University of California Cooperative Extension Ventura County

Update on Ventura County Soil Disinfestation Trials

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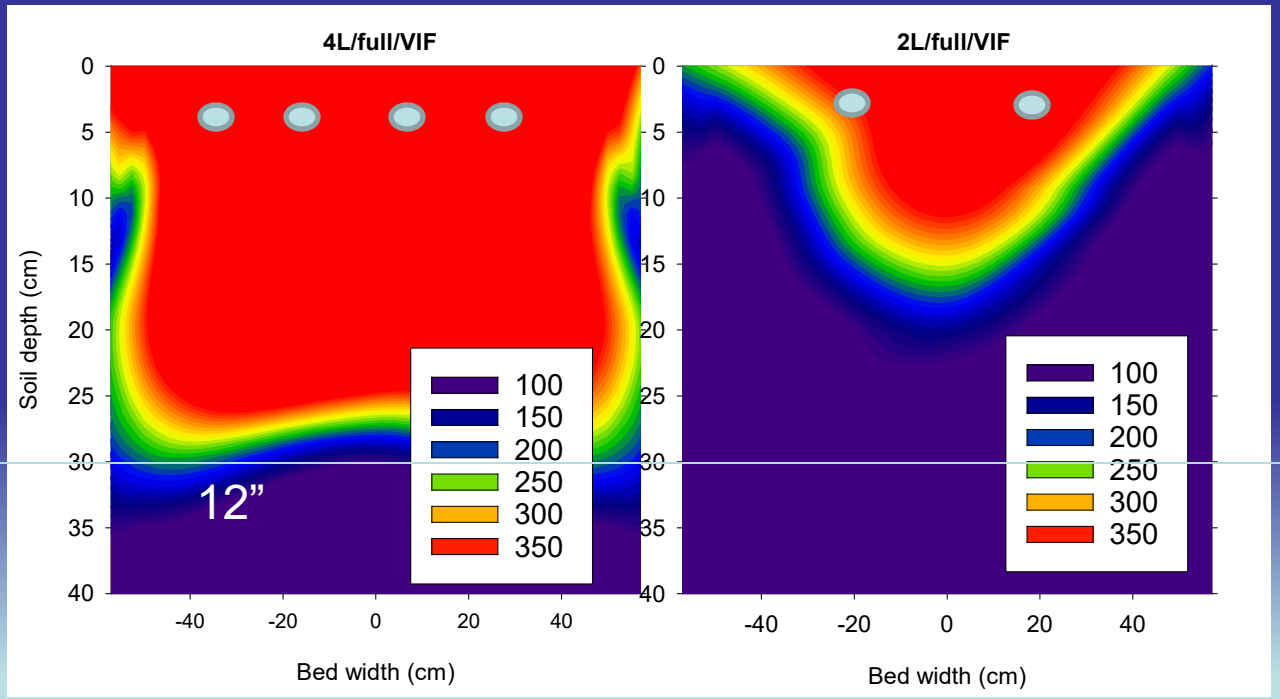
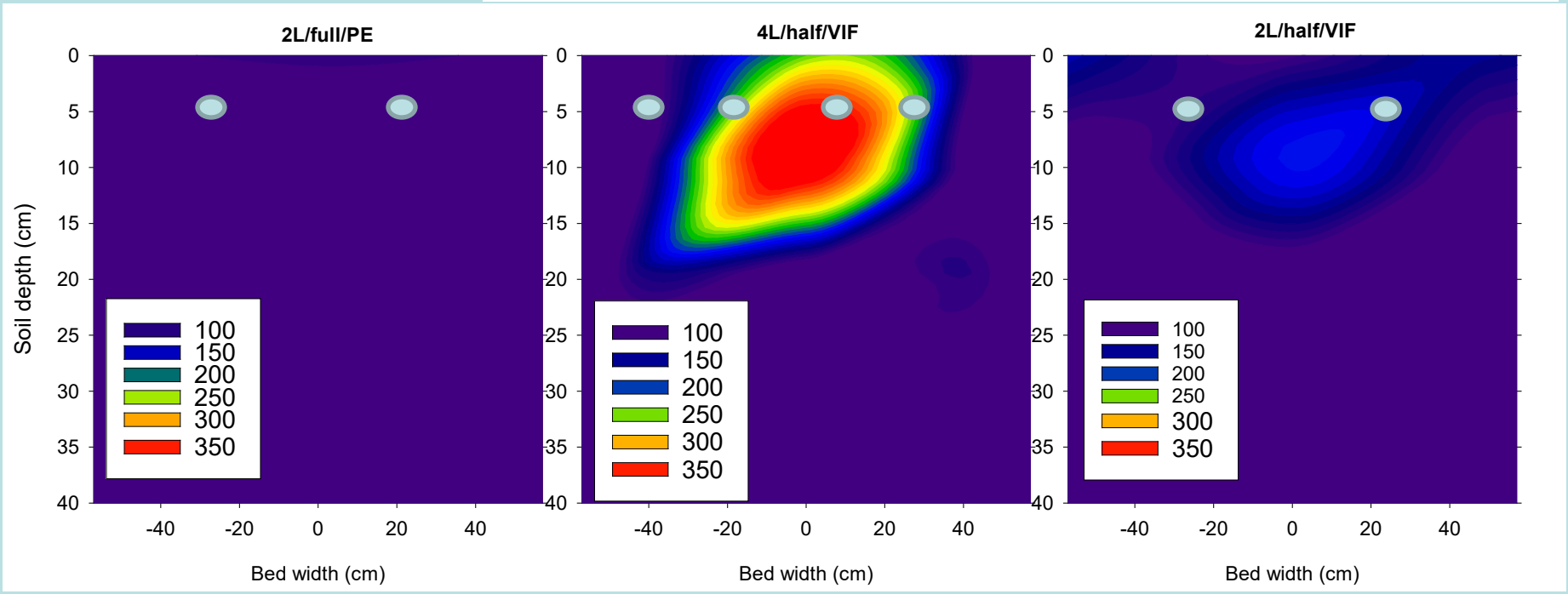
Adding lines for drip fumigation

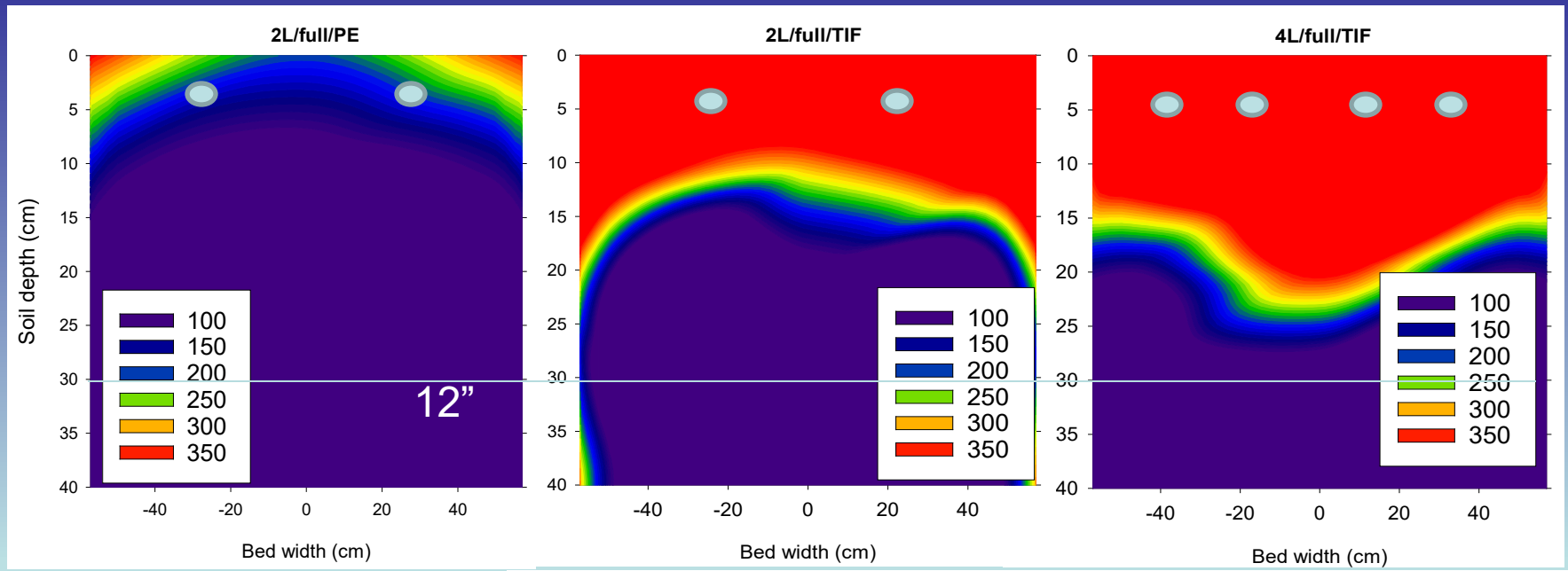
2014 Oxnard trial with Tri-Clor EC

Full rate:

