

# Digital Transformation

Amanda Neely

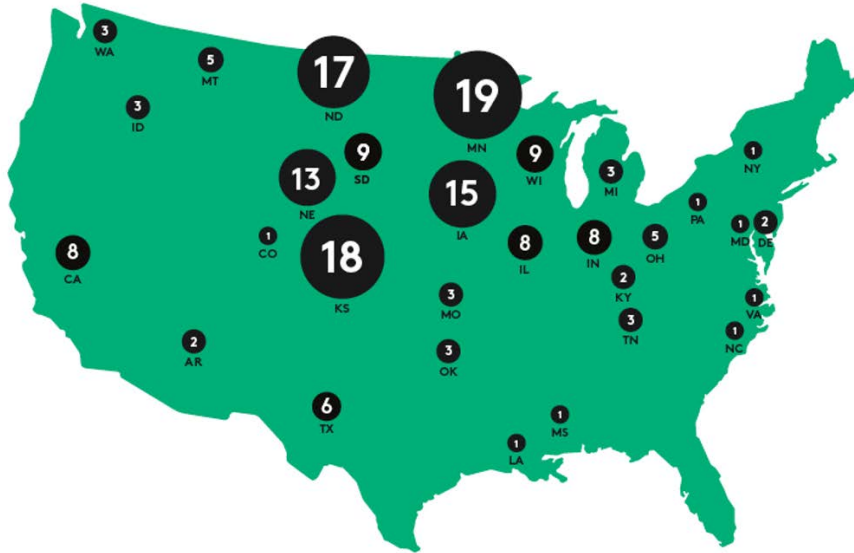


# Technology & Agriculture

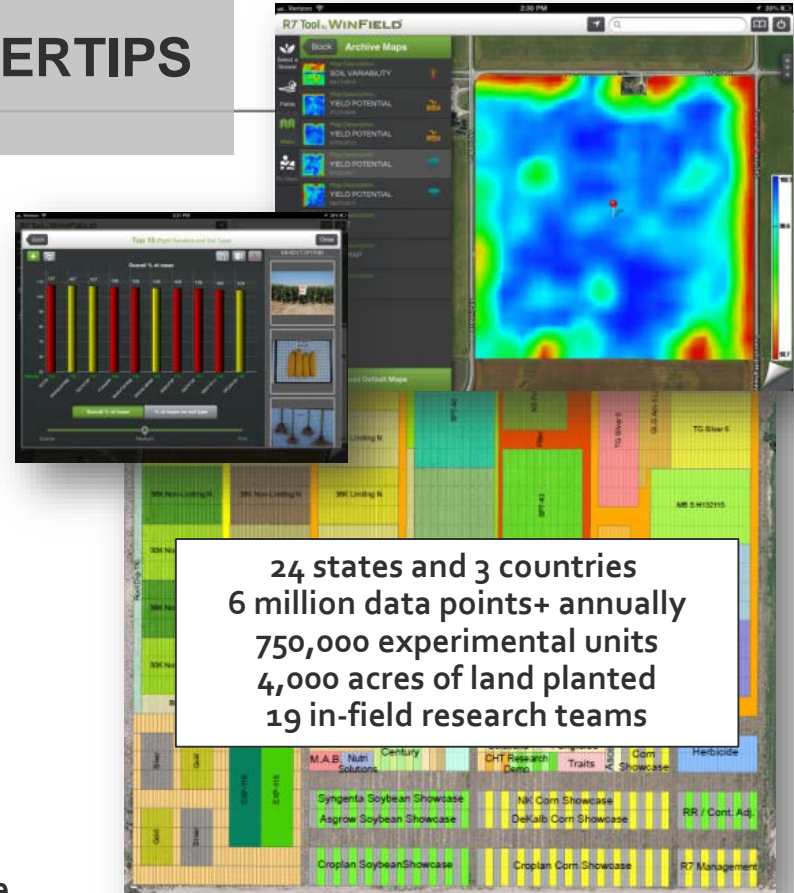
- **Data** Collection & Aggregation
- **On farm** productivity
- **Digital** Transformation
- **Insights** and Efficiencies
- **E-business** & Ease of business
- **Partnerships** & Integrations

