

# 2019 AGRO EXPO

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## OFFICIAL SHOW GUIDE



A SPECIAL SUPPLEMENT TO

**Michigan**  
Farm News

AUGUST 13 & 14, 2019 | ST. JOHNS, MI  
[WWW.THEAGROEXPO.COM](http://WWW.THEAGROEXPO.COM)

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# Table of Contents

Welcome to AgroExpo.....	5
Getting to AgroExpo.....	6
Schedule at a glance.....	8
Schedule for Tuesday, August 13.....	10
Schedule for Wednesday, August 14 .....	12
Plan your experience.....	14
On-farm technology that pays — sensor technology .....	16
Map at a glance.....	21
Exhibitors List.....	22
Detailed Map .....	23
Crop management challenge: Students are now in charge .....	28
Remote Sensing — Practical applications in agriculture? .....	30
It starts with the soil .....	38
AgroExpo field demos focus on sprayer technology .....	40

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# WELCOME

## AgroExpo in 2019: It's about you, the farmer

Welcome to the 2019 AgroExpo!

There is no such thing as a 'typical' year in agriculture. From weather to markets to regulations, our industry is in a constant state of flux. The one thing we have to do is continue to adapt to change. Growers need to be proactive in being ahead of the change curve. From the very beginning, the AgroExpo has strived to provide the tools, education, and information growers need to be ready for the next opportunity. The AgroExpo draws together progressive, innovative farmers and industry professionals for the sole purpose of discussing the latest advances in agriculture.

We want you to go home with additional tools, but this event is not necessarily about the exhibitors. It's about you, the farmer, in 2019; and the information you need to make every season more successful on your operation.

So, take a couple of days and enjoy the AgroExpo. Enjoy connecting with the people who make this industry great. Enjoy the innovation, research and technology that make agriculture an industry unlike any other.



Dale Ruff  
AgroExpo Event Coordinator



### 2019 AGROEXPO STEERING COMMITTEE

**Carla Wardin**  
Evergreen Dairy

**Steve Gower**  
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# GETTING TO AGROEXPO

## Event Address:

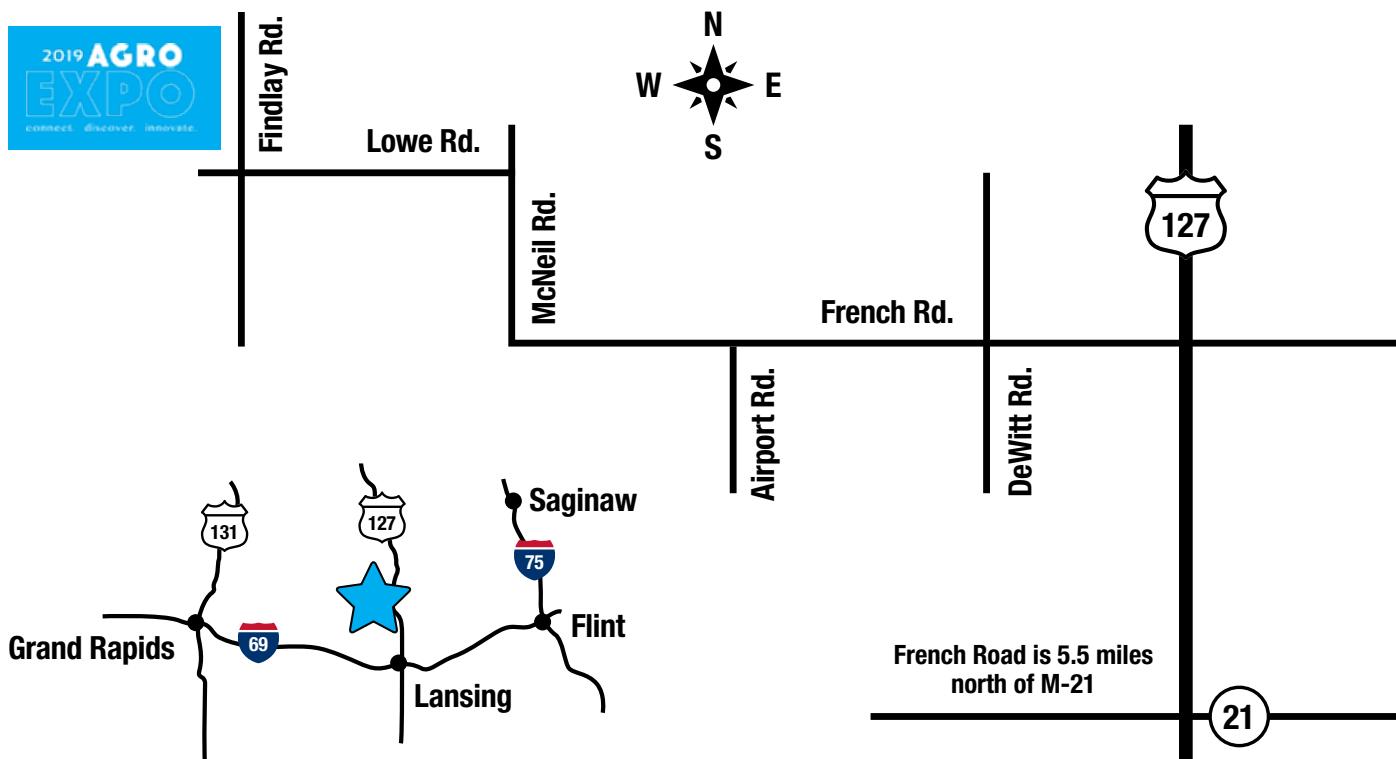
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## Coming from the north on US-127:

French Road is approximately 27 miles south of M-46 and 4 miles south of Uncle Johns Cider Mill.

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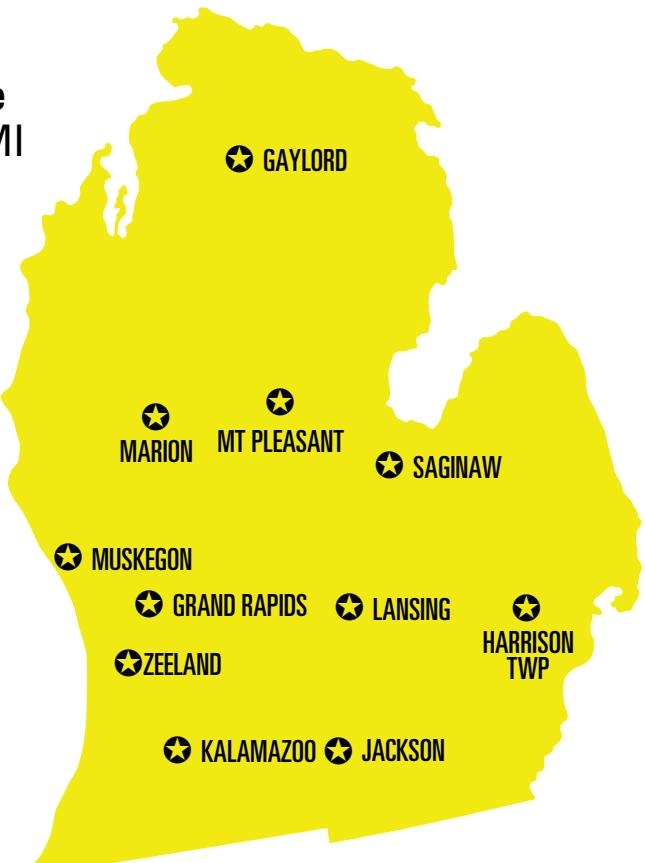
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# SCHEDULE

## Schedule at a glance

### TUESDAY, AUGUST 13

8:30 am	Show is open to attendees
9:00 – 10:00 am	Sprayer Demonstrations*   Demo Area
10:00 – 11:00 am	Soil & Remote Sensing Technology Demonstrations*   Demo Area
10:00 am – 2:00 pm	Learning Center Presentations   Learning Center
11:10 – 12:00 pm	Remote Sensing*   Speaker Tent <b>SPONSORED BY: CORN MARKETING PROGRAM OF MICHIGAN</b>
12:00 – 1:00 pm	The Next Frontier: Refining Fertility for Greater Corn Yields*   Speaker Tent <b>SPONSORED BY: PIONEER</b>
1:00 – 1:45 pm	Managing Risk in Cropping*   Speaker Tent <b>SPONSORED BY: DAVID CHAPMAN AGENCY</b>
2:00 – 3:00 pm	Sprayer Demonstrations*   Demo Area
3:00 – 4:00 pm	Soil & Remote Sensing Technology Demonstrations*   Demo Area
4:00 pm	Show Closes
4:30 pm	Between the Rows* <b>SPONSORED BY: CORN MARKETING PROGRAM OF MICHIGAN AND CONSUMERS ENERGY</b>

