

## Southwest Michigan Field Crops Updates July 1, 2022

Here are updates from the MSU Extension Field Crops team in Southwest Michigan. If you have any items you would like me to include in future email updates—whether events you want others to know about or topics you would like to have addressed—please send me an email or call the office.

### Field Day Teaser

Over the last several years, the MSU Extension Field Crops team has held an annual field day in or near St. Joseph County focused on various on-farm research projects being conducted in southern Michigan. These programs have been offered with support from the Michigan Soybean Committee. We are in the initial planning stages for hosting this event again in the first half of August. Stay tuned for more details coming out in the mid-July edition of this newsletter.

### Heat Stress and Drought Considerations For Corn

The following was excerpted from a [recent article written by Purdue's corn agronomist Dan Quinn](#) regarding the impacts of hot and dry conditions on corn...very timely for us right now in southern Michigan.

Temperatures in the mid-90s during the afternoon typically do not impact corn photosynthetic capacity and yield if soil moisture is adequate. Overall, young corn in the vegetative growth stages is fairly tolerant to high temperatures and drought conditions. In addition, dry soil conditions early in the season can encourage deeper rooting of corn which will likely assist the corn plant with moisture access later in the season if the dry conditions persist. Deeper root systems allow the plant to access greater volumes of soil for increased moisture access.

The combination of hot, sunny days and increased drought stress in corn can limit the total water uptake of growing plants, thus resulting in reduced photosynthesis. Symptoms of drought stress include leaf rolling which is due to plants closing leaf stomates to limit the transpiration of moisture through the plants. Although the attempt to limit transpiration of moisture can help a stressed corn plant, closed stomates can reduce plant photosynthesis due to reduced carbon dioxide accumulation. The earlier leaf rolling occurs in the day and the longer the duration of leaf rolling is observed, the more stress the plant is under, and the more potential yield loss can occur. Yield loss estimates have been previously quantified when drought stress and leaf rolling occur for four consecutive days or more (see table below). Significant drought stress during vegetative growth can impact plant development and size and ear size potential (potential kernel number per row is more sensitive to environmental stress than kernel row number per ear). In addition, since dry soil conditions limit water uptake of a corn plant, these conditions can also limit nutrient uptake. For example, potassium deficiency is often observed under drought stress conditions.

**Table 1. Corn percent yield loss per day estimates when drought stress for four or more consecutive days (Classen and Shaw, 1970; Rhoads and Bennet, 1990; Shaw, 1988, Licht and Archontoulis, 2017).**

Corn Growth Stage	Percent Estimated Yield Loss Per Day Of Observed Drought Stress (%)
Early Vegetative Growth (VE - V12)	1-3
Late Vegetative Growth (V12 - VT)	2-5
Pollination to Blister (R2)	3-9
Milk (R3)	3-6
Dough (R4)	3-t
Dent (R5)	2-4
Physiological Maturity (R6)	0

As corn approaches maximum height and pollination, this is when the risk of yield loss due to heat and drought stress is the greatest. Corn water use increases from emergence to approximately the V15 growth stage where water use peaks through silking and pollination and until the R2 growth stage (blister) before decreasing. Corn needs approximately 0.33 inches per day of water during peak demand and temperature, humidity level, and cloud cover can impact the total amount of daily water lost. Significant heat and water stress that occurs 7-10 days ahead of silking and throughout pollination can result in delayed silk emergence, reduced silk elongation, and silk desiccation. Once the tassel has emerged and pollen shed has begun, a corn plant will only shed pollen for approximately 7 days. Therefore, delayed silk emergence can cause poor synchrony of pollen shed with silk emergence and elongation, thus reducing kernel number and yield. In addition, extreme heat stress (> 100-degrees F) can kill pollen. However, pollen shed does not occur on one single day and peak pollen shed typically occurs in the morning when temperatures are lower. The good news is that the corn crop in Indiana typically reaches 50% silking by mid-July, which means there is still time for the temperature to decrease and precipitation to increase during this critical time period.

## Your Help Needed by July 15 to develop New Online Tool for Optimizing Soybean Production

With funding support from [North Central Soybean Research Program \(NCSRP\)](#), [Michigan State University Cropping System Research Program](#) in cooperation with [Michigan State University Extension](#) are initiating a multi-state, three-year project focused on helping producers optimize soybean production. To do this, we will be analyzing farmer survey data about field management, costs and yields. Survey data collected from Michigan soybean growers will help in the development of a new online tool that can provide management guidelines for your specific field.

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Our objective is to develop a new online cropping system optimization decision tool that can provide management guidelines for your specific field. Over the last decade, massive amounts of data have been generated in soybean production and has been used to develop management guidelines across larger regions. However, there has been a limited success in identifying field-specific guidelines. This project will focus on generating field-specific management decisions focused on not only maximizing yield but also profits by accounting for your input costs.

[Take the NCSRP Soybean Producer Survey](#)



Our approach consists of collecting data from as many Michigan fields as possible. The survey takes about 10-20 minutes and asks information about soybean field conditions, management practices, crop history, yield, seed, fertilizer and pesticide inputs for your operation. Once the survey is complete, we will add soil, weather and satellite image data, based on the field location. We will then use these data to develop a decision-making tool that will make in-season recommendations specific to your field.

Following development, the publicly available tool will allow producers to drop a pin in a field, enter input variables, and receive crop management decision help directly and through online scouting tools such as Sporecaster. The tool will recommend management practices that are specific to your fields to improve soybean production. By providing your field data, you can contribute to the development and accuracy of this tool. Collecting survey information about both management practices and expenses will allow this tool to recommend practices that go beyond increasing yield and allow growers to identify management practices that will optimize profits. The more data we collect, the more accurate the tool will be.

**Additionally, Michigan producers who participate by July 15, 2022 will be entered into two drawings for cash prize of \$1,000 and \$500.** Each field you provide information for will be one entry in the drawings (e.g., four fields equals four entries). The data you provide will stay confidential.

