

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.

AG-CITING EXPERIENCE VOLUNTEERS NEEDED

The Ag-Citing Experience is a joint effort by MSU Extension and the St. Joseph County Fair Board where 3rd graders from area schools come to the fair and learn, among other things, where their food comes from and how crops are grown and animals are raised. They come in for two hours, hear several brief talks on different animals and crops, take a hay ride, and spend some time at the fair or head back to school.

We will have a full house this year! The program will run both in the morning (9:30–11:30) and afternoon (11:30 am – 1:30 pm) on Tuesday, Wednesday and Friday the week of Sept. 16th. Back this year will be members of the St. Joseph Valley Old Engine Association to drive their antique tractors and pull the wagons for the always-popular hay rides.

We need volunteers for **tour guides** for each class and **resource people** for each station: dairy/beef cattle, poultry, sheep/goats, rabbits, and swine. Don't worry about not knowing enough about a given topic—remember, these are 3rd graders and most are not from the farm. We've had adult and student volunteers doing a great job in each of these roles in the past, and we're looking forward to working with another group this year. If you are interested in volunteering or learning more, please contact Eric at the MSU Extension office (269-467-5511, eander32@msu.edu).

MICHIGAN WHEAT PROGRAM 2019-20 REQUEST FOR PROPOSALS

The Michigan Wheat Program has made available their request for research funding proposals for the next growing season. According to the RFP, “Innovation is very important to Michigan’s wheat farmers and they are looking for projects that illustrate out of the box thinking and ideas that could prove to provide new markets for them, increase yields or provide new production techniques.” Do you have any ideas for questions you want answered or practices you have been wondering about and would like to work with Extension to get funding for a project? Let me know ASAP as their deadline is August 9 and MSU needs a couple of weeks ahead of that for proposal processing.

TISSUE SAMPLING TO “DIAL IN” FERTILITY NEEDS

There are several ways to estimate crop fertility needs depending on the crop, and each has its own level of resolution. For example, you could use an across-the-board approach such as “corn needs 1 lb (or 0.8 or 1.2 or...) N per bushel of expected yield”. This would be the blunt hammer approach. You could perform aggregate soil sampling for a field and apply, for example, a recommended amount of P and K over the whole field which would be a bit more refined. You can also do testing according to management zones, soil types, using X number of acres per grid—all of these would allow you to increase the specificity on your applications based on soil/crop need. However, soil sampling is not the best way to measure whether your crop has sufficient levels for all nutrients. For example, nitrogen and sulfur are two that are better measured with tissue sampling to determine sufficiency. With soybeans approaching or already moving through beginning flowering (R1) and “early” corn fields having reached tasseling (VT), tissue testing is still a valid option for determining whether further fertilizer applications are needed, particularly for those set up to fertilize through irrigation (i.e. fertigation).

MSU’s Soil and Plant Lab does not conduct most types of tissue testing—they will send those samples out to other labs like A&L Great Lakes Labs in Fort Wayne. There are numerous labs around the country that will perform these services. I personally like to use A&L because I can send shipments to them via UPS Ground and get them there overnight—especially important when dealing with tissue samples. They

have a resource called the [Plant Analysis Sampling Guide](#) which is useful no matter what lab you use. It gives general guidelines on how to collect and transport samples, including:

- Never send fresh samples in sealed plastic bags unless kept cool [I always use paper bags and don't refrigerate unless storing samples for a number of days as condensation will result]
- Never freeze samples
- Do not include roots with samples for nutrient analysis
- Don't send samples on Friday, they will just end up sitting in unconditioned space over the weekend [that's my recommendation]

The guide also contains crop-specific details about sampling based on the crop's growth stage. The table below contains a small selection of the information in the guide. Note: knowing which soybean trifoliolate to select was addressed by Purdue's Shaun Casteel in [a quick YouTube video](#).

Crop	Growth stage	Plant part / Sampling instructions
Alfalfa	Bloom or prior	Top 6" (12 plants)
Corn	V1-V4	Whole plant (15+ plants)
Corn	V5-Vn	Top leaf w/ collar (15+ plants)
Corn	Tasseling-Maturity	Ear leaf (15+ plants)
Soybeans	Emergence-V2	Whole plant cut 1" above soil (15+ plants)
Soybeans	V3-Maturity	Recent fully developed leaf, no petiole (50+ plants)

Select crops, growth stages, and instructions for tissue sampling, courtesy of A&L Great Lakes Labs. Note: upon contacting A&L, I was told that 50 soybean plants is likely overkill, ~25 is reasonable.