# DELIVERING INSIGHTS TO YOUR FINGERTIPS

115 Answer Plot Locations – 20 Years of R&D



Intelligently advancing agriculture to achieve predictable outcomes requires technology solutions that work for farmers

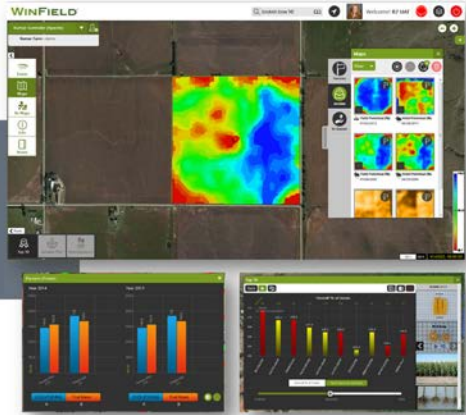


24 states and 3 countries  
6 million data points+ annually  
750,000 experimental units  
4,000 acres of land planted  
19 in-field research teams

# R7<sup>®</sup> Tool

By WINFIELD UNITED

- Best in class seed placement tool
- Easy-to-use Web & Mobile Solution
- Satellite Imagery to Detect Vegetation
- Field-Specific Variability Assessment
- Product-Specific Response Insights
- Enabling In-Season Management
- ROI Understanding for each Field

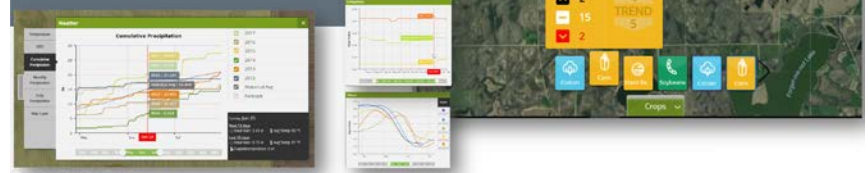


*"Enable the growers that we serve to capture the optimal yield potential on every acre."*

# R7<sup>®</sup> Field Monitoring

By WINFIELD UNITED

- Utilize In-Season Imagery with Crop, Field, Weather Information
- Dashboard view showing Field Performance compared to other like fields
- Compare Trends year over year based on NDVI



# R7<sup>®</sup> Field Forecasting

By WINFIELD UNITED

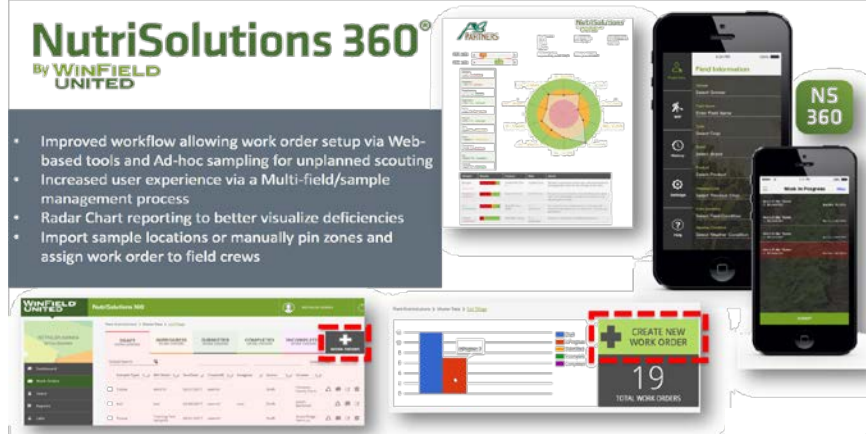
- Real time yield estimates and real time estimates of agronomic issues causing stress – Nitrogen, Potassium, Water
- ROI Scenarios on fertility and water management
- Simulations adjusted using in-season tissue and soil sample results, mgmt./applications and irrigation



# NutriSolutions 360<sup>®</sup>

By WINFIELD UNITED

- Improved workflow allowing work order setup via Web-based tools and Ad-hoc sampling for unplanned scouting
- Increased user experience via a Multi-field/sample management process
- Radar Chart reporting to better visualize deficiencies
- Import sample locations or manually pin zones and assign work order to field crews