### WEDNESDAY, AUGUST 14

7:00 am	Season Long Nutrition: Advances in Fertilizer Technology and Recommendations* (registration required, limited seating) <b>SPONSORED BY: COMPASS MINERALS</b>
8:30 am	Show is open to attendees
9:00 – 10:00 am	Sprayer Demonstrations*   Demo Area
10:00 – 11:00 am	Soil & Remote Sensing Technology Demonstrations*   Demo Area
10:00 am – 2:00 pm	Learning Center Presentations   Learning Center
11:10 – 12:00 pm	Remote Sensing*   Speaker Tent <b>SPONSORED BY: CORN MARKETING PROGRAM OF MICHIGAN</b>
12:00 – 1:00 pm	Estate Planning**   Speaker Tent <b>SPONSORED BY: FRALEIGH LAW</b>
1:00 – 1:45 pm	Building a Crop Insurance Plan Tailored to Your Farm**   Speaker Tent <b>SPONSORED BY: GREENSTONE FARM CREDIT SERVICES</b>
2:00 – 3:00 pm	Sprayer Demonstrations*   Demo Area
3:00 – 4:00 pm	Soil & Remote Sensing Technology Demonstrations*   Demo Area
4:00 pm	Show Closes

\*denotes 1 RUP & 1 CCA credit available

\*\*denotes 1 CCA credit available only

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Horsch RT-370, electronic depth control, \$89,500



Used Horsch RT-230, electronic depth control, like new, \$55,000



2018 Horsch RT-22, electronic depth control, iso bus system for JD 2630 display, hydraulic jack, \$72,000



New Horsch RT-18, mechanical depth control, narrow transport, \$52,000



2017 Horsch RT-25, manual depth control, new blades, like new condition \$65,000



Used RT-370, new blades, electronic depth or manual depth control, used on our farm, \$60,000

## Schedule for Tuesday, August 13

### SHOW OPENS

8:30 AM

### SPRAYER DEMONSTRATIONS\*

9:00 AM | DEMO AREA

This session will include five sprayers from different manufacturers. Each representative will operate their unit and present 6-8 minutes on the features of their unit that relate to correct and safe application of pesticides and crop nutrition products. The features that will be discussed will include but are not limited to: correct tip selection, tip wear and how that affects accuracy, drift control, the importance of regular calibration, boom height, spray controllers and how they assure accuracy, and new technology on the horizon.

### SOIL AND REMOTE SENSING TECHNOLOGY DEMONSTRATIONS\*

10:00 AM | DEMO AREA

This demonstration will include how SoilHawk™, SoilOptix®, and remote sensing/drone technologies can be used to develop maps and strategies to use them for proper placement of crop inputs including seed, fertilizer and pesticides.

### IRRIGATION WATER APPLICATION

10:00 AM | LEARNING CENTER

Jason Preston, General Manager/Sales, Farm Services Inc.

Felipe Alves, Komet Irrigation - Technical Sales Manager, Farm Services Inc.

### THE POWER OF BANDING NITROGEN CLOSE TO THE ROW

10:30 AM | LEARNING CENTER

Taylor Pulver, Regional Manager, 360 Yield Center

### BALANCING DRIFT REDUCTION AND SPRAY COVERAGE TO MAXIMIZE HERBICIDE PERFORMANCE

11:00 AM | LEARNING CENTER

Nick Fleitz, Hypro Agronomist, Pentair Hypro

### REMOTE SENSING\*

11:10 AM | SPEAKER TENT

Rich Price, Researcher, College of Natural Science at Michigan State University

Technology has promised to improve our fertilizer efficiency and produce greater crop yields, therefore making us more profitable. Many producers are struggling with understanding how new technologies in precision agriculture can benefit their operation. Our research under the direction of Dr. Bruno Basso focuses on the applicability of multiple precision agriculture platforms and their viability on the modern farm. These platforms can be utilized to determine the need for pesticides, timing of application, correct pesticide selection for situation and rates to be used. Using this technology can also determine specific areas in the field that may need treatment thus allowing for less use of pesticides.

## NUTRIENT PLACEMENT AND ITS EFFECTS ON THE CORN ROOT SYSTEM

**11:30 AM | LEARNING CENTER**

Mike Peterson, Soil Scientist/Agronomist, Orthman

## THE NEXT FRONTIER: REFINING FERTILITY FOR GREATER CORN YIELDS\*

**12:00 PM | SPEAKER TENT**

**Matt Clover, Ph.D., Agronomy Manager, Pioneer**

**Featuring Michigan's own Don Stall (2018 NCGA Corn Yield Contest; National Top Yield at 477.7 bu/A)**

Bushels per acre continue to increase. Is your fertility program keeping pace? Explore the latest nutrient research and information associated with maximum profitable output. These nutrient management tools can make for better plant health.

## MANAGING RISK IN CROPPING\*

**1:00 PM | SPEAKER TENT**

**David Reddel, Technical Agronomist, Berkley Agribusiness Risk Specialists**

Success in agronomy today is more than the selection and placement of seed, crop protection and fertilizer. David will discuss how these decisions relate to pesticides. Correlating plant health to pesticide use is a risk-management tool for all to learn and execute. In today's highly volatile agronomic and economic environment, David helps develop agronomic Risk Management solutions for today's farmer, rancher, grower and commercial agribusiness.

## HOW CREATION AND INTEGRITY OF THE SEED FURROW ARE CRUCIAL TO YIELD

**1:00 PM | LEARNING CENTER**

Jason Koning, Region Manager, Precision Planting

## BUILDING A CROP NUTRITION PROGRAM THAT WILL SHOW THE BEST RETURN FOR YOUR FERTILIZER DOLLAR

**1:30 PM | LEARNING CENTER**

Katherine Wolfe, Michigan and Ohio Sales Account Manager, AgroLiquid

## SPRAYER DEMONSTRATIONS\*

**2:00 PM | DEMO AREA**

## SHARED INSIGHTS PROGRAM – SOIL AND PLANT TISSUE TRACKING TO ALLOW FOR NUTRIENT ADJUSTMENT DURING THE SEASON

**2:00 PM | LEARNING CENTER**

James Fasching, Field Representative, Midwest Laboratories

## SOIL AND REMOTE SENSING TECHNOLOGY DEMONSTRATIONS\*

**3:00 PM | DEMO AREA**

## SHOW CLOSES

**4:00 PM**

## BETWEEN THE ROWS\*

**4:30 PM | DINING TENT**

Dr. Martin Chilvers, Assistant Professor, Michigan State University

\*denotes 1 RUP & 1 CCA credit available

\*\*denotes 1 CCA credit available only

# SCHEDULE

## Schedule for Wednesday, August 14

### SEASON LONG NUTRITION: ADVANCES IN FERTILIZER TECHNOLOGY AND RECOMMENDATIONS\*

**7:00 AM | SHOW OFFICE BUILDING**

**SEATS ARE LIMITED – REGISTER AT [WWW.THEAGROEXPO.COM](http://WWW.THEAGROEXPO.COM)**

**Kyle Lilly, Senior Product Manager, Compass Minerals**

While adequate pre-plant application of N, P, and K fertilizer has many practical benefits, farmers often ask why they do not get higher yields with higher fertilizer application rates. This presentation will show new research on fertilizer application rate, timing, source, and placement with a focus on micronutrients, crop stresses, and physiology across the growing season. This presentation will demonstrate how reducing plant stress can reduce the susceptibility of crops to insects and diseases, which reduces the needs for pesticide application.

### SHOW OPENS

**8:30 AM**

### SPRAYER DEMONSTRATIONS\*

**9:00 AM | DEMO AREA**

This session will include five sprayers from different manufacturers. Each representative will operate their unit and present 6-8 minutes on the features of their unit that relate to correct and safe application of pesticides and crop nutrition products. The features that will be discussed will include but are not limited to: correct tip selection, tip wear and how that affects accuracy, drift control, the importance of regular calibration, boom height, spray controllers and how they assure accuracy, and new technology on the horizon.