224 lbs/ac



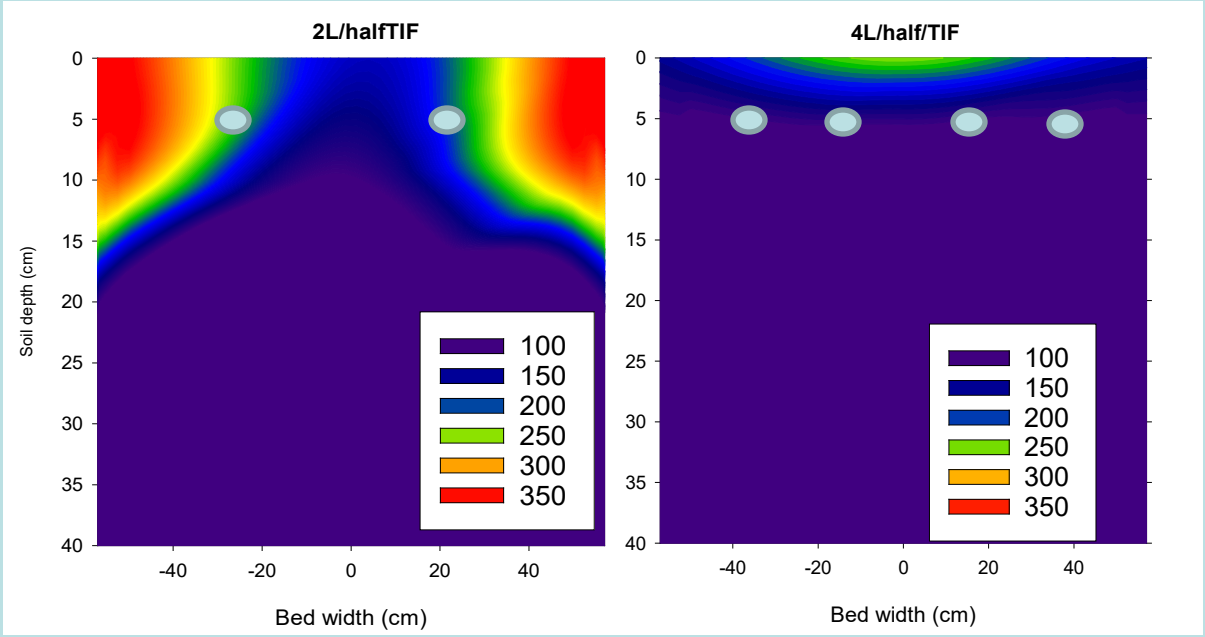




2015 Oxnard trial with Tri-Clor EC:

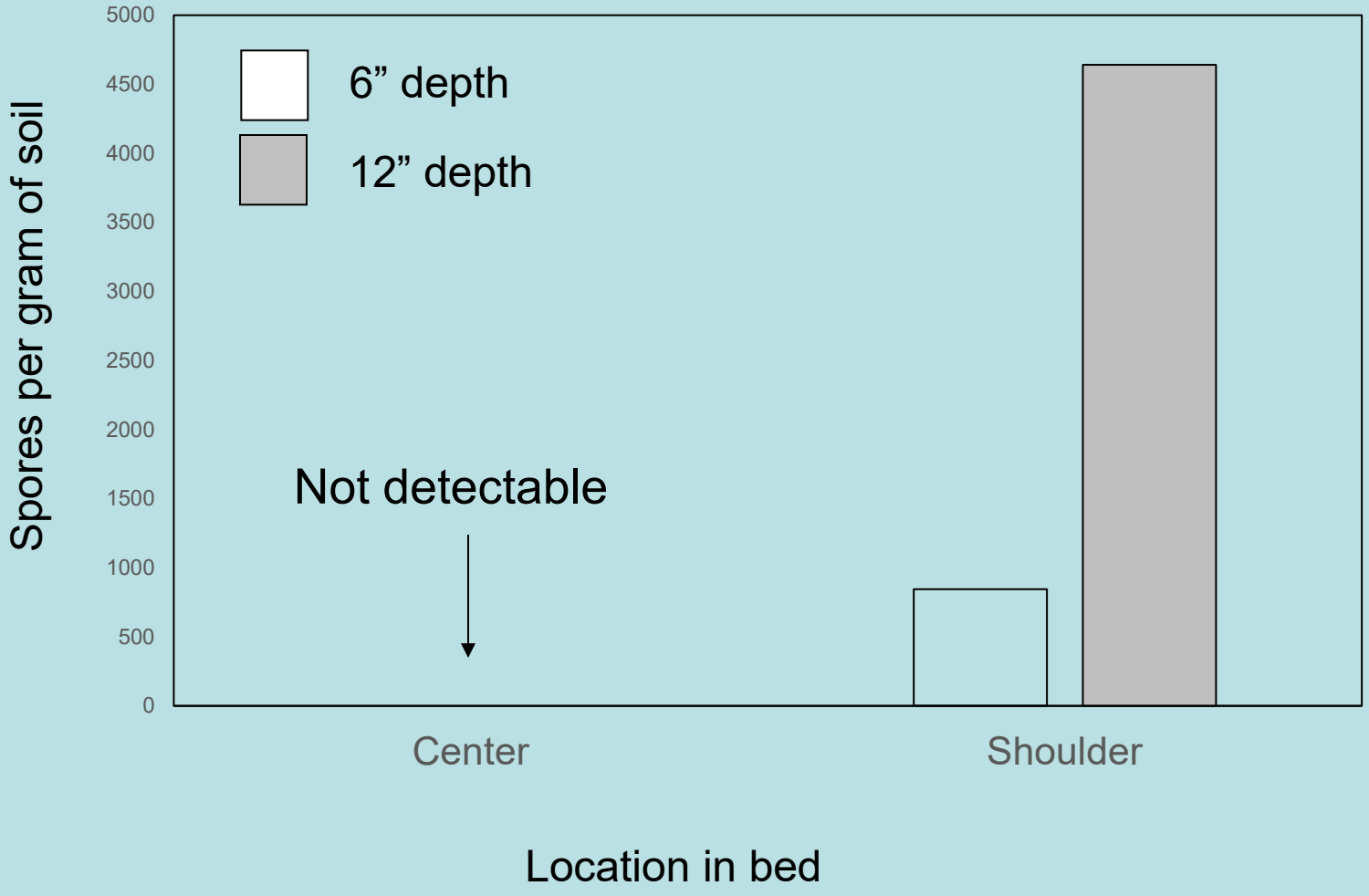
full rate: 200 lbs/ac

half rate: 100 lbs/ac

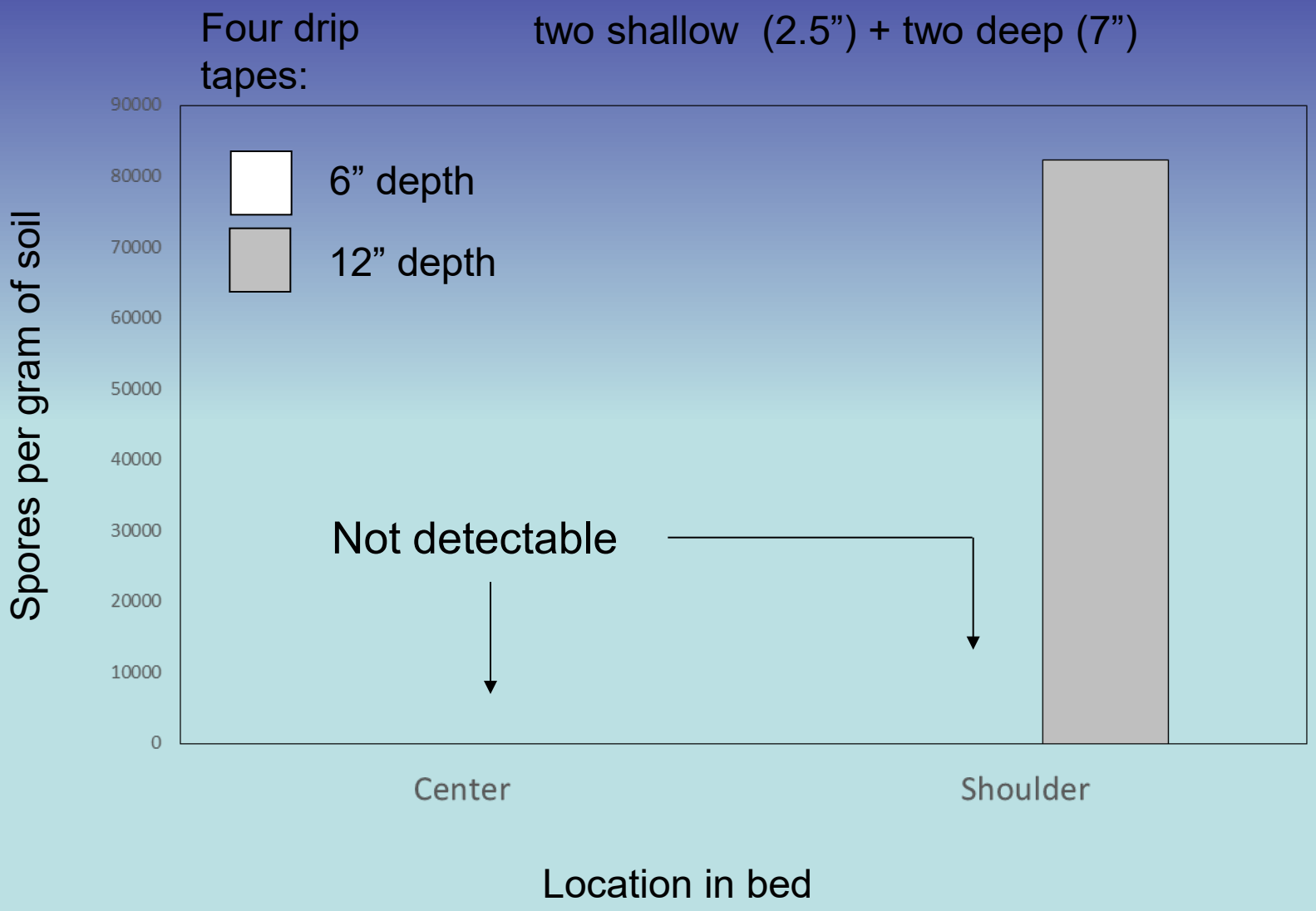


FUSARIUM survivorship

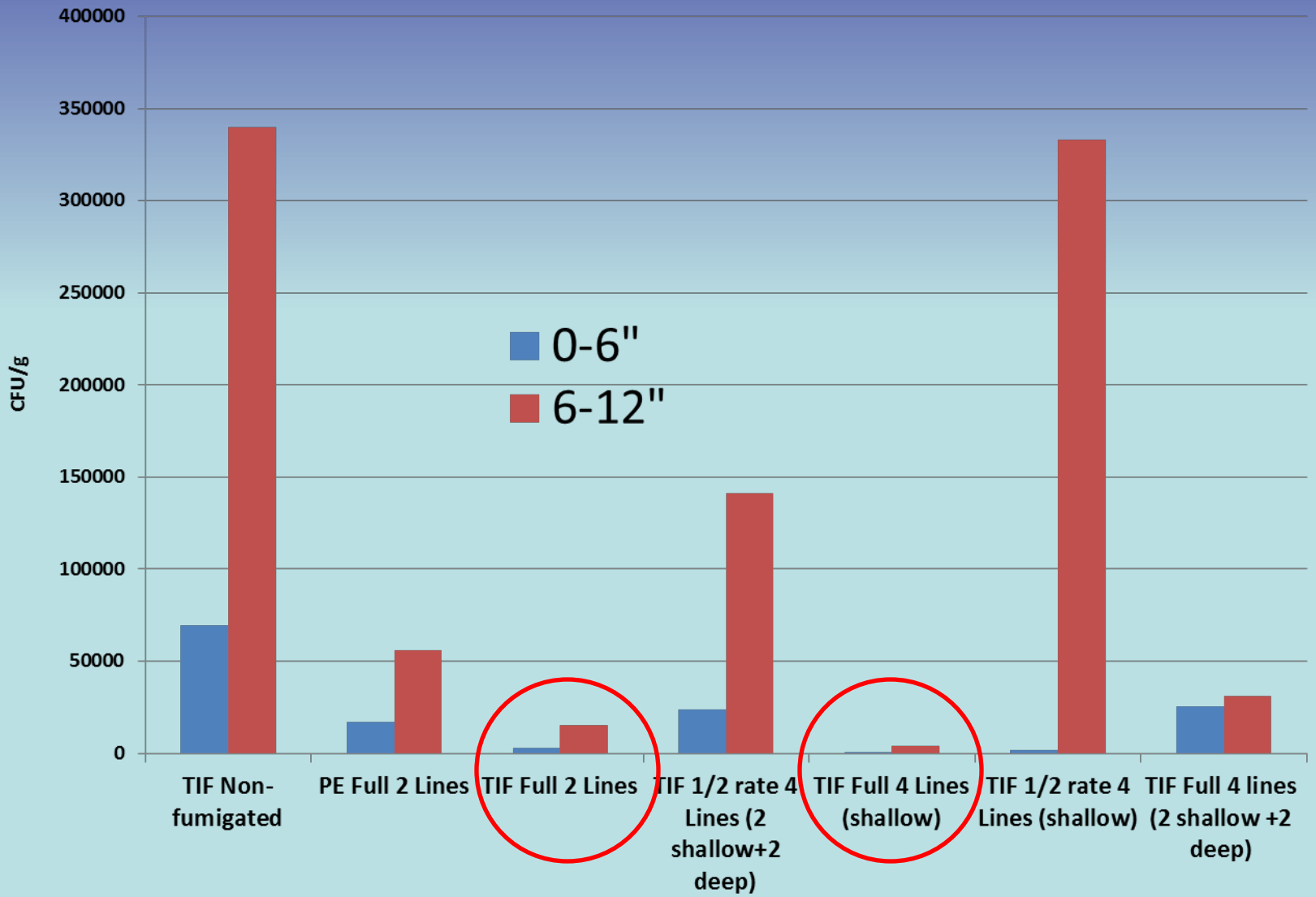
Four drip tapes: 4 Shallow depth (2.5 “)



