Precision Agriculture in Upstate NY: An Overview

Precision Agriculture (Precision Ag) systems hold great potential, however further development is needed for their optimal implementation on the farm. This poster will address the unique challenges faced by farmers seeking to implement Precision Ag systems in their farm operations.

What is Precision Ag?

**Precision Ag Defined**
Precision Ag systems are agricultural information systems that combine Geographic Information Systems (GIS) and Global Positioning Systems (GPS), with guided information recording equipment capable of monitoring and controlling agricultural machinery (i.e. combine, spreader, sprayers).

**Precision Ag Systems Aid Field Scouting**
In theory, Precision Ag systems have the capacity of capturing and storing data about a farm’s soil, historic yield data and product performance with sub-inch (precise) accuracy.

**Precision Ag Systems in Planting & Fertilizer/Chemical Applications**
In addition to data capturing, Precision Ag systems allow for autopilot steering of farming equipment, and sub-inch accuracy for variable rate planting, fertilizer and chemical applications.

**Potential of Precision Ag Systems**
Precision Ag systems provide new information about the farm like never before. Using technology and this new information, farmers will be able to make better decisions (environmental and economically viable) for their farm operation.

**Research Analysis**
The information used for the development of this poster is based on a case study analysis from 10 different farm operations implementing Precision Agriculture systems in Upstate New York from 2011-2012.

**IT DIFFERS FROM FARM TO FARM**
The use of Precision Ag systems differs from farm to farm. Of the 10 farms analyzed, each one is using Precision Ag systems at a different capacity (i.e. only for autosteer of machinery, or autosteer & rate control, or autosteer, rate control and data capturing).

**THE DIGITAL DIVIDE**
Farm work seldom involves computers. As a result, farm workers will struggle to use these advanced computer systems. All 10 farmers outsource the programming of Precision Ag systems (i.e set-up and analysis) to independent consultants/machinery dealerships. This practice can leave the farmer vulnerable to the analysis of third party vendors.

**FINDINGS**
1. Of the 10 farms reviewed for this case study, none have staff with training in agronomy, topography, GIS/GPS enabled technology, statistics, and first-hand knowledge of the field, required to successfully interface with the complete system.
2. As a result of climate change, climate variability, and many external and unexpected factors that may alter what a farmer is able to do during a particular farming cycle, such precise data may become irrelevant overnight.
3. Precision Ag systems lack standardization of data types and interoperability across controllers and machinery. The emergence of a marker standard is far from sight.
4. These systems will eventually play an important role in increasing operational efficiency, but currently they are not a simple transition for the average farm.

**NEXT STEPS**
The agriculture community has remained somewhat isolated from other fields and professions, partially as a result of distance to large population centers and partially due to the distinct way of life. However, with this technological revolution, it will be important to forge new partnerships across agriculture, machinery, and information technology. Further independent research and development is needed.

**For questions and more information, please contact:**
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