

Mechanical Harvest of Fresh Blueberry

Why?

Can we make money at it?

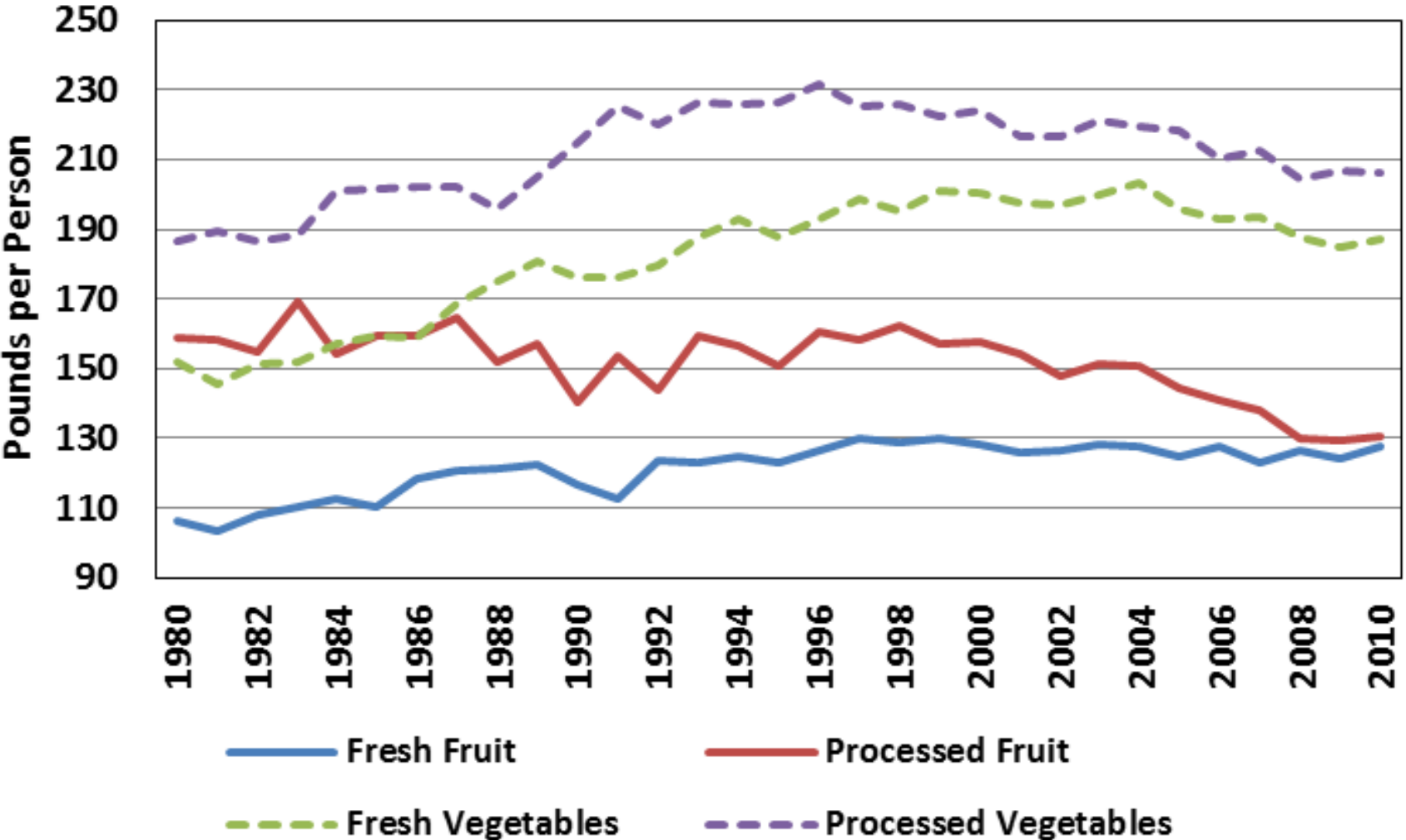
Dr. Jim Julian

Oregon State University

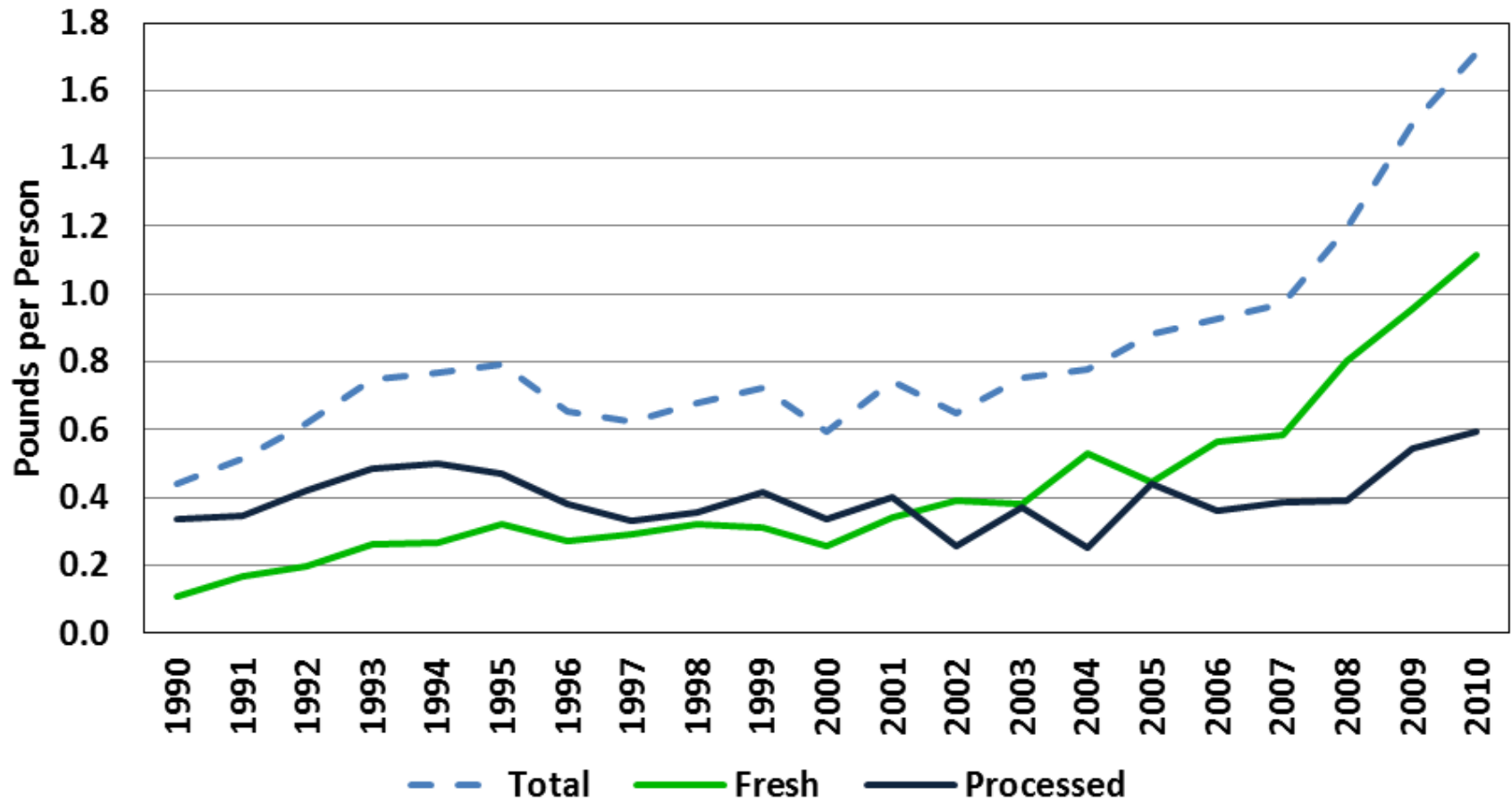
Overview

- Market trends in the produce market
 - Blueberries, Sweet Cherries, Grapes
- The US Blueberry Market
 - Fresh, Frozen, Imports and Domestic production
- Drivers for Mechanical Harvesting
 - Recent research
 - Preliminary economic assessments