If you need assistance or have any questions about this survey, please contact Manni Singh at [msingh@msu.edu](mailto:msingh@msu.edu). If you would rather complete this survey using a [paper copy](#), please contact us and we will mail you a copy along with a return envelope.

## 2022 Tile Drainable Field Day

**August 25, 2022**  
**9:00 AM to 3:30 PM**

*Free lunch will be provided*

**Field demonstration includes:**

- Saturated buffer installation
- Installation of a water control structure
- Demonstration of Water-Gate valve

**Speaker session include:**

- Soil health, Cover crops
- Nutrient placement
- Saturated buffer
- Controlled drainage

Learn how to improve soil health and reduce phosphorus loss from subsurface-drained farms

**Registration required at:**

[events.anr.msu.edu/drain2022](https://events.anr.msu.edu/drain2022)

**MICHIGAN STATE UNIVERSITY** | Extension

**FREE  
Event**

## 2022 Tile Drainage Field Day

*Linking Soil Health, Nutrient Management, and Water Management for Improved Water Quality*



**Located at: 13000 Bird lake Rd Camden, MI 49232**

**Host:** Michigan State University Extension

**Partners and Sponsors:**

Michigan Land Improvement Contractors Association  
Michigan Department of Agriculture and Rural Development  
Michigan Department of Environment, Great Lakes, and Energy  
Creek Valley Farm

**CCA credits available**

For questions, contact Ehsan Ghane: [517-343-4458](tel:517-343-4458) or [ghane@msu.edu](mailto:ghane@msu.edu)

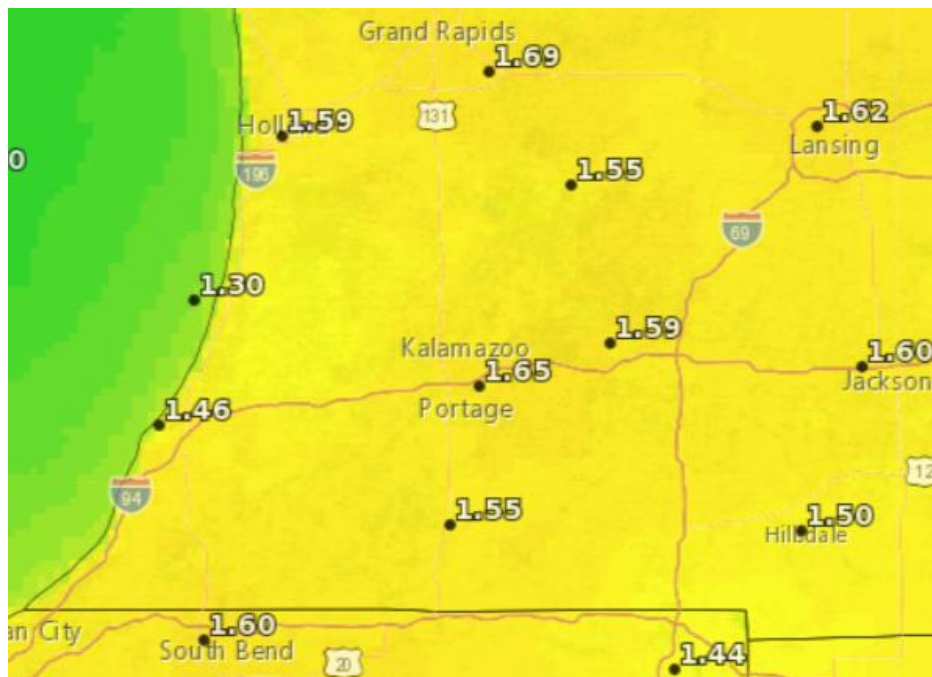
MSU is an affirmative-action, equal-opportunity employer

Register at: [www.events.anr.msu.edu/drain2022](https://www.events.anr.msu.edu/drain2022)

# Weather and Crop Update

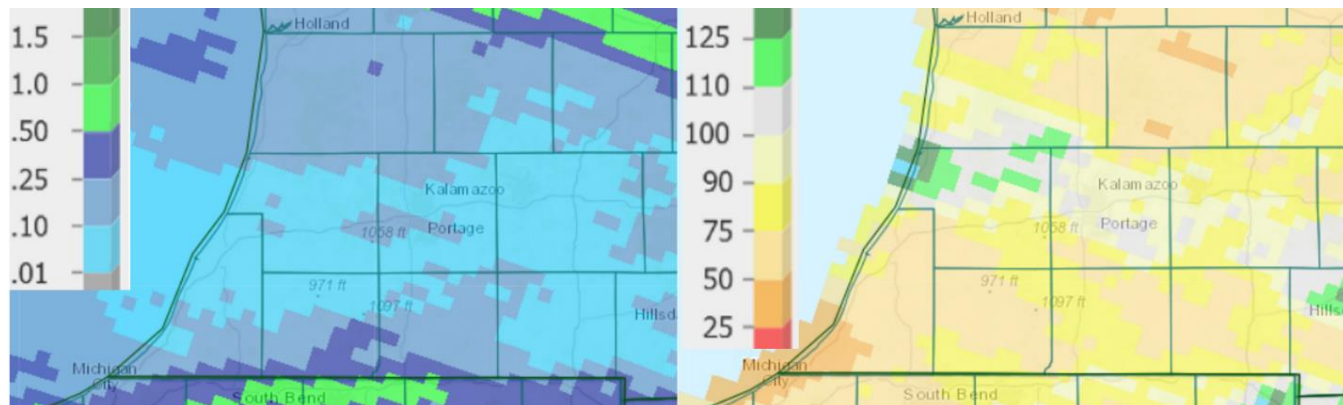
## Weather

Temperatures this past week were normal on average for this time of year. We picked up 175 growing degree days (GDD, base 40 for alfalfa) or 110 GDD<sub>50</sub> (for corn and soybean) this past week, and we are still 60-90 GDD<sub>50</sub> ahead in our region. The forecasted reference evapotranspiration (FRET) rate will be slightly above normal this coming week at ~1.6 inches with daily rates of around 0.2 inch. The forecast predicts the addition of another 210 GDD<sub>40</sub> or 140 GDD<sub>50</sub> in the coming week. Both the 6-10 day and 8-14 day outlooks show a strong confidence in above-normal temperatures for the first half of July.



