California Table Olive Research

Louise Ferguson PhD
University California Davis

Developing Mechanical Harvesting for California Table Olives 2006 – 2014

L. Ferguson, J. Miles, S. Castro Garcia, T. Sarcoglu,
F. R. Aranda, F.J. Jiminez, W.J. Krueger and E.J. Fichtner

California “Black Ripe “Manzanillo” Table Olive

Fruit Removal Force: 0.5 kg


> 50% gross return
Available?
Affordable?
Ability?


Force applied to trunk…
< 60-70%
ENE
R-05-10


Force applied to canopy


Trained Sensory Panels

UCDAVIS OLIVE CENTER

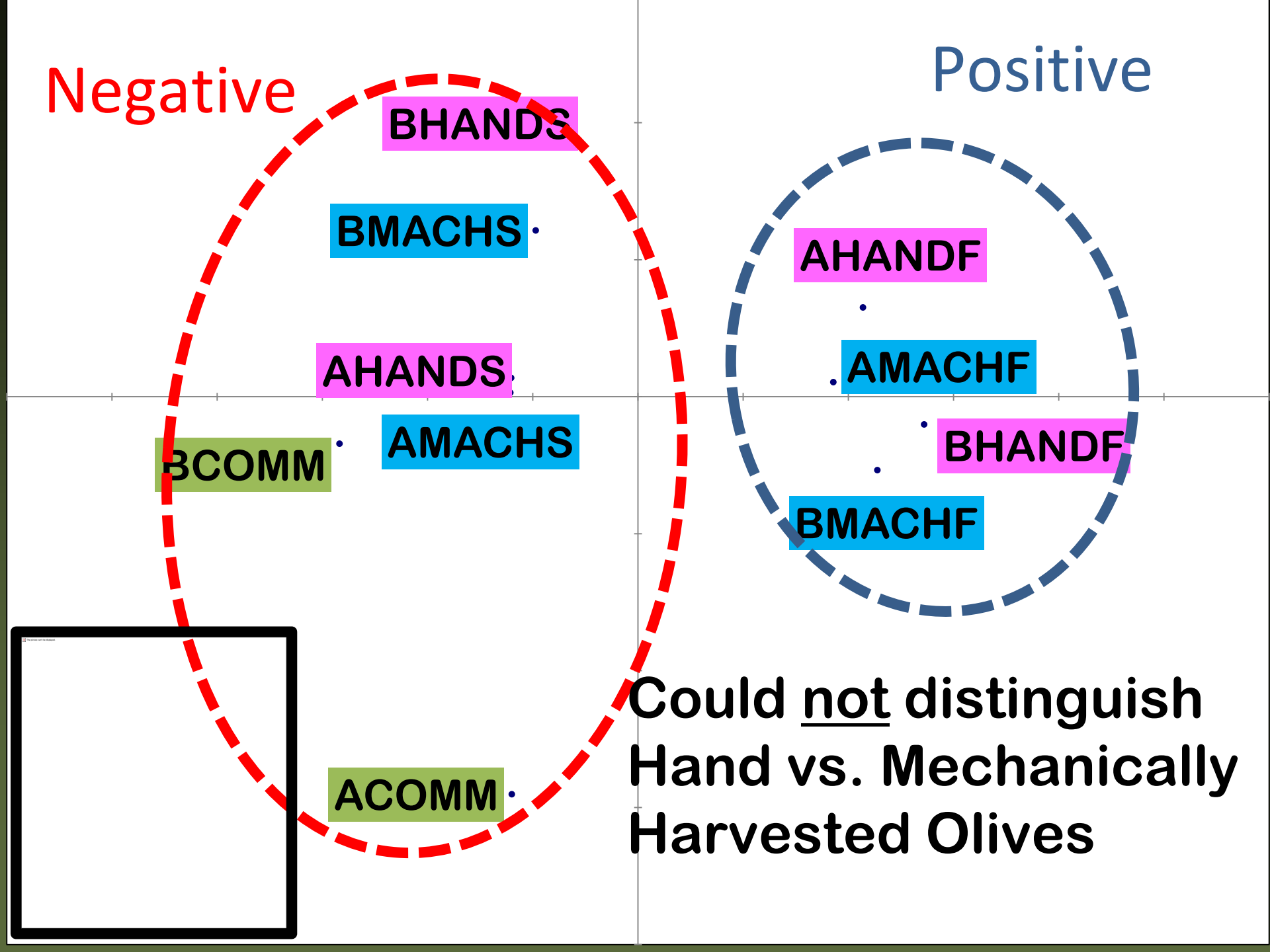
Taste Test for Black Olives

1~ 3 pm

RMI Sensory Rm.1000

Consumer Preference Panels

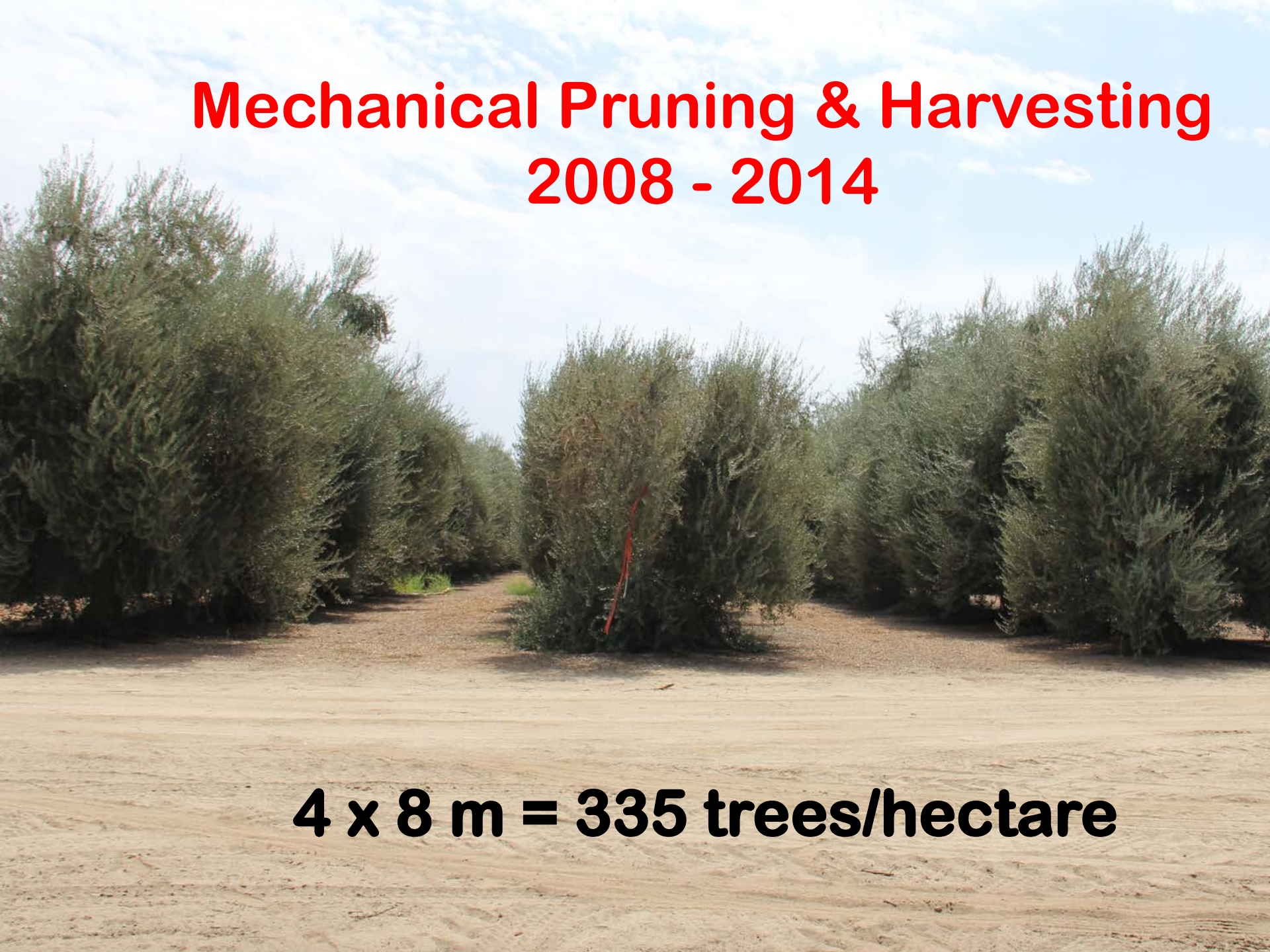
10 ~ 3 pm


Negative
Positive
BHANDS
BMACHS
AHANDS
AMACHS
BCOMM
ACOMM
AHANDF
AMACHF
BHANDF
BMACHF
Could not distinguish
Hand vs. Mechanically
Harvested Olives

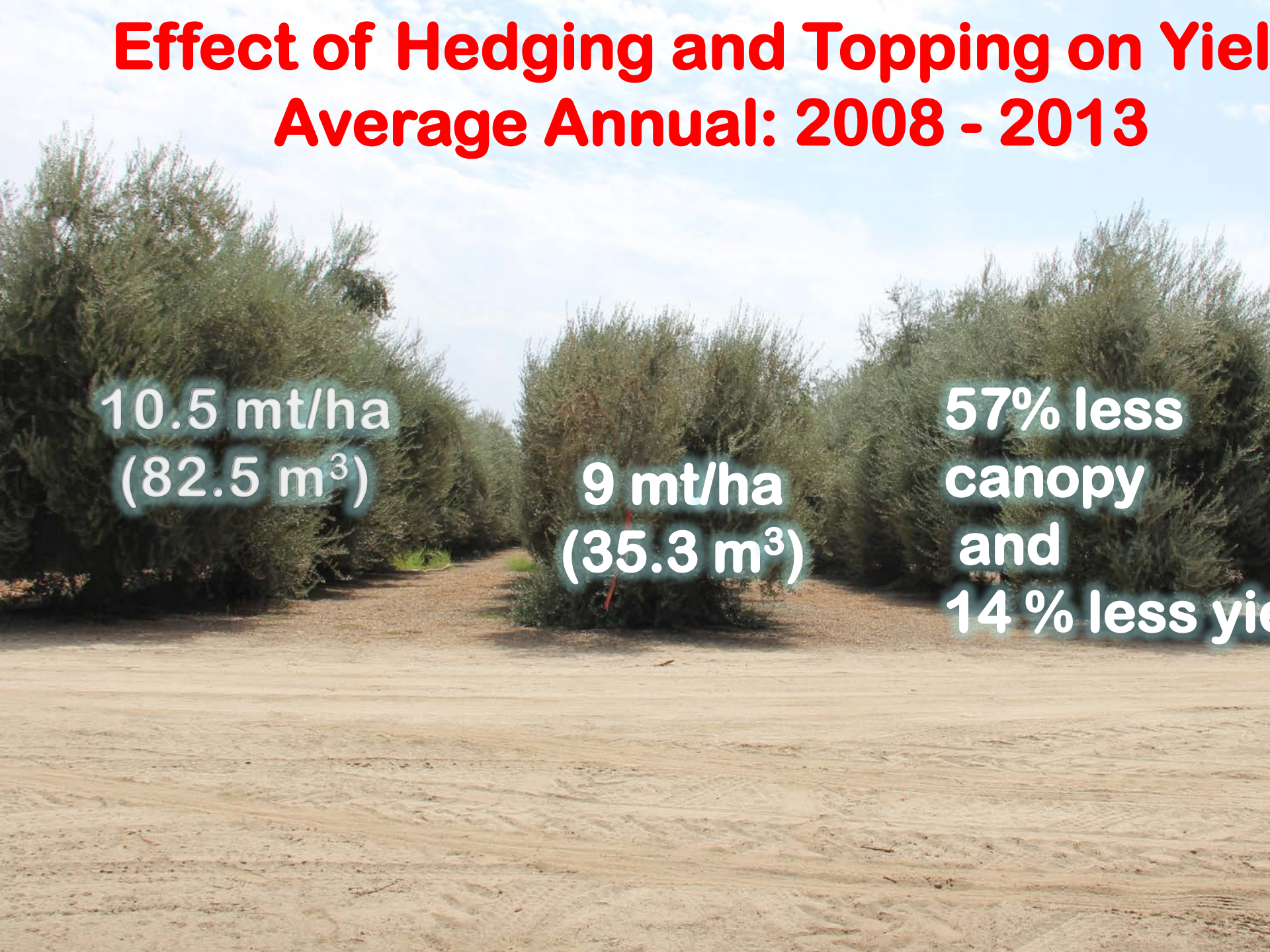
Existing Orchards ?


