Advancing Digital Agriculture and Conservation: A Virtual, Multi-Day Policy Workshop
Farm Foundation is an accelerator of practical solutions for agriculture. Our mission is to build trust and understanding at the intersections of agriculture and society. We accomplish this by leveraging non-partisan objective dialogue, information and training, catalyzing solutions and creating multi-stakeholder collaboration. Our vision is to build a future for farmers, our communities and our world.

Since 1933, we have connected leaders across agricultural sectors—farming, business, academia, organizations and government.

Connect with us: farmfoundation.org

@farmfoundation @thefarmfoundation @farmfoundationorg @thefarmfoundation Farm Foundation

#digitalagworkshop
Workshop made possible with the generous support of our sponsors and organizers:

Cornell Initiative for Digital Agriculture (CIDA)

ILLINOIS

Microsoft

CORTEVA™ agriscience

Farm Foundation

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Advancing Digital Agriculture and Conservation: A Virtual, Multi-Day Policy Workshop

• During the webinar, participant audio will be muted.
• Participants can submit questions by clicking on the Q & A button at the bottom of their screens.
• When submitting questions, please include your name and company so questions may be contextually understood.
• Due to time limits, the moderator may not be able to ask all questions submitted.
• This webinar is being recorded and will be posted on our website at farmfoundation.org.
• If there are any connectivity issues during the webinar, we ask that you stay on the webinar as those generally rectify themselves after a few moments.
Advancing Digital Agriculture and Conservation: A Virtual, Multi-Day Policy Workshop

Steven Wolf
Cornell University

Katherine Baylis
University of Illinois
Moderator

Jonathan Coppess
University of Illinois

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Workshop Objectives

Advance policy dialogue to realize the potential of data applied to the challenges of conservation in agriculture

• How can policy support development and application of tools that advance conservation?
• What opportunities do new tools present for policy changes?
Workshop Objectives

Strengthen the science-policy interface

• Articulate a policy-research agenda

• Networking among researchers, research administrators, and people that use research in their work

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Cornell Initiative for Digital Agriculture
https://www.digitalagriculture.cornell.edu/

• Over 100 faculty from 5 colleges
• Annual Digital Agriculture Hackathon
• Research Innovation Fund
• Curriculum
• External partnerships

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Session One: Risks and Opportunities of Digital Agriculture for Environmental Conservation

Panelists

Jason Weller
Vice President of Truterra, Land O’Lakes

Charles Baron
Chief Innovation Officer and Co-Founder, Farmers Business Network

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Weller joined Land O’Lakes, Inc., in 2017 where he serves as the Vice President of Truterra, leading the team that is generating conservation solutions for the farmer cooperative’s members and owners. He previously served as Chief of USDA’s Natural Resources Conservation Service, the nation’s largest working lands conservation organization. Prior to serving as Chief, Jason served on the U.S. House Appropriations subcommittee on Agriculture, the U.S. House Budget Committee, and in the White House Office of Management and Budget. He and his family live in Minnesota and he’s proud that his young daughters are 6th generation Minnesotans.
Unlocking the Potential of Precision Stewardship

Digital Ag Promise or Peril?
Diminishing Returns

Why?

How do we advance results?

“80 / 20” Rule of Thumb

Precision Stewardship
Manage Acres for Potential . . . and Risk

Nitrogen Use Efficiency

Water Erosion

Profitability
Challenges with Adoption

Value proposition

Trust

Tech Adoption

Expense

Segmentation
Risks

Regulatory
Others Profit
Over Promise
Over Complicate
Credibility
THE ONLY FARMER-OWNED AND FARMER-DRIVEN SUSTAINABILITY PROGRAM IN THE U.S.

Truterra™ Platform connects agriculture with precision conservation results.
Where farmers turn for advice & support

Influence of Ag Stakeholders on Farmers’ Decisions about Ag Practices & Strategies

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Influence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fertilizer/ag chemical dealer</td>
<td>High</td>
</tr>
<tr>
<td>Seed dealer</td>
<td>High</td>
</tr>
<tr>
<td>Other farmers</td>
<td>High</td>
</tr>
<tr>
<td>USDA Natural Resources Conservation Service</td>
<td>Medium</td>
</tr>
<tr>
<td>Landlord/farm management firm</td>
<td>Medium</td>
</tr>
<tr>
<td>Banker, insurance agent, or lawyer</td>
<td>Medium</td>
</tr>
<tr>
<td>Farm organizations (e.g., Farm Bureau, etc.)</td>
<td>Medium</td>
</tr>
<tr>
<td>Extension</td>
<td>Medium</td>
</tr>
<tr>
<td>Nonfarming friends/neighbors</td>
<td>Medium</td>
</tr>
<tr>
<td>State climatologist</td>
<td>Medium</td>
</tr>
<tr>
<td>Conservation nongovernmental organization</td>
<td>Low</td>
</tr>
</tbody>
</table>

