PURDUE UNIVERSITY | Extension ENTOMOLOGY

Pest&Crop newsletter

Issue: 2019.5
April 18, 2019

Purdue Cooperative Extension Service and USDA-NIFA Extension IPM Grant

This work is supported in part by Extension Implementation Grant 2017-70006-27140/ IND011460G4-1013877 from the USDA National Institute of Food and Agriculture.

In This Issue

Moth Trappers Have Been Busy! Worry Time?

(John Obermeyer)

In looking over the black cutworm and armyworm pheromone reports, it is obvious that many moths have arrived into Indiana. This, coupled with a delayed planting season, increases the likelihood that high-risk fields may experience damage. Still at this point, many variables must perfectly align for these pests to cause a stir in many Hoosier fields.

First, understand that eggs are now just being laid on preferred plants. Armyworm are seeking lush grasses (e.g., wheat, cereal rye) while black cutworm target winter annual broadleaves (e.g., chickweed, dandelion). Currently, those fields are in abundance because of the current wet conditions. After hatch, which takes about a week, the young larvae are most vulnerable to natural and man-made events. They are very prone to dramatic weather events, e.g., freeze, ponding, and natural enemies, e.g., ground beetles. They need a constant and healthy food source, only available if field work/herbicides continue to be delayed for multiple weeks. Their death rate, even under ideal conditions, is very high.

Monitoring moth arrival, and numbers captured, is an inexact science. We cannot predict with certainty that high moth counts, which we are currently experiencing, will equate to high pest damage. Instead, it is best to understand the pest and how the next few weeks unfold. Should the moth flight continue at this pace AND fields remain untouched, then you might better understand why future articles might sound as though the “sky (or moths) is falling.”

Happy Scouting!

One night’s catch of armyworm moths at DPAC, Randolph County. (Photo Credit: Jeff Boyer)

2019 Black Cutworm Pheromone Trap Report

(John Obermeyer)

		BCW Trapped						
		Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7
		3/28/19-4/3/19	4/4/19-4/10/19	4/11/19-4/17/19	4/18/19-4/24/19	4/25/19-5/1/19	5/2/19-5/8/19	5/8/19-5/15/19
County	Cooperator							
Adams	Roe/Mercer Landmark	0	7	20*				
Allen	Anderson/Syngenta							
Allen	Gynn/Southwind Farms	0	0	14*				
Allen	Kneubuhler/G&K Concepts		1	65*				
Bartholomew	Bush/Pioneer Hybrids		0	2				
Boone	Emanuel/Boone County CES/Lebanon	0	2	13				
Clay	Bower/Ceres Solutions/Brazil		6	11				
Clay	Bower/Ceres Solutions/Clay City		1	2				
Clinton	Emanuel/Boone Co. CES	1	6	20*				
Clinton	Foster/Rossville		3	9				
DeKalb	Hoffman/ATA Solutions			0				
Dubois	Eck/Dubois Co. CES	4	14	23				
Fayette	Schelle/Falmouth Farm Supply Inc.	1	11	24*				
Fountain	Mroczkiewicz/Syngenta	0	16*	24*				
Fulton	Jenkins/Ceres Solutions/Talma		0	3				
Fulton	Ranstead/Ceres Solutions	0	0	0				
Hamilton	Campbell/Beck’s Hybrids	0	4	20*				
Hendricks	Nicholson/Nicholson Consulting	0	1	8				
Hendricks	Tucker/Bayer							
Howard	Shanks/Clinton Co. CES		0	0				
Jasper	Overstreet/Jasper Co. CES	0	0	7				
Jasper	Ritter/Brodbeck Seeds		0	12				
Jay	Boyer/Davis PAC	2	24	52*				
Jay	Shrack/Ran-Del Agri Services	0	6	55*				
Jay	Temple/Jay Co. CES/Redkey	0	0	4				
Jay	Temple/Jay Co. CES/Pennville	0	1	48*				
Jennings	Bauerle/SEPAC	1	5	8				
Knox	Bower/Ceres Solutions/Freelandville		0					
Knox	Bower/Ceres Solutions/Vincennes							
Lake	Kleine			7				

