

Cost of handling harvesting debris at a citrus processing plant

2010 Citrus Mechanical Harvesting Field Day and Workshop

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SWFREC - Immokalee, FL



Outline of cost study

Based on 6 plant interviews, Mar-Jun 2009:

- 1) Cost of handling excess debris
- 2) Cost of equipment breakdowns
 - Repairs - material and labor
 - Cost of downtime
- 3) Juice yield losses

Survey Response:



- 10 juice processing plants
 - 75% of total boxes received
- 52K lbs per 100K boxes (<0.6%)
 - 85% of debris wood

During 2008-09:

- 1/10 plants rejected a load b/c wood
- 6/10 plants rejected loads b/c non-wood
- 3/10 plants did not reject any load
- 6/10 plants received MH loads (~7% boxes)

Repair & Downtime Costs (2006-09)

- Hauling debris \$\$.001 /bx
- Extra graders \$.012 /bx
- Fruit Rec. Equip \$.004 /bx
- Fruit Rec. Downtime \$.016 /bx
- Juice Ext. Equip \$.001 /bx
- Juice Ext. Downtime \$.049 /bx
- **Sub total** **\$.083 /bx**

Downtime

Range of Hourly Costs

(2006-09)

- **Fruit Rec Equip (\$/hr)** **\$1,200 (\$200 - \$3,600)**
- **Juice Extr Equip (\$/hr)** **\$4,700 (\$500 - \$13,600)**
 - *(inc just plant-owned equipment)*
- **Leased Juice Extraction equip:**
 - cost of repair ?
 - juice yield losses ?

Juice Yield Losses (2006-09)

Juice Yield Losses	0.2% per bx
Avg production	6.67 p.s./bx
Juice Yield Losses	0.0127 p.s/bx
Price (2008-09 del-in)	\$1.22 /p.s.
Value of juice yield losses	\$0.015 / bx

Estimate of Total Cost (?)

- Value of juice yield losses \$0.015/bx
- Repair & downtime Costs \$0.083/bx
- Total Costs \$0.098/bx
- Interpretation:
 - If ALL debris is removed from the system, costs of processing juice would decline by ~10-cents/bx.

Concluding Comments

- Excellent response from juice processing plants.
- Significant variability w.r.t:
 - total debris reported
 - costs w.r.t. specific equipment repairs
 - cost of extra graders appears to be significant
 - cost (hourly) of downtime widely varies
- Accurately account for juice yield losses?

Implications

- Reducing debris costs, enhances economic position of Florida citrus juice industry.
- What's the most "efficient" way to reduce costs?
- Oxbo: 2,000 acres * 450 bx/ac = 900,000 bx
 - 900k * \$.098/bx =
 - \$88,200/yr cost of debris @ plants
- Opportunity for MH systems.

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