

## Southwest Michigan Field Crops Updates April 2019

Here are updates from the MSU Extension Field Crops team in Southwest Michigan. This is the last monthly newsletter before we go weekly in May. 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 Crops Virtual Breakfasts 2019

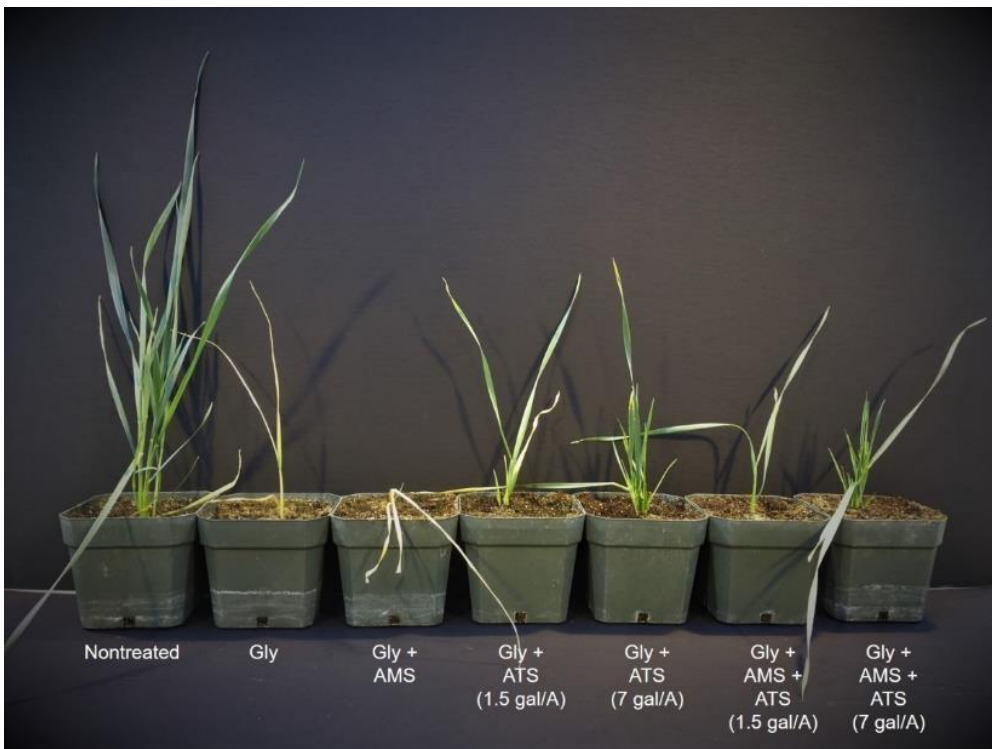
Once again the MSU Field Crops Team will be hosting a “Virtual Breakfast” each Thursday morning from 7:00 to 7:30. Each week someone from the Team will provide a short presentation on a timely topic followed by updates of what we are seeing in the field. Michigan State University Ag Climatologist Jeff Andresen will also share a 7-10 day weather outlook each week. Virtual Breakfasts will run weekly through August starting April 25<sup>th</sup>. You can join by one of the following ways:

- By computer or mobile device (audio & visual), follow the link at <https://msu.zoom.us/j/552324349>.
- By phone (audio only) dial **669-900-6833** and enter meeting ID **552-324-349**.

For those who can't join on Thursdays at 7:00 AM, Virtual Breakfast sessions will be recorded for posting on YouTube and as a podcast, ~24 hours after each session. To receive a weekly reminder of the Virtual Breakfast, sign up at <http://eepurl.com/gm-PIv>.

### Burndown Applications with Ammonium Thiosulfate

In Purdue's latest [Pest and Crop Newsletter](#), their weed scientists conducted a quick study of the impact of applying glyphosate (see photo below, taken 11 days after application) and glyphosate + 2,4-D with and without ammonium thiosulfate (ATS). It appears there is some antagonism between ATS and glyphosate (results were similar with glyphosate + 2,4-D). Herbicides were applied at full label rates under warm conditions in the greenhouse. Though this is just a preliminary greenhouse study, it raised enough concern for them to recommend applying ATS in a separate pass a few days after the burndown.



# Fusarium Head Blight (Head Scab) in Wheat - Part 2

Last month I summarized the first of a two-part webinar by the American Society of Agronomy on fusarium head blight (FHB) in wheat. Here I will summarize the second presentation on management with fungicides. The presenters included Dr. Carl Bradley from U of KY (formerly from U of IL, my alma mater) and Dr. Pierce Paul from Ohio State. In addition to their own research findings, they used materials from the Crop Protection Network ([Fungicide Efficacy for Control of Wheat Diseases](#)) and referenced materials from Take Action ([Fungicide-Resistance Management](#)). They showed some excellent graphics, and I will use those to tell the story below.

