Preliminary Studies of Mechanically Harvested Blueberries for Fresh Markets in Florida

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Blueberry Variety Selections for Mechanical Harvesting and Fresh Pack

- Funding source – USDA Specialty Crops Block Grant.
- Funding agency – Florida Department of Agriculture and Consumer Services.
- Grant Recipient – Florida Blueberry Growers' Association .
- Investigators – Paul Lyrene, Jeff Williamson, Steve Sargent, and Jim Olmstead.

Grant Components

- Breeding for mechanical harvest
- Analysis of efficiency of machine harvesting selected cultivars and advanced selections.
- Postharvest physiology of machine harvested berries.

Korvan harvester

Base pruned plants

Plant material

- 2009 – 13 cultivars and advanced selections from the UF breeding program.

- 2010 – ‘Meadowlark’, ‘Farthing’, and ‘Sweetcrisp’

‘Sweetcrisp’

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‘Meadowlark’

‘Farthing’

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Day of harvest: cooling to 50F

Fruit grading on packing line

Fruit Storage

Machine Picked

Day of Harvest

- Cooled to 50F at packinghouse
- Held overnight in lugs

Next Morning

- Run over packing line
- Sorted; packed into 125 g clamshells
- Returned to lab

Seasonal Packout of three SHB cultivars harvested by hand and by machine - 2010

‘Farthing’

Harvest Method	Marketable (%)	Immature (%)	Soft (%)
Hand	94.3	4.5	1.2
Machine	80.5	17.3	2.2
Significance	0.0039	0.0051	0.0356

‘Meadowlark’

Harvest Method	Marketable (%)	Immature (%)	Soft (%)
Hand	92.1	6.2	1.7
Machine	84.1	11.9	4.0
Significance	0.0058	0.0133	0.0005

‘Sweetcrisp’

Harvest Method	Marketable (%)	Immature (%)	Soft (%)
Hand	95.3	3.7	1.0
Machine	77.4	20.6	1.9
Significance	0.0030	0.0006	0.0682

Combined seasonal packout for ‘Sweetcrisp’, ‘Meadowlark’ and ‘Farthing’ – 2010

Harvest method	Marketable	Immature	Soft
Hand	93.9	4.8	1.3
Machine	80.7	16.6	2.7
Significance	0.0001	0.0001	0.0008