### SOIL AND REMOTE SENSING TECHNOLOGY DEMONSTRATIONS\*

**10:00 AM | DEMO AREA**

This demonstration will include how SoilHawk™, SoilOptix®, and remote sensing/drone technologies can be used to develop maps and strategies to use them for proper placement of crop inputs including seed, fertilizer and pesticides.

### BUILDING A CROP NUTRITION PROGRAM THAT WILL SHOW THE BEST RETURN FOR YOUR FERTILIZER DOLLAR

**10:00 AM | LEARNING CENTER**

**Katherine Wolfe, Michigan and Ohio Sales Account Manager, AgroLiquid**

### IRRIGATION WATER APPLICATION

**10:30 AM | LEARNING CENTER**

**Jason Preston, General Manager/Sales, Farm Services Inc.**

**Felipe Alves, Komet Irrigation - Technical Sales Manager, Farm Services Inc.**

### NUTRIENT PLACEMENT AND ITS EFFECTS ON THE CORN ROOT SYSTEM

**11:00 AM | LEARNING CENTER**

**Mike Peterson, Soil Scientist/Agronomist, Orthman**

## REMOTE SENSING\*

11:10 AM | SPEAKER TENT

## HOW CREATION AND INTEGRITY OF THE SEED FURROW ARE CRUCIAL TO YIELD

11:30 AM | LEARNING CENTER

Jason Koning, Region Manager, Precision Planting

## ESTATE PLANNING\*\*

12:00 PM | SPEAKER TENT

**Mike Fraleigh, Attorney At Law, Fraleigh Law**

The Ag community faces increasing risk due to financial challenges, the changing role of government and agriculture programs, changes in production technology, global competition, complex environmental regulations, an uncertain tax environment, liability exposure, and the list goes on and on. As part of a family that has been farming for four generations, Mike has a unique understanding of the issues the Ag community faces. He will discuss how to go about developing a plan that meets both your business and family goals.

## BUILDING A CROP INSURANCE PLAN TAILORED TO YOUR FARM\*\*

1:00 PM | SPEAKER TENT

**Devin Roth, Crop Insurance Specialist, Greenstone Farm Credit Service**

Today's portfolio of crop insurance products has evolved into a complex matrix of tools and services. Knowing how to design the best plan for your farm will be the topic of Devin Roth's presentation. He will discuss the various risk management resources available to farmers, including options for covering crop, dairy and livestock operations. He will address factors farmers should consider when choosing insurance coverage and how the individual programs are structured.

## SHARED INSIGHTS PROGRAM – SOIL AND PLANT TISSUE TRACKING TO ALLOW FOR NUTRIENT ADJUSTMENT DURING THE SEASON

1:00 PM | LEARNING CENTER

James Fasching, Field Representative, Midwest Laboratories

## THE POWER OF BANDING NITROGEN CLOSE TO THE ROW

1:30 PM | LEARNING CENTER

Taylor Pulver, Regional Manager, 360 Yield Center

## SPRAYER DEMONSTRATIONS\*

2:00 PM | DEMO AREA

## BALANCING DRIFT REDUCTION AND SPRAY COVERAGE TO MAXIMIZE HERBICIDE PERFORMANCE

11:00 AM | LEARNING CENTER

Nick Fleitz, Hypro Agronomist, Pentair Hypro

## SOIL AND REMOTE SENSING TECHNOLOGY DEMONSTRATIONS\*

3:00 PM | DEMO AREA

## SHOW CLOSES

4:00 PM

\*denotes 1 RUP & 1 CCA credit available

\*\*denotes 1 CCA credit available only

# Wear Your Walking Boots!

There's a lot to see at the 2019 AgroExpo

## WHERE DO I START?

Your first stop should be at the information tent. This is a great spot to take a moment to get your bearings. Identify where you are, and where all the AgroExpo attractions are located. You can also use this time — and take advantage of the shade in these tents — to circle the speakers or in-field demos you are interested in seeing. Also, if you have any questions at any point — the folks in these tents can help. Make sure you stop at the welcome booth to enter for a chance to win awesome prizes.



## EDUCATIONAL SESSIONS

There are opportunities each day to hear from the experts in our industry. These featured speakers will be focused on providing practical, usable information on a number of topics. Sessions last 45 minutes to an hour, and most offer RUP and CCA credits for attending. This is a great way to earn those continuing education credits and hear from the best in the business. Be sure to review the descriptions of these sessions in this Show Guide.

## FIELD DEMOS

Numerous in-field experiences and demonstrations are planned throughout the AgroExpo to provide hands-on opportunities to see how these new technologies can be incorporated into a management strategy. There are live sprayer demonstrations, as well as soil testing and remote sensing equipment that will be running at various times. Again, be sure to review this entire Guide to know when and where you can see this equipment in the field.



## TRADE SHOW

New equipment, technology and information — you can find it all in the trade show area of the AgroExpo. A record number of vendors are bringing their best people and newest methods, advancements and technology to the AgroExpo. You get to see it all in one place!



## MEALS

Always an important consideration — where is the best food? Well, that depends on your preference, and luckily, the AgroExpo has several food trucks to choose from for a variety of delicious options. Have a seat in the food tent, and enjoy good food and the company of others in the ag industry.



## NETWORK

The AgroExpo is an opportunity to come together with others in the ag industry. Sit down next to someone new at lunch, strike up a conversation at the sprayer demo, take advantage of the ideas and experiences of other attendees and exhibitors. These connections and interactions could be your most valuable take-away from the AgroExpo.

**Most of all, enjoy your time at the AgroExpo. Make the most of this rare day off in mid-summer and appreciate everything our industry has to offer — and in one place — at the 2019 AgroExpo.**

# On-farm technology that pays – sensor technology

## FARM NEWS MEDIA

Driven by economic necessity, Michigan farmers are constantly considering new ways to increase yields and cutting costs to improve profitability. The latest advancements in nitrogen management — utilizing sensor technology — could be essential to interpreting interactions between the soils, weather, plants and other management decisions determine full yield potential.

Crop sensing technologies, designed to feed the corn crop the right amount of nitrogen, when the crop needs it, have gained the confidence of many growers. Sensors that estimate crop nitrogen needs drive variable rate application (VRA) applicators on the go based on crop chlorophyll content to simplify nitrogen management.

On-the-go sensor technology is helping to reduce costs and application rates of nitrogen (N) — considered one of the most commonly applied nutrient and most expensive inputs, ranging from 13% to 18% of the variable costs of Michigan corn production for two Lenawee county farmers.

Blaine Baker and Tim Stutzman have been using crop nitrogen sensing technology for more than a decade. With this technology, variable nitrogen rates (based on the NDIV field map of a well-fertilized reference strip) can be applied up to V9 corn growth, minimizing losses and supplying the nitrogen when it is most crucial to the plant.

According to Baker and Stutzman, since the sensors read the corn on the go, they are applying about 30% less nitrogen when compared with the conventional “1 bushel per 1 pound of nitrogen” recommendation and still getting the same yields.

Baker, a no-till grower, began testing on-the-go nitrogen sensing

on a small portion of his farm about 10 years ago. Retaining nutrients in the root zone and improving nitrogen use efficiency for profitability and protecting the environment are a high priority on the farm.

All fields are grid-soil sampled regularly, and commercial fertilizers are applied as close to planting as possible using VRA. Split applications of nitrogen on the corn ground include a portion applied through the planter with makeup sidedress nitrogen.

Previously, makeup nitrogen was based on the pre-sidedress nitrogen

test (PSNT). As confidence grew in on-the-go nitrogen sensing technology, PSNT acreage dropped and sensor acreage increased on Baker's corn crop. Now, all sidedress nitrogen is sensor-based.

Total nitrogen per acre has decreased, but the most significant benefit is in getting the right amount of nitrogen in the right place. Applying a flat rate based on expected yields may be correct on average, but over-apply in low-yielding areas and under-apply in others.

Baker believes the technology does an excellent job in conventional tillage

»CONTINUED ON PAGE 17



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## »CONTINUED FROM PAGE 16

systems with lower soil organic matter, but still can be improved in no-till situations where the percent of soil organic matter tends to be higher.

Even so, he and Stutzman contend that sensor technology is less labor intensive compared to the pre-sidedress nitrogen test (PSNT), and it eliminates the lag time between measurement and application. Closing the lag gap reduces the risk of yield and profit-robbing nitrogen loss from leaching and nitrogen loss to the atmosphere with excessive rain when nitrogen is applied pre-plant or early in the growing season.