## Fungicide Efficacy for Control of Wheat Diseases<sup>1</sup>

Fungicide(s)			Rate/A (fl. oz)	Powdery Mildew	Stagonospora Leaf/Glume Blotch	Septoria Leaf Blotch	Tan Spot	Stripe Rust	Leaf Rust	Stem Rust	Head Scab <sup>2</sup>	Harvest Restriction
Class	Active Ingredient	Product										
Strobilurins	fluoxastrobin 40.3%	Evito 480SC <sup>®</sup>	2.0-4.0	G	U	U	VG	U	VG	U	NL	Feekes 10.5 and 40 days
	picoxystrobin 22.5%	Approach SC <sup>®</sup>	6.0-12.0	G	VG	VG <sup>3</sup>	VG	E <sup>4</sup>	VG	VG	NL	Feekes 10.5
	pyraclostrobin 23.6%	Headline SC <sup>®</sup>	6.0-9.0	G	VG	VG <sup>3</sup>	E	E <sup>4</sup>	E	G	NL	Feekes 10.5
Triazoles	metconazole 8.6%	Caramba 0.75SL <sup>®</sup>	10.0-17.0	VG	VG	U	VG	E	E	E	G	30 days
	propiconazole 41.8%	Tilt 3.6EC <sup>®5</sup>	4.0	VG	VG	VG	VG	VG	VG	VG	P	Feekes 10.5.4
	prothioconazole 41%	Proline 480SC <sup>®</sup>	5.0-5.7	U	VG	VG	VG	VG	VG	VG	G	30 days
	prothioconazole 19% tebuconazole 19%	Prosaro 421SC <sup>®</sup>	6.5-8.2	G	VG	VG	VG	E	E	E	G	30 days
	tebuconazole 38.7%	Folicur 3.6F <sup>®5</sup>	4.0	NL	NL	NL	NL	E	E	E	F	30 days
Mixed Modes of Action <sup>6</sup>	benzovindiflupyr 2.9% propiconazole 11.9% azoxystrobin 10.5%	Trivapro SE <sup>®</sup>	9.4-13.7	VG	VG	VG	VG	E	E	VG	NL	Feekes 10.5.4 14 days
	cyproconazole 7.17% picoxystrobin 17.94%	Approach Prima SC <sup>®</sup>	3.4-6.8	VG	VG	VG	VG	E	VG	U	NR	45 days
	fluxapyroxad 14.3% pyraclostrobin 28.6%	Priaxor <sup>®</sup>	4.0-8.0	G	VG	VG	E	VG	VG	G	NL	Feekes 10.5
	fluapyroxad 2.8% pyraclostrobin 18.7% propiconazole 11.7%	Nexicor EC <sup>®</sup>	7.0-13.0	G	VG	VG	E	E	E	VG	NL	Feekes 10.5
	fluoxastrobin 14.8% flutriafol 19.3%	Preemptor SC <sup>®</sup>	4.0-6.0	U	U	VG	VG	E	VG	U	NL	Feekes 10.5 and 40 days
	propiconazole 11.7% azoxystrobin 13.5%	Quilt Xcel 2.25E <sup>®5</sup>	10.5-14.0	VG	VG	VG	VG	E	E	VG	NL	Feekes 10.5.4
	prothioconazole 16.0% trifloxystrobin 13.7%	Delaro 325SC <sup>®</sup>	8.0	G	VG	VG	VG	VG	VG	VG	NL	Feekes 10.5 35 days
	prothioconazole 10.8% trifloxystrobin 32.3%	Stratego YLD <sup>®</sup>	4.0	G	VG	VG	VG	VG	VG	VG	NL	Feekes 10.5 35 days
	tebuconazole 22.6% trifloxystrobin 22.6%	Absolute Maxx SC <sup>®</sup>	5.0	G	VG	VG	VG	VG	E	VG	NL	35 days

<sup>1</sup> Efficacy ratings: P=poor, F=fair, G=good, VG=very good, E=excellent, NL=not labeled for use against this disease, U=unknown efficacy or insufficient data to rank product.

<sup>2</sup> Application of products containing strobilurin fungicides may result in elevated levels of the mycotoxin Deoxynivalenol (DON) in grain damaged by head scab.

<sup>3</sup> Product efficacy may be reduced in areas with strobilurin-resistant fungal populations.

<sup>4</sup> Efficacy may be significantly reduced if solo strobilurin products are applied after stripe rust infection has occurred.

<sup>5</sup> Multiple generic products containing the same active ingredients also may be labeled in some states.

<sup>6</sup> Products with mixed modes of action generally combine triazole and strobilurin active ingredients. Nexicor<sup>®</sup>, Priaxor<sup>®</sup>, and Trivapro<sup>®</sup> include carboxamide active ingredients.

Strobilurins, aka QoI's (quinone outside inhibitors) have good efficacy on foliar diseases but have very low efficacy on FHB and are not labeled for use against this disease. This table taken from the Crop Protection Network's resource shows several chemistries that have poor to good efficacy against FHB, all of which belong to the triazole family.

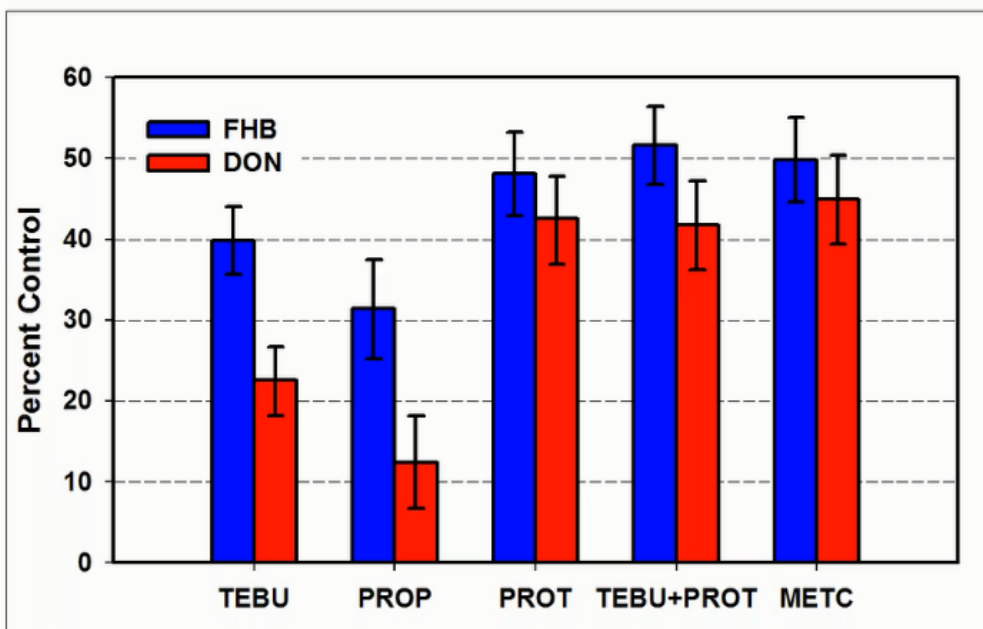
Product Name	Active ingredient(s)	Fungicide class
<b>Caramba</b> (BASF)	Metconazole	Demethylation inhibitor (DMI) – FRAC Code 3
<b>Folicur, others</b> (Bayer, others)	Tebuconazole	DMI
<b>Proline</b> (Bayer)	Prothioconazole	DMI
<b>Prosaro</b> (Bayer)	Prothioconazole Tebuconazole	DMI DMI
<b>Miravis Ace*</b> (Syngenta)	Propiconazole Pydiflumetofen	DMI Succinate dehydrogenase inhibitor (SDHI) – FRAC Code 7



\*Miravis Ace is still pending state registrations as of 2/17/2019



Several DMI fungicides are available to fight FHB when applied at anthesis. Miravis Ace is a premix propiconazole with pydiflumetofen, a new type of fungicide (FRAC 7) that has good control of FHB. Syngenta claims that it has good efficacy when applied ahead of anthesis at 50% head emergence. Miravis Ace is now labeled for use in Michigan as of a couple of weeks ago according to MSU field crop pathologist Marty Chilvers.