WBC TRAPPING REPORT

Purdue's current trapping report shows a significant rise in western bean cutworm (WBC) moth captures this past week. The table below is a selection of more northern sites. Since corn in our area is pre-tassel in many fields, we have a lot of prime egg-laying ground. Scouting should commence now and continue for the next several weeks. You can refer to these MSU Extension articles regarding scouting for WBC: ["Managing western bean cutworm in field corn"](#) and ["Time to scout and manage western bean cutworm in southern Michigan."](#)

County	WBC Trapped			
	Wk 1	Wk 2	Wk 3	Wk 4
	6/20/19-	6/27/19-	7/4/19-	7/11/19-
	6/26/2019	7/3/2019	7/10/2019	7/17/2019
Elkhart	1	2	28	118
Jasper	0	1	31	252
Jasper	5	3	7	114
Lake	0	1	4	10
Lake	0	1	12	16
Lake	1	0	0	19
LaPorte	4	1	40	45
Marshall	1	1	5	16
Marshall	0	0	8	105
Porter	0	0	1	9
Pulaski	6	0	0	30
Pulaski	2	0	0	1
St. Joseph	0	0	5	
St. Joseph	0	0	5	10
Starke	0	0	1	21
Sullivan	0	0	4	0
Sullivan	0	0	3	0
Sullivan	0	0	0	0
Whitley	0	0	1	8
Whitley	0	0	2	11

WEATHER AND CROP UPDATE

Corn and Soybeans: Earlier-planted corn fields have reached tasseling (VT) and are on their way to silking (R1). As the picture below shows, however, those fields may be right next door to a field still at V10. The same could be said about soybean. This will make the window of concern for pests such as western bean cutworm that much longer (see above). Japanese beetle damage has been severe on isolated soybean plants, but the injury on a field scale is not enough to warrant treatment.



Adjacent corn fields at V10 (left) and R1 (silking, right and background) exemplify challenging planting conditions in 2019.



Japanese beetle feeding and mating in soybean...looks ugly, but this level of injury does not warrant treatment.

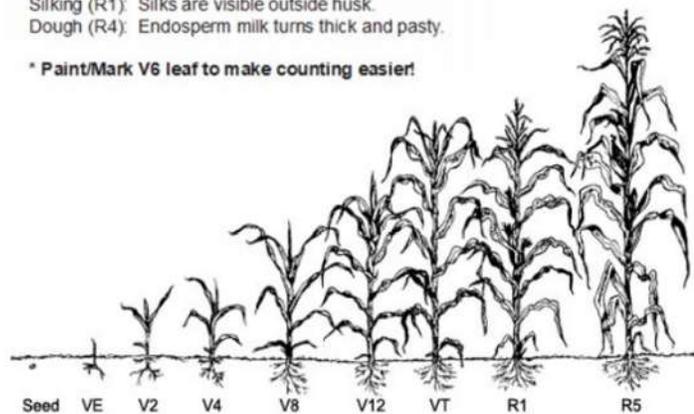
With the recent hot and dry weather, crop water needs are on everyone's mind. MSU Extension has numerous tools to assist with irrigation topics. Visit the [MSU Extension Irrigation website](#) to find out more. [Enviroweather](#) also has useful tools based on local weather data. On the main page, after clicking on a site closest to you on the map, scroll down to "Water-use tools" where you will find resources including the [Soil Water Balance Sheet](#) which is where the graphics for corn and soybean below came from. You can get estimates on the daily crop water usage based on current and forecasted weather data. You can also sign up to receive daily text messages with this information.

Crop Stage	K _c	Rooting Depth	% Growing Season
V2	0.2	6	10
V4	0.20	10	15
V6	0.39	15	20
V8	0.56	20	27
V10	0.76	23	34
V12	1.0	26	50
V14	1.1	28	55
V16-VT	1.2	30	60
Silking	1.2	30	65
Blister	1.2	30	70
Dough	1.2	30	75
Begin Dent	1.2	30	80
Full Dent	1.0	30	85
Black Layer	0.66	30	90
Full Maturity	0.11	30	100

Corn Growth Stages

2 leaf (V2): Two collars visible.
 4 leaf (V4): Four collars visible.
 6 leaf (V6): Growing point above ground, tassel forms.*
 8 leaf (V8): Ear formation begins.
 Silking (R1): Silks are visible outside husk.
 Dough (R4): Endosperm milk turns thick and pasty.

