TESTIMONY
Presented to the Committee on Agriculture
U.S. House of Representatives

Presented by:
Matt Rushing
Vice President, Advanced Technology Solutions (ATS) Product Line
AGCO Corporation

October 28, 2015

Big Data and Agriculture: Innovation and Implications

Big Data and Agriculture: Innovation and Implications

Chairman and members of the Committee: thank you for the opportunity to testify today on behalf of AGCO Corporation. My goal here is to offer you some perspective into the area of agricultural data: what it is, the potential it holds for helping growers increase productivity, some challenges the industry faces and, most importantly, the exciting opportunity before us if we help our nation's growers leverage their data effectively.

Founded in 1990 with worldwide headquarters just north of Atlanta, GA, AGCO is a global leader in the design, manufacture and distribution of agriculture equipment in over 140 countries. We support more productive farming across every phase of the crop cycle through a full line of equipment, precision technologies and services. Nearly 700 of our 3,100 dealers are based in the U.S. AGCO's vision is to deliver high tech solutions for professional farmers feeding the world. This means everything we do supports growers in their efforts to feed the rising population.

I. Precision Farming and the Role of Data

Farmers face a number of challenges that modern agriculture helps meet, while also creating some unprecedented dilemmas. We are at a hinge point in the global agriculture industry. Our customers—growers—must increase food production 60-70% between 2005 and 2050 (United Nations Food and Agriculture Organization Report: http://www.fao.org/docrep/016/ap106e/ap106e.pdf) in order to feed the global population; they must do more with less. AGCO is driving one of the next phases of evolution for the modern farm through the advent of technology-enabled services to help farmers optimize and fine-tune their operations like never before. Most precision farming technologies that have been widely adopted today focus on minimizing waste of fuel, water, chemicals, seeds, fertilizers or time, and reducing soil and water pollution. (Using the right amount of water is critical in light of growing demand and damaging droughts.) Thus, the use of data in farming optimizes across several aspects of the farm operation, lowering growers' costs, improving overall efficiency and improving stewardship of the land.

These technologies have also created tremendous amounts of data that has so far not been fully utilized by most growers. The data will be leveraged to drive decisions on selecting the best crop varieties for each individual zone in a field. Fertilization and crop protection plans best suited for those plants in those specific field conditions are combined with recommendations for the optimal timing of each field operation. Machinery that collects it, farm

managers and agronomists who analyze it, and on- and off-board technologies that transfer it, read it and put it into action will be the next tools farmers use to unlock the value in their data.

Harnessing this data has the potential to be the next big driver in productivity gains, similar to the transition more than 100 years ago from horses to tractors, and later from mechanical to electronic machines. Improved sensors and sensor fusion enable better data acquisition and better insights into input deployment. Cloud computing and wireless connectivity allows for more efficient analysis and more granular management of land, machines and inputs. AGCO submits to this committee that smart, connected machines and growers' ability to effectively manage and use farm data is at the forefront of the next farming revolution.

II. Challenges to Effective Use of Agricultural Data

With such change must come shared standards for accessing, processing and ownership of this data. In terms of access, expansion of rural broadband/Internet access which enables farm equipment connectivity is critical to the continued progression of evolving farming practices which lead to increased food, fuel and fiber production. In terms of processing, adherence to industry-wide farm data formats and quality standards enables growers to efficiently work with the agriculture service providers (ASPs) to increase farm efficiency. Today, farm data is highly varied and follows different and often proprietary formats which dramatically limit growers' ability to work with their data. Key agriculture industry associations and initiatives, of which AGCO and others testifying here today are proud to be a part, are working hard to get the "small data" right in order to improve data portability and interoperability, streamlining farmers' ability to utilize it. Ownership is another key piece of this farm data discussion. AGCO and many of the other key players in the industry assert that the farmer owns and should have control and responsibility for the data generated by his or her operation.

Aside from technical barriers, farmers must perceive the value of 'big data' in their operations. Like in other industries going through a similar 'big data revolution,' stakeholders must see to believe. Adoption of precision farming tools and services is driving the realization of data benefits and return on investment. Agricultural equipment and service providers must continue to demonstrate the value of data—make it tangible across the wide variety of operations that exist.