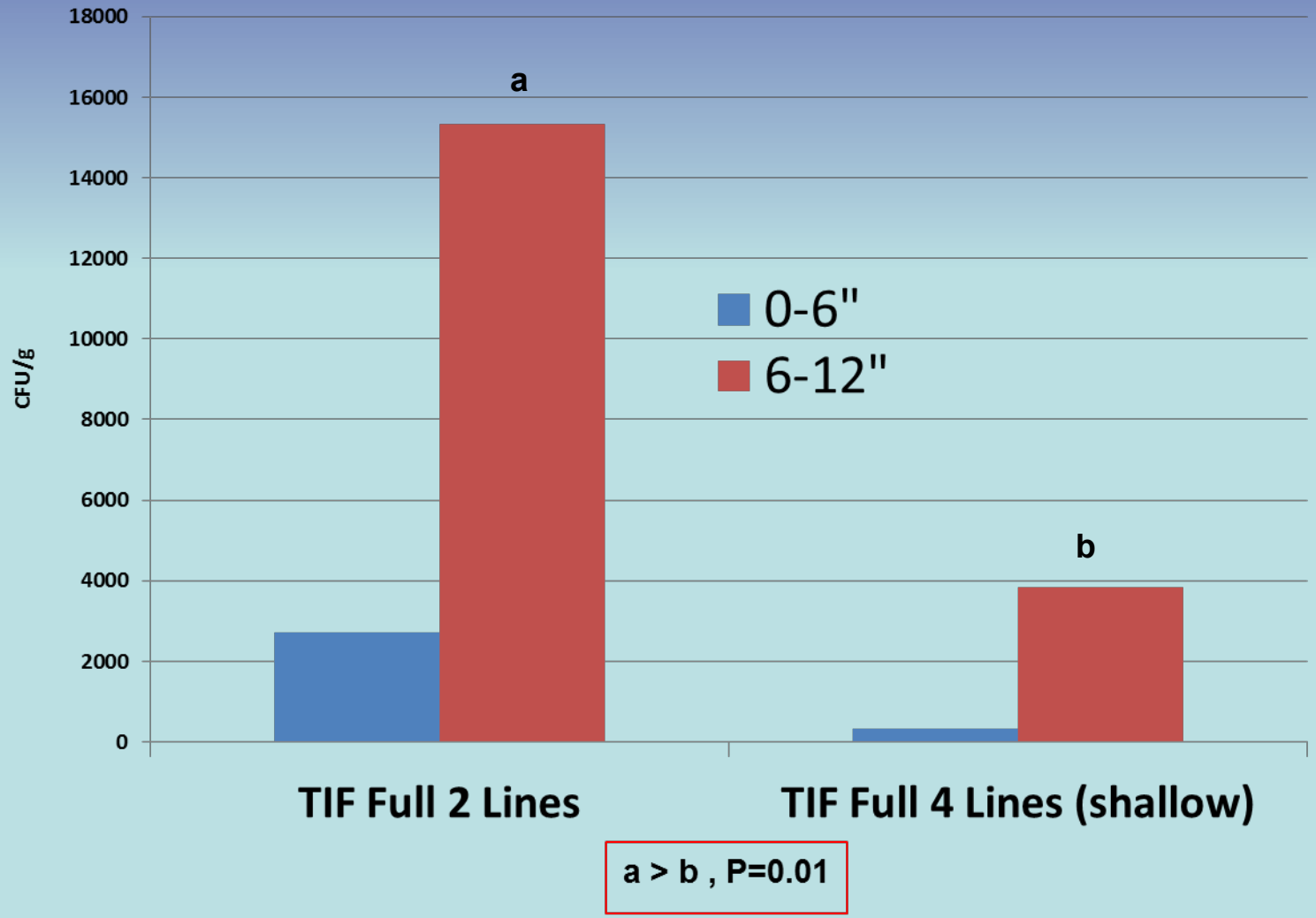
FUSARIUM survivorship



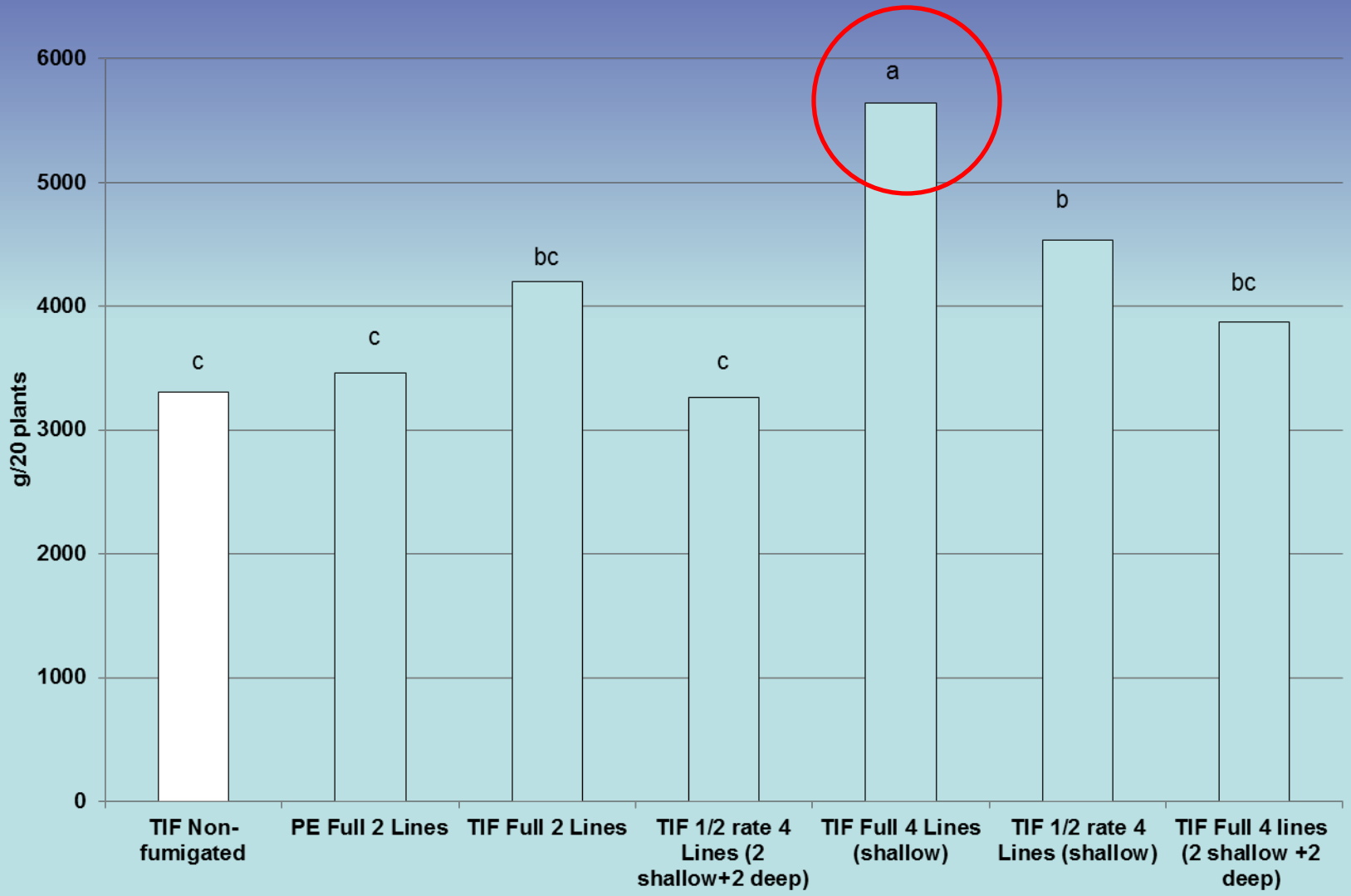
Fusarium in sand inoculum



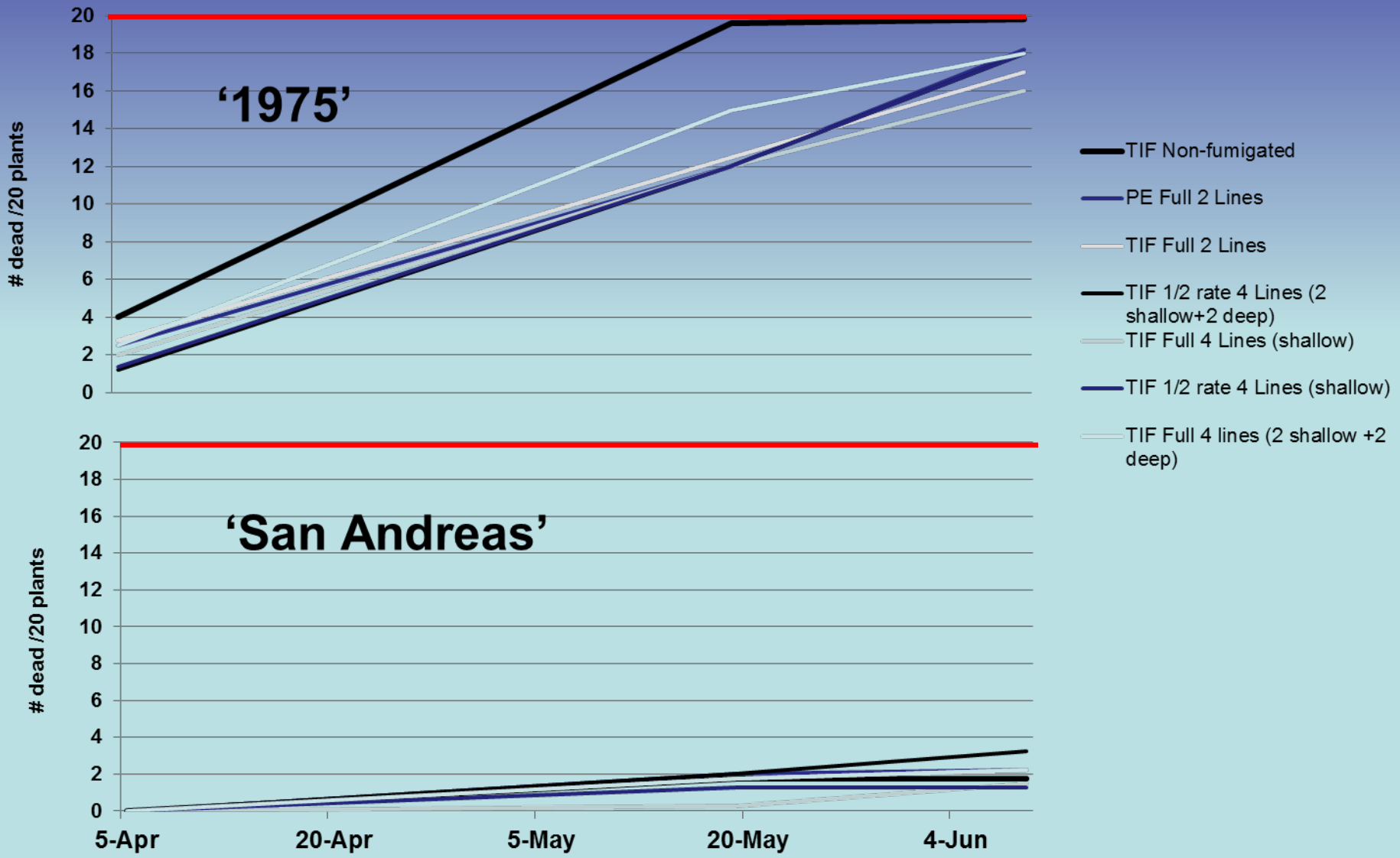
Fusarium in sand inoculum



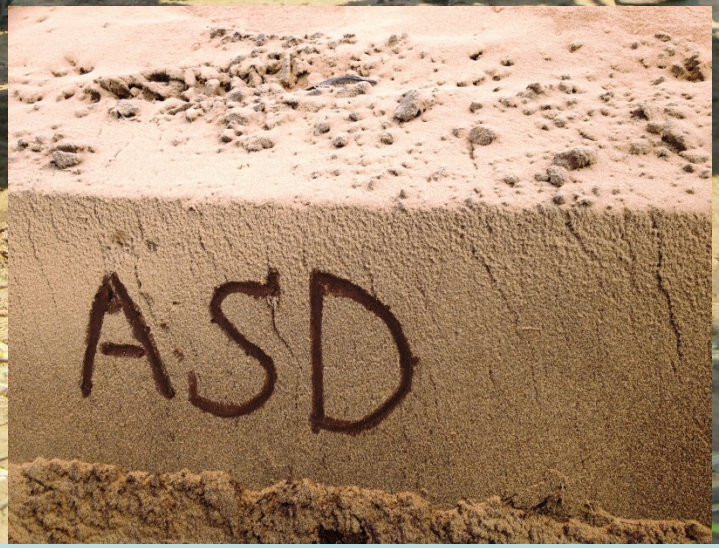
Marketable fruit yield: Jan-April



Plant mortality



ASD = Carbon source + water + plastic



Adding rice bran to soil for ASD

Anaerobiosis

Organic acids

pH reduction

Micronutrient availability

Available Nitrogen

Infiltration and salt leaching

Available Phosphorus

Microbial population shifts → Interaction with pathogenic organisms?

Short vs long term?

Other C-sources and soil environments?

