



# Santa Maria Strawberry Field Day Spring 2015

May 8, 2015

David Holden

# What we Will Look at Today

- Biopesticides for Disease Suppression
- Biotimulents for crop production.



BioSafe Systems TerraClean 5.0  
Trials in Conventional  
Strawberries.  
2014 and 2015

# BioSafe Systems TerraClean 5.0

- OMRI Listed
- Registered on most cropping systems
- Applied twice a month in season at 1.5 to 2 gallons per acre.
- Overlaid onto the growers pre-plant application of 400 pounds per acre chloropicrin flat fumed.
- Ground known to be infected with Charcoal Rot (*Macrophomina phaseolina*)



# Photo 1: 11-20-13. First application Day





# Photo 2: 12-23-13. Beds with Orange Flags Treated with TerraClean





# Photo 2: 1-20-14.





# Photo 4: 5-5-14. End of Season Macrophomina Disease Development





# Photo 5: 5-15-14. End of Season Macrophomina Disease Development



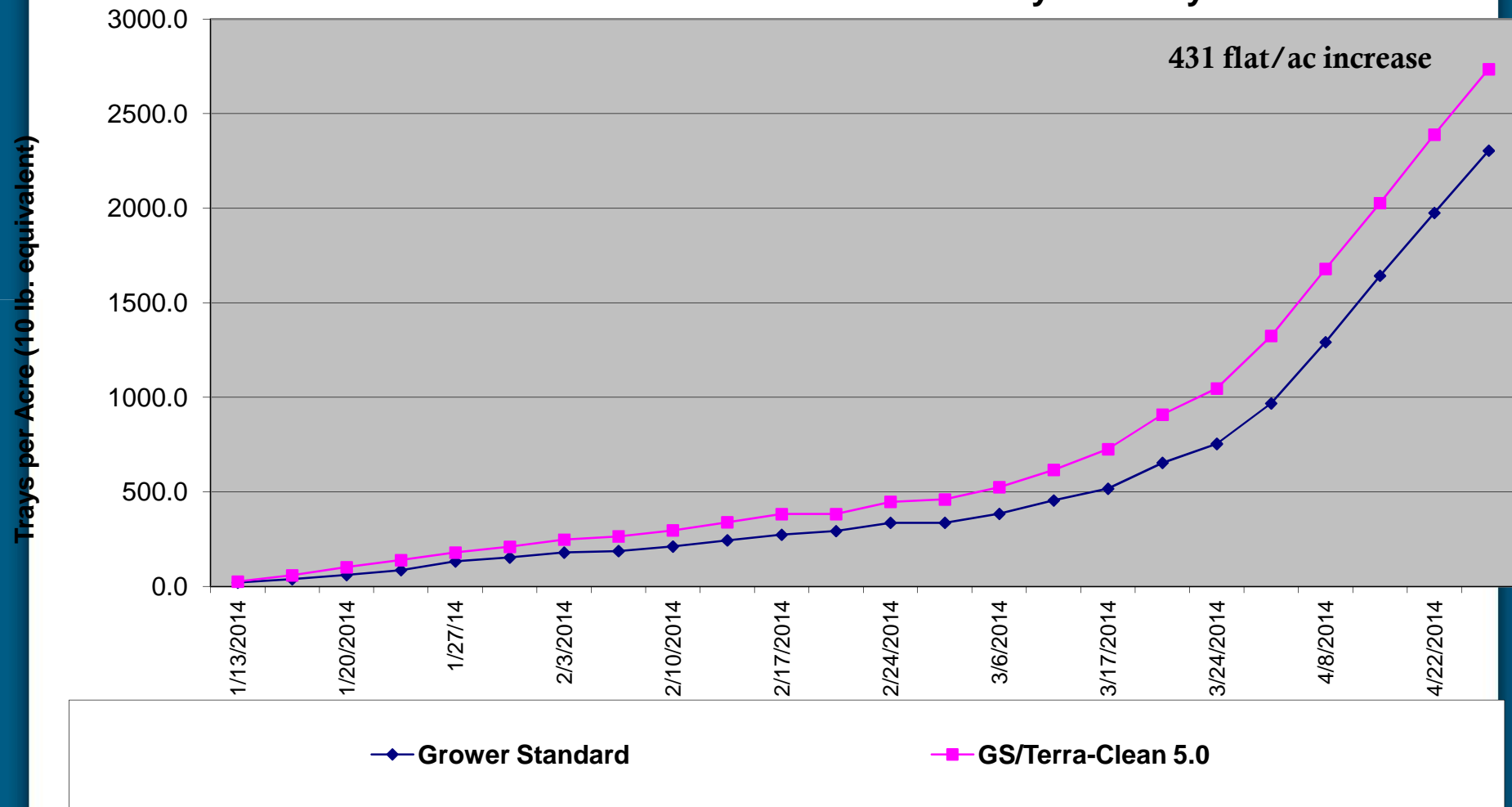
**TerraClean Treated Bed**

# Plant Mortality at End of Season – June 6, 2014

- Grower Standard (Preplant Chloropicrin Fumigation) – 24.9% **a** dead plants
- Grower Standard (Preplant Chloropicrin Fumigation) plus multiple applications of Terra Clean 5.0 – 10.7% **b** dead plants