TEBU = Folicur  
PROP= Tilt  
PROT= Proline  
TEBU+PROT= Prosaro  
METC= Caramba

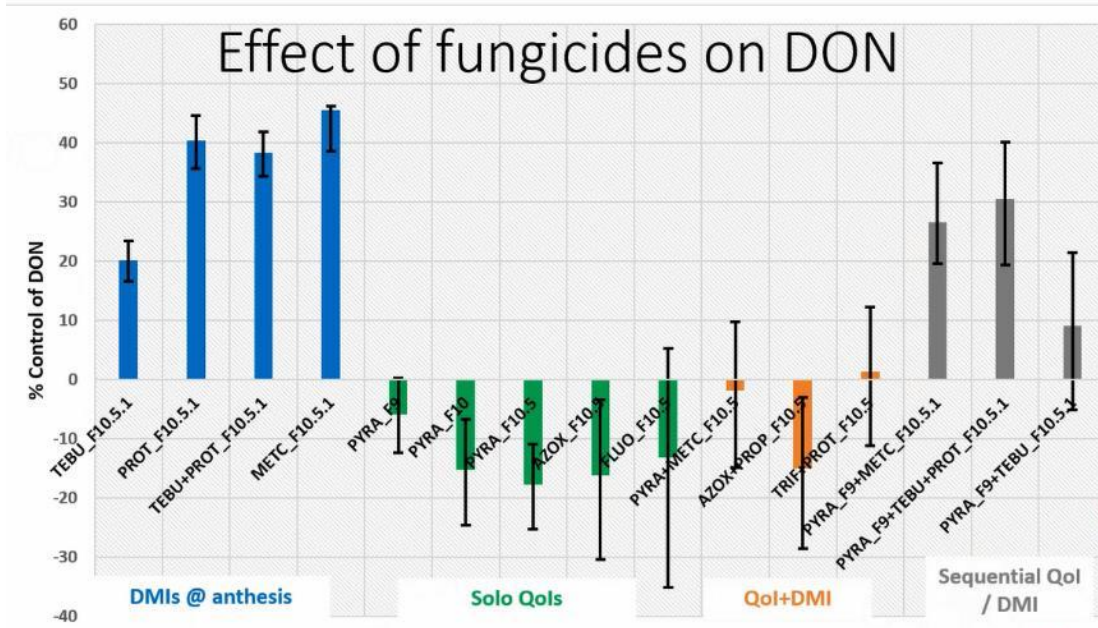
All applications made at anthesis (Feekes 10.5.1)



Paul et al. 2007. Phytopathology 97:211-220  
Paul et al. 2008. Phytopathology 98:999-1011  
McMullen et al. 2012. Plant Disease 96:1712-1728



Several studies have shown that Caramba, Prosaro, and Proline all achieve good control of FHB and reduce DON levels. Other products including Folicur and Tilt have had lower levels of control.



Paul et al. 2018. Plant Disease 102:2602-2615



This chart summarizes a study investigating the question of whether an application of a DMI at anthesis can overcome any increases in DON caused by an earlier application of a QoI. Higher bars represent greater control/reduction of DON. Strobilurins (QoI's) have a tendency to increase DON levels (green bars). Using a DMI at anthesis mixed with a QoI (orange bars) increased DON compared with the DMI alone. Using a QoI earlier in the season followed by a DMI at anthesis (gray bars) resulted in higher control of FHB and lower DON, but it was not able to achieve the same level of control as applying a DMI with no QoI (blue bars).

## Heading: Feekes 10.1-10.5

10.1

10.2

10.3

10.4

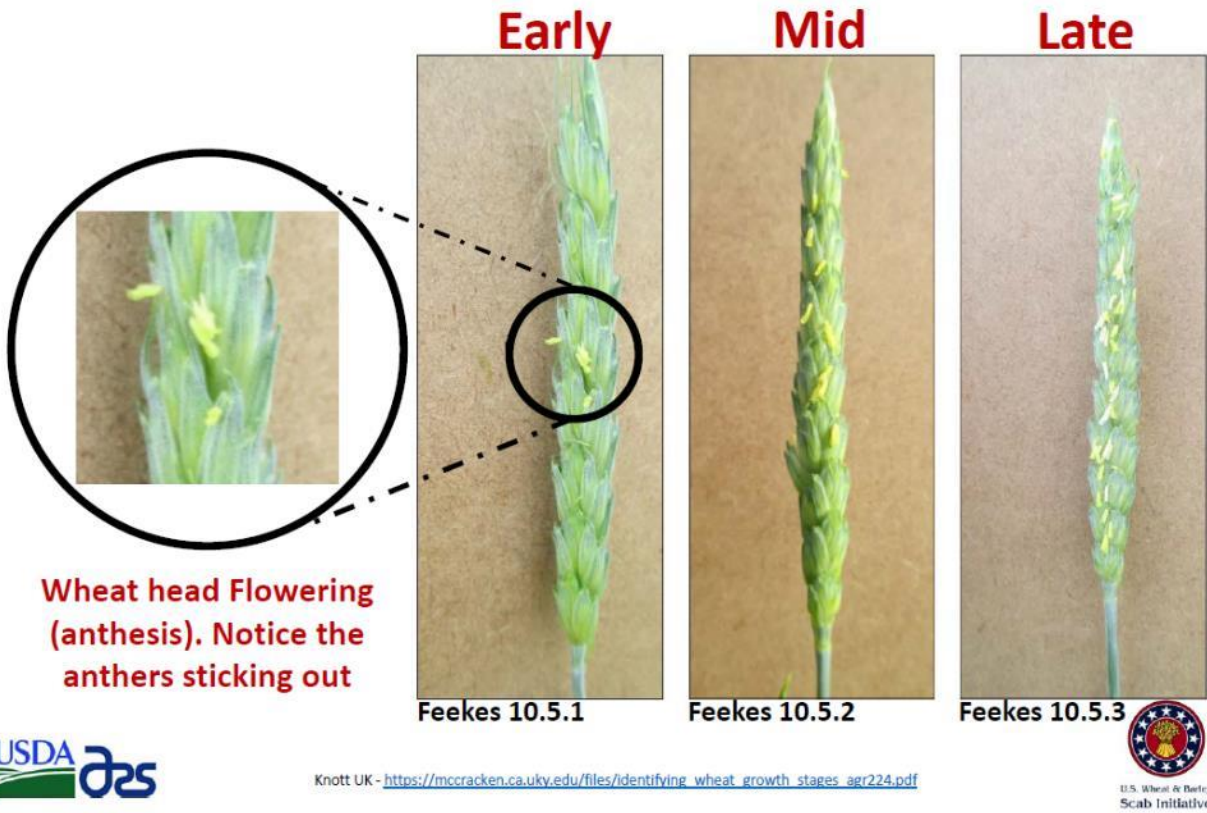
10.5



Warrick Texas A&M - <https://soilcropandmore.info/Newsletter/nl042005.htm>  
 Knott UK - [https://mccracken.ca.uky.edu/files/identifying\\_wheat\\_growth\\_stages\\_apr224.pdf](https://mccracken.ca.uky.edu/files/identifying_wheat_growth_stages_apr224.pdf)