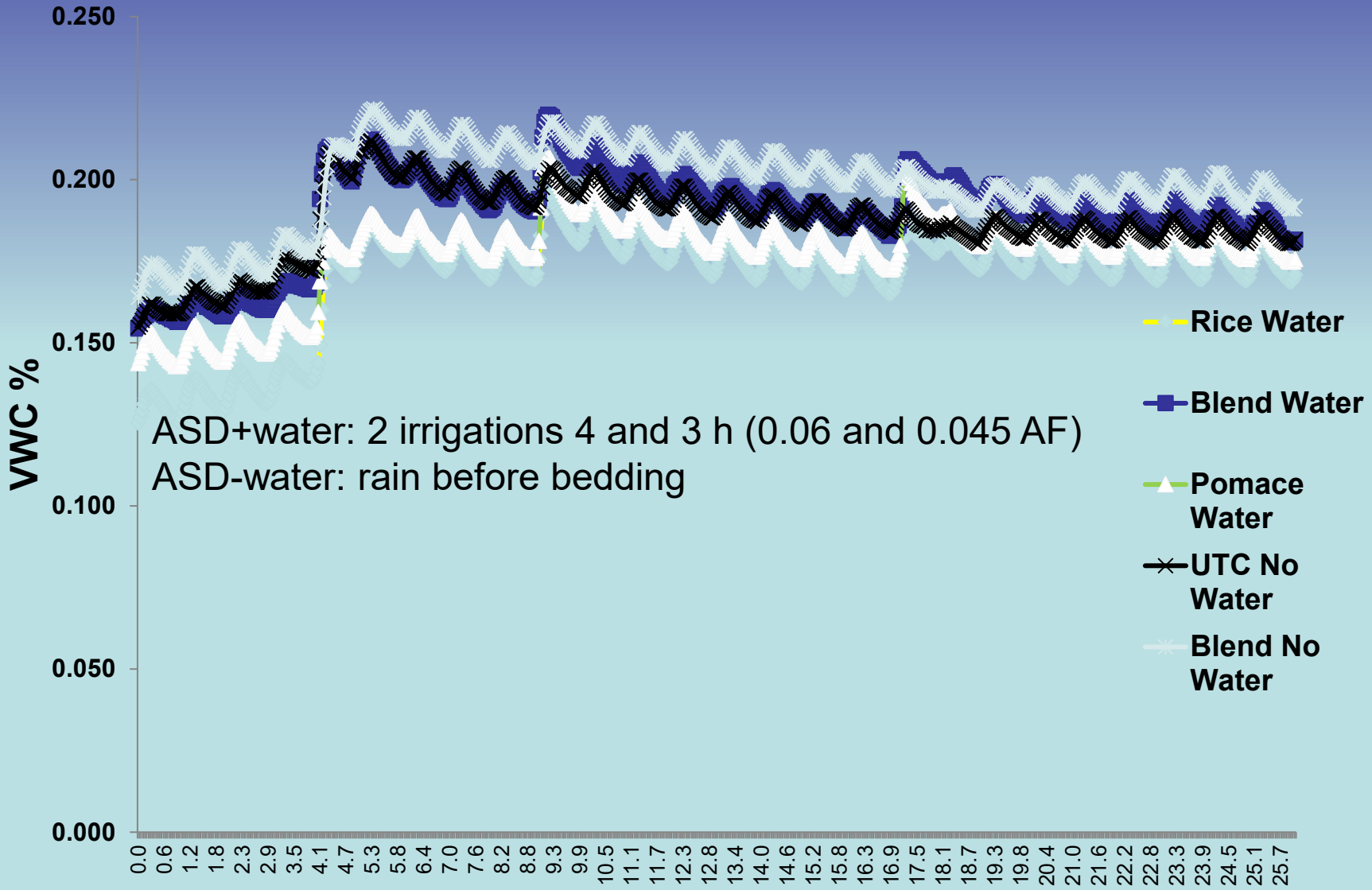
For C-source:

- Rice bran
- Glycerin
- Grape pomace
- Molasses
- Coffee grounds
- Grass clippings
- Spent grain
- And other

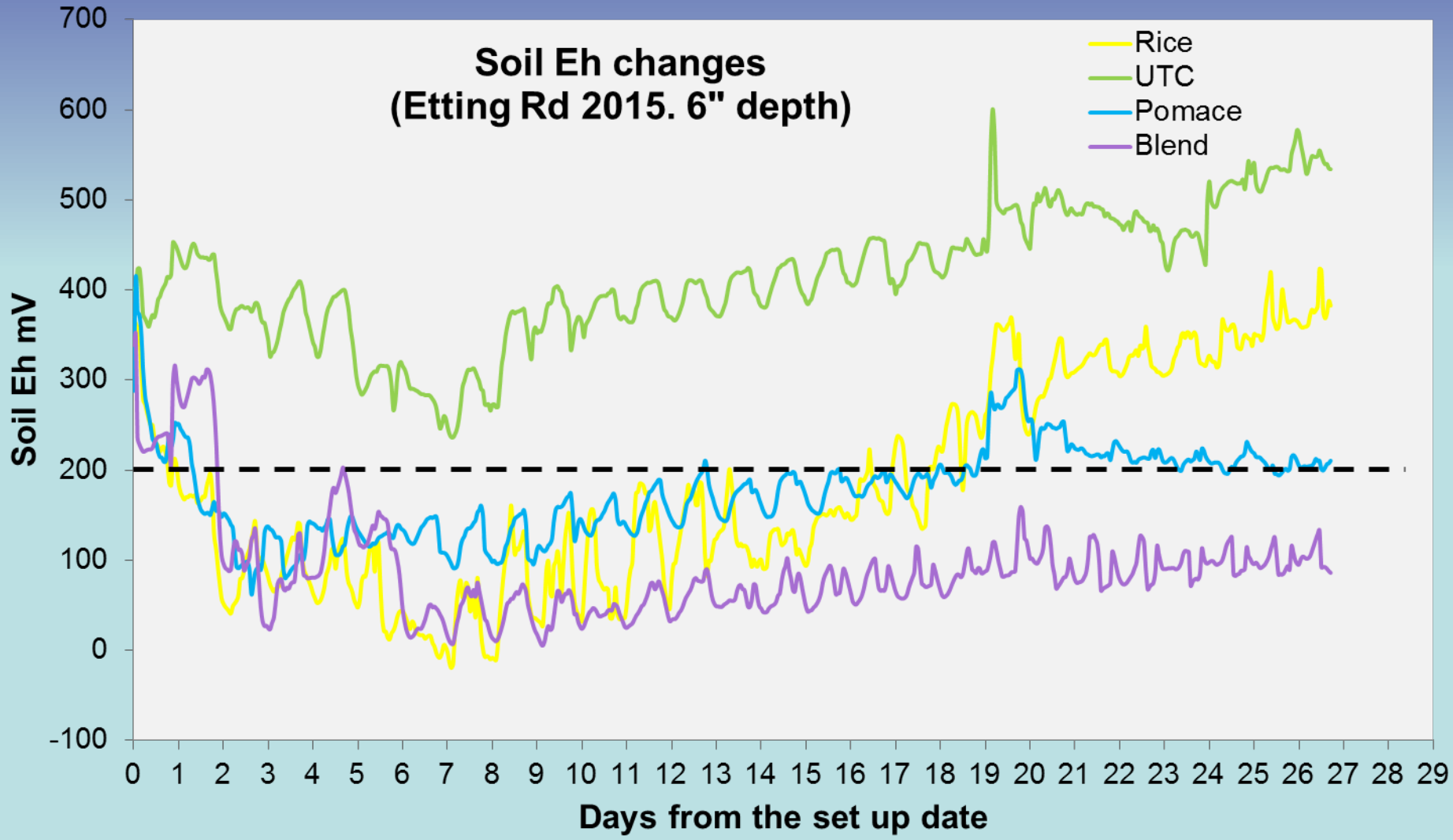
- Favorable C/N
- Easy to apply
- Cheap or Free and Available
- Min.Transportation
- Works consistently

Grape pomace, rice bran and blend (rice+almond mix) in organic field

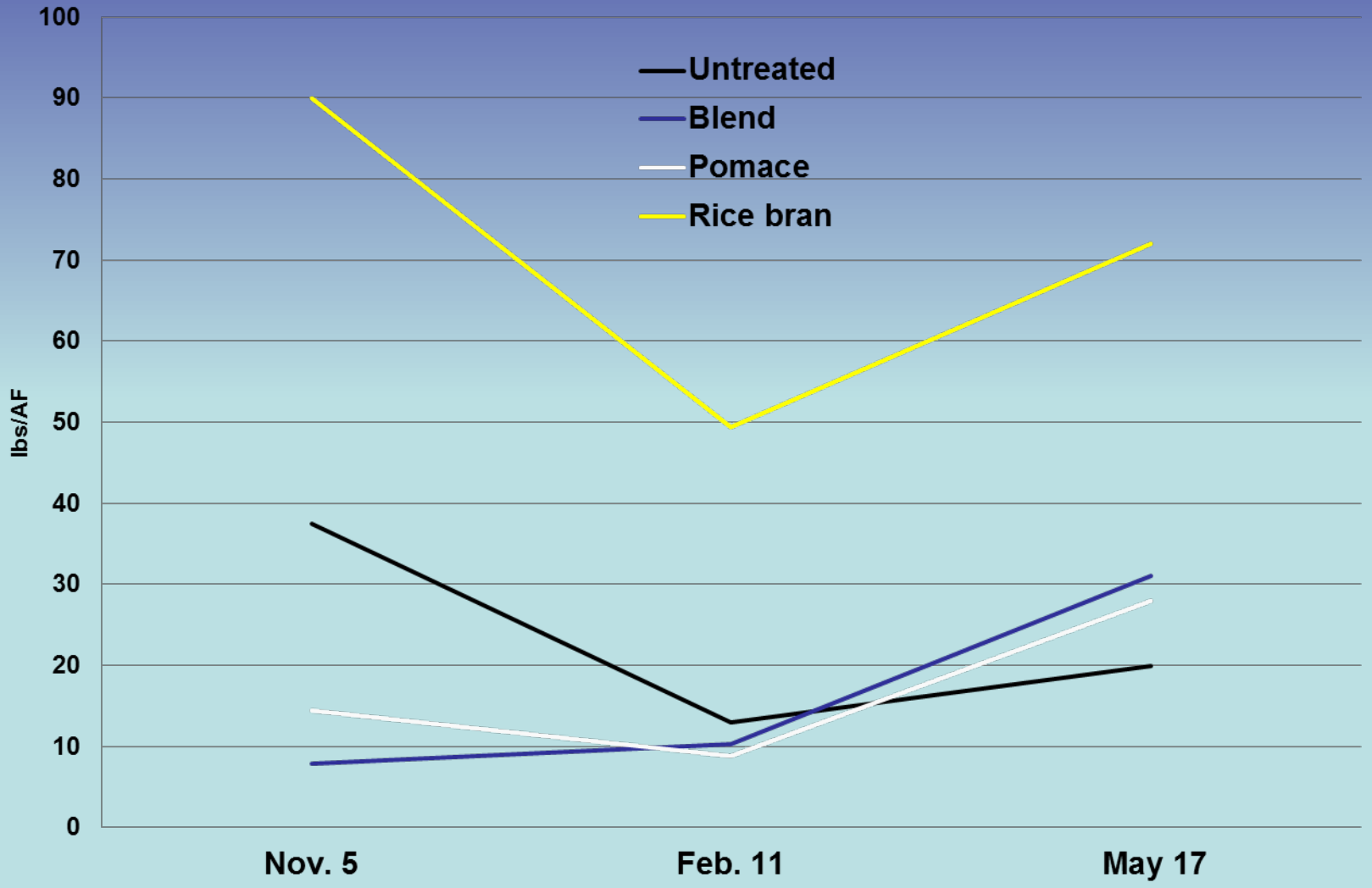
Soil Moisture



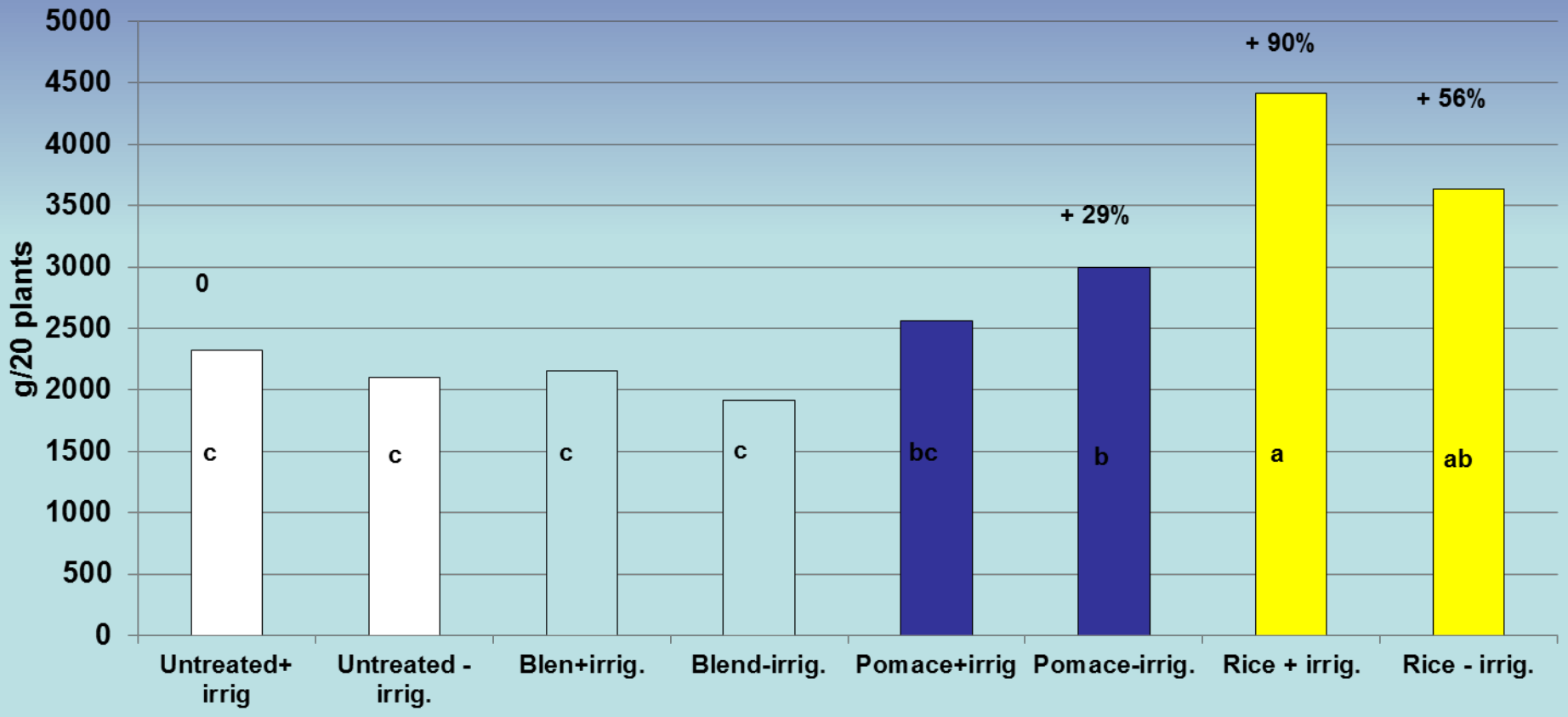
Anaerobic conditions in sandy soil



NO_3-N
at 0 -12”