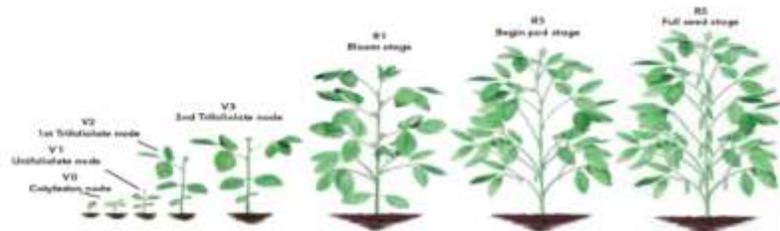
* Paint/Mark V6 leaf to make counting easier!



Corn growth stages and crop water usage coefficient (K_c) at different stages, as found in [Soil Water Balance Sheet](#).

Soybean Growth Stages

- V0 Cotyledon node 0 -- cotyledons extended
- V1 Unifoliate node 1 -- unifoliate leaves expanded
- V2 1st Trifol node 2 -- trifoliate leaves expanded
- V3 2nd Trifol node 3 -- trifoliate leaves expanded
- R1 Begin bloom -- new flower any node
- R2 Full bloom -- flowers at top 2 nodes
- R3 Begin Pod -- A pod 3/16 inch long in any of the top 4 nodes
- R4 Full Pod -- A pod 3/4 inch long in any of the top 4 nodes
- R5 Full Seed -- A seed 1/8 inch long in any of the top 4 nodes
- R6 Full Seed -- A seed filling a pod cavity in 4 top nodes
- R7 Begin Pod Mature (leaf fall) -- one brown pod anywhere on plant
- R8 95% pods mature
- Mature Harvest ready



Crop Stage	Crop coefficient Kc	Root Depth (in)	% of Growing Season
V0 Cotyledon	0.2	6	0
V1 1st Node	0.3	9	4
V2 2nd Node	0.5	12	8
V3 3rd Node	0.6	16	11
R1 Begin Bloom	1.0	24	26
R2 Full Bloom	1.1	24	32

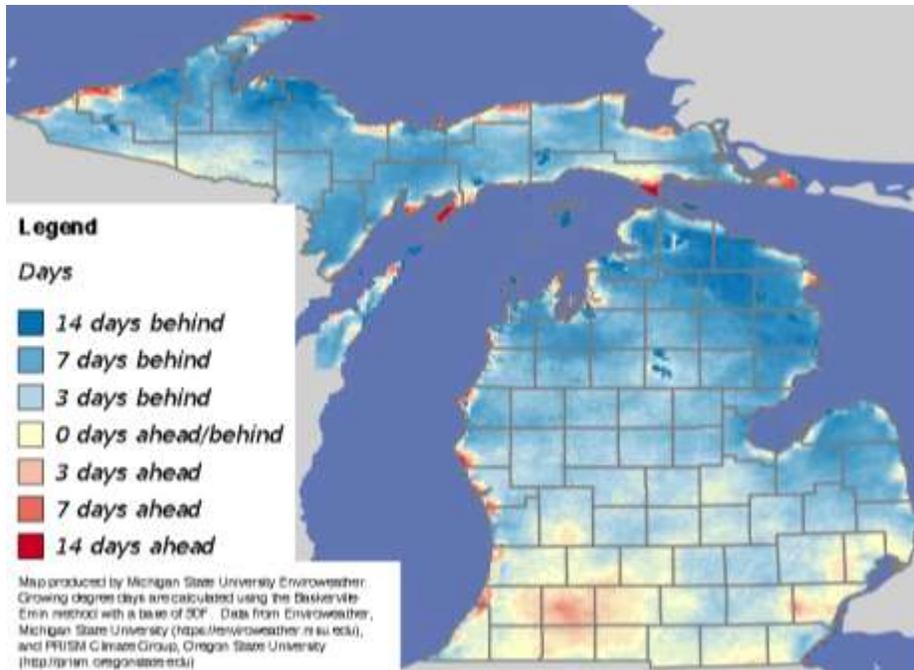
Crop Stage	Crop coefficient Kc	Root Depth (in)	% of Growing Season
R3 Begin Pod	1.2	24	41
R4 Full Pod	1.2	24	50
R5 Begin Seed	1.2	24	63
R6 Full Seed	1.2	24	80
R7 Begin Pod Mature	1.0	24	89
R8 95% Pods Mature	0.2	24	100

Soybean growth stages and crop water usage coefficient (K_c) at different stages, as found in [Soil Water Balance Sheet](#).