Sensors are typically positioned directly over a cornrow. The sensors measure light reflected by the crop canopy, so the best results come with applications made at or after growth stage V6. The sensors have a light source, so they work equally well in low light as in full sunlight. Information from the sensor adjusts the nitrogen application rate on the go.

Typically, one-third to one-half of the expected nitrogen needed for the season is applied at planting with the remainder delivered at sidedress time based on information from the sensor. Growers need to create a well-fertilized nitrogen reference strip in each field at planting time as a benchmark or calibration strip for that field to "train"

the sensor about variability in the field.

While the nitrogen cost-to-benefit ratio usually exceeds that of other fertilizer inputs, growers seek to use nitrogen efficiently to maximize its value and minimize nitrogen losses by applying the nutrient at the appropriate rate and timed to coincide with the need of the crop. The goal is to make sure crop yield is not limited by lack of nitrogen throughout the crop life cycle.

Stutzman thinks many farmers fear they aren't applying enough nitrogen, and a possible corn yield reduction is one of the reasons why more farmers don't use this technology. He believes farmers who have been applying nitrogen in the same way for the past

several years (based on bushels) might find it challenging to switch to a new technology such as nitrogen sensing.

Baker's recommendation to farmers wary of trying the technology is to start small (10 acres or so) and compare it to their current way of applying nitrogen. According to both farmers, they have had excellent results throughout the years, and "there is money to be made with this technology."

Pictured below: Variable nitrogen application through the use of nitrogen sensing technology is helping farmers to minimize nitrogen losses and reduce costs, proving that integrating crop-sensing technology in your nutrient management program is an effective way to feed your corn crop on the go.

| Ricardo Costa, MSU Extension



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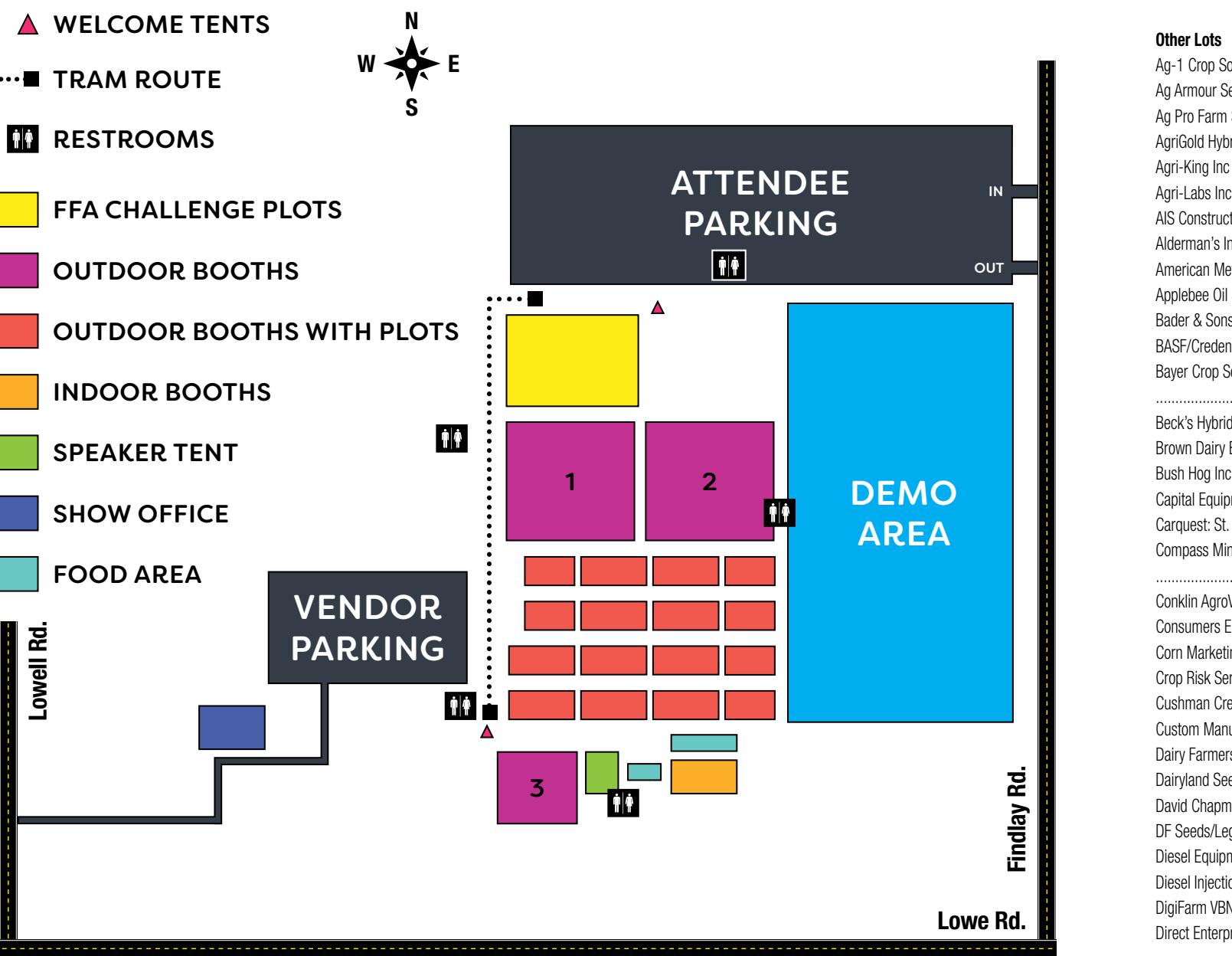
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# Map at a glance