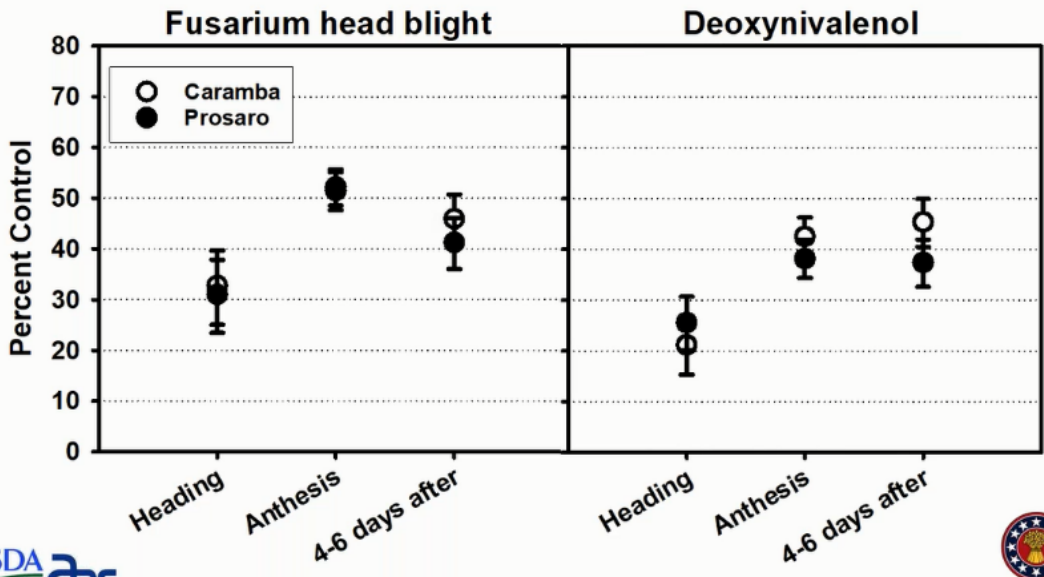
The ideal timing for a FHB fungicide application is anthesis (flowering, Feekes stage 10.5), but sometimes it is not possible to get into the field at that time. Producers have asked whether an application made 5 days before or after the start of anthesis would still be effective. These images show wheat at different stages of heading leading to anthesis...



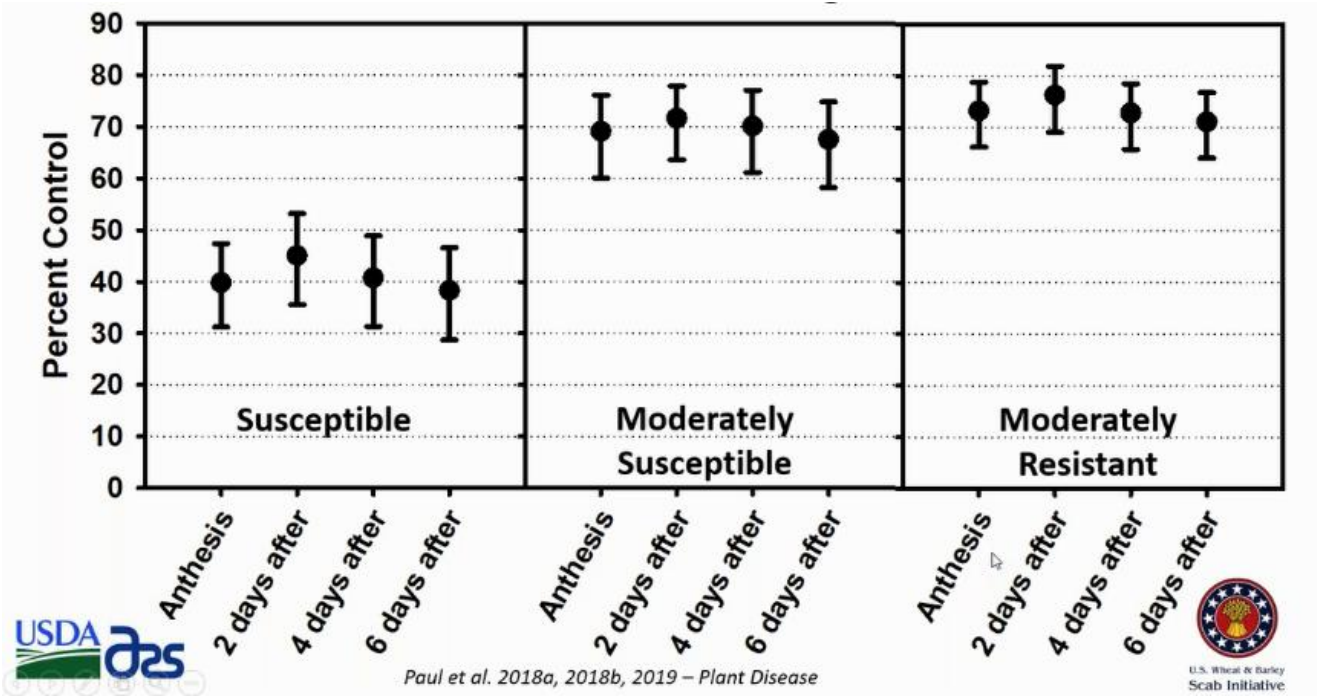
...and these photos show what wheat looks like from early to late anthesis. Growers should target applications when 50% of primary tillers in a field are at Feekes 10.5.1 (few anthers extruded in middle of spike but not high or low) for the best efficacy.