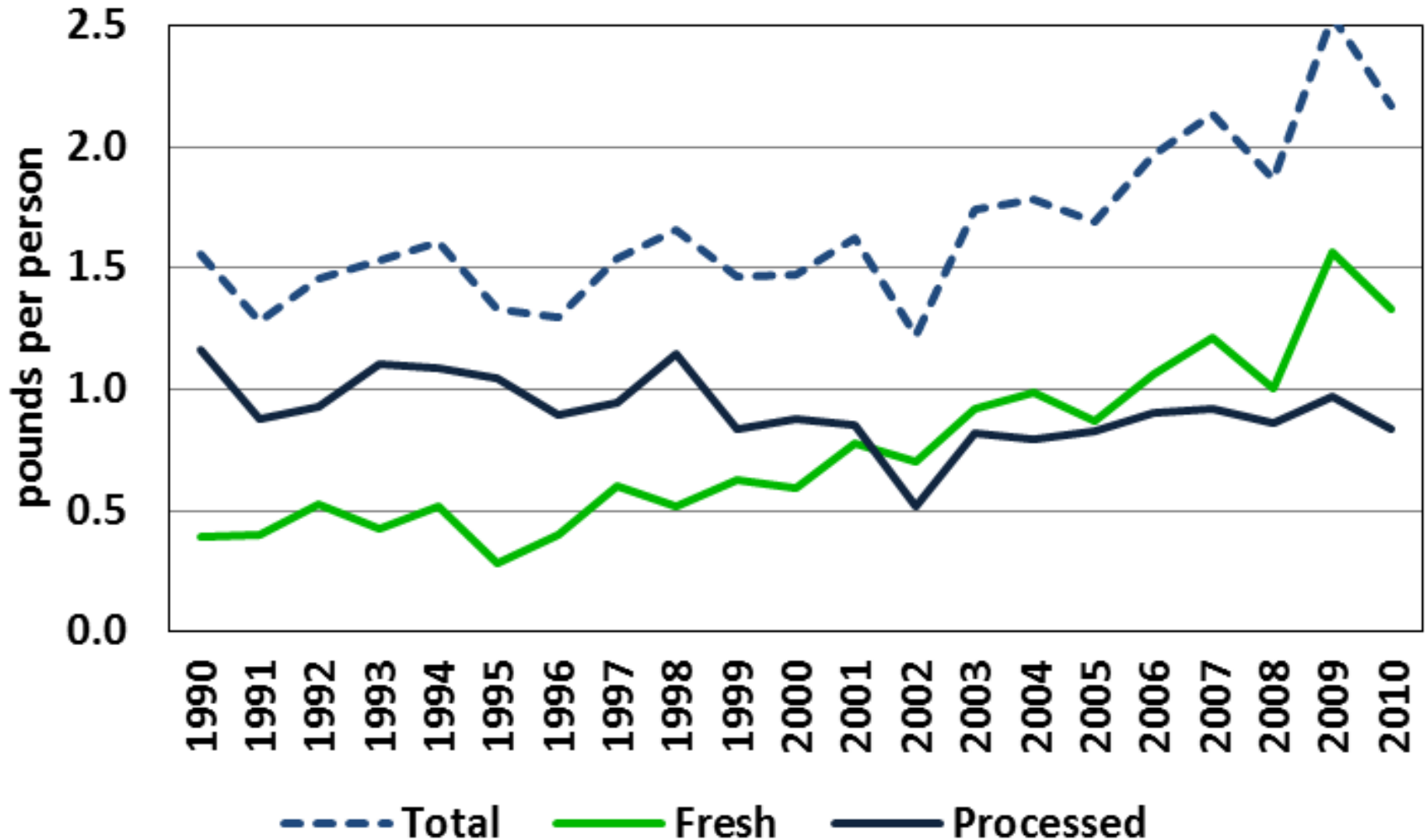
US Per Capita Produce Consumption



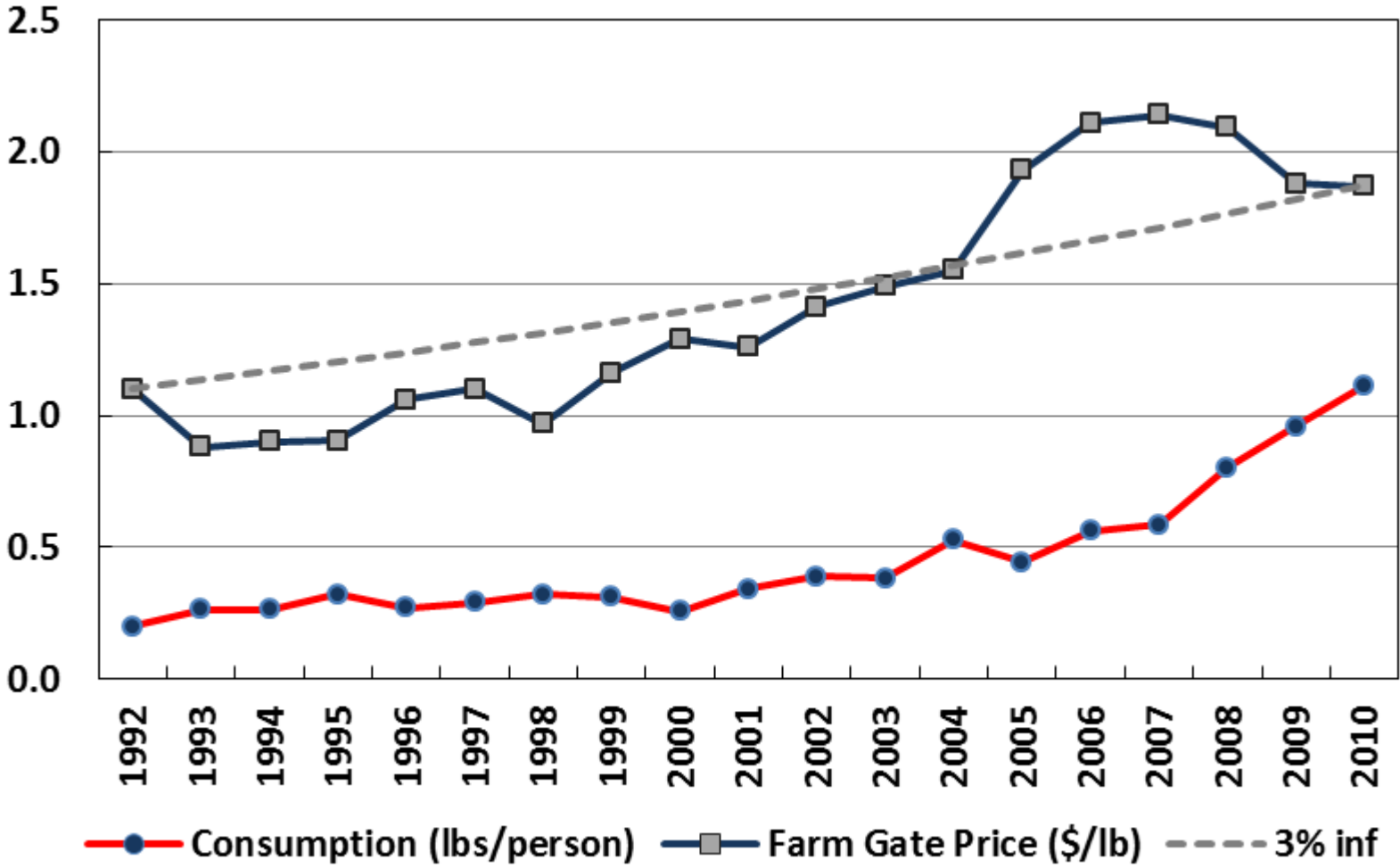
US Blueberry Per Capita Consumption



