Farmer feedback in innovation: seeking redress for a 'big data divide' in North American agriculture

Kelly Bronson,
Ph.D and Canada Research Chair (Tier II) in Science & Society
École d'études sociologiques et anthropologiques, Université d'Ottawa
Institute for Science, Society & Policy, University of Ottawa

Map of talk:

- Define so-called smart farming and the innovations currently in use across N. American farms
- Summarize survey literature on digital agricultural adoption
- Discuss my qualitative research which reveals uneven engagements with smart farming is not something that begins on the farm, with farmer decision-making; rather, policy and industry are implicated
- Make concrete suggestions for policy-makers

A"SMART EQUIPMENT FOR SUSTAINABLE AGRICULTURE … PRODUCING MORE WITH LESS"

Adoption of digital agricultural innovations has been uneven.

Digital Farming engagements have mostly been studied through quantitative surveys of commodity growers:

"intensive" management and size	+ adoption (Kutter et al., 2011)
Costs of technologies	- Adoption (Lambert et al., 2014)
Farmer education and digital skill	+ adoption (Robertson et al., 2011)
Farmer age	- Adoption (Yeonh Sheng & Brindal, 2012)
Access to experts (dealers)	+ adoption (Busse et al., 2014)

17th PRECISION AG SURVEY

CropLife • Purdue Center for Food and Agricultural Business • • Purdue Department of Agronomy • PURDUE UNIVERSITY

Play a part in agricultural history! *Please fill out and return this brief survey in the enclosed pre-addressed, postage-paid envelope, and send to:*

CropLife, *37733 Euclid Ave., Willoughby, OH 44094; Fax: 440-942-0662.*

PLEASE RETURN BY FEBRUARY 20, 2015.

1. Your primary responsibility: [*check one*]
   - ☐ Owner/general manager/location manager
   - ☐ Departmental manager
   - ☐ Precision manager
   - ☐ Application manager
   - ☐ Technical consultant/agronomist
   - ☐ Sales/sales management
   - ☐ Other: _____(Please specify)

2. Are you a: [*check one*]
   - ☐ Cooperative
   - ☐ Independent dealership
   - ☐ Part of a national or regional (multi-state) chain of retail dealerships (not a cooperative)
   - ☐ Other: _____(Please specify)

3. What were the **total annual retail sales** (in dollars) of agronomic products and services (fertilizer, chemicals, seed, services) **at this location** in 2012?
   - ☐ Under $1,000,000
   - ☐ $1,000,000 - under $2,000,000
   - ☐ $2,000,000 - under $3,000,000
   - ☐ $3,000,000 - under $5,000,000
   - ☐ $5,000,000 – under 7,000,000
   - ☐ $7,000,000 or more

