

Mechanical Harvesting 2006 - 2013

Louise Ferguson, Sergio Castro Garcia, Uriel Rosa, John Miles
Jackie Burns, Soh Min Lee and JX Guinard
William Krueger, Elizabeth Fichtner, Neil O'Connel, Paul Vossen
Heraclio Reyes, Kitren Glozer, John Ferguson, Damoon Moin, Peter Kalekow
JM Ortiz, JL Ladux, FJ Fernandez, PS Searles, C Searles
JA Gil Ribes, GLB Roldan, JA Vega, FJ Jiminez
DSE, ENE Inc., AgRight, MacTeq
Rocky Hill Ranch, Burreson Ranches and Finca La Bella
Bell Carter Olives and Musco Family Olives
California Olive Committee



March 9th, 2013; Terra Bella CA - 1% of California's Manzanillos







Available? Affordable? Ability?

Outline

- I. **Develop olive removal method**
- II. **Eliminate fruit damage**
- III. **Adapt grove to increase efficiency**
- IV. **Commercial adaptation**

Outline

- I. Develop olive removal method**
- II. Eliminate fruit damage**
- III. Adapt grove to increase efficiency**
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ENE

R-05-10

S-03-06



Outline

- I. Develop olive removal method**
- II. Eliminate fruit damage**
- III. Adapt grove to increase efficiency**
- IV. Commercial adaptation**



Hand



Mechanical



Processed

Commercially Graded and Processed

Bell Carter Crisosto

Musco

10-16-06
Row 3
Tree 2
Hand pick
+
ground

CHARACTER CERTIFICATE
Official Inspection Certificate
No. 116-206
Tree 2
L.A.M.A.
THICKNESS
CAPACITY
ADJUSTMENT
DATE
CLASSIFICATION
BUREAU OF AGRICULTURE
CALIFORNIA DEPARTMENT OF
AGRICULTURE
DESIGNED BY
ADDRESS

STANDARD USE ONLY	
DEFECTS	
COVERS	
MUTILATED	
WASHED	
DEFORMED	
CONTAMINATED	
ABUSED	
SCALE	
SOFTNESS	

OFFICIAL INSPECTION CERTIFICATE			
CLASSIFIED BY		SAMPLE	
SIZE	QUANTITY	NO.	WEIGHT
SUPER CALSICAL	08		
CALSICAL	09		
(X)RND	04		
S (S) 1/2 LARGE (S)	55		
EX-LARGE (S)	06		
EX-LARGE (S)	07	1	
A LARGE LS	08	1	
MEDIAN	09	5	
M SMALL	10	15	134
PETITE	LOJA	18	166
SUB-PETITE	LM	19	192

Trained Sensory Panels



Form with multiple sections and tables, likely a data collection sheet for the sensory panel. The text is too small to read, but it appears to be a structured form for recording results.