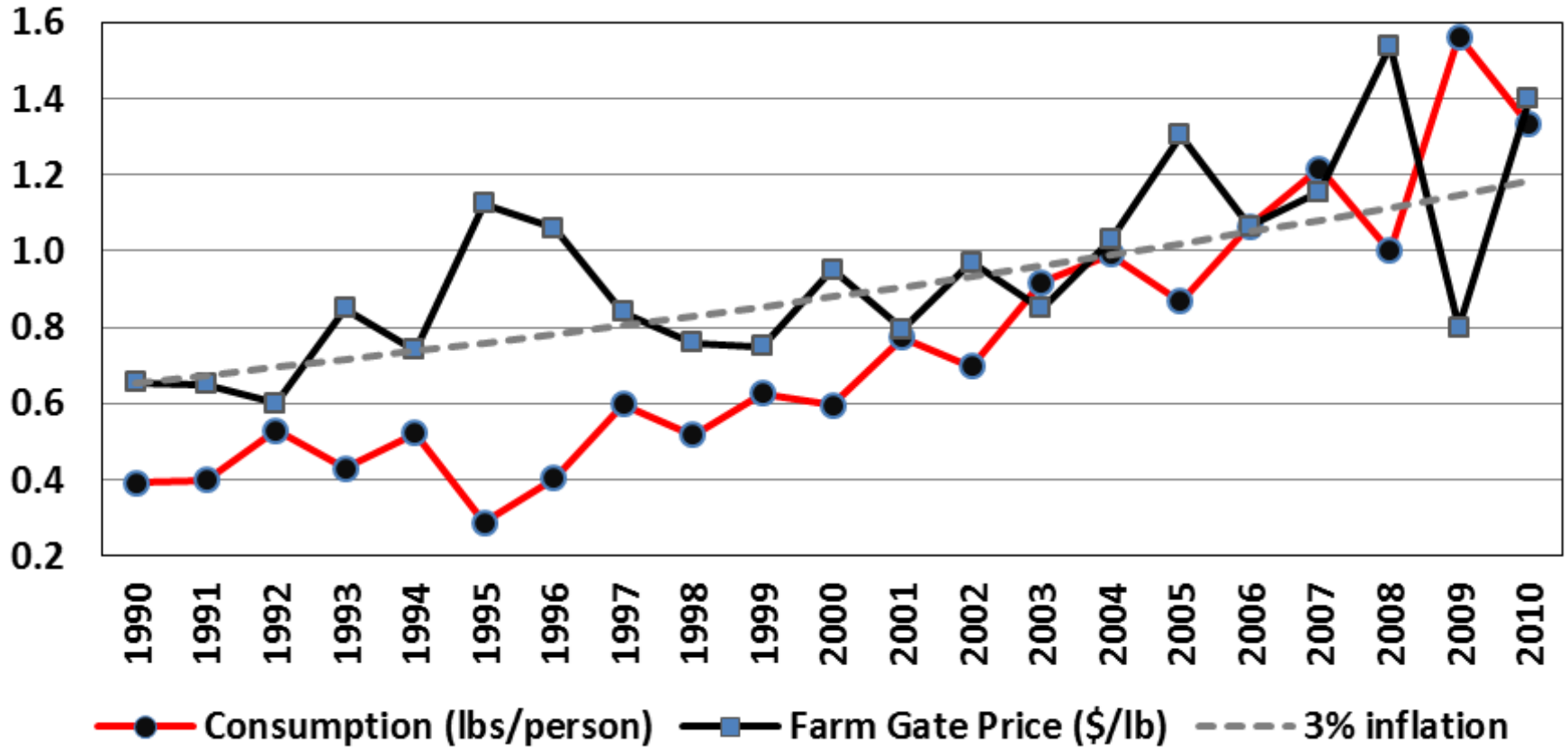
US Cherry Per Capita Consumption



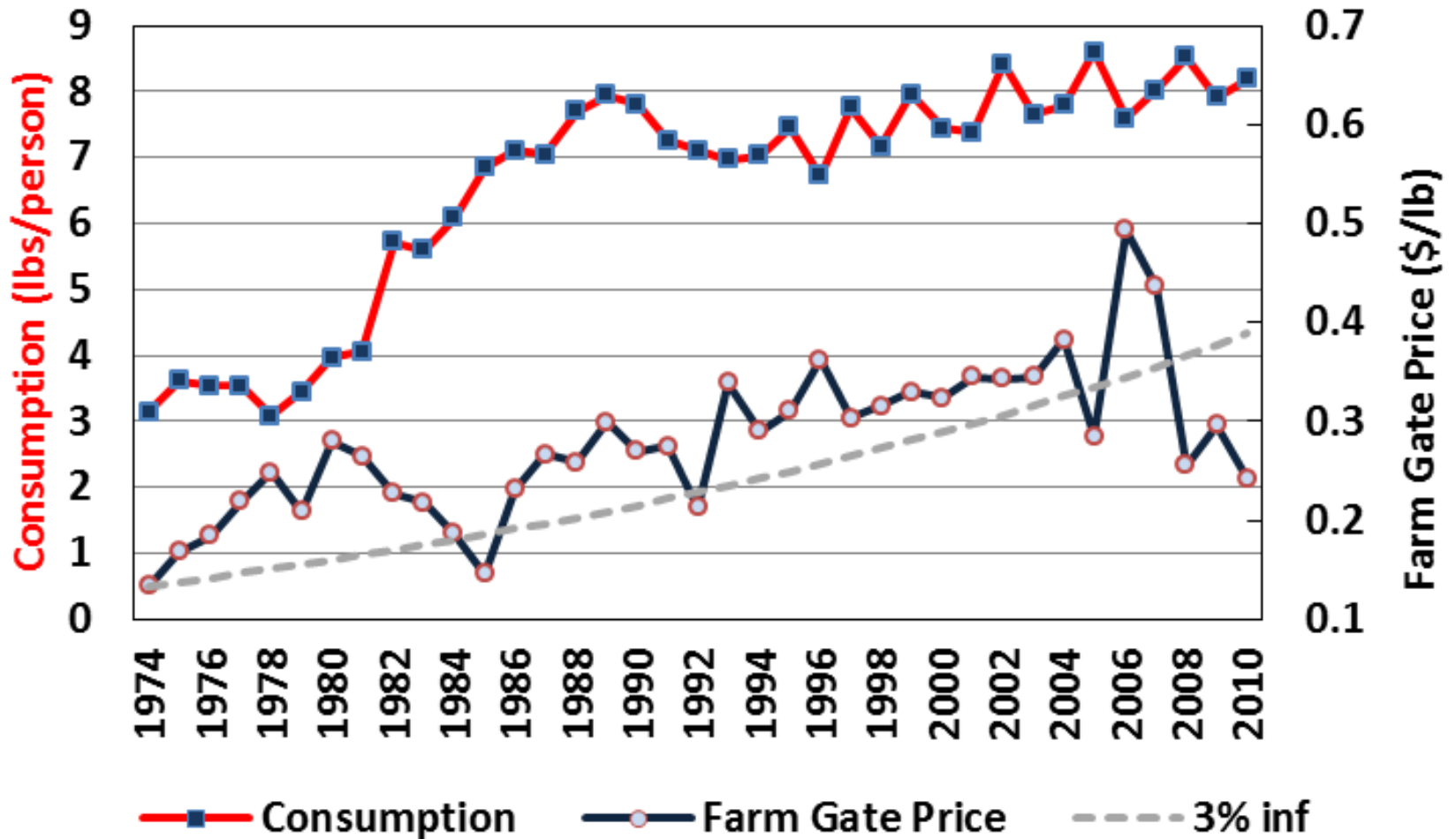
Fresh Blueberries Consumption & Farm Gate Price