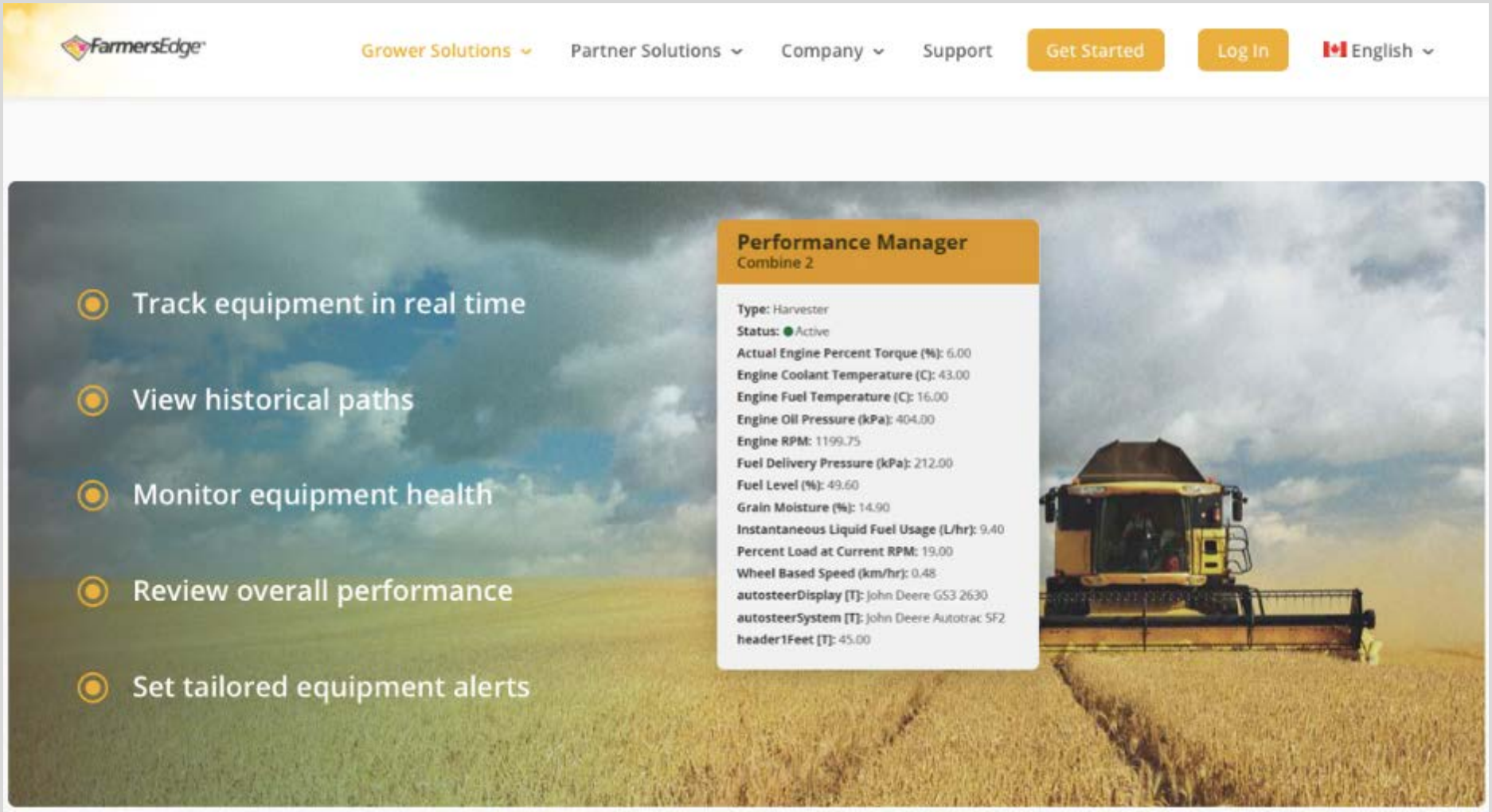
4. How many total retail outlets does ***your company*** own or manage? [*check one*]
   ☐ None ☐ 1 ☐ 2-5 ☐ 6-15 ☐ 16-25 ☐ More than 25