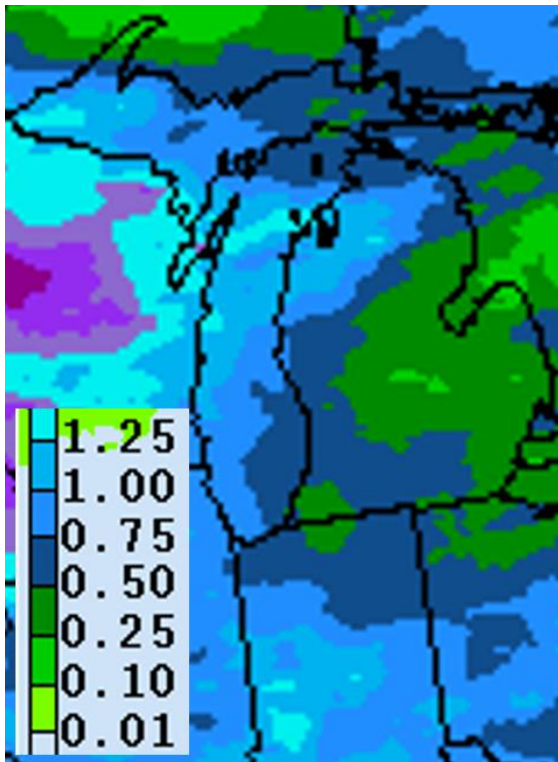
Weekly forecasted reference evapotranspiration rate for the week ending July 6.

Precipitation this past week was very low for the second week running with most areas receiving less than 0.25 inch. The month of June was dry overall with much of the region having received up to 50% less rain than normal, save the band that was blessed with a couple of rounds of rain in the first half of the month. The next chance of rain comes on Friday as a cold front moves through the state although amounts are predicted to be only one to two tenths. With the troughing upper air feature over Michigan, we will have more chances of rain next week although totals for our region will likely be less than 0.75 inch. The medium-range outlooks call for slightly greater than normal chances for rainfall in the first half of July.

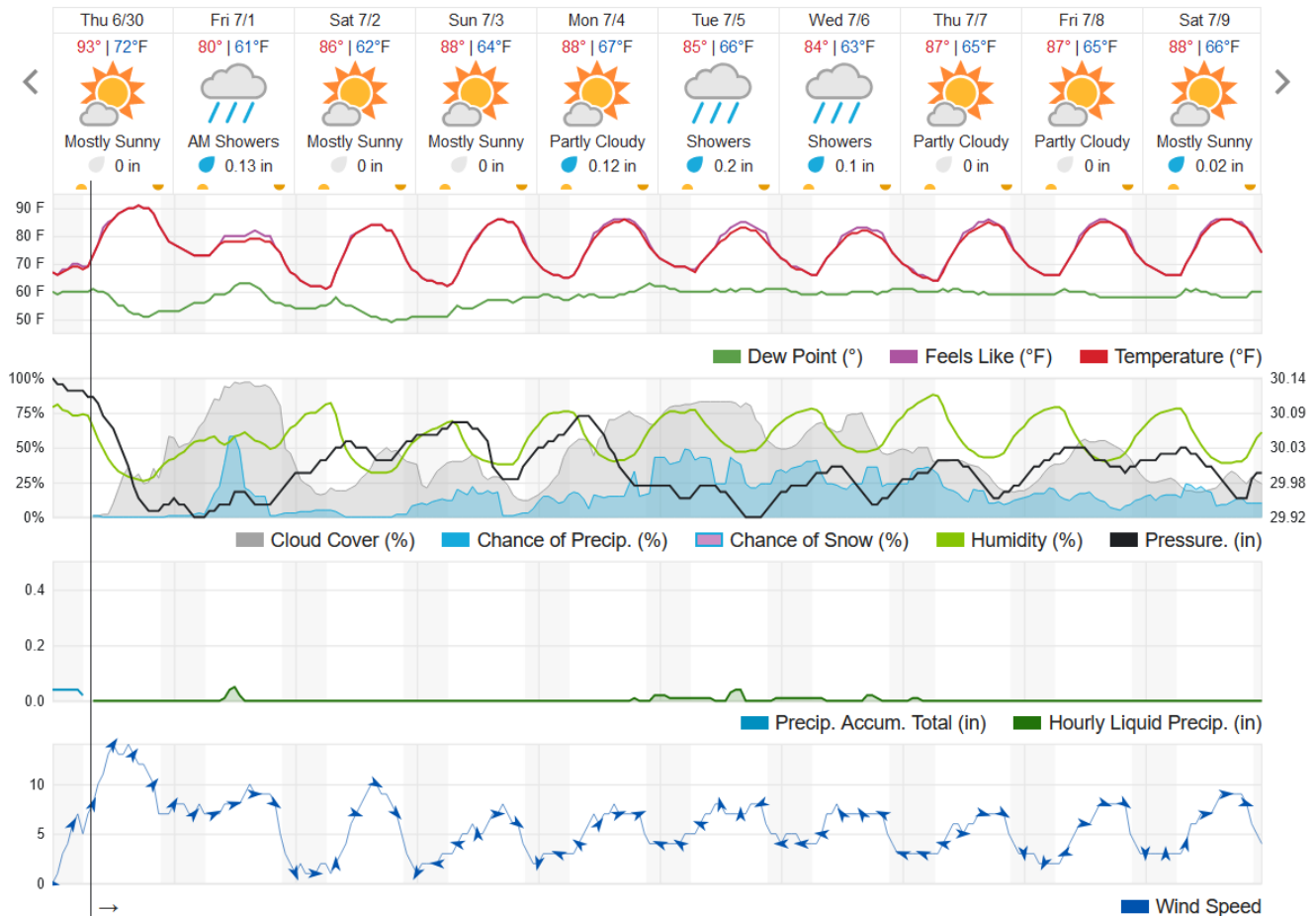


Precipitation totals from the past 7 days (left) and percent of normal for the past 30 days (right) as of June 30.