WINFIELD UNITED

# WINFIELD UNITED ATLAS OMNI-CHANNEL SOLUTION



R7® Tool



Nutrisolutions®



R7® Field Forecasting



Truterra™



## INSIGHTS

Data / Insights for Decision Making

## PURCHASE

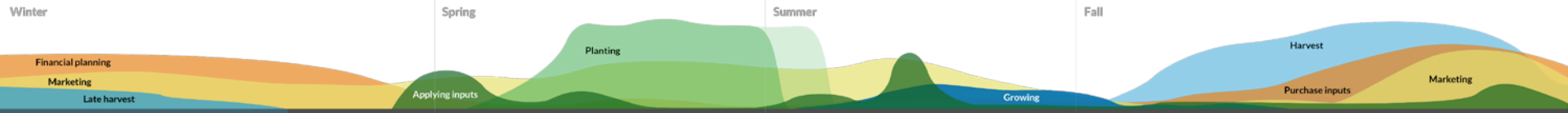
Website / Digital Marketing  
Personalized Experience  
Commerce

## FULFILLMENT

Inventory Transparency  
On-Time Delivery  
Operational Efficiency



# Understanding the Growers Journey



## Financial planning

Project the earnings, and strategize the spending for the new year, with financial advisors and crop consultants. Secure line of credit and purchases crop insurance.

**Activities:** review prior year, budget and forecast new year, secure line of credit, purchase crop insurance, prepare tax.



## Networking and community

Attend grower meetings to learn about best practices and the latest in farming. This maintains a sense of community which is diminishing in farming business.

## Preparing pre-season

Make sure everything is good to go, equipment is tuned up and seeds are received. **Activities:** repair machinery during "fix-it months", seed and input delivery, create Rx.



## Late harvest

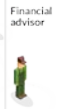
**Activities:** tractor shows, volunteering

## Marketing and selling crops

Staying on top of the trends, while relying closely on marketing advisors to determine when to sell. **Activities:** monitor market, sell crop, haul grain.



## Applying inputs



## Planting

With help from agronomists, load the USB drive that contains the Rx and import new files into the John Deere planter (uses auto-steering for planting. **Activities:** load Rx to equipment, plant seeds (replant if needed).



## Vacation

Vacation with the family. Text with agronomist to receive images of the fields in case anything abnormal comes up.

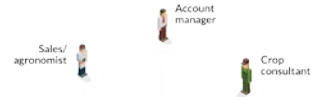
## Growing

Trust in the agronomist to monitor the fields and make in-season applications depending on diseases, pests or deficiencies. **Activities:** crop scouting, diagnose and treat, soil and tissue sampling.



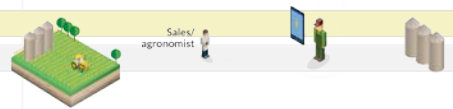
## Selecting and purchasing inputs

With insights learned during harvest, discuss hybrids, chemical and fertilizers for next year with agronomist. Choose the inputs from the local co-op's product brochures. Place orders and prepay. **Activities:** select inputs, negotiate price, lock down and prepay.



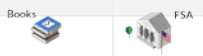
## Harvest

With the seasonal staff operate the combine to harvest crops. The grower sits in front of the monitors with real time imagery of the yield map—at the same time, looking at the combine and watching the field condition. **Activities:** prepare bins, harvest, evaluate and analyze, haul and store grains.



## Record keeping

With help from marketing, financial advisors and agronomist, the grower tracks the financial and operational activities related to his farm. **Activities:** bookkeeping, submit record to FSA.



## Monitoring grain elevator

The agronomist had suggested to use temperature sensor and remote management program to monitor the grain conditions in the elevators. Makes sure grains are in a low temperature and dry environment—warmth and humidity will cause sprouting.

# Providing connected solutions and an integrated farming experience

Connectivity through combined data provides growers with a **complete, cross-dimensional view into their farm, fields, activities, purchases, collaborators and finances.**

Completeness of data guarantees more accurate insights and forecasting—growers are motivated to keep their field and farm data up to date and understand the benefits of a data input service.