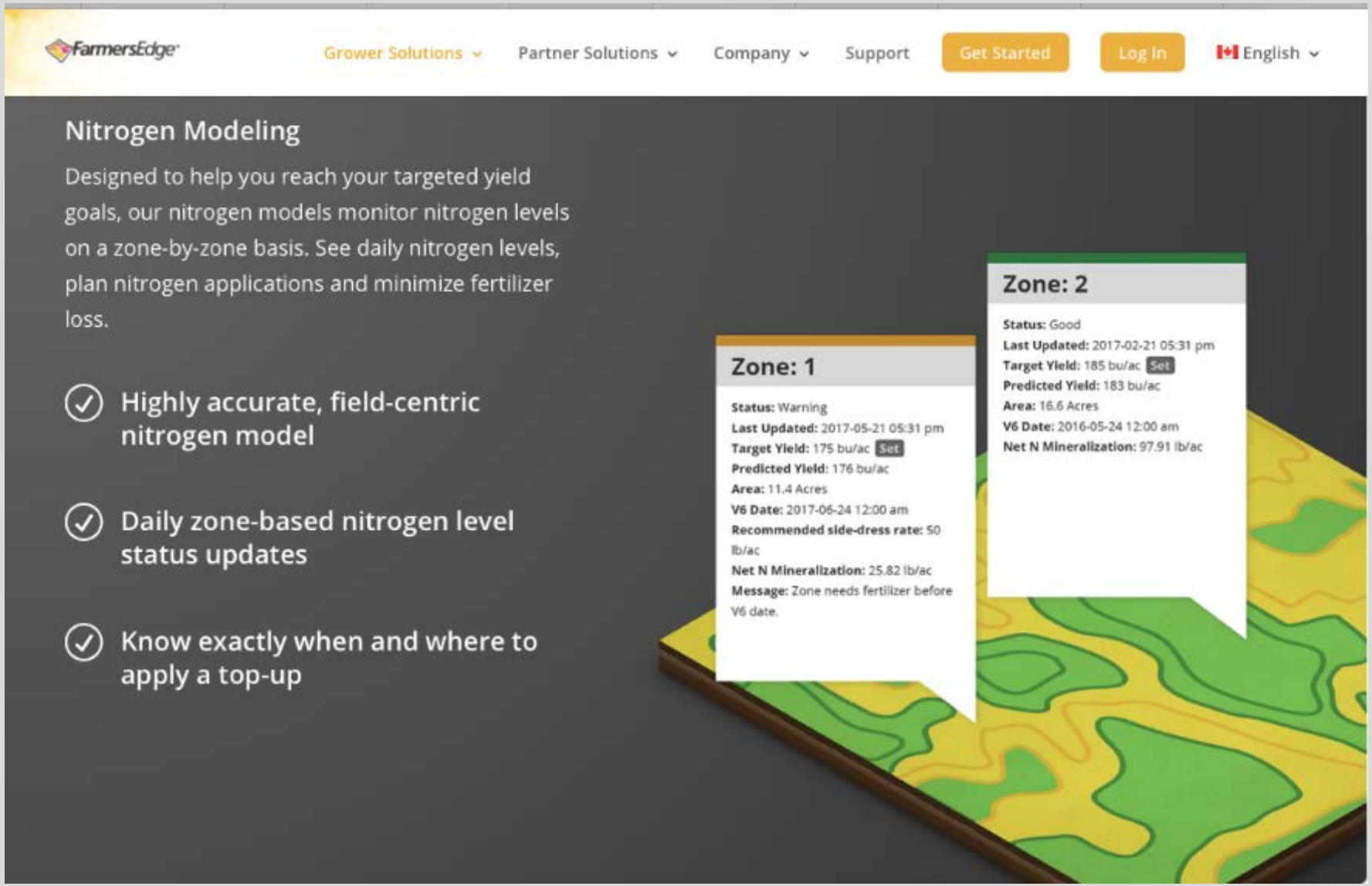
5. In a typical year how many total acres do you custom apply **at your location** (fertilizer, chemicals, seeding – total acres including multiple applications)? [*check one*]