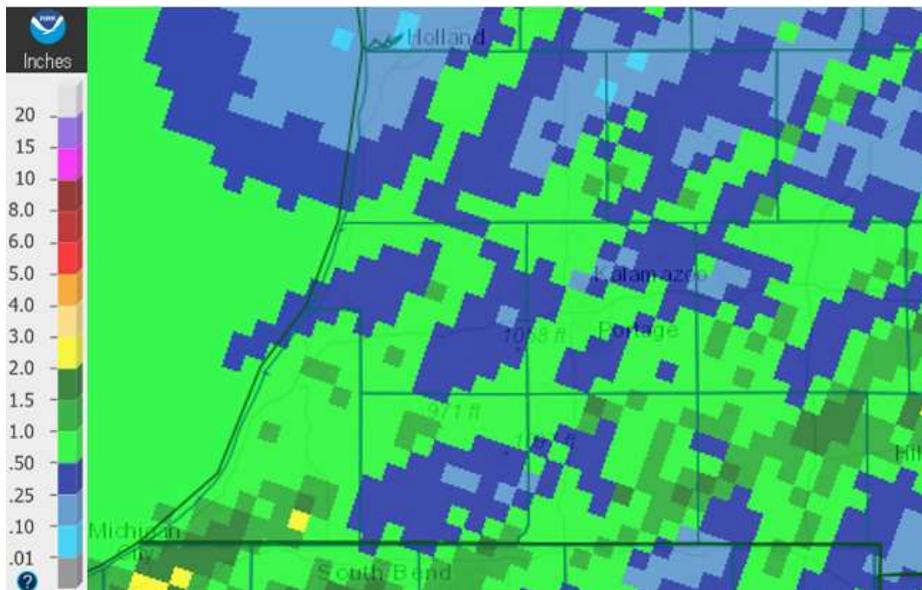
Date	Max Temp °F	Min Temp °F	Ave Temp °F	Chance of Rain	rPET (in.) Daily Total	Corn at VT	Soybean at R1
7/12/2019	79.9	55.3	67.6	--	0.15	0.18	0.17
7/13/2019	89.1	58.5	73.8	--	0.21	0.25	0.23
7/14/2019	83.8	58.1	71	--	0.2	0.24	0.22
7/15/2019	89.9	59.3	74.6	--	0.19	0.23	0.21
7/16/2019	82.9	70	76.4	--	0.1	0.12	0.11
7/17/2019	87.6	69	78.3	--	0.16	0.19	0.18
7/18/2019	85	67.5	76.3	--	0.13	0.16	0.14
7/19/2019	87	77	81.8	64%	0.18	0.22	0.20
7/20/2019	89	76	82.5	45%	0.21	0.25	0.23
7/21/2019	78	71	74.5	76%	0.14	0.17	0.15
7/22/2019	73	59	66	20%	0.17	0.20	0.19
7/23/2019	74	55	64.5	21%	0.19	0.23	0.21
7/24/2019	74	55	64.5	21%	0.18	0.22	0.20
7/25/2019	76	56	66	18%	0.16	0.19	0.18

Example of daily crop water use calculations based on [Enviroweather](#) data. Shaded values are based on predictions.

