

Harvesting Transport, Processing & Storage

**Jim Thompson, Uriel Rosa, John Miles
Biological & Ag. Engineering Department
Louise Ferguson
Plant Sciences Department
UC Davis**

ADVANCES IN
PISTACHIO
PRODUCTION

VISALIA CONVENTION CENTER

NOVEMBER 13 - 15, **2012**

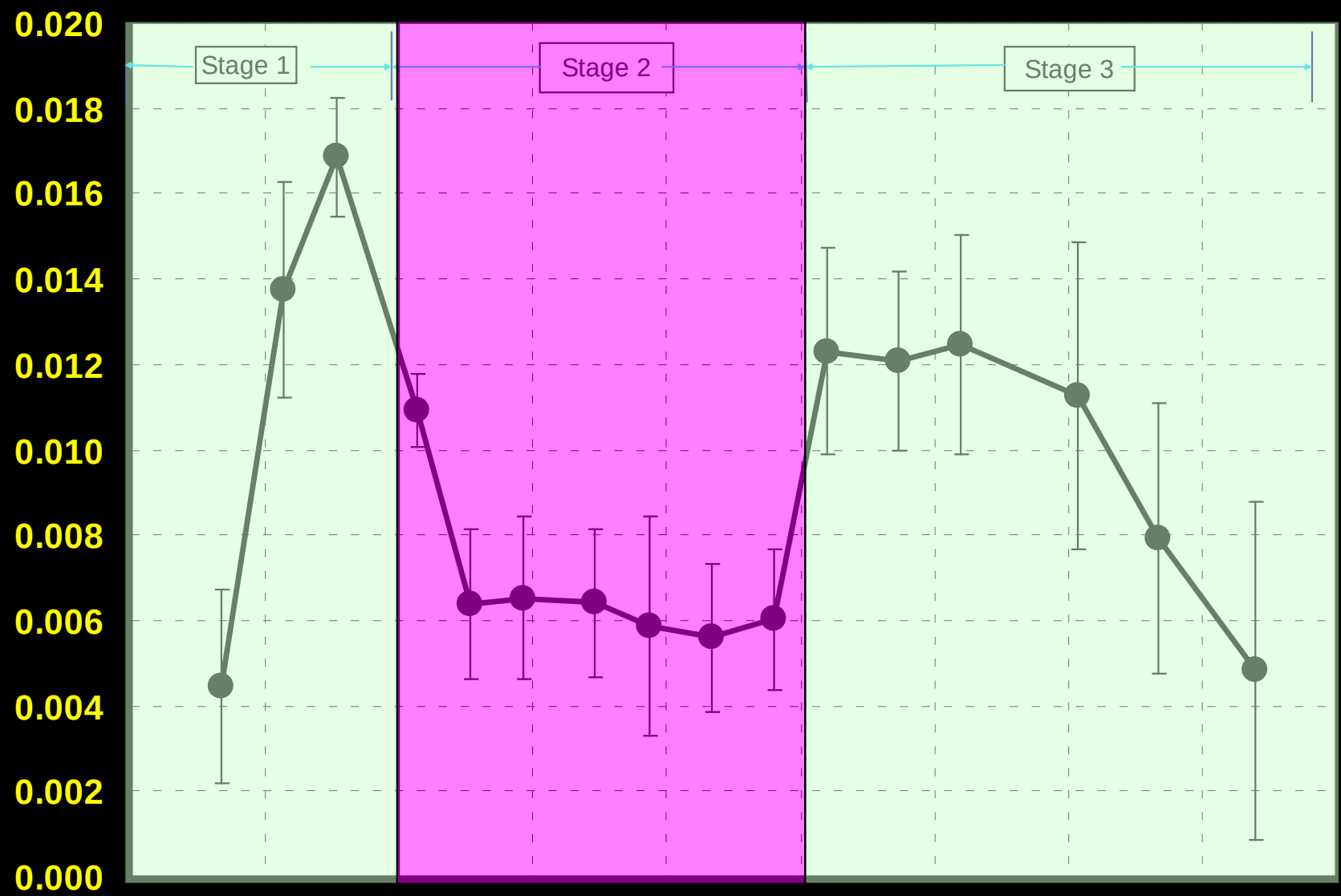


Harvest Preparation

Prevent water deficits July - harvest



Fruit Dry Weight Gain Rate (g/d)



Apr 16 May 1 May 16 May 31 Jun 15 Jun 30 Jul 15 Jul 30 Aug 14 Aug 29

Harvest Preparation

- Prevent NOW infestation of early splits



Photo: J. Siegel

Harvest Preparation

Harvesting and Delivery Contracts



Proper Nut Maturity

- Easy to squeeze nut out of hull
- Nuts easily removed with light shaking



Harvesting Young Trees (< 6 years)

- Spread tarps 5' beyond canopy.
- Knock trunk w/ mallet or pole near clusters.
- Remove large trash and dump tarps into bins.
- Bins hold 1000 lbs.









