MICHIGAN STATE UNIVERSITY | Extension

Southwest Michigan Field Crops Updates
May 15, 2020

Here are updates from the MSU Extension Field Crops team in Southwest Michigan. **We are switching to a bi-weekly update for the cropping season with critical pest updates issued as needed.** 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.

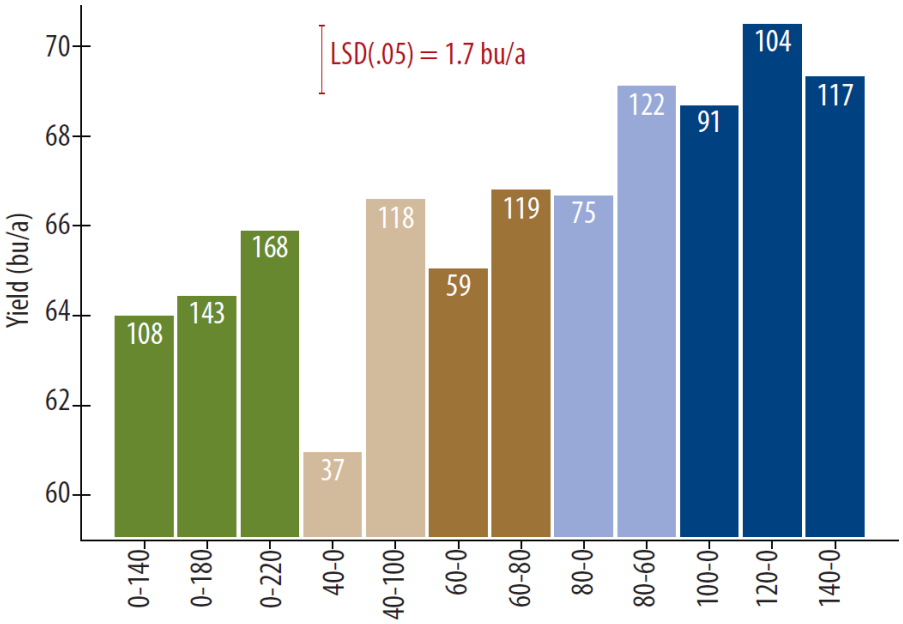
Soybean Replant Decisions

With early-planted beans under threat of freeze injury (see discussion below under Crop Update) from either emergence prior to last week's freeze event or imbibitional chilling, questions arise as to whether a poor stand should be left alone, interseeded, or ripped up and replanted. MSU Extension soybean educator Mike Staton wrote a good summary article, "Thin soybean stands can produce surprisingly high yields," that pulls research data from MSU and other sources. Another concise but thorough summary was published by soybean researcher Shawn Conley at UW-Madison, and I am including his conclusions and two useful graphics here. You can also read their fact sheet, "Think Twice Before Replanting Soybeans," in its entirety.

> "The first step in deciding if replanting is required is to determine the initial plant stand. Our study demonstrated that replanting soybean stands below the threshold (100,000 plants/a) by filling in the existing stand, increased yields regardless of the date (May-June 20th) and seed treatment use. Below threshold plant stands should be filled in with enough seed to bring the final stand above 100,000 plants/a. Using tillage and replanting the entire stand greatly limited yield potential, even at replant seeding rates of 220,000 seeds/a. This is due to the entire plant stand being replanted or essentially planted later, which reduces yields by 0.32 bu/a/day on average. These replant recommendations are applicable through June 20th in southern WI, where replanting after this date is not advised. Traditionally, the notion of adequate weed control has led producers to desire higher plant stands to quickly shade out competing weeds. However, preherbicide use and modern post herbicide technology has essentially eliminated this concern. This study only evaluated soybean replanting in terms of yield and did not take into account the economics of a replant decision, which include additional seed, fuel, labor, and machinery costs; along with potential crop insurance replant payments. Producers should consult their crop insurance agent before making any replant decisions. Ultimately, the producer's efforts should be placed on using this data in conjunction with their own finances to determine if replanting will increase economic return."

Plant Condition	Will the plant survive?
Plant cut off below the cotyledons	No
Plant missing only one cotyledon	Yes
Plant missing both cotyledons but growing point intact	Yes
Plant cut off above unifoliate leaves	Yes
Plant lightly bruised on the stem	Yes
Plant heavily bruised and folded over	No

Plant conditions when determining survival after severe weather.



Yield (bu/a) of twelve replant scenarios across three planting dates (early May, late May, and mid-June). The number printed at the top of the bars represent the final plant stand (1000 plants/a) after replanting. The numbers below the bars indicate the initial seeding rate followed by the replant seeding rate.

Take Steps Now to Prepare for Coronavirus Assistance

In April, USDA announced the Coronavirus Food Assistance Program (CFAP). CFAP will provide direct support based on losses for agriculture producers where prices and market supply chains have been significantly impacted and will assist eligible producers facing additional adjustment and marketing costs resulting from lost demand and short-term oversupply for the 2020 marketing year caused by COVID-19.

CFAP will provide assistance to most farms that have experienced at least a five percent loss and will be available to farms regardless of size. We are still working on the final details of the actual payment rates and those details will be determined and included as part of the rulemaking process. Once the rule making process is complete, the application period will be open and subject to the eligibility and payment limit criteria described in the rule.

As part of applying for the program, you'll need to contact the Farm Service Agency county office to schedule an appointment. Your local FSA staff will work with you to apply for the program.

Information on CFAP can be found at https://www.farmers.gov/cfap. The USDA also just hosted a webinar this week on CFAP and that recording is linked on that site.