		BCW Trapped						
		Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7
County	Cooperator	3/28/19-4/3/19	4/4/19-4/10/19	4/11/19-4/17/19	4/18/19-4/24/19	4/25/19-5/1/19	5/2/19-5/8/19	5/8/19-5/15/19
Lake	Moyer/Dekalb Hybrids/Shelby	0	3	14				
Lake	Moyer/Dekalb Hybrids/Scheider	0	2	6				
LaPorte	Rocke/Agri-Mgmt. Solutions	0	0	13				
Marshall	Barry							
Marshall	Harrell/Harrell Ag Services		2					
Miami	Early/Pioneer Hybrids	0	0	2				
Montgomery	Delp/Nicholson Consulting		23*	23*				
Newton	Moyer/Dekalb Hybrids/Lake Village	0	0	2				
Porter	Tragesser/PPAC	0	0	7				
Posey	Schmitz/Posey Co. CES	0	1					
Pulaski	Capouch/M&R Ag Services		0					
Pulaski	Leman/Ceres Solutions							
Putnam	Nicholson/Nicholson Consulting		11*	8				
Randolph	Boyer/DPAC	0	2	6				
Rush	Schelle/Falmouth Farm Supply Inc.	0	0	1				
Shelby	Fisher/Shelby County Co-op		3	2				
Shelby	Simpson/Simpson Farms	1	21*	49*				
Stark	Capouch/M&R Ag Services		0					
St. Joseph	Carbiener		0	3				
St. Joseph	Deutscher/Helena Agri-Enterprises	0	0	5				
Sullivan	Bower/Ceres Solutions/New Lebanon		12	6				
Sullivan	Bower/Ceres Solutions/Sullivan		0	16*				
Sullivan	Bower/Ceres Solutions/Farmersburg		2	6				
Tippecanoe	Bower/Ceres Solutions	0	9	0				
Tippecanoe	Nagel/Ceres Solutions	0	5	20*				
Tippecanoe	Obermeyer/Purdue Entomology	0	0	0				
Tippecanoe	Westerfeld/Monsanto Research Farm	0	7	18				
Tipton	Campbell/Beck's Hybrids	0	25*	54*				
Vermillion	Bower/Ceres Solutions/Clinton		0	0				
Wabash	Enyeart/Ceres Solutions		0	8				
White	Foley/ConAgra	0	0	2				
Whitley	Richards/NEPAC/Schrader		10					
Whitley	Richards/NEPAC/Kyler		4					

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

Armyworm Pheromone Trap Report – 2019

(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	5	24								
Jennings/SEPAC Ag Center	0	2								
Knox/SWPAC Ag Center	105	34								
LaPorte/Pinney Ag Center	0	127								
Lawrence/Feldun Ag Center	148	60								
Randolph/Davis Ag Center	0	193								
Tippecanoe/Meigs	8	5								
Whitley/NEPAC Ag Center	4	191								

Wk 1 = 4/4/19-4/10/19; Wk 2 = 4/11/19-4/17/19; Wk 3 = 4/18/19-4/24/19; Wk 4 = 4/25/19-5/1/19; Wk 5 = 5/2/19-5/8/19; Wk 6 = 5/9/19-5/15/19; Wk 7 = 5/16/19-5/22/19; Wk 8 = 5/23/19 – 5/29/19; Wk 9 = 5/30/19-6/5/19; Wk 10 = 6/6/19-6/12/19

ATS and Burndown Herbicide Treatments (Updated with Velvetleaf Data and Pictures)

(Bill Johnson), *(Bryan Young)*, *(Julie Young)* & *(Marcelo Zimmer)*

This spring we have received a number of questions regarding the use of glyphosate-based burndown herbicides programs with ATS (ammonium thiosulfate). Increased use of ATS is being driven by the fact that sulfur deficiency symptoms are showing up on fields with low sulfur soil test levels. Because of the number of questions we were receiving, we conducted a quick study in the greenhouse to determine the impact ATS has on weed control with glyphosate and glyphosate plus 2,4-D.