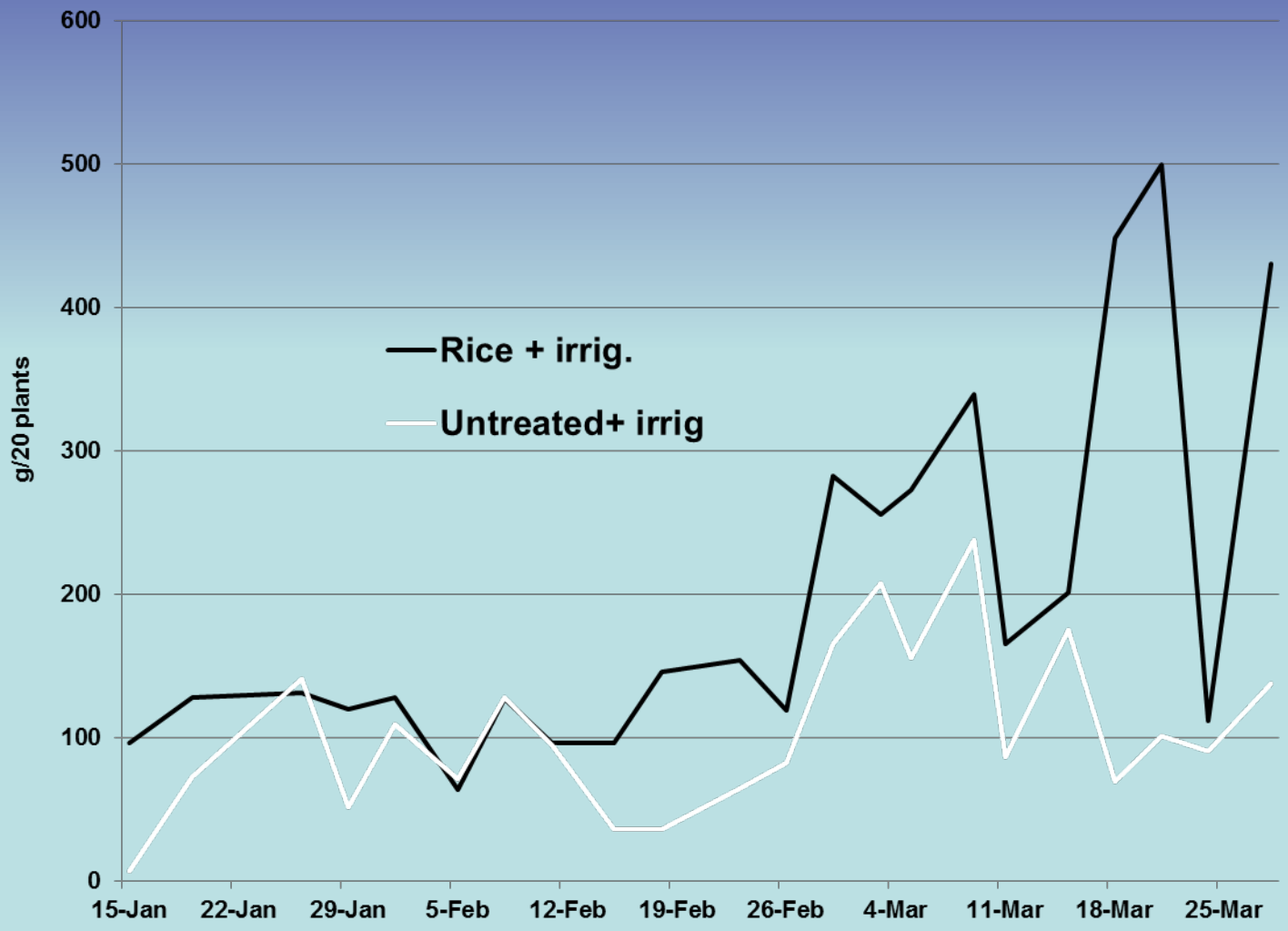

100
90
80
70
60
50
40
30
20
10
0
lbs/AF
Untreated
Blend
Pomace
Rice bran
Nov. 5
Feb. 11
May 17

Marketable fruit yield, Dec-March

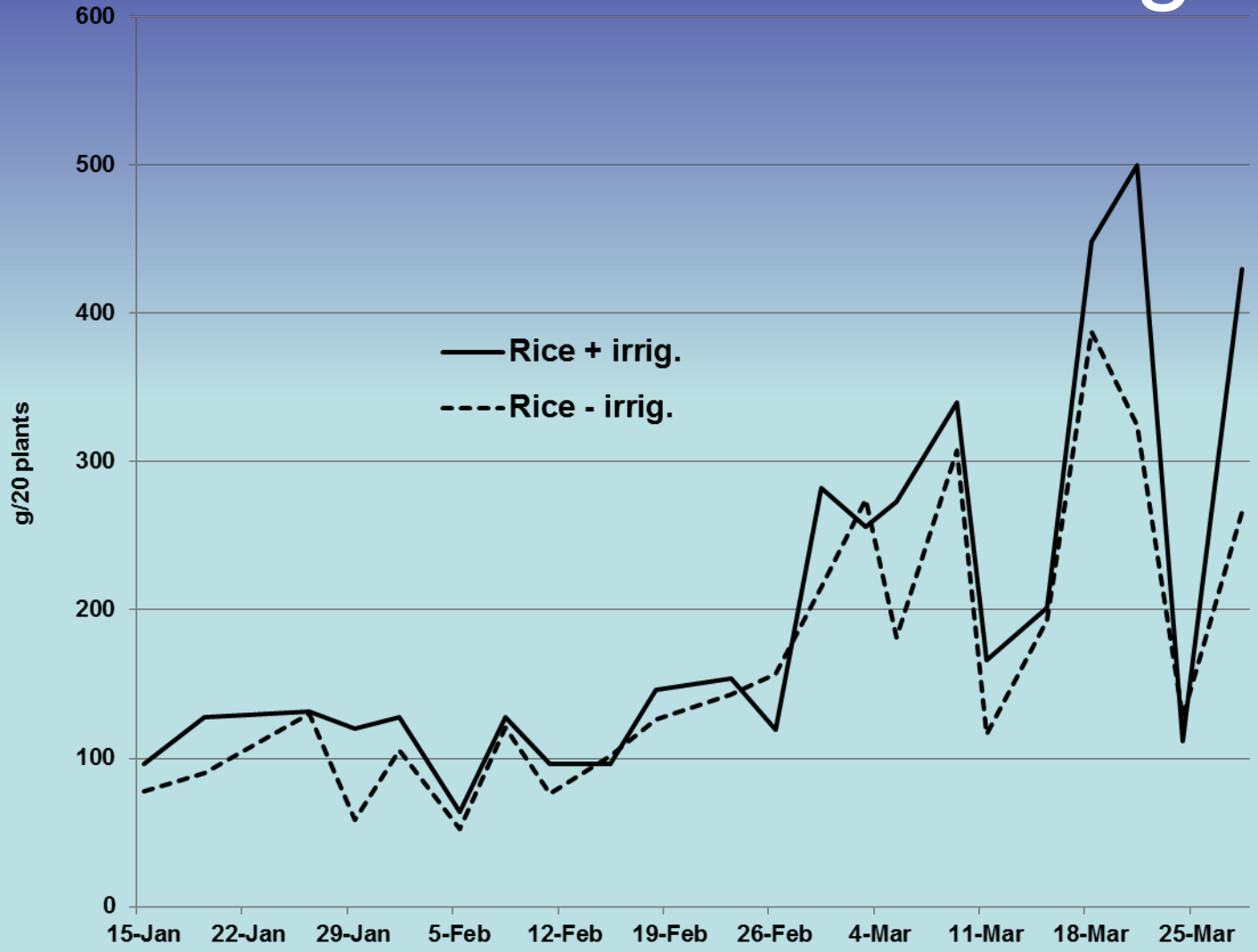


Tretements with the same letter are not signif. different at P=0.05

Yield: Rice vs Untreated



Yield: Rice with or w/o irrigation



Blend 9T (almonds shells, rice etc.)

Strong anaerobic conditions, but N deficiency, poor growth, susceptibility to spider mite damage

Rice bran 9T

Fewer cumulative anaerobic hours than blend, but sufficient NO3-N availability for 2 months

March 14, 2016

~~MB~~ Rice bran alternatives

C-sources:

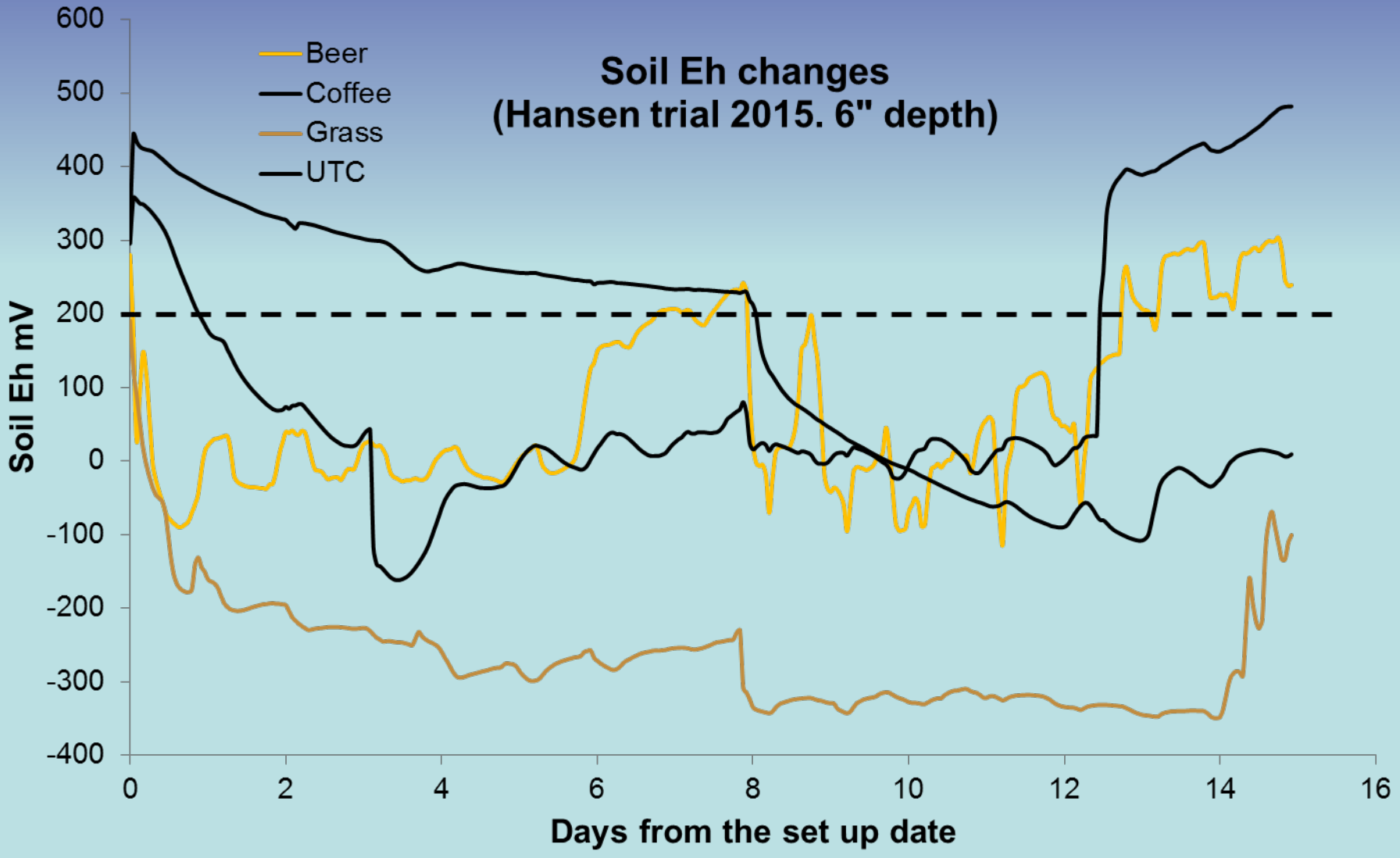
favorable C/N ratio, local, available, cheap