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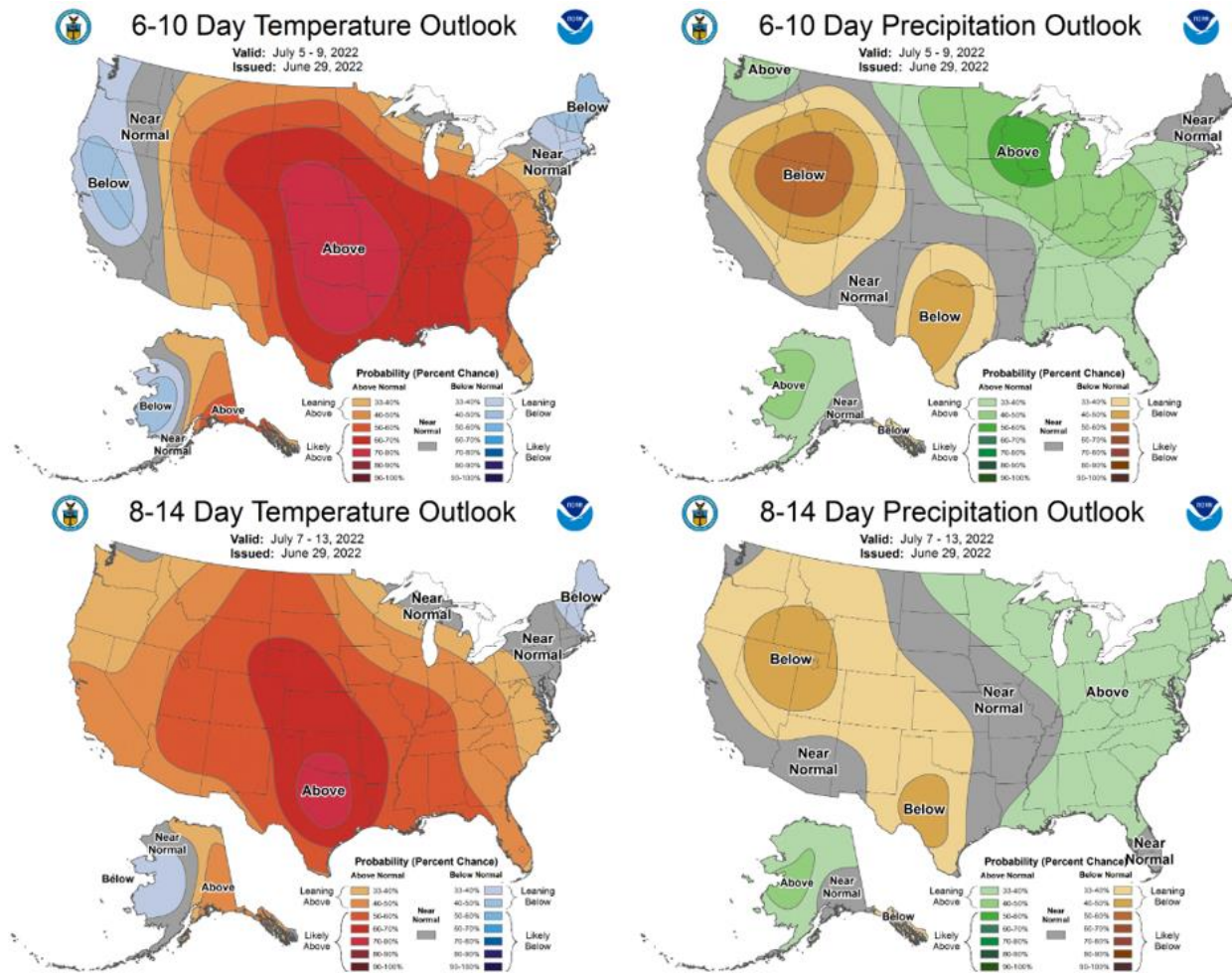


Precipitation forecast for June 30-July 7.



The 10-day weather forecast for Kalamazoo according to wunderground.com.

