Comprehensive Automation for Specialty Crops

Student Involvement

From left to right: Dr. Jim Schupp, student intern Evan Moore, graduate student Tom Kon, student intern Celine Kuntz, and technicians Katie Reichard and Edwin Winzeler conducting WeedSeeker research at PSU's Fruit Research and Extension Center.

Russell Rohrbaugh and Alex Leslie, Penn State ag engineering students, pruning trees in a commercial high density pilot orchard.

Reuben Dise with WeedSeeker.

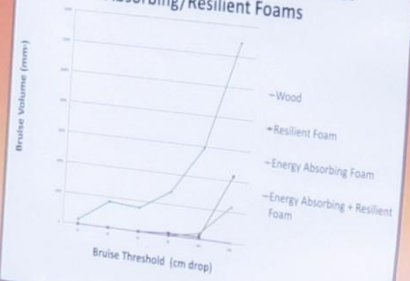
Alex Leslie gives a talk on passive bin filler research at the CASC Open House in PA.

Harvest Assist Technologies for Improved Efficiency

Labor Platform for Testing in Orchard Pilot Plantings

Labor costs associated with fruit harvest are approximately 40 percent of an orchard enterprise annual budget. Mechanical harvest aids offer the potential for more efficient harvest and increased consistency in fruit handling. However, current in-field bin filler technologies result in excessive bruising of fruit. The complex fruit handling and equipment/operator interface is a major hurdle engineers must address for successful technology transfer.

Reductions in Bruise Volume with Energy Absorbing/Resilient Foams



Assessments of Passive Bin Filling Devices

Treatment	Extra fancy (%)	Fancy (%)	Downgraded due to Bruises (%)	Bruise Width (mm)	Bruise Volume (mm^3)
Foam balls	97 a	3 a	0 a	1.8 a	20.2 a
Splash balls	97 a	3 a	0 a	4.3 a	24.8 a
1 layer each	97 a	3 a	0 a	1.6 a	37.1 a
2 layers elastics	100 a	0 a	0 a	2.5 a	16.3 a
2 layers balls +1 layer elastics	100 a	0 a	0 a	1.2 a	7.2 a
2 layers each	100 a	0 a	0 a	3.3 a	87.8 a
Control	69 b	28 a	6 b	10.8 b	322.9 b

Reuben Dise and Tom Kon (on Reuben's left) talk about the Weedseeker at CASC Open House in PA.


Brian Kliethermes and Gwendolyn Barr discuss the passive bin filler prototype with Prof. Sanjiv Singh and Prof. Bill Messner.

Jacob Koan, engineering intern from Michigan State, conducting mechanical thinning research.

Reuben Dise conducting string thinner positioning trial.

Reuben Dise recording data in string thinner positioning trial.

Penn State summer interns visited Mike Glenn (USDA-ARS) to learn about fruit tree physiology.

Matt Aasted and Reuben Dise testing sensors for automated positioning of string thinner.

Jackson Kowalski, intern at Oregon State's
North Willamette Research and Extension Center.

Brian Moore, intern at Oregon State's
North Willamette Research and Extension Center.

Mike Kapsimalis, intern at Oregon State's
North Willamette Research and Extension Center.

Sarah Sydow, intern at Oregon State's
North Willamette Research and Extension Center.

Robin Pritz, Kyle Tynan, and Dave Ferguson examine the APM after its seven-day trip across the country.

Matt Aasted (2nd from left), Robin Pritz (3rd from left), Jackie Libby (2nd from right) and Dave Ferguson (4th from right) join CASC researchers in field tests at Sunrise Orchard, WA.

Lily Li (on the APM), Lauren Von Dehsen (white jacket) and Matt Morrill (behind vehicle) during tests of the new APM user interface in Biglerville, PA.

Nicolas Liberum takes pictures of internal feeding worm injury for the development of computer algorithms to detect injury in orchards.

Jason Fissel checks the latest version of the electronic monitoring traps for capturing adult codling moth and oriental fruit moth in apples.

Matt Aasted instructs WSU's Karen Lewis on the use of the new APM user interface.

Dani Peters working on the AgTools.org web site