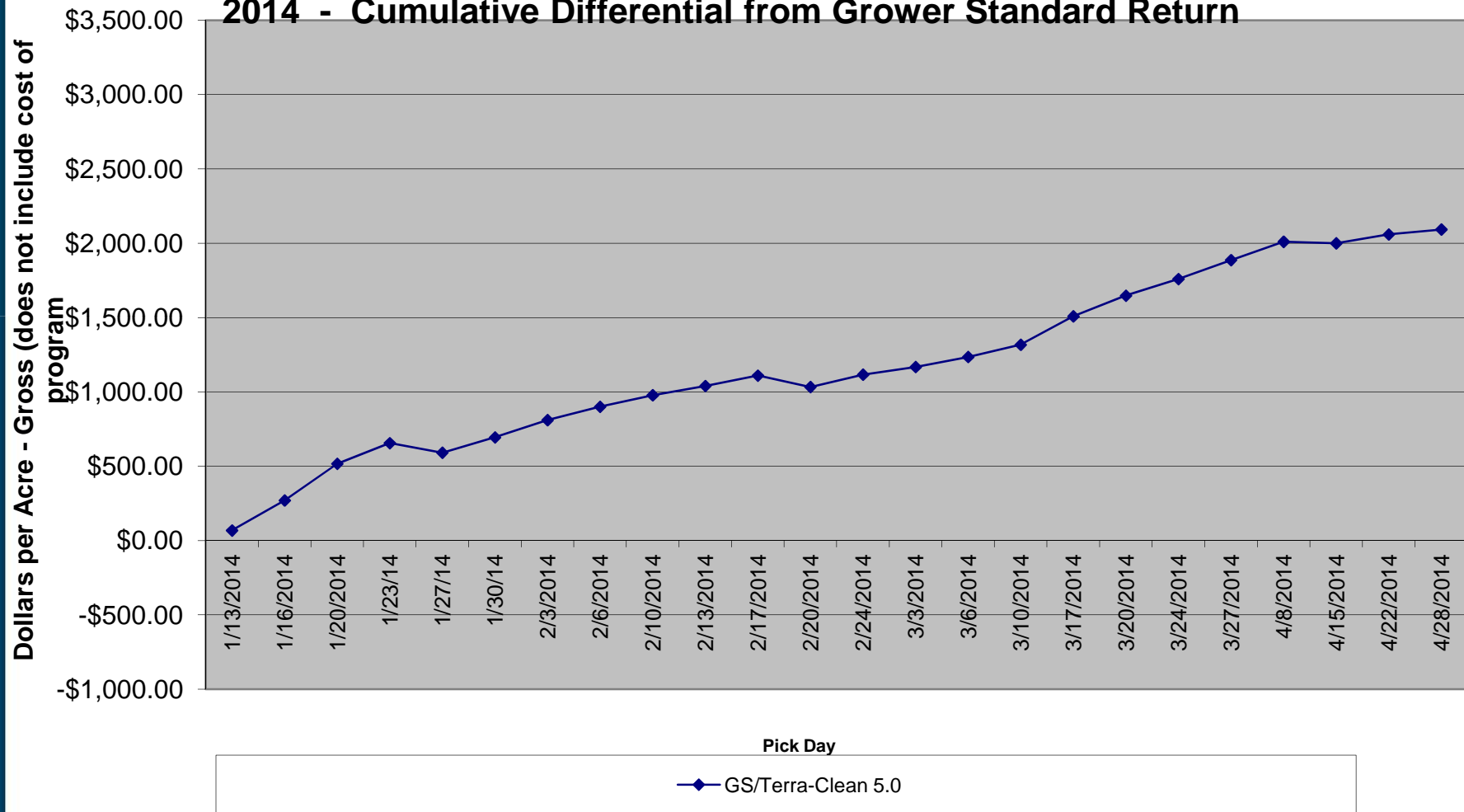
# 2013-14 Production Results

Chart 2: BioSafe in Strawberries - Ventura County, Fall/Winter 2013-2014 - Cumulative Marketable Production by Pick Day