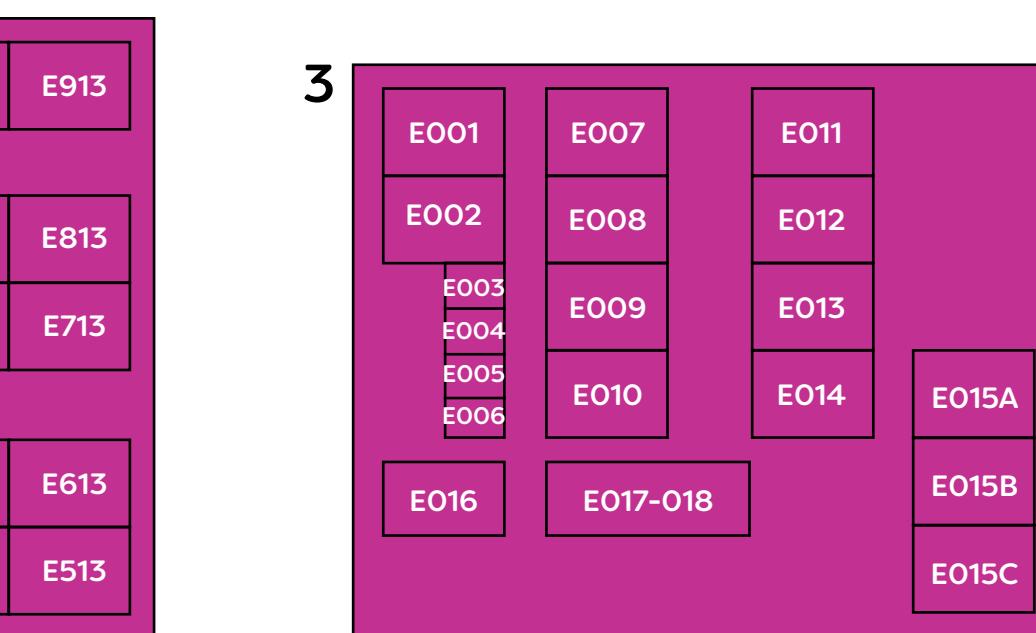


# Exhibitors List

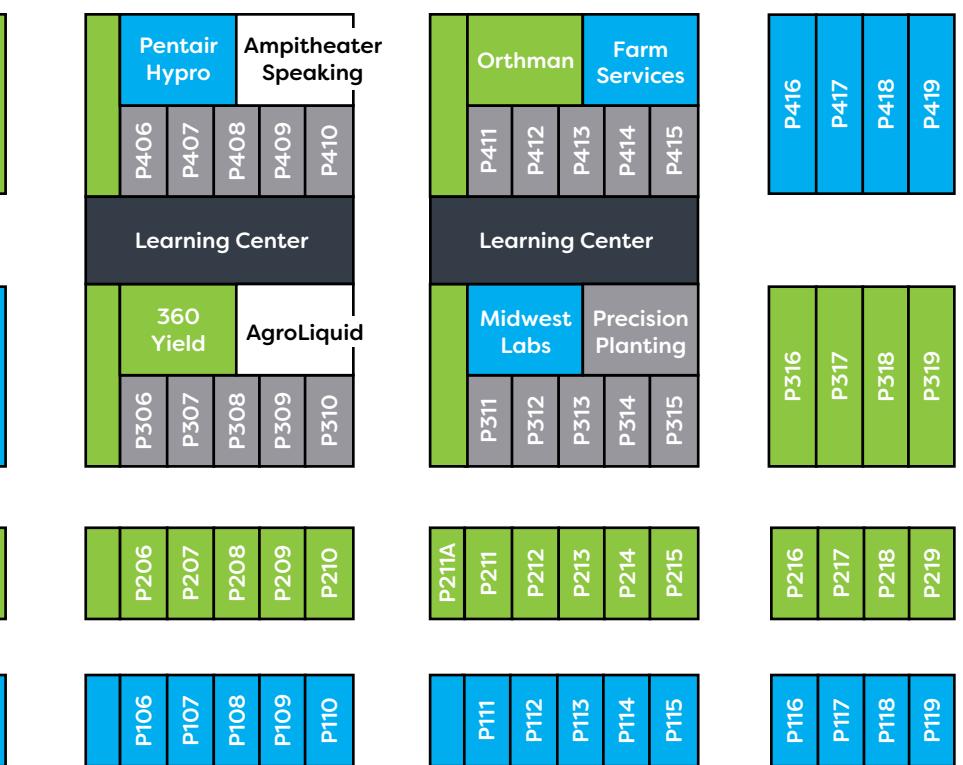
COMPANY	Lot #
<b>Learning Center Area Lots</b>	
360 Yield Center	P306, P307
AgroLiquid	P309, P310
Farm Services Inc	P414, P415
Midwest Laboratories	P311, P312
Orthman Manufacturing	P411, P412
Pentair Hypro	P406, P407
Precision Planting	P314, P315
<b>Other Lots</b>	
Ag-1 Crop Solutions LLC	E611
Ag Armour Seeds	P110, P210
Ag Pro Farm Services / Enduraplas	E702
AgriGold Hybrids	P112, P212
Agri-King Inc	E004
Agri-Labs Inc	E807B
AIS Construction Equipment	E705, E706
Alderman's Incorporated	E711
American Metal Roofs	47
Applebee Oil & Propane	43
Bader & Sons Co	E508, E509, E510
BASF/Credenz	P119
Bayer Crop Science DEKALB/Asgrow	P107, P108, P207, P208
Beck's Hybrids	P219
Brown Dairy Equipment	E003
Bush Hog Inc	E712, E713
Capital Equipment	E603
Carquest: St. Johns Auto Parts	E505
Compass Minerals	P002, P302, P303, P304, P402, P403, P404
Conklin AgroVantage	P118, P218
Consumers Energy	E008
Corn Marketing Program of Michigan	18
Crop Risk Services	37
Cushman Creek Supply	33
Custom Manuri Irrigation	E710
Dairy Farmers of America	2
Dairyland Seed	P113, P114, P213, P214
David Chapman Agency	49
DF Seeds/Legacy Seeds	48
Diesel Equipment	22
Diesel Injection Service	E707B
DigiFarm VBN	34
Direct Enterprises	E612
Easterseals Michigan AgrAbility	35
Ellens Equipment	E701
Exhibit Farm	15
Farm Bureau	E007
Farm Depot	E605, E606
Farmco Distributing Inc	E011, E012, E013, E014
Feldpausch Precision Services	P316, P416
Fertilizer Dealer Supply	E503, E504
Fiber By-Products	3
Fox Chrysler Dodge Jeep Ram	E015B, E015C
Fraleigh Law Firm PLLC	24
Genesee County Farm Bureau	E607B
Gilbert Sales & Service Inc	E507B
Golden Harvest	P106, P206
Great Lakes Cleaning Systems	E707A
GreenStone	21
H&S Manufacturing Co Inc	E502
Harvest Energy Solutions	E811
Herbruck Poultry Ranch Inc	29
HJV Equipment	E812
Hub Tire	E506
INA Store Inc	E501
MSU/Institute of Agriculture Technology	30
Janson Equipment Company	E703, E803
JW Turf	E905
Kaeb Sales Inc	E903, E904
Kubota Tractor Corporation	E609, E610
La Crosse Seed	P319
LaSalle Agri Inc	E907B
Legend Seeds Inc	P405
LG Seeds	P101, P201
LSQ North America	26
Lynnman Construction LLC	19, 20
MAIN	32
Stokes Seed Inc	39
Stor-Loc	16, 17
Texas Refinery	28
MDARD: MAEAP	55
MDARD: RTF	54
The Nature Conservancy	E507A
Thumb Drone Works/P&C Ag Solutions	E807A
Timac Agro USA	P317, P417
Topcon Agriculture America's	23
University of Michigan & Rich Earth Institute	P318
US Department of Agriculture	53
Valley Farms Supply	E907A
Walinga USA Inc	E604
Williams Farm Machinery	E906
Young Chevrolet of St. Johns	E017, E018
Michigan Foundation for Agriculture	5