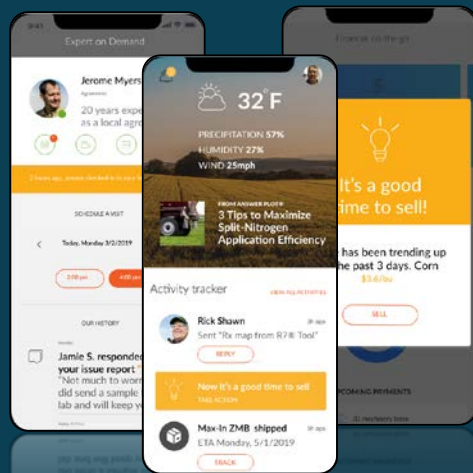


**WINFIELD**  
**UNITED**  
ATLAS

# Example concept: Grower's dashboard

A **dashboard** with access to all the platform modules (i.e. financial planning, ops platform, grain connect) along with **seasonal updates and insights** based on the grower's farm profile.

The dashboard also incorporates a **live feed to track all the on-going farm activities**, which gives growers a prompt to take real-time action.



The screenshot shows the Agerland Grower's Dashboard. At the top, the Agerland logo is on the left, and navigation icons for TOOLS, PRODUCTS, and a user profile are on the right. The main header features a weather widget with 51°F, 57% precipitation, 82% humidity, and 25mph wind. Below this is a large banner for "Your 2<sup>nd</sup> week of planting" with three featured articles: "Use Sensors to Get Smart About Soil Moisture", "Your 2018 Soil Moisture Level Nitrogen Levels 23", and "Use an In-Season Checklist to Maintain Yield Potential".

**Financial planning**  
LAST UPDATED TODAY

|                       |                         |
|-----------------------|-------------------------|
| PROJECTED PROFIT      | PROJECTED REVENUE       |
| \$ 123, 456.78        | \$ 123, 456.78<br>+1.2% |
| PROJECTED COST        | CASH                    |
| \$ 123, 456.78<br>+2% | \$ 123, 456.78<br>-2%   |

[VIEW SUMMARY](#)

**My farm operations**  
13 ACTIVE JOBS

- Status: PENDING  
**Prowl H2O spray**
- Status: ON TRACK  
**N-Dure application**
- Status: COMPLETED  
**Prowl H2O spray**

[VIEW SUMMARY](#)

**Activity tracker** [VIEW ALL ACTIVITIES](#)

- Rick Shawn** 3h ago  
Sent "JD installment plan"  
[REPLY](#)
- Now it's a good time to sell**  
TAKE ACTION
- Pramitol 25L shipped** 5h ago  
ETA Monday, 5/1/2019  
[TRACK](#)
- Prowl H2O Spray** 8h ago  
Jason completed this task  
[TRACK](#)
- Brandon Lynn** Yesterday  
Linked QuickBooks  
[TRACK](#)
- 200 bu corn** Yesterday  
Out for delivery

**Grain connect**

85,000 bu in storage

- 30% On farm
- 10% Summer co-op
- 60% Jefferson co.

**Corn hedged** \$37,000 - 10,250 bu

**My AgTeam**  
1 NEW MESSAGE


Today  
**Michael L. added "2019 Rx Ponytail Corn"**  
"Rick check out the Rx, as discussed. I'll upload if you gives a thumbs up."

Monday  
**James M. shared a product post "Pramitol 25E Herbicide"**  
"Performs great, think would be great for corn 01."



# Mock up – Seller APP

9:41


Good morning, Frank 

Franklin, MN

PRECIP: 1.46  
WIND: SSE @ 8 mph  
GDD: 23  
SOIL TEMP: 61\*


82/45 **67°**

Latest News

 Three Tips to Maximize Split-Nitrogen Application...  
FROM ANSWER PLOT®

Top 10 CHT Files

Messages VIEW ALL


 Rick Shawn 3m ago

I have a question on the how many quarts of Max-In ZMB I need to apply.