# 2013-14 Production Results

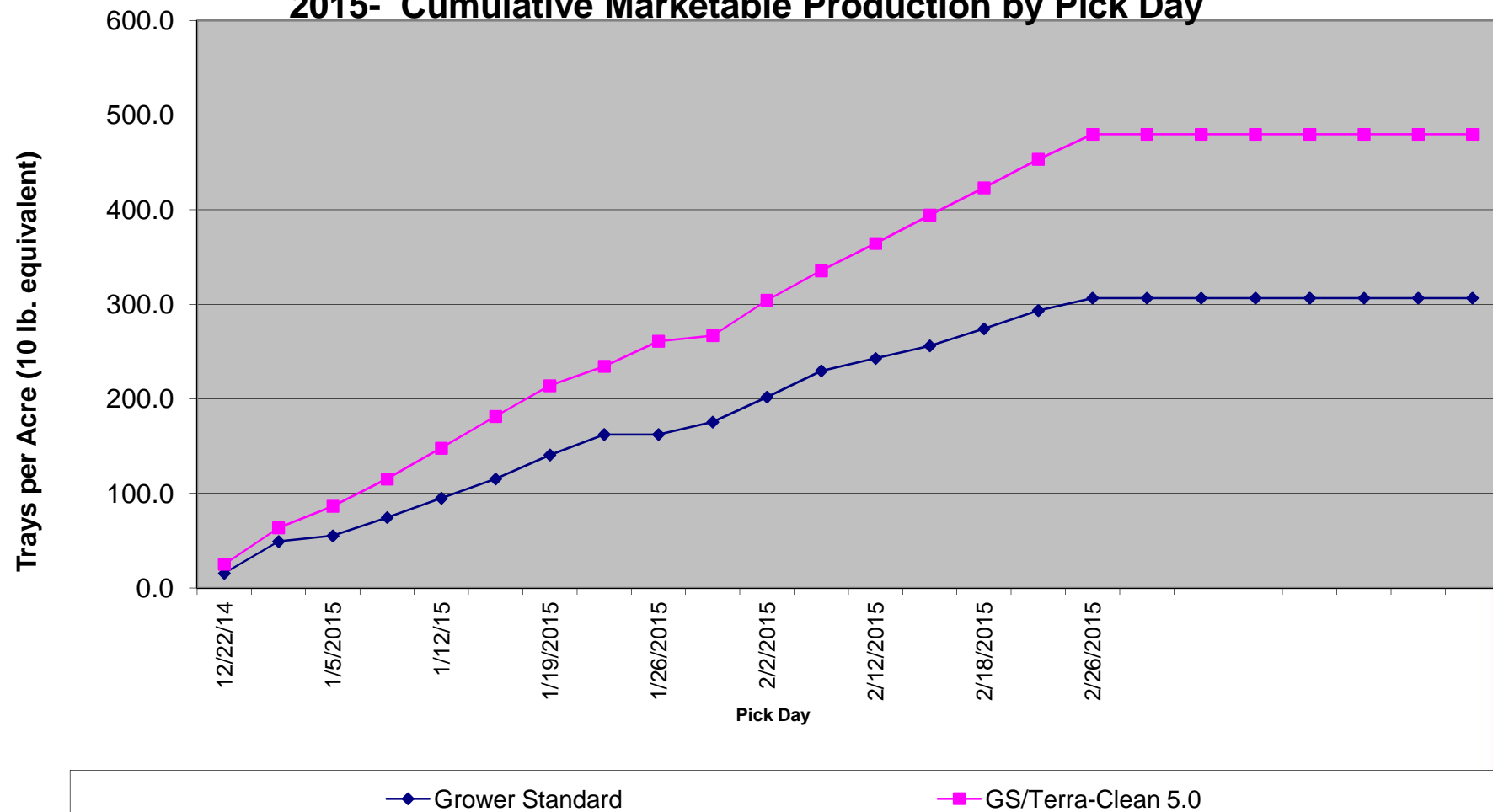
**Chart 7: Biosafe in Strawberries - Ventura County, Fall/Winter 2013-2014 - Cumulative Differential from Grower Standard Return**



