PROJECT 17
AGRICULTURAL TECHNOLOGY CLUSTER

INNOVATIVE TECHNOLOGIES IN FOOD SAFETY: TRACKING PRODUCE AND PROCESS

THINK TANK SESSION
JUNE 29, 2012

SESSION NOTES

On June 29, 2012, Project 17 International, in collaboration with the Grower-Shipper Association of Central California and Hartnell College, convened an invitation-only think tank session to delineate the needs in the food safety around the areas of:

- tracking produce and processes with reliable remote readers;
- innovative technologies in tracking and traceability for food safety: those considered, dismissed, and should be re-considered; and
- futuristic technologies from other industries that could be adapted and adopted.

The second in a series on food safety issues in the agricultural sector, this Think Tank Session encouraged participants to discuss what technology solutions have worked, been dismissed, and should be re-considered. The first part of this session reviewed what is working and what is not working, per the group's input, in the area of tracking and traceability. The group then heard from Mr. Peter Wong, Chief Technology Officer of TruTag Technologies, Inc. about an advanced silica-based form of microtagging. Afterwards, the group refined its "Wish List" for technology-based solutions for track and tracing. During the second part of the session Dr. Rudolph Darken, from the Naval Postgraduate School, presented cutting-edge technologies that could possibly be deployed in the agricultural arena, especially relative to food safety. The session wrapped with the group delineating a Wish List for any technology solutions that could improve processes in the agricultural arena. Most suggestions focused on the attainment, processing and management of important data for the farms and processing plants.

Participating companies and organizations included:

- Coastline Produce
- Comgro Soil Amendments, Inc.
- Driscoll Strawberry Associates, Inc.
- Grower-Shipper Association
- J L White International, Inc.
- Monterey County Farm Bureau
- Naval Postgraduate School
- Rose Royal Radicchio
- SKAI Ventures
- SureHarvest
- TrueTrac
- TruTag Technologies, Inc.
- United Fresh Produce Association
- Hartnell College
- Project 17 International
- Smart World Center

GOALS OF THE SESSION

- *Delineate what works and what does not work regarding current technologies used for tracking produce and process (including hardware and software solutions)*
- *Create a Wish List of technology-based solutions in the tracking arena (for the short-term and for the long-term)*
- *Create a Wish List of technology-based solutions for food safety – in any regard – that need to be created.*
- *Come to understand that there are opportunities for agriculture in adopting technologies coming out of other sectors. (e.g., "Open Innovation")*

TOP THREE THINGS THAT ARE WORKING REALLY WELL IN THE AREA OF TRACKING PRODUCE AND PROCESS

Generated Ideas from Written Exercise – Hardware: Pro/Working Well

- Water sensing technology is strong for automated entry
- Hand written tags and bar coding
- Data devices
- "Rugged-ized" equipment/hand held devices
- Opportunities for technology improvements are coming faster

Generated Ideas from Written Exercise – Software: Pro/Working Well

- Cloud-based technologies/communications
- Tracking material brought in and through processing
- Software is available to manually enter data into
- Lot number; commodity; crew number; time harvest; time to the cooler

TOP THREE THINGS THAT ARE NOT WORKING REALLY WELL IN THE AREA OF TRACKING PRODUCE AND PROCESS

Generated Ideas from Written Exercise – Hardware: Con/Not Working Well

- Printing at field
- Handhelds are outdated quickly or fail to live up to expectations
- Nitrogen sensing equipment not available
- Battery life (is too short)
- Tags not sticking; lose tags due to wind or water
- Atmosphere sensing equipment not remote enough

Generated Ideas from Written Exercise – Software: Con/Not Working Well

- Automated carton readers for complete pallets – not RFID
- Education – training (is lacking)
- Not being able to track product through distribution to end user
- Ease of use among harvesting foremen/supervisors (i.e., field workers)
- Cost

PROS & CONS OF TAGGING FOR TRACKING: TRUTAG TECHNOLOGIES, INC.

Discussion Notes from the presentation by Mr. Peter M.O. Wong, Chief Technology Officer, TruTag Technologies, Inc. (TruTag provides a silica, micro-tag about the size of a grain of sand that is currently being used in the pharmaceutical industry where the tiny tags are combined with other silica normally used in the coating of a pill. The tag contains a code that is formed by putting holes in the silica. Nothing is added.)