REPLY

Home Growers Messages Menu

9:41

Top 10 

Season

2019/2020

Answer Plot®  Insight Trials

Select a Crop

Corn


Define product maturity min and max values Min: 93 Max: 120

93  120

Select Search Area

Home Growers Messages Menu

9:41

CHT 

Corn 2018 CHT-080


Search CHT

Combined Treatment Yields (1.9) First Year C Non-Limited N, I (3.4)


|                       |                       |
|-----------------------|-----------------------|
| DKC32-12RIB<br>174.4  | 2288VT2P/RIB<br>180.0 |
| MY83T15RA<br>171.4    | DKC32-12RIB<br>178.3  |
| NK7823-3010<br>171.3  | NK7823-3010<br>178.0  |
| 2288VT2P/RIB<br>169.3 | 2123VT2P/RIB<br>174.7 |
| MY79C56<br>168.5      | DKC31-10RIB<br>174.3  |
| DKC31-10RIB<br>167.8  | MY79C56<br>174.2      |
| 2123VT2P/RIB<br>167.7 | NK8005-3110<br>170.9  |
| MY81A45               | MY83T15RA             |

Home Growers Messages Menu

9:41


Messages 

Inbox Sent Contacts Compose

 Rick Shawn 11:39 AM


Rx Map for Back 40

I sent Sent Rx map from R7® Tool let me know when you want to discuss. Thanks, Rick

 Rick Shawn 6:05 AM


Meeting on Thursday

Are you still available on Thursday to meet at the farm?

 Rick Shawn 07/01/19


In-season images available

I checked your fields and the R7 Tool is showing in-season images for your fields.

 Rick Shawn 06/29/19

Max-In ZMB

There is a promo code for new purchases


 Rick Shawn 06/07/19


Delivery of product


Your seed order was dropped off this morning the homestead locations


Home Growers Messages Menu


9:41

Growers 

 Rick Shawn  
Shawn Farms, Inc. CALL TEXT MESSAGE

 Jerome Meyers  
Meyers Brothers CALL TEXT MESSAGE

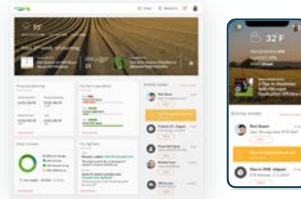
 Brandon Lynn  
Lynnco Ag CALL TEXT MESSAGE