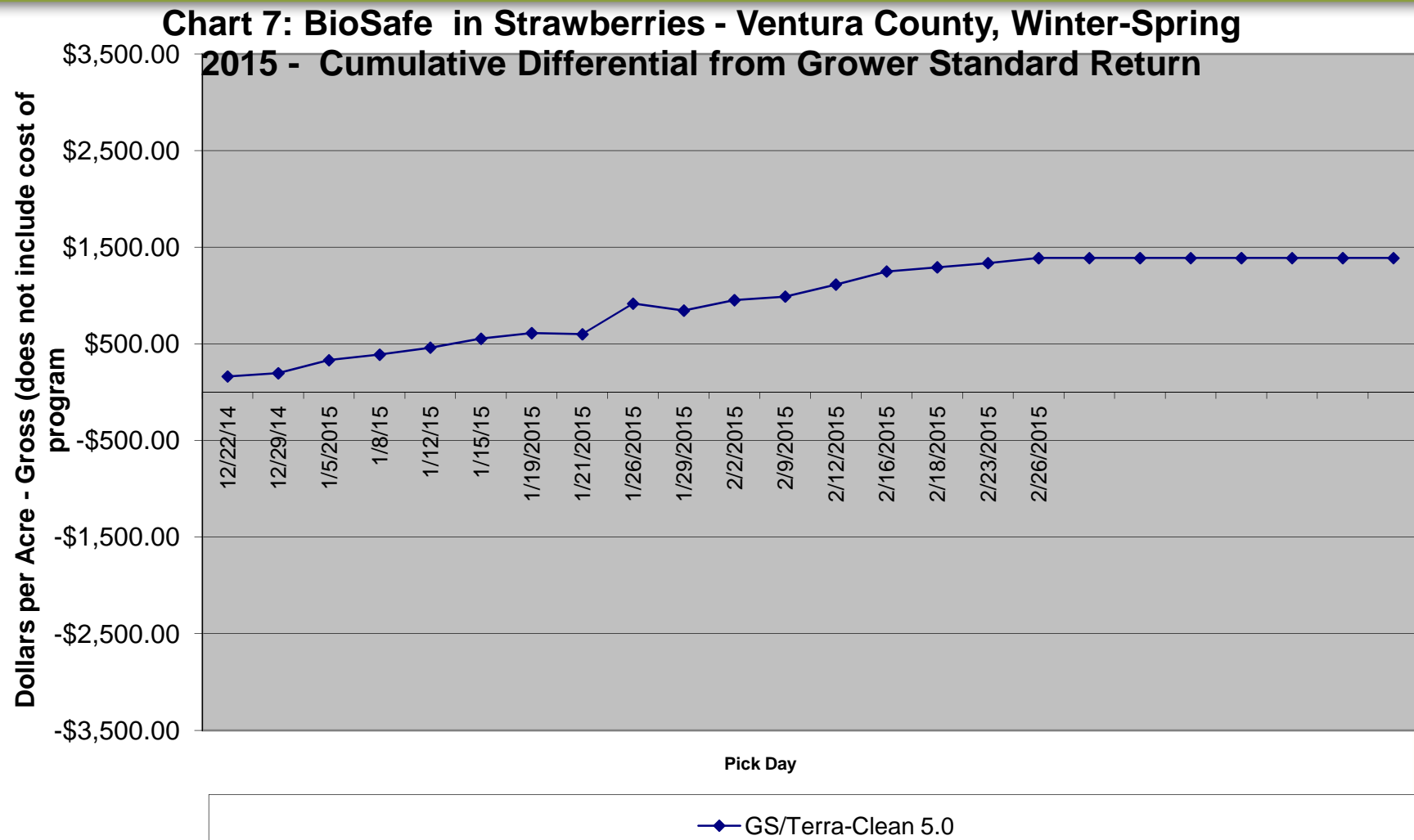


# 2014-15 Production Results To Date

**Chart 2: BioSafe in Strawberries - Ventura County, Winter-Spring 2015- Cumulative Marketable Production by Pick Day**



# 2014-15 