Taste Test for Black Olives

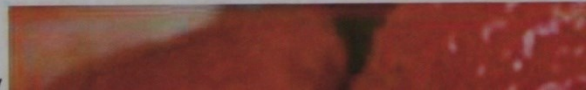
1 ~ 3 pm

RMI Sensory Rm.1000

Consumer Preference Panels

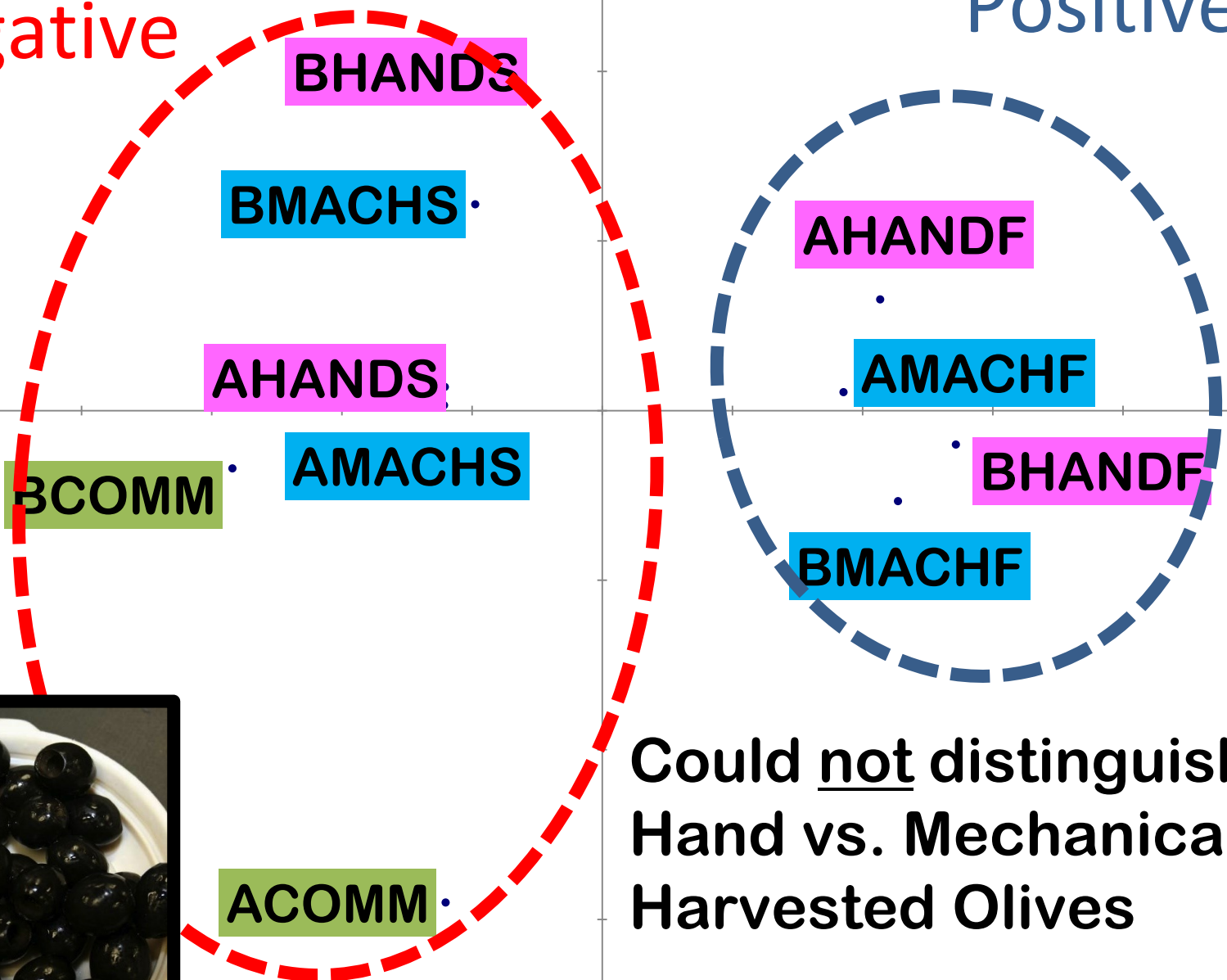
10 ~ 3 pm

RMI Sensory



Negative

Positive



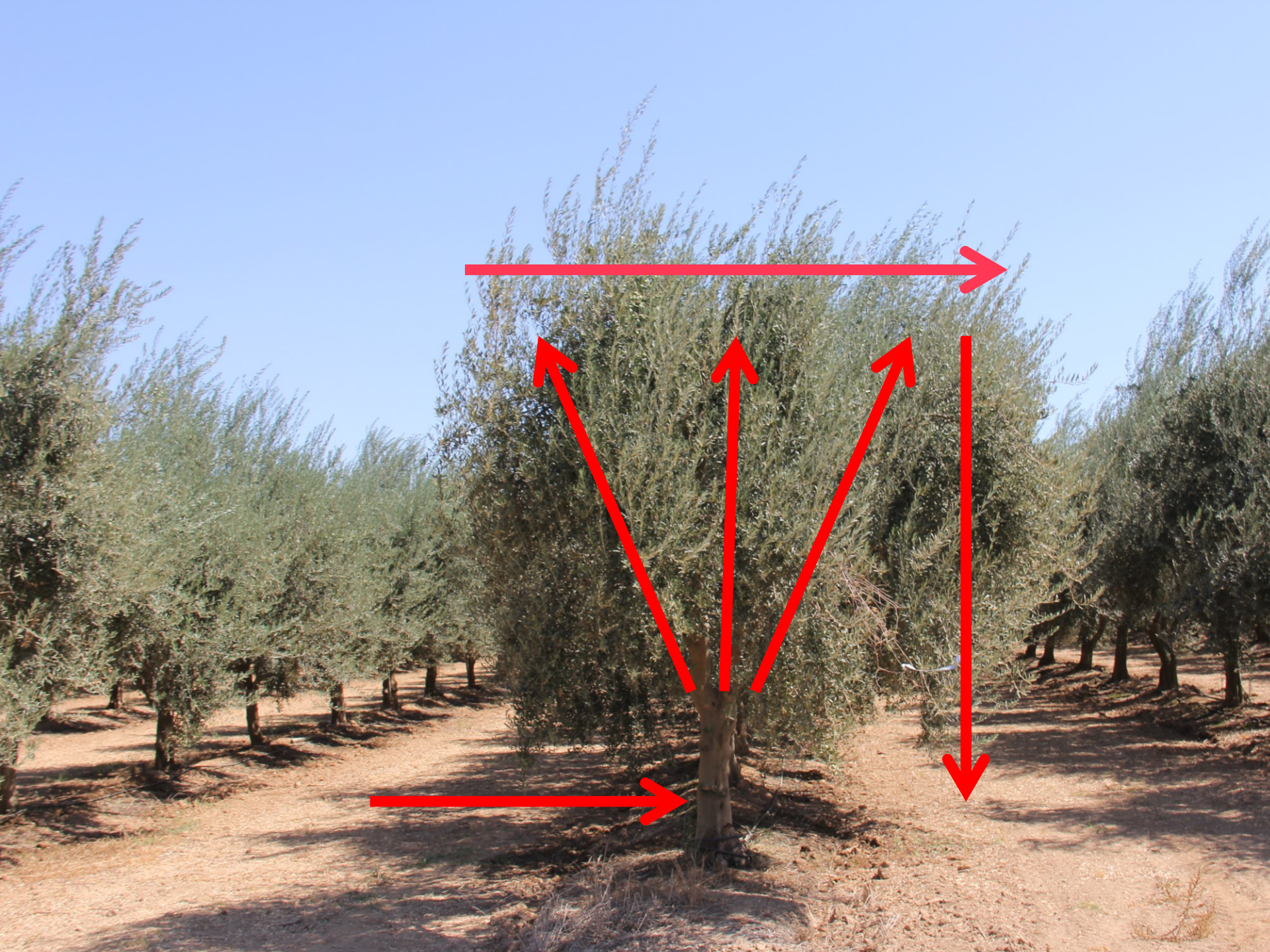
Could not distinguish Hand vs. Mechanically Harvested Olives

Outline

- I. **Develop olive removal method**
- II. **Eliminate fruit damage**
- III. **Increase harvester efficiency**
 - I. **Trunk Shaker**
 - I. **Adapting trees or grove**
 - I. **Existing or new**
- IV. **Commercial adaptation**



**Abscission
Agent**



Pruned trees:

180 trees/acre

\$1,000.00/acre

30 - 40"/tree = 90 - 129 trees/ha

2 tons/hour





22/09/2012: > 95% acceptable



**Hand harvested
control**

Trunk Shaker vs. Hand Harvest

Trunk Shaker

- 30 tons (4 T/A on 7.5 A)
- 77.5% efficiency
- 10+ hours
- \$200.00 per ton
- \$1,005.00 per ton
- 23,366. – 4,650
- **\$18,716 net**

