

Digitized Agriculture: Sustainability and Regulation

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SUSTAINABLE AGRICULTURAL INNOVATIONS & FOOD

INDUSTRY FUNDED RESEARCH CHAIR IN AGRIFOOD INNOVATION

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Agriculture Faces a Digital Tech Wave



The agriculture industry is the last & largest sector of the economy to be impacted by new digital technologies

Canada's Innovation Gap

In 2019, the Global Innovation Index (2019) ranked Canada:

- 9th in terms of innovation inputs
- 22nd in terms of innovation outputs
- 61st position for innovation efficiency, the lowest of any of the G20 countries
- Canada has a significant innovation gap between what goes into innovation and what is commercialized

Canada's Regulator Burden

- It's been estimated that the increase in regulations between 1980 – 2012, cost the US economy \$4 trillion
- The World Economic Forum (2019) ranked Canada in 53rd position in terms of the burden of government regulation
- The Advisory Council on Economic Growth (2017) set an ambitious target of \$75 billion in agri-food exports by 2027
- To be able to achieve this, regulatory efficiency is essential

Digitizing Plants

- Plant growth is being modelled to learn about leaf development and how photosynthesis can be improved
- Blue River Technologies had developed a robotic vision sprayer that only sprays weeds
- In 2017, John Deere purchased BRT for \$305 million
- Estimated that chemical use could decrease by 80-90%

Scale of Investment

- ~\$40 billion is annually invested globally in plant breeding, 80% public, 20% private
- Between 2012-17, \$37 billion invested in agri-food technology, 29% annual increase
- Digitization in agricultural life science, geo-spatial science and farm and food production systems being called 'Agriculture 4.0'
- The challenge is that less than 1% of bioscience investment results in a commercialized product or technology

Data and Privacy

U of S Ag Econ research examined willingness of farmers to share their data, finding:

- Only 36% were willing to join a data-sharing program
- Reluctance based on privacy concerns
- Non-financial incentives, such as benchmark statistics and prescription maps increased participation
- The organization managing the data-sharing program mattered
- Farmers most willing to share data with university researchers, crop input suppliers, grower associations, financial institutions or equipment manufacturers
- Farmers were least willing to share their data with government

Challenges Ahead

- The pace of digitized agriculture is only going to increase going forward
- Fully autonomous equipment now capable of every growing season field pass from start to finish
- Farm level benefits need to be more clearly identified
- Privacy concerns need to be credibly addressed
- Lack of trust in gov't indicates that regulations will be minimally effective
- Industry led solutions optimal

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