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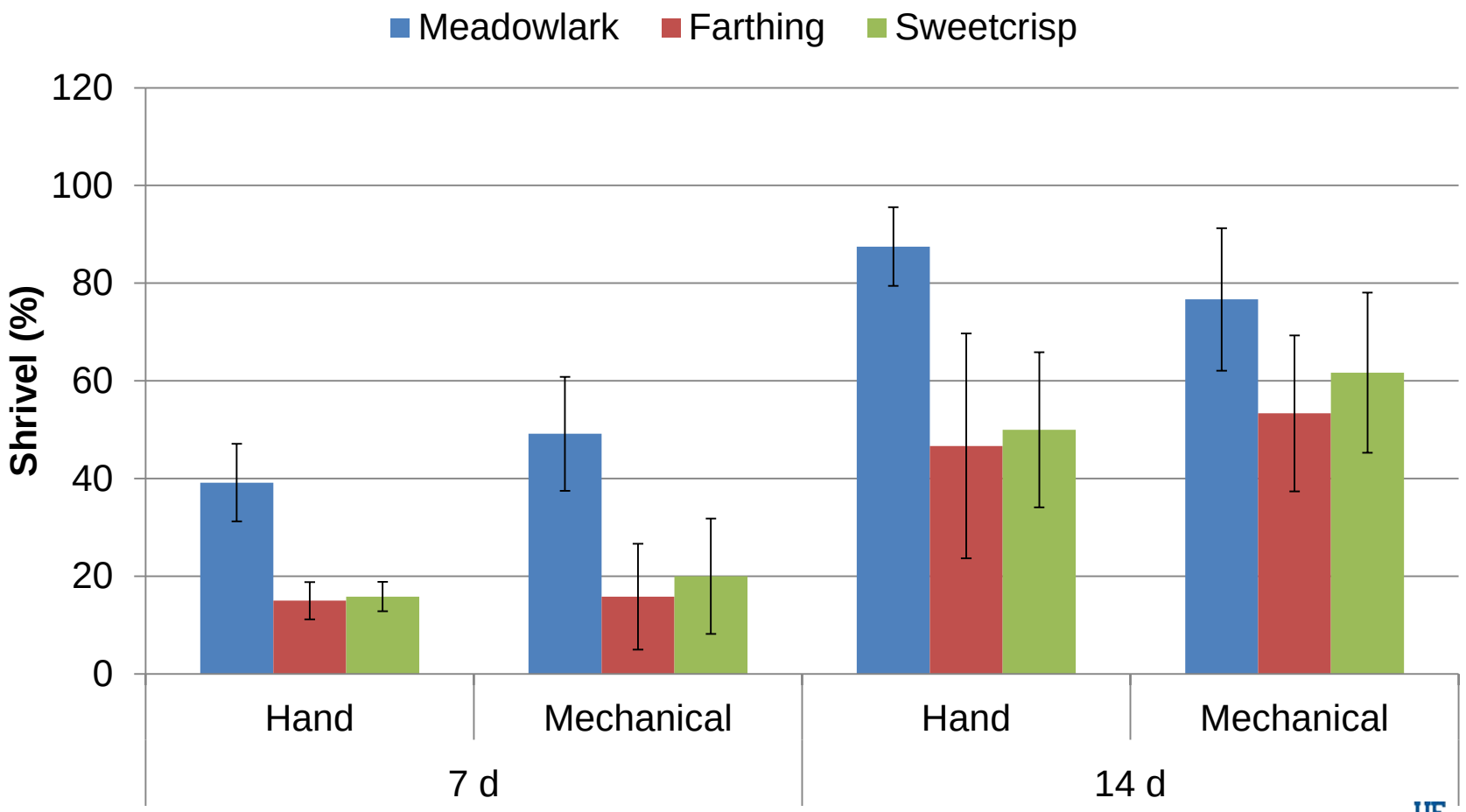
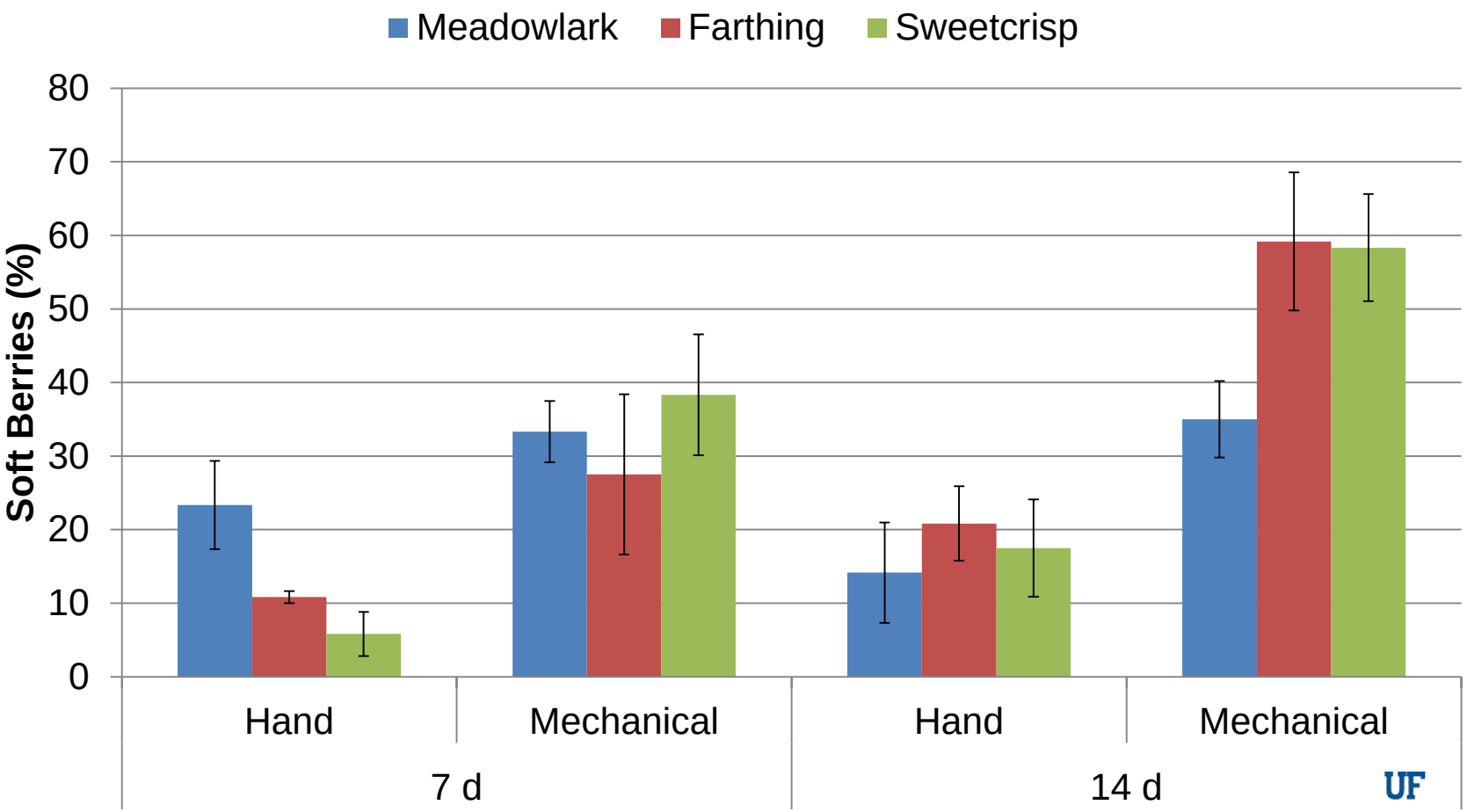
Postharvest Quality - 2010

- Cultivars: ‘Farthing’, ‘Meadowlark’ and ‘Sweetcrisp’
- Picked, packed into 125 g clamshells
- Stored at 1 ^{o}C
- Evaluated at 0, 7, 14 days

Percent shrivel - 2010



Percent soft berries - 2010



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Fruit ripeness and bruising

Drop tests for bruising

- Fruit ('Sweetcrisp', 'Star', 'Emerald') tagged at red/purple stage; harvested at early and late blue stages.
- Stored overnight at 5°C
- Brought to room temperature, dropped once from 61 cm (n=10).
- Stored at 5C for 3 days then evaluated for bruising.