30 Pickers @ t/day

- 30 tons (4 T/A on 7.5 A)
- 100% efficiency
- 10 hours
- \$400.00 per ton
- \$1,005.00 per ton
- 31,150 – 12,000
- **\$18,150 net**

Trunk Shaker vs. Hand Harvest

Trunk Shaker

- 30 tons (4 T/A on 7.5 A)
- 77.5% efficiency
 - Increase with pruning
- 10 hours
- \$200.00 per ton
 - \$134.00/ton
- \$1,005.00 per ton
- 23,618 – 4,650
- \$18,716 net

30 Pickers @ t/day

- 30 tons (4 T/A on 7.5 A)
- 100% efficiency
 - 93 – 95%
- 10 hours
- \$400.00 per ton
 - Not under your control
- \$1,005.00 per ton
- 31,150 – 12,000
- \$18,150 net

Outline

- I. Develop olive removal method**
- II. Eliminate fruit damage**
- III. Increase harvester efficiency**
 - I. Canopy contact harvester**
 - I. Adapting existing groves**
 - II. Developing new groves**
- IV. Commercial adaptation**





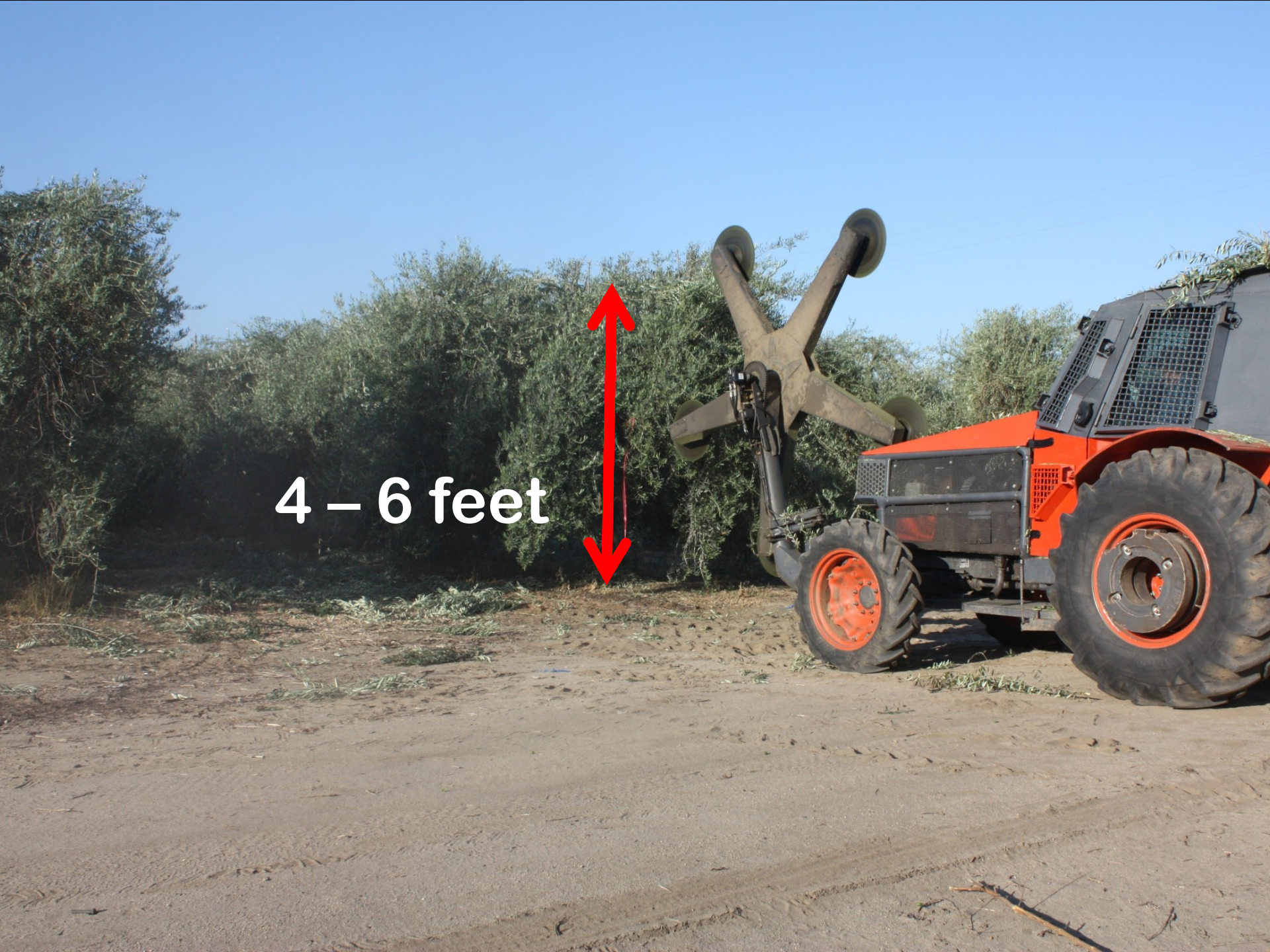
Existing Orchards ?

