PURDUE UNIVERSITY | Extension - Entomology

Pest&Crop newsletter

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In This Issue

Switching To Hybrids Without Rootworm Protection For Late Planted Corn?

(Christian Krupke) & (John Obermeyer)

In some parts of the state, delayed planting – or re-planting – of corn is a reality. Some producers may be attempting to switch to shorter day hybrids, including some without desired insect traits, including rootworm-specific Bt traits. What is the rootworm risk, especially to central and northern Indiana fields? Low. BUT… if you did NOT scout corn fields during corn pollination last year, or sample soybean fields during August for the presence/absence of rootworm beetles, then the localized risk is unknown. However, Indiana as a whole, has seen far lower rootworm beetle populations for several years. As we've written in previous years on this topic recently, those replanting or planting late may find 2021 a good time to experiment and plant non-Bt hybrids, as the pest pressure remains extremely low. Not zero! But very low.

First, the worst-case scenario. 2002 had a horrendous start to the growing season, first planting was delayed by excessive rains, followed by a long, hot dry spell. That year, producers pushed the window and planted into wet soil creating side-wall compaction. Producers were so hurried that inputs such as soil insecticides for rootworm protection were neglected in some cases. When drying finally occurred, the top inches of soil baked, becoming rock hard. The end result was that even a rootworm population that was not excessive caused high levels of damage by feeding upon puny, misshapen, and slow-growing roots causing "floppy corn," "small corn-tall corn," and sometimes plant death. Meaning, it took very few rootworm larvae to cause devastating damage to these already challenged root systems. But 2002 corn hybrids were inferior to those planted today in terms of vigor, nutrient and water uptake and virtually every other agronomic trait.

Best-case scenario: today, seed-applied insecticides (SAIs) are applied to virtually all corn seed, although rates vary. This isn't generally optional, so if you are growing conventional corn SAIs are on there. Low and moderate rates (up to 0.5 mg/kernel) are not labeled for corn rootworm control, but this year, late planted fields will offer close proximity in timing to rootworm hatch and may offer some help. Rootworm egg hatch is underway throughout Indiana – it typically begins in late May in central counties, plus or minus several days to account for soil temperature differences from one end of the state to the other. Although egg hatch occurs over multiple weeks, those lower rates of SAIs may help long enough to protect some early root development. More likely though, fields not planted by now will result in starving young RW larvae as they hatch and find no host plant nearby – they need to eat within a day of hatching. We weep for them!

These late-planted, restricted roots, of corn were severely damaged by rootworm feeding. (*Photo Credit: John Obermeyer*)

Corn rootworm are beginning to hatch throughout the state. In order to survive, larvae must soon find and tunnel into corn roots, otherwise they starve. (*Photo Credit: John Obermeyer*)

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	3	65	51	12	0	23	10		
Jennings/SEPAC Ag Center	0	1	0	7	7	2	2	1	3		
Knox/SWPAC Ag Center	0	6	1	10	35	1	12	11	7		
LaPorte/Pinney Ag Center	27	50	12	393	189	42	231	242	34		
Lawrence/Feldun Ag Center	14	62	7	434	717	83	79	43	41		
Randolph/Davis Ag Center	0	0	0	0	0	0	53	14	14		
Tippecanoe/Meigs	1	0	0	16	31	12	13	5	16		
Whitley/NEPAC Ag Center	0	0	0	18	20	8	32	22	5		

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

Purdue Weed Day

(Bill Johnson) & *(Marcelo Zimmer)*

The **Purdue Weed Science** team is hosting an educational field day for farmers, agricultural industry professionals, Extension educators, consultants and others who apply herbicides.

Purdue Weed Day will be held June 24th, 2021 at the **Throckmorton Purdue Agricultural Center**, 8343 U.S. 231 S., Lafayette.

“Highlights for the event will be Enlist, Xtend, and Liberty Link soybean weed control programs and research updates from our graduate students,” said **Bill Johnson**, Purdue professor of weed science. “In addition, we will have information on waterhemp and giant ragweed control, and weed control with cover crops in corn and soybean.”