Production Results To Date

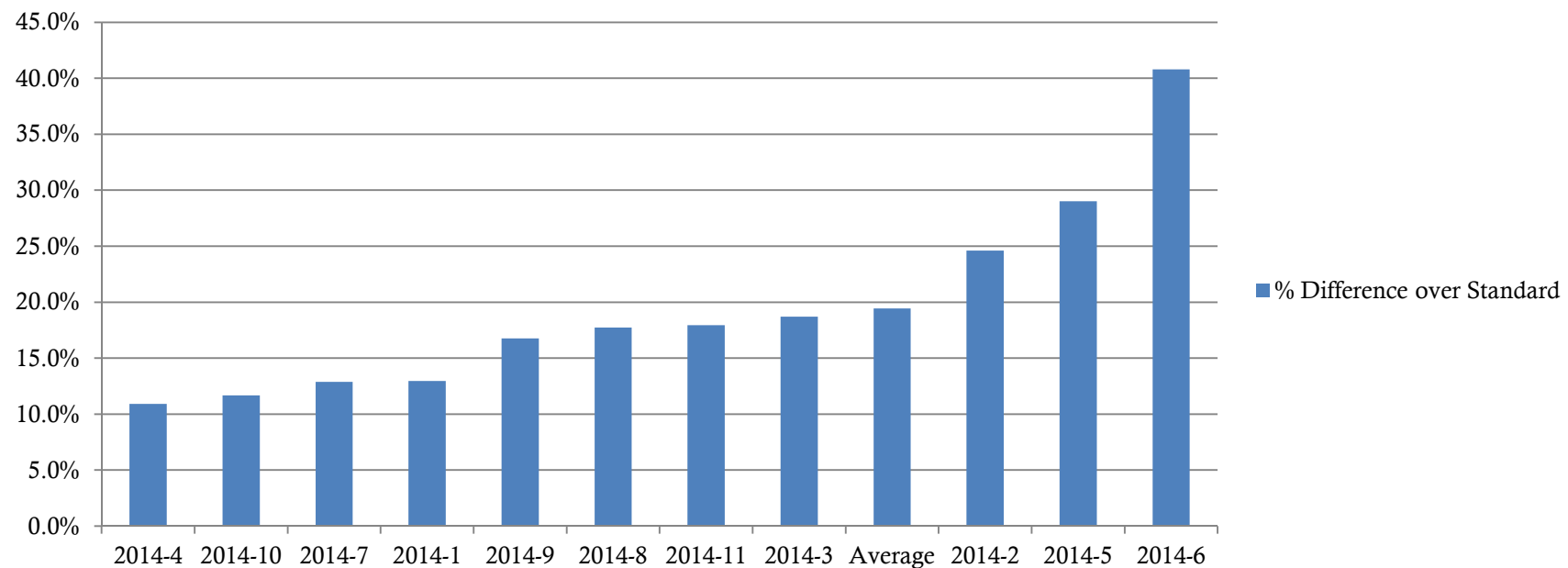


# Results from other BioPesticides

- All applied in fields known to have issues with Macrophomina and varieties susceptible to that disease.