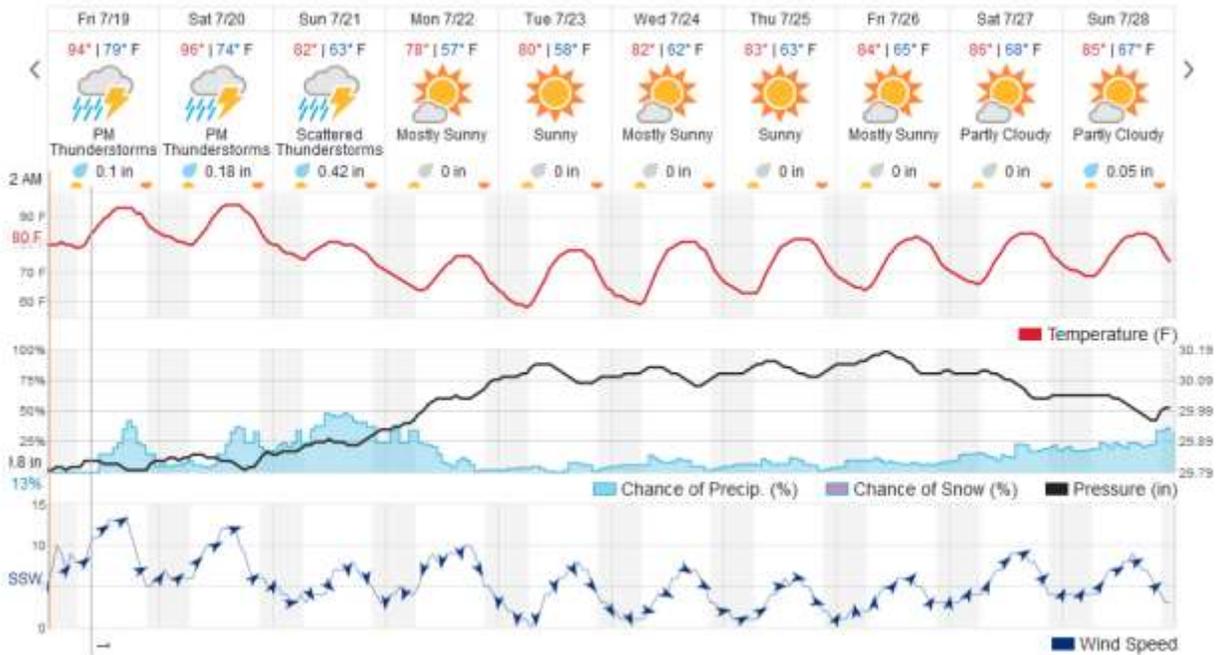
Weather: A trough in the air pattern recently has brought unusually hot and humid conditions that will last through the weekend. Since March 1st we have accumulated nearly 1400 growing degree days with another 160 predicted for the coming week. We are now a few days ahead in heat units which is a reversal from our cool spring. Rainfall this past week throughout the region was spotty with one-week totals ranging from one-hundredth of an inch in Fennville to 1.35” in Coldwater with an average of only three-tenths for the region. A shift in the upper air pattern will be occurring for next week bringing cooler and dryer conditions for the rest of July, but little guidance is currently available for August. The rainfall forecast through next Thursday calls for ¾ to 1.5 inches of rain, most of which will fall between this past Thursday through the weekend.



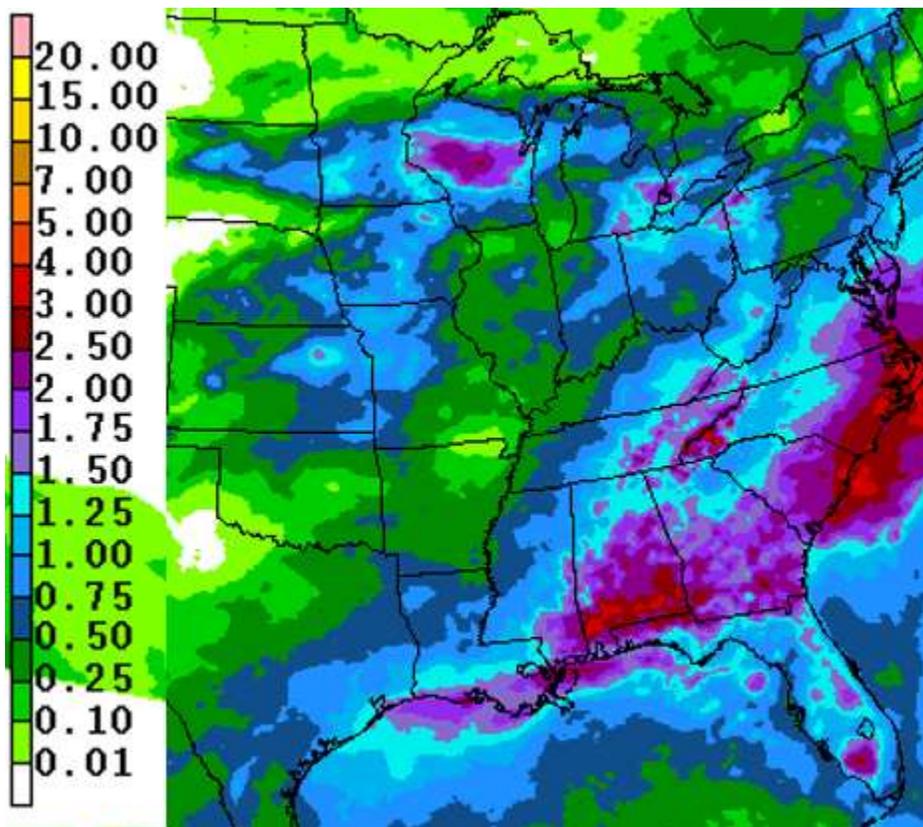
Accumulated growing degree days (base 50F) from Mar 1 – Jul 18, 2019...a much different picture than we had just a month ago.