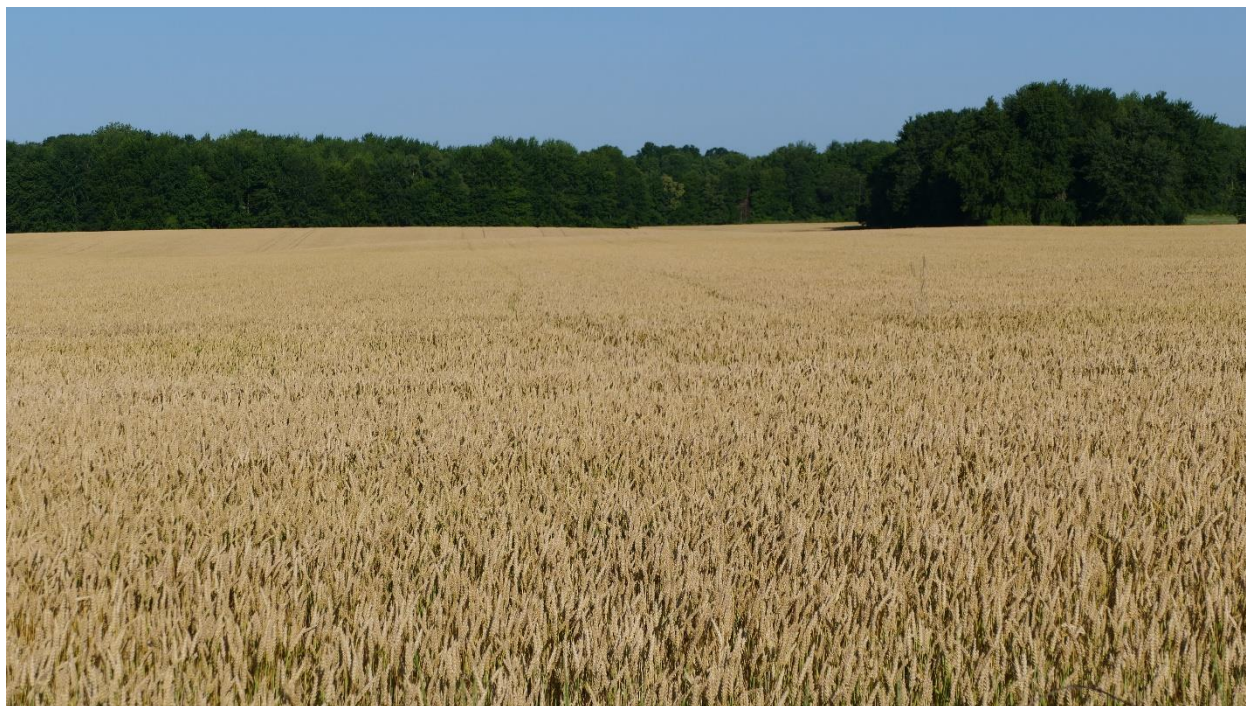
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The 6-10 day (July 5-9, top) and 8-14 day (July 7-13, bottom) outlooks for temperature (left) and precipitation (right).

## Crops and Pests

**Wheat** is approaching the hard dough stage (Feekes 11.3, kernel hard but dividable with thumbnail) and with the return to normal warm temperatures for early July, fields should reach physiological maturity (Feekes 11.4) by the end of next week.



Winter wheat in Kalamazoo County nearing the hard dough stage. Photo courtesy of Eric Anderson.



Winter wheat at the tail end of the soft dough stage with the kernel not yet firm enough to resist crushing with the thumbnail. Photo courtesy of Eric Anderson.



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**Forages.** Second cutting of alfalfa is underway in the region as farmers are taking advantage of the dry conditions. Leafhopper has not been an issue yet, but the next couple of weeks is typically when this pest begins attacking alfalfa in our region.



Second cutting of alfalfa in Kalamazoo County. Photo courtesy of Eric Anderson.

**Corn and soybean** plantings were doing well last week with statewide ratings of roughly two-thirds of the crop rated good to excellent at the end of last week. However, with the continued dryness in the region, crops—corn in particular—are showing signs of water stress as leaves roll in dry corners of irrigated fields and in many dryland fields.



Rolled corn leaves are a sign of water stress, seen here in a non-irrigated field in St. Joseph County. Photo courtesy of Eric Anderson.

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Soybean has reached V6-V7 in many fields but only 5% of fields in the state have reached flowering. However, one field visited with a short-season variety (MG 2.1 planted April 30) has already reached R2 (full flower with at least one flower at the top two nodes on the main stem).



Soybean (MG 2.1) at full flower (R2) in St. Joseph County. Note the flowers at both of the top two nodes in this plant. Photo courtesy of Eric Anderson.



No agronomic value to this picture, just fun to see one of our annual forests from a different perspective. Photo courtesy of Eric Anderson.

**Insects.** No major insect problems have been reported yet although minor bean leaf beetle and Japanese beetle feeding have been spotted. This is not typically yield-limiting in soybean at this stage, and even during the critical bloom to pod stages, soybean can tolerate 15-25% defoliation [according to Purdue Extension](#).