Coffee grounds
(Roasting plant at Camarillo)

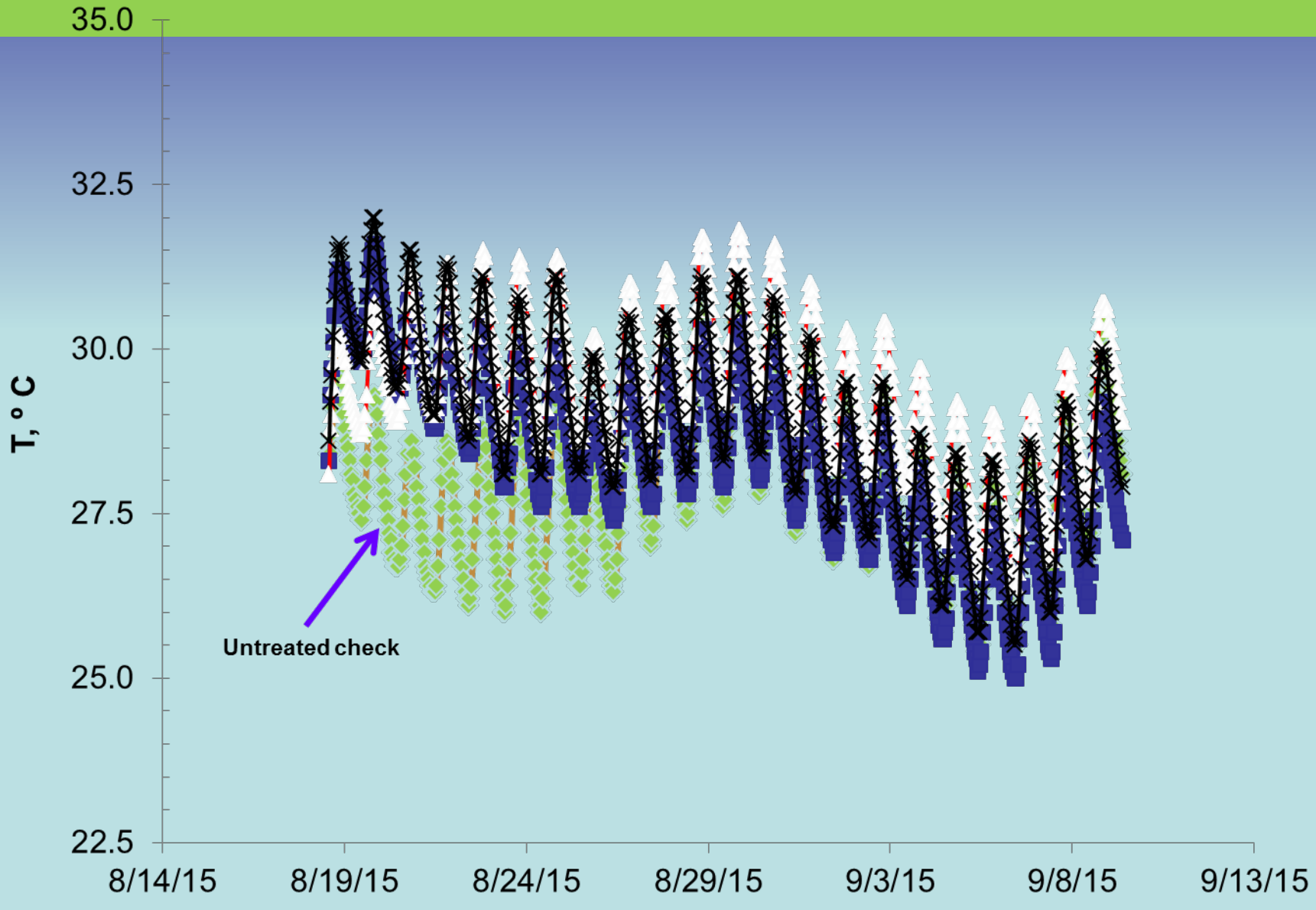
Spent grain
(Surf Brewery, Ventura)

Grass clippings
(Southland Sod at Camarillo)

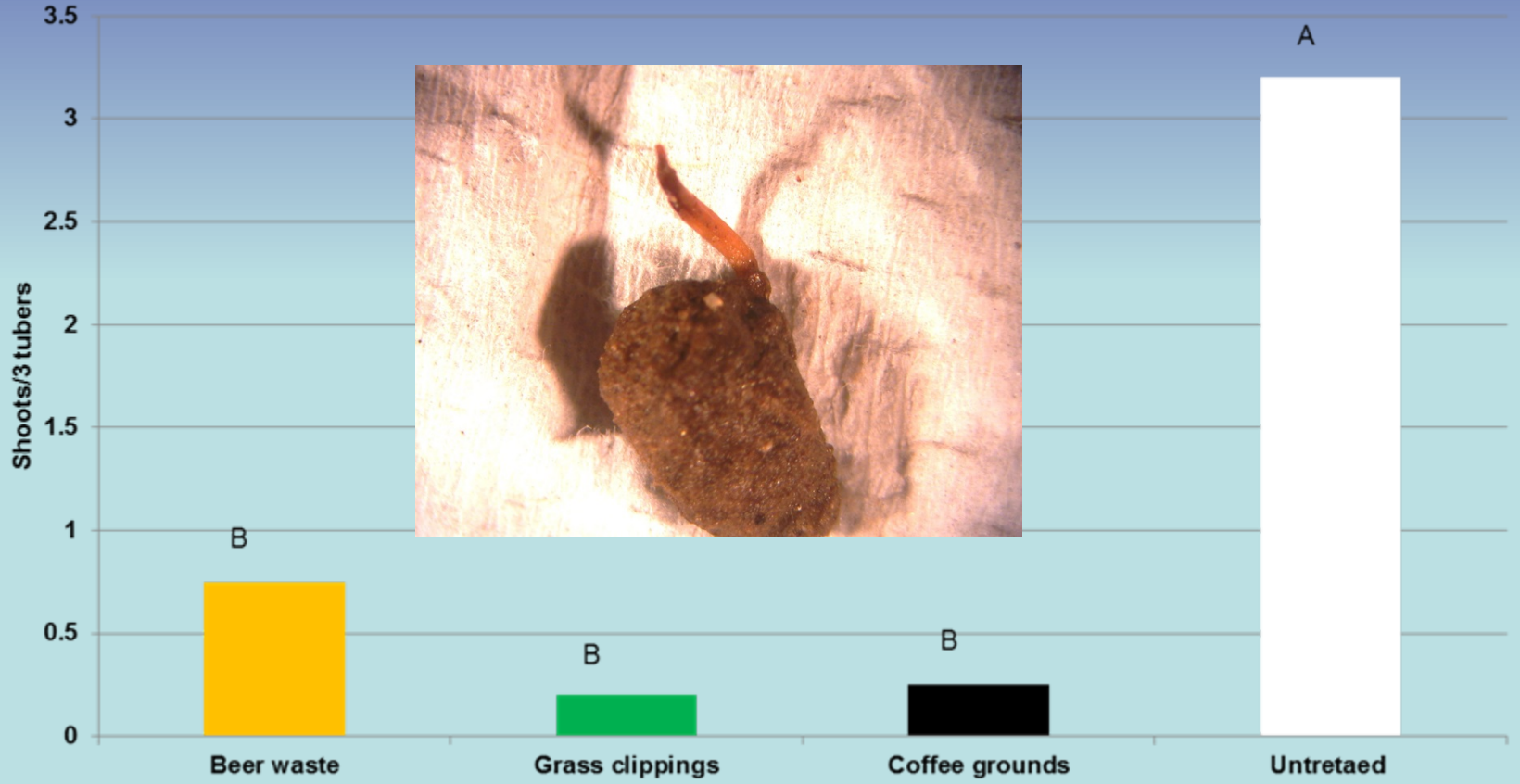
Anaerobic conditions in clay loam soil (9 t dry weight /acre)



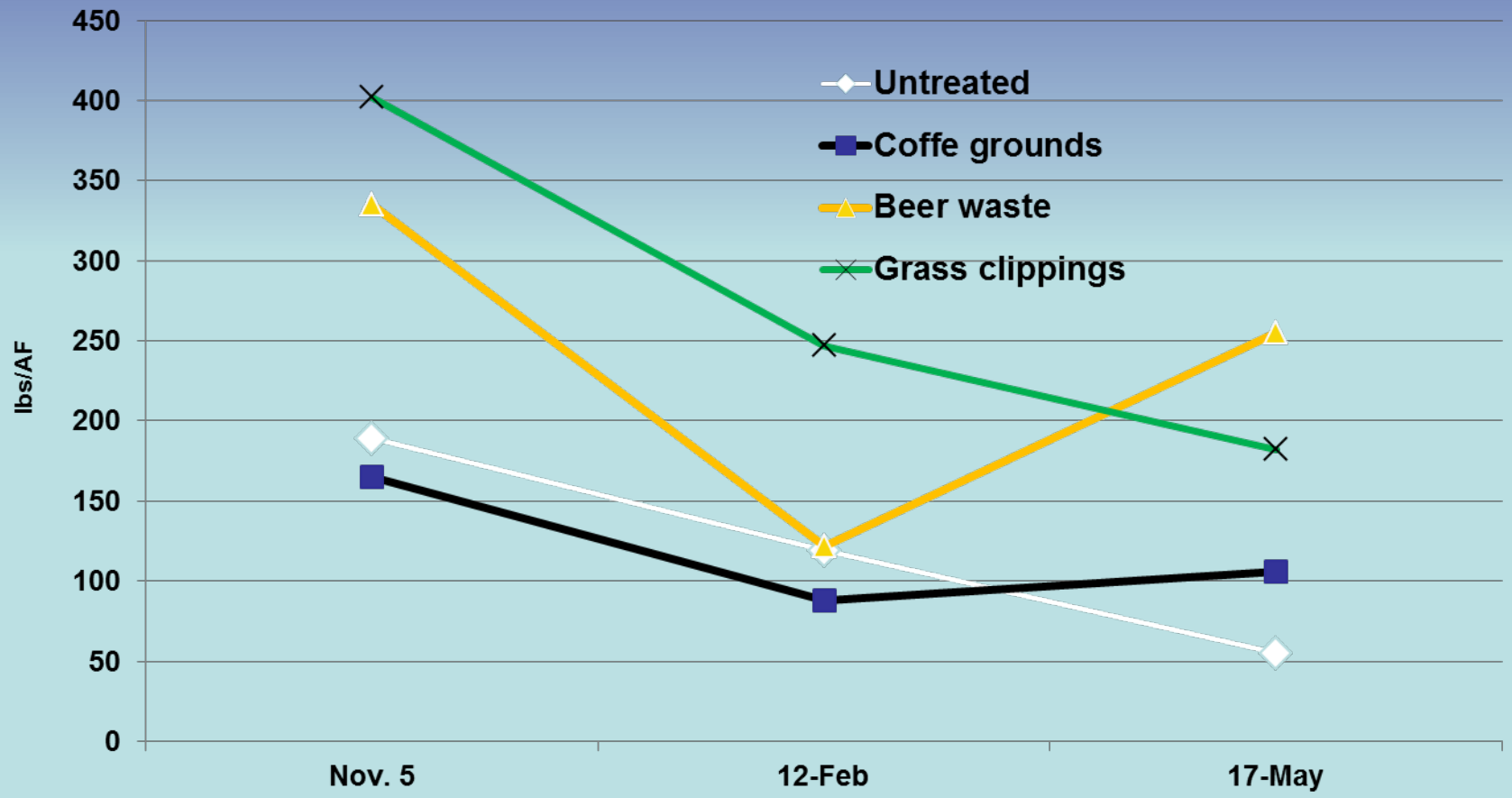
Soil temperature at 15 cm in clay loam soil