# Detailed Map

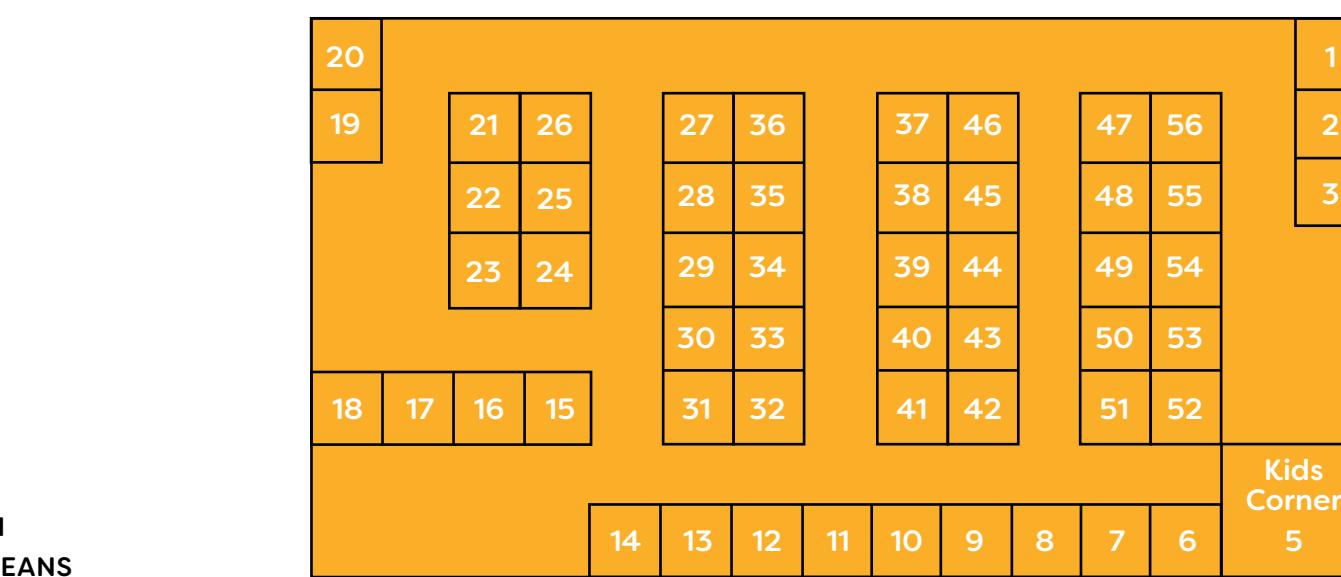
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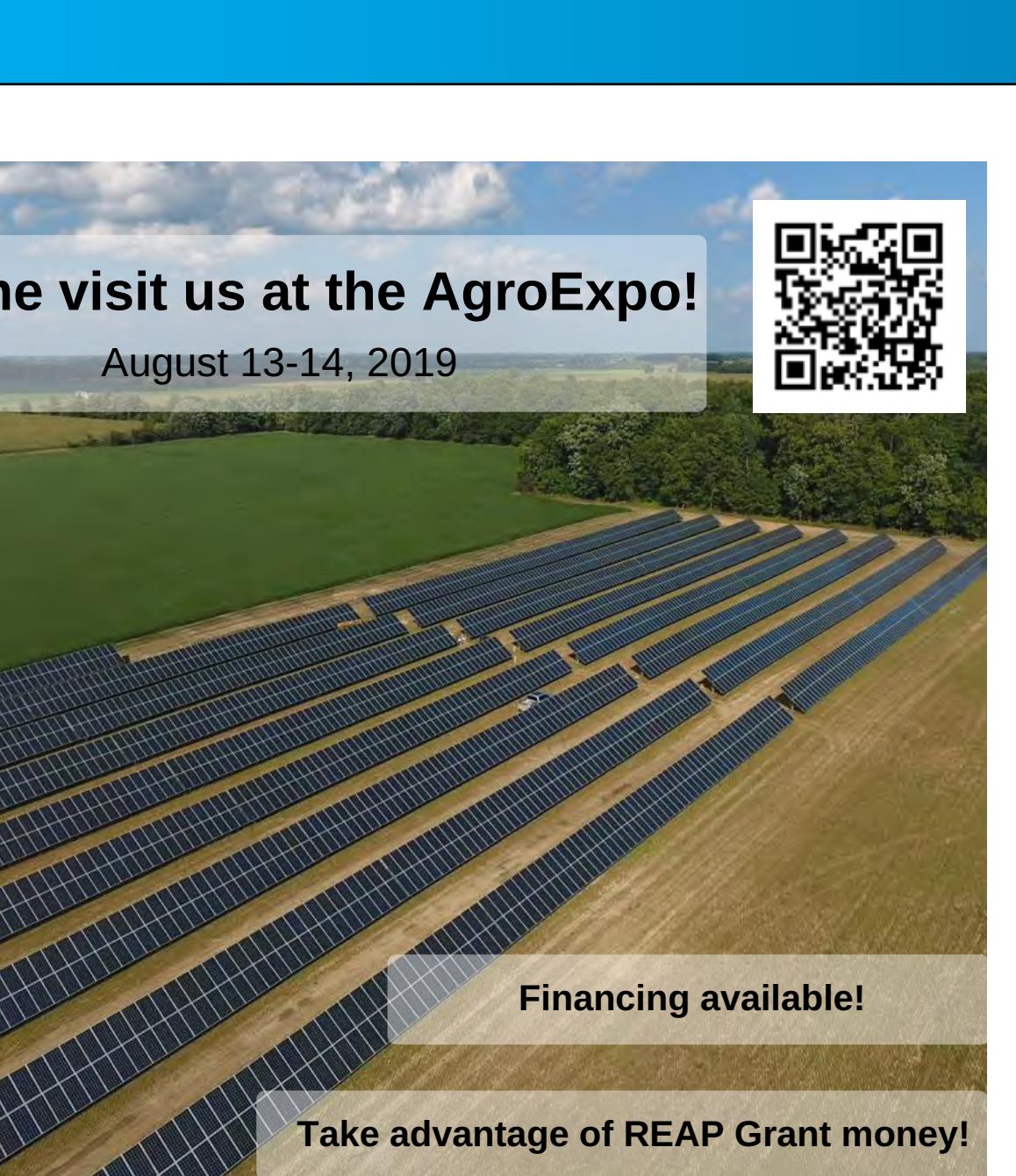
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**ZINC (Zn)**  
Zinc is necessary for chlorophyll and carboxylate production. High yields are impossible without zinc due to its importance in growth, metabolism, and photosynthesis. High soil phosphorus, soil organic matter, biological activity, and irrigation play a role in zinc availability.

**COPPER (Co)**  
Copper plays a critical role in the overall growth of plants. Copper is necessary for the processes of stem growth, elongating the coleoptiles, and expanding leaf discs. A cobalt deficiency will reduce or stunt plant growth and reduce seed germination.

**IRON (Fe)**  
Iron is required for the formation of chlorophyll in plant cells. It activates respiration, photosynthesis, and symbiotic nitrogen fixation. Low iron levels in the plant result in poor energy transfer from leaves to growing points or fruiting structures thus slowing growth and lowering yields.

**MANGANESE (Mn)**  
Manganese is a secondary plant nutrient. It serves as an activator of many plant enzymes required in growth. It's the central atom in chlorophyll, and also aids in phosphorus and nitrogen metabolism. Manganese is necessary for the formation of oils, fats, amino acids, and sugars. It promotes early growth and uniform crop maturity.

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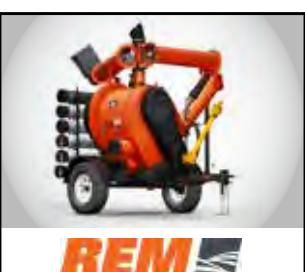
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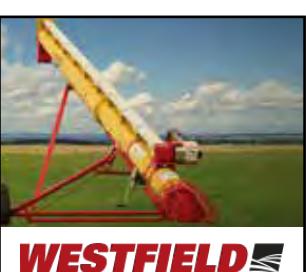
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# Crop management challenge: FFA students are now in charge

## FARM NEWS MEDIA

By entering AgroExpo's 2019 Crop Management Challenge, FFA students are now in charge.

At least, that's the idea behind the first-year competition, said Megan Merrill, a Springport agriscience teacher and FFA advisor.

"From our end, what I like about this event is that many of our students are coming from family farms, but those kids aren't making decisions," Merrill told *Michigan Farm News*. "The event is structured where students have to dig into the costs and ... management skills. Kids here are having a conversation and really have to engage."

The Crop Management Challenge is a competition for FFA chapters to enter and expand their members' agronomy skills. Contestants compete with other chapters to make sound agronomic, marketing and environmental decisions in a demonstration plot of corn.

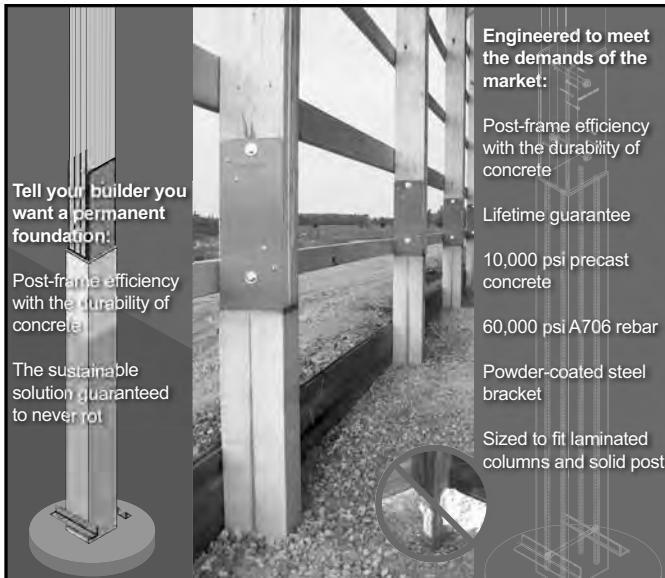
The goal of the first-year event? To raise student awareness in agronomical career opportunities.

Normally, according to Merrill, "kids aren't in those big decisions" on the farm.

"They learn to expect a return (from the crop), (and) when it is not a beneficial input," Merrill said. "I think it's awesome. It gives my students a very real and hands-on experience with decision-making and agriculture. The idea behind the project is to give students an experience to make decisions."

Merrill has five students participating in the corn plot challenge — two soon-to-be juniors, one sophomore and two freshmen. Contestants in the challenge are judged on yield (35%), economics (35%) and presentations/responses (30%) to the judges' questions.





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## »CONTINUED FROM PAGE 28

The FFA chapter involved in the competition will be expected to attend the AgroExpo and occupy a tent by their plot area. There, participants will explain their challenge plot decisions and provide a final report based on yield data after the harvest.

First-place winners will receive a plaque, traveling trophy and \$1,000; second-place winners will receive a plaque and \$500; and third-place winners will receive a plaque and \$250.

"I love the concept, and I want to continue this," Merrill said. "My students can mentor and carry this over to others. The students I chose are the ones who are the tractor drivers on the farms. ... They don't get to be decision-makers.

"This gives them a chance to do that."