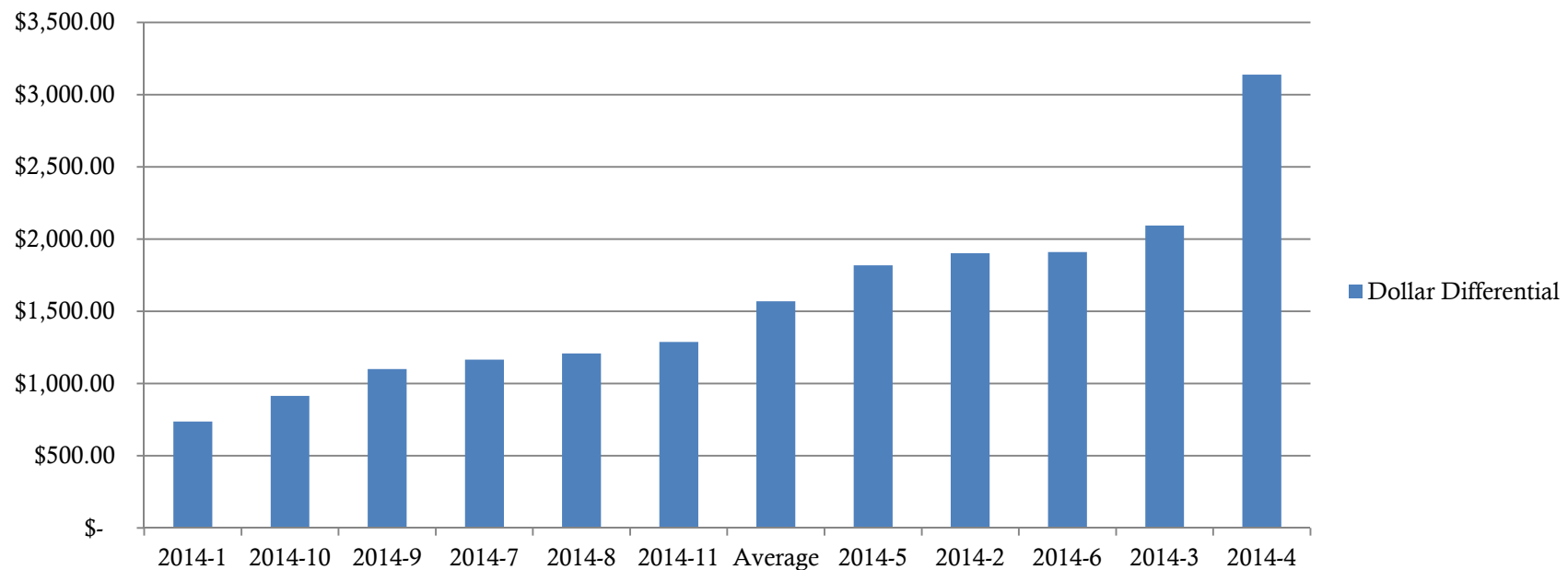
# Average Percent Yield Increases in 2014

**Holden Research and Consulting Biofungicides on Strawberries for 2014 through the tape on Ground that had been Fumigated with 400 lbs/ac Chloropicrin Percent Increase in Yield over the Grower Standard. *Macrophomina phaseolina* present in the field.**



# Average Dollar Increase in 2014

**Holden Research and Consulting Biofungicides on Strawberries  
for 2014 through the tape on Ground that had been Fumigated  
with 400 lbs/ac Chloropicrin, Net Dollar Increase per Acre  
(after pick cost, but not extracting cost of Materials in Yield over  
the Gr**