USDOT Announces Technology Partners for Remote ID with Drones

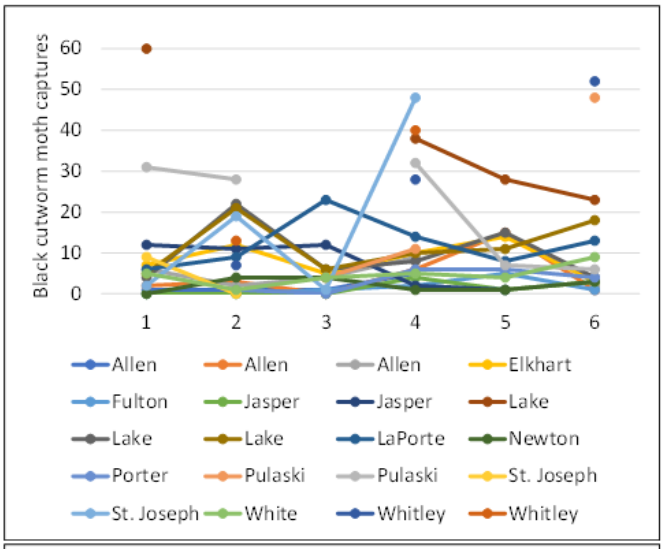
The U.S. Department of Transportation's Federal Aviation Administration (FAA) recently announced the eight companies that will assist the Federal government in establishing requirements for future suppliers of Remote Identification (Remote ID). Remote ID will enable Unmanned Aircraft Systems (UAS), commonly called drones, to provide identification and location information while operating in the nation's airspace. The technology is being developed simultaneously with the proposed Remote ID rule.

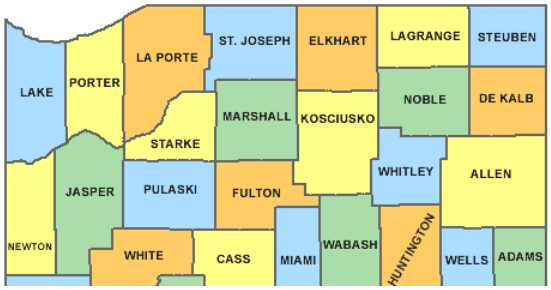
Drones are a fast-growing segment of the transportation sector with nearly 1.5 million drones and 160,000 remote pilots now registered with the FAA. The agency's ability to develop Remote ID technology simultaneously with the rule enables the FAA to continue to build on a UAS Traffic Management (UTM)

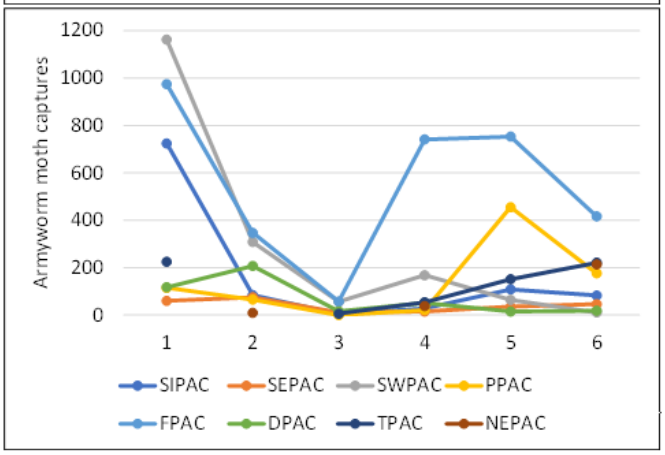
system that has demonstrated global leadership through the small UAS rule and the implementation of the Low Altitude Authorization and Notification Capability (LAANC), which automates the application and approval process for most UAS operators to obtain airspace authorizations.

Black Cutworm and Armyworm Report

Purdue's trap counts at most locations over the past two weeks appear to be holding steady or tapering off, particularly with black cutworm captures, although "intensive captures" continue at a few locations. If we had to pick a time frame for peak flight, it would be Week 4 (April 23-29) for black cutworm and Week 1 (April 2-8) for true armyworm, although they recorded intensive captures of black cutworm even from Week 1. In an average year, we could estimate larval emergence and potential feeding damage by number of weeks after a peak flight, but with cold temperatures in April, larval development has been slow just as it has for crops. Purdue's field crops entomologists described the necessary number of heat units required for development of black cutworm to reach the cutting stage as 300 GDD's. We have only received roughly 185 GDD's (base 50) since April 1, so these are not a concern yet. As temps warm up during the rest of May and crops begin emerging, scouting for injury is recommended.







Black cutworm (top) and armyworm (bottom) captures in Indiana from week 1 (April 2-8) through week 6 (May 7-13).

Wheat Research

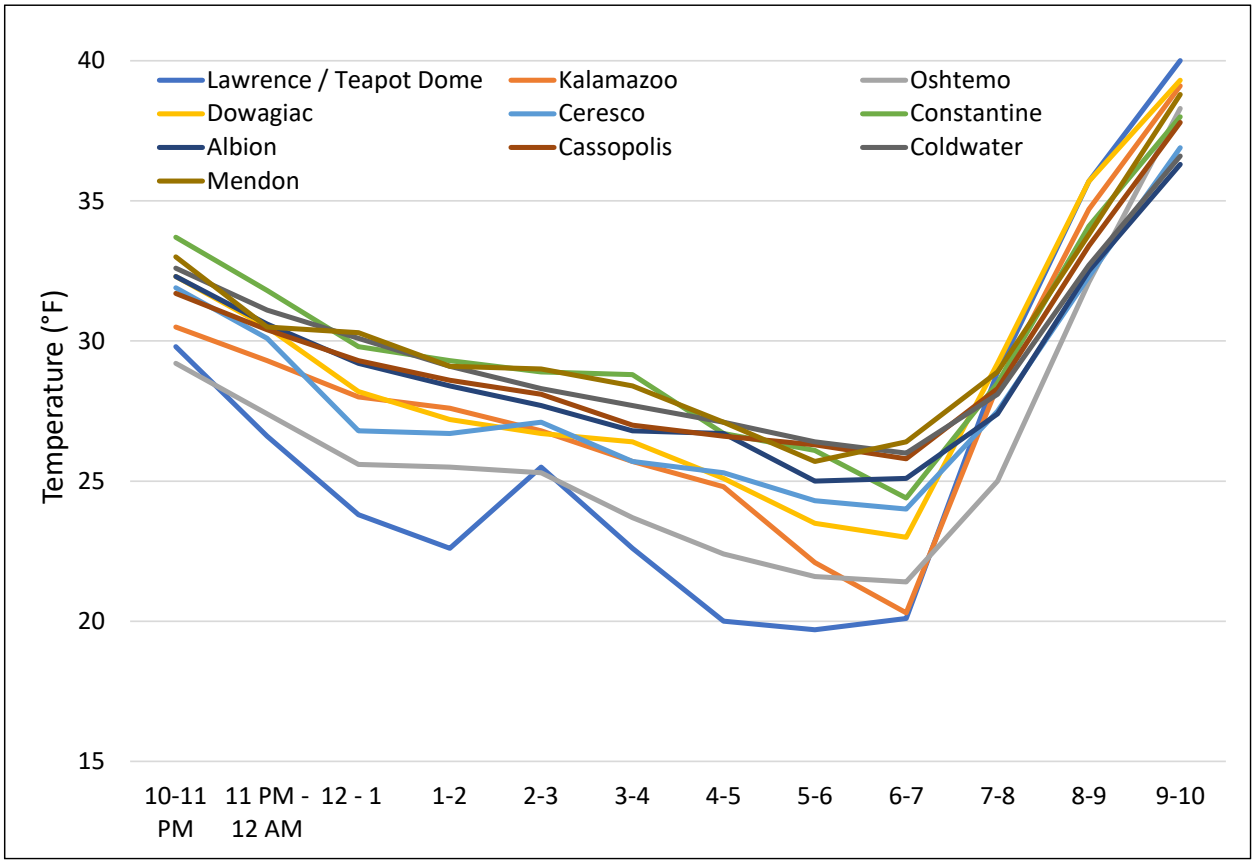
The Michigan Wheat Program has once again put out its annual Request for Proposals for research. The submission deadline is August 14, although I will need a bit more lead time to route the proposal through MSU. The proposals will be evaluated by the MI Wheat board according to the following criteria:

1. Improve yield?
2. Improve quality?
3. Appropriate level of funding requested for the project scope being proposed?
4. Cutting Edge? New Ideas? Out of the box thinking?
5. Reproducible/high standards/strong science?
6. On target with current wheat research priorities?
7. Does this project include matching funding?
8. Does the proposal entail internal or external collaborators?
9. What is the plan for getting results to farmers?

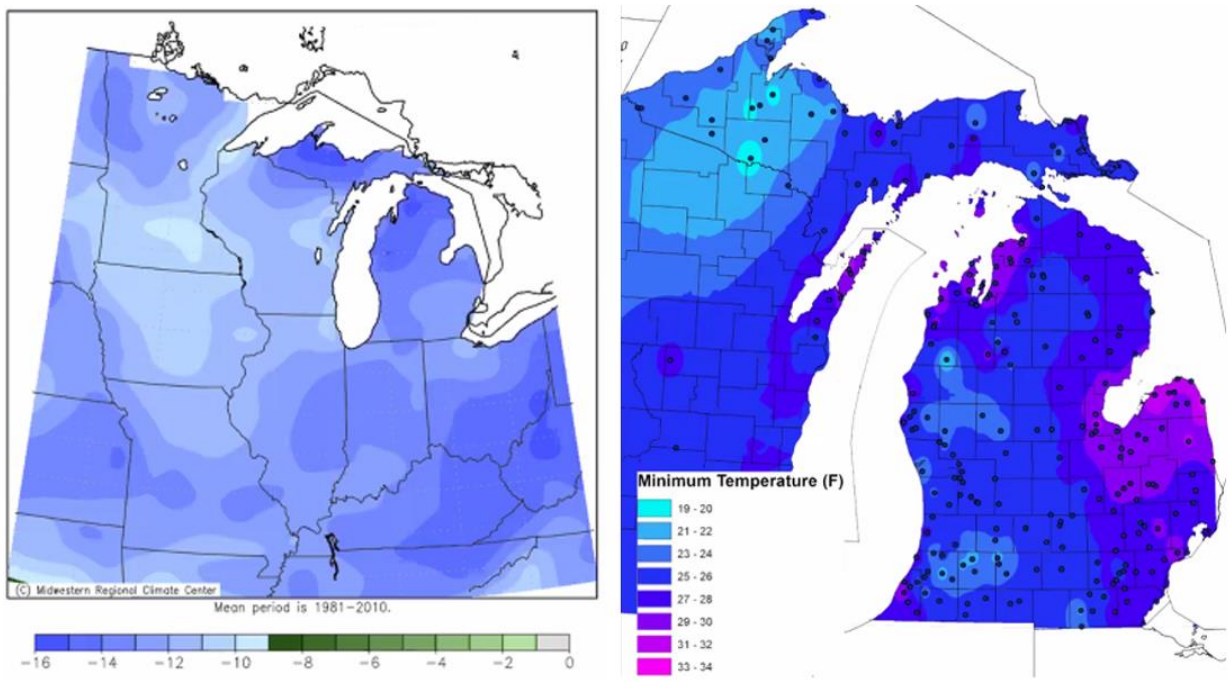
If you are interested in addressing a question or problem on your farm under one of their general research interest areas, let me know and I will work with you to put together a proposal.

Weather Update
(Crop Update is below)