The AgroExpo FFA Crop Management Challenge is sponsored by AgroLiquid and Michigan Corn Growers Association. FFA chapters participating include Mason, Springport, Laker, Sanilac Career Center, Montcalm Career Center, Fowlerville, Perry, Ovid Elsie, Olivet and Coleman.

"This is a great opportunity," said Robert Sollman, biotechnology instructor at the Sanilac Career Center. "I have six kids working on the project. So far, we are weighing the pros and cons of the timing of the nutrient applications. The students did quite a bit of research."

Similarly to Merrill, Sollman said he enjoys his students finally making the farming decisions.

"Kids are forced to learn and then defend what they are learning," he told

Michigan Farm News.

"They ... go deeper into the subject. This project is so awesome at driving kids into the subject matter so they truly understand what goes into a crop."

Merrill agrees.

"The beauty is we made contact with a local producer," she said. "He met with our team and gave us a real-life perspective on how he uses the local product while helping us make our management decisions.

"He gave us that real perspective."



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# Remote Sensing – Practical applications in agriculture?

## GRINDGIS, FARM NEWS MEDIA

Remote sensing is the acquisition of information about an object or any phenomenon without making any physical contact with the object. It is a phenomenon that has numerous applications including photography, surveying, geology, forestry and more.

But it is in the field of agriculture that remote sensing has found significant use. There are very many applications of remote sensing in the agricultural sector. Below is a summary of these applications.

### **Crop production forecasting:**

Remote sensing is used to forecast the expected crop production and yield over a given area and determine how much of the crop will be harvested under specific conditions. Researchers can be able to predict the quantity of crop that will be produced in a given farmland over a given period of time.

**Assessment of crop damage and crop progress:** In the event of crop damage or crop progress, remote sensing technology can be used to penetrate the farmland and determine exactly how much of a given crop has been damaged and the progress of the remaining crop in the farm.

### **Horticulture, Cropping Systems**

**Analysis:** Remote-sensing technology has also been instrumental in the analysis of various crop planting systems. This technology has mainly been in use in the horticulture industry where flower growth patterns can be analyzed and a prediction made out of the analysis.

**Crop Identification:** Remote sensing has also played an important role in crop identification especially in cases where the crop under observation is mysterious or shows some mysterious characteristics. The data from the crop is collected and taken to the labs where various aspects of the crop

including the crop culture are studied.

**Crop acreage estimation:** Remote sensing has also played a very important role in the estimation of the farmland on which a crop has been planted. This is usually a cumbersome procedure if it is carried out manually because of the vast sizes of the lands being estimated.

**Crop condition assessment and stress detection:** Remote sensing technology plays an important role in the assessment of the health condition of each crop and the extent to which the crop has withstood stress. This data is then used to determine the quality of the crop.

**Identification of planting and harvesting dates:** Because of the predictive nature of the remote sensing technology, farmers can now use remote sensing to observe a variety of factors including the weather patterns and the soil types to predict the planting and harvesting seasons of each crop.

**Crop yield modelling and estimation:** Remote sensing also allows farmers and experts to predict the expected crop yield from a given farmland by estimating the quality of the crop and the extent of the farmland. This is then used to determine the

overall expected yield of the crop.

### **Identification of pests and disease infestation:**

Remote sensing technology also plays a significant role in the identification of pests in farmland and gives data on the right pests control mechanism to be used to get rid of the pests and diseases on the farm.

**Soil moisture estimation:** Soil moisture can be difficult to measure without the help of remote sensing technology. Remote sensing gives the soil moisture data and helps in determining the quantity of moisture in the soil and hence the type of crop that can be grown in the soil.

**Irrigation monitoring and management:** Remote sensing gives information on the moisture quantity of soils. This information is used to determine whether a particular soil is moisture deficient or not and helps in planning the irrigation needs of the soil.

**Soil mapping:** Soil mapping is one of the most common yet most important uses of remote sensing. Through soil mapping, farmers are able to tell what soils are ideal for which crops and what soil require irrigation and which

»CONTINUED ON PAGE 31



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»CONTINUED FROM PAGE 30

ones do not. This information helps in precision agriculture.

**Monitoring of droughts:** Remote sensing technology is used to monitor the weather patterns including the drought patterns over a given area. The information can be used to predict the rainfall patterns of an area and also tell the time difference between the current rainfall and the next rainfall which helps to keep track of the drought.

#### Land cover and land degradation

**mapping:** Remote sensing has been used by experts to map out the land cover of a given area. Experts can now tell what areas of the land have been degraded and which areas are still intact. This also helps them in implementing measures to curb land degradation.

#### Identification of problematic soils:

Remote sensing has also played a very important role in the identification of problematic soils that have a problem in sustaining optimum crop yield throughout a planting season.

#### Crop nutrient deficiency detection:

Remote sensing technology has also helped farmers and other agricultural experts to determine the extent of crop nutrients deficiency and come up with remedies that would increase the nutrients level in crops hence increasing the overall crop yield.

**Reflectance modeling:** Remote sensing technology is just about the



only technology that can provide data on crop reflectance. Crop reflectance will depend on the amount of moisture in the soil and the nutrients in the crop which may also have a significant impact on the overall crop yield.

#### Determination of water content of field crops:

Apart from determining the soil moisture content, remote sensing also plays an important role in the estimation of the water content in the field crops.

**Crop yield forecasting:** Remote sensing technology can give accurate estimates of the expected crop yield in a planting season using various crop information such as the crop quality, the moisture level in the soil and in the crop and the crop cover of the land. When all of this data is combined it gives almost

accurate estimates of the crop yield.

**Flood mapping and monitoring:** Using remote sensing technology, farmers and agricultural experts can be able to map out the areas that are likely to be hit by floods and the areas that lack proper drainage. This data can then be used to avert any flood disaster in future.

**Water resources mapping:** Remote sensing is instrumental in the mapping of water resources that can be used for agriculture over a given farmland. Through remote sensing, farmers can tell what water resources are available for use over a given land and whether the resources are adequate.

**Precision farming:** Remote sensing has played a very vital role in precision agriculture. Precision agriculture has resulted in the cultivation of healthy crops that guarantees farmers optimum harvests over a given period of time.

**Soil management practices:** Remote sensing technology is important in the determination of soil management practices based on the data collected from the farms.

**Crop health analysis:** Remote sensing technology plays an important role in the analysis of crop health which determines the overall crop yield.

**Land mapping:** Remote sensing helps in mapping land for use for various purposes such as crop growing and landscaping.

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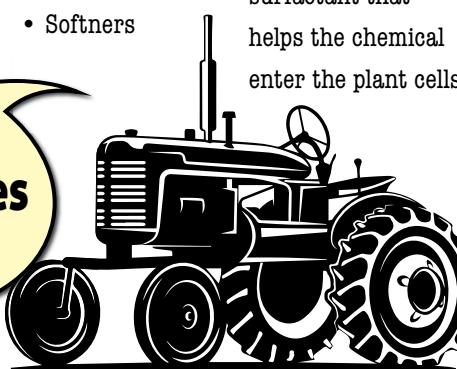
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# It starts with the soil

## AGROLIQUID

Every grower has a budget for crop inputs – where should the first crop nutrition dollar be spent? What seed genetics will minimize variability? What crop protection products will I need? The first, most important tool for developing a crop management program is a good soil test. Unless a grower knows the condition of their soil, any cropping plan will be based on averages and generalities. In today's economic environment, it is vital to understand what the soil has, and what it doesn't have, in order to make a well-thought-out management program.

The first step is, of course, collecting a sample. So, what do you need to keep in mind when soil sampling?

## KNOW YOUR FIELDS

Soil sampling can be done in a grid sampling pattern if nutrients are being applied using precision application and variable rate technology equipment. If variable rate applications are not intended, fields can be separated into similar areas (zones). Often the similar areas can be grouped by soil type. Knowledge of the field is critical, so that distinct areas of the field can be sampled separately. A composite soil sample should represent an area no larger than 20 acres. Larger areas should be split into multiple samples. Sampling should be done in a zig-zag pattern throughout the zone, making sure to stay away from the outside boundaries of each area. Make sure the zone is well represented in the soil sample. Remember that up to 20 acres are to be represented by less than 1 pint of soil in the sample bag, and the lab uses just a small portion of that to do their analysis.