1.2 m
0.8 m


3.5 m


Mechanical Pruning & Harvesting
2008 - 2014
4 x 8 m = 335 trees/hectare

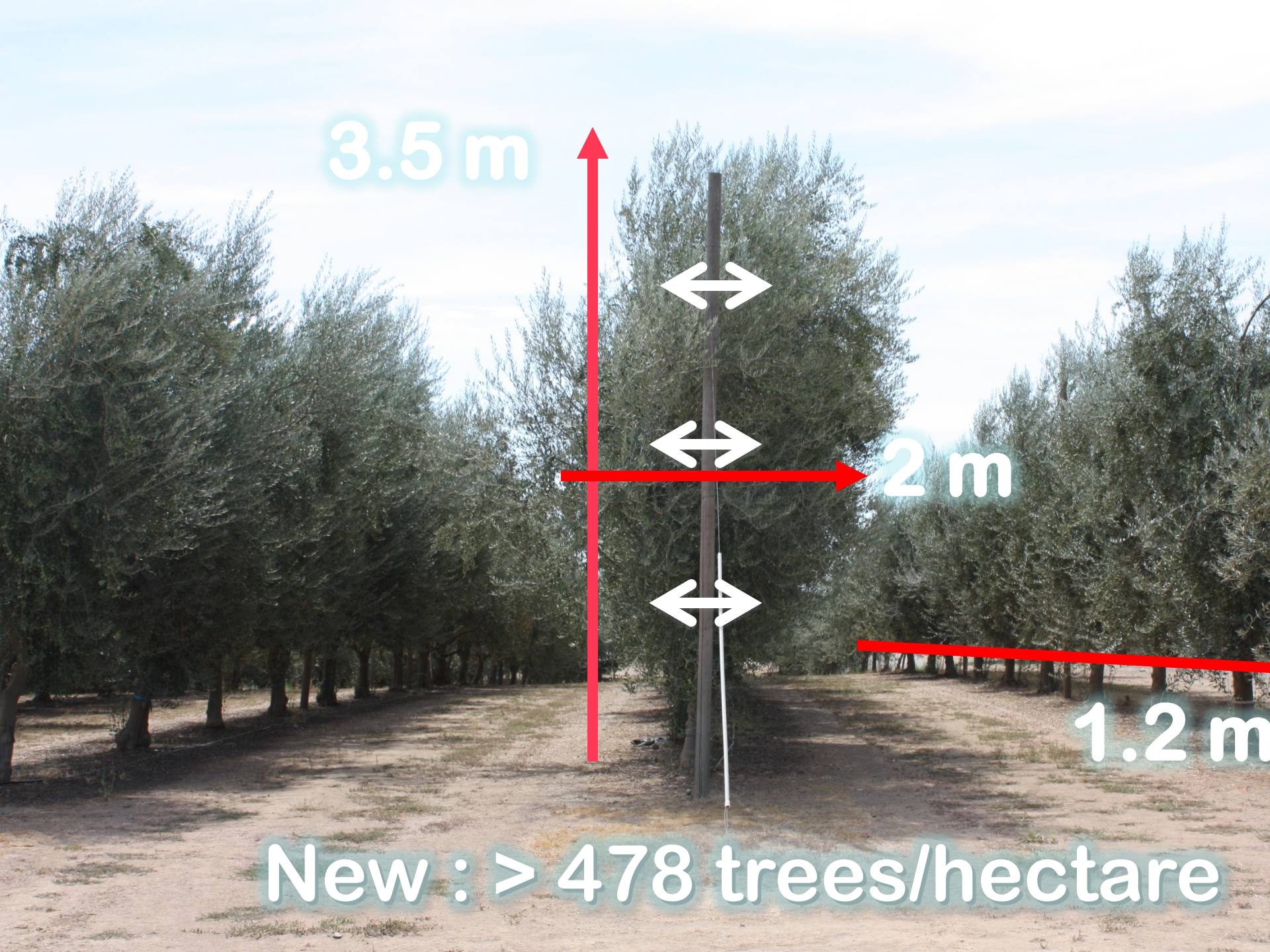
Effect of Hedging and Topping on Yiel
Average Annual: 2008 - 2013