## Fungicide Timing:

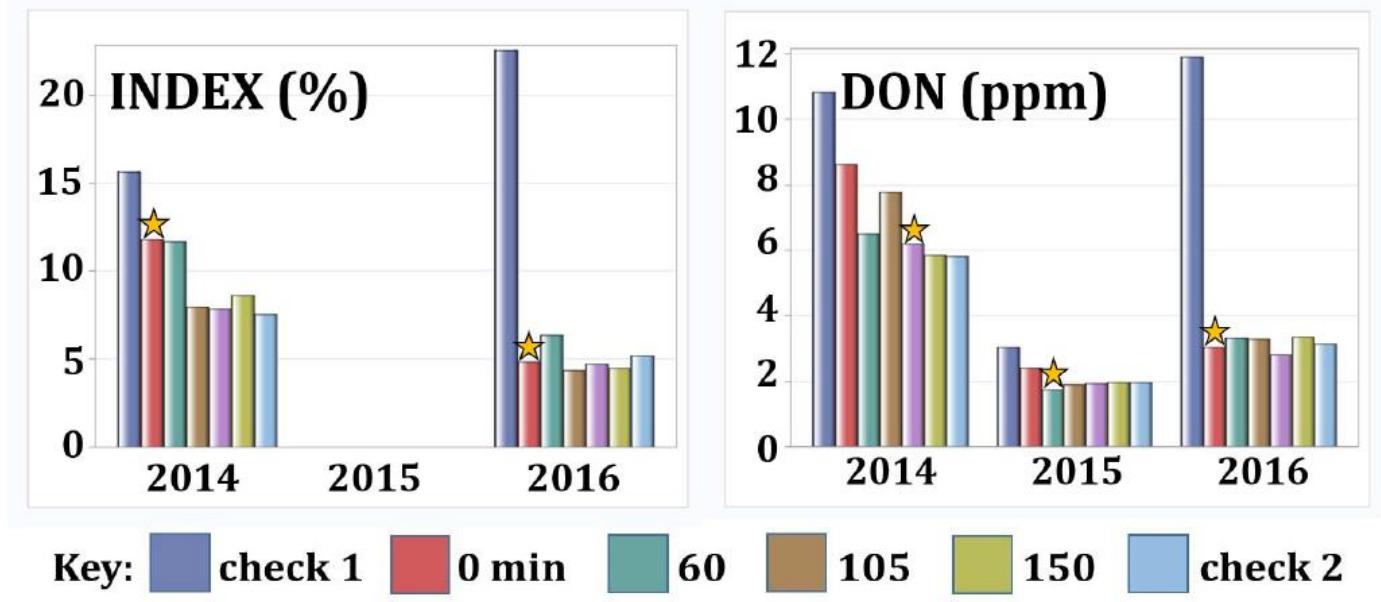
*Pre- and post-anthesis applications of Prosaro and Caramba*



Post-anthesis applications of Prosaro or Caramba were more effective than pre-anthesis at controlling FHB and decreasing DON, so if you cannot get into the field right at early anthesis, it is better to delay by a few days.



These results showed that combining a timely application (anthesis to 6 days after) with selection of a variety having some level of FHB resistance provided good control of FHB and pursuant DON levels.



**Check 1 - Non-treated check, no rainfall**

**Check 2 - Caramba-treated, no rainfall**



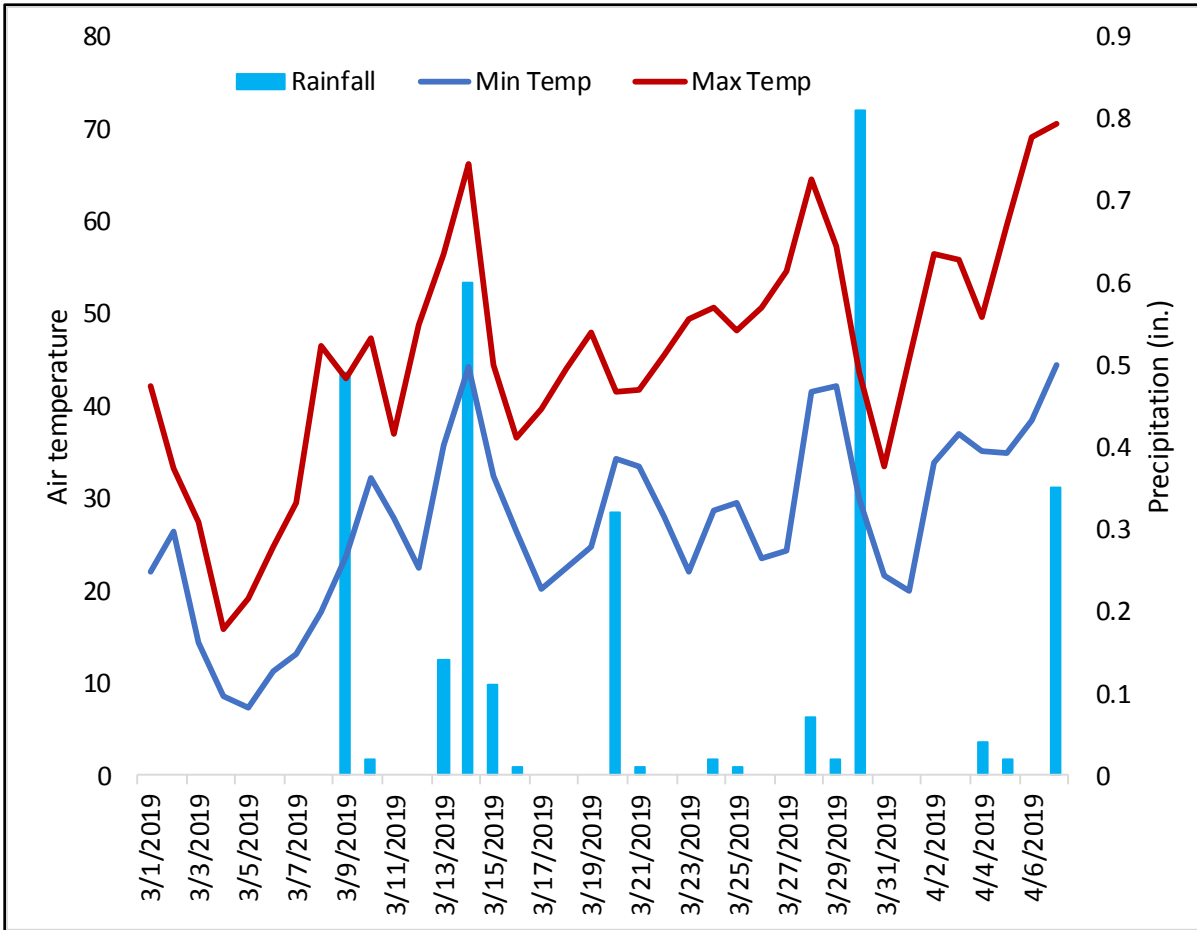
Mills et al 2014 – OSU - [https://scabusa.org/pdfs/forum14\\_proc\\_mgmt.pdf](https://scabusa.org/pdfs/forum14_proc_mgmt.pdf)



How rainfast are FHB fungicides? This study showed that Caramba (similar results were found with Prosaro) is fairly rainfast within an hour in most cases with some reduction when water was applied 0 or 60 minutes after application in one site-year.