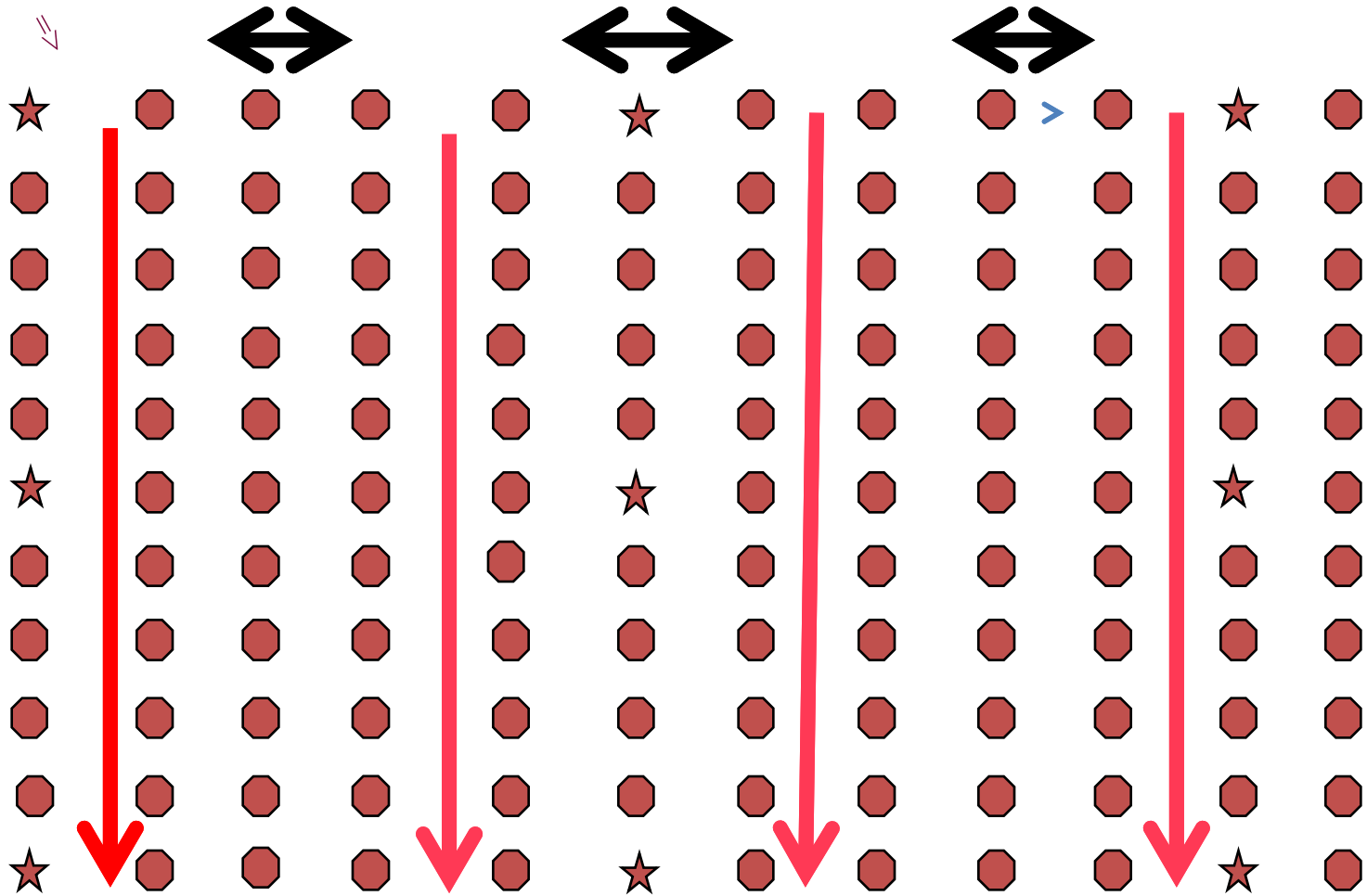




11 - 12 Feet

4 – 6 feet





Hedging and Topping Trial 2008 - 2013



13 x 26 feet = 139 trees/acre



Effect of Hedging and Topping on Yield

Average Annual: 2008 - 2013

5.3 tons/acre

4.2 tons/acre

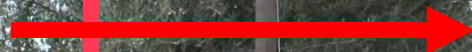


Hedging and Topping Trial Canopy Contact Harvester Efficiency 2013

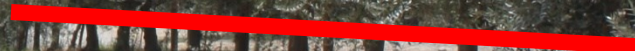
81% efficiency

92% efficiency

