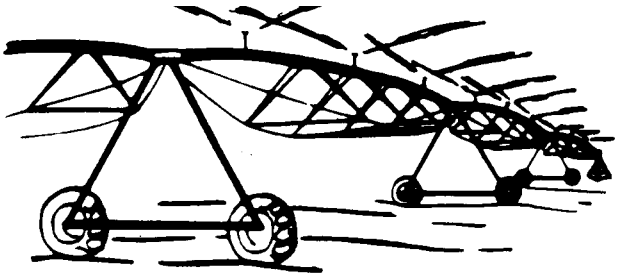
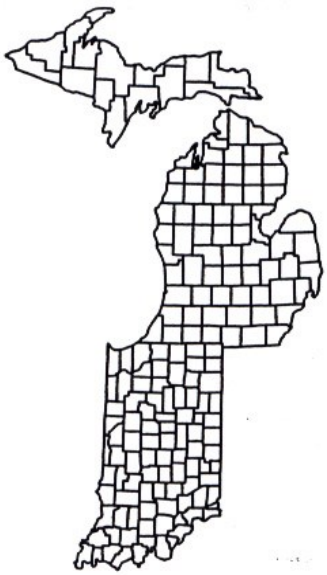
MICHIANA IRRIGATION ASSOCIATION



MICHIGAN-INDIANA IRRIGATION NEWSLETTER

NOVEMBER 2019

52540 LAWRENCE RD
LEONIDAS, MI 49066



Greetings,

Please find enclosed the brochure for the annual Michiana Irrigation Association Winter Workshop on December 13, 2019 at the Blue Gate Garden Inn in Shipshewana, Indiana. We have a full day of speakers with presentations on irrigation. Please send in your registration and we will see you in December.

If you have questions about what Michigan Irrigation Association does, don't hesitate to reach out to one of the current members. Following is list of current board members with their e-mail address:

- Joel Annable joel.annable@peerlessmidwest.com
- Todd Feenstra todd@tritiuminc.net
- Tom Frank tfrank70@comcast.net
- Justin Gentz gbfarms@live.com
- Brian McKenzie mckenziehighlander@msn.com
- Mike Morehouse mmore@maplenet.net
- Doug Pedler dpedler@maisco.net
- Ben Russell brussell@mwconnections.com
- Jeremy Walker walkerprecisionag@gmail.com

Sincerely,

Jeremy Walker
MIA President

JW:dm

A big Thank You to Tritium, Inc. for the mailing of this newsletter!

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Water Use Advisory Council

Jason Walther, Walther Potato Farm

The Water Use Advisory Council (WUAC) is established under Part 328 of the Natural Resources and Environmental Protection Act to study and make recommendations to the Quality of Life (QOL) agencies (EGLE, Department of Natural Resources, Department of Agriculture and Rural Development) on Michigan's Water Use Program, which includes the following major elements: the Great Lakes Compact; water withdrawal regulations; and water use conflict. The Council provides a forum for discussion of the following broad areas that were identified by previous councils, stakeholder groups, and QOL staff:

- Water conservation and efficiency goals, objectives and voluntary measures
- Technical underpinnings of the process, tools, data, assumptions and decision end-points used to determine whether proposed water withdrawals can be authorized
- Technical and compliance assistance
- Methods and tools to assist water users in resolving and preventing conflicts
- Environmental monitoring to identify and help reconcile potential discrepancies between the program's decision making and data management protocols and the real world impacts of withdrawals
- New and emerging water use categories
- Outcomes and metrics for determining the program success

The WUAC expects to meet quarterly. The council has met twice this year with our last meeting scheduled for December. The initial two meetings have focused on reviewing previous council's work and determining how this council will function and make decisions. At our October meeting four subcommittees were formed that will be charged with work in between the quarterly meetings. The four subcommittees named are Implementation, Data, Modeling and New Ideas. If you have questions or suggestions for the WUAC please email me at jason.walther@waltherfarms.com.

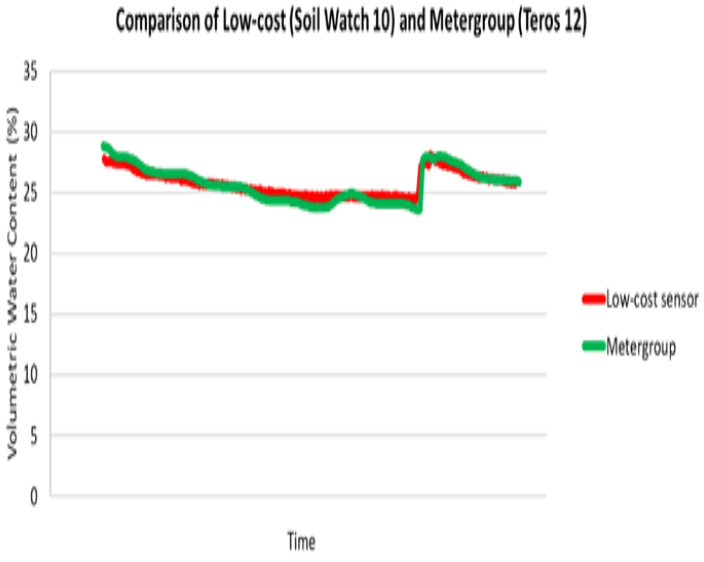
Budget-friendly Field Monitoring for the Future