We chose to evaluate wheat, velvetleaf, and lambsquarters, because these weeds are known to be tough to control with glyphosate. In this article, we will discuss wheat and velvetleaf control. Our treatment structure and results at 14 days after application (DAA) are shown in Figures 1 and 3. Figures 2 and 4 show wheat and velvetleaf control 21 and 19 DAA, respectively. Results for lambsquarters are inconclusive at this point.

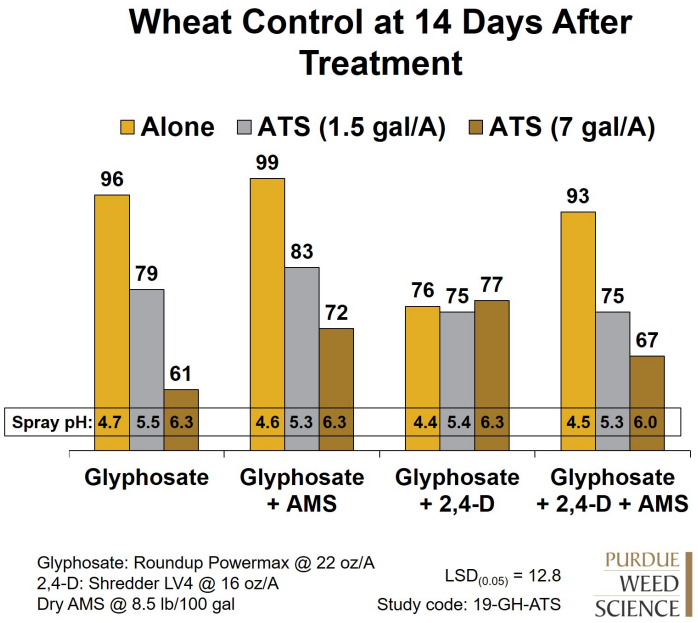


Figure 1. Effect of ammonium thiosulfate (ATS) on glyphosate activity on wheat 14 days after treatment.

Figure 2. Effect of ammonium thiosulfate (ATS) on glyphosate activity on wheat 21 days after treatment.

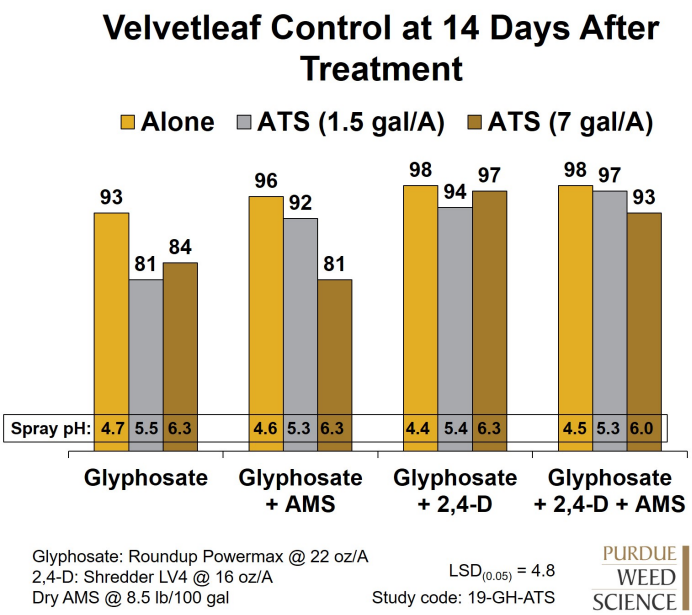


Figure 3. Effect of ammonium thiosulfate (ATS) on glyphosate activity on velvetleaf 14 days after treatment.