Deliver precision services through network that farmers trust

Source: Journal of Soil and Water Conservation, May/June 2017
Today

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

Reduced Till
2019 GEOGRAPHIC OVERVIEW

ACRES BY COUNTY

3 STATES
135 COUNTIES

TOP COUNTIES BY ACRES

- IA Benton: 80K
- IA Hardin: 62K
- IA Hamilton: 38K
- IA Jasper: 37K
- IA Linn: 37K
- IA Story: 31K
- IA Jones: 25K
- IA Fayette: 24K
- IA Grundy: 23K
- IA Buchanan: 19K
- IA Tama: 19K
- IA Delaware: 18K
- IA Franklin: 17K
- IA Dallas: 17K
- IA Clayton: 17K
- MN Dodge: 15K
- MN Wetonwan: 15K
- MN Freeborn: 15K
- MN Fairbank: 14K
- MN Wright: 14K
- IA Allamakee: 14K
- IA Howard: 13K
- WI Grant: 12K
- IA Poweshiek: 11K

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## 24 OF 26 PRACTICES IN USE

### 15,555 TOTAL PRACTICES IN USE

### PRACTICE USAGE (BY COUNT AND % OF FIELDS)

<table>
<thead>
<tr>
<th>Practice</th>
<th>Count</th>
<th>% of Fields</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grassed Waterway</td>
<td>7,129</td>
<td>53%</td>
</tr>
<tr>
<td>Terrace</td>
<td>1,416</td>
<td>11%</td>
</tr>
<tr>
<td>Field Border</td>
<td>1,127</td>
<td>7%</td>
</tr>
<tr>
<td>Amending Soil Properties with Gypsum Produ...</td>
<td>1,027</td>
<td>6%</td>
</tr>
<tr>
<td>Sediment Basin</td>
<td>1,013</td>
<td>6%</td>
</tr>
<tr>
<td>Conservation Cover</td>
<td>675</td>
<td>5%</td>
</tr>
<tr>
<td>Contour Farming</td>
<td>516</td>
<td>4%</td>
</tr>
<tr>
<td>Filter Strip</td>
<td>535</td>
<td>3%</td>
</tr>
<tr>
<td>Contour Buffer Strips</td>
<td>363</td>
<td>3%</td>
</tr>
<tr>
<td>Controlled Traffic Farming</td>
<td>501</td>
<td>2%</td>
</tr>
<tr>
<td>Strip Cropping</td>
<td>274</td>
<td>2%</td>
</tr>
<tr>
<td>Windbreak/Shelterbelt Establishment</td>
<td>268</td>
<td>2%</td>
</tr>
<tr>
<td>Pond</td>
<td>290</td>
<td>2%</td>
</tr>
<tr>
<td>Vegetative Barrier</td>
<td>80</td>
<td>1%</td>
</tr>
<tr>
<td>Riparian Forest Buffer</td>
<td>104</td>
<td>1%</td>
</tr>
<tr>
<td>Drainage Water Management</td>
<td>71</td>
<td>1%</td>
</tr>
</tbody>
</table>
THANK YOU
Charles Baron  |  Chief Innovation Officer and Co-Founder  
Farmers Business Network 

Baron guides the development of the breakthrough farmer-to-farmer network. Previously, Charles was a program manager at Google where he started and led product, investment and research initiatives in advanced energy technologies. Charles’ passion for farming developed after working a corn harvest on his brother-in-law’s farm in Arapahoe, Nebraska, prior to joining Google. Charles earned a bachelor’s degree from Dartmouth and an MBA from Harvard with coursework at MIT.
RISKS & OPPORTUNITIES
THE POTENTIAL OF DIGITAL AG & CONSERVATION
STRENGTH IN NUMBERS

Farmers First® Network for information & pricing
THE FBN NETWORK

+11,300 FARMS
+38M ACRES
WHAT IF YOU HAD A 230M ACRE PLOT TRIAL?
NETWORK ANALYTICS
LEARN FASTER

FARMING EXPERIENCE:
ONE FARMER VS. NETWORK

25,000 YEARS
OF EXPERIENCE
SEED FINDER

RELABELING

PERFORMANCE

PRICE TRANSPARENCY

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AUTOMATED STRIP TRIALS

<table>
<thead>
<tr>
<th>Color</th>
<th>Median Yield (Bu/Acre)</th>
<th>Product Name(s)</th>
<th>Median Rate (Gal/Acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orange</td>
<td>239.1</td>
<td>29-0-0-3 I Bonom 10% I Agrotain Ultra I Fertilizer</td>
<td>31</td>
</tr>
<tr>
<td>Blue</td>
<td>238.4</td>
<td>29-0-0-3 I Bonom 10% I Agrotain Ultra I Fertilizer</td>
<td>35</td>
</tr>
<tr>
<td>Green</td>
<td>235.4</td>
<td>29-0-0-3 I Bonom 10% I Agrotain Ultra I Fertilizer</td>
<td>28</td>
</tr>
<tr>
<td>Purple</td>
<td>221.8</td>
<td>29-0-0-3 I Bonom 10% I Agrotain Ultra I Fertilizer</td>
<td>23</td>
</tr>
<tr>
<td>Yellow</td>
<td>217.4</td>
<td>29-0-0-3 I Bonom 10% I Agrotain Ultra I Fertilizer</td>
<td>19</td>
</tr>
</tbody>
</table>

