Ag & Food Traceability: Trends & Opportunities

Presentation to Syngenta with attendance by U.S. research “Traceability Consortium”

Steve Holcombe, CEO
Pardalis®
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Traceability Consortium (geographically)

- Michigan State Univ.
- Univ. of Arkansas
- Oklahoma State Univ.
- Pardalis Inc.
- North Dakota State Univ.
- Univ. of Arkansas
Traceability Consortium (attributes)

- Food safety
- Food protection
- Microbiology
- Virology

- Social sciences
- Standards in society
- Supply chain management
- Nanotechnology
- Extension

- Biosystems & ag engineering
- Precision Ag. & Sensors
- Stored product eng.
- Ag economics
- Food processing
- Extension

- Food Systems
- Training & education
- Risk Management
- Extension

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Traceability Consortium
(Interesting connections)

- Walmart, Tyson
- Arkansas Assoc for Food Protection
- Food Safety Consortium

- Sen. Conrad (D), Member, Senate Ag Committee
- Microsoft Dynamics
- Northern Crops Institute

- Rep. Lucas (R), Head, House Ag Committee
- Promises to be a “strong voice for production agriculture ...."

- Sen. Stabenow (D), Head, Senate Ag Committee
- Mandatory livestock identification
- Kellogg Company

- OSU
- NDSU
- MSU
- UARK
Northern Crops Institute

Industry Advisory Board includes:

- Amaranth
- Barley
- Buckwheat
- Canola
- Corn
- Crambe
- Dry Edible beans
- Field Peas
- Flax
- Lentils
- Millet
- Mustard
- Oats
- Potatoes
- Rye
- Safflower
- Sorghum
- Soybeans
- Sunflowers
- Triticale
- Wheat, Durum
- Wheat, Hard Red Spring

Duel Over Sugar Beet Seeds Could Create Shortage
Ag Traceability Overview

• The promise of “whole chain” traceability for addressing:
  – Supply Chain Optimization
    • Vertically integrated & federated chains
      – Overcoming the Bullwhip Effect
    • The missing data of fragmented chains
      – You don’t know what you don’t know
      – Data ownership & privacy issues
  – Risks & Liabilities
    • Limits of one-up/one-down
      – Recognized by FDA/USDA
    • Public and industry relations
      – Global Trust Bust says Frank Yiannas, VP of Food Safety, Walmart
      – What would 12 jurors think?
Current context - Ag & Food traceability

- Food safety
  - Recall after recall .... Microbiological toxins (salmonella), viral toxins (norovirus), chemical toxins (dioxin)
  - Food allergies from GM Crops? Science versus perception.
- GMO seeds/grains (environmental impacts)
  - Bayer to pay $1.5M in 2nd (of 500) lawsuits over GM Rice
  - Duel Over Sugar Beet Seeds Could Create Shortage
  - crop differentiation, segregation, verification & food ingredient tracking
- Social media raising expectations for real-time supply chains
  - Effects of Facebook, Twitter, etc.
One-up/One-down Traceability
(Legal Overview)

• One-up/one down: Vendors must know what is going on inside of their four walls.

• Representative laws and industry initiatives:
  – EU General Food Law
  – Hazard Analysis and Critical Control Point (HACCP) plans
  – US Bioterrorism Act of 2002
  – US Food Safety Modernization Act (food safety plans)
One-up/One Down

(limitations)

• EU and US Food Recalls
  – Investigations still take weeks to months
  – Innocents tainted by actions of others
  – Need for real-time, trustworthy data to respond to 24 hour news cycles

• Addresses supply chain optimization? No.
• Addresses real-time risk management? No.
• Addresses customer-driven supply chains? No.
• Addresses global trust bust? No.
“Whole Chain” Traceability  
(working definition)

A “whole chain” product tracing system consists of information elements provided by persons in the supply chain to other persons in the supply chain (e.g. Value Chain).

Graphic’s Source:  http://en.wikipedia.org/wiki/File:Value_Demand_v_small2.png
Legal trends in US and EU

• One-up/one down traceability is the standard but because of its lack of real-time responsiveness there is increasing interest by FDA, USDA FSIS, European Commission in “whole chain” traceability
  – *Product Tracing Systems for Food*, 74 FR 56843 (food safety)
  – *IFT/FDA Traceability in Food Systems* (food safety)
  – Recent EU Dioxin scare (food safety)
  – Turmoil over GMO crops (e.g., impacts on organic operations)

• Representative laws and/or standards:
  – None but murmurings ....