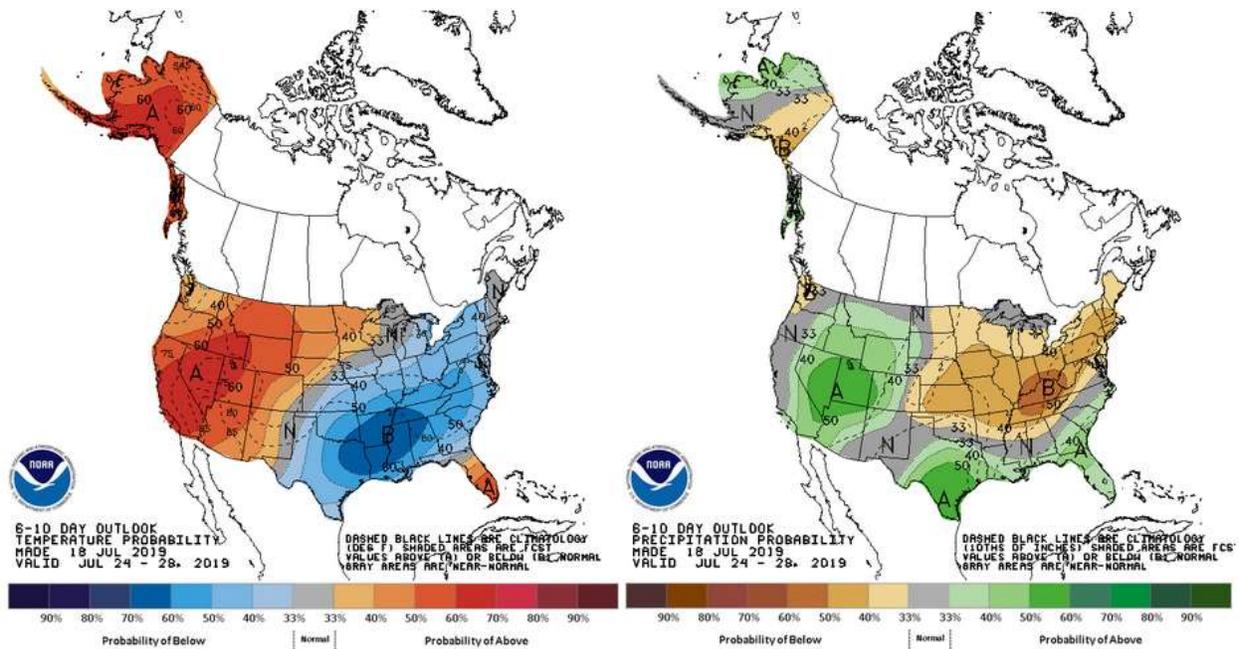
Precipitation totals for week ending July 18, 2019. Rainfall totals at Enviroweather stations in the region ranged from 0.12" (Hastings) to 2.94" (Grand Junction) with an average of 0.59".



The 10-day forecast for Centreville according to wunderground.com.



Forecast for precipitation totals for the week of July 19-26, 2019. The 0.25-1.0 inches for our area will come by the end of the weekend.



National Weather Service 6-10 day outlook (Jul 24-28) for temperature (left) and precipitation (right). The 8-14 day outlook (Jul 26-Aug 1) is similar for temperature but equal chances for precip.

CALENDAR [Note: titles are clickable links to online content when highlighted and underlined]

Jul 22 **Deadline for FSA Acreage Reporting.** The deadline to file crop acreage reports to FSA county offices and federal crop insurance agents for spring-seeded crops is extended for agricultural producers in Michigan impacted by flooding and heavy moisture. Contact your local FSA office for details.

