New Frontiers in Digital and Carbon Farming

Crop Science Innovation Summit

June 20, 2023

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Digital Platform Optimizing Through the Farm into the Value Chain

Enabling Sustainable Solutions from Farm to Fork

Lab & Greenhouse

Digital shifting from data collection and visualization to an essential tool for all farming operations

Farm

Digital is transforming to enable new opportunities across the value chain

Value Chain

DRONE-BASED APPLICATION
- TIMING RECOMMENDATIONS
- PEST DETECTION
- HYBRID RECOMMENDATIONS

AG MARKETPLACES
- DOWNSTREAM VALUE
- RISK SHARING
- SUSTAINABILITY & CARBON
Digital Farming Brings Transformational Solutions While Driving Significant Franchise Value and Opportunities Downstream and in Value Chain

Our Vision for Digital Agriculture

- Increase yield and improve profitability
- Glean insights from data to help manage risk and address variability
- Manage fields down to the square meter, to farm more efficiently and sustainably
- Seamlessly collect, visualize and analyze data to enable more informed decisions

Three Core Value Drivers

01 FRANCHISE VALUE
02 DOWNSTREAM VALUE
03 PLATFORM VALUE
FieldView Drives Incremental Franchise Value and Customer Loyalty

>€1bn of Pipeline Franchise Value is Enabled by Digital

U.S. corn customers who are active FieldView Plus users have a higher retention rate\(^2,3,4\) by volume segmentation. U.S. customers who are active FieldView Plus users have a higher U.S. Net Promoter Score in 2021-2022\(^2\) and are more likely to recommend Bayer. U.S. corn customers who are active FieldView Plus users have a higher seeding rate for Bayer owned corn brands in 2022 vs. national average\(^5\).

- >220m subscribed acres
- #1 brand in digital ag\(^1\)
- Operates in 23 countries
- Largest database of grower and field trial seed performance data in industry
- >80 partners on platform

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\(^1\) According to Kynetec December 2021 FieldView Brand Tracker | \(^2\) vs. non FV Plus users | \(^3\) based on U.S. GPOS data 2018-2021 | \(^4\) Internal estimate as of 2022 | \(^5\) national average based on Kinetic/GFK Analysis
Digital Solutions Deliver Sustainable Profitability
Enabling Decisions that Matter with Industry Leading Data Collection

Industry Leading Data Collection
- >8,000 digital field trials
- >115bn data points of product performance under real-world farmer management practices
- > 62M hrs of equipment data
- Environmental and weather data
- Sensor or IoT data
- Platform Partner data

Enabling Solutions
- Seed Placement
- Disease Management
- Weed Management
- Pest Management
- Horticulture

Providing Tools to Help Growers
- Increase yield and improve profitability
- Farm more efficiently and sustainably
- Manage risk and address variability

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Fieldview Digital Insights
Maximizing Smart Corn System

Comprehensive Digital Agronomic Support

- Hybrid Selection & Placement
- Planting Density
- Planting Date
- Fertility Recommendations & Timing
- Crop Protection Recommendations & Timing

Spray Rig in Short-Stature Corn Plot
Jerseyville, IL August 2019

Poseyville, Indiana July 2021
Nitrogen Y-Drops for Precise In-Season Application
Digitally-Proven: 2023 Bayer Corn Seed Showcase Pilot
Providing Confidence to Farmers in putting the Best Seed in the Ground

Program jointly developed and tested with growers and dealers to minimize the risk of trying new brands and different hybrids of seed on their farm, reducing uncertainty and optimizing return on investment

- **BCS Corn Product Rec.**
- **Digital Split Plant Trial**
- **Performance Warranty**

**Targeting 250k acres** and 700-1000 farmers in targeted U.S. geography

- Seed Showcase farmers will **split plant** fields with competitor seed brand product and a **recommended BCS product**.
  - If recommendation doesn’t beat the competitor, BCS will pay a **$6 bu/ac performance warranty** up to a **maximum of $60/ac**

**Fieldview data-driven recommendation more accurately predicts winning products**

**Excellent Customer Experience**

**Increased Engagement with Digital Tools and Outcome Based Offers**

**Value Created for Growers, Partners and Bayer**

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1 Internal estimates generated from Digital Recommendation Model assessing last 5 years of agronomic results. The information on this document is to aid in understanding the 2023 Bayer New Business Models Master Agreement and the 2023 Channel or Dekalb Showcase Protocols, which govern all requirements associated with the two programs. This document does not change or modify the 2023 Bayer New Business Model Master.
Advancing Climate Smart Practices on Farm To Achieve Carbon Goals for Growers and Businesses; Creating New Revenue Stream

ForGround by Bayer

Digital platform that helps farmers transition to climate-smart practices and connects growers, acres, and buyers to more meaningful opportunities.

