

Pest & Crop newsletter

Purdue Cooperative Extension Service and USDA-NIFA Extension IPM Grant

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Beauties and the Beasts

(John Obermeyer) & (Christian Krupke)

This is a wonderful time of the year in the Hoosier state, as we drive through the countryside, we are greeted with the pleasing sight of several colorful butterfly species gliding across roads, near puddles of water, or on fall flowering plants. Many of these beauties originated from larvae that likely fed on soybean or alfalfa. However, it is rare for any of these species to cause significant yield losses from defoliation. Below is a listing, with pictures, of some of the common butterflies and their caterpillars this time of year. Although you will find some of these feeding in crops, none are pests.

The painted lady butterfly, *Vanessa cardui*, is mostly orange mottled with black and white markings. This is a migratory species flying from and to Mexico and the Southwestern United States in the spring and fall. Adults arrive in Indiana in the spring and lay their eggs on several species of plants. Although they feed on many weed species, their preferred host is Canada thistle. Several generations occur in Indiana before they begin their migration southwestward in the fall. The larvae, known as thistle caterpillars, are generally dark in color, with conspicuous yellowish markings on their bodies. The larvae are covered with many branching spines. Larvae reach a length of about 1-1/4 inches. The larvae feed within webbed enclosures on the upper leaves and may defoliate entire patches of weeds and feed in a similar manner on soybean – you may have seen a few leaves webbed together to form a “tent”, and you will find the spiky caterpillars inside.



Painted lady butterfly

Painted lady caterpillar feeding and webbing of soybean leaves

The yellow alfalfa butterfly, *Colias eurytheme*, is a member of the “sulfurs.” These butterflies congregate in large numbers near sources of moisture, including puddles and wheel ruts. They are most active during mid-day, their peak mating time. The larvae of these butterflies are the alfalfa caterpillar. This caterpillar is up to 1-1/2 inches long, has a

velvety-smooth lime-green body with a white stripe on each of its sides. This caterpillar is common in legumes like alfalfa, clover, and vetch, but it can be occasionally found defoliating soybean leaves. Though the numbers of butterflies may be numerous, this does not indicate an outbreak of caterpillars is soon to follow. These caterpillars are very susceptible to insect diseases that can rapidly bring their numbers down to very low levels.



Sulfur butterfly feeding on alfalfa flower

Alfalfa caterpillar on alfalfa leaves

The creepiest-looking caterpillar award goes to the silver-spotted skipper, *Epargyreus clarus*. These larvae are up to 2 inches in length, have brownish-red heads with two orange spots and a yellowish-green body. This is a common subject of the “what the heck is this bug” emails and text messages we receive. Larvae can often be found in leaves that have been rolled together and held by the caterpillars’ silken threads. Feeding damage is generally localized to a few surrounding plants. Adult skippers, which are commonly seen feeding on flowers late in the summer, have an obvious silver-white splotch on each wing.



Silver-spotted skipper feeding on clover

Silver-spotted skipper caterpillar feeding and webbing of soybean leaves

When Hay Harvest is Complete Do the STAB

(Keith Johnson)

When early September arrives, hay harvest is coming to a close for another year. It is important to now follow through and Sample, Test, Allocate, and Balance or STAB your hay. Doing the STAB is an important best management practice to keep your livestock healthy.

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. Probing 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). 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 have worked hard to get the hay made this year. Follow through so it can be used to best advantage to keep your livestock in proper body condition.

STAB YOUR HAY FOR LIVESTOCK HEALTH

- SAMPLE**
Use a hay probe to take ~20 probings from different bales of the same field and harvest
- TEST**
Send to a certified laboratory for analysis. Request: dry matter, crude protein, insoluble crude protein, Neutral Detergent Fiber, Acid detergent Fiber and minerals
- ALLOCATE**
Review test results and allocate the hay based on livestock needs
- BALANCE**
Provide results to a trained nutritionist so cost-effective supplements can be recommended and fed along with the hay to meet livestock nutritional needs

PURDUE UNIVERSITY Extension Probes on loan at many county Purdue Extension offices More information on Sampling and Testing: www.foragetesting.org

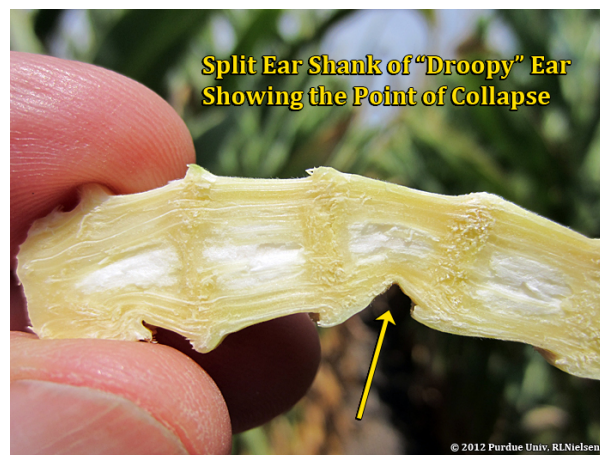
Taking time to STAB hay is important to keep livestock in excellent health

Do Your Ears Hang Low? (Premature Ear Declination in Corn)

(Bob Nielsen)

Droopy ears are cute on certain breeds of dogs, but droopy ears on corn plants prior to physiological maturity are a signal that grain fill has slowed or halted. Ears of corn normally remain erect until some time after physiological maturity (black layer development) has occurred, after which the ear shanks eventually collapse and the ears decline or “droop” down. The normal declination of the ears AFTER maturity is desirable from the perspective of shedding rainfall prior to harvest and

avoiding the re-wetting of the kernels. PREMATURE ear declination, however, results in premature black layer formation, lightweight grain, and ultimately lower grain yield per acre.