# Biostimulant Trials in Conventional Strawberries.

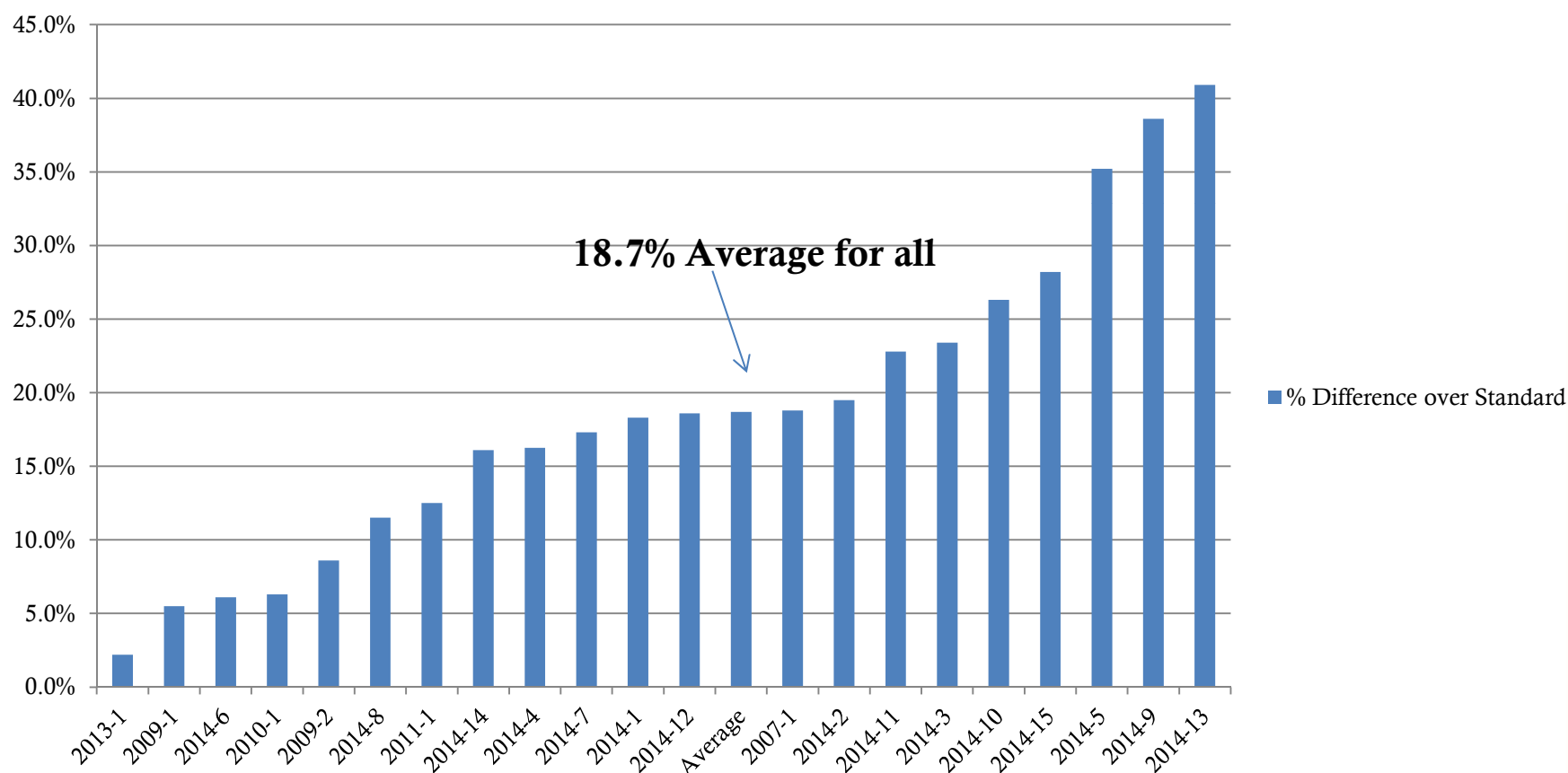
2007 to Current

# Details

- Most applications were in the tape, not foliar
- Most trials involved natural chemically based products (seaweeds, CPPA, humics), but one was also a bacterial based product.