Growers have access to tools, resources, discounts and financial benefits (through Bayer Carbon Program)

Companies have access to carbon assets and services powered by platform to support their sustainability goals

Our Commitment: 30% Reduction of Field Greenhouse Gas Emissions by 2030

Builds on Success with our Existing Bayer Carbon Program

~2,600 participating farmers 10 countries covered ~1.5m acres globally

// Long-term program providing annual incentives to users, enrolled in the program, for verified and validated climate-smart practices like no-till and cover cropping

// Enables 3 Expected Downstream Revenue Opportunities in >$200bn/year market

Creates new opportunities for growers and businesses alike

Carbon Services

Product Sales

Carbon Assets

- First food value chain B2B collaboration on ForGround platform spanning across Perdue’s entire grain network
- Perdue grain farmers may be compensated for adopting regenerative practices, allowing Perdue to decarbonize their supply chain
- Supports Nori in advancement of the carbon marketplace
- Pave the way for price discovery of carbon removal credits on the open market

Norri

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Seeking to Create Carbon Neutral Soybean Industry by Combining Bayer PRO Carbono Practices with FieldView

PRO Carbono

- Be a change agent to create a carbon neutral industry
- Increase **productivity** and **profitability** from intensification of practices to sequester carbon
- Seed and trait technologies like Intacta 2Xtend, that increase productivity, reduce insecticide use and enable conservation and no-till systems foundational to success
- Measure and track with FieldView

CO₂ eq per mt of soybean produced

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<tr>
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<th>PRO Carbono Avg</th>
<th>Brazil Avg</th>
<th>Global Avg</th>
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Carbon Emissions of Soybean Growers in Bayer’s PRO Carbono 70% lower than Brazil Average

Assumptions and challenges of carbon footprint accounting in agriculture - Marcelo Morandi and Marília Folegatti - Embrapa Meio Ambiente; SOC = Soil Organic Carbon

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Orbia JV is the Largest Digital Ag-Marketplace in LATAM

In combination with FIELDVIEW, provides an integrated digital grower experience

- JV between Bayer, Bravium\(^1\), Yara and Itau; Bayer with ~60% stake
- Connects growers, input providers and grain traders to a network to expand their reach, secure financing, redeem rewards from Bayer’s Impulso loyalty program, purchase and sell inputs
- Established in 2019 in Brazil, later expanded to Argentina, Colombia and Mexico\(^2\)
- ~300 distributors with inputs such as pesticides, seeds and fertilizers
- ~€460m in commissioned online transactions (GMV\(^3\)) in 2022
- >270,000 registered growers across LATAM
- Covers ~75% of Brazil planted area
- Recently launched Orbia Pag, the first digital pre-approved credit mechanism for farmers

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\(^1\) Brazil-based marketing agency who managed Bayer’s loyalty program in Brazil, prior to the formation of Orbia.

\(^2\) Orbia is named “Nucleo” in Mexico

\(^3\) GMV means Gross Merchandise Value, the most common metric for marketplace development
Industry First Collaboration Offering B2B Digital Solutions that Connect the Farm to the Value Chain

Azure Data Manager for Agriculture is the largest connection point of agricultural data and services driving interoperability across the value chain – including food, feed, fiber and fuel.

Combines Bayer’s ag expertise and leading digital farming platform with Microsoft’s cloud technology for unrivaled B2B solutions.

Bayer AgPowered Services, based on proprietary capabilities, now available to the industry on Azure Data Manager’s robust infrastructure:
- Imagery Insights
- Crop Water Use Maps
- Growing Degree Days

Provides cloud-based digital tools and data science solutions for ag and agri-food businesses to license and use for internal platforms or customer-facing digital solutions.

Will provide solutions to address farming operations, sustainable sourcing, manufacturing and supply chain improvement, and ESG monitoring and measurement.

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1 Additional offerings in development.

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Disorderly Data in Today’s Food and Ag Supply Chains

Enabling Transparency and Sustainability for Companies and Consumers; Advancing New Opportunities for Farmers
Key Takeaways – New Frontiers in Digital & Carbon Farming

01 Empowering digital transformation through the value chain with Fieldview #1 platform

02 Digital unlocking franchise and downstream value through system solutions including digital recommendations

03 Industry leading data collection and interoperability

04 Digital offerings unlock new value through Seed Showcase and ForGround

05 First B2B digital ag solution via Azure Data Manager and AgPowered Services
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