Impact bruising

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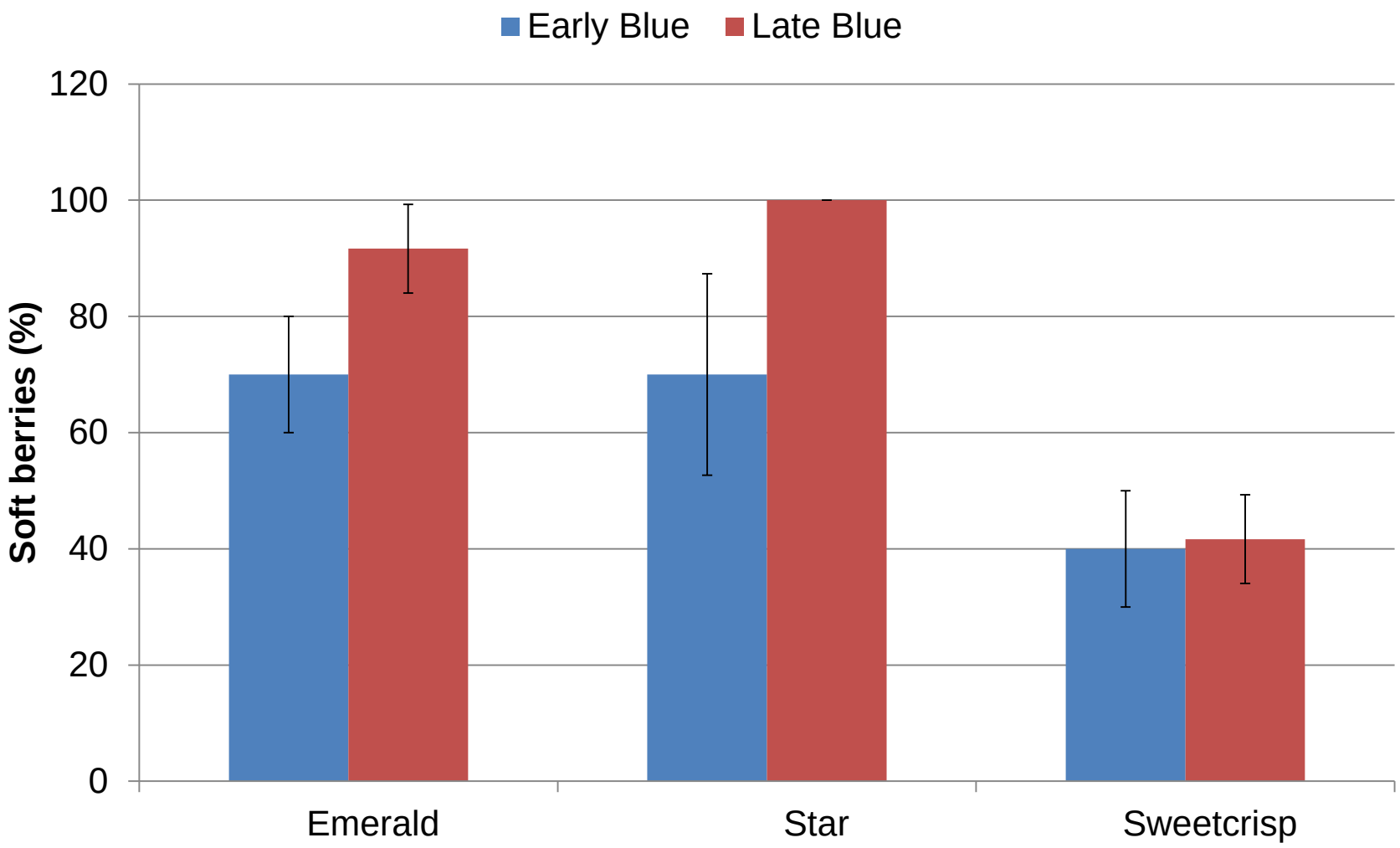
Spring 2012 – Drop Tests



Summary

- Significant packout losses occurred from the harvest of immature fruit.
- Marketable packout was about 81% for machine and about 94 % for hand harvested fruit.
- Apart from packout losses, significant losses occurred from blue and immature fruit dropped on the ground by the harvester.
- Mechanically harvesting resulted in a high incidence of soft berries, especially during storage.
- For the drop tests, the firm-fruited cultivar ‘Sweetcrisp’ had and fewer soft blueberries than ‘Emerald’ or ‘Star’.

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Thank you!
Questions?
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