Collapsed ear shank of droopy ear

What Causes Premature Droopy Ears? The most common contributing factor is severe drought stress that extends late into the grain filling period. I have seen droopy ears in quite a few fields around Indiana these past few weeks in areas afflicted with severe drought stress. Even though Indiana has not experienced a lot of excessively hot ($\geq 95^{\circ}\text{F}$) days in 2020, drought conditions coupled with sunny days and unusually low humidity (i.e., low dew point temperatures) result in significant evapotranspiration demands on the crop during grain filling. In most of the affected fields, the severity of leaf rolling and premature leaf death (senescence) due to drought stress was also high.

The “droopy” symptom suggests a loss of turgidity in the ear shank due to stress, possibly combined with some cannibalization of the ear shank similar to what can occur with the stored reserves of the main stalk in response to severe photosynthetic stress. Eventually, the ear shank collapses and the ear droops down.

Flashback: In hybrids without the Bt-corn borer trait, collapsed ear shanks can also result from extensive tunneling by European corn borer larvae. Such tunneling weakens the ear shank, allowing it to collapse, and can ultimately also cause the ear to literally drop from the plant.

Impact on Yield? Remember that the ear shank is the final “pipeline” for the flow of photosynthates into the developing ear. An ear shank that collapses prior to physiological maturity will greatly restrict, if not totally prevent, the completion of grain fill for that ear and will likely cause premature black layer development in the grain. If the droopy ears have not yet black layered, they will black layer prematurely; sooner than neighboring erect ears.

The timing of the onset of the collapsed ear shanks determines the magnitude of the expected yield loss. If grain fill were totally shut down at the full dent stage of grain development (milk line barely visible at dent of kernels), the yield loss would be as much as 40 percent. If grain fill were totally shut down at the late dent stage of grain development (milk line halfway between dent and tip), yield losses for the affected ears would equal about 12 percent.

Multiplying the percentage of affected ears in a field by the estimated yield loss per ear will give you an estimate of whole field loss. For example, if ten percent of the field contained plants whose ears drooped prematurely at the late dent stage, whole field loss would be

estimated at 1.2 percent (10 percent of the ears multiplied by 12 percent yield loss per ear).

Final thought: While it is never enjoyable assessing the yield potential of drought-stressed fields, it does serve a purpose in helping you develop your grain marketing strategy. Let this article serve as a reminder that the proverbial “windshield survey” often fails to provide an accurate assessment of crop condition.

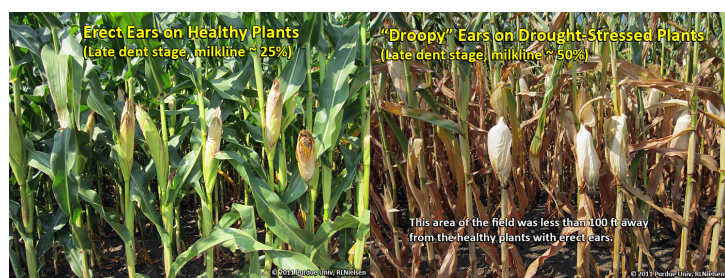
Related reading

Nielsen, RL (Bob). 2012. Opportunities to Assess Yield Potential of Drought-Stressed Corn. Corny News Network, Purdue Univ.
<http://www.kingcorn.org/news/articles.12/YldAssessment-0727.html>

Nielsen, RL (Bob). 2018. Estimating Corn Grain Yield Prior to Harvest. Corny News Network, Purdue University.
<http://www.agry.purdue.edu/ext/corn/news/timeless/YldEstMethod.html>

Nielsen, RL (Bob). 2019. Grain Fill Stages in Corn. Corny News Network, Purdue University.
<http://www.agry.purdue.edu/ext/corn/news/timeless/GrainFill.html>

Examples of droopy ears from a field in 2011 with drought-stressed and non-droughty areas.



harvest. Growers are spending more time in the field observing plants and collecting samples for testing to measure THC (tetrahydrocannabinol), CBD (cannabidiol) and CBG (cannabigerol). Growers should also continue to scout for pests.

Corn earworm is one of the most concerning pests of hemp this time of year. Last year we observed corn earworm (CEW) from late August to October, feeding on seed heads (grain production) or female flowers (cannabinoid production). The damage results in browning and die back of flowers and seed heads. I am now getting a few reports of CEW damage. Unlike last year though, there are insecticides available for use on CEW in hemp.