What does qualitative research with a variety of farmers from across Canada reveal?

The bifurcation in the market for smart farming technologies is not simply an adoption issue beginning on the farm; instead, it at least partly results from design decisions which are producing digital farming "haves" and "have-nots."

The majority of digital agricultural tools favour farms aiming to maximize the output of commodity crops for export markets





"Auto-steering for seeding using GPS is a no-brainer. … But the thing about field-mapping is, well it requires some very expensive technology to do a variable fertilizer application. Data helps you determine which areas of the field are the least productive. And then as you go through your soil testing you can soil test those quadrants and then you can see if they require different applications of fertilizer. But in order to do that you have to have application equipment which is quite expensive, which is variable rate technology."

-'Jon,' Saskatchewan grain farmer

Farmers Edge and other corporations developing data systems are currently making little attempt to overcome historic patterns of variation in 'foodways'

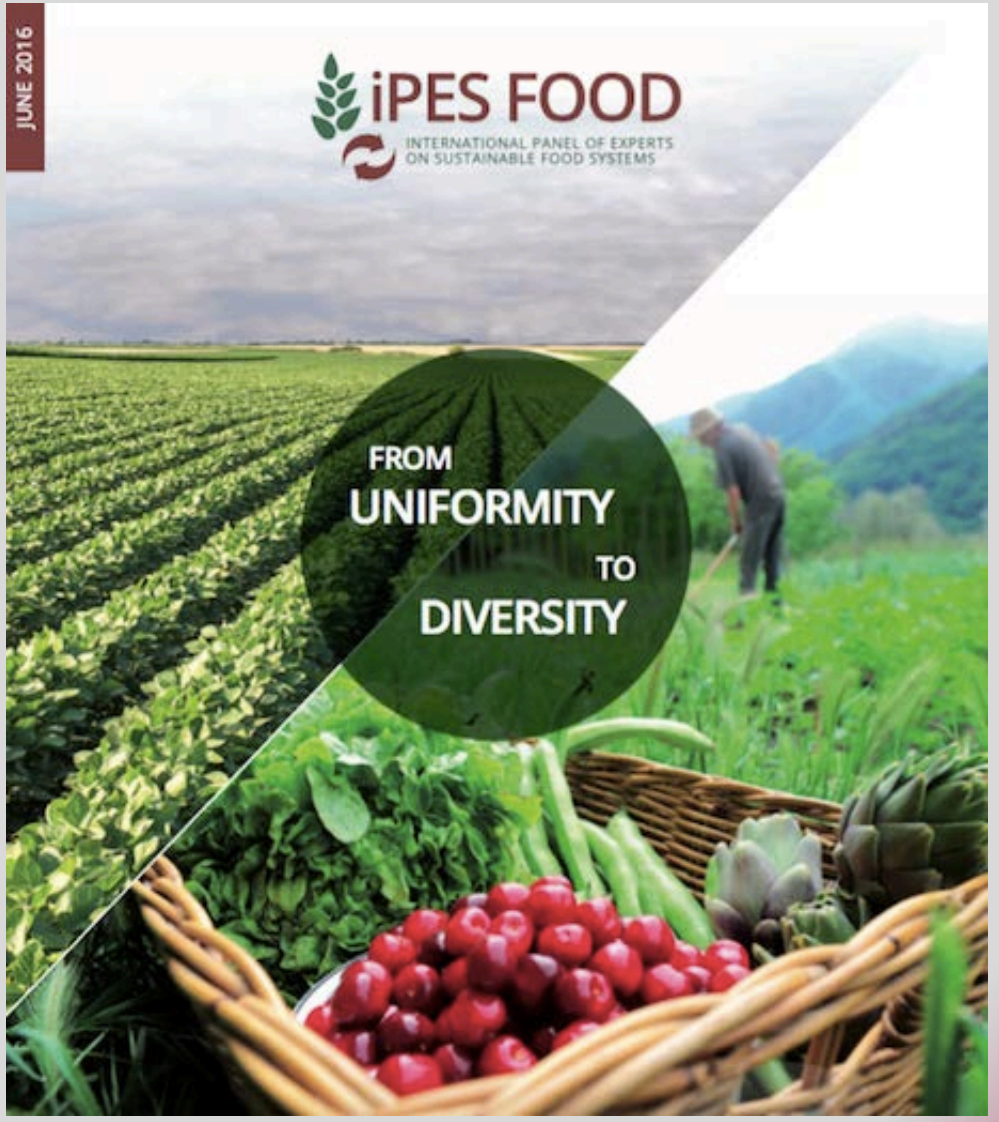
"Of course industry is interested [to design technologies for] large farmers, they are the ones with money to pay."

- 'Phil,' public sector agronomist

"There is [sic] sensors on satellites that are run by various space agencies within the governments: American, Canadian, Japanese, oh you know European, umm… We have access through open data policies to a lot of these instruments so we download, acquire, and download tools to process these data and we get a lot of the data for free. Now some of the data you have to pay for and with Government we don't have a lot of money to do these things, umm so we have to be opportunistic in the sense that we use the data that's free, open …"

- 'Andy,' public sector data scientist

There is evidence that fostering diversity of farm strategies and sizes, among other kinds of diversity, is key to meeting food system and environmental crises.



1) Be attuned to and support "small" digital innovations alongside the "big" ones (e.g. AI, robotics, Internet of Things)

Autoconstruction

À la CAPÉ, on ne se prive pas pour amener de nouvelles idées et pour construire en gang! On part d'un besoin concret sur la ferme, on réunit une équipe de patenteux et on programme les ateliers d'autoconstruction. C'est pas plus compliqué! Pour rejoindre cette joyeuse tribu, il faut juste être membre de la CAPÉ!

Pour commander du matériel (achat collectif) ou pour vous inscrire aux ateliers de montage, il n'y a qu'un seul formulaire mais vous pouvez commander du matériel sans participer aux ateliers.
Formulaire de commande et d'inscription pour l'autoconstruction
Participer à un atelier collectif de fabrication d'outils avec la CAPÉ permet certainement d'économiser beaucoup d'argent en pièces et métaux car achetés en gros mais surtout, de profiter d'un super espace de travail et de l'expertise de tout un groupe, en plus de fabriquer des outils qui n'existent pas sur le marché et permettent d'avoir de meilleures pratiques culturales.

- **Contact:** Yan Gordon, responsable du comité Autoconstruction à la CAPÉ
- **Courriel:** autoconstruction@listes.capecoop.org

Projets à venir en 2018

- Atelier sur-mesure pour optimiser l'espace de transport pour multi-cellules et enjamber une planche (février 2018)
- Atelier autoconstruction d'enrouleuses à bâches et toiles (février 2018)
- Atelier automatisation de serre: construction de boîtiers de relais et de contrôleurs Arduino pour ouverture et chauffage de serres (mars 2018)
- Atelier autoconstruction de laveuses à racines (mars 2018)
- Atelier autoconstruction de chariots de récolte (date à définir)

"The intention behind Farm OS is to be able to have democratized access to environmental data so that anybody has access to high quality, high resolution data at very low cost, and has high participation..."