Registration will begin at 8:00 AM EDT, and the program will begin at 8:30. Click this link to register:

https://purdue.ca1.qualtrics.com/jfe/form/SV_6tfBJEldwftSZ4p

We will view the plots on the west side of Highway 231 in the early part of the morning, and at a second site 1 mile east of TPAC during the latter part of the morning. The Throckmorton PAC farm is located approximately 5 miles south of Lafayette on the corner of county road 800S and U.S. 231 South. For those attending the 2021 Purdue Weed Day at Throckmorton, we have applied for 3 CCH’s for category 1A. Please register below. You may also call Lisa Gross at 765-494-9871.

It’s Not Easy Being Green. The Many Colors Of Early Season Corn.

(Dan Quinn)

Over the last couple weeks in central Indiana, average air temperatures have increased by 28% to an average of 78°F and then again decreased by 33% to an average of 52°F. The combination of large temperature swings, significant cooling off, and bright sunny days combined with cool nights have led to an array of different colored corn showing up as farmer’s begin to walk their fields this spring. The good news is for the majority of these colors, warm, sunny days will correct these issues.

Purple Corn: purple corn symptoms (Image 1) are caused by the accumulation of a purple pigment in the corn leaves known as **anthocyanin.** Corn leaves produce sugars by photosynthesis and these sugars are typically metabolized to generate energy for further plant growth. However, when cool temperatures caused plant growth to slow or root development is restricted, these sugars tend to accumulate in the leaf and trigger anthocyanin pigment formation (e.g., purple leaf color). Purple corn can also occur from a genetic response to bright, sunny days and cool nights (Nielsen, 2000). In addition, hybrid genetics can play a role in whether or not a corn plant produces anthocyanin. This symptom often disappears with warmer temperatures and yield losses should be minimal to none.

Image 1: Purple corn leaf symptoms observed on V2 corn in Northern Indiana in 2021 caused by the build up of anthocyanin in the corn leaves due to cool temperatures.

Note: *This symptom is often confused with phosphorus deficiency of corn. So, before you get the fertilizer spreader out once these symptoms occur, pay attention to your soil test levels and to the corn as temperatures become warmer and if these symptoms begin to disappear.*

Yellow-Green Corn: cool temperatures can also cause corn to appear ugly yellow-green instead of that dark, beautiful green we are all looking for. Up until corn reaches the V3 growth stage (3 visibly collared leaves), the energy and nutrition of the seedlings are dependent on the kernel reserves. Once corn gets beyond the V3 growth stage, seedlings begin to transition to being dependent on the nodal root system (Nielsen, 2010; Quinn, 2021). During this transition, when poor growing conditions occur (e.g., cool temperatures) this causes insufficient photosynthesis, slowed nodal root development, and poor plant nutrient uptake. Therefore, corn plants appear an ugly yellow-green. However, with more sunshine and higher temperatures, these symptoms are often resolved.

Silver Corn: over the last few days we have observed cool, calm, and clear nights which can cause radiational heat loss from corn leaves, thus causing minor leaf surface damage (Nielsen, 2021). This minor chilling injury can result in a silver or gray leaf surface often known as “silver leaf syndrome”. For more information please read this recent

article: http://www.kingcorn.org/news/timeless/Silverleaf.html.

White Corn: white or “bleached” corn leaves are often blamed on herbicide damage, specifically the pigment inhibitors herbicides (e.g., group 13 and 27). However, young corn that has been under environmental stress such as cool and cloudy weather, which can cause poor root development, can cause a white appearance (Hager and McGlamery, 1997). These symptoms have also been observed this year on corn that had significant root burn caused by a spring anhydrous application. Frost damage can also cause the bleaching of corn leaves, which was observed from frost events occurring recently in the Northern Corn Belt. Furthermore, single, white corn plants within a field can be genetic mutants, although this is a rare occurrence.

Image 2: Corn at the V2 growth stage exhibiting symptoms of white corn leaves caused by stressful early-season conditions in 2021.

References:

Hager, A., and M. McGlamery. 1997. Causes of White Corn Plants. Univ. of Illinois Coop. Ext. Serv. http://bulletin.ipm.illinois.edu/pastpest/articles/v9712g.html#:~:text=We%20have%20received%20several%20calls,glyphosate%20(Roundup%20or%20Touchdown).