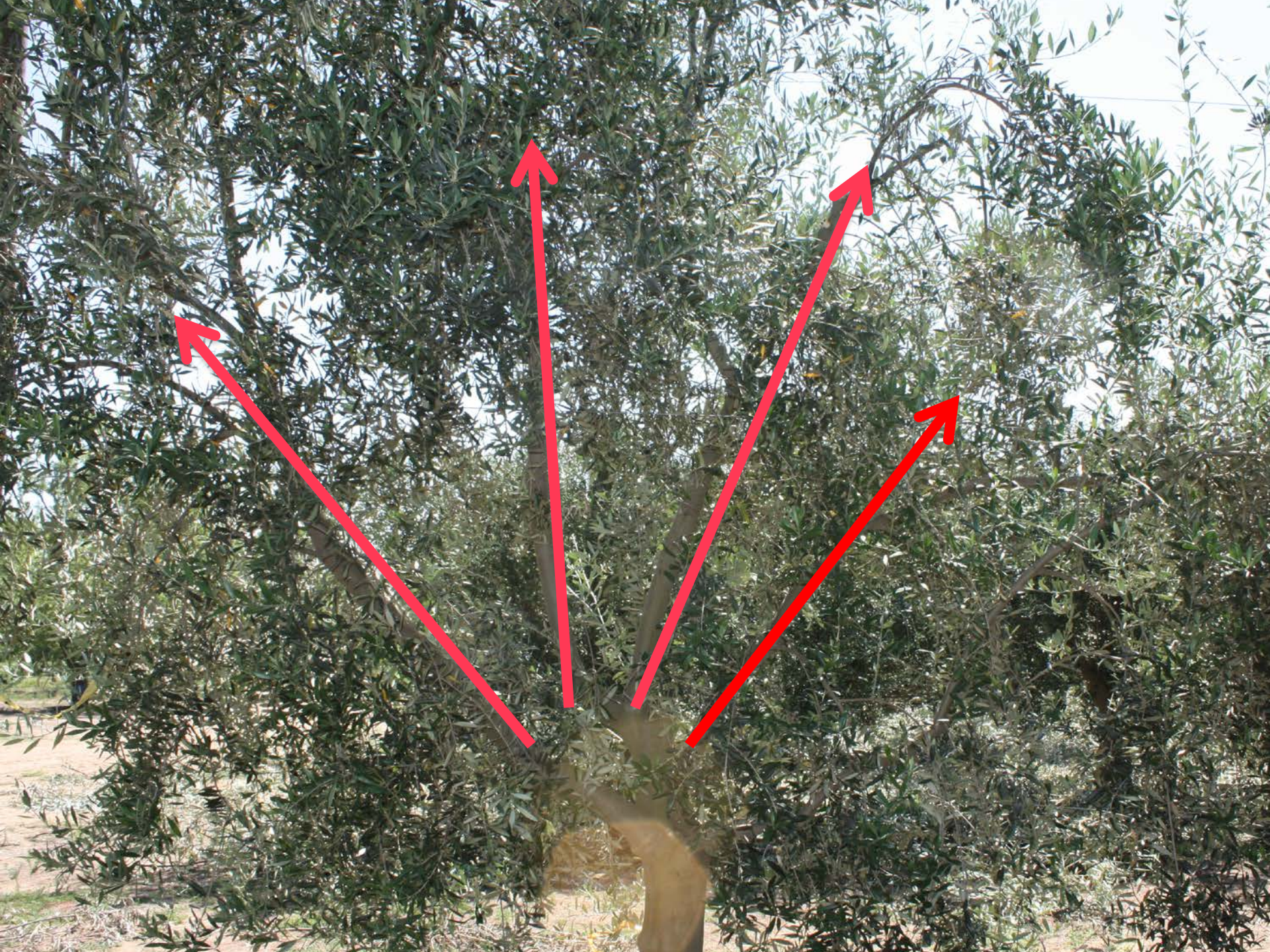


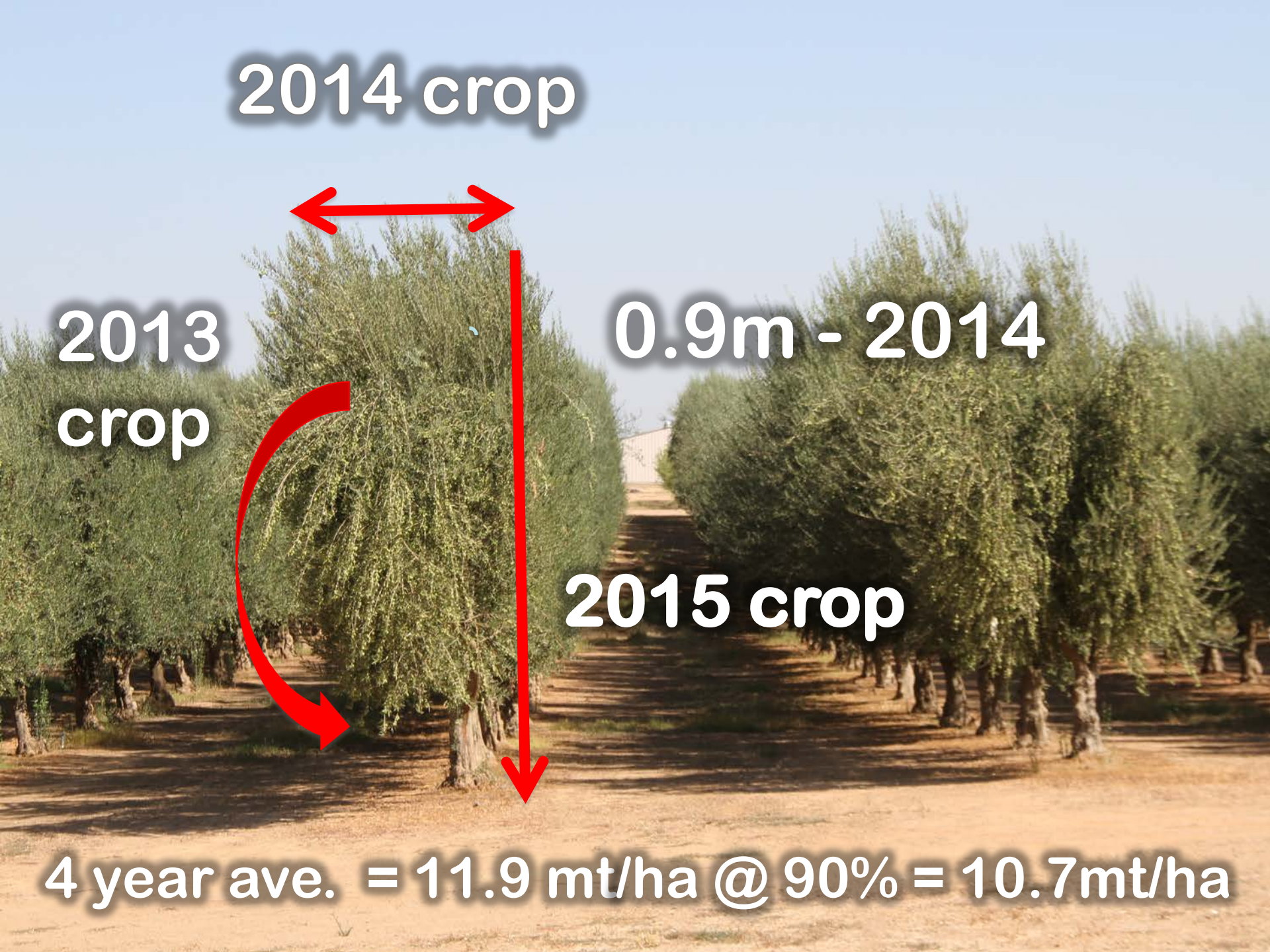
Hedging and Topping Trial
Canopy Contact Harvester Efficiency
2013