# Weather and Crop Update

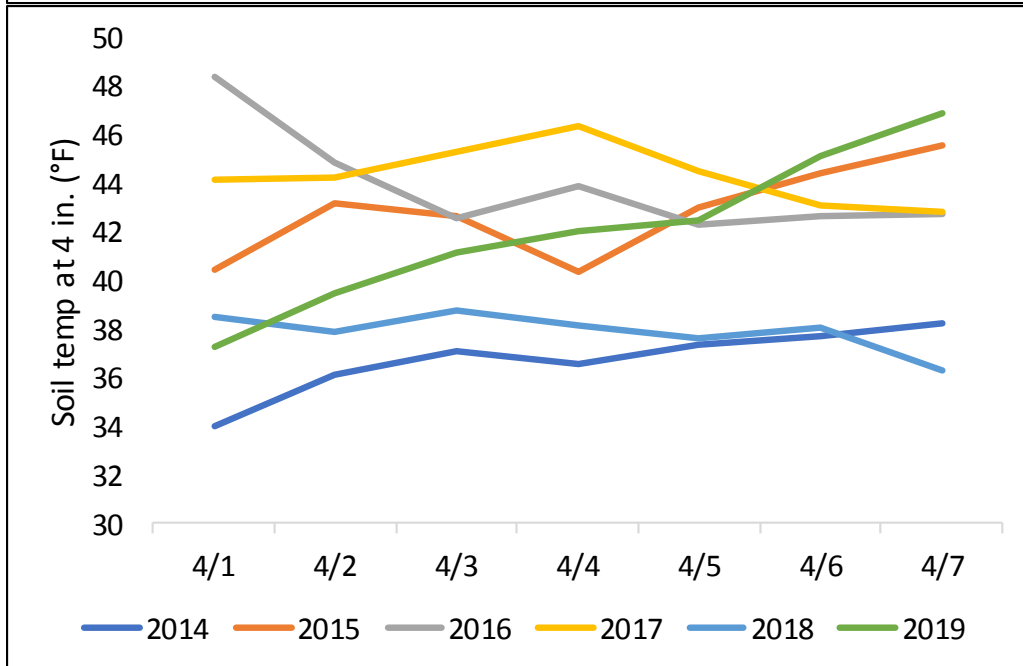
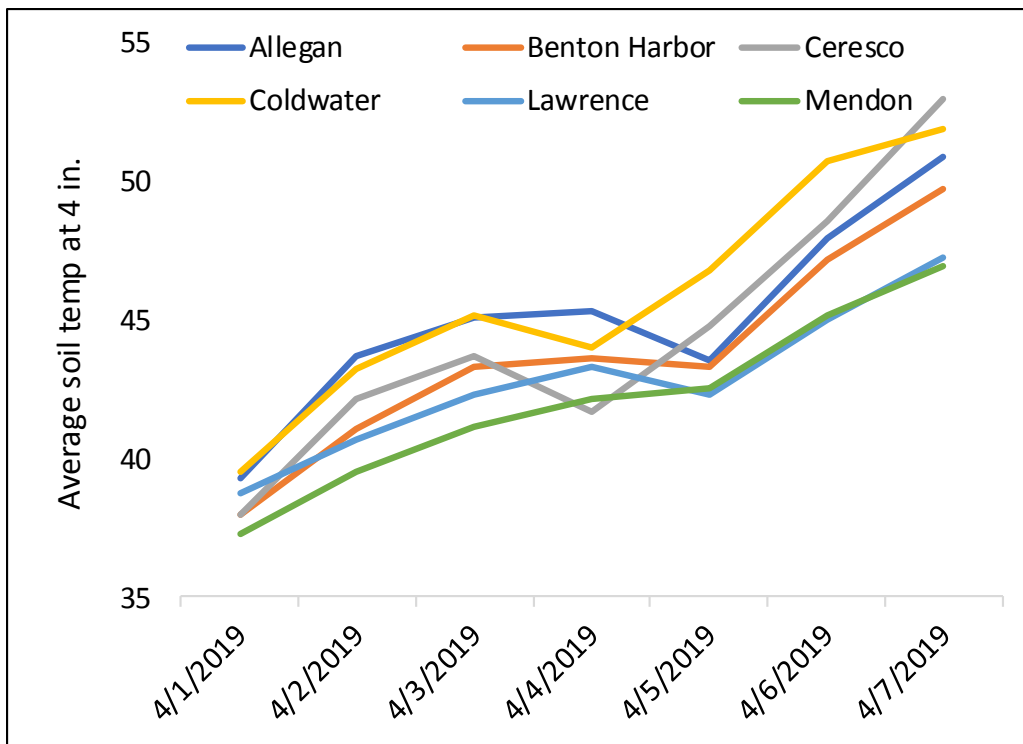
Spring has arrived, and temperatures have been on the increase over the past month. Average temperature for the first week of April was more than double that for the first week of March (46 vs 21 °F). Heat units are about on track with the 5-year average for March 1 to the present – the statewide GDD departure from norm Enviroweather map shows we are 0-3 days behind, but the numbers for the Mendon station (see below) show us just a touch ahead of normal. This increase has caused soil temps to warm significantly, surpassing temps from the past 5 years for the first week of April. With NOAA’s 6-10 and 8-14 day outlooks predicting normal temperatures and the 3-4 week outlook predicting warmer than normal temperatures, we may see early planting conditions this year if soils dry out.



Maximum and minimum air temperature and rainfall at the Enviroweather station in Mendon, St. Joseph County.