Yellow nutsedge shoots from buried tubers



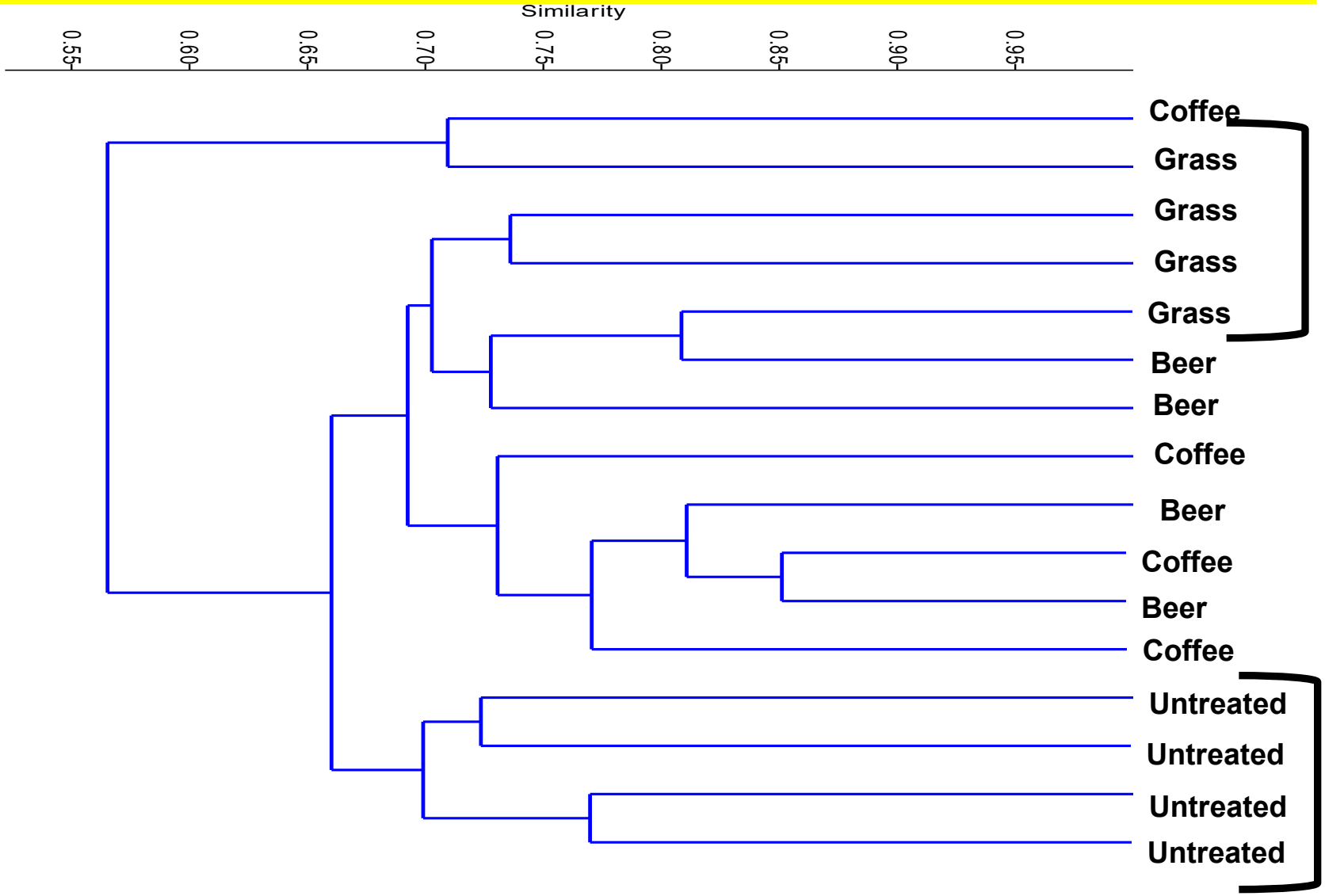
NO_3-N
at 0 -12”



Untreated check beds received 500 lbs/A of 18-6-8 pre-plant

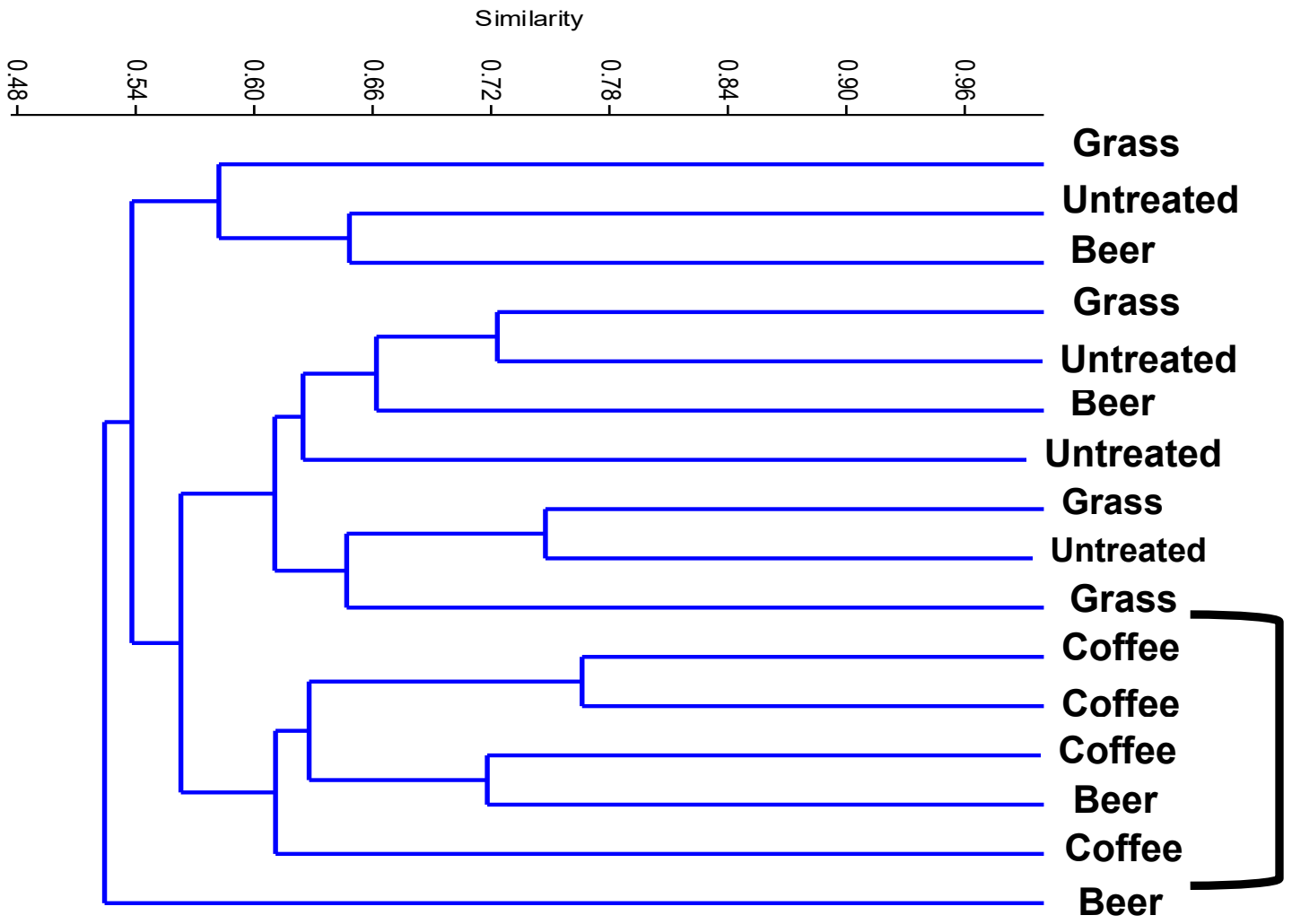
Changes in soil microbiology and strawberry fruit production

Cluster analysis of **Bacterial** 16S gene T-RFLP data (Simpson similarity index)



Data from Mark Mazzola, USDA-ARS

Cluster analysis **of Fungal** ITS T-RFLP data (Simpson similarity index)



Data from Mark Mazzola, USDA-ARS

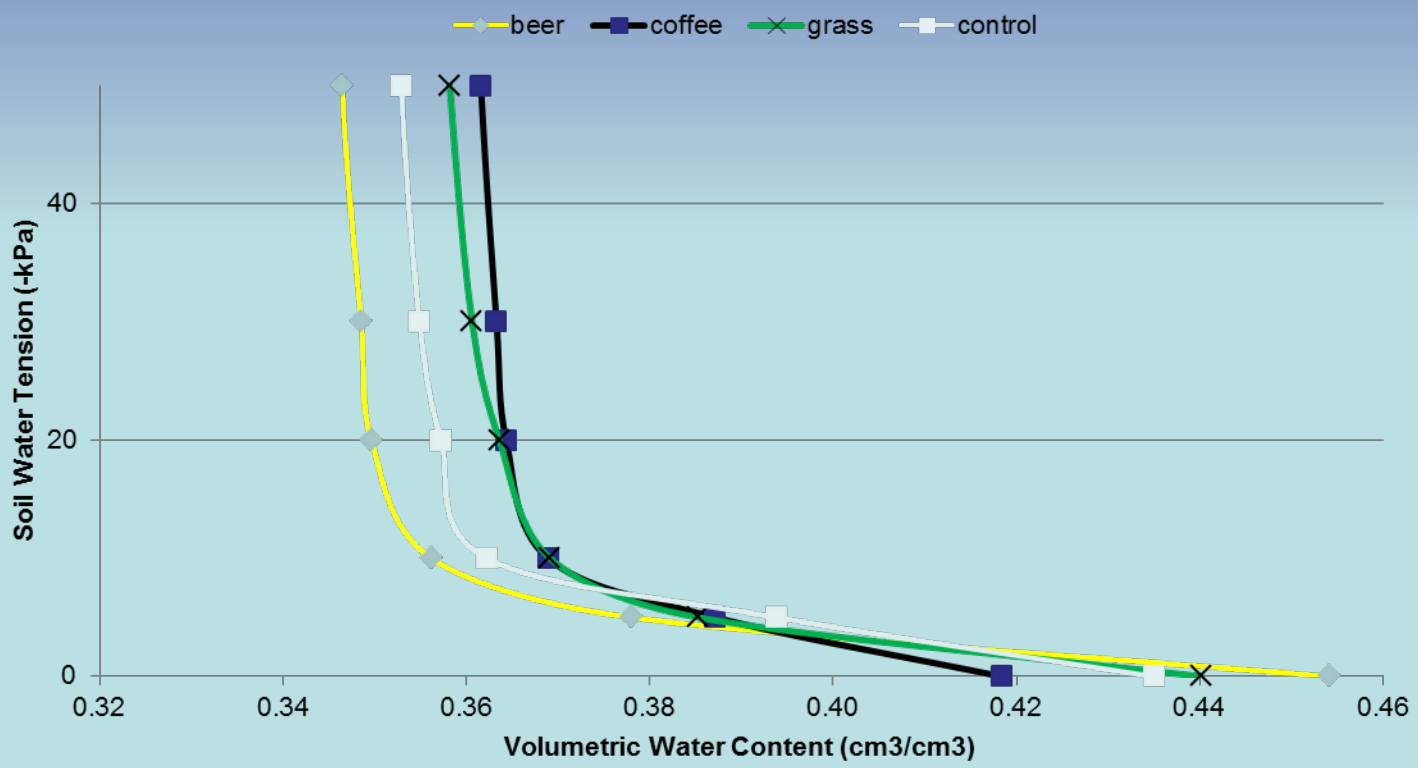
SOIL BULK DENSITY 9 MONTHS AFTER 9t /acre