Figure 4. Effect of ammonium thiosulfate (ATS) on glyphosate activity on velvetleaf 19 days after treatment.

As you can clearly see in the figures, use of ATS with glyphosate resulted in lower control of wheat and velvetleaf in this greenhouse study. It is also important to emphasize that adding 2,4-D to glyphosate reduced wheat control if no AMS was added, but increased velvetleaf control, especially for treatments containing ATS.

To translate what this would mean in the field, the potential for control of weeds or cover crops like wheat, annual ryegrass, barnyardgrass, velvetleaf, lambsquarters, marestail, etc. could be lower or result in incomplete kill if ATS is used with a burndown herbicide program that relies on glyphosate or glyphosate + 2,4-D. This situation is more likely to occur when the weeds are large, or when spray applications are made to plants that are not actively growing (e.g. cool, cloudy weather conditions for many days surrounding spray day). Please note this research included full rates of both glyphosate and 2,4-D under warm greenhouse conditions that favor herbicide activity.

We also recorded the pH of the spray solution prior to application and noted that ATS applied at a high rate of 7 gal/A increased the pH by approximately 1.5 pH units. Since we don't currently understand the basis for the antagonism between glyphosate and ATS, we can't suggest that this change in pH is the primary cause of reduced efficacy or that reducing the pH with an adjuvant that reduced spray pH will restore glyphosate activity.

To avoid antagonizing glyphosate activity in a situation like this, we would suggest the following strategies:

1) Apply ATS in a separate trip across the field a few days after the burndown treatment

2) Increase the rate of glyphosate to at least 2 qts/A

3) Consider adding another effective mode of action to glyphosate for control of weed species that are historically difficult-to-control in a spring burndown with glyphosate.

Wild Garlic Control in Indiana No-till Corn and Soybeans

(Bill Johnson) & (Marcelo Zimmer)

Wild garlic (*Allium vineale*) has shown up in many Indiana no-till corn and soybean fields this spring especially, in southern Indiana. Wild garlic is most troublesome in wheat, where aerial bulblets contaminate harvested grain and impart the garlic flavor into processed products such as wheat flower. Infestations in corn and soybean fields have less adverse effects on the crop, but can spread quickly across fields and are difficult to control with typical burndown treatments of glyphosate and 2,4-D.

Management of wild garlic must occur early in the spring as this perennial will quickly become reproductive in mid to late spring. Wild garlic produces aerial bulblets and begins to senesce in late spring to early summer. As with all weeds, wild garlic management needs to occur prior to seed or in this case bulblet production to reduce future infestations. Ideally herbicide applications should take place in early April when the wild garlic is less than 12 inches tall and actively growing. To assure active growth is occurring make applications when daytime temperatures are consistently maintained at 60 degrees or higher.

An additional challenge for herbicide application is the growth habit and leaf structure of wild garlic. The smooth, linear, and erect leaves of wild garlic can create difficulties in getting good spray coverage. Spray carrier volume has the greatest effect on herbicide coverage, and higher volumes should be considered when making applications to difficult to cover weeds such as wild garlic. A minimum of 15 gal/acre would be recommended for effective coverage of wild garlic.

Typical spring no-till burndowns of glyphosate plus 2,4-D will only have marginal and variable control of wild garlic. The addition of thifensulfuron, thifensufluron plus tribenuron, or chlorimuron containing products to the glyphosate plus 2,4-D tank mix will provide additional and less variable control of wild garlic. Applications with higher rates of thifensulfuron will be most effective in controlling heavy infestations of wild garlic. Again as mentioned above these herbicide applications will be most beneficial when applied at the correct timing and with higher carrier volumes.