Year	GDD Base 42 °F	GDD Base 50 °F
<b>2019</b>	<b>103</b>	<b>34</b>
2018	22	2
2017	120	34
2016	175	65
2015	93	29
2014	40	8
<b>Average, not including 2019</b>	<b>90</b>	<b>27.6</b>

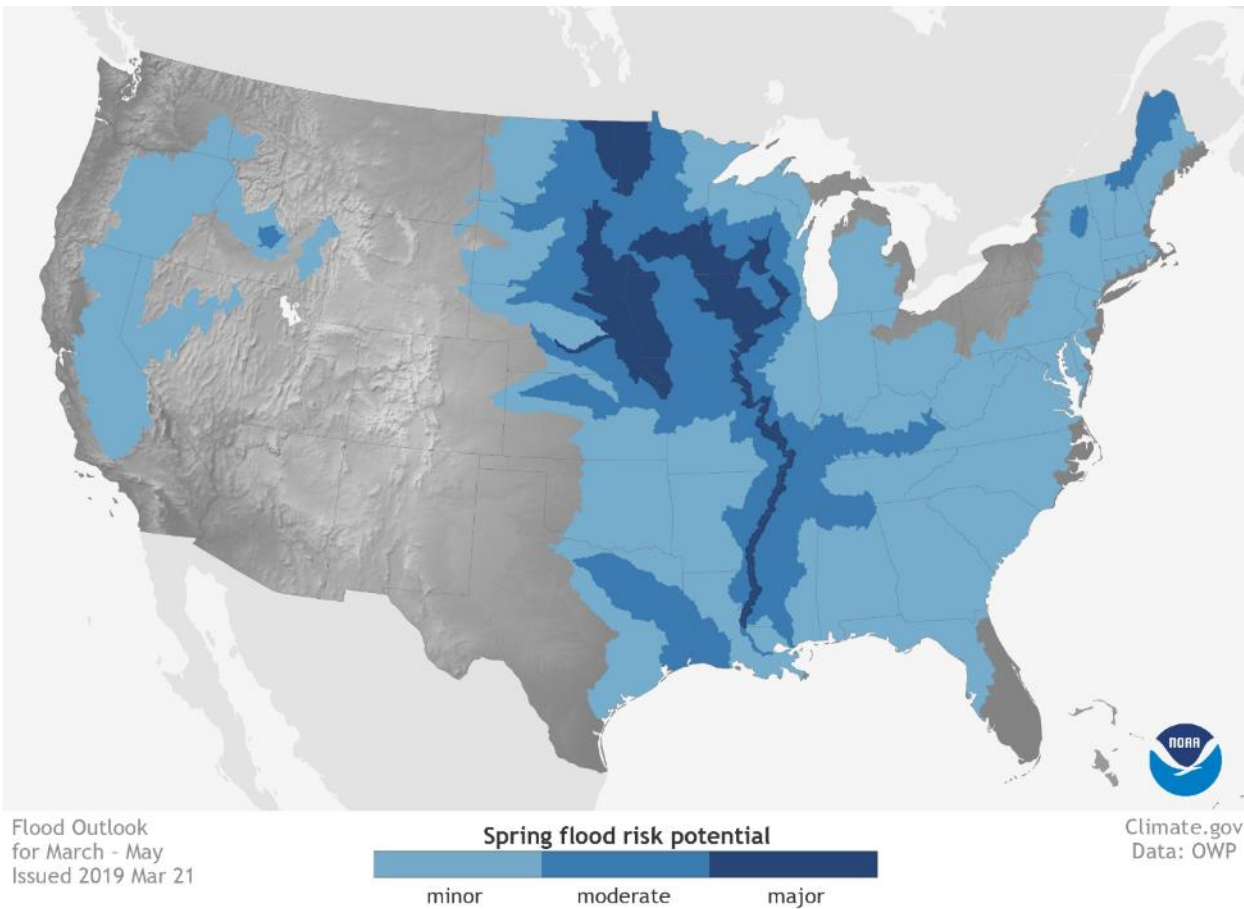
Growing degree day accumulation since March 1, 2019 at the Enviroweather station in Mendon, St. Joseph County, as of April 8.



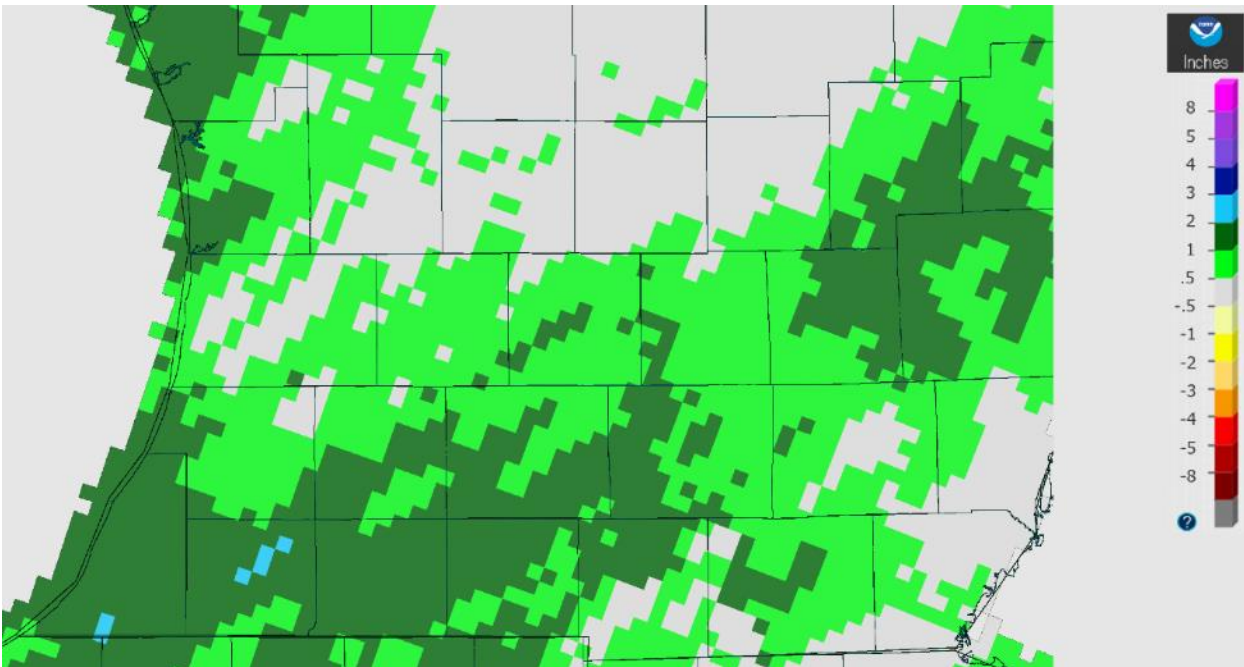
Average soil temperatures at 4 in. depth for the first week of April for six Enviroweather stations in south central and southwest Michigan in 2019 (above) and for the Mendon station from 2014-2019 (below).

Soil moisture for much of the Midwest remains high, and the spring flooding risk potential for the eastern half of the US is projected to be minor (for us in MI) to major for much of the Corn Belt. Precipitation in the region over the past month has been 0.5 to 2 inches higher than normal with a few isolated pockets receiving up to 3 inches more than normal. Tillage equipment has been moving this past week with not that much dirt making it to the roadways, so hopefully this is a sign that fields are indeed drying out.