	g/cm^3	
ASD rice bran	1.35	b
Untreated	1.41	a
ASD-Glycerin	1.42	a

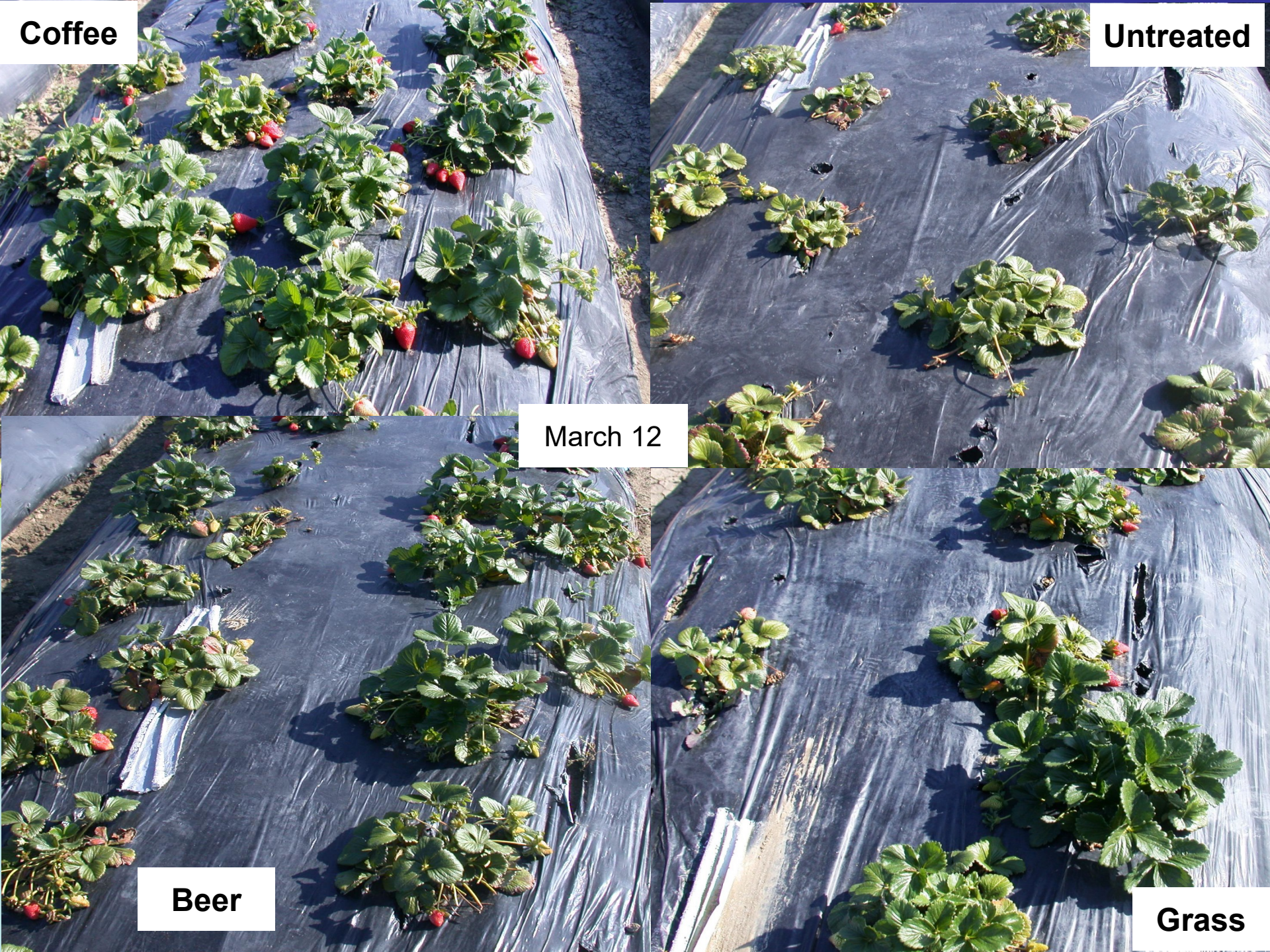
2016

ASD coffee	1.39	bc
ASD beer	1.42	b
ASD grass	1.38	c
Untreated	1.47	a

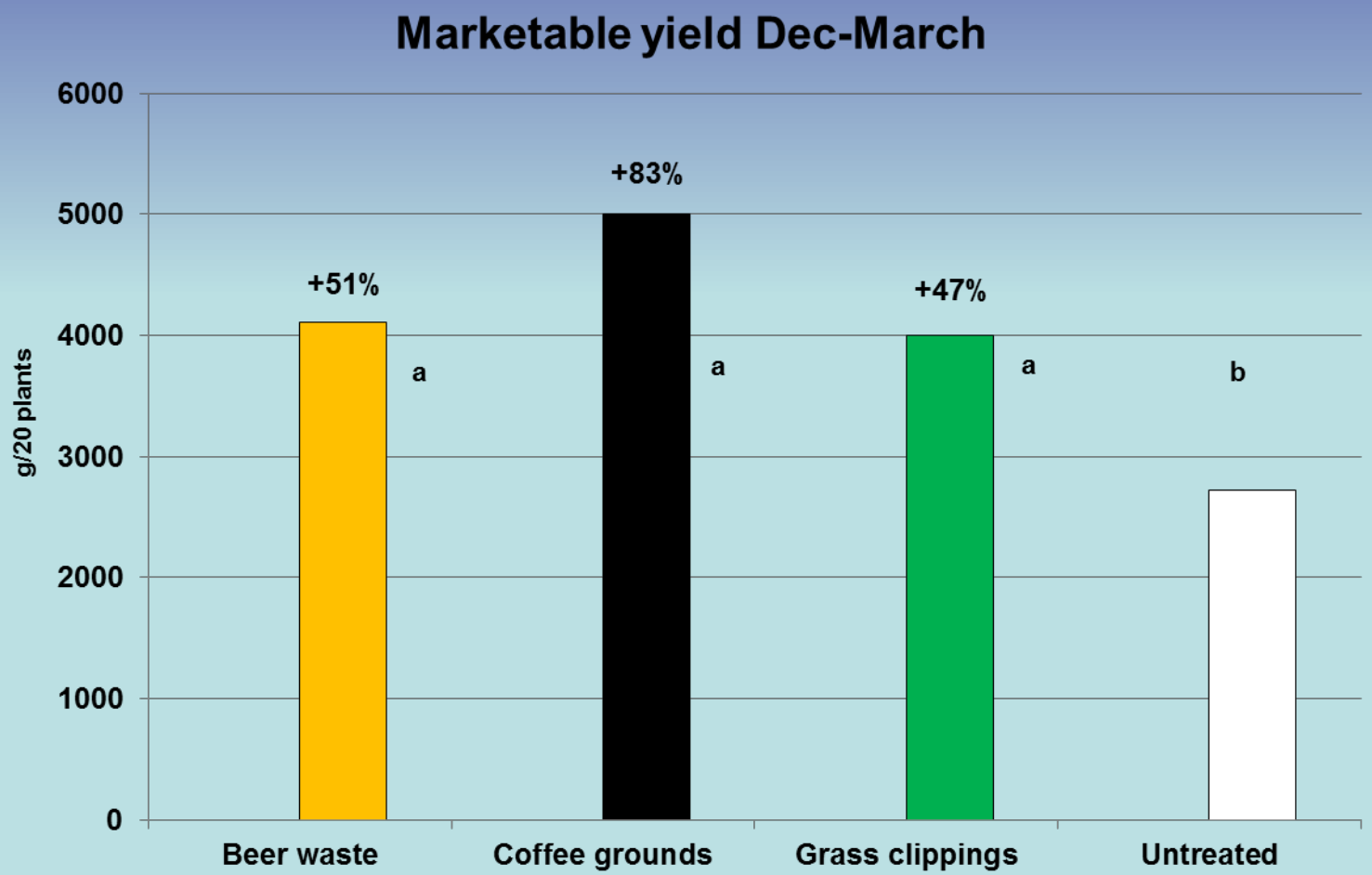
Volumetric water content in July 2016




Untreated
Grass clippings
Nov 30, 2015
Beer waste
Coffee grounds


Coffee
Untreated
March 12
Beer
Grass

Marketable yield: Dec-March



Continuation of soil disinfestation work

- C-sources that are cheap, abundant, local and **WORK**
- Since we don't eradicate the problems:

  - intergrade ASD with other strategies (rotation, fumigation, steam, varieties)

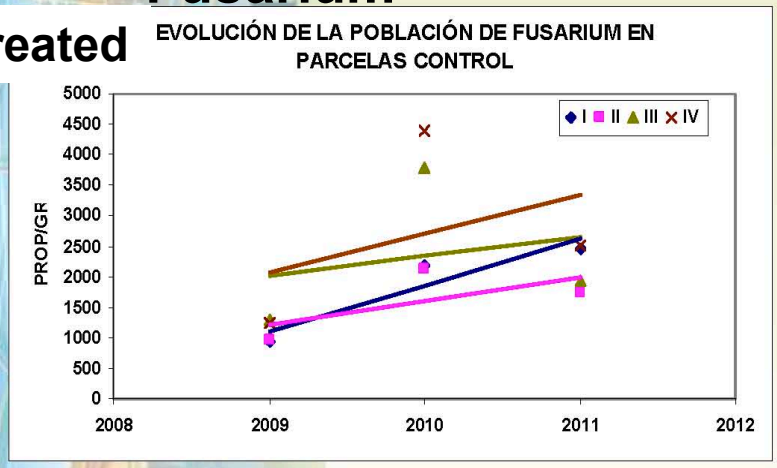
  - Site-specific management

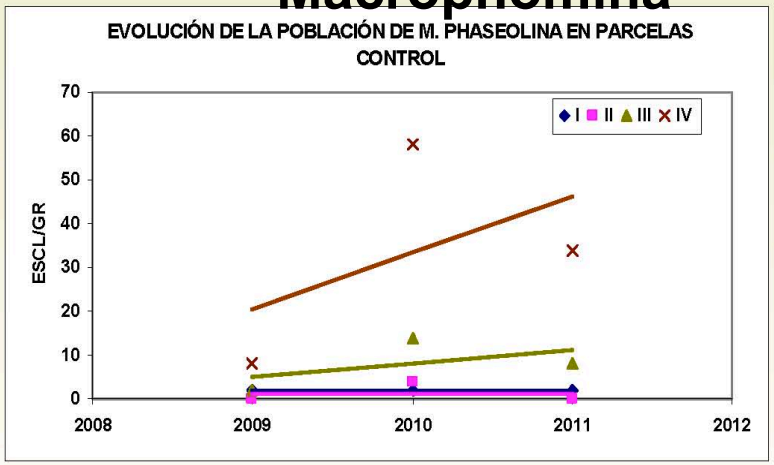
ALTERNATIVAS BIOLÓGICAS

Fusarium

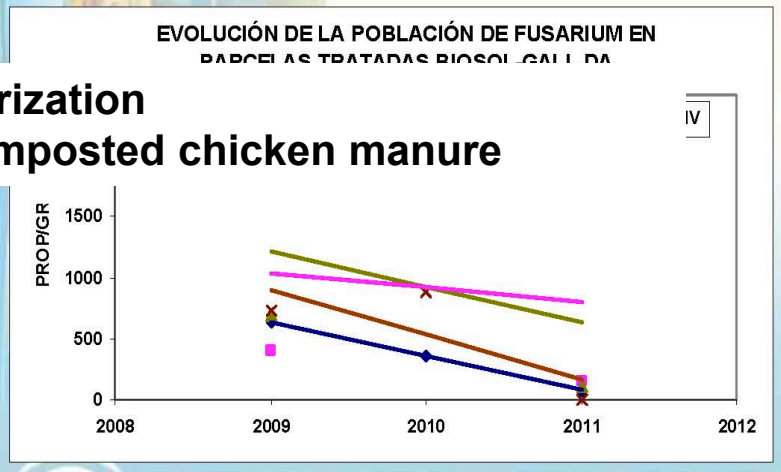
Macrophomina

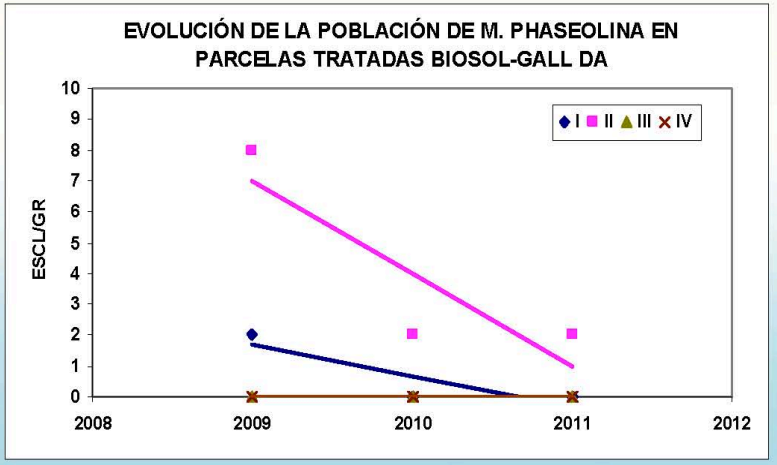
Untreated





Biosolarization with composted chicken manure





DATOS DEL MUESTREO PRE-TTO

Acknowledgements:

- Jose Romero and Hector Gutierrez
- UC Hansen staff
- UCCE Master Gardeners
- CSC
- Solimar Farms
- Farm Fuel
- IFAPA-Spain