Digital Transformation

Amanda Neely
Technology & Agriculture

- Data Collection & Aggregation
- On farm productivity
- Digital Transformation
- Insights and Efficiencies
- E-business & Ease of business
- Partnerships & Integrations
Intelligently advancing agriculture to achieve predictable outcomes requires technology solutions that work for farmers.

115 Answer Plot Locations – 20 Years of R&D

- 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® Tool

- 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® Field Monitoring

- 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® Field Forecasting

- 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, mg/ft², applications and irrigation

NutriSolutions 360°

- 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 ATLAS OMNI-CHANNEL SOLUTION

**INSIGHTS**
Data / Insights for Decision Making

**PURCHASE**
Website / Digital Marketing
Personalized Experience
Commerce

**FULFILLMENT**
Inventory Transparency
On-Time Delivery
Operational Efficiency

- R7® Tool
- Nutrisolutions®
- R7® Field Forecasting
- Truterra™
Understanding the Growers Journey

Winter

**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.

**Late harvest**

Activities: tractor shows, volunteering

Spring

**Applying Inputs**

**Preparation**

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.

**Financial planning**

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).

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**Vacation**

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

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

**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.

**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.

**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.

**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.

**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.

**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.

**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.

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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.
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.
BRINGING THE AGGREGATOR POSITION TO LIFE

ATLAS
Web Portal & APP

Answer Tech
DATA SILO

R7® Tool
Field Management Information Systems
Retailer ERP

R7® Field Forecasting Tool

NutriSolutions

Equipment

Answer Tech® Partners

Merchant Ag

AgVantage
Software

AgWorks

CLIMATE
FIELDVIEW

John Deere

FARMOBILE®
Data Silo Planting / Harvest

Planting Data:
- Planting Date
- Planting Population
- Crop
- Brand
- Hybrid

Harvest Data:
- Harvest Date
- Average Yield
- Total Yield
- Moisture
- Crop
Data Silo Planting / Harvest

Planting Data:
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Geospatial is a WIP
Summary data is live

API's

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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
Connectivity – Key to Identifying Nutritional Issues
Data Movement

Lite Data:

Heavy Data:

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Redesigning Agriculture
Truterra – 4th Business Unit of Land O’ Lakes
At Truterra...

Sustainability means:

1. Supporting profitability and resiliency for farmers

2. Protecting natural resources
Partners / Stakeholders

Up Stream
- Farmers
- Ag Retailers

Mid-Stream
- WinField
- United
- John Deere
- Cargill
- Syngenta
- Corteva
- AGCO
- Bayer

Down Stream
- Campbells
- Walmart
- Tate & Lyle
- Nestlé PURINA

Licensee
- AGI SureTrack
- Conservis

Ecosystem Credit

Conservation Partners
- Quail Forever
- Pheasants Forever
- Iowa Soybean Association
- USDA
- Department of Agriculture
- EDF
- The Nature Conservancy
- NFWF
- Field to Market
- 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.
Precision Soil Insights

Hi-Res Water and Wind Erosion Risk

Soil Carbon Trend

Net GHG Emissions
Redesigning Agriculture & Food