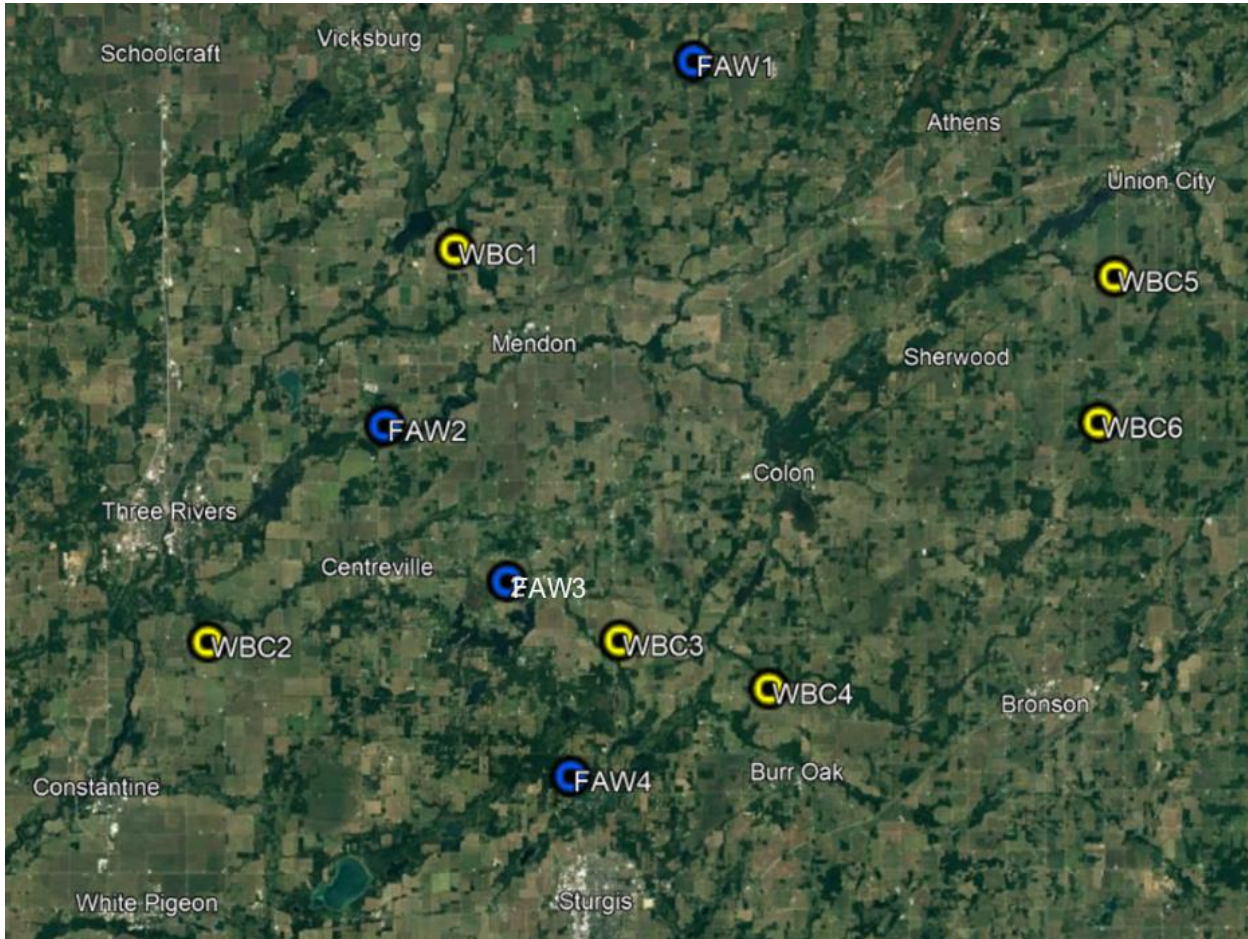


Japanese beetle adults have begun mating and feeding, resulting in the tell-tale shotgun holes in leaves. Photos courtesy of Eric Anderson.

Moth traps for western bean cutworm (WBC) and fall armyworm (FAW) were set this week in three counties in our region, and I will be monitoring trap counts and reporting those in subsequent crop reports. Since this is the first year I've trapped for FAW, we'll have to see when (or if) this species shows up in force in our region—hopefully nothing like last year. Peak flight for WBC is typically later in July.

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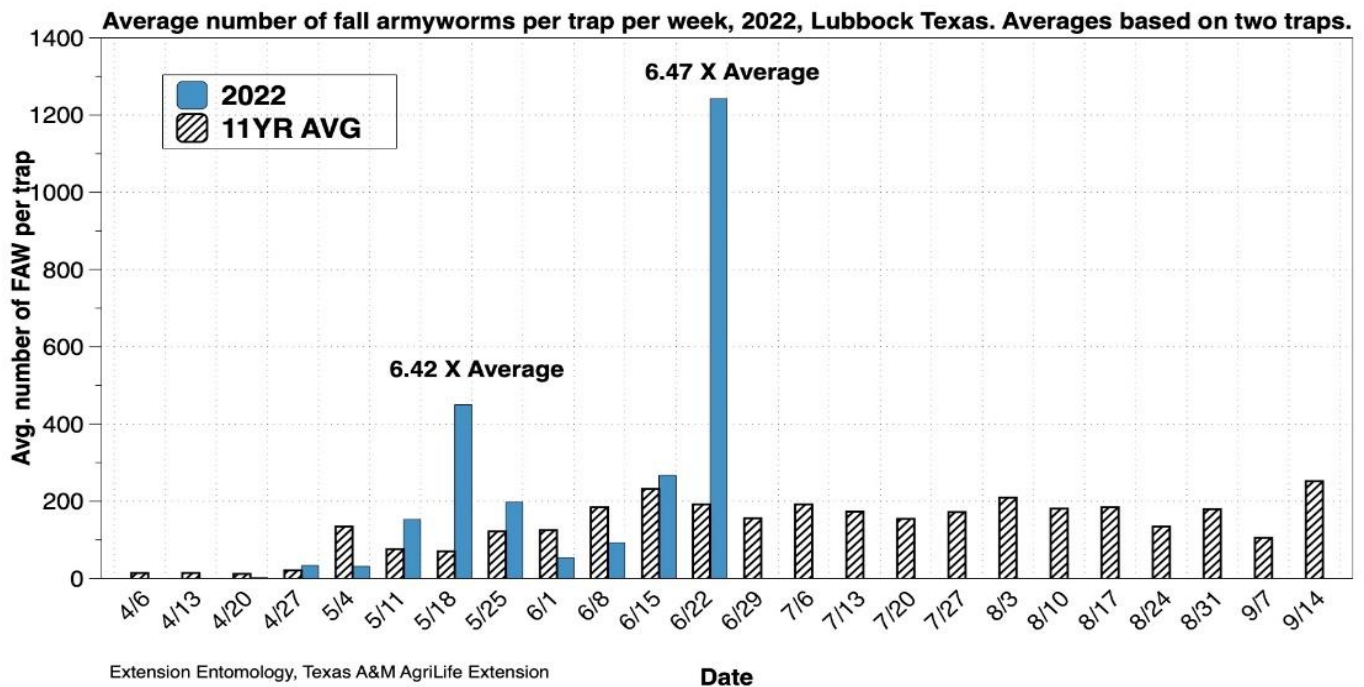
According to the Purdue Extension entomologists, “Those in high-risk areas, i.e., sandy soils, high moth flight and western bean cutworm history, should be gearing up for field scouting of corn, even those with Bt-traits. Remember that WBC larvae are no longer susceptible to most of the Bt traits in our corn hybrids (including those in SmartStax hybrids) and therefore scouting, followed by timely insecticide sprays are really the only reliable control option for the vast majority of producers in the zone where this insect is common. This is principally the northern tier of counties in Indiana, extending into Michigan and parts of Ohio. Only Bt hybrids expressing the Vip3a toxin will offer reliable control of this pest, so be sure to know what you have in your field and scout as needed. See this [handy Bt Trait Table](#) to check where your hybrids fit in terms of the pests managed.”