Jul 25 **Field Crops Virtual Breakfast Free Webinar.** Thursdays 7:00-7:30 AM. This week: “Insect Management” with Chris DiFonzo. Join via computer or mobile device (audio and video, <https://msu.zoom.us/j/552324349>) or by phone (audio only, **669-900-6833** and enter meeting ID **552-324-349**). To receive a weekly reminder of the Virtual Breakfast, sign up at <http://eepurl.com/gm-PIv>.

Jul 25-Aug 8 **Industrial Hemp Production 101 Webinar Series.** Thursdays 12:30-2pm. Join MSU Extension for a webinar series to cover the basics of growing industrial hemp, particularly but not exclusively geared toward greenhouse considerations. Register online, cost is \$20.

Jul 26 **Ag Innovation Day - Focus on Precision Technology That Pays.** 8:30am-5:00pm, MSU Research Farm, East Lansing, MI. Day will be split into morning and afternoon tours with a free lunch. Attendees are asked to register beforehand to help with logistics and food ordering.

Jul 31 **Clean Sweep Pesticide Disposal in Benton Harbor.** Available to all MI residents. Collections are for any unwanted pesticides in MI (not fertilizers). Registration is required, forms can be found online or at MSUE and CD offices in Berrien, Cass and Van Buren Counties.

- Jul 31** **Forage Research Field Day.** 9am-2pm. MSU Agronomy Farm, 4450 Beaumont Road, East Lansing, MI. Join the MSU Forage Research Team to learn about completed and ongoing forage research from our field tour and demonstration stations. Event is free but you must register online by July 22nd to reserve space and the free lunch.
- Aug 2** **Tools to Navigate a Challenging Farm Economy.** 8:30am-1:00pm. GreenStone FCS, 225 W. Lyons Street, Schoolcraft, MI. Topics include FSA updates, Crop insurance options, Finding Financial Success in Uncertain Times, Weathering the Storm-managing farm stress. Cost is free, register online by July 31st to reserve space and lunch.
- Aug 16** **SW MI Crop and Irrigation Research Field Day.** 8:30am-1pm. N. Centreville Rd. ½-mile south of Featherstone Rd., Sturgis, MI. Join MSU crop and irrigation educators and specialists for several talks highlighting ongoing research and current recommendations in irrigated corn and soybean. Cost is free, register online by Aug. 14th to reserve space and lunch (registration should be live by next week).
- Aug 20-21** **2019 Bridging the Experience Gap.** Saginaw Valley Research and Extension Center, 3775 S Reese Rd, Frankenmuth, MI. This program provides a platform for professionals to gain experience, network with their peers and ask questions from knowledgeable instructors without fear of rejection or criticism. Cost is \$350, supplies and lunches included, register online.
- Sep 5** **Cass MAEAP Field Day.** 4-7pm. Crane Pond DNR office, 60887 M-40, Jones, MI. Managing for Forestry Health and Profit. Program offers 2 RUP credits. Co-sponsored by SWMLC, DNR, SWxSW CISMA & MAEAP. Dinner provided to registrants. Call 269-445-8641 x 5 to RSVP.

MSUE DIGEST BRIEFS

Potato leafhopper and general insect update for field crops

PUBLISHED ON JULY 18, 2019

General field crop insect comments and potato leafhopper information for alfalfa and dry beans.

Weed control in late planted corn

PUBLISHED ON JULY 18, 2019

Make weed control in late planted corn a priority.

Enviroweather stations detect low level inversions to help reduce pesticide drift

PUBLISHED ON JULY 18, 2019

Before you spray, check out the Temperature Inversion Tool on MSU Enviroweather.

Michigan potato late blight forecast – July 17, 2019

PUBLISHED ON JULY 17, 2019

No late blight reported. Weather-based risk remains moderate throughout Michigan growing regions.

Horseweed (marestalk) control options in fallow prevent plant fields

PUBLISHED ON JULY 16, 2019

Weed control needs to be a priority in non-planted fields this summer to prevent future weed problems.

Join the irrigated corn and soybean research field day in southwest Michigan

PUBLISHED ON JULY 15, 2019

Research efforts in irrigated corn and soybean production and pest management will be discussed at a field day in St. Joseph County on August 16, 2019.

Forage research field day scheduled for July 31

PUBLISHED ON JULY 12, 2019

Join us for a day of learning on a variety of trending forage topics.

Weighing the risk of cannabis cross-pollination

PUBLISHED ON JULY 12, 2019

Industrial hemp and marijuana growers must work together to ensure a bright future for all sectors of the budding cannabis industry.

Eric Anderson

Michigan State University Extension

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