0.81% X 10.5 mt/ha VS 0.92% X 9 mt/ha)

8.5 Mt/ha VS 8.3 Mt/ha (NSD)


3.5 m
2 m
1.2 m
New : > 478 trees/hectare




2014 crop
2013
crop
0.9m - 2014
2015 crop
4 year ave. = 11.9 mt/ha @ 90% = 10.7mt/ha

Dwarfing Rootstock Trial: 2014

UNIPA

1. Nikitskaya
2. *Olea cuspidate*
3. Verticillium resistant Oblonga
4. Seedling Dwarf D.

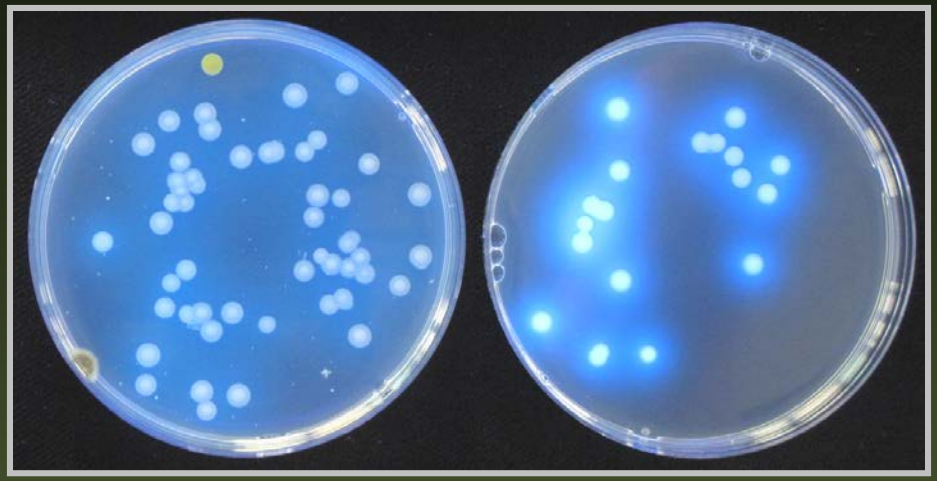
Epidemiology and management of olive knot caused by *Pseudomonas syringae* pv. *savastanoi*

Dr. J.E. Adaskaveg
University of California, Riverside

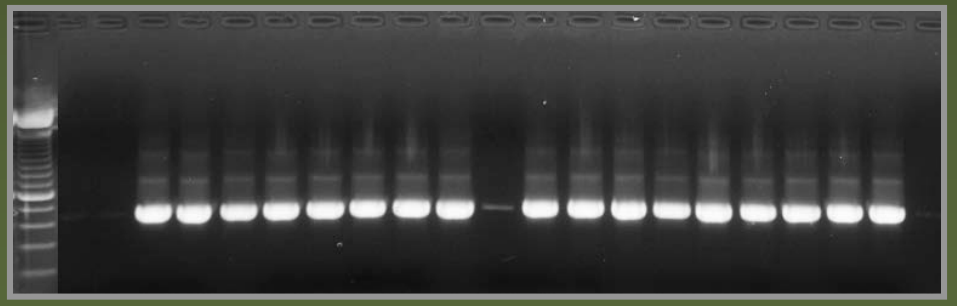
Collaborating: H. Forster, D. Thompson, K. Nguyen, J. Connell, B. Krueger, E. Fichtner

Objective: Collection of strains

- Collection of *P. syringae* pv. *Savastanoi* Identification by
- cultural morphology and by PCR
- A total of 80 isolates were obtained from 7



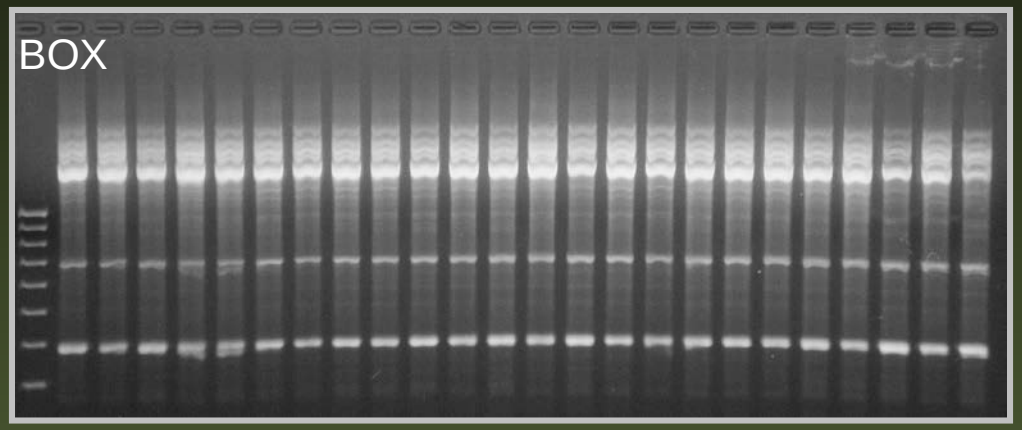
Isolation of *P. syringae* pv. *Savastanoi*

