Sustainability: A New Business Priority

InfoAg

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Future Demands for 21\textsuperscript{st} Century Agriculture

Understanding the Challenges

• Meet the growing demand for fuel, feed, food & fiber while protecting our natural resources
• Increasing supply chain transparency (end-to-end awareness)
• Shaping these complex questions with practical solutions that are fact based
Societies needs around food and agriculture have shifted

“Feed the world”

“Feed the world responsibly”

1920s
- Beginning of scientific plant breeding with statistical methods being developed to distinguish heritable variation from variation caused by environment
- Combine Harvester begins to be widely marketed

1930s
- New herbicides developed out of the research during WWII, and the era of the “miracle” weed killers begins

1940s
- Synthetic Ammonia and synthetic pest control begin to drive massive productivity increase in agriculture

1950s
- Green Revolution resulted in the adoption of new technologies, including high-yielding varieties of cereals

1960s
- Biotechnology becomes a viable technique for improving crop and livestock products

1970s
- Synthetic Ammonia and synthetic pest control begin to drive massive productivity increase in agriculture

1980s
- Biotechnology becomes a viable technique for improving crop and livestock products

1990s
- 1999: John Deere suggests a cableless autonomous version of its 5310 tractor
- 2000: the final rule establishing the National Organic Product program first published in the Federal Register
- Regulatory and legal challenges to active ingredients – freedom to operate shrinking…
- Organics 10-15% of all US produce sales…
- Use of low and no-till farming accelerates…
- Voluntary guidelines on fertilizer e.g. to minimize impacts on Mississippi River Basin…
- Pressure to increase supply chain traceability…

2000s
- 2010s
- 2020s and beyond

What is on the horizon?
- Sustainability as an opportunity vs a cost?
Digital Transformation in the Ag Industry

Why Digital & Why Now:

• Continue to break thru yield barriers
• Food Security (Abundant & Affordable)
• Integrated systems to maximize productivity and natural resource management
• Building a more resilient system
“It is not the strongest that survive, nor the most intelligent, but the ones most responsive to change”  Charles Darwin
Sustainability—Substantial Portion of a Brand’s Footprint is on the Farm and there’s a clear disconnect with data flow

Sustainability Challenges Identified by The Sustainability Consortium

- Energy consumption
- Fertilizer application
- Land transformation
- Pesticide application
- Soil management
- Supply chain traceability
- Water use
- Worker health & safety

Nutrien Ag Solutions

CPG

Elevators & Merchandiser

Growers

US Processors

Retailers

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What does the Future Hold?

Closing the loop with interconnectivity & automation

Source: The Hale Group
What will it take to drive scale & adoption of technology for Agriculture and the next frontier?

Local Agronomists
Trusted face to the grower- Grower training, education & engagement at all levels of the Industry

Science
Enhancing agronomy and modeling to improve real time on farm decision making

Technology & Innovation
Digital integrations will enable critical data capture and measurement with technical support

Industry Collaboration
Industry partnerships to work towards a common goal inclusive of NGOs, Supply Chain & Government.
Thank You!