Fresh Cherries Consumption & Farm Gate Price



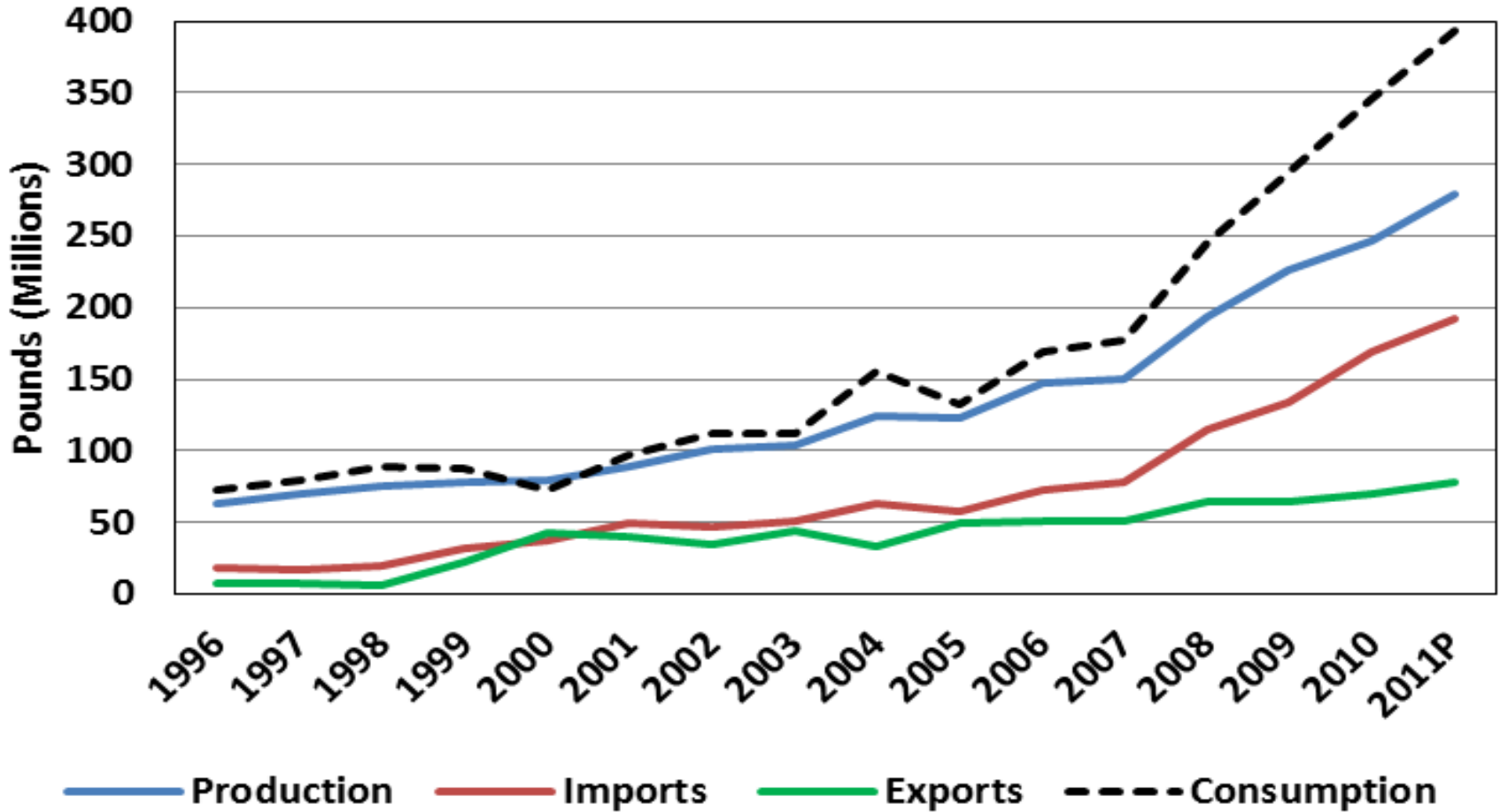
Fresh Grape Consumption & Farm Gate Price



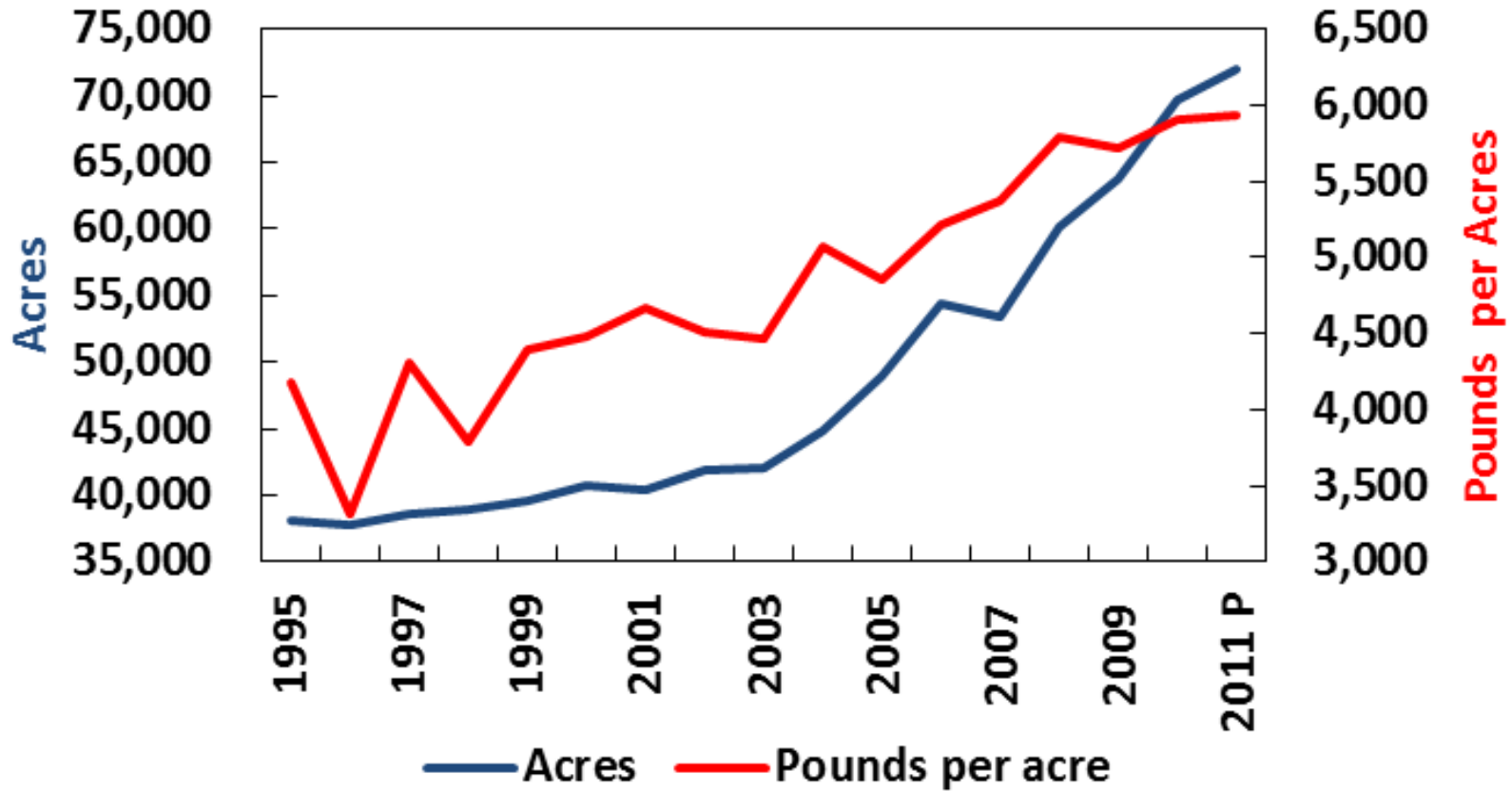
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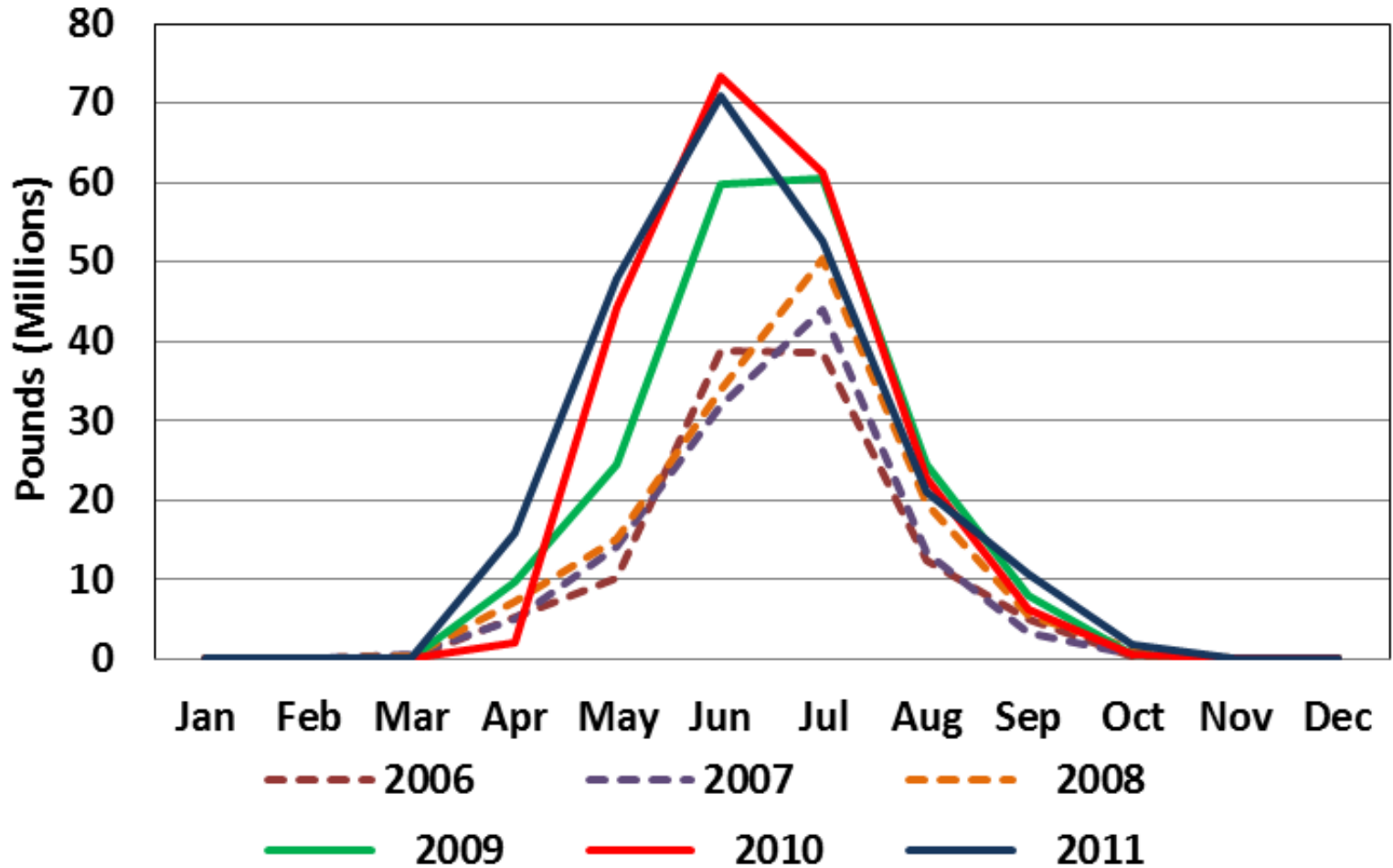
US Fresh Blueberry Market