 CM  
Carl Malone  
Malone Family Farming CALL TEXT MESSAGE

Home Growers Messages Menu

# BRINGING THE AGGREGATOR POSITION TO LIFE

ATLAS  
Web Portal & APP



ATLAS



R7® Tool



Field Management Information Systems



R7® Field Forecasting Tool



Retailer ERP



NutriSolutions®



Answer Tech® Partners



Equipment



FieldAlytics™  
empowering decisions

FIELDREVEAL™

xarvio™  
Digital Farming Solutions

CLIMATE  
FIELDVIEW

JOHN DEERE

FARMOBILE®

Merchant Ag™  
agri-business management

Agvance.  
AgVantage Software

AgWorks  
By Ag Retail, For Ag Retail

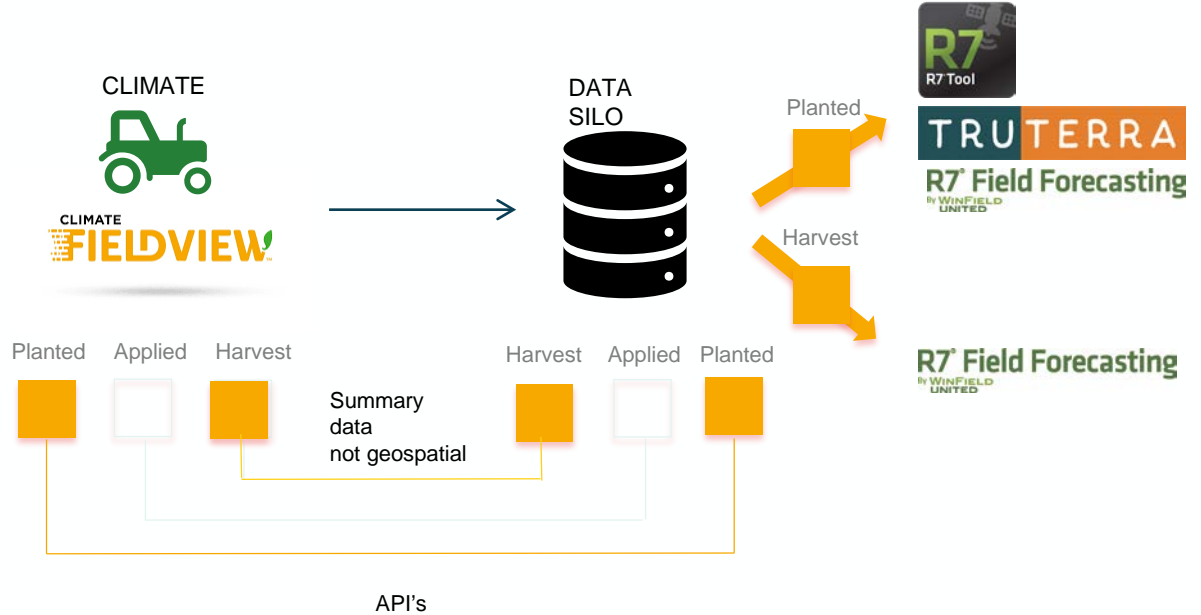
# Data Silo Planting / Harvest

## Planting Data:

- Planting Date
- Planting Population
- Crop
- Brand
- Hybrid

## Harvest Data:

- Harvest Date
- Average Yield
- Total Yield
- Moisture
- Crop



| Resource Summary   | Grower Stats | Partner Mapping Stats   |
|--|--------------|---|
|  <p>Total Growers<br/>4</p> |              |  <p>Total Growers<br/>12</p> |

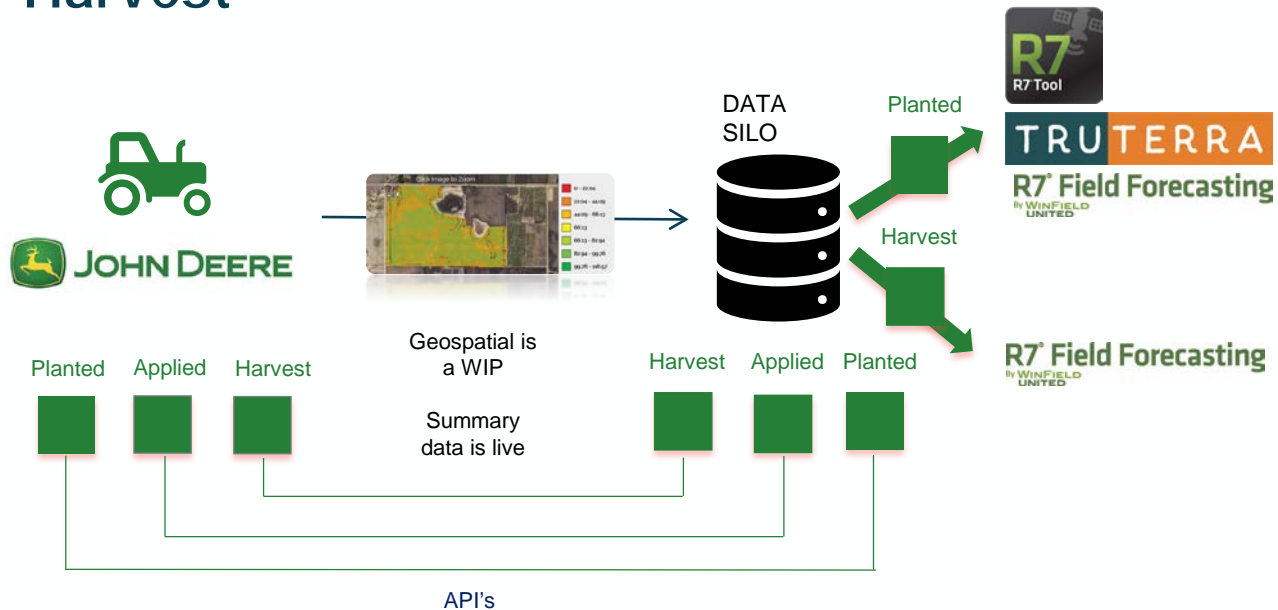
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| Resource Summary   | Grower Stats  | Partner Mapping Stats |
|--|---|-----------------------|
|  Total Growers<br>4 |  Total Growers<br>12 |                       |