PUREWAL
CUSTOM
HARVESTING

Harvesting Mature Trees

- Rootstock + cultivar combination

Golden Hills and Lost Hills > diameter Kerman on PG1 and UCB1



Harvesting Mature Trees

- Rootstock + cultivar combination
- Harvester efficiency as a function:
 - tree age
 - trunk circumference
 - canopy dimensions







Final Harvester % Efficiency

dry weight harvested split in-shell
(harvested) + (unharvested)



2009 Preliminary Trials

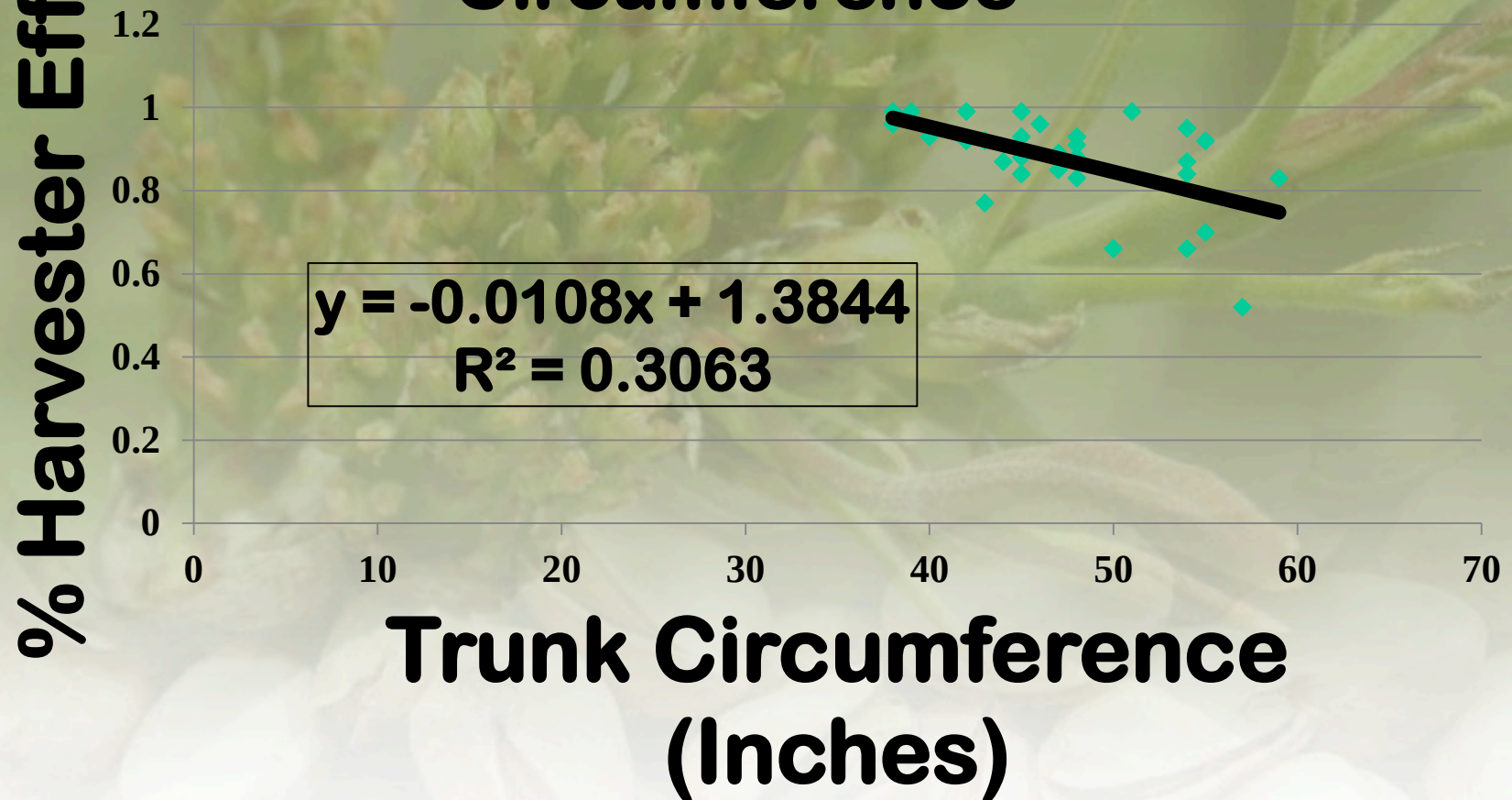
- **Effect of tree size on shaker efficiency:**
 - **Efficiency decreased with increasing girth**
 - **High percentage edible nuts unharvested**
 - **Especially in years with cool springs: second shake**