Plant back restrictions for corn and soybean should be noted for the herbicide products applied. Products containing thifensulfuron and tribenuron can have plant back restrictions up to 45 days depending on product rates. Chlorimuron products are not labeled for use prior to corn planting. Always refer to the label for plantback restrictions.

The list of products containing thifensufluron, thifensulfuron plus

tribenuron, and chlorimuron is extensive and beyond the scope of this article. A list of products can be found in the 2015 Weed Control Guide for Ohio, Indiana, and Illinois (link here). Additional information for control of wild garlic in winter wheat can be found in the "Control of Problem Weeds" section of the 2019 Weed Control Guide.

The Planting Date Conundrum for Corn

(Bob Nielson)

- Early planting favors higher yields, but does not guarantee higher yields.
- Statewide averages for planting date and yield are not strongly related.
- Planting date is but one of many yield influencing factors.

Conventional wisdom says that the prime planting "window" to maximize corn yields in much of Indiana opens about April 20 and closes about May 10. This "window" typically opens about one week later across the northern tier of Indiana counties (later warmup) and about one week earlier across the southern tier of Indiana counties (earlier warmup).

Recent rains, and SNOW, across Indiana, plus the forecast for even more rain, threaten to delay the start of the 2019 corn planting season. Mark my words, the fearmongers and pessimists among us will soon begin to worry about the consequences of a delayed planting season and the risk that imposes on the crop's yield potential in 2019.

But, hold on… How absolute are the negative consequences of late planted corn? How accurately does planting date predict statewide corn yield anyway? Does late planting in and of itself guarantee lower than normal yields? Good questions, but the effect of planting date on statewide average corn yield is simply not clearcut.

If one reviews USDA-NASS crop progress reports for the past 25 years (USDA-NASS, 2019), there is **NOT** a strong relationship between planting date and **absolute** yield or departure from trend yield on a statewide basis for Indiana. Figures 1 and 2 illustrate the relationships between the departure from statewide trend yield and two measures of statewide planting progress; percent of total corn acres planted by April 30 or by May 15. Even though mathematical relationships, or "trend lines", can be discerned, they only account for 12 to 16% of the variability in trend yield departures from year to year, respectively. In other words, **a number of Yield Influencing Factors in addition to planting date also affect yield for any given year.**

Here's the Conundrum

Why is it that every corn agronomist worth their salt preaches about the importance of timely planting and yet the statewide statistical data suggest that planting date accounts for only 12 to 16% of the variability in statewide yields from year to year? Let's look more closely at this apparent conundrum.

It is true that **RELATIVE grain yield potential** of corn declines with delayed planting after about May 1 (Myers & Wiebold, 2013, Nafziger, 2008; Nafziger, 2011). Estimated yield loss per day with delayed planting varies from about 0.3% per day early in May to about 1% per day by the end of May. **RELATIVE YIELD POTENTIAL** goes down with delayed planting because of a number of factors, including a shorter growing season, greater insect & disease pressure, and higher risk of hot, dry conditions during pollination.

However, the good news is that planting date is only one of many yield influencing factors for corn. What is important to understand is that the **ACTUAL YIELD in response to delayed planting is relative to the maximum possible yield in a given year**.

In other words, if all the other yield influencing factors work together to determine that the maximum possible yield this year for the optimum planting date is 220 bu/ac, then the consequence of a 10-day planting delay beyond April 30 (at 0.3% decrease per day) would be a yield potential of about 213 bu/ac (i.e., 220 bushel potential minus [10 days x 0.3%] due to delayed planting). However, if all the other yield influencing factors work together to determine that the maximum possible yield this year for the optimum planting date is only 150 bu/ac, then the consequence of a 10-day planting delay beyond May 1 (at 0.3% decrease per day) would be a yield potential of about 146 bu/ac (i.e., 150 bu/ac potential minus [10 days x 0.3%] due to delayed planting). Make sense?