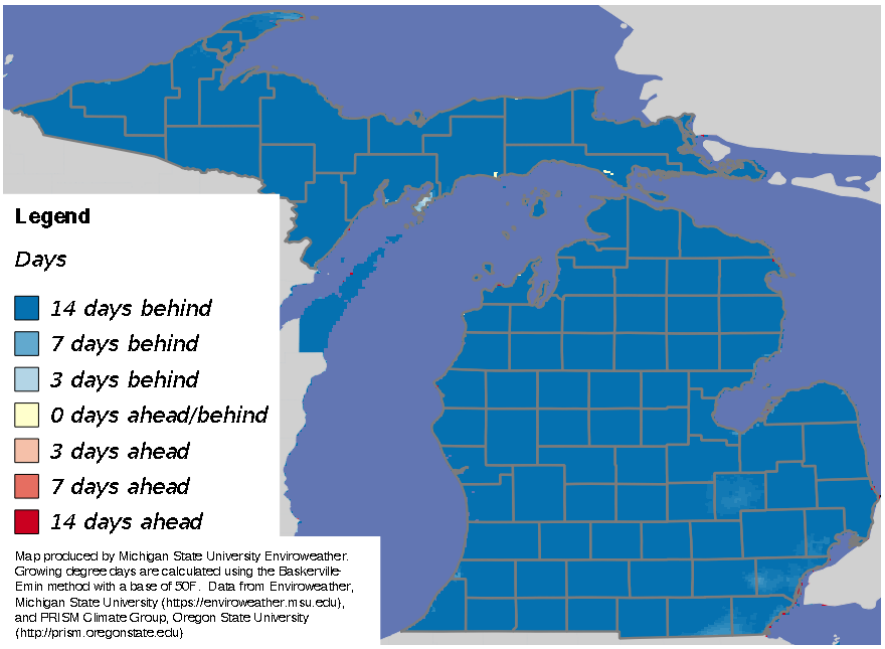
I have some good news and some bad news. Most people opt for the bad news first, so here we go. Temperatures during the deep freeze that lasted a full four days set us back at least 5 °F in soil temperatures, several more days in accumulated heat units, and brought overnight temperatures last Saturday that were low enough for several hours to cause concerns about crop injury. From the first graphic, we can see that air temperatures in several areas in and near Kalamazoo County reached all the way down to 20 °F on Saturday morning. Since 28 °F is generally considered the temperature where injury can occur in many crops, this was not good news. See the Crop Update for pictures of impacts to several crops.



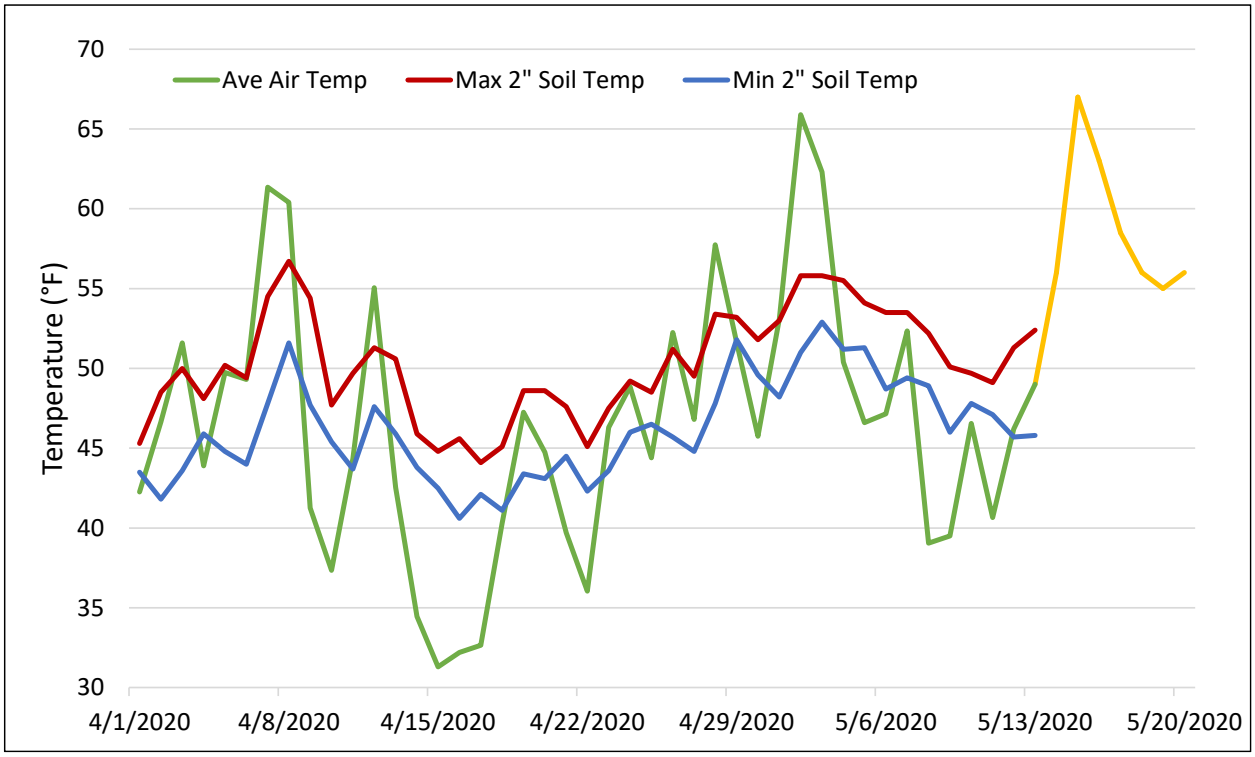
Overnight low temperatures at select Enviroweather stations in south central and southwest Michigan. Aside from a few “cold domes” around Kalamazoo County, most areas saw lows from 24-30 °F, but most locations were below the critical 28 °F for several hours.



Mean temperature departure from normal for May 6-12 (left) and minimum temperature on Saturday, May 9 (right). This cold event was definitely one to remember. Graphics courtesy of Jeff Andresen.

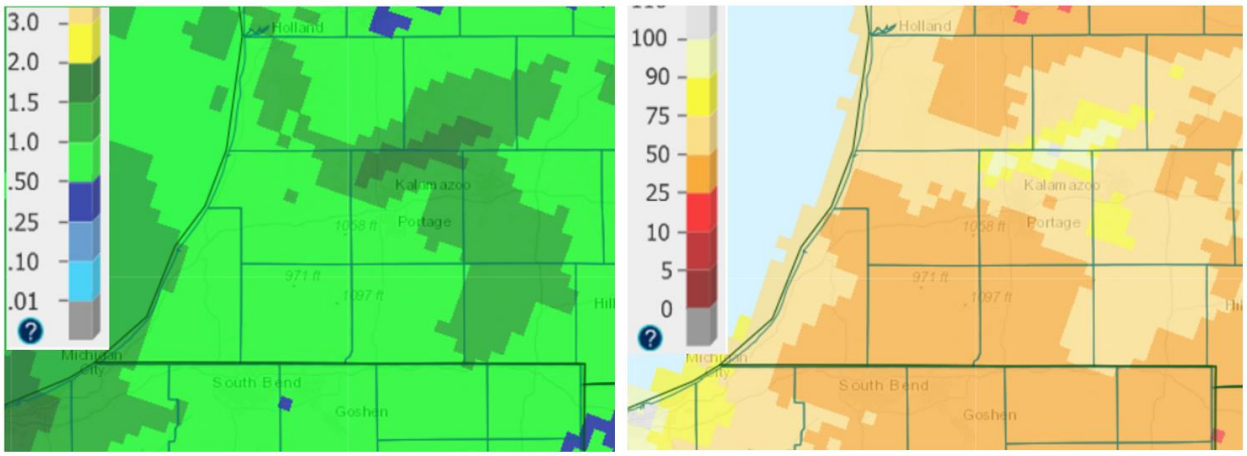


Growing degree days compared with normal from March 1 through May 13. As predicted, we have been dropping further and further behind and are now a solid 2+ weeks behind in heat units.

