is difficult to find an online source that provides estimates of daily GDD accumulations based on SOIL temperature. There may be some commercial ag-related sources for these estimates that I am not aware of (someone please tell me if there are). The alternatives are 1) the Guess 'n by Golly method and 2) the Brute Force method. Both rely on soil temperature data obtained from the Purdue University – Indiana Mesonet system, which you can find through the Indiana State Climate Office.

TIP: From the main page of the Indiana State Climate Office Web site, click "Data" in the menu, then "Purdue Mesonet", then "Purdue Mesonet Dashboard Page". Once on that page, you can select either select a weather station from the map (Firefox, Chrome browsers but not Safari) or click "Stations" in left menu and then select a weather station from the dropdown list. Once on a weather station's dashboard, scroll down to find the "Soil Temperature" graph. Choose "Bare Soil" if you practice conventional tillage or "Grass Covered Soil" if you practice no-tillage. You can customize the dates to your interest.

The "Guess 'n by Golly" Method is one where you simply estimate and track average daily soil temperatures by visually examining the soil temperature graph on the Purdue Mesonet Web site. Remember, you are looking for daily AVERAGE soil temperatures of roughly 60F.

The "Brute Force" Method involves 1) selecting "bare soil" or "grass covered soil" temperatures, 2) customizing the dates of interest, and 3)

then clicking the “ellipse” icon in the upper right of the graph (looks like 3 horizontal lines) and choosing to download the data in a .csv file format. You can then open that file in Microsoft Excel or similar spreadsheet and create your own calculations of daily soil-based GDD accumulations (Nielsen, 2020).

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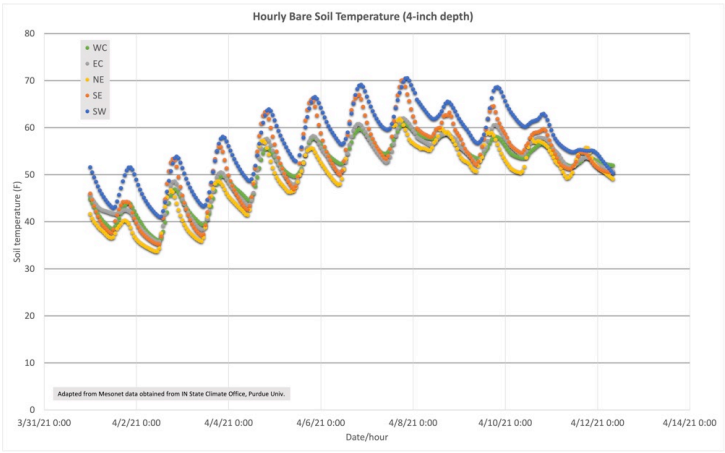

Fig. 1. Hourly Soil Temperatures (4-inches) at selected Purdue Ag Centers from Apr 1 – 12.

Purdue Crop Chat Episode 17, Is The Soil Fit To Plant?

(Bob Nielsen)

Planting season is here and there has been some of that activity in Indiana, but is it the right time, or maybe too early? In the new Purdue Crop Chat podcast, Dr. Bob Nielsen and a special guest discuss fit soils.

Across Indiana much of the state’s topsoil is dry, according to Nielsen.

“The percentage of the subsoil and topsoil that is short or shorter is much higher this year than it was a year ago, so I think it remains to be, maybe a fear monger kind of thing as to whether we’re going to move on into a real drought,” he said. “But nevertheless, we can’t seem to really get rid of those nagging areas of areas that are in the drought categories.”

The latest U.S. drought monitor has parts of the northern third of Indiana abnormally dry, with some pockets of moderate drought.

Dr. Tony Vyn, Purdue professor of agronomy, is surprised just how dry the topsoil is for this point in April. But are soils fit for first tillage operations or planting in no-till and strip till fields?

On the podcast Vyn explains the determination of whether soils are fit for those operations “is what is the status of the soil moisture one inch below the intended depth of that mechanical operation, whether that’s tillage to its 3-inch depth or whether it’s planting to its 2-inch depth.”

Vyn describes his non-scientific, but practical method of assessing soils.

“Remove that drier solid at the top, dig down with a flat spade to one inch below the intended depth of that spring tillage pass or that planting pass,” Vyn explained. “So let’s say you’re going down from 3 to 4 inches. Take an inch of soil at that layer and attempt to squeeze it and to roll it between the palms of your hands. How likely is it that I can form a one quarter inch cigar or one quarter inch worm that is 4 to 5 inches long between my hands?”