-Michael Stenta, organizer, FarmOS

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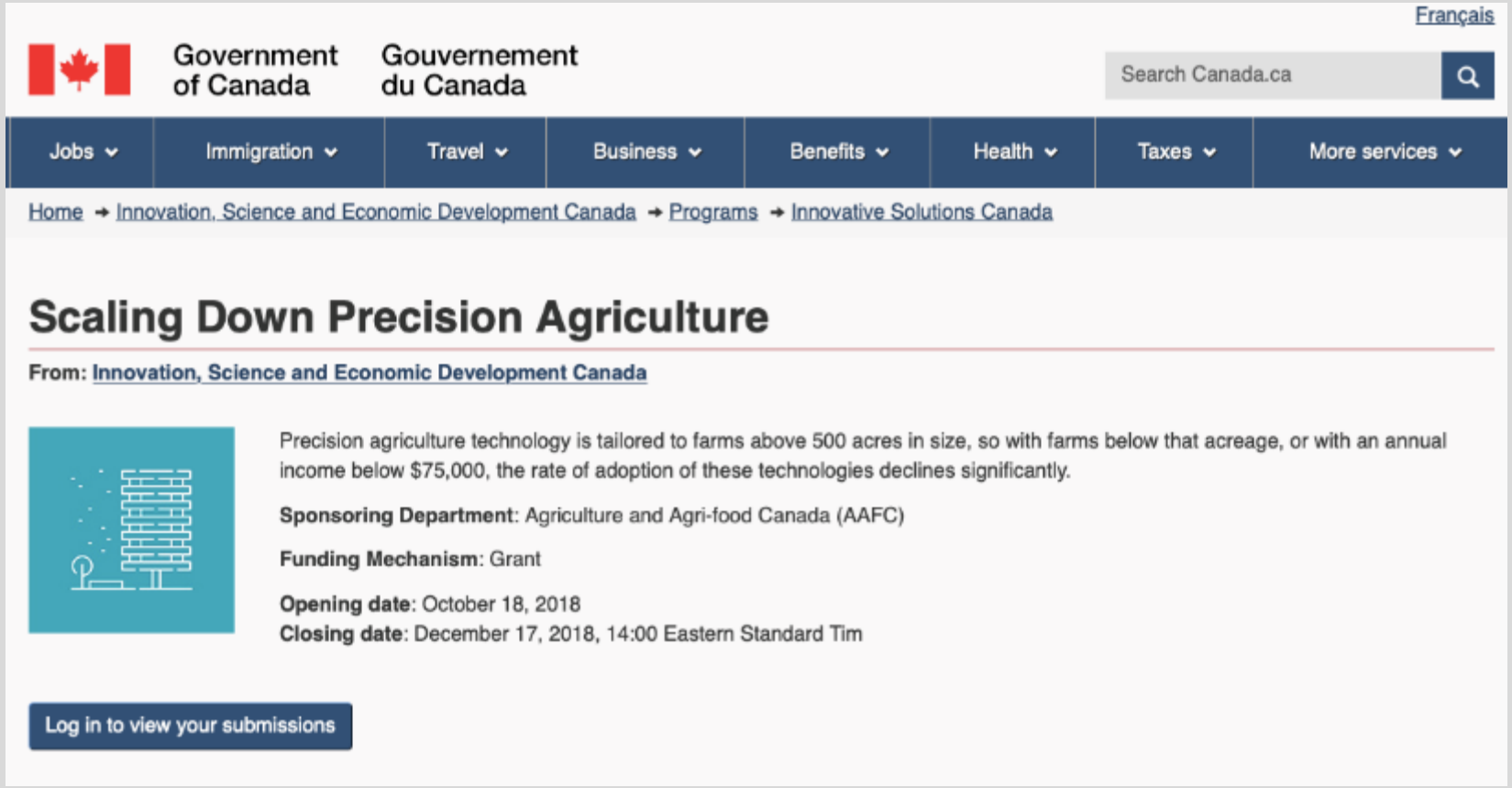
2) Attempt to foreground in funding and other decisions the normative aspects and purposes of innovation: Who exactly stands to benefit from this specific research direction? What kinds of historic inequities might be reproduced by this decision?

3) Team up with researchers whose job and capacities allow for in-depth gathering of feedback from farmers and diverse food system actors.



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Thank you

kbronson@uottawa.ca

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