# What's New in Digital Ag & How to Use the Data

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Remote monitoring of grain conditioning and storage equipment

Wireless transfer of work orders: variable rate application or seeding files

Remote monitoring of swine & poultry facilities

Wireless transfer of work records: yield files, as applied Mobile apps & other field scouting tools



Infield IoT sensors: weather, moisture, soil properties, plant heath/growth Equipment monitoring and other services enabled by connected machines

Farm office connection for market

information, file transfer, use of cloud

based agronomic/ERP platforms,

input & logistics management,

communication with advisors

Supply chain interaction with vendors, inventory, regulatory reporting, imagery and other agronomic tools & services

Remote monitoring of machines for logistics, machine health, maintenance, software updater terminal mirroring

Irrigation system monitoring, control and work order/work record transfer

GNSS correction signals for guidance systems (NTRIP)

#### Emerging Technologies

- "New" Sensors & IoT
- "Cloud" based data storage
- "Cloud" based analytic tools



#### "New" Sensors

- Precision Plantings new SmartFirmer
- Veris Technologies U3 Soil EC, pH and Organic Matter cart
- See & Spray Technology being developed by Blue River Technologies



#### Internet of Things (IoT)

- Basis of IoT is connecting sensor to low speed and low cost Internet connections
- Companies are building new networks to connect new area of Crop Production to the web
- This will bring new learning to producing crops in the future
- Focused today on High Value Crops and Irrigation, but will be in Row Crops soon



#### One Example of Network Development





#### Data storage option

- USB sticks or portable hard drives
- Personal computers
- "Cloud" based storage tools



### Is This Your Data Storage Plan?





#### "Cloud" based options

- AFS Connect
- Ag Data Coalition-ADC
- AGCO AgCommand
- AgLeader AgFiniti
- FieldView Plus
- Digi-Star Harvest Tracker

- MyJohnDeere
- Trimble Connected Farm
- Raven Slingshot

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 Some local Service Providers offer these services also



#### Why use "Cloud" service

- Provides a tool to store agronomic data in a single location
- Allows you the ability to "catalog" your farm data
- Most of these systems allow you to share data with trusted service providers



#### "Cloud" Storage Consideration

- Define your goals of using a "Cloud" based data storage solution
- Does this system support your hardware solution
- Read and understand the services Terms of Use and Data Privacy agreements



#### "Cloud" based analytic tools

- Agralogics
- Agrible
- FieldView Plus
- Conservis
- Cropzilla
- Encirca

- Farmer Business Network (FBN)
- Farmobile
- FarmLogs
- Granular



#### Good Use of Data????





#### Ways we use data

- Grid soil sample every 4 years
- Yield data for upcoming fertilizer applications
- Advanced planter monitoring data for reporting and analysis
- Elevation data for Water Management decision



#### Ways we use data

- Crop Protection application data for reporting
- If tillage is needed, we use tillage data in our analysis tools
- Tracking cover crop planting for analysis
- Scouting data is used to develop application recommendations



#### Why Collect Quality Data

- Must identify the limiting factor to yield
- Could be fertility
- Could be hybrid
- Could be other factors





# Value of Planting Data



Product - Name Hybrid 1 (20.10 ac) Hybrid 2 (20.44 ac)

#### Map Layer 1



Grower : Wade Wilson Farm : Bob meers Field : WBM23 South of House Year : 2016 Operation : Planting Crop / Product : Multiple Op. Instance : Planting - 1 Area : 40.56 ac Est. Amount : 1,213.7 ksds Avg. Rate : 29.93 ksds/ac Start Date : 5/30/16 End Date : 5/30/16 Working Time : 3.663 h Avg. Productivity : 11.07 ac/h GPS Count : 13186

Product - Name Hybrid 1 (20.10 ac) Hybrid 2 (20.44 ac)



## Value of Planting Data

#### Analysis Description

Allows the comparison of an attribute(s) or property(s) against other attributes/properties

Wade Wilson | Bob meers | WBM23 South of House | 2016 | Grain Harvest | Corn | CORN | NO Pest | Harvest - 1 | <1>

Analysis Results- Yield (Dry), Moisture Classified By- Planting : Product - Common Name

Product - Common Name	Avg. Yield (Dry) bu/ac	Total Yield (Dry) bu	Min. Yield (Dry) bu/ac	Max. Yield (Dry) bu/ac	Avg. Moisture %	Total Moisture %	Min. Moisture %	Max. Moisture %	Area ac
Hybrid 1	135.46	2,529.5	5.016	290.84	13.78	56,339	8.223	19.50	18.67
Hybrid 2	156.93	2,810.4	5.032	360.39	14.58	62,287	8.476	18.51	17.91
(All)	145.97	5,339.8	5.016	360.39	14.17	118,626	8.223	19.50	36.58







# Value of Application Data



#### 2016 W1 Yield Map



Grower : Wade Wilson Farm : Wade wilson Field : W1 South of Pond Year : 2016 Operation : Grain Harvest Crop / Product : CORN Op. Instance : Harvest - 1 Area : 28.37 ac Avg. Yield : 154.87 bu/ac Avg. Moisture : 17.23 %

	Yield (Dry) (bu/ac)								
183.76	-	399.44	(3.987	ac)					
172.44	-	183.76	(4.336	ac)					
163.72	-	172.44	(4.291	ac)					
154.01	-	163.72	(4.117	ac)					
142.63	-	154.01	(4.013	ac)					
123.09	-	142.63	(3.864	ac)					
5.23	-	123.09	(3.757	ac)					















#### Value of Elevation Data





## Spatial Trends

- Shows yield potential for areas based on 6 years of yield data
- Green areas of the field show regions we are considering new treatments to maximize yield





## Temporal Stability

- Used to understand the likelihood of yield variability
- Defines areas of the field that may have other limiting yield factors than fertility or hybrid selection





#### Management Units

- Used to potentially define areas within the field to consider new management
- Exploring more intensive sampling of Below Average yield through Unstable regions





One day Alice came to a fork in the road and saw a Cheshire cat in a tree. "Which road do I take?" she asked. "Where do you want to go?" was his response. "I don't know," Alice answered. "Then," said the cat, "it doesn't matter."



#### Something to Think About

- Technology is an important tool on our farm today, are you using these tools?
- Don't be afraid to consider new technology
- Make sure the technology you purchase will bring return on investment to your farm
- Technology and data collection can be used to provide new insights into your operation



# Questions?

Thanks for the opportunity speak!

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