# Trends



- 2019 vs. 2018: 16% more clear pixels
- 2018 vs. 2017: 2.75x more images processed
- 2017 vs. 2016: 2.5x images processed



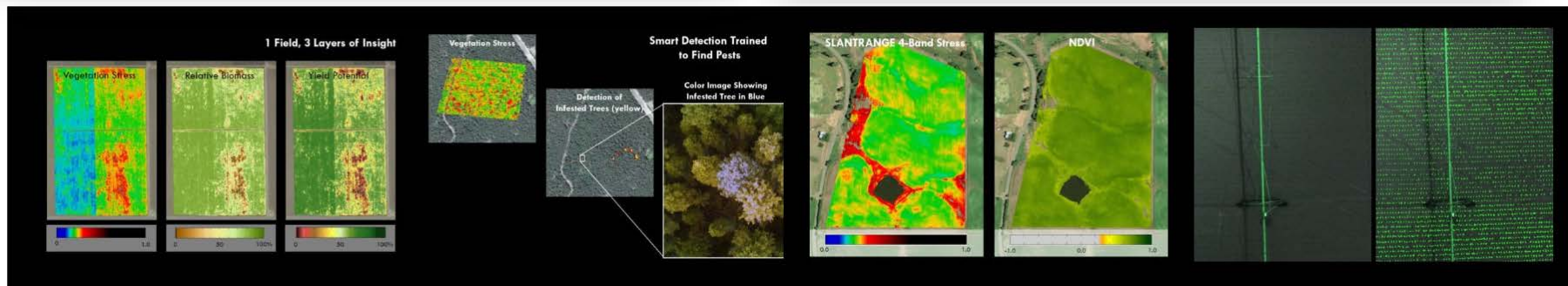
- 1 day in 2019 (52% in <24h)
- 3.2 days in 2018
- 3.4 days in 2017
- 4.3 days in 2016



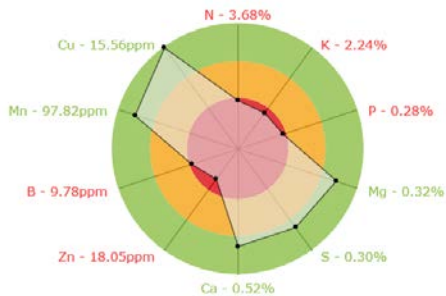
- 2019: 35 maps on average
- 2018: 30 maps on average
- 2017: 20 maps on average

# Drone Innovation & Weather stations

American Robotics  
SlantRange



# Connectivity – Key to Identifying Nutritional Issues



|                    |                      |
|--------------------|----------------------|
| Field ID           | VO03NW01             |
| Crop               | CORN                 |
| Work Order Name    | Gadd Ranch: VO03NW01 |
| Nutrient displayed | N                    |
| Growth stage       | V7                   |
| Grower Name        | Steve Gadd           |
| Retailer Name      |                      |
| Sample Name        | Sample 3             |
| Sample Date        | 07/17/2019           |









