

A Producer's Experiences and Insights on New Technologies for Orchards

Helping us do what we do – Only Better

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February 25, 2013

A Start...

Technologies I've Worked with Directly & "Indirectly"

- ❖ APM – various iterations
- ❖ Automated Insect Traps
- ❖ Phil Brown Harvest Assist System
- ❖ Darwin Blossom Thinner

From There...

- ❖ Employee & “User-Level” Feedback
- ❖ Re-Inventing the Wheel. Or not??
- ❖ Where do we go from here and how do we get there?

APM (Autonomous Prime Mover)



APM (Autonomous Prime Mover)

- ❖ “Base” vehicle upon which CASC project was built
- ❖ Autonomous movement in the orchard – potential for *many* uses
 - ❖ Mowing
 - ❖ Pheremone application
 - ❖ Bin transport
 - ❖ Herbicide application
 - ❖ Tree trunk painting
 - ❖ Disease detection
 - ❖ More...?

APM with Scissor Lift

Training



Pruning



APM with Scissor Lift

- ❖ 1 significant offshoot of CASC's APM
- ❖ Autonomous vehicle with a platform that can be raised & lowered for various hands-on activities:
 - ❖ Thinning
 - ❖ Tree Training
 - ❖ Pruning
 - ❖ Trellis Installation
 - ❖ Pheremone hanging

APM with Bin Dog

Filling bins...



Having just filled both bins –
ready for driverless
transport...



APM with Bin Dog

- ❖ Automated advancement through orchard pulling bin trailer
- ❖ Challenges include: means of control, loading & unloading of bins & working height of bins being used
- ❖ Potential for automatic removal of full bins from orchard & re-entry with empties



APM... Evolution



BAH -- IFTA 2013

Automatic Insect Traps

- ❖ Automating and improving an already practiced industry standard.
- ❖ Will count insects entering the trap in real time and forward compiled data, through networking, to a base station.
- ❖ Enormous potential advantages when combined with other in-orchard, networked data collection.
 - ❖ Weather data
 - ❖ Environmental conditions
 - ❖ Disease potential

Vacuum Harvest Assist

- ❖ Modular mechanism for expediting movement of fruit from tree to the bin
- ❖ Great potential with many challenges
 - ❖ Maintaining fruit quality
 - ❖ User-friendliness
 - ❖ Incorporation with pre-existing harvest equipment (ie: diversity of tractors, forklifts, bin trailers & bin sizes)
 - ❖ Sufficiently robust
 - ❖ Cost effective

What about the Users??!

Employee Perspective – A Process to Consider

1. Initially: Intrigue and Excitement
2. Apprehension & Uncertainty
3. Passive Acceptance – Let others try. But I'll watch...
4. Exploration – “It Worked for him...”
5. Challenge – “I can do this too...”
6. Acceptance

Considerations for Employee/User Compatibility

- ❖ Interface intelligibility proportionate to the “Tech level.”
- ❖ Sufficiently Robust for “real-world” application
- ❖ Safe
- ❖ Designed *for* the application it’s being used for

Invention or Improvement?

Do We Really *Need* a New Wheel?

Then



Today



What Does the Future Hold?

Where do we go from here?

- ❖ Standardize orchard systems that will optimize use of new technologies
- ❖ Work together as an *industry* to direct research and communicate to effect the best possible results
- ❖ Engage scientists and funding sources to support the research being done and assure it is continued
- ❖ And, finally, no matter what...

Don't Ignore This Guy...!





July 16-17—Adams County, PA Orchards & Penn State Fruit Research & Extension Center Field Day

Optional Pre- and Post-tours – July 15 and 18 –hosted by Ridgetop and Boyer Orchards & Bob Black and Family of Catocin Mountain Orchard, MD

Summer 2013—Heritage and Innovation **IFTA Visits Pennsylvania!**



Thank You!

- ❖ Agriculture... is our wisest pursuit, because it will in the end contribute most to real wealth, good morals and happiness

-Thomas Jefferson to George Washington,
1787