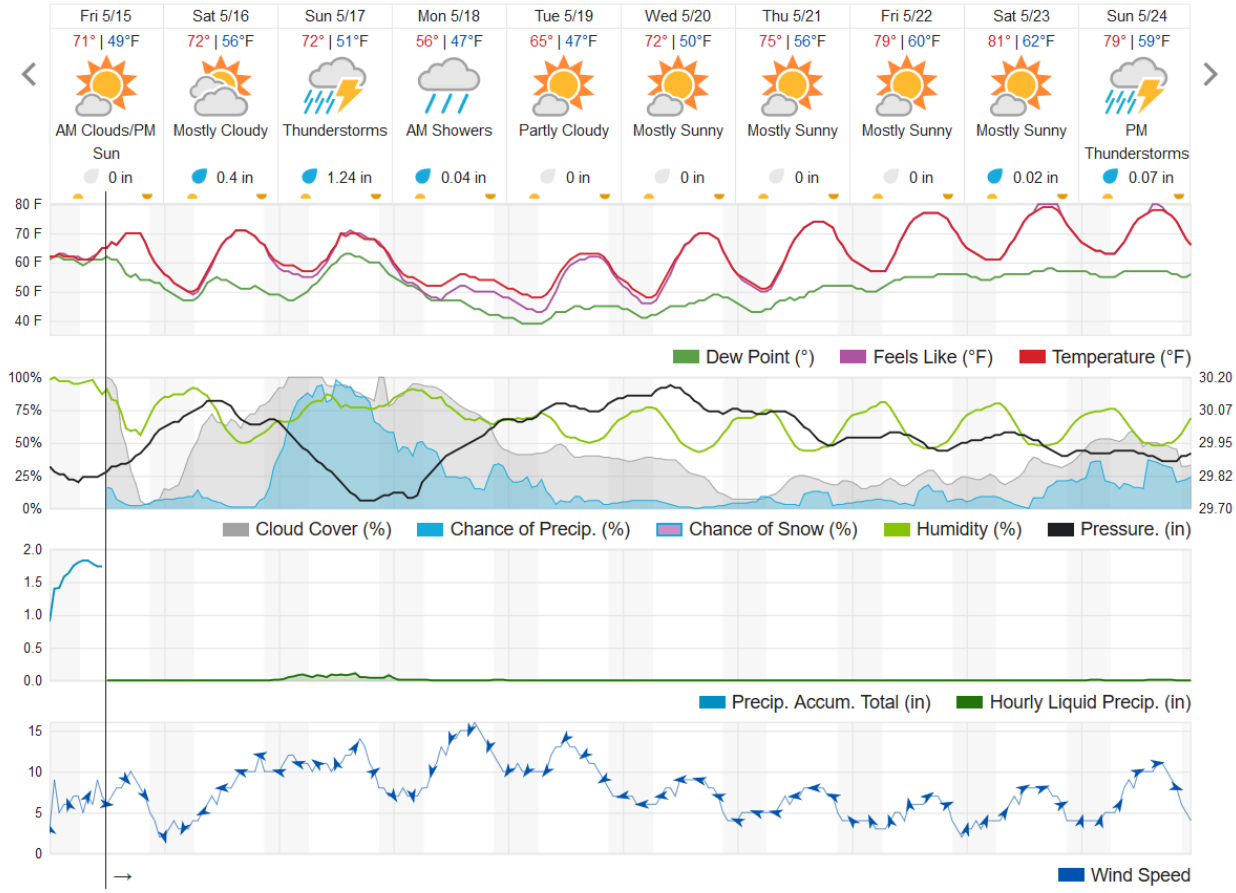


High and low soil temperatures (2" depth) and average air temperature (yellow is projected) according to the Enviroweather station at Mendon. We only lost about 5 °F in soil temps during the deep freeze, but we should see minimum soil temps well over 50 °F by next week.

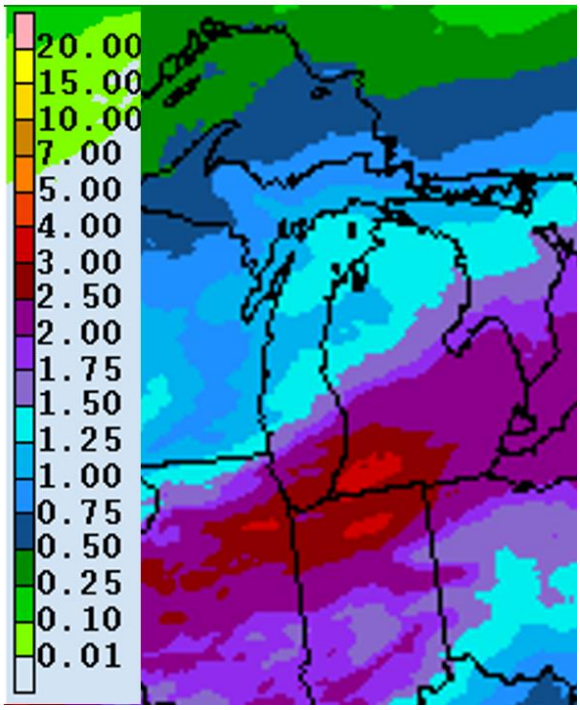
Now for the good news. Looking back over the past couple of weeks, precipitation was roughly 50% of normal which freed many up to get a considerable amount of field prep and planting done. We now have a "week off" with rainfall predictions as high as 3 inches over the long weekend. Spring temperatures are also approaching with daily highs in the 70's next week and—wait for it—even approaching 80 °F by late next week. These conditions will be prime for getting the crops that were planted out of the ground quickly. Predictions for the end of May are also calling for warmer than normal conditions, and although the June outlook won't come out until the end of next week, MSU Extension's ag climatologist Jeff Andresen says they should be pointing toward warmer and wetter than normal weather.



