Practical considerations in implementing metrics for Sustainable Agricultural Production

Jennifer L. Shaw, Ph.D., Head Sustainability North America

The National Academies, Workshop 1: Measuring Food Insecurity and Assessing the Sustainability of Global Food Systems
February 16-17, 2011
Food security depends on continuous improvement of our ag systems --- how do we get there?

1. **Definitions & Metrics**: What do we mean by ag sustainability? What are the outcomes? How will they be defined & measured?

2. **Benchmark Crop Production**: How will metrics be adopted/improved? What do we know today? How much participation is necessary for broad adoption?

3. **Deliver Improvements**: What can be improved at the grower level? How do we ensure a difference will be made? How do we incentivize change?

- This is the goal, but need steps 1 & 2 as a foundation

---

2

---

syngenta
For many of us this can be personal...

...it is important to get it right
Discussion of principles linked to metrics going forward

- Science based & validated
- Transparent & open sourced
- Pragmatic & focused on what matters
- Value creating for the grower (must exceed the cost & disruption)
- Respectful of confidentiality
- Improvements verifiable
- Not disruptive to efficient product movement & relationships
- Focus on decisions in the control of the grower
- Recognize & address land tenure relationships in creating incentives
- Phased & realistic
  - Move with value creation, not in front of it
  - Improve over time
Agreement on metrics is an essential first step in making progress with sustainability

- Metrics adoption is in a state of flux
  - Competing, parallel efforts exist
  - Few commitments
- Difficult to evaluate options & make meaningful investment e.g.,
  - Downstream companies are waiting for producers
  - Producers are waiting for downstream commitments
A leading, science-based effort in the US is the Keystone Field to Market (FTM) initiative.

**Corn Efficiency Indicators**
(Per Unit of Output, Index 2000 = 1)

The smaller the spidergram the lower the impact. Indicates progress in recent decades. More is needed.

A successful story going forward depends on the adoption of FTM metrics by growers......
Syngenta adopted the FTM metrics for a range of pilots to gain practical experience with growers & collaborators

- Incorporated into Syngenta’s farm management tool (Land.db™)
  - Existing grower relationships
  - Already capturing farm data
  - Confidentiality

- Initiated several pilots
  - Evaluate the metrics
  - Feedback from growers across multiple crops & geographies
  - Identify areas of improvement

Land.db™ is broadly deployed by Syngenta
Syngenta growers evaluated the effects of potential management decisions on a real time basis.

Original Fieldprint

Change Production Variables

Represents Field to Market Indicators generated in Land.db™
Opportunities for improvement were highlighted e.g., energy use.
What did we learn from our growers? (positive feedback)

- Grower interest in comparisons to:
  - Neighbors
  - State & national averages

- Operational improvements were made visible. These may be adopted as they represent cost savings & efficiency (example: fuel usage)

- Efficiency in data entry greatly appreciated (critical success factor)
What did we learn from our growers? (areas for improvement)

- **Time required to enter quality data was significant**
  - 3-4 hours per farm
  - Building on an existing farm management tool
  - Opportunities to improve the grower experience

- **Value perception varied**
  - Growers varied in their perception of sustainability
  - Significant suspicion about the future impact

- **Data privacy was a prevalent and significant concern**
A full understanding of performance will take time...

**Corn Sustainability Performance**
Field to Market Land Use Indicator

A short term view can miss the true story

Based on USDA NASS Crop Production Data
The challenge is that we cannot get ahead of value

Value > Cost?

- Recognize grower costs & potential disruption
- Ensure adequate incentive if changes are needed
- Stepwise and flexible approach
- Move at the pace of created value & available resources, not ahead of it

Incentives will be essential moving forward
An ROI perspective of potential grower improvements informs decision-making & increases the likelihood of driving change.

- **Incentives Required Align with Market Value**
- Financing could be a barrier

**Size of Impact**

- The wider the bar, the greater the positive impact

- **Incentives Required Exceed Market Value**

- Focusing only on the largest impacts can lead to economically misplaced emphases

Analysis approach adapted from McKinsey
Conclusions

- “Certainty” around metrics is critical to get things moving
- Leverage existing systems & relationships as possible
- Significant effort is required to gather data (esp. at field level)
- If readily usable, the FTM efficiency indicators would inform operational decisions on a routine basis (field by field)
- Aggregated data will inform the environmental benefit of certain production practices over time
- Going forward, data can be used to support life-cycle inventories for crop production on a regional and local basis
- Grower time & costs are significant - adequate incentives are essential
- Many of the basic insights likely applicable to other regions
Bringing plant potential to life

www.growmorefromless.com