Harvester Comparison: 2010

Harvester	% Efficiency (dry in-shell splits)	Average Trunk Circumference (cm)
I	86 b	121.4
II	79 b	118.9
III	82 b	124.0
IV	84 b	126.0
V - experimental	96 a	111.8
VI - experimental	96 a	120.4



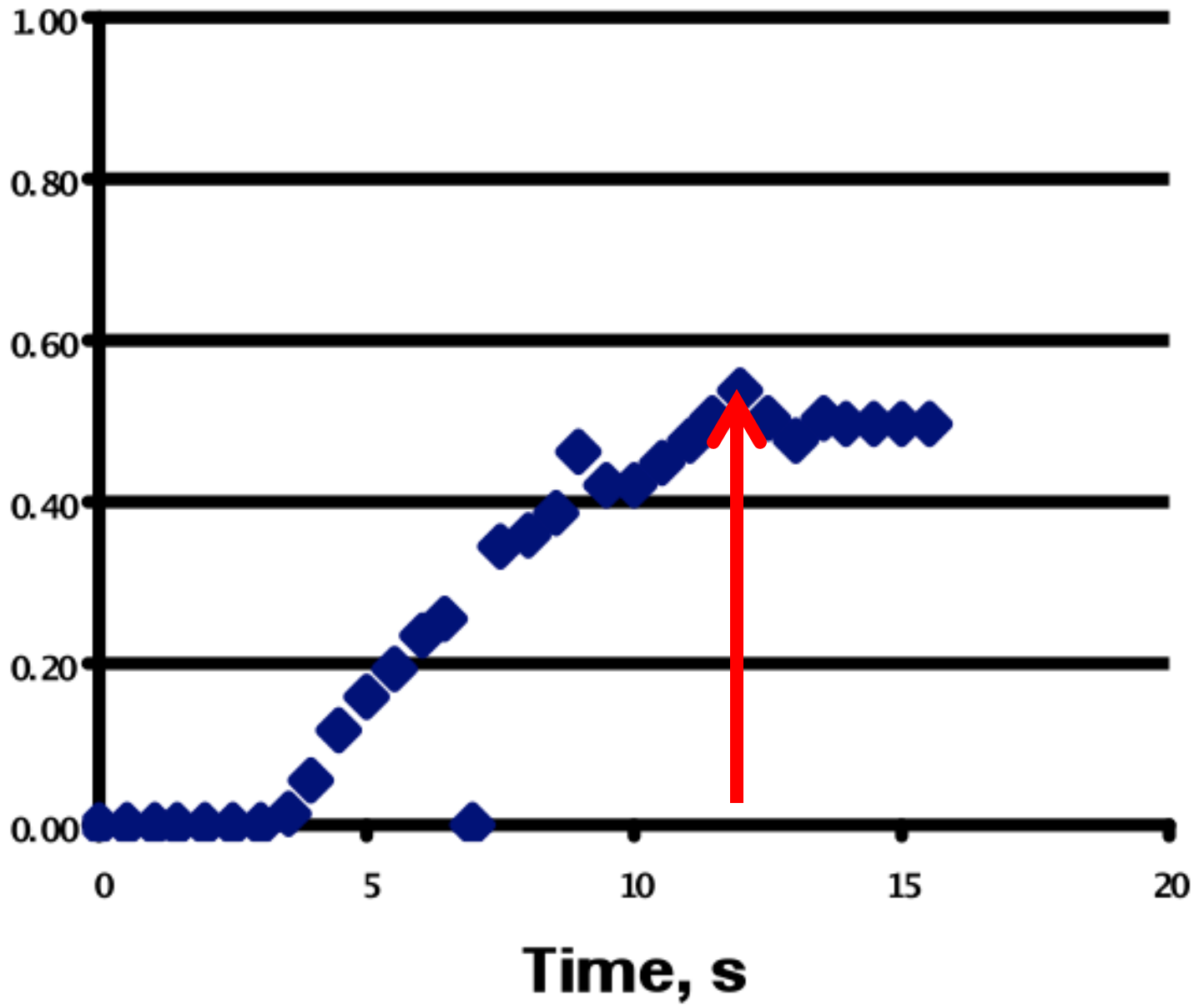
Harvester Efficiency as a Function of Trunk Circumference