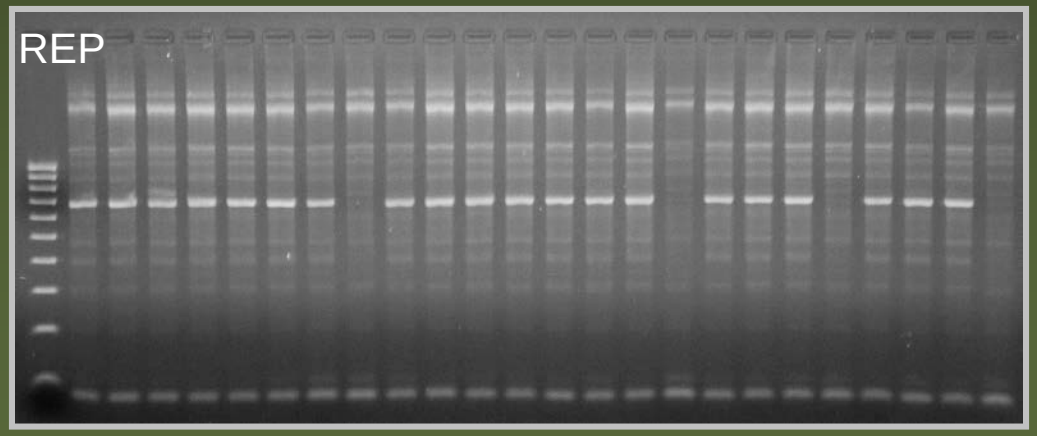


Specific amplification of *P. syringae* pv. *savastanoi*

Objective: Genotypic diversity among strains of *P. syringae pv. savastanoi*

- Genetic diversity evaluated
- Diversity limited.
- California population is rather homogeneous.





Objective: Evaluation of copper, kasugamycin, and selected sanitizer treatments for the management olive knot

Treated with selected bactericides.

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- Field studies on efficacy and timing

Alternate Bearing in Olive

Summary of Key Results

Elizabeth Fichtner
Farm Advisor, Orchard Systems, Tulare County

Carol Lovatt
Professor, Plant Physiology, UC-Riverside

Alternate bearing in ‘Manzanillo’ olive

(1) The ON-crop inhibits summer vegetative shoot extension growth:

Less summer vegetative shoot growth = less node pairs = less floral buds at spring bloom

Alternate bearing in ‘Manzanillo’ olive

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Less summer vegetative shoot growth = less node pairs = less floral buds at spring bloom

Alternate Bearing in ‘Manzanillo’ olive:

(3) The ON-crop reduces bud break the following spring

Inhibition of spring bud break = fewer inflorescences

Alternate bearing in ‘Manzanillo’ olive

The ON-crop inhibits floral development at the level of gene expression

Inhibition of floral development = fewer inflorescences

Injecting ON-crop ‘Manzanillo’ olive trees with cytokinins:

(i) increased summer shoot extension growth
(ii) increased spring bud break
(iii) increased inflorescence number

oliar application of cytokinins to ON-crop trees to increase yield the following year is currently be tested

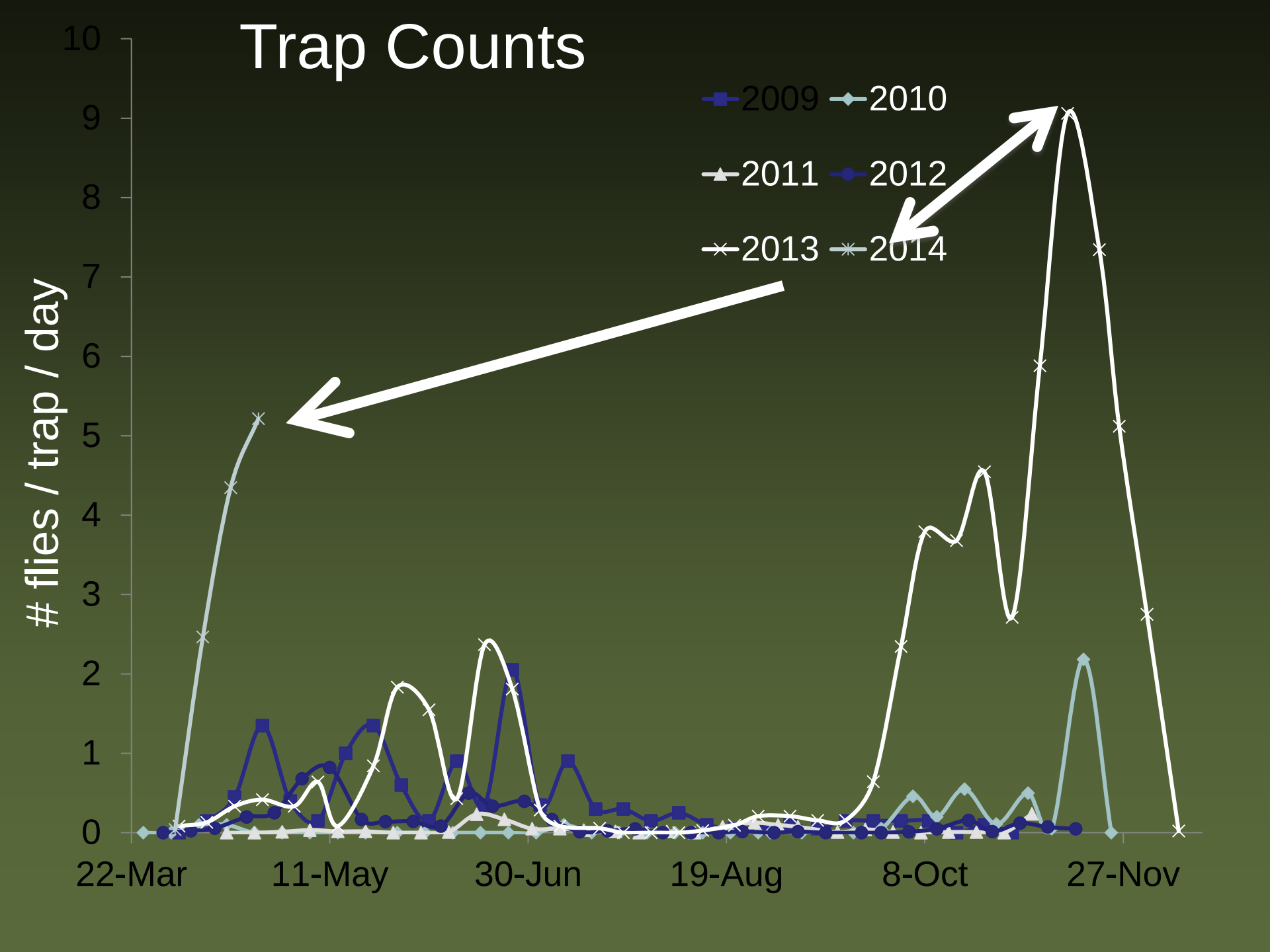
Insect Updates: Olive Fly & Brown Marmorated Stink Bug