Consequently, it is possible for early-planted corn in one year to yield more than, less than, or equal to later-planted corn in another year depending on the exact combination of yield influencing factors for each year. Figure 3 illustrates this confusing concept. In that graph, delayed planting of corn in an otherwise high yielding year (**B**) may still be higher yielding than a crop planted on the optimum planting date in an otherwise lower yielding year (**C**). Farmers know this to be true because some have had June-planted crops in recent years that ultimately yielded better than any crop they have ever had…….. because the remainder of the growing season following the delayed planting was extremely favorable for crop growth and development.

For example, the crop years 2009 and 2012 represent late and early planting date years respectively in Indiana. About 94% of the state's corn crop was planted by May 15 in 2012, but only 20% of the crop was planted by May 15 of 2009 (Fig. 2). Yet, the earlier planted 2012 crop yielded 38.6% **BELOW** trend yield for that year and the later planted 2009 crop yielded 9.5% **ABOVE** trend yield. Why? There were other important differences in yield influencing factors between the years other than simply the planting dates.

Bottom Line

Let's not succumb quite yet to fearmongering triggered by the **potential** risk of the 2019 corn crop getting off to a late start. We need only look back to the 2018 planting season for an example of a slow start to the planting season that was followed by a 2-week period in early May in which 60% of the state's corn acreage was planted. "Mudding in" a crop early to avoid planting late will almost always end up being an unwise decision.

When faced with prospects of delayed planting, one should certainly look for ways to expedite the planting process by eliminating unnecessary tillage trips or delaying some field operations (Thomison & Culman, 2017) so that you do not plant any later than absolutely necessary. One example of a field operation that can be delayed with little risk of yield loss is to forego pre-plant nitrogen fertilizer applications in favor of sidedressing the crop later. This choice is especially low risk if your planting operation includes 2×2 starter fertilizer at rates no less than 20 lbs/ac of nitrogen.

Finally, since **delayed planting by itself is no guarantee of lower ABSOLUTE grain yield**, I see little reason to change any crop inputs because of delayed planting, other than possibly seeding rates. Significantly delayed planting generally coincides with warmer soil temperatures compared to early planting. Consequently, stand establishment may be more successful with delayed planting, resulting

in established plant populations that are closer to actual seeding rates than the usual 90 to 95% success rate with earlier planting dates. So, you might consider slightly reducing your seeding rates with delayed planting.

Related Reading

Coulter, Jeff. 2018. Planting Date Considerations for Corn. Univ. Minnesota Extension. https://extension.umn.edu/corn-planting/planting-date-considerations-corn [URL accessed Apr 2019].

Larson, Zachary. 2017. Planting Date, Temperature, Spacing, and Emergence: What Really Matters? Penn. State Univ. Extension. https://extension.psu.edu/planting-date-temperature-spacing-and-emergence-what-really-matters [URL accessed Apr 2019].

Myers, Brent and Bill Wiebold. 2013. Planting Date 2013. Univ of Missouri Extension http://ipm.missouri.edu/IPCM/2013/4/Planting-Date-2013. [URL accessed Apr 2019].

Nafziger, Emerson. 2008. Thinking About Corn Planting Date and Population. The Bulletin (No. 2, Article 7, April 4), Univ. of Illinois Extension. http://http://bulletin.ipm.illinois.edu/article.php?id=890. [URL accessed Apr 2019].

Nafziger, Emerson. 2011. Corn Planting: Optimism on Hold. The Bulletin (No. 3, Article 9, Apr 22), Univ. of Illinois Extension. http://bulletin.ipm.illinois.edu/article.php?id=1469 [URL accessed Apr 2019].

Nafziger, Emerson. 2017. Planting Date for Corn and Soybeans in Illinois. The Bulletin, Univ. of Illinois Extension. http://bulletin.ipm.illinois.edu/?p=3848. [URL accessed Apr 2019].

Nielsen, RL (Bob). 2018. Corn & Soybean Planting Progress in Indiana Over the Years. Corny News Network, Purdue Extension. http://www.kingcorn.org/news/timeless/PlantingPace.html [URL accessed Apr 2019].