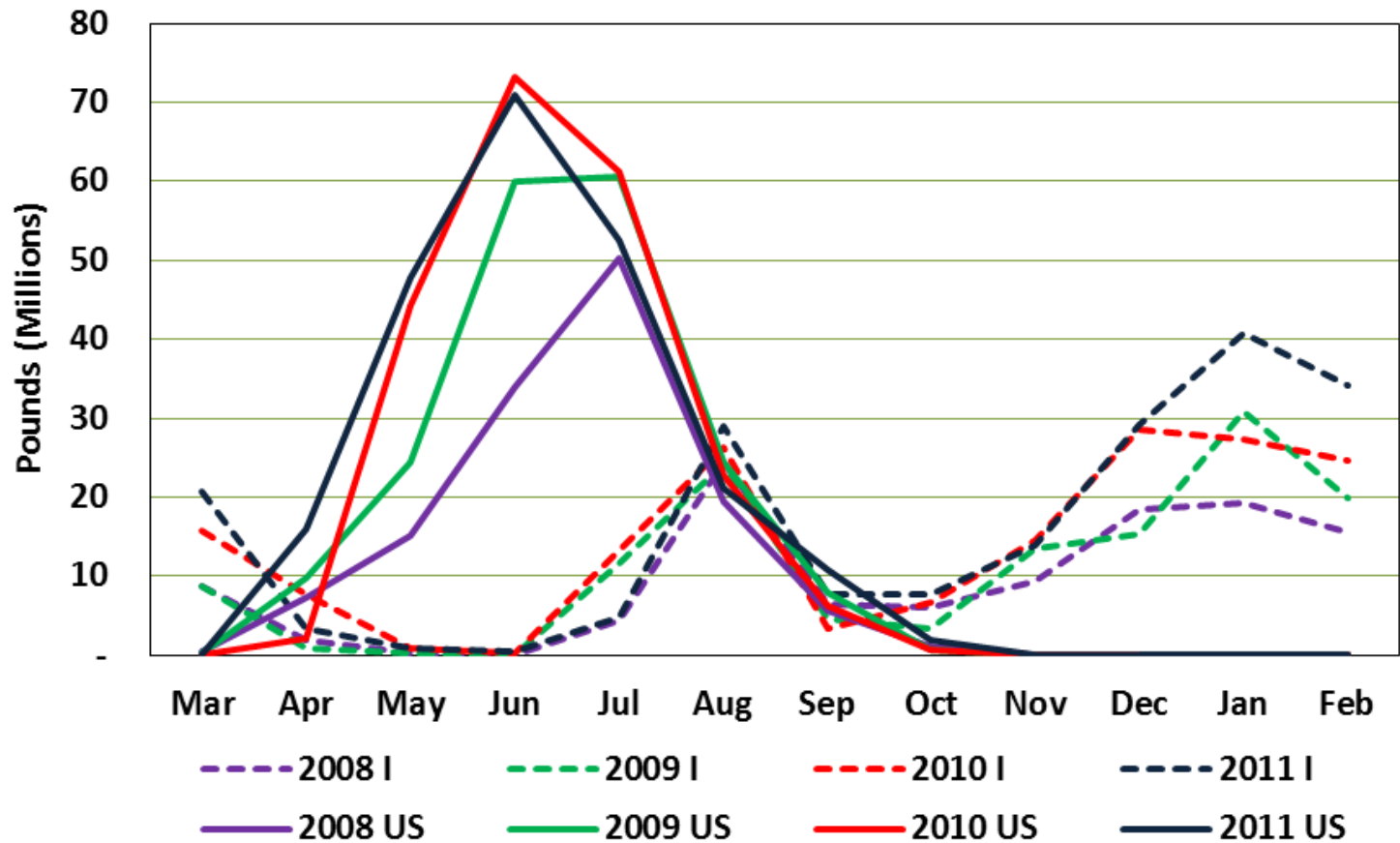
US Blueberry Cultivated Acres and Yield



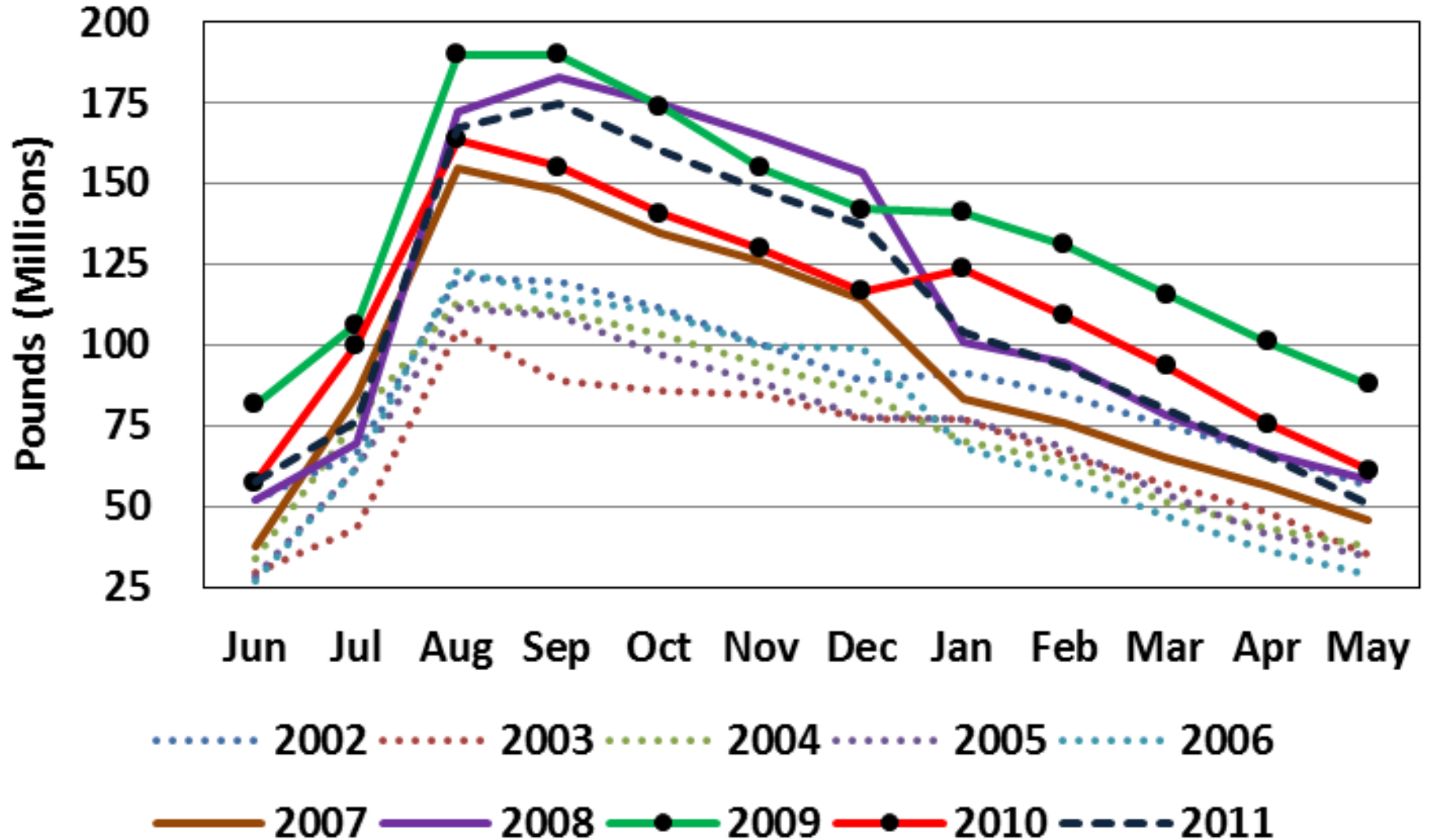
US Blueberry Shipments



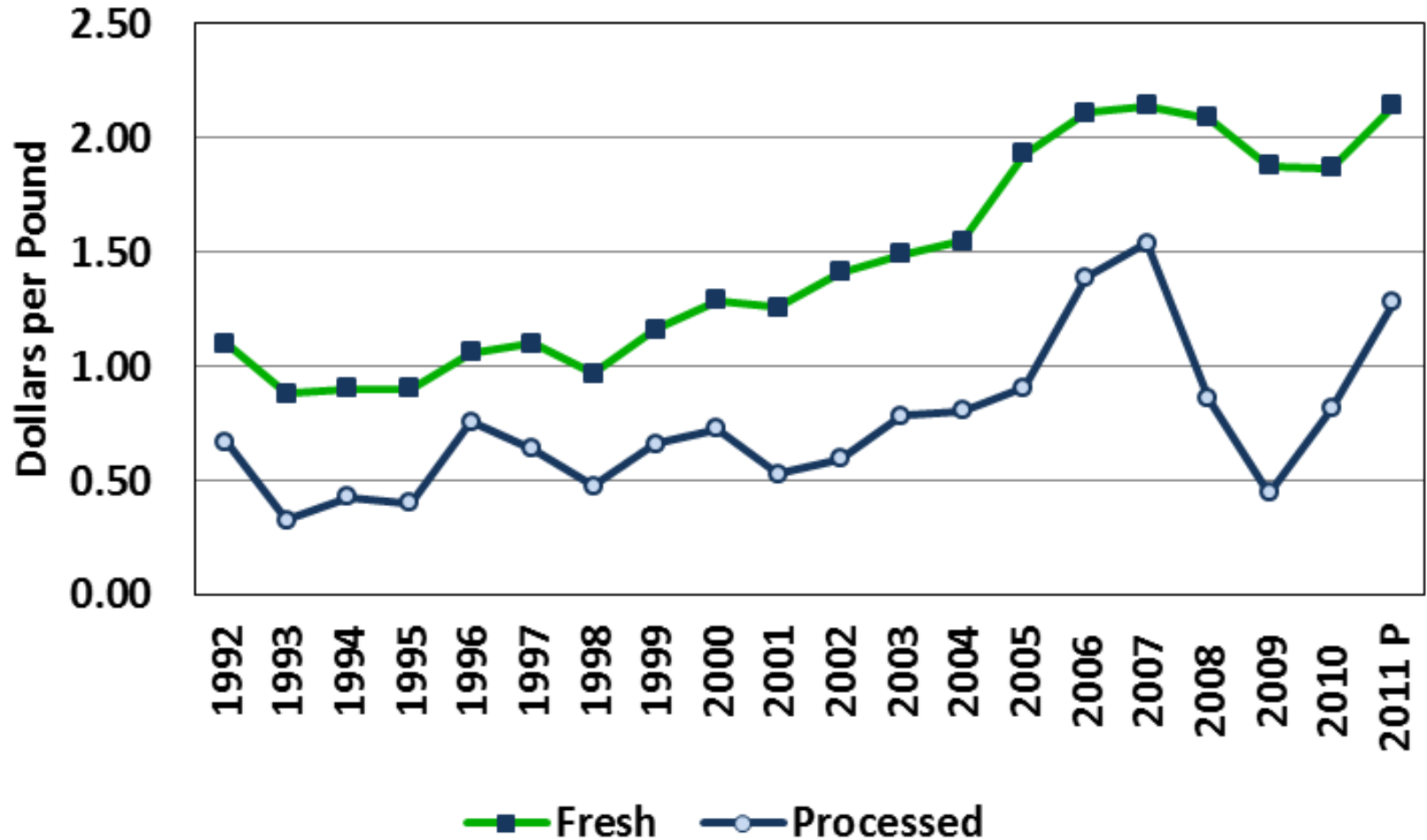
Monthly US Fresh Blueberry Production and Imports



US Frozen Blueberry Stocks



US Farm Gate Blueberry Prices



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Fresh blueberry hand harvest costs

	CA	FL	AL	OR ¹
Hand harvest Cost (\$/lb)	\$1.33	\$0.72	\$0.72	\$0.55
Yield (lb/acre) ²	8,000	5,500	1,200	8,500
Utilized fresh blueberries (Mil. lb) ²	33.0	21.4	0.50	36.7
Total hand harvest costs (Mil)	\$43.89	\$15.41	\$0.36	\$20.19
Farm gate price (\$/lb) ²	\$2.50	\$3.23	\$1.70	\$1.99
Total fresh farm gate value(Mil) ²	\$82.65	\$69.12	\$0.85	\$43.78
Harvest costs as % of farm gate value	53.1%	22.3%	42.4%	46.1%

1 Yield includes blueberries for processing.

2 Farm gate values from 2011 USDA NASS NonCitrus Fruit and Nuts Summary

Fresh blueberry hand harvest Laborer

	CA	FL	AL	OR
Estimated harvest hours per acre ²	667	458	100	567
Estimated laborer harvest hours (Mil) ²	2.75	1.78	0.04	2.45
Estimated laborer count (total people) ³	9,167	5,944	139	8,156
Harvest laborers per acre	2.13	1.56	0.35	--- ¹

1 Can not calculate due to combined fresh and processing blueberries.

2 Labor count assumes 5 week harvest season at 60 hour/person/week

3 Harvest rate of CA, AL, FL 12lb/hr; OR 15lb/hr

Comparison of hand and mechanical harvest of new “crispy” flesh Florida cultivars