Spring (March through May) flood risk potential for much of the major crop producing regions in the U.S.



30-day precipitation departure from normal as of April 8, 2019.

[From Bruce MacKellar]

Wheat, cover crops, and winter annual weeds have been greening up this past week, and they provide the right kind of environment that can help insects such as Asiatic Garden Beetle (AGB) and Japanese Beetle larvae (white grubs) “green bridge”, that is thrive by feeding on their roots as the soils first begin to warm. These weed species also create excellent egg laying habitats for “deposited pests” such as black cutworm and armyworm moths to lay eggs. It is important to note

the weed or cover crop level in the field at the time the moths arrive to evaluate the likelihood the field will potentially need to be scouted. Purdue University has begun detecting black cutworm moths in traps in the southern half of the state in the first week of April, and with the weather coming out of the south this past weekend, we may begin spotting them early this year in southwest Michigan. Fields that have been burned down or tilled by this time are not likely to need scouting following seedling emergence. [MSU Weed Control Specialist Christy Sprague wrote an excellent article highlighting the advantages of early season weed control and control options last spring.](#)

Winter annual weeds also provide challenges in wheat. Wheat plants are particularly sensitive to competition from weeds during their early vegetative growth stages in Michigan, which will begin shortly. Scout wheat fields for weed pressure in mid-April and don't overlook these species. For more information on weed control options in wheat, visit the [MSU Weed Control Guide for Field and Forage Crops.](#)



Winter annual weeds, April 6, 2019. Photo courtesy of Bruce MacKellar.

## Calendar

Titles are clickable links to online content when highlighted and underlined

- Apr 11** [Census of Ag Report Released.](#) The 2017 Census of Agriculture report will be released at noon at this website.
- Apr 20** [St. Joseph Annual Spring Tree Sale.](#) Order online, orders are being accepted through April 20, 2019. For more information call (269) 467-6336 Ext. 5.
- Apr 25** [Field Crops Virtual Breakfast Season Opener.](#) Thursdays 7:00-7:30 AM. Starting this week, this free webinar will provide field crop producers with timely crop and pest management and weather updates. This week: "Early Season Weed Control" with Dr. Christy Sprague. 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>
- May 4** [St. Joseph CD Golf Scramble.](#) 9:30 AM shotgun start. St. Joe Valley Golf Club. \$60/person. For more information call (269) 467-6336 Ext. 5.

## MSU Extension Digest Briefs

[Farm transition is a lot like investing – start early!](#)

**PUBLISHED ON APRIL 5, 2019**

The emotional and financial transitioning of farms to the next generation can be difficult. The best way to make it easier is to start the conversation early.

[Reducing labor through streamlining production](#)

**PUBLISHED ON APRIL 4, 2019**

Michigan greenhouse growers are using many methods to reduce labor costs and increase efficiency.

[Corn nitrogen guidelines and focusing on the right rate](#)

**PUBLISHED ON APRIL 4, 2019**

Optimal nitrogen rates are not closely related to grain yield.

[Doing more with less or less with more in winter wheat?](#)

**PUBLISHED ON APRIL 4, 2019**

Profitability must be considered when incorporating multiple-input management systems.

[Michigan Hay Sellers List helps buyers locate scarce hay](#)

**PUBLISHED ON APRIL 4, 2019**

Whether buying or selling hay, the Michigan hay sellers list makes the task easier.

[Final organic non-GMO soybean results are available](#)

**PUBLISHED ON APRIL 1, 2019**

For the seventh year, Michigan State University reports results of non-GMO soybeans grown on certified organic farms.

[Reducing soybean production costs in 2019](#)

**PUBLISHED ON MARCH 28, 2019**

Recommendations for soybean producers on reacting to low commodity prices by reducing production costs without affecting yields.

[Evaluating wheat stands and spring management](#)

**PUBLISHED ON MARCH 27, 2019**

Scout wheat fields now to make proper management decisions.

[March is frost seeding month in Michigan](#)

**PUBLISHED ON MARCH 20, 2019**

Frost-seeding with improved legumes and grasses is an economical way to improve pasture yield and quality.

[Soybean seed quality considerations for 2019](#)

**PUBLISHED ON MARCH 14, 2019**

Due to the potential for reduced seed quality, Michigan soybean producers should determine the quality of their seed and use this information to maximize seed performance.

[Overview of 2019 SMaRT \(Soybean Management and Research Technology\) on-farm research projects](#)

**PUBLISHED ON MARCH 7, 2019**

On-farm research trials conducted by Michigan soybean producers are an important part of the SMaRT program. The 2019 projects are listed in this article and producers are encouraged to participate.

[Demonstration of wildlife palatability preferences in corn hybrids](#)

**PUBLISHED ON MARCH 7, 2019**

A variety's nutritive characteristics and palatability for key wildlife species should be part of your decision-making process when deciding what and where to plant.

[Parts 1-3 of mycotoxins in swine feed](#)

**PUBLISHED ON MARCH 6, 2019**

What you don't want in your pig feed. This series talks about two of the major mycotoxins affecting the northern United States and a part on how to alleviate their effects in the feed.

[Tips on quality hay and pasture for beginning farmers: Part 1 - Quality](#)

**PUBLISHED ON MARCH 4, 2019**

Just about anybody can make hay and put animals out on pasture, but achieving quality goals for that forage takes knowledge, planning and effort.

[Adequate water supply is the heart of an irrigation system](#)

**PUBLISHED ON MARCH 4, 2019**

Irrigation investments start with securing an adequate water supply that meets the state legal requirements for large scale water use and minimal potential for conflict with neighbors or adverse resource impacts.

[Meeting the Michigan or Indiana water use reporting requirements](#)

**PUBLISHED ON MARCH 4, 2019**

Agricultural water users in Michigan and Indiana with the capacity to pump 70 gallons per minute or more need to report their water use by April 1.

[Nitrogen rate trial results in Michigan's Thumb](#)

**PUBLISHED ON MARCH 1, 2019**

A three-year nitrogen application rate study shows little difference between 165, 205 and 245 pounds of nitrogen applied pre-plant incorporated as anhydrous ammonia.

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*Eric Anderson*

*Michigan State University Extension*

*Field Crops Educator - St. Joseph County*

*612 E. Main St., Centreville, MI 49032*

*(269) 467-5510 (Office)*

*(269) 467-5641 (Fax)*

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