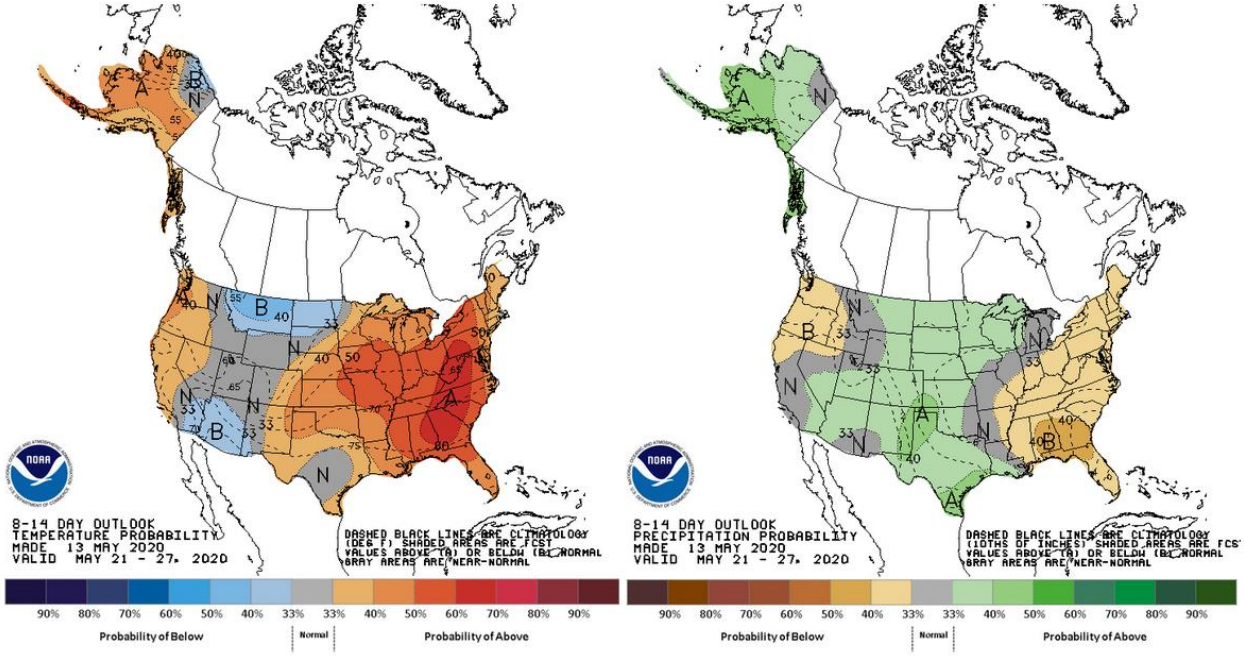
Precipitation over the past 14 days, reported on May 14th in inches (left) and as a percentage of normal (right)…dry conditions resulted in a lot of field prep and planting being done in the southwest.



The 10-day forecast for Centreville as of May 15th. **Do I see an 80° prediction here?**



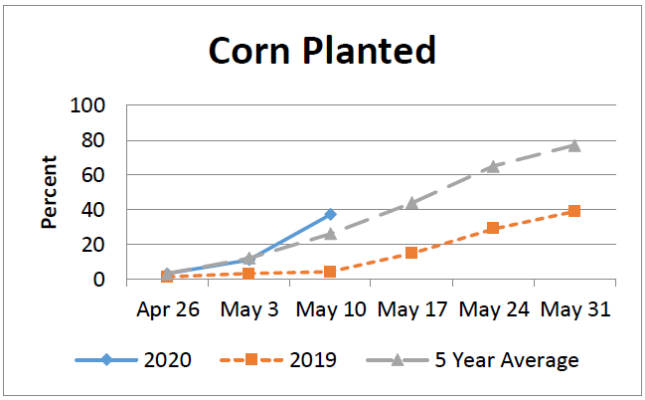
Precipitation forecast for May 14-21. All of this is predicted to fall by Monday morning.

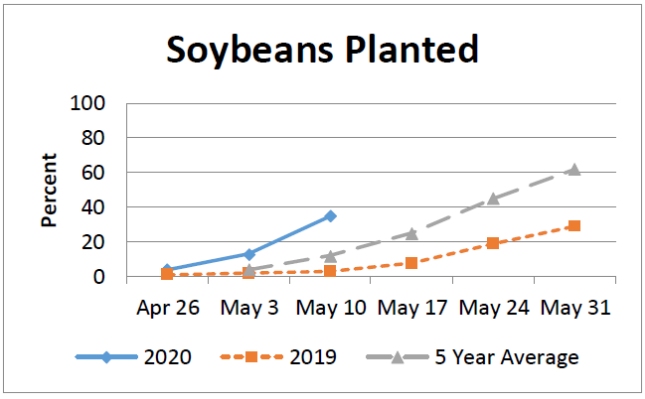


The 8-14 day outlook from May 21-27 for temperature (left) and precipitation (right). The 6-10 day outlook predicts even higher chances for warmer-than-normal temps and leaning toward wetter than normal.

Crop Update

Corn and Soybean. As noted above, the two newsworthy topics are the planting progress achieved during the drier weather these past two weeks, and the potential crop injury associated with the freezing temperatures of this past week. As of May 10, 37% of the corn crop in Michigan was planted, a full 25% more than the previous week and 11% more than the 5-year average. Only 3% of that had emerged which is a good thing with regards to avoiding freezing air temperatures. Similar progress was made in soybean with 35% planted (23% ahead of average) and 2% emerged. What did emerge ahead of the freeze last Saturday looks like it sustained significant injury. Fortunately, most of what has emerged this week looks like it has sustained less severe injury, if any. MSU Extension soybean educator Mike Staton says we'll need to scout after beans emerge to look for signs of imbibitional chilling that may have occurred for those crops that were planted right before (or during) the deep freeze.