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“Silver Leaf” Symptom In Corn

(Bob Nielsen)

Forecasts of unusually low temperatures in late May or early June can set off warning bells for corn growers and lead to fearmongering about frost damage to young corn. Even if frost does not form during these cool nights, minor leaf surface damage can still occur as a result of radiational heat loss from the leaves during cool, calm, clear nights. Such leaf damage results in a curious leaf symptom that may remind you of “freezer burn”.

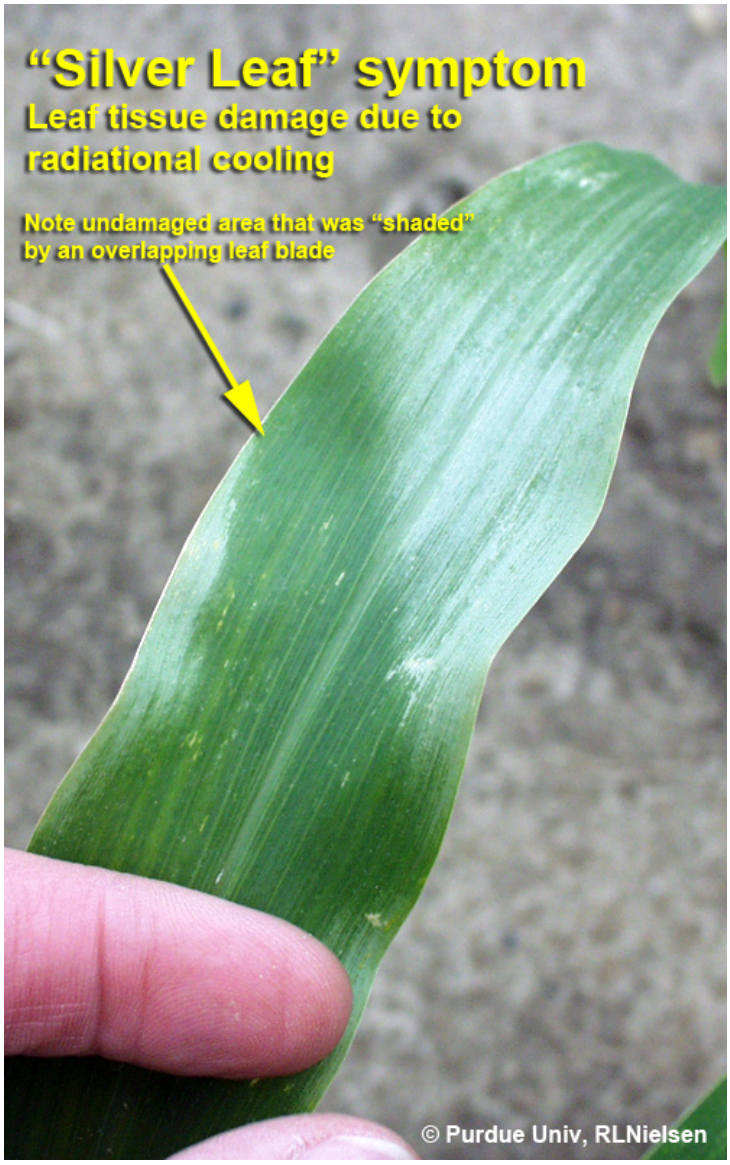
Rapid heat loss from terrestrial surfaces to the atmosphere (i.e., radiational cooling) can occur on clear, dry (low humidity), calm nights with temperatures in the low 40’s F or cooler. Many areas of Indiana experienced such low morning temperatures over Memorial Day weekend. Minor levels of radiational cooling can damage the outer surfaces of corn leaves that are positioned horizontally or parallel to the night sky. The subsequent symptom of such minor chilling injury is often referred to as “silver leaf” in corn.

The “silver leaf” symptom indeed appears as a silvery or dull gray leaf surface. Any portion of a leaf that was not horizontal to the sky or that was protected by another leaf or plant part will not exhibit the symptom. The effect of this minor leaf damage is negligible, if any. The leaves will not die abruptly as will genuinely frosted leaf tissue. Continued expansion of the whorl will not be restricted in any way. New leaves that expand from the whorl will be normal in appearance. This symptom is more of a curiosity than a nuisance.

Related Reading

Nielsen, RL (Bob). 2020. Assessing Frost / Cold Temperature Injury to Young Corn. Corny News Network, Purdue Extension. http://www.kingcorn.org/news/timeless/FrostedCorn.html [URL accessed June 2021].