Silva, George. 2018. When is the Best Time to Plant Corn in Michigan? Michigan State Univ. Extension. https://www.canr.msu.edu/news/what_is_the_best_time_to_plant_corn_in_michigan [URL accessed Apr 2019]

Thomison, Peter and Steve Culman. 2017. Corn Management Practices for Later Planting Dates: Changes to Consider. C.O.R.N. Newsletter, Ohio State Extension. https://agcrops.osu.edu/node/2156 [URL accessed Apr 2019].

USDA-NASS. 2019. Crop Progress (archives). USDA, National Agricultural Statistics Service. http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1048. [URL accessed Apr 2019].

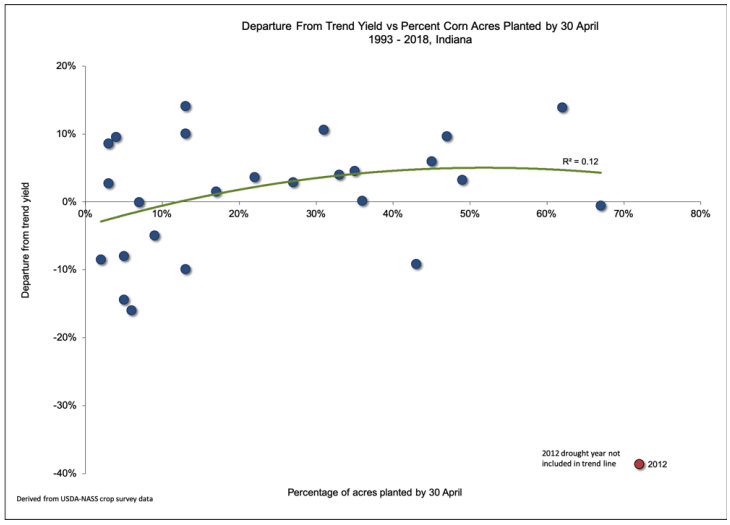


Fig. 1. Percent departure from statewide trend yield versus percent of corn acres planted by
April 30 in Indiana, 1993 – 2018. Data derived from USDA-NASS crop survey data.

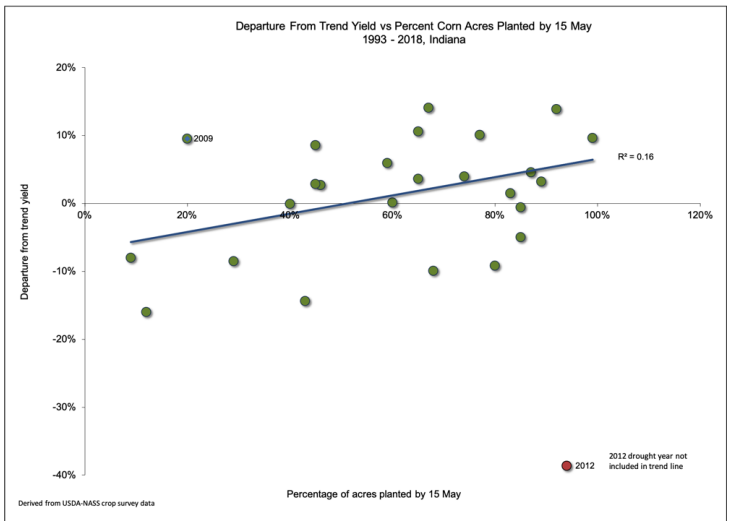


Fig. 2. Percent departure from statewide trend yield versus percent of corn acres planted by
May 15 in Indiana, 1993 – 2018. Data derived from USDA-NASS crop survey data.