If you can form that soil cigar or worm, then the soil is too wet for operations without running the risk of compaction.

Hear the full podcast now on your preferred podcast platform, and it’s available at the Purdue Crop Chat page on ***HoosierAgToday.com***.

The Purdue Crop Chat Podcast is presented by the Indiana Soybean Alliance and the Indiana Corn Marketing Council.

Below-Normal Temperatures Expected Over Next Few Weeks

(Beth Hall)

Just when we thought we were done wearing sweaters and using our furnaces, Mother Nature decided to throw us a curve ball. Growing degree days were accumulating nicely last week, but we have started to see that rate of accumulation decrease greatly this week and with continued sluggish accumulations over the next few weeks (See included maps for more growing degree-day detail). Forecasts and outlooks are calling for increased chances for below-normal temperatures. It is too soon to know if these low temperatures will fall below freezing, but it is certainly a possibility.

With respect to precipitation, very little is expected to fall over the next several weeks with chances slightly improving by the end of April. This could be a concern for those in the northern Indiana counties who have already been in abnormally dry conditions, but might be a welcome reprieve for those areas further south who have had enough rain to keep conditions either normal or on the wetter side.

Four-inch soil temperatures seem to be hovering around the 50°F mark with cooler temperatures to the north and warmer temperature to the south. Northern areas have exceeded the 60°F mark for the first time, last week; southern areas have exceeded the 60°F mark across several days last week, but have recently started cooling off again due to the recent cooler temperatures. These brief periods of warmer soil temperatures could have an impact on some pest emergence, but it does not look like there has been (or will be over the next week or two) a significant, sustained period of 4-inch soil temperature staying over 60°F across most of Indiana.

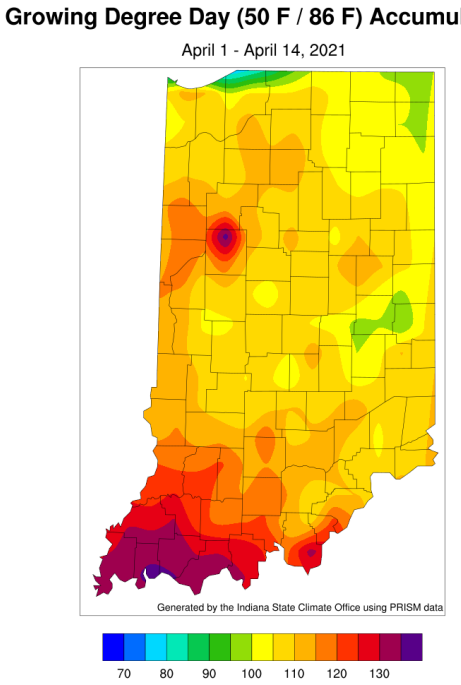

Figure 1. Modified growing degree day accumulation from April 1-14,2021.

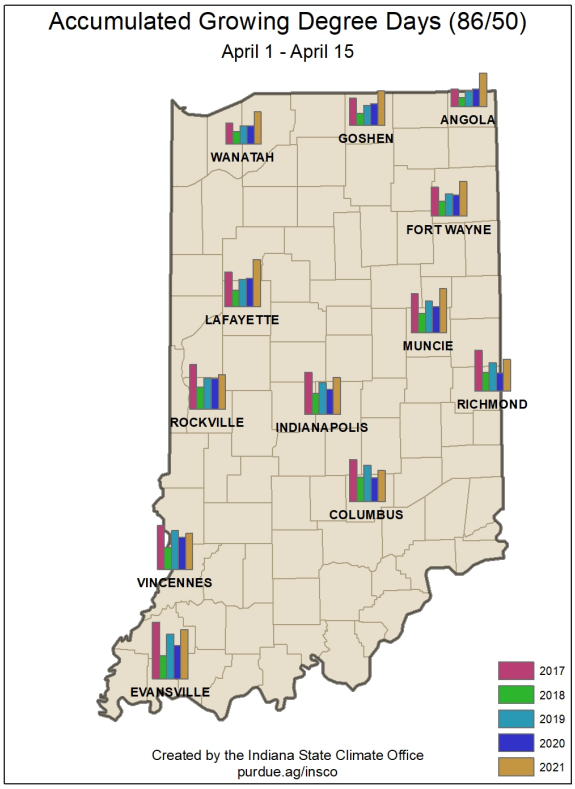

Figure 2. Comparison of 2021 modified growing degree day accumulations from average for April 1-15 to the past four years.

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