"Silver Leaf" symptom
Leaf tissue damage due to radiational cooling
Note position of overlapping leaf relative to accompanying image
© Purdue Univ, RLNielsen


"Silver Leaf" symptom
Leaf tissue damage due to radiational cooling
Note undamaged area that was "shaded" by an overlapping leaf blade
© Purdue Univ, RLNielsen


"Silver Leaf" symptom
Leaf tissue damage due to radiational cooling
© Purdue Univ, RLNielsen

When Hay Harvest Is Complete Do The STAB

(Keith Johnson)

After hay has fully cured following the harvest, it is important to follow through and **S**ample, **T**est, **A**llocate, and **B**alance or **STAB** your hay. Doing the STAB is an important best management practice to keep your livestock healthy. As hay is put into storage, store it so different harvests can be retrieved that best meet the need of the class of livestock being fed at a given date. Make note as to where different lots of hay are stored within the storage area.

Sample – Hay from each harvest from a field should be sampled with a hay probe. Many Purdue Extension offices have a hay probe to loan to sample hay. The website foragetesting.org has a list of hay probes that can be purchased for sampling hay. Twenty probings comprise a sample. Ten large bales are sampled twice on opposite sides of the curvature of a round bale and each butt end of a rectangular bale. One probing is taken from one butt end of each of twenty small rectangular bales to comprise a sample. If probing baleage (bale silage), seal the probing site with plastic tape provided by the plastic provider. Probings should be placed in a clean plastic bag that can be sealed to retain moisture. Mark the plastic bag with the forage type(s), location harvested, and cutting number.

Test – Certified laboratories can be found at foragetesting.org. A basic test will suffice in most cases. A form from the laboratory should accompany the samples and it likely is available at the laboratory website. Minimally, request moisture, crude protein, adjusted crude protein, Neutral Detergent Fiber (predicts dry matter intake), and Acid Detergent Fiber (predicts digestibility). If the forage was harvested as bale silage, request pH, too. Mineral analysis should be requested if a total mixed ration is fed to livestock. A test can be done by wet laboratory or Near Infrared Reflectance Spectroscopy (NIRS) methods. The advantage of NIRS analysis is it takes less time to process the sample and the test will cost less.

Allocate – Results received from the laboratory should be reviewed and each test allocated to the class of livestock that the analysis best meets nutritional needs. Growing livestock and females in early lactation will require the best quality hay harvested.

Balance – Be trained or utilize the service of a nutritionist to balance rations to meet needs that the hay cannot provide alone. Purdue Extension Educators will likely know individuals that have the skill to balance rations to keep livestock in excellent health.

You work hard and invest much money to get hay made. Follow through so it can be used to best advantage to keep your livestock in proper body condition.

Taking time to STAB hay is important to keep livestock in excellent health. (*Photo Credit: Keith Johnson*)

Indiana Forage Council Hosts Inaugural Hoosier Hay Contest

(Abby Leeds)

The Indiana Forage Council (IFC), with assistance from Purdue Extension and SureTech Laboratories, is hosting a contest for Indiana producers who harvest forage for hay or baleage within the state for the 2021 hay season.

Objectives of the Hoosier Hay Contest are to promote forage production, inform hay producers on the nutritive value of their hay and encourage producers to sample and test their hay or baleage before feeding it to livestock. It also creates a friendly competition amongst Indiana producers on who produces higher quality hay.

All samples will be analyzed by SureTech Laboratories in Indianapolis, Ind. and released only to the contest organizer, producer and producer's local Purdue Extension agriculture and natural resources educator.

The Hoosier Hay contest has two categories, hay or baleage. Prize money will go to first, second and third place entries in both categories. First place will receive $250 and a one-year membership to IFC; second place $150; and third place $100.

Winners will be recognized at the annual IFC meeting and the IFC website. The cost to participate is $15 per sample with the contest being limited to 100 samples.

Rules and entry forms can be found at https://indianaforage.org/. For more information, contact Nick Minton at 812-279-4330 or nminton@purdue.edu and Jason Tower at 812-678-4427 or towerj@purdue.edu.