# Seven Years of Yield Data for Strawberries Treated with Biostimulants

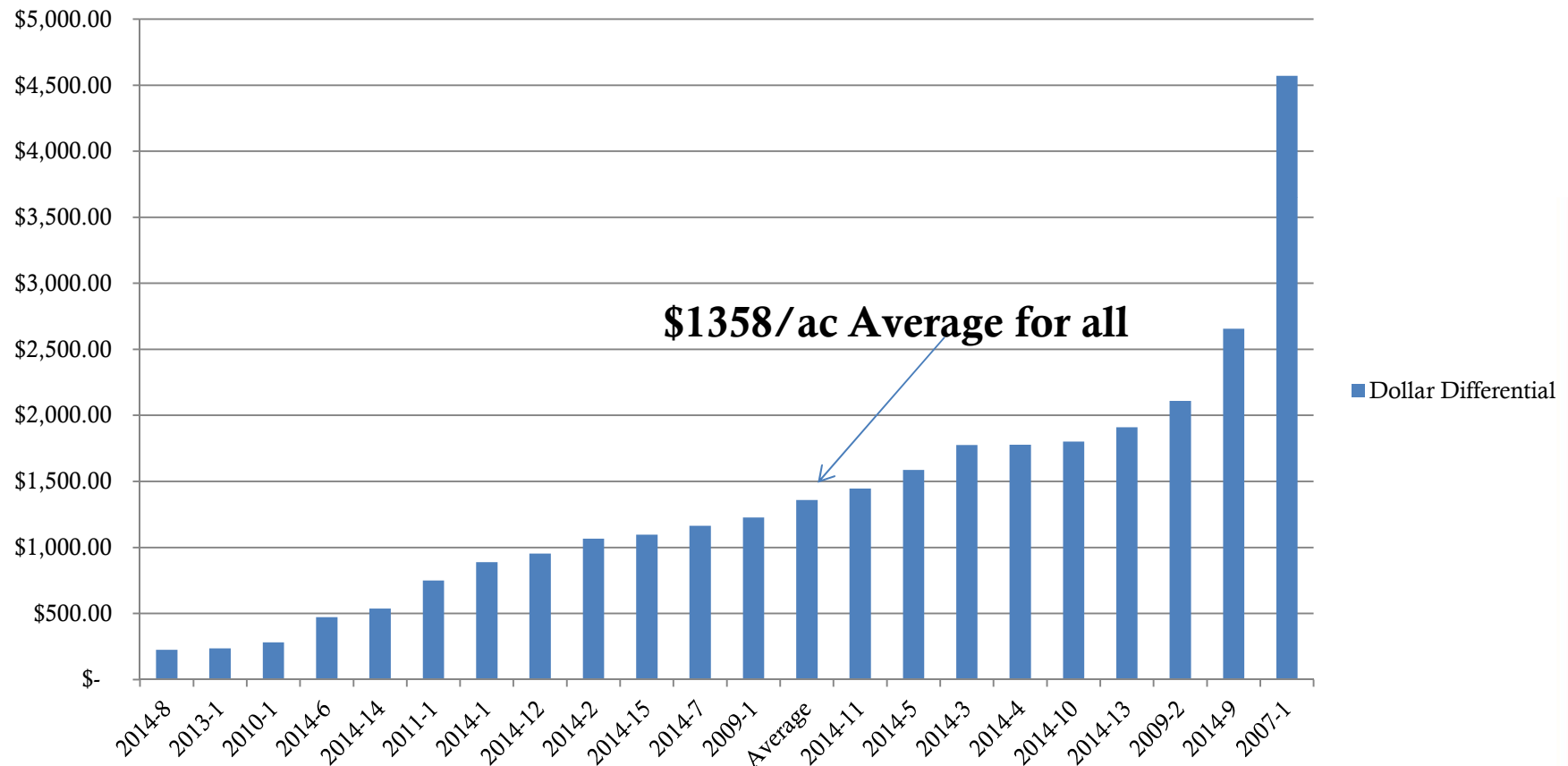
**Holden Research and Consulting Biostimulants on Strawberries  
from 2007 to 2014 Percent Difference in Production for Harvest  
Days Tracked over the Grower Standard**





# Dollar Value 2007-2014

**Holden Research and Consulting Biostimulants on Strawberries  
from 2007 to 2014 Net Dollars per Acre Difference in Production  
for Harvest Days Tracked over the Grower Standard**





# Thank you

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[www.holdenresearch.com](http://www.holdenresearch.com)