12 feet

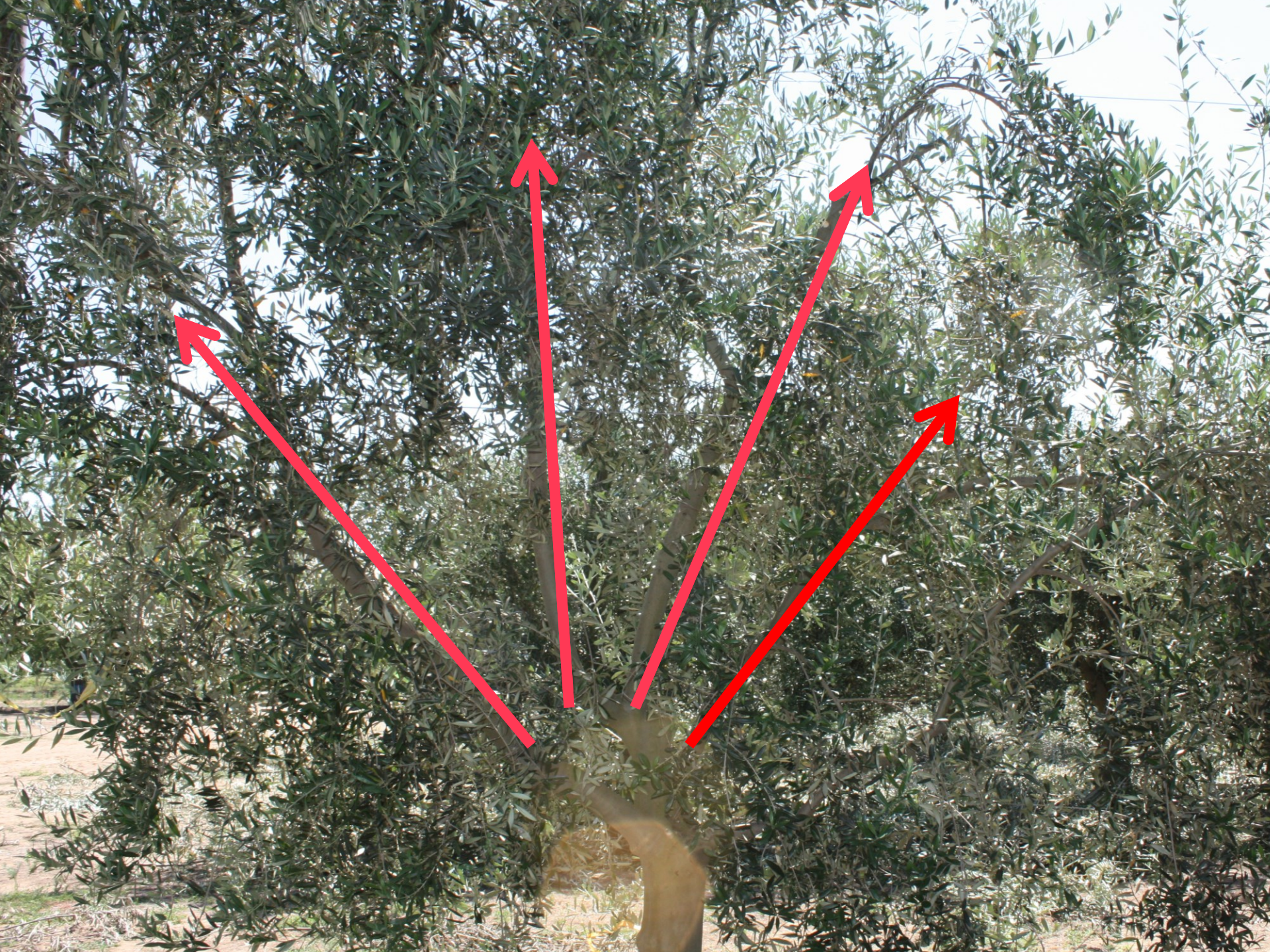


6 feet



4 feet

New Orchards: > 202 trees/acre



2011: 10 feet

2 feet



A photograph of an olive tree in a field, heavily laden with green olives. The tree is the central focus, with other olive trees visible in the background. The sky is clear and blue. A red horizontal line is drawn across the middle of the image, positioned below the '2012: 11 feet' text.