Locations of western bean cutworm (yellow) and fall armyworm (blue) traps in Kalamazoo, St. Joseph and Branch counties for 2022.

MSU field crop entomologist Chris DiFonzo recently released another edition of her Fast Fonz Facts. **Texas “mothpocalypse”**: Huge “off-the-charts” flights of fall armyworm were reported this week by my colleague Pat Porter at Texas A&M. The moth flight in Lubbock TX in mid-May was 6 times the 11-year average for that date, and the flight of the following generation, measured on June 22, was similarly elevated.

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Will this impact Michigan? Not yet, and maybe not at all. Fall armyworm is a tropical pest that rarely makes it north to Michigan by the end of the season. But you might recall that last year, FAW populations were high in the mid-southern states and by the end of the season, moths were carried on favorable winds into Indiana, Ohio, and Michigan. And with the warm extended fall, there were infestation of FAW caterpillars in alfalfa, cover crops, and turf in Ohio, Indiana and other northern states. So take this message as an alert (vs an alarm) to watch for FAW in August.

I typically don't trap for fall armyworm, but this season I am setting up bucket traps in the next few weeks. Ohio State is doing the same. I will report numbers on the Great Lakes moth monitoring site (<https://arcg.is/0Lry5a>). If you are interested in trapping, be sure to use the specific lure labeled "FAW". DO NOT use the lure for regular armyworm (True Armyworm or AMW) which is a different species. Lures and bucket traps are available from [Great Lakes IPM in Vestaburg](#).

### Other insects on Corn:

- \* Asiatic garden beetle adults have emerged in northern Ohio, and grubs are pupating in southern Michigan. Thus, AGB larval injury is done for 2022. MSU and OSU have been sampling multiple infesting field sites this spring, and we hope to have additional information about soil insecticides and grub injury for winter meetings.
- \* Western bean cutworm moths will start emerging by mid-July. If you trap, hang your buckets at least by the week of July 4th. Trap catches from hundreds of locations in the Midwest will be posted on the Great Lakes monitoring web site. Remember, trapping doesn't tell you when to spray. It gives you an idea of flight intensity and helps to time scouting for egg masses, i.e. when trap catch peaks. Infestations are hard to predict because egg laying is usually tied to crop stage (pre-tassel), thus each field can be different depending on how stage lined up with flight.
- \* Corn rootworm hatch has started. If you follow this insect in continuous corn, look for root injury or lodging 4 weeks from now.
- \* I've had zero calls about 1<sup>st</sup> generation corn borer. Onward to 2<sup>nd</sup> generation. Moth flight will occur in mid to late-July. Later-planted corn will be at more attractive for egg laying at that time.

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### Insects on Soybeans:

- \* Soybean aphids are in fields by now, but populations usually don't increase until mid-July. A note about late-planted or replanted beans: aphid populations are often higher in fields that were planted very late or double-cropped. Keep an eye on these fields in mid to late July for over-threshold populations.
- \* Soybean gall midge. This is another case of Alert, not Alarm. Gall midge is in the ag press a lot, and people ask about it all the time. But it is NOT yet in Michigan or any state bordering Michigan. Gall midge was first discovered in Nebraska a few years ago. Its tiny maggoty larvae infest and weaken soy stems, causing lodging or stalk breakage. This usually happens in rows adjacent to last year's soybean. As of June 22, Univ of Nebraska reported midge adults emerging in NE, IA, SD, and MN, and larvae in Nebraska fields. The good news is that gall midge is spreading very slowly and all evidence indicates it is still hundreds of miles west of Michigan. But weirder things have happened! So as you scout in July and August, keep your eyes open for lodging on field edges. If you see something odd, investigate. Collect plants. Send samples to the MSU diagnostic clinic. Call me, an extension agent, or trusted field scout, or send us pictures. This web site <https://soybeangallmidge.org/> has pictures and a lot of info.

**Irrigation.** Evaporative demand and crop water use once again outpaced rainfall this past week. Corn at V12 will use roughly 1.6 inches of water this coming week while later-planted corn still at V6 will use only around 0.6 inch. Soybean that has reached R1 will also need 1.6 inches while beans at vegetative stages (not yet flowering) will use between 0.5-0.75 inch this week. According to [Shawn Conley at the University of Wisconsin](#), "...Coarse sandy loams...simply cannot hold substantial water reserves, so withholding irrigation entirely until R3 isn't typically advisable. Instead, consider setting your [soil moisture] deficit threshold somewhere between 50 and 75% without impacting your final seed yield." We typically advise to minimize watering during flowering if possible to reduce the risk of white mold—the fungus *Sclerotinia sclerotiorum* attacks the flowers—so consider applying 0.75-1.0 inch of water to saturate the top foot of soil prior to R1.

**Planting cover crops following wheat** was the topic of this week's [MSU Extension Field Crops Virtual Breakfast](#) with Brook Wilke, Associate Director of Agronomy for MSU's Long-Term Agroecosystem Research (LTAR) Network at the Kellogg Biological Station. The three main reasons for planting cover crops following wheat include weed management, nitrogen fixation or scavenging, and for a variety of soil health considerations.

When designing a weed management strategy in this situation, it is advised to kill emerged weeds first and then plant a cover crop that will hopefully out-compete any weeds that emerge in late summer or fall. Wilke suggested that species such as oats and radish are good options as they will winterkill, although he advised against planting radish before August 1<sup>st</sup> to keep them from bolting prior to a killing frost. Mustards, rapeseeds and other brassicas won't likely harbor diseases for the next crop, but rape may overwinter in Michigan so it would need to be controlled in the spring. Refer to the [MSU Cover Crop Termination bulletin](#) for recommendations. Sorghum sudan and other grasses would also be a good option; however, unless you plan to use sorghum sudan as a source of forage, choose non-forage seed varieties as they are less than half the cost. Wilke provided recommended seeding rates and typical costs per acre for several cover crop species. Seeding rates don't need to be near the top of the recommended ranges for an effective cover. Wilke noted that all cover crops after wheat need to be either drilled in or broadcast and then lightly incorporated to get the seed into soil moisture during the heat of summer.