Given these challenges, it is up to us leaders in the industry to develop and advocate for technology that achieves a secure, standardized yet adaptable environment. As you'll hear from those of us testifying today, and others in the industry, there are many exciting recent and currently underway developments to get us there.

III. What AGCO Is Doing to Help Farmers Overcome Data Hurdles

Before we can do all that, we must demystify this idea of "big data." We must educate the industry and growers themselves on what farm data is. Many generate and use data every day and don't even realize it. There's a good deal of confusion and some fear of the unknown surrounding agricultural data. AGCO's focus is on helping growers make sense of their data, and keeping it private so they can use it how they want, to maximize its potential. AGCO leads and participates in critically important agriculture industry associations and initiatives that are working to address these issues through information sharing and education. Much of a farmer's concern over his or her data comes from the nature of the farm business itself. Most other industries would consider this type of information to be proprietary or trade secret, however, due to the relationship between a farmer and his or her operation, farmers see it as personal data. This data also falls into a few categories. Agronomic data is the record of what was done in each field, and operational results. Machine data is information about the performance and operational settings of the equipment that was used. There are also other categories such as weather data, financial information, supply chain information and several others, but machine and agronomic are generally the most discussed.

In terms of technology development, AGCO is actively implementing its strategic decision to focus on engineering equipment that accurately records the data parameters required for farm managers to engage in robust analytics that enable better decision making, while ensuring this smart equipment can then implement management plans derived from that data. To respect growers' data privacy choices, we've separated our data pipelines; one for machine data, and one for more sensitive agronomic data. For agronomic data AGCO has chosen to not aggregate, evaluate or even store the data other than to facilitate the transfer between the machine and the software that the grower or the grower's advisors use to manage the information. The second data "pipe" is for machine data; we encourage growers to share this information with us and our dealers. Machine data is less sensitive to growers since it generally is difficult to use to determine any of that farmer's "secret sauce" in producing their crop, or determining their profitability. This data can be used to provide services for improved uptime as well as optimization for efficient operation. Machine data is also valuable for equipment manufacturers like AGCO to use when developing the next generation of farm equipment.

We call this strategic initiative Fuse®—AGCO's open approach to precision agriculture that optimizes the farm, providing mixed-fleet operations improved access to farm data and

better connections to trusted service providers. This enables more informed business decisions, reduced input costs, and improved yields and profitability. Within this strategy, Fuse Technologies is the technology foundation—tools—including machine guidance, telematics and advanced sensors to create smart, connected machines, fine-tuned for each application that can communicate with farm managers, third party service providers, and each other. On top of this technology foundation, AGCO's dealers are now beginning to offer Fuse Connected Services, which combines the right machines, technology, parts, service and support to help customers optimize their operation and maximize uptime through preventative maintenance, machine condition monitoring and year-round consultation. This system is highly flexible—our customers who have the ability to manage their data on their own can leverage our tools to do it themselves, while those who prefer extra support can get it from their AGCO dealers.

AGCO's strategy is made possible in large part through a focus on mobility, and our pioneering open approach. Our tools and technologies are easy-to-use and developed for maximum accessibility from the farm office, in the field or on the go. We co-develop with a wide range of industry partners and suppliers from Silicon Valley to the Corn Belt—allowing for advanced, nimble and quick-to-market innovations that will help growers keep pace with the farming data revolution. Our open approach also allows growers to choose the service providers they work with, while maintaining a high level of data privacy and security.

IV. Conclusion

As farm sizes increase, data will enable growers to continually optimize and become data-driven managers of their fields. By developing technologies to capture, process and utilize farm data, OEMs like AGCO and other suppliers will help growers become not only qualitative but quantitative experts of their land, using the knowledge gleaned from their data to truly optimize their operations and improve productivity, putting the right amount of inputs in the right spots in the field, at the right time. Agricultural data is the ultimate grower tool to minimize risk and increase profitability while enabling them to become better stewards of the land.

AGCO applauds this committee for highlighting this important topic. It's an exciting time to be part of the agriculture industry – new technology innovations and ways to utilize data are propelling growers' productivity and efficiency. We are experiencing an unprecedented level of cooperation among farmer advocacy groups, industry associations, biotech companies, equipment manufacturers and technology providers—all coming together to help growers utilize data to feed the world. We look forward to your continued support.