- TruTags are primarily for tracking through the supply and distribution chain
- Is this a spray-on application? Could be . . .
- Are you putting it on whole plants? Yes, i.e., mushrooms.
- Other examples where it could work well: with sliced apples, pineapples
  - It is a bother to take the tags off of individual apples and slices
- Cost depends on how much of the TruTag solution you are using per unit

- Readers: usage of the readers depends on location of the Microtags
- This could be useful for product recalls and consumer safety. If you pull out a head of lettuce from fridge you can then trace it back to where it came from.
- Tracing the uniqueness of products: we lose traceability after it leaves the distribution center. Example: if someone is looking to buy only organic produce from a certain farm, this product could be used to verify that that produce is indeed from the specific organic farm.

Questions for TruTag Technologies, Inc.

- Are there health concerns about silica with the brain? -- No. Most pill coatings currently contain silica.
- Are there labeling requirements for Microtags? No. It is considered food-grade.
- Can you mix different codes and use on one piece? Yes.
- How can you apply it on produce in the field?
- How to keep it out of the soil once it is applied to produce in the field.
- Is there a standard to use to TruTag Microtags worldwide? No. But we need a standard.

DISCUSSION OF WISH LIST FOR TRACKING AND TRACEABILITY

- Environment monitoring versus product monitoring: we need product monitoring
- Monitoring is needed from field → to the cooler
- And additional monitoring is needed from the cooler → to the end user
- Companies which are not vertically integrated in the production and distribution process are hard to track; therefore the data is hard to track
- We need to overcome human error (or manipulation) of monitors or monitoring equipment.
- How can we use these data to improve our own processes (beyond simply compliance)?
- Need to get a handle on this quantity of data early in the process so as to leverage it for our advantage (for individual companies and for the industry; rather than having a lot of data that is out in front of us and not being digested).
- Hard part: meld both First Mile and Last Mile together for decision-making
  - First Mile Data: Real Time assessment
  - Last Mile Data: Post-ship scenarios

- Downloading data – tends to deal only with exceptions rather than with predictive patterns.

- Food is too cheap so "shrink" doesn't matter as much in USA (We currently lose 4-12% of our produce to shrinkage; what if we can lower this percentage through better tracking and traceability?)

- Low-Margin Industry: hard to "buy" application packages ready to go (though pharmaceutical industry may have them)

- RFID didn't work
  - Moisture
  - Slow ROI – 20 years out

Wish List FOR TRACKING AND TRACEABILITY

- First Mile solution: harvesting, packing, shipping to cooler

- Track times
  - Harvest
  - Pallets

- Getting field workers to do these tasks (simple technology)

- Educational challenge regarding current students who need more pre-college prep and access to technologies and real farm experience.

- Cheap: we need low cost solutions

- We need solutions based on per-minute model Provide winning solution for grower: better ROI

- Scalable systems: something that works on a small farm and then can be scaled up to large concerns.

- Usable for small growers and scalable up

- Cannot impact growers' and harvesters' productivity

- Needs to be remotely entered

- Yes, we need water sensors

- We could use better sensors with compost , but the current sensors are really expensive

- Build and put applications on smartphones – ubiquitous technologies that are cloud-based (i.e., Sprint/Nextel)

REFINING OUR WISH LIST FOR FUTURE TECHNOLOGY-BASED SOLUTIONS FOR FOOD SAFETY (IN GENERAL; NOT JUST FOR TRACKING AND TRACING)

- Combine information from different players in your own "system" – data consolidation
- LGMA audits
- Confidentiality is a must!
  - Online sharing of ag data: only if secured
- Problem: Ag companies suffer from "Audit Fatigue"
  - We would like "harmonized audits" where we combine information and share out to the different agencies.
- What if we could share these data within the audit phase to improve the audit data collection?
- How to "blind the data" to make it useful to multiple agencies → no current platform to do this
- Distrust of sharing data within the industry (even though bad data is "good").
- How to be protected against lawsuits once data about a problem is shared?
  - We don't have a "kill step" against pathogens, so there is no guarantee to the public. (And, we do not see a kill step solution in the future.)
- How to leverage hardware-based solutions for a better end (not always software)?

NOTE: The Next Session on Commercialization of Technology from the Agricultural Research Service and from the Naval Postgraduate School: **July 27, 2012**