• Industry Initiatives are still one-up/one-down, too:
  – Produce Traceability Initiative
    • one-up/one down grocery industry initiative
  – US GS1 Rapid Recall Exchange
    • One-up/one down distributor/retailer initiative but supportive interest by GS1 in Traceability Consortium
Hot off the Grill:
What the regulators want ...

“[T]he regulators want a traceability system that is consistent, speedy, covers the entire supply chain, has electronic records, has interoperable systems, and covers domestic and imported foods. On top of that, the FDA wants the industry to develop the tools and to pay for the system.”

Issues and technical challenges

• Increasingly complex and lengthening global supply chains are poorly served by one-up/one-down

• High interest in “Value Chains” for optimizing supply chains.

• Whole chain traceability made possible by minimal disclosures of product identity data that are traceable and controllable by persons in supply chains
  – What does that mean? CRM versus VRM as an illustrative example ...
Customer Relationship Management (a universe of solutions?)

CRM graphic sources: How to pick an ATS and CRM for your company? (picture).
Customer Relationship Management (CRM) is about companies trying to manage their prospect and customer relationships. Even though billions have been spent on CRM over the last 15 years ($9+ billion in 2008 alone), overall customer satisfaction has remained flat.

Bullwhip Effect (graphical)

Bullwhip Effect (charted)

Vendor Relationship Management ("whole chain" lite)

Vendor Relationship Management (VRM) is the flip side of CRM. VRM has the power to give people – individuals who recognize their value as customers, and wish to better define the terms of their relationships – the software, tools and ability to manage their vendor relationships, as well as their interactions and experiences.

Whole Chain Traceability
A starting point for the Value Chain

Whole Chain Traceability
A technically achievable starting point for the Value Chain

Food Recall Data Bank

Solution of National Agricultural Product Traceability Center

• No such center currently exists. Why not?
  – Strangely, nobody has really asked!
• Center would anchor the multi-disciplinary "traceability consortium"
• Center would address both:
  – Stakeholder and industry needs
  – Regulatory needs
Previously engineered source code for “whole chain” traceability. Patents issued or pending in Australia, Brazil, Canada, China, Europe, Hong Kong, India, Japan, Mexico, New Zealand and the United States.
“Whole Chain” Traceability Consortium

Ag Industry Stakeholders

OSU

NDSU

MSU

UARK

Other universities

Ag Product Traceability Center

[Logos of OSU, NDSU, MSU, UARK, and Other universities]
Multi-disciplinary Research

“Whole Chain” Traceability Consortium

- Ag & Food Safety
- Training & Education
- Precision Ag
- Standards
- Supply Chain Management
- Ag Economics
- Sensors
- Environmental Impacts
- Other
Industry Stakeholder Benefits

- **University relations**
  - Stakeholder case studies
  - Political and commercial relationships

- **Technology Transfer**
  - Access to open source systems
  - Private cloud deployments

- **Traceability Consortium**

- **Public relations**
  - Good corporate citizenry
  - Address global trust bust
  - What would 12 jurors think?

- **Industry relations**
  - Trusted industry data
  - Cloud deployments?
Roadmap for such an initiative

• Formalization of trusted multi-state project between members of the "traceability consortium"
• Technology transfer and licensing agreement between OSU and Pardalis Inc.
• Continue with applications for competitive research funding (over $50M in 2010 submissions)
• Pursue private funding with specific commercial applications
• Goal of operational Traceability Center by Q1 2012
What would 12 jurors think?

- Closing arguments to the jury:
  - Could the company have responded sooner to a crop or food traceability crisis with “whole chain” technologies?
  - Did the company take full advantage of “whole chain” technologies at hand for providing greater food security beyond one-up/one down?
  - Was the company a proactive, corporate citizen or did it recklessly ignore “whole chain” technologies to the detriment of consumers’ health, the environment, etc.?
How may Syngenta shape bigger game in this area?

• Join us
  – Next, a “face to face” meeting?
  – Then, a short-term project or case study for building confidence?
  – Then, a plan of action for funding an International Ag Product Traceability Center?
Appendices
Critical Traceability Identifiers

- Field
- Packer
- Process
- Manuf
- Distrib
- Distrib Cntr
- Store

CTID identifiers:
- CTID1
- CTID2
- CTID3
- CTID4
- CTID5
- CTID6
- CTID7
- CTID8
- CTID9
- CTID10
One up/One Down Traceability of transactional data

No real-time, minimal disclosures of product identity data. Disclosures only upon recall and after food safety incident.
Whole Chain Traceability of transactional data

Real-time, minimal disclosures of product identity data