Dani Lightle
UCCE Farm Advisor
Glenn, Butte, & Tehama Cos.

Olive Fly

Adult female

Oviposition punctures


Trap Counts
2009
2010
2011
2012
2013
2014
flies / trap / day
10
9
8
7
6
5
4
3
2
1
0
22-Mar
11-May
30-Jun
19-Aug
8-Oct
27-Nov

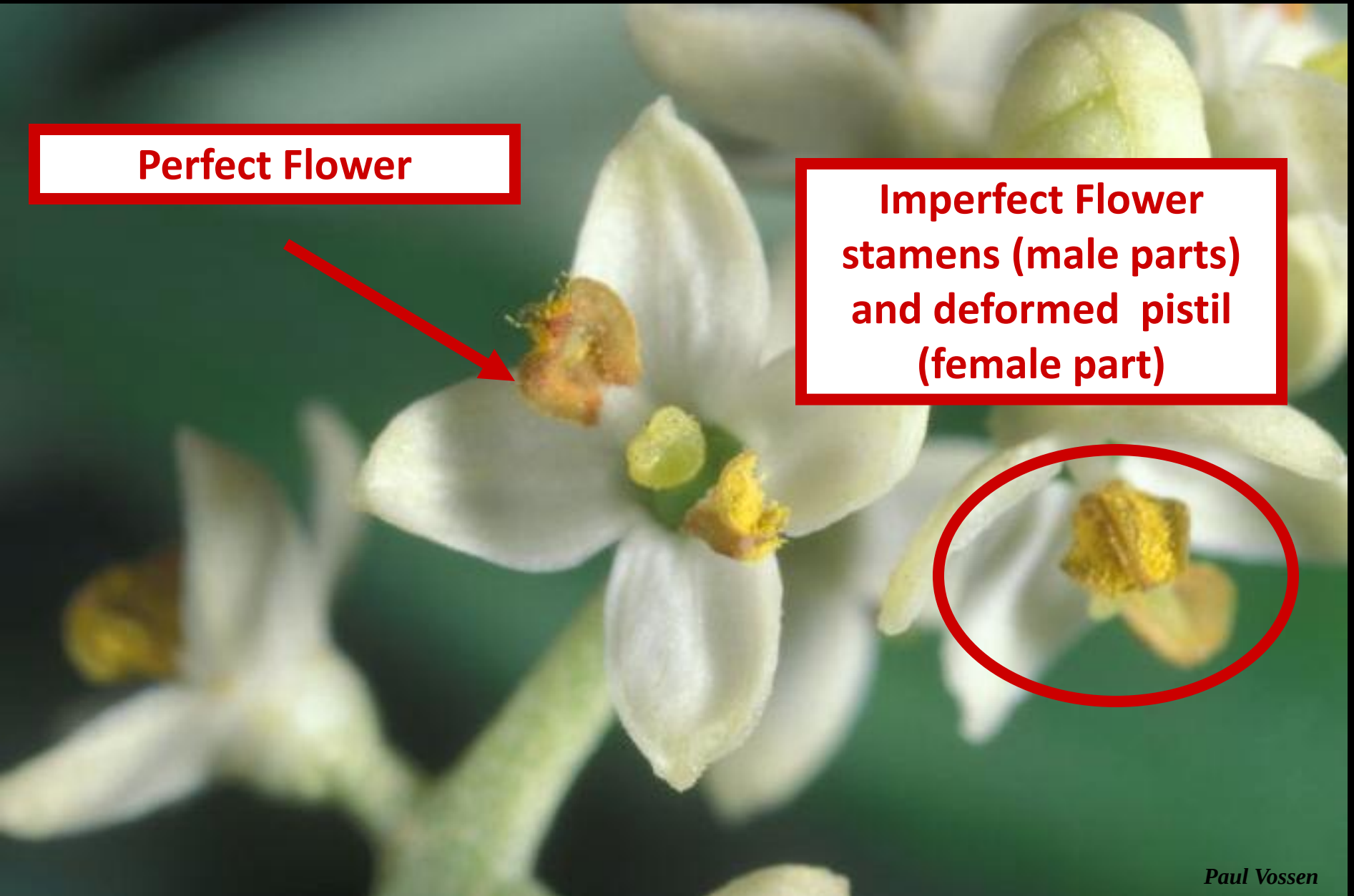
Known Host Plants for Brown Marmorated Stink Bug, *Halyomorpha halys*

