Evaluation of Blueberry Fruit Quality Using Standard and Modified Catch Plates

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Background

- Blueberry growers face high labor costs and labor shortages
- New machine harvesters with soft-surface catch plates
- Difference in fruit quality between hand-picked and machine harvested fruit
- Current methods of evaluating fruit quality are dependent on the human eye when blueberries are dropped on standard and modified catching plates
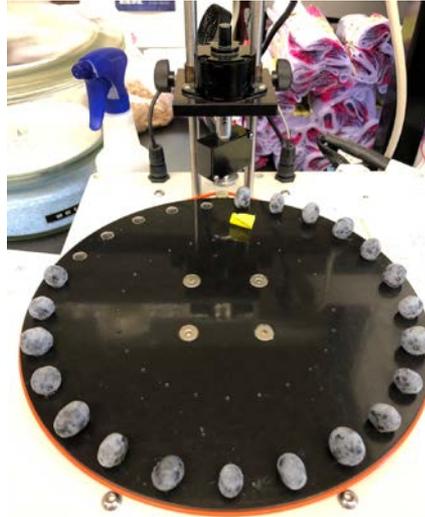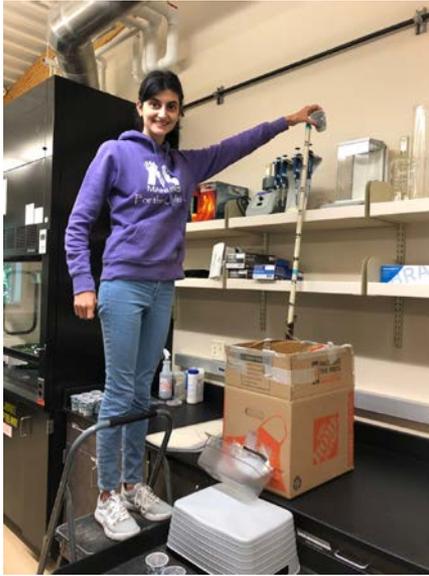
Overall Project Objective

A more objective approach to blueberry internal quality evaluation by utilizing image processing with Matlab to distinguish variations in bruising from impact with different catcher plate types for the machine harvest for 'Liberty' and 'Draper'.

Process

Picked 'Liberty' and 'Draper' blueberries and pooled to form random samples by cultivar, Conducted drop tests and firmness tests, Placed into Phenotyping box for an image, Ran Matlab for bruise detection analysis

Results

	Firmness (g/mm deflection)			
Treatment	'Liberty'		'Draper'	
Control (handpicked)	185 a^z		208 a	
Soft (modified catch plate)	158 b		206 a	
Hard (standard catch plate)	132 c		177 b	
P-value	0.0001		0.0001	

^{z}Means with the same letter are not significantly different (alpha =0.05).

Interpretation of Results

-'Liberty' berries: firmer in the control treatment, intermediate in the soft catch plate treatment, and softest for the hard catch plate treatment, softer and lose firmness when machine picked therefore a softer catch plate is more effective

-'Draper' berry: firmness was the same between the handpick control and soft catch plate treatments, while less firm when dropped on the hard catch plate, firmer and less sensitive to firmness losses when dropped on the soft catch plate when compared to the control

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FACT: Research Experience for Undergraduates on Phenomics Big Data Management

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Questions