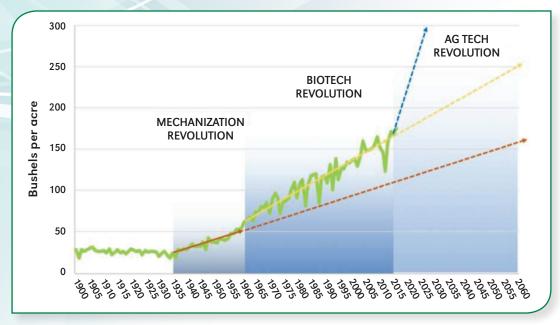## THE DIGITIZATION OF AGRICULTURE

Historical U.S. Corn Yield
Source: V. Estes and USDA Feed Grains Database

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Agriculture is the least digitized major industry in the USA. This statement might seem surprising considering all the buzz around big data in agriculture over the past couple of years, but this was one of the points made by Vonnie Estes, VP of Business Development for Caribou Biosciences, at the recent New Ag International Conference. In her presentation, she discussed recent developments in the ag industry that will propel the shift to data-driven agriculture.

What have been some of the barriers to a shift to digital agriculture? One reason suggested in the presentation was that focus has been more on the technology itself rather than the value to the user. Growers need to be delivered insights, not just data. Supporting this issue was another presentation at the Precision Ag Innovation Workshop earlier this year where it was noted that less than 25% of growers who have access to aggregated farm data ever look at it. Other concerns impeding adoption are data quality, scalability, ownership, and protection.

One change that is helping overcome the barriers to digitization is a shift of focus from products to systems. The industry has seen equipment become "smart" then "connected" through digitization but the focus now is on delivering and supporting product systems and even more complex farm management systems. Increased data intelligence, analysis, and communication allows greater integration among farming practices such as planting, fertilization, irrigation, and harvesting, as well as the opportunity to incorporate real-time weather and crop physiological development into the decision-making process. Digital farm management

systems will continue to become more common as Internet of Things (IoT) connected devices are projected to exceed 50 billion by 2020.

Connecting various phases of production through IoT-based solutions is expected to have a major impact on agriculture and will be a featured session at InfoAg 2017. Several factors including lack of arable land, global climate change, scarcity of water, increasing regulatory pressure, and consumer demand for higher transparency create an environment where a connected farming operation can have a significant advantage. The IoT session at InfoAg will cover such topics as an overview of the IoT ecosystem, hardware and sensors, and application software platforms.

Ag technology is picking up speed…***Fast***. Estes pointed out that ag tech deals and disclosed funding doubled and tripled, respectively, between 2013 and 2014. Since that time, there has been sustained growth with more than US$280M invested in ag tech in 2016. Corporate technology has become increasingly important in ag technology. This participation is reflected in nearly a quarter of all ag tech deals in 2016 having a corporate partner, up from just 3% in 2013. The

growth in connectivity is enabled by changes in several technologies. Some of these changes are the falling cost of IoT sensors, higher quality LEDs, improved robotics, and a greater capacity to handle massive datasets.

So, what does all this mean for production agriculture? Farming will become increasingly data-based and these data will only have value if combined and aggregated in useful ways. Decision support systems that are fed by on-farm, machine-to-machine-derived data and adjunct data like weather and crop development information will allow farmers to understand what is happening on the farm at a higher level than ever before and make the appropriate decisions for nutrient management and other practices. Digitization will also increase precision management to close existing yield gaps around the world and meet the food production challenges in the coming decades.

To learn more about digitization in agriculture, consider attending InfoAg 2017. The conference will be held July 25-27 at the Union Station Hotel in St. Louis, MO. Registration details and conference information can be found at www.infoag.org.

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