Common name	Scientific name
Abelia, Glossy	*Abelia x grandiflora*
Apple	*Malus domestica*
Apple	*Malus pumila*
Apricot	*Prunus*
Apricot, Japanese	*Prunus mume*
Ash, Green	*Fraxinus pennsylvanica*
Ash, Oregon	*Fraxinus oregona*
Ash, White	*Fraxinus americana*
Asparagus	*Asparagus officinalis*
Basswood	*Tilia americana*
Bean, Bush & Kidney	*Phaseolus vulgaris*
Bean, Lima	*Phaseolus lunatus*
Bean, Long	*Vigna unguiculata sesquipedalis*
Bean, Pole	*Phaseolus vulgaris*
Beet, Sugar	*Beta vulgaris*
Birch	*Betula*
Bittersweet	*Celastrus*
Blackberry	*Rubus*
Blueberry	*Vaccinium*
Buckthorn	*Rhamnus*
Burcucumber	*Sicyos angulatus*
Burdock	*Arctium minus*
Butterfly Bush	*Buddleia davidii*
Cantaloupe	*Cucumis melo*
Catalpa	*Catalpa speciosa*
Cedar	*Cedrus*
Celosia	*Celosia argentea*
Cherry, Black	*Prunus*
Cherry, Sour	*Prunus*
Cherry, Sweet	*Prunus avium*
Chokecherry	*Prunus virginiana*
Chrysanthemum	*Chrysanthemum*
Citrus	*Citrus*
Coleus	*Coleus blumei*
Comfrey	*Symphytum officinale*
Corn, Sweet	*Zea mays*
Crabapple	*Malus*
Cranberrybush, American	*Viburnum opulus* v. *americanum*
Cucumber	*Cucumis sativus*
Dahlia	*Dahlia*
Dogwood, Gray	*Cornus racemosa*
Dogwood, Red Osier	*Cornus sericea*
Eggplant	*Solanum melongena*
Elderberry	*Sambucus*
Euonymus	*Euonymus*
Euonymus, Winged	*Euonymus alatus*
Filbert, Turkish	*Corylus colurna*
Fig	*Ficus*
Firethorn	*Pyracantha*
Golden Chain Tree	*Laburnum anagyroides*
Golden Rain Tree	*Koelreuteria paniculata*
Grape (Cultivated, Table)	*Vitis*
Grape (Cultivated, Wine)	*Vitis*
Grape (Wild)	*Vitis*
Hackberry	*Celtis occidentalis*
Harlequin Glorybower	*Clerodendron trichotomum*
Hawthorn	*Crataegus*
Hibiscus	*Hibiscus rosa-sinensis*
Hinoki	*Chamaecyparis*
Holly	*Ilex*
Holly, American	*Ilex opaca*
Holly, Winterberry	*Ilex verticillata*
Honeyberry Bush	*Lonicera kamchatika*
Honeysuckle	*Lonicera*
Honeysuckle, Tartarian	*Lonicera tatarica*
Jerusalem Artichoke	*Helianthus tuberosus*
Jetbead	*Rhodotypus scandens*
Jujube	*Ziziphus sativa*
Kiwi	*Actinidia deliciosa*
Laurustinus	*Viburnum tinus*
Lilac	*Syringia*
Magnolia, Star	*Magnolia stellata*
Malabar spinach	*Basella rubra*
Maple, Bigleaf	*Acer macrophyllum*
Maple, Hedge	*Acer campestre*
Maple, Japanese	*Acer palmatum*
Maple, Norway	*Acer platnoides*
Maple, Red	*Acer rubrum*
Maple, Sugar	*Acer saccharum*
Mountain Ash	*Sorbus*
Mulberry	*Morus*
Mullein, Woolly	*Verbascum thapsus*
Nightshade	*Solanum*
Nightshade, Black	*Solanum nigrum*
Oregon Grape	*Mahonia aquifolium*
Paulownia	*Paulownia catalpifolia*
Paulownia	*Paulownia elongata*
Paulownia	*Paulownia fortunii*
Paulownia	*Paulownia kawakamii*
Pea	*Pisum sativum*
Peach	*Prunus persica*
Pear, Asian	*Pyrus pyrifolia*
Pear, European	*Pyrus communis*
Pecan	*Carya illinoiensis*
Pepper	*Capiscum annuum*
Periwinkle	*Catharanthus roseus*
Persimmon	*Diospyros*
Persimmon, Japanese	*Diospyros kaki*
Plum	*Prunus*
Plum, Ornamental	*Prunus*
Princess Tree	*Paulownia tomentosa*
Privet	*Ligustrum*
Raspberry	*Rubus*
Rape	*Brassicus napus*
Redbud	*Cercis canadensis*
Rose, Rugosa	*Rosa rugosa*
Rose of Sharon	*Hibiscus syriacus*
Russian Olive	*Eleagnus angustifolia*
Serviceberry	*Amelanchier canadensis*
Siberian Pea Shrub	*Caragana arborescens*
Soybean	*Glycine max*
Spider Flower	*Cleome hasslerana*
Spiraea	*Spiraea*
Strawberry Tree	*Arbutus unedo*
Sumac	*Rhus*
Sunflower	*Helianthus*
Sweetgum	*Liquidambar*
Sycamore	*Platanus occidentalis*
Tomato	*Solanum lycopersicum*
Viburnum, Blackhaw	*Viburnum prunifolium*
Viburnum, Tea	*Viburnum setigerum*
Walnut, Black	*Juglans nigra*
Watermelon	*Citrullus lanatus*
Willow, Pussy	*Salix*
Zelkova	*Zelkova*
Zinnia	*Zinnia*

170 known host plants

Olives are not currently listed as a host

Weather Related Crop Failures



Chilling (Winter & Spring)

- **Dynamic Chill Model**

- **First step: Reversible**
  - Opposition of chilling and high temperatures
  - Form and destroy 'Precursor for Dormancy Breaking Factor' (PDBF) (hormone)
- **Second step: Irreversible**
  - Moderate temperature: fixes chilling effect
  - When a critical portion of the PDBF is accumulated = 'Dormancy Breaking Factor' (DBF) or chilling portion.