Dr. Younsuk Dong, MSU-BAE

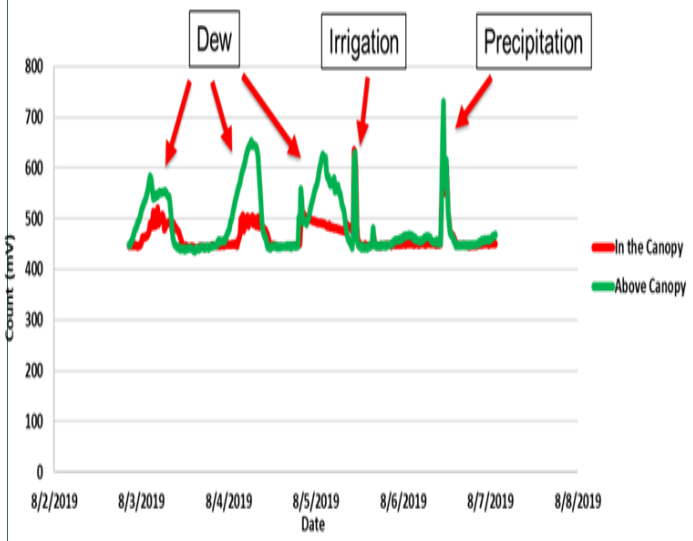
Real-time field monitoring data such as soil moisture content and leaf wetness are used to provide data to inform agronomy decisions. Soil moisture sensor have been used to improve the water and fertilizer effectiveness and the crop production. Leaf wetness sensors also have been used to determine fungicide applications for diseases and infection, which will save time and cost. Research grade remote monitoring systems are commercially available, but the high cost of the commercial system is a barrier for farmers and crop consultants. The team developed a low-cost remote monitoring system that can continuously measure multiple depths of soil moisture levels and display the collected data to the website to determine critical agronomy decisions. Having multiple low-cost remote monitoring can account for variations in soil types and application rates across the field avoiding reliance on data from one site that may not be representative of the field.

This year, the team installed and tested nine low-cost remote monitoring systems across Michigan. This was conducted along with our summer research program. The research programs were to compare the soil moisture content at the irrigated field and dry corner using commercially available soil moisture sensors and evaluate the usability of leaf wetness sensors to detect the crop diseases. This system is capable to read most of the commercially available soil moisture and leaf wetness sensors. The development of this system for other agronomy purpose is on-going. The comparison of the low -cost remote monitoring system with Metergroup was conducted. As shown below, the low-cost sensor performed similarly to the Teros12 moisture sensor, manufactured by Metergroup (Pullman, WA).

Leaf wetness sensor data was able to obtain by the low-cost remote monitoring system. The sensors are installed in the canopy and above the canopy for soybean fields, and 1/3 height and 2/3 height for corn fields. Below is an example of leaf wetness data.



Tar Spot Observations in Irrigated Corn: What We Have Seen, What We Think and What We Don't Know



Bruce MacKellar – MSU Extension
Pest Management Educator

Tar Spot remains a bit of a mystery. For the last two years, we have seen this virulent fungal pathogen march across Michigan's corn fields. However, the time frame the pathogen progressed was markedly different in 2019 than it was in 2018. Different in timing, somewhat different in the level of average yield losses, but ultimately a powerful force to be dealt with in its ability to impact corn yield and quality.

Why is irrigated corn hit so hard? It appears that corn produced under irrigation remains at substantially higher risk for early infection from tar spot than dryland fields or dry corners. As with most fungal pathogens, how often and the length of time the leaves remain wet plays an important role in the development of the disease. Where irrigation seems to come into play is the duration of the time the leaves remain wet. While irrigators strive to water corn in a timely manner to provide adequate moisture reserves to maintain optimal growth, we have not had to seriously think about the impacts caused by the period of leaf wetness. While it has long been recognized that leaf wetness can be an important factor in the incidence and potential severity of several leaf diseases in corn, it appears that most hybrids we raise today do not have enough tolerance to tar spot to be able to keep the disease in check. Especially under situations where the plants are exposed to high spore loads and prolonged wet and cloudy conditions following irrigation. These kinds of conditions, which can be very hard to accurately predict, can set the stage for the kind of severe tar spot we have seen in some fields around the region over the last two years. And the impact can be ugly. We have seen yield reductions as high as 40+ bushels per acre on irrigated portions of fields compared to reasonably well rain fed fields and dry corners.