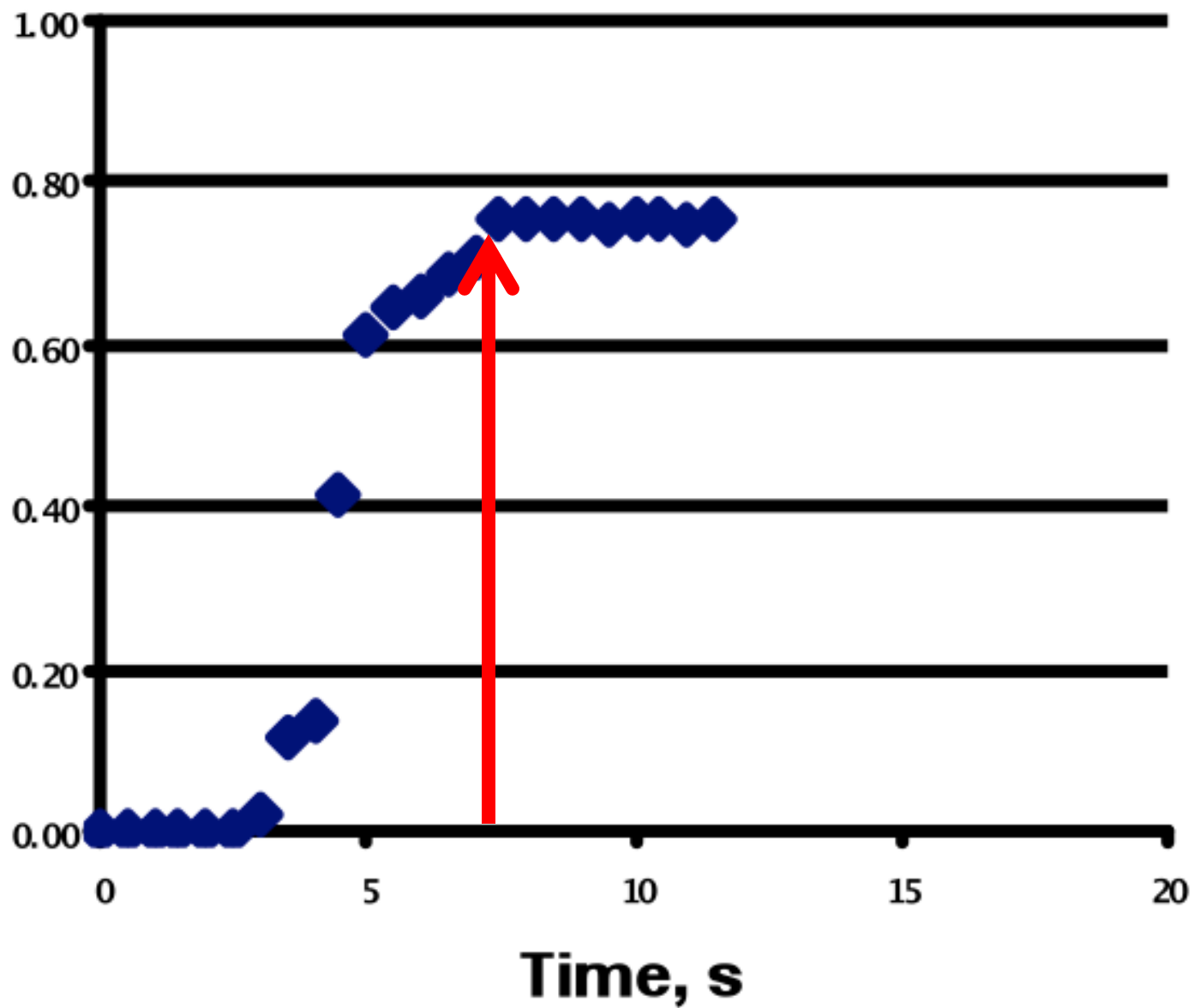
Tree#16

**Area of harvested fruit /
area of white reference
frame, %**



Tree#9

**Area of harvested fruit /
area of white reference
frame, %**



2010 Trial Conclusions