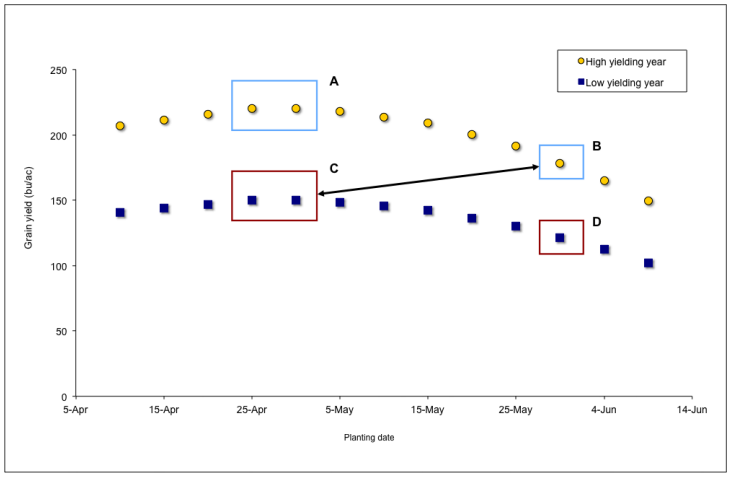


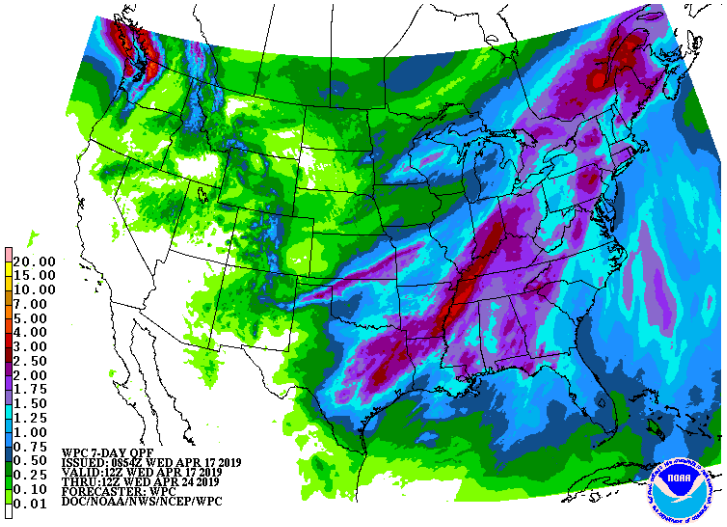
Fig. 3. The planting date conundrum relative to absolute yield potential: A delayed planted
crop in one year (B) can yield better than a crop planted on the optimum date in another year (C).

Indiana Climate and Weather Report – 4/17/2019

(Beth Hall)

In spite of the high variability of both temperature and precipitation that is typical for April, Indiana's month-to-date precipitation is near normal and temperature is only a few degrees above normal. There is a slight indication that temperatures will remain above normal into the middle of next week with increasing confidence that temperatures will finish the month above normal. Precipitation is another story, however, with much more uncertainty. Climate outlooks (based upon larger-scale atmospheric-oceanic data models) are indicating little confidence in precipitation being either above or below normal into next week, but probabilities increase near the end of the month for above normal precipitation. With this being said, however, precipitation forecasts are indicating Indiana will be quite wet over the next week with as much as 2.5" predicted for the southern half of the state (see Figure).

Growing degree-days seem to be on track with climatology indicating slightly above normal accumulations (base 50°F) throughout the state. Based on climatology, alone, there is still a 60%-85% chance of a 32°F and a 10%-30% probability of a 28°F freeze this season. However, weather forecasts for the rest of the month are not currently indicating low temperatures near the freezing level, so the actual chance of a harmful freeze event is looking to be unlikely.



Accumulated precipitation amount predicted for the April 17-24, 2019 period.

Pest&Crop newsletter © Purdue University - extension.entm.purdue.edu/newsletters/pestandcrop
Editor: Tammy Luck | Department of Entomology, Purdue University, 901 W. State St., West Lafayette, IN 47907