Reshaping Agriculture

# Truterra – 4<sup>th</sup> Business Unit of Land O' Lakes



**WINFIELD<sup>®</sup>  
UNITED**



**TRU TERRA**

**Dairy Foods**

**Crop  
Inputs/Insights**

**Animal  
Nutrition**

**Sustainability**

# At Truterra...

## Sustainability means:

1. Supporting profitability and resiliency for farmers
2. Protecting natural resources



# Partners / Stakeholders

## Up Stream

Farmers

Ag Retailers

## Mid-Stream



## Down Stream



## Licensee



## Ecosystem Credit



## Conservation Partners



UNIVERSITY OF MINNESOTA



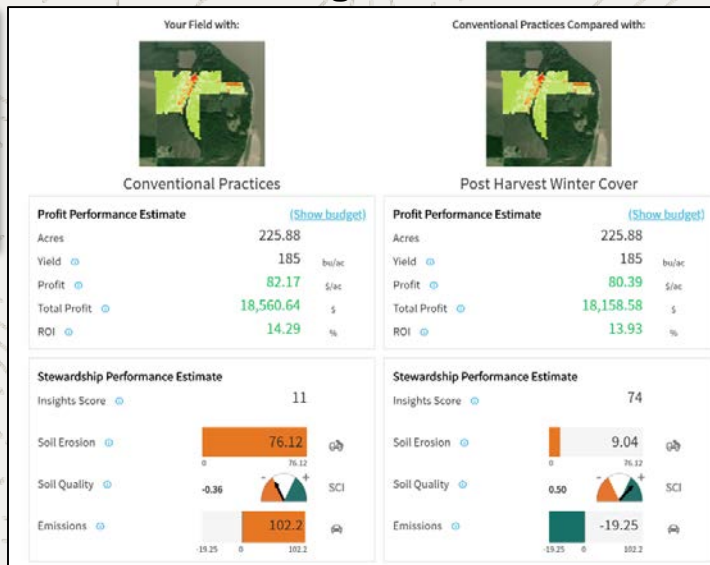
# Today

Truterra™ Insights Engine is the industry-leading precision stewardship platform – generating field-by-field insights and opportunities to advance economic and environmental performance

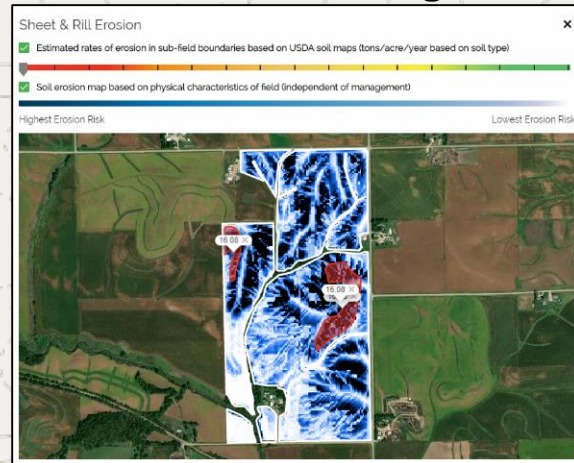
## Stewardship Score



## Profit Insights

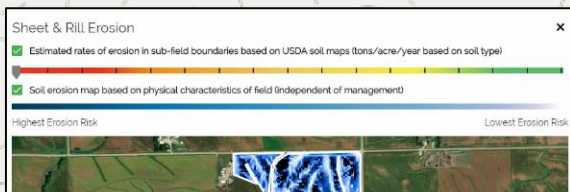


## Precision Soil Insights

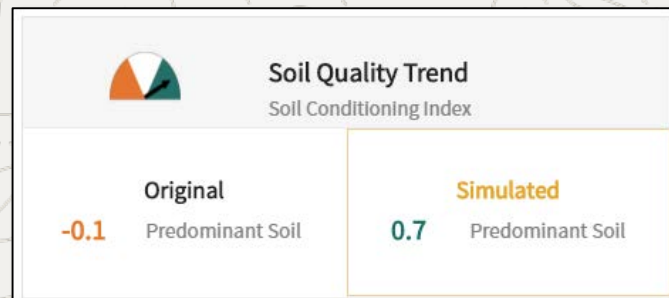


# Precision Soil Insights

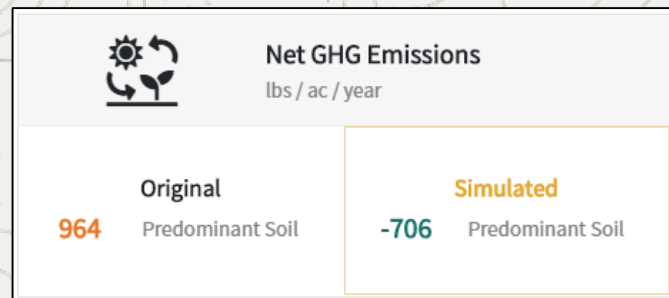
## Hi-Res Water and Wind Erosion Risk



## Soil Carbon Trend



## Net GHG Emissions







TRUTERRA

Redesigning Agriculture & Food

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