AGROTAI N Ultra is a registered trademark of Koch Agronomic Services LLC.
AUTOMATED STRIP TRIALS = NETWORK CHEM & FERT ANALYTICS

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COMPREHENSIVE FARMER SERVICES

- VIRTUAL ELEVATOR
- MARKET ADVISORY
- BROKERAGE
- CROP INSURANCE
- REGENERATIVE AG PROGRAMS
- BIDS & ALERTS
- SPECIALTY GRAINS

@FBNfarmers
#F2F19
OPPORTUNITY

- The creation of a system that provides growers with economically better outcomes while delivering conservation & sustainability benefits.
  - Enabling farmers to differentially market based on their attributes
  - Enabling food manufacturers to ”purchase” regenerative attributes at scale
  - Enabling consumers to know their food
RISKS

- CPG premiums, can we really get meaningful premiums for producers?
- No unified definition of “sustainable” or “regenerative”
- No standardized soil data test & reporting system
- No clearinghouse of field data, at scale.
REGENERATIVE AG
GETTING PAID FOR PRACTICES

@FBNfarmers

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SUSTAINABILITY IS TOP OF MIND

GROWERS: ECONOMICS & SOIL
- Planting Strategy
- Application Plan
- Field Allocation

BUYERS: CUSTOMERS & CLIMATE
- Walmart Project Gigaton
- Unilever $300 Million
- Millennial 73%

"CRP Enrollment - March 31, 2016"
COMMODITY CROPS CAN BE SET APART

- Conventional
  - Chemical Application
  - CRP
  - Cover Crops
  - Tillage Practices
  - Erosion Management
  - Water Management
  - Buffer zones

- Organic/IP
  - Crop Rotation & Diversity
  - Nutrient Management

Profit
Soil Health
Water
GHG

#F2F19
FARMERS & BUYERS SPEAK DIFFERENT LANGUAGES

Definitions Vary

Opportunities Muddled

Reporting Arduous
FBN VISION: HUB FOR SUSTAINABILITY

Customized, Profitable, Farmer-Focused Sustainability

- Corporate, Gov., Non-profit funding
- Extension Field Test Data
- FBN Members
- Profitable opportunities aligned with soil health
- Smart allocation of budget & measurable improvements
WHY WOULD BUYERS PAY MORE?

- Appeal to Millennial consumers buying preferences
- Direct customers like Walmart and McDonalds have pressure campaigns to measure and reduce carbon footprint of supply chains
- ESG Activist Investors
- Talk credibly about their supply chain transparency and avoid shock PR from environmental groups
- Prepare for state or federal environmental policy
WHAT PRACTICES MATTER?

- No Till! (reduced soil disturbance)
- Nitrogen efficiency - lbs of nitrogen per bushel
- Cover crops
- Nitrogen
- Manure application
- Buffers
TYSON OVERVIEW

- Carbon Scoring & Efficiency Program: Focused on N Usage
- 400,000 acres
- 117 farms
- Representation from 16 states - do not need to deliver to Tyson
- 3 years
- Participation incentive in cash or Direct/Advisory credits
- Data is primarily machine-collected + 20 minute survey

@FBNfarmers

#F2F19
TYSON FARMER EXPERIENCE

- Average grower makes $1,300-$2,600 per year
  - Payment in Cash
  - OR FBN Services
- 1 hour in reporting (less if you share data with FBN already)
- FBN helps you collect data
- Are not obligated to adopt changes
- Reports can help reveal how you compare in Nitrogen efficiency
UNILVER PROGRAM

- Durum wheat program in North Dakota
- Supports the Sustainable Farming initiative for Knorr Pasta brand
- Uses Field to Market Fieldprint Calculator
PROGRAMS EXPANDING SOON
Regenerative Premiums
Price Transparency
Better Seed & Chem
Better Loans
Better Insurance
Better Hedging

NETWORK + DATA

BETTER FUTURE
FARMERS FIRST®
Advancing Digital Agriculture and Conservation: A Virtual, Multi-Day Policy Workshop

Session One: Risks and Opportunities of Digital Agriculture for Environmental Conservation

Q&A
Let’s continue the conversation…

advancingdigitalagandconservation.com/collaboration
Save the date – May 27 & 29

Session Two – Conservation Implementation and Policy Perspectives

Session Three – Mobilizing Data for Conservation: On- and Off-Farm Perspectives

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