Cut forage in windrows ready to be baled. (Photo Credit: Brooke Stefancik, Purdue Extension Educator, Sullivan County)

Updated Climate Normals Led To A Cooler May

(Beth Hall)

The month of May in Indiana was 2°F-4°F below normal across the state, based upon the new 1991-2020 climatological normals that were released last month. Climatological *normals* are roughly the 30-year average of weather variables and are updated every 10 years. Prior to the new normals being released, climatologists were using the 1981-2010 period for the climatological normals. However, since data from 1981-1990 were dropped and 2011-2020 were added, this modified the new climatological normals to account for climate change trends such as warmer temperature and either wetter or drier precipitation values depending upon the time of year. Therefore, the fact that May 2021 ended up being cooler *than normal* was likely due more to the use of the updated climatological normals being warmer than any other remarkable cause.

May's precipitation totals across the state was near normal throughout most of the central and northern counties. However, the southern third of Indiana was much drier with monthly totals falling within the 25th to 75th percentile of normal (Figure 1). This has led to the development and expansion of abnormally dry conditions in various counties in the south and the gradual elimination of abnormally dry conditions in the north (Figure 2). The climate outlooks for both June and the June-July-August periods are only slightly favoring above-normal precipitation, so forecasters and climatologists are keeping an eye on conditions to closely track whether or not drought develops further across the state or gets eliminated. At this time, there is not serious concern of an intense drought occurring such as what was experienced in 2012, but with increased temperatures and the potentially longer periods of dryness between rainfall events, water stress could occur. This will raise concern for those areas dependent upon groundwater, particularly where irrigation is occurring and groundwater supplies haven't fully replenished over the winter and early spring.

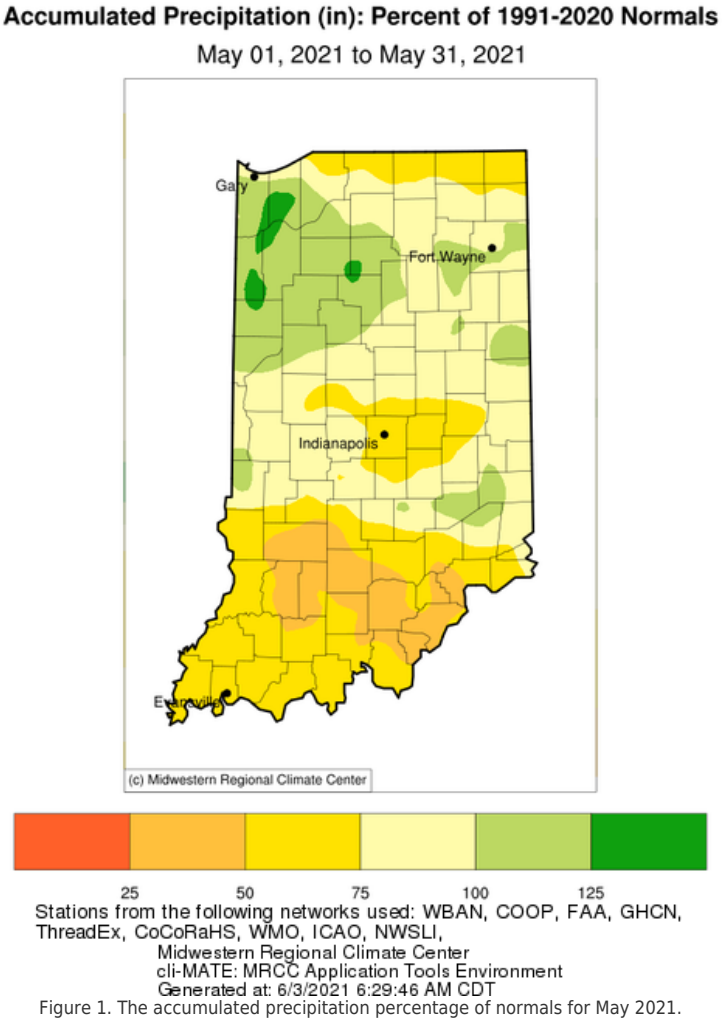


Figure 1. The accumulated precipitation percentage of normals for May 2021.

