Overview and Value of Digital Technologies for Soybean Producers

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BACKGROUND

- Increased adoption of precision agriculture technologies
- Increasing options of innovative digital tools drawing site-specific information and new learnings.
- However, reasoning behind actual adoption of these tools, and their value, remains unclear for farmers.
“BUZZWORDS” OF DIGITAL TOOLS TODAY
“Digital Technologies”

Ag data tools requiring use of producer data to provide products, information and recommendations.
## 2017 ACTIVITIES

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<tr>
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<th>Description</th>
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<tbody>
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<td>1</td>
<td><strong>Producer Survey</strong>&lt;br&gt;Responses from 120 producers with focus on those that have already invested in ag technologies (using VR fertilizer or seeding)</td>
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<td>2</td>
<td><strong>Company Research</strong>&lt;br&gt;Categorization of over 100 currently available digital tools into six categories with features and solutions identified</td>
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<td><strong>Focus Group Workshop</strong>&lt;br&gt;Open dialogue with 30+ workshop participants and utilizing Slido question and answer tool for feedback</td>
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<td><strong>Ag Technology Expert Interviews</strong>&lt;br&gt;Additional information gathered from four noted ag tech experts regarding current value, potential value and limitations</td>
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FARMER RESPONSE TO VALUE OF DIGITAL TECH

While “less than $2.50/acre” was an option, no respondents selected it.
FARMER RESPONSES

• 83% conducting on-farm research trials.

Data Sharing

• 92% of the farmers surveyed share data today.
  • 66% share data with 2 or more people (e.g. seed rep, consultant, university/extension, retailer, etc.)
  • Most commonly shared with were seed representatives and agronomic consultants
• 70% have high or very high expectations that sharing their data will be valuable.
FARMER RESPONSES

• 90% of farmers prefer to manage their own data.

• Farmers are actively using technology in soybean production.
  • 77% view variety results online (67% with a smartphone or tablet).
  • 96% are using data collected as a direct input for management decisions.
  • 91% are using some type of digital tool or service.
  • 88% use prescription maps for managing inputs such as seeding or fertilizers.
COMPANY RESEARCH

113 unique companies / tools identified (2017). Each company was grouped into at least one of the categories listed below.

<table>
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<th>Digital Tool Category</th>
<th>Number of Companies Identified</th>
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<td>1 Data Warehousing</td>
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<td>2 Production Analysis</td>
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<td>3 Production Benchmarking</td>
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<td>4 In-Season Monitoring</td>
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<td>5 Crop Modeling</td>
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<td>6 Recommendations</td>
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With the exception of production benchmarking, the majority of producers did find some level of value in each category.
COMPANY RESEARCH

Data Warehousing: Cloud storage for any type of data. Tools that allow producers to have a centralized location to store data. Data sharing and organization may or may not be a functionality provided by a platform.
COMPANY RESEARCH – DATA WAREHOUSING

Top Benefits:
• Storage and comparisons of environmental parameters, imagery, or weather history
• Organize data by year, farm, field, machine, etc.

Top Limitations:
• Lack of understanding value in sharing data
• Inconsistencies in data types across platforms
COMPANY RESEARCH

Production Analysis: Platforms where producers can analyze their production data (agronomic, machine, imagery, etc.) and information permitting insights to support decisions.
COMPANY RESEARCH – PRODUCTION ANALYSIS

Top Benefits:
• View yield interactions based on planting date, populations, soil types, weather, etc.
• Digital models to optimize operations/predictions

Top Limitations:
• Low amount of value without input from other sources
• Inability to analyze exactly as producers want
Production Benchmarking: Ability for producers to benchmark themselves against similar farms. These tools provide comparative insights regarding agronomic response, yield, costs, profit margins, and possibly other aspects.
COMPANY RESEARCH – PRODUCTION BENCHMARKING

Top Benefits:
• Insight to manage with transparency/confidence
• Awareness of local pests, diseases, and weeds

Top Limitations:
• Proximity, data quality, and financial multipliers not always accounted for
• “Crowdsourced” systems may not be accurate
COMPANY RESEARCH

In-Season Monitoring: Facilitate in-season monitoring of crop health, development, and stress during the growing season. The tools may harness imagery or organize/simplify scouting notes to identify problem areas quickly.
COMPANY RESEARCH – IN-SEASON MONITORING

Top Benefits:
• Alerts for local pest, disease or weed pressures
• Organize, standardize and geo-reference scouting

Top Limitations:
• Reduced accuracy in boundaries/other datasets
• Noted as more of “potential” value with increase in GPS and image resolution
COMPANY RESEARCH

Crop Modeling: Includes crop modeling to estimate crop needs (e.g. nutrients) and crop development providing information to support in-season decisions or provide information such as yield estimates.
COMPANY RESEARCH – CROP MODELING

Top Benefits:
• Determine optimal solutions for field level
• Estimate crop yields to create budgets based on current conditions

Top Limitations:
• Not accurate enough for confidence in decisions
• Access to more telling UAV and satellite imagery
COMPANY RESEARCH

Recommendations: Most platforms providing recommendation capabilities can link producers to trusted consultants and advisors so they can support the recommendation process.
COMPANY RESEARCH - RECOMMENDATIONS

Top Benefits:
• Identify potential ROI and modify less profitable areas
• Easy transfer of application files and maps

Top Limitations:
• Need to develop relationship between farmer and advisor
• Lacks “boots on ground experience”
FOCUS GROUP WORKSHOP

- A primary concern expressed by the focus group were the roadblocks that prevent data from being simply managed and accessed.

- When asked about the limitations of existing digital ag technologies, 35% of participants selected “ease of use”. Numerous comments were made about difficulties related to content, file structure and formatting of data.

“There isn’t any one way to view all your information. The question is how do we use [digital tools] together to our best ability.” -Farmer Comment
AG TECH EXPERT INTERVIEWS

- *Data and digital tools are not going away.* Key to using them will be education and understanding.

- A disconnect between farmers and industry identified in all 6 categories --- *limits the value of digital tools.*

- Ag tech experts noted that *data warehousing was most valuable but that crop modeling tools had too many limitations to provide value to a farm today.*
SUMMARY

• Sharing data with trusted advisors will increase over the next few years but there remains a complexity to implementation.

• Farmers using digital technologies find value in them today.

• Disconnect between industry and farmers is limiting adoption and value of digital technologies.
Information from the 2017 project seen in this presentation, as well as additional data literacy materials from the 2018 project will be introduced as a part of the new Ag Tech Toolshed webpage which will be released in the near future.
Questions?

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