Another important function of cover crops following wheat is to scavenge leftover nitrogen (N) from the wheat crop or to generate N by planting a legume species such as clovers, hairy vetch, cowpeas, and even soybean. Red clover is often frost-seeded into wheat in late-winter but it can also be planted after wheat. As with sorghum sudan, choose a non-forage variety for lower seed cost if not using the clover for forage. Hairy vetch has "hard" seed which means that some of it will not germinate until after a winter freeze, so expect some degree of carryover of vetch coming up in subsequent years.

One question many growers ask is how much of a N credit can you expect for the following crop. This is difficult to estimate as it depends on several factors such as what species were planted and at what density, how much biomass accumulated, what termination method is used, etc. Tillage will release the N faster than when using a burndown herbicide application. One study by [Sullivan et al. \(2020\)](#) found that up to 100 lbs of plant-available N

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per acre can be generated from leguminous cover crops, although Wilke suggested 50-75 lbs as a more realistic estimate. To better estimate the N credit in your situation, he recommends conducting a replicated N fertilizer rate trial on your farm to see how much N you can short your corn crop following the legume cover crop without a yield impact.

If you were not able to join the session, the recordings will be closed-captioned and available at the [Field Crops Virtual Breakfast](#) webpage and the MSU Extension Field Crops Team social media platforms: [Facebook](#), [Spotify](#), [YouTube](#), [Apple Podcasts](#), and [Twitter](#).

## Calendar

Note: Titles are clickable links to online content when highlighted and underlined.

- July 7**     [Virtual Breakfast – Tar Spot in Corn with Marty Chilvers](#) . 7-8am. This hour-long broadcast from the MSU Extension Field Crops Team will run throughout the cropping season and feature a brief weather forecast and a presentation from a MSU specialist or educator on a timely topic. One RUP and one CCA credit will be available with each session. Cost is free. Register to receive the link that will be used throughout the season.
- July 14**     [Virtual Breakfast – Sugarbeet Cyst Nematode Management with Daniel Bublitz](#) . 7-8am. Register online once for the entire series.
- July 15**     Final Date to Report Crop Plantings & CRP
- July 21**     [Virtual Breakfast – Hot Topic Q&A session](#) . 7-8am. Register online once for the entire series.
- July 28**     [Virtual Breakfast – Bugs and More Bugs with Chris DiFonzo](#) . 7-8am. Register online once for the entire series.
- August 25**     [2022 MSU Tile Drainage Field Day](#). 9am-3:30pm. 13000 Bird lake Rd Camden, MI. Field demonstrations and speakers addressing demo of a water-gate valve, installation of a water control structure, nutrient placement, cover crops, saturated buffers, and more. Cost is free, lunch is provided, register online.

## MSU Extension Digest Briefs

[REGISTER FOR MICHIGAN'S 2022 TILE DRAINAGE FIELD DAY](#)

**PUBLISHED ON JUNE 30, 2022**

Linking soil health, nutrient management, and water management to protect water quality and improve yield on Aug. 25.

[CAMERA OR DRONE VIDEO CAN HELP IDENTIFY CENTER PIVOT SPRINKLER REPAIRS](#)

**PUBLISHED ON JUNE 23, 2022**

Before we enter July and August when the bulk of irrigation water is applied, use a camera or drone video of pivot water patterns and pipe leaks to greatly help you prioritize needed repairs or sprinkler replacement.

[JUNE CROP WATER NEEDS](#)

**PUBLISHED ON JUNE 23, 2022**

Many areas in Indiana and Michigan quickly went from too much rainfall at planting to sparse rainfall from emergence on leading to an early start for the irrigation season.

[2022 FIELD CROPS WEBINAR SERIES RECORDINGS AVAILABLE TO THE PUBLIC](#)

**PUBLISHED ON JUNE 23, 2022**

## Southwest Michigan Field Crops Update – July 1, 2022 - 16

The Field Crops Webinar Series is offered each winter to educate farmers and agribusiness professionals about timely crop production topics. Recordings from the 2022 season are now available for free to the general public.

### FINANCIAL MANAGEMENT RESOURCES AVAILABLE FOR BEGINNING FARMERS

**PUBLISHED ON JUNE 22, 2022**

Understanding the financial side of managing a farm can be especially challenging for beginning farmers.

### IRRIGATION SEASON: START WITH INSPECTIONS AND REPAIRS

**PUBLISHED ON JUNE 16, 2022**

Running through a checklist of inspections and repairs for each irrigation system greatly improves the chance of being able to start irrigating the day the crop needs it.

### ASSESSING HAIL DAMAGE TO SOYBEANS IN THE EARLY VEGETATIVE STAGES

**PUBLISHED ON JUNE 16, 2022**

Properly assessing hail damage to soybeans will help producers make important management decisions.

### EXTENSION AGRICULTURE & AGRIBUSINESS IN MICHIGAN

**PUBLISHED ON JUNE 16, 2022**

Michigan State University Extension educators work with farms of all sizes helping to positively impact individual farming operations.

### FIRST CUCURBIT DOWNY MILDEW SPORES IDENTIFIED IN AIR SAMPLES IN BAY AND SAGINAW COUNTIES

**PUBLISHED ON JUNE 13, 2022**

Cucurbit downy mildew spores have been verified in air samples from Saginaw and Bay counties using a Burkard volumetric spore trap coupled with molecular analysis of the spore trap tape and microscopy.

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