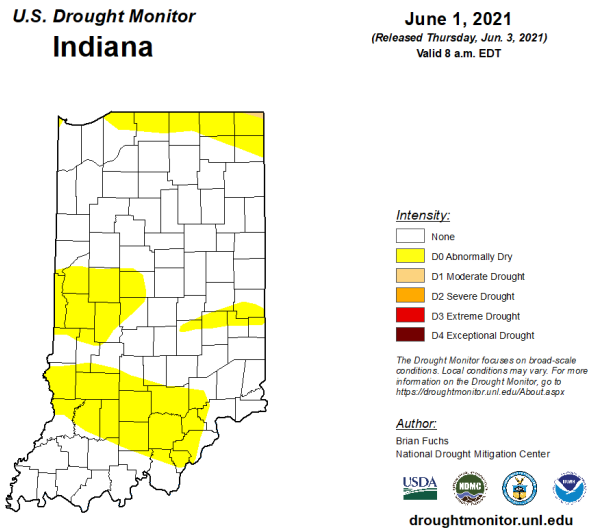


Figure 2. The US Drought Monitor status for June 1, 2021.

Modified growing degree-day (MGDD) accumulations since April 1 have started to catch up to near average for the 1991-2020 period. Northern counties are slightly ahead of normal MGDD accumulations and southern counties are still slightly behind normal (Figure 3). However, when compared to just the past 4 years, 2021 accumulations are still well behind what they were in 2017 and 2018 (Figure 4) across the state.

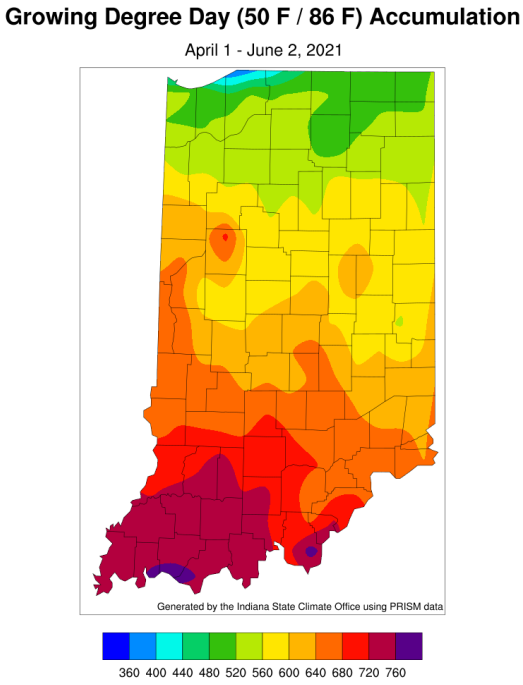


Figure 3. Modified growing degree day accumulation from April 1 to June 2, 2021.

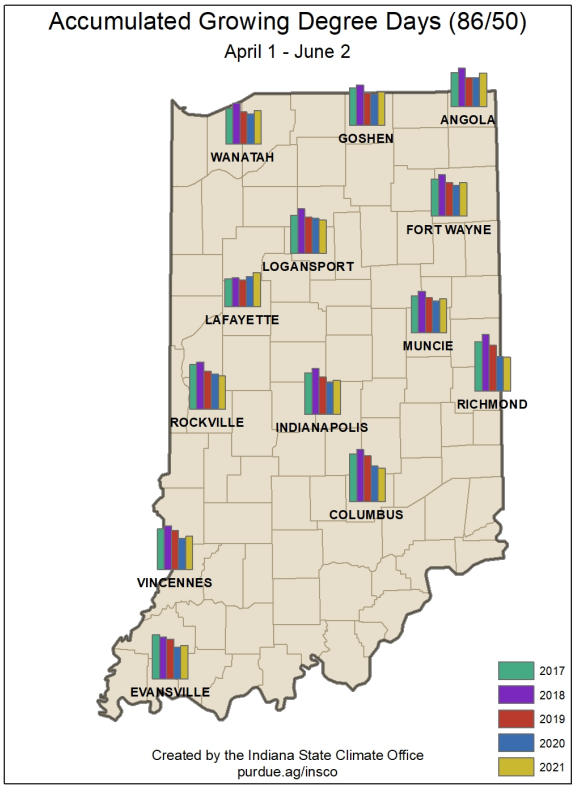


Figure 4. Comparison of 2021 modified growing degree day accumulations from average for April 1 – June 2 to the past four years.

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