Corn earworm has caused yield loss in hemp across the country and in Indiana. Purdue and OISC worked to develop 24(c) Special Local Needs labels for Venerate® XC, Gemstar® LC, and Agree® WG insecticides. Refer to the 24(c) labels for rates and timing of application for the various products, which can be found at the OISC pesticide site. EPA also approved Spear®-Lep, which is used for many different caterpillars, including CEW. These biopesticides are most effective when larvae are very young, instars 1-3. Using the corn earworm trapping network as a guide, you can look at moth flights across the state to see when flights are high in your area.

<https://extension.entm.purdue.edu/veg/cornearworm/>
However, we do not have action thresholds for hemp yet. Smaller hemp farms may opt to hand pick CEW larvae off of their plants, but this can be very time consuming. With several insecticide options available, we hope to see better control of CEW this year.



Corn earworm feeding on hemp grown for grain



Corn earworm feeding on hemp grown for CBD

Hemp Harvest is Approaching

(Marguerite Bolt, mbolt@purdue.edu)

Many hemp growers are beginning to harvest or are gearing up to

Climate Outlooks for Early September Busted

(Beth Hall)

For those keeping track of my articles over the last few weeks, the outlooks of wetter and cooler than normal conditions have been the theme. The cooler temperatures never really came to fruition. In fact, most of Indiana was 1°F to 3°F above normal over the past two weeks (Figure 1)! Regarding the wetter-than-normal precipitation outlook, northern counties, northeastern Indiana, as well as along the Ohio River received above normal precipitation. However, the rest of the state experienced 1" to 2" less-than-normal precipitation over the past 2-week period (Figure 2). Even the above-normal precipitation in the northern and northeastern counties have had little impact relieving the developing drought conditions!

Average Temperature (°F): Departure from 1981-2010 Normals

August 27, 2020 to September 09, 2020

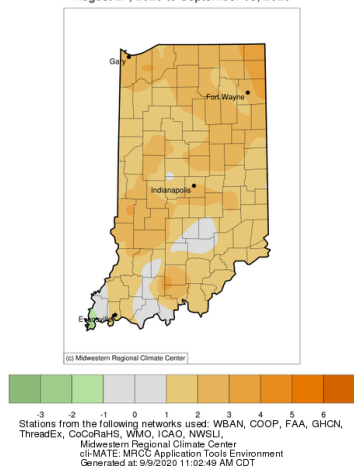


Figure 1

Accumulated Precipitation (in): Departure from 1981-2010 Normals

August 27, 2020 to September 09, 2020

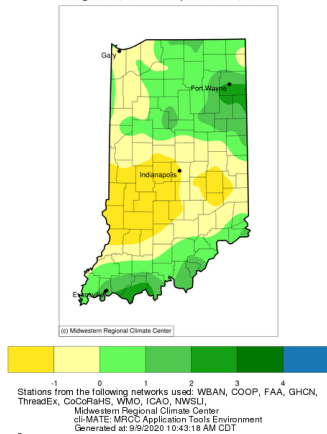


Figure 2

What may have caused such a bust in these climate outlooks? First, the

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tropical storm activity tends to disrupt the atmosphere and patterns over a broad area. Second, the western heat waves and wildfires also have an influence on these larger-scale weather patterns. Finally, the Pacific equatorial region that is showing signs of developing a La Niña tends to confuse the computer models that generate the climate outlooks. Therefore, the combination of these (and likely other factors) make climate outlooks very challenging. Unfortunately, as we transition into fall, the day-to-day variability of the weather will further complicate any confidence in climate outlooks.

The precipitation forecast over the next 7 days looks to be on the dry side. Cooler temperatures should become more obvious next week, but there is still no indication of the snow or frost conditions that the Dakotas and Colorado are facing this week. Climate outlooks from September 14th through 22nd are showing too much uncertainty for both temperature and precipitation, so there is very little guidance that can be offered in this area.

For the most recent maps of accumulated modified growing degree days for this year, in addition to comparison to recent years, see Figures 3 and 4.

Growing Degree Day (50 F / 86 F) Accumulation

April 1 - September 9

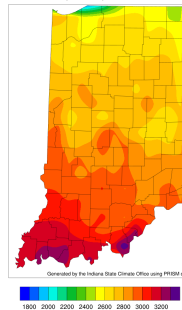


Figure 3. Modified accumulated growing degree-day units for April 1 - September 9, 2020

Accumulated Growing Degree Days (86/50)

April 1 - September 9

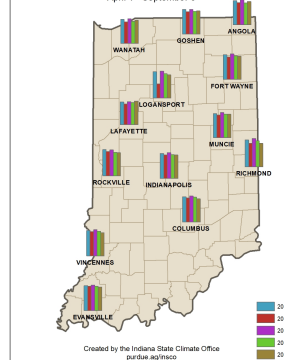


Figure 4. Comparison of accumulated modified growing degree days for April 1 through September 9 for 2016 through 2020