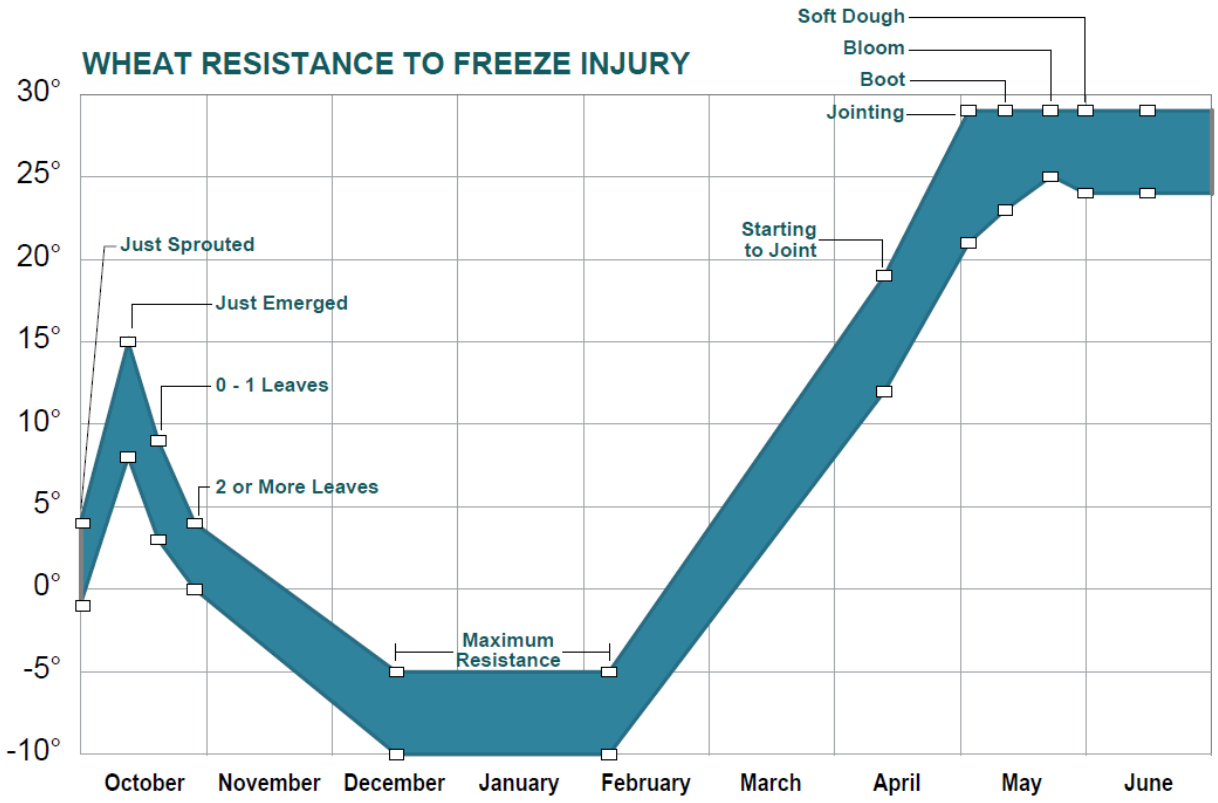
Planting progress in Michigan as of May 10 according to the USDA Crop Progress report. Thanks to the dry weather last week, we are ahead of the 5-year average with both crops.

Corn that emerged prior to last Saturday. Scouting this field over the coming week will show to what extent any freeze injury occurred. Photos courtesy of MSU and Purdue Extension irrigation educator Lyndon Kelley.

Soybean in early April that had emerged prior to the freezing temperatures last Saturday. Photos courtesy of Lyndon Kelley.

Soybeans that had just emerged prior to the freeze event on May 9. The unifoliate leaves were scorched on some plants (left) but remained healthy on others (right). Although certain varieties normally have a purple hypocotyl (middle), it appears beans in this field may have suffered freezing injury. Scouting in the coming week will determine the extent of any injury. Photos courtesy of Eric Anderson.

Wheat/Small Grains. Most wheat in the region is at jointing in Feeke's 6 (first node visible), 7 (second node visible) or 8 (flag leaf emerged). According to the most recent USDA Crop Progress report, 59% of Michigan wheat was rated excellent or good and another 32% as fair. The graph below taken from the bulletin Spring Freeze Injury to Kansas Wheat by Kansas State Extension shows that the more advanced the wheat, the more susceptible it is to freeze injury. According to the table from the same source, wheat at jointing is susceptible to injury at 24 °F which was measured at many locations in the region last weekend. On the MSU Extension Field Crops Team's Virtual Breakfast this week, wheat specialist Dennis Pennington talked about how to scout and assess freeze injury. Dennis also wrote an article and produced a YouTube video describing further how to scout and identify freeze injury in wheat.



Temperatures that cause freeze injury to winter wheat at different growth stages. This graph is taken from Spring Freeze Injury to Kansas Wheat by Kansas State Extension, so the timeline on the x-axis does not exactly align with ours.

Growth stage	Approximate injurious temperature (two hours)	Primary symptoms	Yield effect
Tillering	12 F (-11 C)	Leaf chlorosis; burning of leaf tips; silage odor; blue cast to fields	Slight to moderate
Jointing	24 F (-4 C)	Death of growing point; leaf yellowing or burning; lesions, splitting, or bending of lower stem; odor	Moderate to severe
Boot	28 F (-2 C)	Floret sterility; spike trapped in boot; damage to lower stem; leaf discoloration; odor	Moderate to severe

Symptoms and yield effect from freeze injury to winter wheat at different growth stages. This table is taken from Spring Freeze Injury to Kansas Wheat by Kansas State Extension.

Wheat stem at Feeke's 7 showing two nodes (circles). Slice the stem just above the uppermost node (arrow) to expose the growing point.

A healthy (left) and injured (right) wheat growing point. To find the growing point, slice the stem lengthwise just above the uppermost node. If it is yellow/green and turgid (firm), it is healthy, but if it has turned white or brownish, is flaccid (limp) and possibly has a foul "silage" smell, it has been injured. Pictures are taken from Spring Freeze Injury to Kansas Wheat by Kansas State Extension.