Why was tar spot so variable in 2019? Rainfall was extremely variable across much of southern Michigan in 2019. Almost all of the rain was received during thunderstorm events. Some areas would receive heavy rainfall, where others very close by may have seen almost none. This creates hotspot areas where tar spot tends to gain a foothold, and some fields were more susceptible because of leaf wetness than others. Once the areas started sporulating, tar spot became much more widespread over the dryland fields as well as those that were irrigated. Our delayed corn planting dates this season meant that there was much more green leaf tissue that was susceptible for spot infection. This, in combination with almost perfect conditions for disease development in the much warmer than normal September, allowed the fungal pathogen to spread to virtually every county in Michigan that plants substantial acreage of corn. The impact of the disease on later planted corn was almost entirely dependent upon the stage of growth the plant was at when the leaves started to die from the infection. Many later planted fields did not show significant levels of tar spot stroma until the middle of September. Yield impacts, such as kernel starch accumulation (test weight) and kernel depth were almost all directly correlated to how far the milk line had progressed down the kernel at this point.

If damage was relatively light in 2019, what can we expect next year? We think it is important to remember that impact from the disease really depends upon three factors: The abundance of spores for infection, the duration of leaf wetness that occurs at the time the spores are deposited on the leaves, and the stage of development the plant is at when the infection occurs.

Let's address the spore abundance question first, as it is the easiest to definitively state. We will have ample spores to cause the problem in southwest Michigan, and probably northern Indiana as well. The sporulating bodies overwinter on infected corn leaf and husk tissue. Even if you field moldboard plowed, there will be ample spores from adjacent fields to infect your corn.

The earlier the infection occurs, the more likely it is to cause significant yield losses. This is because severe tar spot infection can take out the plants leaf tissue rapidly after a significant infection event. Many growers I have talked to say that the disease is like white mold. You can smell the dying leaf tissue sometimes even before you can see significant tissue decline (but not before you see

stroma). Advanced symptoms include rapid leaf discoloration (yellowing, purpling, reddish hues).

Take home message for irrigators: Look to limit the duration of leaf wetness. While we do not have experimental data that shows this (yet), there is some observational evidence that irrigation water applied at heavier rates as opposed to more frequent light application rates has the potential to reduce the risk of early tar spot infection by reducing the number of times that that canopy is wet and the overall hours of leaf wetness. This falls squarely in the category of what we think we know. The other thing to consider is focusing on irrigating when the leaves can dry out. We will be looking at this further during research conducted next summer.

Fungicides and Tar Spot Control

Applying fungicides to protect the plants from tar spot looks as though it is going to turn out to be more of a challenge than some of the other leaf diseases. We did see suppression in disease development in the weeks following application of fungicides. However, at the end of the season in 2019, a lot of the treated plants end up looking like areas that were untreated. The fungicide provided some degree of protection for a period of time, but eventually ran out while the deposition of spores continued. At the time this article is being written, the lab is working on determining the yield response to fungicide applications at various timings (and growth stages) and will hopefully be included in the talk at the meeting in December.

Marty Chilvers, MSU's Field Crop Pathologist, says that there should be some yield protection if the fungicide was applied at the correct time when the disease was active and reduced disease levels. The main issue is that we only get 2-3 weeks of protection and a short term knock down of the inoculum in the field. If weather conditions are favorable for the continued spread of the disease (warm, wet, cloudy) for an extended period, the disease can develop after the fungicide suppression has worn off, and the pathogen can go through enough disease cycles that the amount of damage is overwhelming. Since high levels of infection can kill leaf tissue in 7-14 days, the timing of application will be important to limit costs and to protect the crop. Having said this, seed corn fields did appear to have much less tar spot where they had been treated (probably 2 times) with fungicides compared with nearby commercial corn fields. What is not known is when tar spot pressure became significant in the seed corn fields that we checked. Because so many fields developed the disease later in the season, it is not clear if the seed corn escaped significant damage because of fungicide applications or because the plants were terminated shortly after the disease ramped up. We were able to find tar spot on seed corn leaves in areas in St. Joseph, Cass and Van Buren counties where commercial corn had significant damage from tar spot.

Scouting Update: In both 2018 and 2019, tar spot was initially observed in fields produced under irrigation. In 2019 especially, we saw the initial leaf symptoms in areas of higher air flow, along field edges. The disease can also be heavier near tree lines as well, where there is more canopy shading. These may be good places to start looking in fields in 2020.