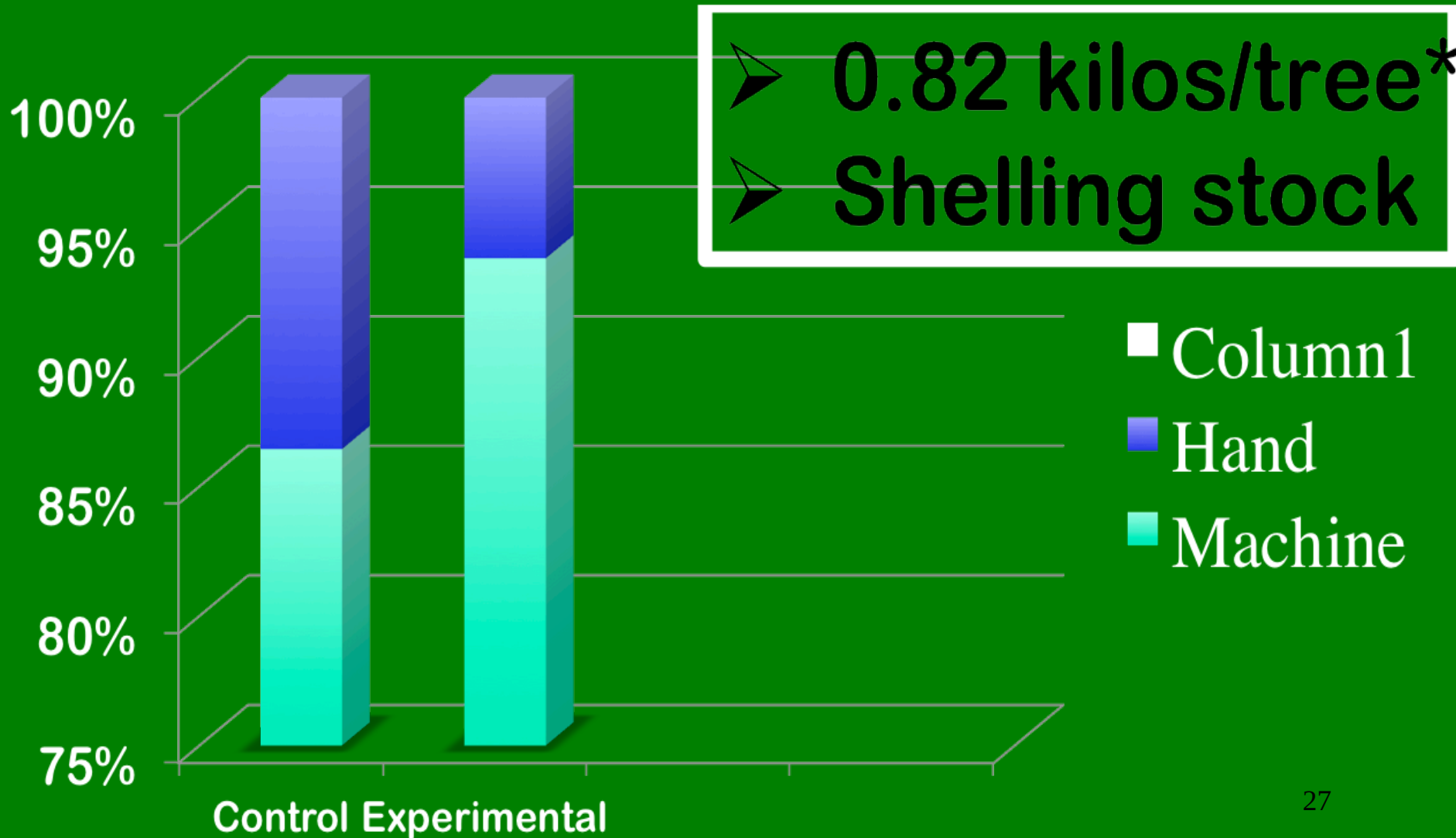
- **Difference in trunk shakers:**
 - **Technology can be improved**
- **No significant difference between quality:**
 - **Harvested fruit**
 - **Unharvested nuts in tree**

