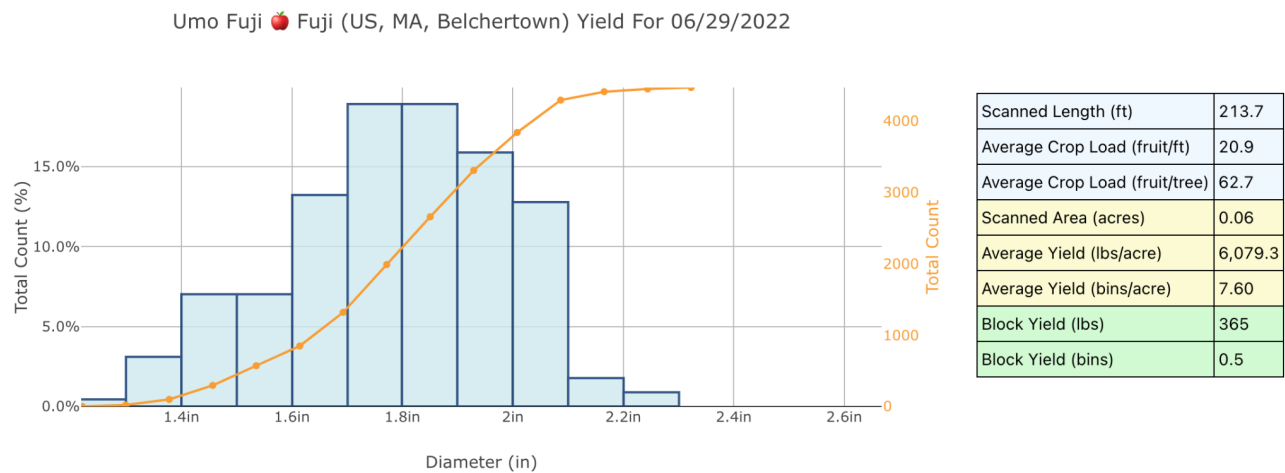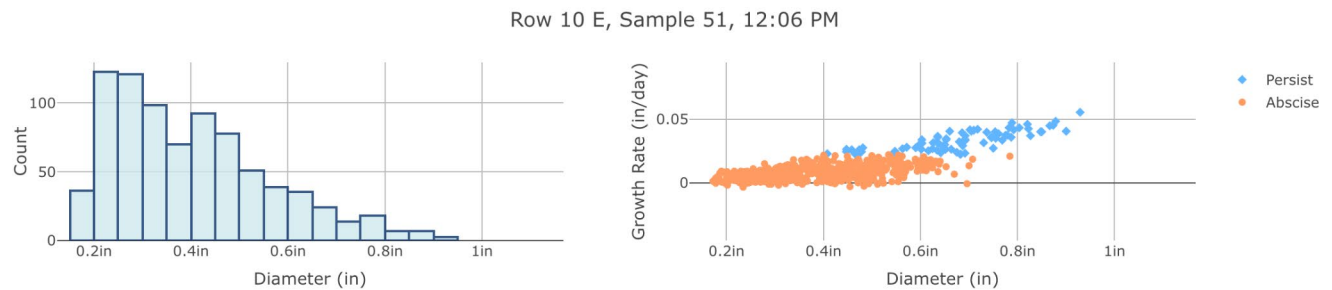# 2a. Precision Apple Cropload MANagement (PACMAN)

J. Clements

- SCRI funded, sub-contract with Cornell (pacman.extension.org)
- *Apple crop load management most important and most difficult*
- Fruitlet growth rate model (Gala, Fuji, and Honeycrisp) with apps (Malusim, FruitGrowth)
- Farm Vision Technologies (fruitlet growth, yield prediction)
- FruitScout (fruitlet growth, yield prediction)
- Pixofarm (yield prediction and fruit size)
- CropTracker (yield prediction and fruit size, bin scanning)

Row 10 E, Sample 51, 12:06 PM

Umo Fuji 🍎 Fuji (US, MA, Belchertown) Yield For 06/29/2022

Scanned Length (ft)	213.7
Average Crop Load (fruit/ft)	20.9
Average Crop Load (fruit/tree)	62.7
Scanned Area (acres)	0.06
Average Yield (lbs/acre)	6,079.3
Average Yield (bins/acre)	7.60
Block Yield (lbs)	365
Block Yield (bins)	0.5

2b Using Computer Vision to Improve Data Import for Precision Thinning Models in Apples

Paul O'Connor[1], Daniel Cooley[1], Jon Clements[1], Zachary Rubinstein[2], George Kantor[2]

[1]University of Massachusetts, Amherst [2]Carnegie Mellon University

The University of Massachusetts has partnered with Carnegie Mellon University to create a tool to help automate the data collection of fruitlet measurements for the fruitlet growth rate model.

✓ Acquire fruitlet measurements through a handheld camera or phone or with an autonomous robot

✓ Automate fruitlet measurement accurate within tenths of a millimeter

✓ Measurements can be automatically run through the thinning model pioneered by Dr. Duane Greene

✓ Provide real-time actionable model results
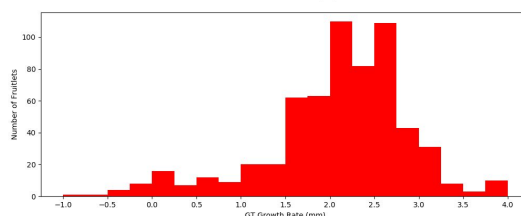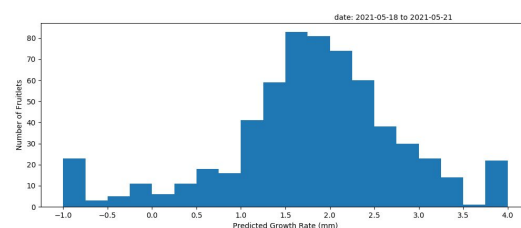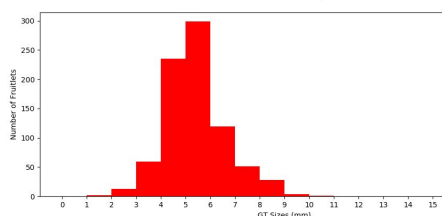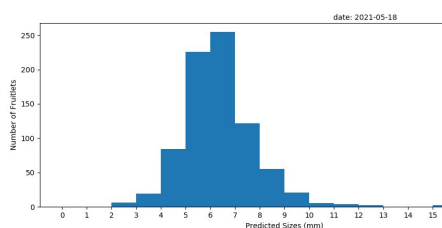
-The mean differences by dates between imaging and calipers ranged from 0.1 to 0.4 mm.

-The r^2 for each date were 0.70, 0.89, 0.76 for 29 May, 1 June and 3 June, respectively.

United States Department of Agriculture
National Institute of Food and Agriculture