Growing point of wheat (left and center) and the head of barley in the boot (right) taken from fields in St. Joseph County. Photos courtesy of Eric Anderson.

Wheat field in St. Joseph County. Some leaf scorching was observed although the overall health of the crop looked good. Scouting in the coming week will help determine the extent of injury to the growing point. Photos courtesy of Eric Anderson.

Barley at Feeke's 9-10 with the head in or nearly in the boot. Purpling of the stem and leaves could be due to nutrient deficiencies (e.g. phosphorus) or a buildup of anthocyanin pigment due to plant stress, but it is not itself a good indicator of injury. Split open the stem or flag leaf sheath to reveal the head and note color, firmness, odor, etc. Photos courtesy of Eric Anderson.

Potato. Cold soil temperatures have affected potato development and emergence this spring. The following observations are provided thanks to Karl Ritchie, lead agronomist with Walther Farms. "A handful of potatoes had emerged last Friday before the frost burnt them back. We expect emergence by the end of this week. It's been a cold slow spring for potato emergence. The crop is taking an extra 2 weeks to emerge compared to

normal. But we had good planting weather and got the crop planted about 1 week ahead of schedule = bottom line, about 1 week behind."

Alfalfa. Established stands are 6-12 inches tall with slower growth this season due to cold temperatures. Established alfalfa stands can be damaged at temperatures of 25-27 °F or lower with injury affecting leaves, buds and growing points according to Steve Barnhart at Iowa State University. As can be seen in the picture below, it is possible for only parts of plants to be injured while adjacent plants appear unaffected. For alfalfa seedlings at the second trifoliate leaf stage (and older) "seedlings become more susceptible to cold injury and may be killed by four or more hours at 26 °F or lower temperatures," according to Barnhart.

Alfalfa freezing injury. Scouting in the coming week will determine to what extent this crop has died back and what impact on first-cutting yield the freezing temperatures will have. Photos courtesy of Eric Anderson.

Alfalfa seeding that had emerged prior to Saturday, May 9. Photos courtesy of Lyndon Kelley.

Calendar

Titles are clickable links to online content when highlighted and underlined

May 21 **MSU Extension Field Crops Virtual Breakfast Begins.** 7:00-7:30 AM. "Postemergence Weed Control" with Erin Burns. Participants must sign up to receive an email notification with instructions for joining the Virtual Breakfast. You only need to do this once and you will receive the Zoom link and call-in phone number, as well as weekly reminders every Wednesday.

May 28 **MSU Extension Field Crops Virtual Breakfast Begins.** 7:00-7:30 AM. "Dry Bean Planting" with Scott Bales. Participants must sign up to receive an email notification with instructions for joining the Virtual Breakfast. You only need to do this once and you will receive the Zoom link and call-in phone number, as well as weekly reminders every Wednesday.

As you can tell, there is not a lot on the calendar at this point besides the Virtual Breakfast which has become one of our team's flagship outreach programs. Here is the tentative schedule although it is fluid based on pressing needs, e.g. switching the wheat and post-emergent weed control topics to address post-freeze issues. And remember, RUP credits are now available for the live sessions (2 sessions = 1 credit). If you can't participate in the live session on Thursdays at 7 a.m., you can view the recorded version at any time. Recordings are closed-captioned and available on the MSU Extension Field Crops webpage and social media platforms: Spotify, Apple Podcasts, YouTube, Facebook and Twitter.

June 4 - Alternative forages with Kim Cassida
June 11 - Sugar beet Cercospora and BeetCast with Daniel Bublitz
June 18 - Drainage design considerations with Ehsan Ghane
June 25 - Farm stress with Eric Karbowski
July 2 - Organic field crop production with Vicki Morrone
July 9 - Insects taking flight with Chris DiFonzo
July 16 - Stored grain with special speaker
July 23 - Tar spot and white mold with Martin Chilvers
July 30 - Cover crops after wheat with Dean Baas
August 6 - Irrigation and diseases with Lyndon Kelley and Martin Chilvers

August 13 - Alfalfa autotoxicity with Kim Cassida
August 20 - Grain marketing with Aleks Schaefer
August 27 - Wheat planting with Dennis Pennington
September 3 - Corn silage mycotoxins with Manni Singh
September 10 - Industrial hemp with Kurt Thelen

MSU Extension Digest Briefs

PUBLISHED ON MAY 14, 2020

- **Southwest Michigan field crop update – May 14, 2020 -** Cold weather appears to be behind us with warmer temperatures predicted for the rest of May. Now is the time to scout and determine the extent of injury that may have occurred during the recent freeze event.
- **Thin soybean stands can produce surprisingly high yields -** The recent low temperature events reduced emerged soybean stands, but do you need to replant?

PUBLISHED ON MAY 13, 2020

- **Potential survival of potato volunteers in Michigan in 2020 -** Begin scouting for volunteer potatoes, which may serve as possible sources of late blight inoculum. Observed high risk of survival throughout the state.

PUBLISHED ON MAY 12, 2020

- **Assessing freeze injury to wheat in Michigan -** Late season frost can damage wheat, so scout now.
- **Special freeze edition on this week's Field Crops Virtual Breakfast -** May frost/freeze will be the focus for the May 14, 2020, Field Crops Virtual Breakfast.

PUBLISHED ON MAY 8, 2020

- **Giant wasps aren't coming for you -** Facts about the giant invasive hornet.

PUBLISHED ON MAY 7, 2020

- **Southwest Michigan field crop update – May 7, 2020 -** Warmer and drier weather has given farmers the opportunity to prepare fields and plant, but the approaching cold snap should put a halt to spraying and planting operations.
- **Historically low temperature effects on early planted soybeans and soybean planting decisions -** Learn how the predicted low temperatures will affect planted soybean fields and soybean planting decisions over the next five days.

PUBLISHED ON MAY 4, 2020

- **Deadline extended for the water use reporting requirements -** Agricultural water users in Indiana and Michigan have until at least June 1 to report their water use for water source with the capacity to pump 70 gallons per minute.

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