2012: 11 feet

2013 crop

2012 crop

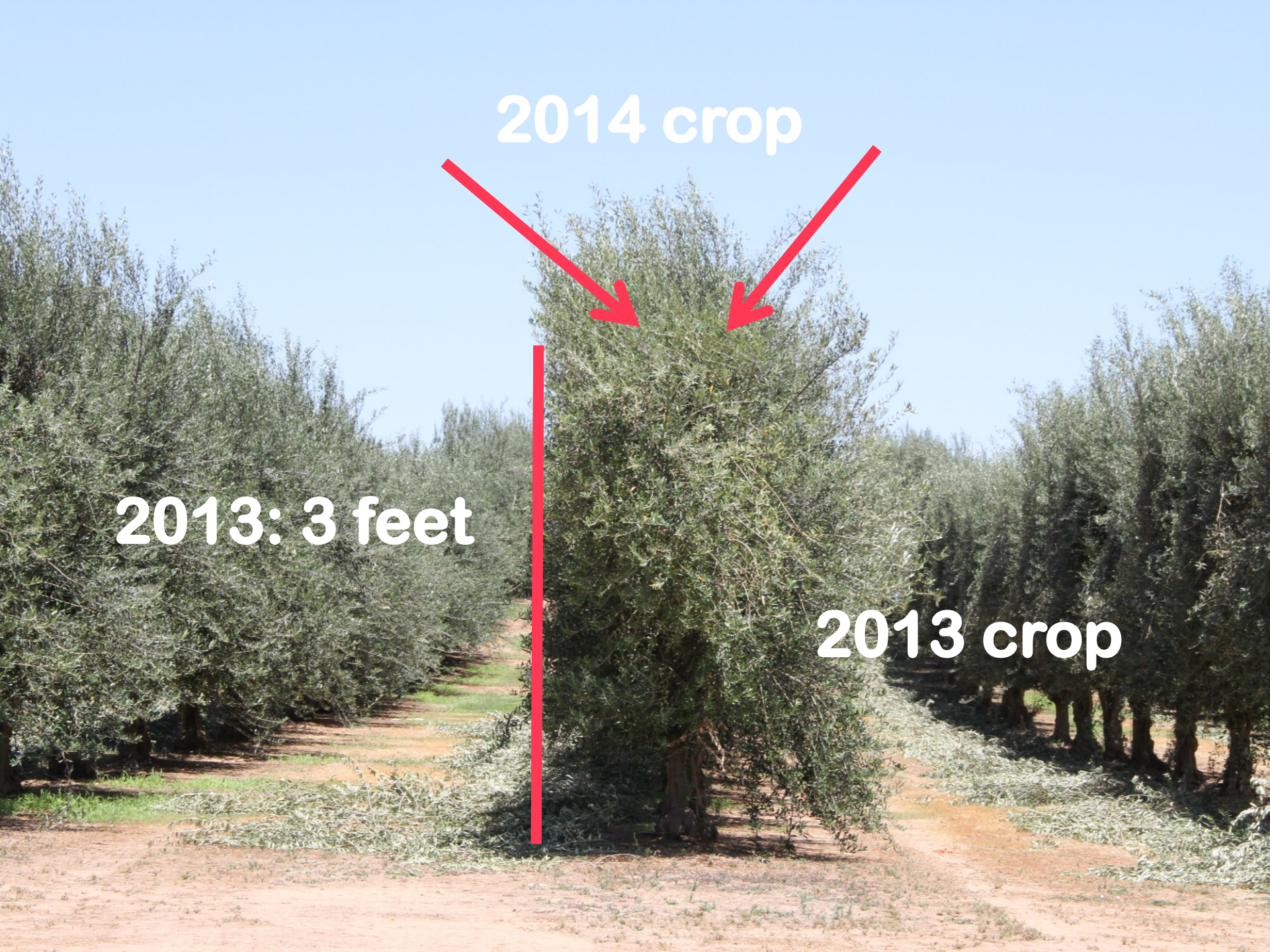
2014 crop



2013: 3 feet



2013 crop





Mechanically vs. Hand Pruned Hedgerow

- **Hand:**

- **3.7 tons/acre**
- **80 % harvest efficiency**

- **Mechanical:**

- **4.3 tons/acre**
- **81% harvest efficiency**

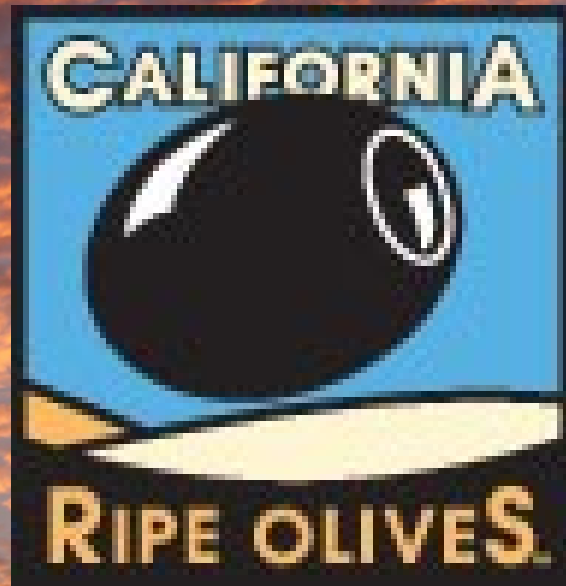
Mechanical Harvesting Progress Summary

– Trunk shaker

- 77% efficiency**
- Marketable olives**
- Commercially available**

– Canopy Contact Harvester

- 80 - 92% efficiency**
- Marketable fruit**
- Prototype with no catch frame**



Pruning Method	2010	2011	2012*	2013	Average Annual Yield
Mech. Prune	9.5	7.9	0.9	5.25	4.2
Hand	12.4	2.8	2.3	12.8	5.3

