

Digital agriculture report looks to datadriven future

November 18 2016, by Matt Hayes

Cornell experts issued a report this week outlining the opportunities and challenges facing New York state's farmers and food producers as emerging digital technologies shape the agriculture industry.

For the report, Harold van Es, professor in the School of Integrative Plant Science (SIPS), and Joshua Woodard of the Charles H. Dyson School of Applied Economics and Management investigated how <u>farmers</u> are incorporating <u>digital technologies</u> and advanced analytics into farming operations.

What they found was a gap in analytics and <u>data</u> management relative to the capabilities of modern-day equipment, sensors and data generation. They conclude that strategic investments in research and development, improved training in data analytics and system technologies, and reliance on the capabilities of public institutions and technology companies could impact the <u>agriculture industry</u>'s national and global competitiveness in coming decades.

The Cornell researchers conducted a statewide survey of farmers, held workshops, reviewed prior research and performed a study on trends in "Digital Agriculture," a term for the use of computational and information technologies to improve the profitability and sustainability of agriculture and food systems.

"Agriculture, like other industry sectors, stands to see tangible benefits in the form of increased production efficiencies once digital agriculture



technologies are effectively employed," said van Es. "New York has the chance to become an agricultural leader in the digital space and to fully capitalize on potential production gains, but doing so requires leveraging emerging technologies to improve the profitability and sustainability of agriculture."

The surge in digital agriculture technologies has led to the accumulation of large amounts of data. High-resolution soil data, site-specific weather maps, aerial imagery, nutrient applications, and milking and animal health records are being continuously generated by farms across the state. Much of that data can be sent via broadband or mobile connections to cloud-based services.

Most farmers recognize the benefits that improved technological capabilities might bring to the state's farms. Higher profits, time savings and opportunities to reduce environmental impacts of farming operations were cited as the largest motivators, and 74 percent said that digital agriculture technologies provide efficiencies and environmental benefits.

For all the enthusiasm surrounding the technologies, farmers expressed trepidation about how to make use of the data. About one-third of farmers surveyed by the researchers said they received insufficient technical support, and half reported uncertainty on how best to deploy technology in a way that will have an economic impact.

"Farmers today have access to advanced technologies like precision planters and combines that are generating all these data, but they are telling us they don't always know how to make use of the information in a profitable way," Woodard said.

Woodard, an expert in data analysis, said that nearly half of those surveyed reported analyzing the data generated on the farm themselves. He said asking farmers to make sense of huge data sets to improve



decisions is a monumental task and, not surprisingly, can lead to frustration.

The report identified several barriers that have impeded digital agriculture in the state, including technologies that aren't specific to the type of farming favored in New York, such as forage crops, dairy and high-value specialty crops. The researchers also highlighted a need for improved research, digital communication infrastructure and educational programs to support farmers.

As the state's land-grant university and a top-tier research university, Cornell is in a position to provide analytics and research capabilities to the state's farms and food system. The researchers proposed an Institute for Digital Agriculture at Cornell that would focus on research, education, <u>data management</u> and business development. Among other benefits, according to the report, the institute would provide farmers a secure data center to store and analyze confidential information, and give researchers aggregate, anonymized data to develop next-generation technologies and recommendations to benefit farmers.

In the spring, Cornell plans to hold meetings to bring together leading researchers in computing, agriculture and economics to discuss ways to leverage the university's expertise.

The report, "Digital Agriculture in New York State," was commissioned by the New York State Commission on Rural Resources. Michael Glos and Aaron Ristow of SIPS and Leslie Veteramo Chiu and Tribid Dutta of Dyson contributed to the report.

More information: NYS Digital Agriculture Report and Recommendations: <u>fieldcrops.cals.cornell.edu/ex</u> ... <u>agriculture-</u> <u>workshop</u>



Provided by Cornell University

Citation: Digital agriculture report looks to data-driven future (2016, November 18) retrieved 27 April 2024 from <u>https://phys.org/news/2016-11-digital-agriculture-data-driven-future.html</u>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.