Pistachio Harvester Evaluations: 2011

Two Trunk Shakers



Control vs. Experimental Trunk Shaker: 2011



Control vs. Experimental Trunk Shaker: 2011*

- 1.81 lb./tree X 107 trees/ac
- 193 lb/ac X 1.98/lb*

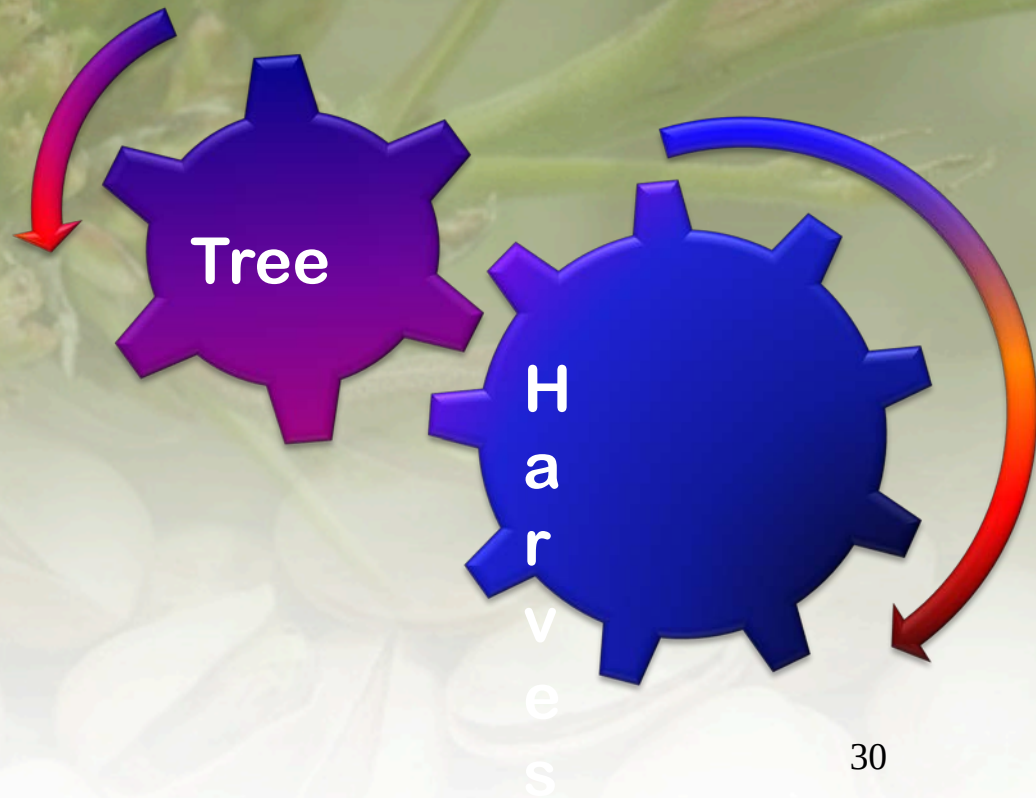
\$382.14/acre

2011 Trial Conclusions

- Currently, trunk shakers work well
 - For trees < 40 inches circumference
 - 86 % on larger trees (> 25 years)
 - 95% on smaller trees (< 12 years)

Overall Conclusions

- Difference in commercial shakers
- Efficiency can be improved
 - Engineering
 - Tree



- WE need to be investigating how to increase harvester efficiency now!



Harvesting Mature Trees

- **Contract harvesters:**
 - % efficiency
 - trash in bin
 - transport time
 - temperature monitoring











Transport Delays

- Good quality nuts with intact shells can be held for 48 hours in truck with minimal staining
- Nuts with damaged/tattered hulls are damaged in 8 hours at 104° F or 24 hr. at 86° F











RTT LIBRARY
SAMPLE BIN

#S102351-102400

18

MacroBin® 26-R

[illegible]





Grade Sheet

- **How you can affect your grade sheet:**
 - Lbs. of fresh weight delivered
 - % by weight of:
 - Filled nuts
 - Split nuts
 - Stained nuts
 - Adhering hull nuts
 - Insect infested nuts
 - Lbs. of trash in bin at delivery

Websites

- [HTTP://ucanr.org/sites/mechpistachio/](http://ucanr.org/sites/mechpistachio/)
- Fruitsandnuts.ucdavis.edu
- Postharvest.ucdavis.edu

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SHORT COURSE