Of course, there is available technology that can be helpful in developing maps and strategies to use for proper placement of crop inputs, including seed, fertilizer and pesticides. These technologies can make it possible

to test more ground in less time than conventional soil sampling. Some of these technologies will be demonstrated on the AgroExpo grounds.

SoilHawk™ helps farmers save on labor and avoid inaccurate soil tests by allowing one person to easily obtain accurate, pure soil samples from hundreds of acres per day.

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## BE AWARE OF SEASONAL EFFECTS

Regardless of your sampling methods, consistency is key when comparing multi-year soils tests. There can be considerable seasonal influence on soil

test values, especially on potassium and pH. According to Midwest Labs, clay soils, like those in much of the northern corn belt, have a tendency to have a higher potassium level during winter months. Soil pH values can vary, as well, depending on rainfall or irrigation, nitrogen or sulfur inputs, and soil buffering capacity. It may be wise to take soil samples during periods when these variations hit average values. These periods are generally in the early fall (September-November) and again in the late March-April time frames.

## THE NEXT STEP

While properly collecting and submitting soil samples is a critical first step, interpreting the results is another challenge. Upon first glance, a complete soil sample report can look like something a nuclear engineer carries in his briefcase. Luckily, the AgroExpo has some of the best agronomists in the business available to discuss your soils and cropping situation. Take advantage of having these professionals together at this event — and don't miss the Soil Sampling & Remote Sensing Technology demonstrations at 10:00 am and 3:00 pm each day in the demo area.



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# AgroExpo field demos focus on sprayer technology

## FARM NEWS MEDIA

Five of the top sprayer manufacturers will be represented at AgroExpo's demonstration site, offering a close-up look at all of the features of each unit. You'll get helpful tips on calibration, tip selection, tip wear and sprayer maintenance to name a few. Most importantly, you will get to see them in action as they operate in the demonstration area each day at 9 a.m. and again at 2 p.m.

### JOHN DEERE R4038 SPRAYER

Completely redesigned from the ground up with the latest advances in technology, the smartest cab in its class, higher application rates and smooth-running comfort, John Deere's R4038 Sprayer can take your productivity to whole new levels, said Tony Rockafellow, commercial application specialist for Baders & Sons.

A 120-foot boom means fewer passes for less compaction and less time spent spraying. Swing link suspension improves stability, allowing the booms to shift horizontally (side-to-side) rather than lateral (up and down) movement, which helps to more accurately maintain spray height above the crop and deliver a precise spray pattern.

Equipped with the Gen 4Extended Monitor option, the operator can monitor quality of the work being done in broad acre, high-speed operations

by seeing a second full page run screen on a second interactive touch screen monitor. It also allows the operator to easily make or implement setting adjustments by reducing the need to swipe between multiple run pages.

Rockafellow also plans to showcase John Deere's ExactApply technology which gives users the ability to switch spraying between two pre-selected nozzles with the push of a button. There is also the option to automatically vary the rate across the entire boom. This ensures that the correct amount of material is applied to the right area of the field, improving spray resolution accuracy.

### ROGATOR 1100C

Sponsored by Farm Depot, salesman Blake Laethem said the latest self-propelled sprayer system from Rogator has some very big changes that improve upon an already trusted machine. Outfitted with a 120-foot boom, the newest machine comes with an improved drive system and a totally redesigned liquid system, including one continuous boom.

Labelled as "the new benchmark in precision application," the RoGator C Series by Challenger has been redefined starting with the industry-exclusive LiquidLogic system to the sophisticated AWD SmartDrive system to the simple, intuitive AccuTerminal

operational platform that controls all chassis and machine functions.

Unprecedented Product Recovery: ClearFlowTM, the industry's first full-recovery system, pushes unused product from the plumbing back into the tank prior to a tank or boom rinse. Rainout? No problem. Product goes back in the tank to be re-agitated or off-loaded, so waste and contamination are minimized.

Prevent Product Build-Up: More resistant weeds require more complex, potent product mixtures, which can create a greater risk of product contamination and crop damage. The FlowLogic system keeps product in motion and in suspension.

Prime Without Waste: Once the product pump and recirculation is turned on, product begins to flow through the entire boom plumbing, quickly priming the boom. You save time and money, and apply product only where it's needed.

### APACHE MODEL AS1040

Designated as "The Best Selling Apache," the 1,000-gallon AS1040 sprayer fits perfectly for most any farming operation size, according to John Murphy of HJV Equipment LLC in Chesaning, Mich., which acquired the distributorship of the Apache line of

»CONTINUED ON PAGE 41



»CONTINUED FROM PAGE 40

Spray Equipment in 2009.

According to Murphy, the AS 1040 will be equipped with 100-foot aluminum boom, as well as standard features, including auto-steer, a Viper 4 controller, boom height control and a chemical injection and inductor system, keeping chemical and water separate until application.

A durable ZF six-speed power shifting transmission, equipped with a lock-up torque converter, doubles the engine's torque. A lock-up feature couples the engine to the transmission, creating a direct drive transmission which has been battle tested year-round in extreme conditions by world-class off-highway heavy equipment makers. This provides the shifting power you need without the added weight.

With a 1,000-gallon capacity tank, the Apache AS1040 Sprayer is the most popular sized model in the lineup. It features a mechanical drive that makes it simple to operate and nimble enough to work in field conditions competitive sprayers can't.

Capable of 35 mph road speeds, the AS1040 is engineered lightweight at just 20,000 pounds. That means better fuel economy, reduced compaction and a lower price. The Apache 1040 offers a turning radius of 18 feet and a wheel base of 15 feet — perfect for tight-fit areas.

#### CASE IH PATRIOT 3340

AgroExpo visitors will be able to witness the accuracy and consistency of the Case IH Patriot 3340, according to



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Aaron McKenzie of Janson Equipment. For 2019, the Patriot series is equipped with Advanced Farming Systems (AFS) AccuTurn and is now available through the AFS Pro 700 display.

The 3340 also includes AutoBoom automatic boom height control to maintain spray height for better coverage. AIM Command FLEX advanced spray technology delivers the ultimate in spray control so you can maintain optimal coverage over a range of speeds and terrain. This new system features flexible application, turn compensation and nozzle valve diagnostics.

The cab-forward, rear-engine Patriot design does much more than create a distinctive look — it also provides optimal weight distribution across the machine for earlier field access and less rutting and soil compaction.

With the option of a 60-, 90- or 120-foot boom, the 285 horsepower Patriot 3340 includes a 1,000 gallon tank and a centrally located service center for all tendering functions.



#### NEW HOLLAND GUARDIAN SP370F

Sponsored by Ellens Equipment, the demonstration will include a New Holland Guardian SP370F sprayer. The ground-breaking Guardian front boom sprayers from New Holland combines rugged construction with innovative design to save you time and make you more productive all season long.

Guardian front boom sprayers are the easiest way to spray. With the boom in front, you get the very best view of the spray nozzles and the field ahead to confidently cover ground faster. And with the highest ground clearance on the market — up to 78 inches, you'll be ready for late-season applications. You can adjust under-body clearance on the go from the seat to adapt to changing needs. For truck transport, you can easily lower the overall height down to 153 inches (12.75 feet) from the operator's seat.

The SP370F planetary drive system is electronically controlled and provides a long list of outstanding features such as full-time traction control, cruise control, anti-stall, integrated speed limiting and four driver-programmable speed settings.

Add to that a 32-mph road speed with four-wheel dynamic braking, and you have an effortless system to operate. Since the engine is mounted in the rear, Guardian sprayers offer better weight distribution, and you get better access and a quieter ride.



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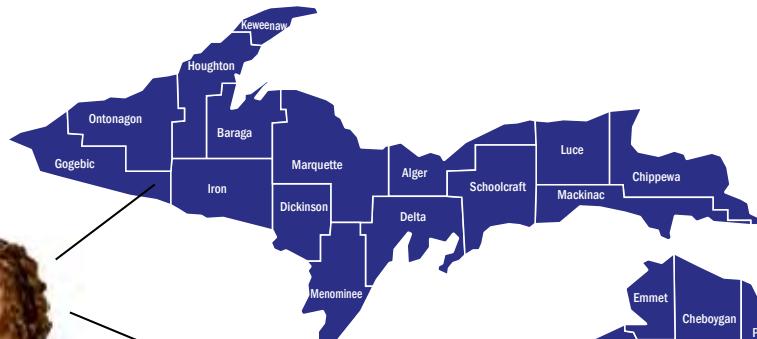
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