

AGRICULTURE TECHNOLOGY



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Need for Agriculture Technology

- The Earth's population is expected to reach 9 billion by 2050
- The United Nations' Food and Agriculture Organization predicts that food production must increase by 60% to meet increasing demand
- 90% of the growth in crop production needs to come from higher yields on existing farm land

Funding Agriculture Technology

- The agriculture technology market is still immature, with most deals done at the seed stage
- In 2012, there was an estimated \$27 billion of venture capital investment in the United States
 - Of this, agriculture technology companies raised about \$100 million resulting from 40 deals
 - While a majority of U.S. venture capital deals take place in Silicon Valley, only around 20% of agriculture technology deals take place there, with the rest occurring closer to big agriculture markets

Precision Agriculture

- Allows farmers to determine when, where, and what to plant with a level of accuracy not previously possible
 - Today, precision agriculture provides:
 - Satellite navigation and guidance
 - Monitoring and mapping of yields
 - Live soil information through sensors installed in vehicles

The Future: Big Data

- Companies are now collecting vast amounts of data to improve precision agriculture and predict farming trends
- Data can be uploaded to the cloud in real-time providing farmers with instant information on their land and crops
- Climate Corp., recently acquired by Monsanto Company for \$950 million, uses Big Data to generate trillions of data points to predict daily patterns and insure farmers against the weather scenarios of their choice

Legal Issues: Data Ownership and Privacy

Data Ownership:

- The American Farm Bureau Federation (“AFBF”) warned that companies collecting data from farmers may use the data to their own commercial advantage in ways not foreseen by farmers
 - The AFBF advised farmers to consider their data ownership rights when agreeing to contracts which store data in the cloud

Privacy:

- Environmental activist groups are demanding information and transparency from farmers and with data in the cloud there is now more information for them to request
 - In 2012, the Environmental Protection Agency controversially released personal information on farmers following a Freedom of Information Act request from environmental groups
- Data could be sensitive and farmers may want to keep some information out of the public eye e.g. pesticide use

The Future: Drone Technology

- Drones could revolutionize farming through:
 - Mass data collection
 - Surveying land and planting seeds
 - Surgical precision in the use of pesticides, fertilizer, and water
- Brazil and Japan already use drones in agriculture, however commercial use of drones is still prohibited in the U.S.
- Safety and privacy concerns that affect urban areas may not apply to farms
 - However, farmers are concerned that drones will be used by environmental groups to spy on and monitor their operations

Concluding Thoughts

- More communication is needed between technology start-ups, farmers, and venture capital firms for further advancement
- Growth and technology in this industry is promising as farmers strive to meet the challenges of feeding the Earth's increasing population



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