**Blueberry Mechanical Harvesting Workshop
25 April 2012**

Kim Morgan, Harald Scherm, Jim Olmstead, Jeff Williamson, Gerard Krewer, Fumi Takeda, Dan MacLean, Rob Shewfelt, Charlie Li, Anish Malladi & Paul Lyrene

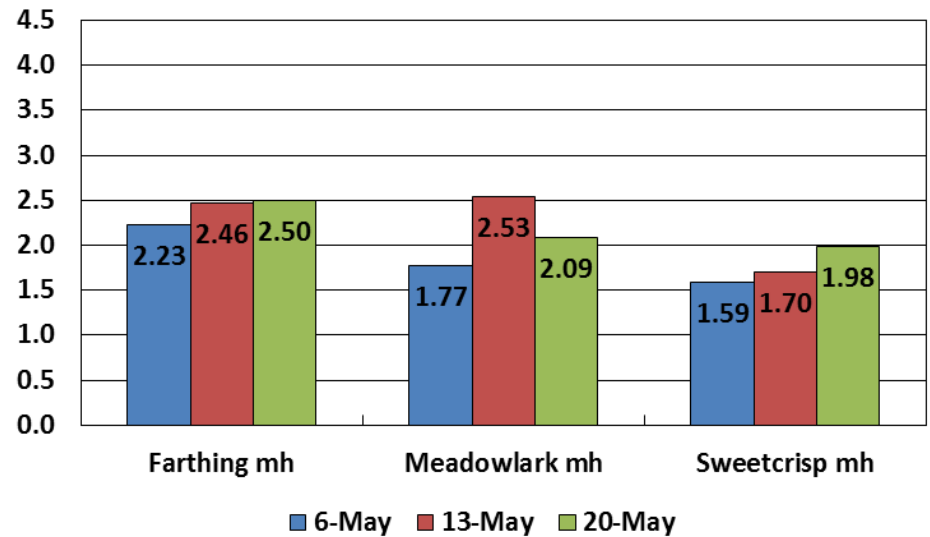
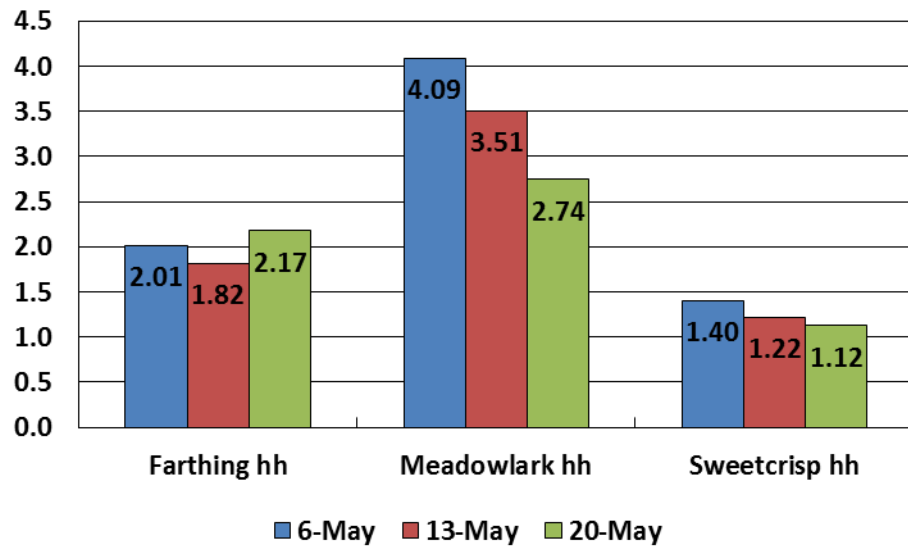


This project was supported by the Specialty Crop Research Initiative Competitive Grant # 2008-51180-19579 from the USDA National Institute of Food and Agriculture

2010 FIELD TRIAL - ASSUMPTIONS

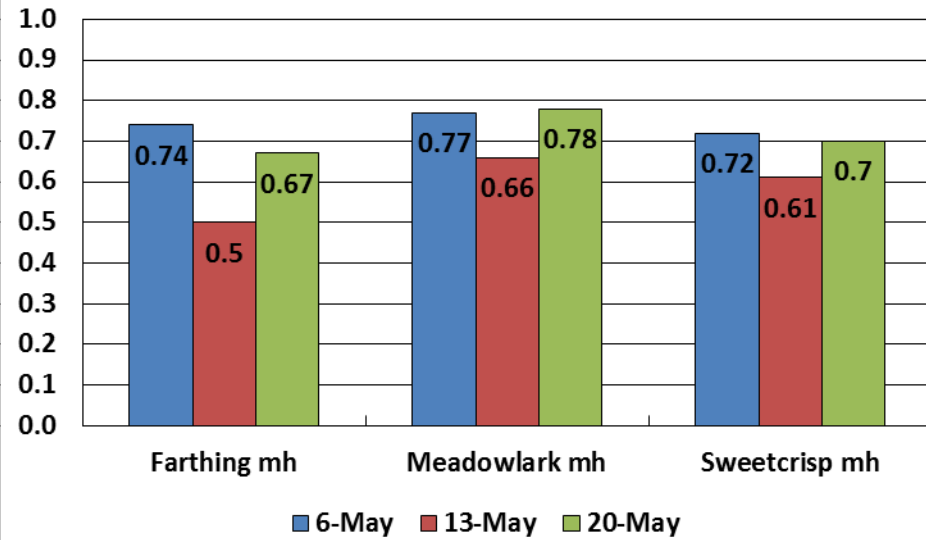
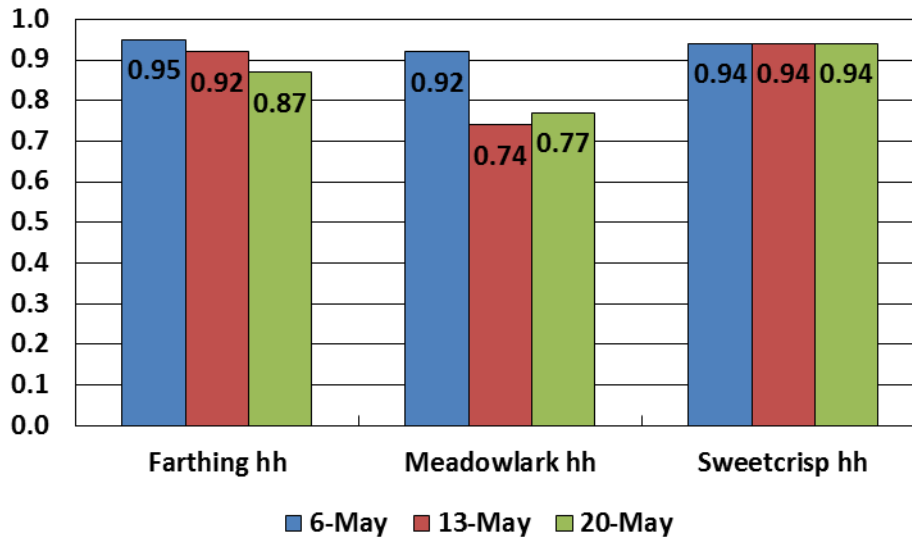
- Actual field harvest weights under commercial conditions for three crispy cultivars
- Hand-picked all trial bushes first time, then hand versus machine for 2, 3 and 4th trials
- Harvest costs \$0.72/lb (**\$1.58/kg**) hand-pick or \$0.18/lb (**\$0.40/kg**) custom mechanical harvest
- Net return (\$/bush) = (yield kg/bush

