Agricultural Sustainability: Where is the conversation headed?

A presentation to The InfoAg Conference, St. Louis, July 2018

Steve Savage
The Basic Definition of Sustainability

This sort off “triple best” concept is broadly accepted; however...
The discussion of ag sustainability has frequently tended towards dogmatism...

Low Input, Organic, agroecological farming, small family farms, permaculture, perennial crops...
...or sustainability is tied to unrealistic or only partial “solutions”
However, there are also positive, rational principles and options being discussed

- Rational Intensification
- Land-sparing
- Precision Farming
- Integrated Pest Management
- The “Four R’s” of Fertilization
The sustainability conversation has been shifting to various “multi-stakeholder” groups.
At least there are many key players “at the table” in this conversation:

- Retailers
- Manufacturers
- Food Service
- Commodity Groups
- Environmental NGOs
- Regulators
- Tech Companies
- Industry Associations
- Academics...

FTM now has >135 members.
However; there is a missing party at that table

Non-operating land owners
There are several positive features of the recent sustainability dialog...

• Outcome-based

• Focused on measurable phenomena

• Production as the denominator

• Envisions continuous improvement

• Acknowledges historical progress

![Canadian Maize History Chart]
What variables are most feasible to measure or model?

- Efficiencies or footprints per “bushel”:
  - Land
  - Water (rainfall, irrigation)
  - Fertilizers
  - Soil loss
  - Energy and/or its related CO$_2$ footprint
Some consensus has evolved on practices that improve measurable outcomes

- Elite crop genetics
- Minimum tillage systems
- Cover crops
- Precision-ag
  - Yield mapping
  - Variable rate technologies
  - Auto-steer
  - Moisture sensors
  - Remote imaging
  - Weather data
Efficiencies achieved via precision farming are ideal to document desirable outcomes

- Usually linked to measurable phenomena
- Direct linkage to economics
- An area of rapid technological innovation
- Attractive to younger generations
Some parts of the Carbon Footprint are much harder to quantify

– Soil carbon sequestration
– Nitrous oxide emissions
– Methane emissions
  – Manure management and application scenarios
– Composting
– Alternate wetting/drying for rice
Improving soil health is a consensus desired outcome but...

- There is so much to measure!
  - OM, CO2 burst, microbiome sequencing, water infiltration rate, WHC, CEC, aeration...

- Even so, there is some general agreement on best practices
  - Minimum tillage
  - Cover crops
  - Crop rotation
  - Compaction control, e.g. CWT
  - Other ideas (bio-stimulants, OM additions...)
There are some novel practices that minimize off-site nutrient flows

- Minimized erosion
- No-till/cover crops
- Prairie strips
- Tile drain management
- Flow controls, buffer strips, saturation zones, wood chip bioreactors, nitrification inhibitors, nitrate immobilization “foods”
Some other important outcomes are also challenging to quantify

- **Biodiversity**
  - Pollinators, beneficials, microbiome...
  - Quantify suitable habitat area?

- **Sustainable pest management**
  - **Optimally Productive**: Protects other resource use-efficiencies, and farmer financial stability, but also quality, safety, and downstream waste
  - **Resilient**: stability via diversity, pest exclusion and long-term pest suppression
  - **Protective** of the environment, well targeted...
Some other big questions

• How to deal with agricultural diversity
• What about the weather?
• By field or by farm?
• Goal or goals?
• Convergence or fragmentation?
• How does it come down to the farmer?
• What about the consumers?
“Farm ain’t a thing, farm is a verb”
How to factor in the weather...

• Yields rise and fall for reasons outside of the farmer’s control
  – Extreme weather events
  – Basic soil and climate differences
• How should a production-based efficiency or footprint trend account for this?
  – Relative to regional average
  – Long-term trend averaging
By field or by farm?

- Rotations matter
- What about the logical non-crop areas?
  - Pollinator strips
  - Saturation zones
  - Prairie strips
  - CRP rather than farming in unprofitable management zones
  - Windbreaks
Goal or Goals

• Downstream players may want to be transmitting different messages to their customers

Our products are sustainably sourced

We are helping to drive sustainability progress

We source from the leaders in sustainability progress
Convergence or fragmentation?
A continuum of possibilities

Convergence
Standards
Terminology
Data requirements
Future goals
Consumer message

Fragmentation

Sustainable Food Policy Alliance
How will all of this come down to the farmer?

• Leverage in ag value chains is intrinsically unbalanced
  – “The customer is always right” is a practical, not an ethical conclusion

• This could easily become a large, multi-faceted data/survey burden for growers

• A range of incentive scenarios
  – Price premiums for best practices
  – Unfunded mandates
  – Requirements for market access
What about consumers?

How will they be able to digest this?
This is difficult because society is so detached from agriculture

We should blame Jethro Tull!

Not this one

This one!
For decades consumers have been exposed to misleading marketing and advocacy that erodes trust.

Trust has also been eroded by downstream players who have been “Reaping profit by sowing doubt.”
So what should farmers and their allies do?

• Stay engaged in the multi-stakeholder efforts
• Communicate directly with consumers
• Ponder ways to address...
  – How to engage non-operating land owners
  – How to enable future farmers
Thanks. Questions?