Blueberry yield lbs./plant by variety



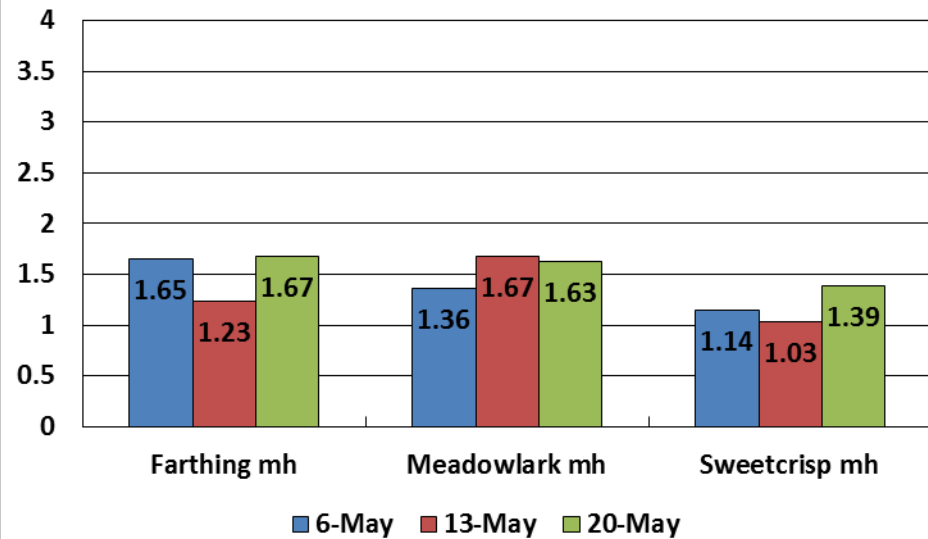
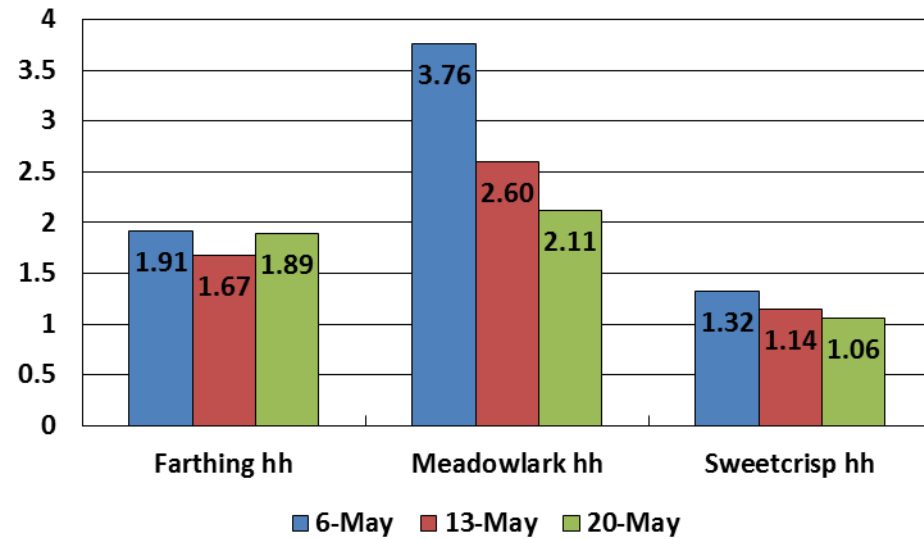
hh – Hand Harvest mh – Machine Harvest

Pack out percent by variety



hh – Hand Harvest mh – Machine Harvest

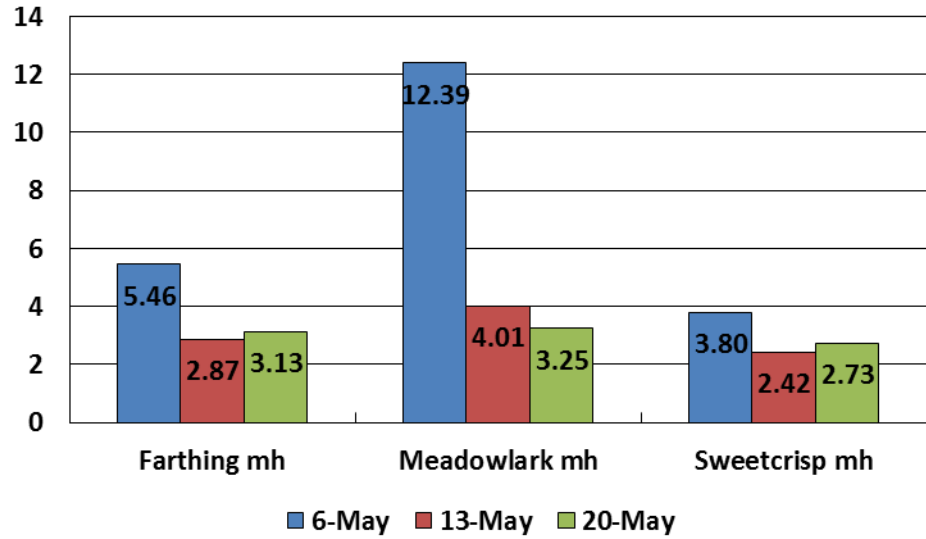
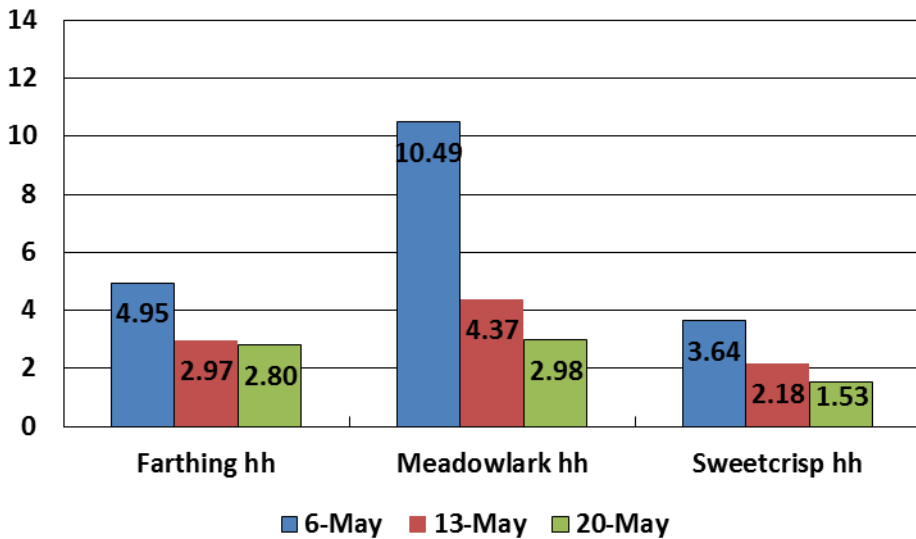
Packed lbs. per plant by variety



hh – Hand Harvest mh – Machine Harvest

Net return(\$/bush)

by variety, by harvest style, by harvest trial, flat of 12 - 1 pint cups with lids



hh – Hand Harvest mh – Machine Harvest

Economic model assumption of impacts of **grafted** blueberry planting with a 15 year life

	Standard	Grafted
<u>Per Plant Costs</u>	\$3.50	\$5.00
1320 Plant/acre	\$4,620	\$6,600
<u>Mulch - 50% reduction</u>		
Planting	\$1,000	\$500
Replenishment	\$100	\$50
<u>Acidification - 50% reduction</u>		
Year 1	\$1,300	\$650
After year 1	\$200	\$100
Water	\$1,200	???

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Economically Equivalent Production systems

Economic model assumption of impacts of grafted blueberry planting with a 15 year life

At Full Production

	CA Hand Harvest	Machine Harvest
Yield (lb./acre)	13,000	13,000
Harvest cost (\$/lb.)	\$1.30	\$0.27
<i>Harvest cost total</i>	<i>\$16,900</i>	<i>\$3,510</i>
Pack out	95%	75%
Pack out (lb./acre)	12,350	9,750
Harvest & packing cost (\$/lb.)*	\$2.37	\$1.21
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Returns per acre**	\$30,875	\$24,375
Production costs per acre	\$36,400	\$23,900
Net returns per acre	(\$5,525)	\$475

* Includes picking, sorting, cooling, packing & shipping

** Fresh blueberry farm gate price \$2.50 per lb.

Conclusions

- Overall produce market flat to declining
 - Growth from displacement
 - Increasing consumption of blueberries
- Increasing blueberry production capacity
 - More acres at higher yields
 - Downward pressure on prices
- Need for improved production efficiencies.
 - If you are not moving forward you are moving backward
 - Mechanical harvest of mentioned varieties has shown potential
 - Grafted blueberry has even more potential for grower profits