C. acutatum management in production field with conversion to drip in the nursery

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Anthracnose (*Colletotrichum acutatum*):

Kills plants

Reduces marketable yield

Causes lesions on fruit

Chemical control before and after planting:

http://ceventura.ucdavis.edu/AgMenu/

↓

vegetable and strawberry crop production

↓

strawberries

CULTURAL CONTROL

Can we minimize disease spread from infected mothers to daughters?

Evaluation of nursery production with drip vs. sprinkler

Daughter plants from Tulelake ⟶ to Oxnard and Watsonville production

	Mother plant uninoculated ('clean')	Mother plant inoculated with *C. acutatum* ('infected')
Grown with drip	T1	T3
Grown with sprinklers	T2	T4

Nursery : ‘Ventana’ on drip, July 26, 2005

Oxnard: daughters from ‘ clean’ mothers: Drip ~ Sprinkler

Sprinkler - ‘infected’ mother

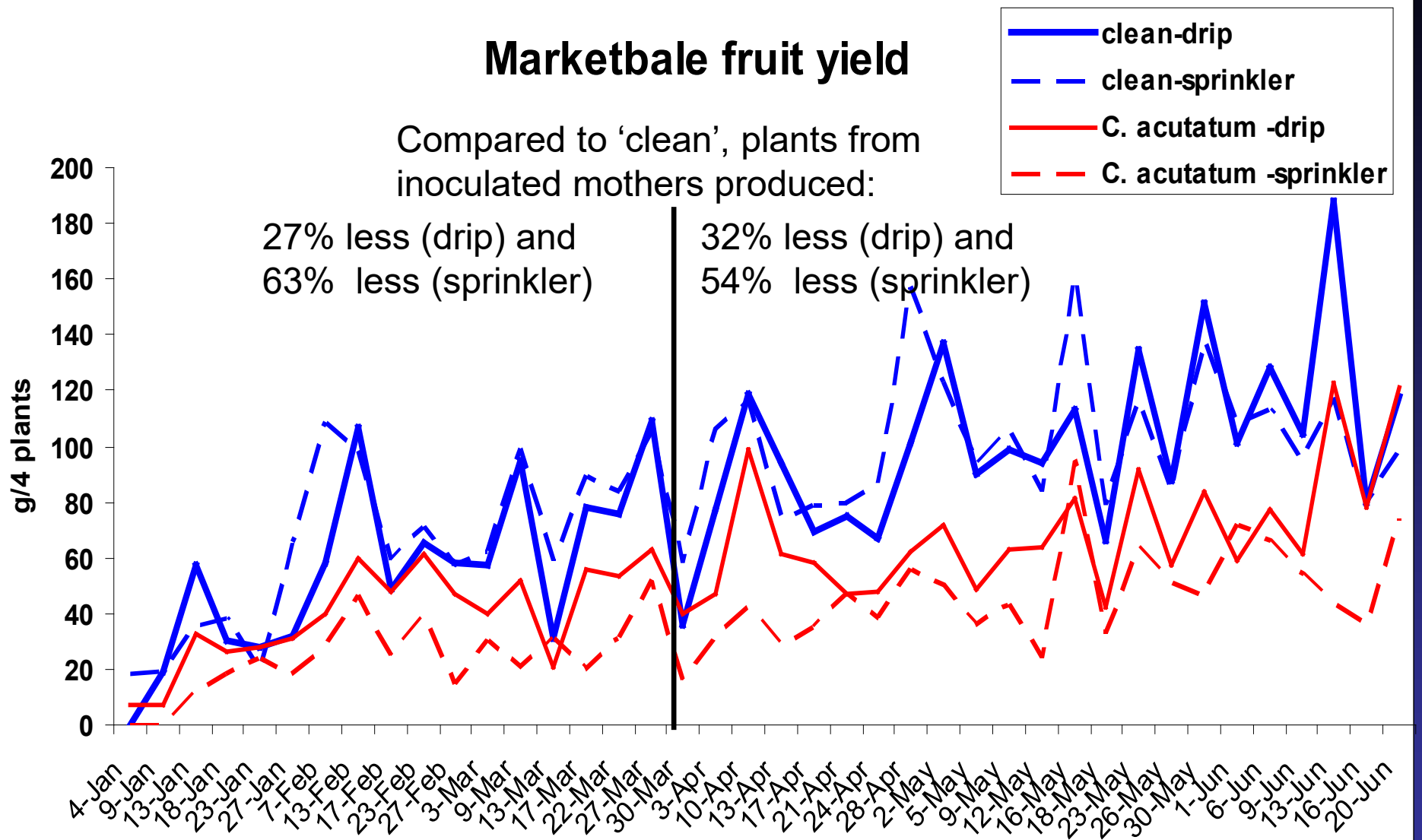
Drip - ‘infected’ mother

MORTALITY: 2005

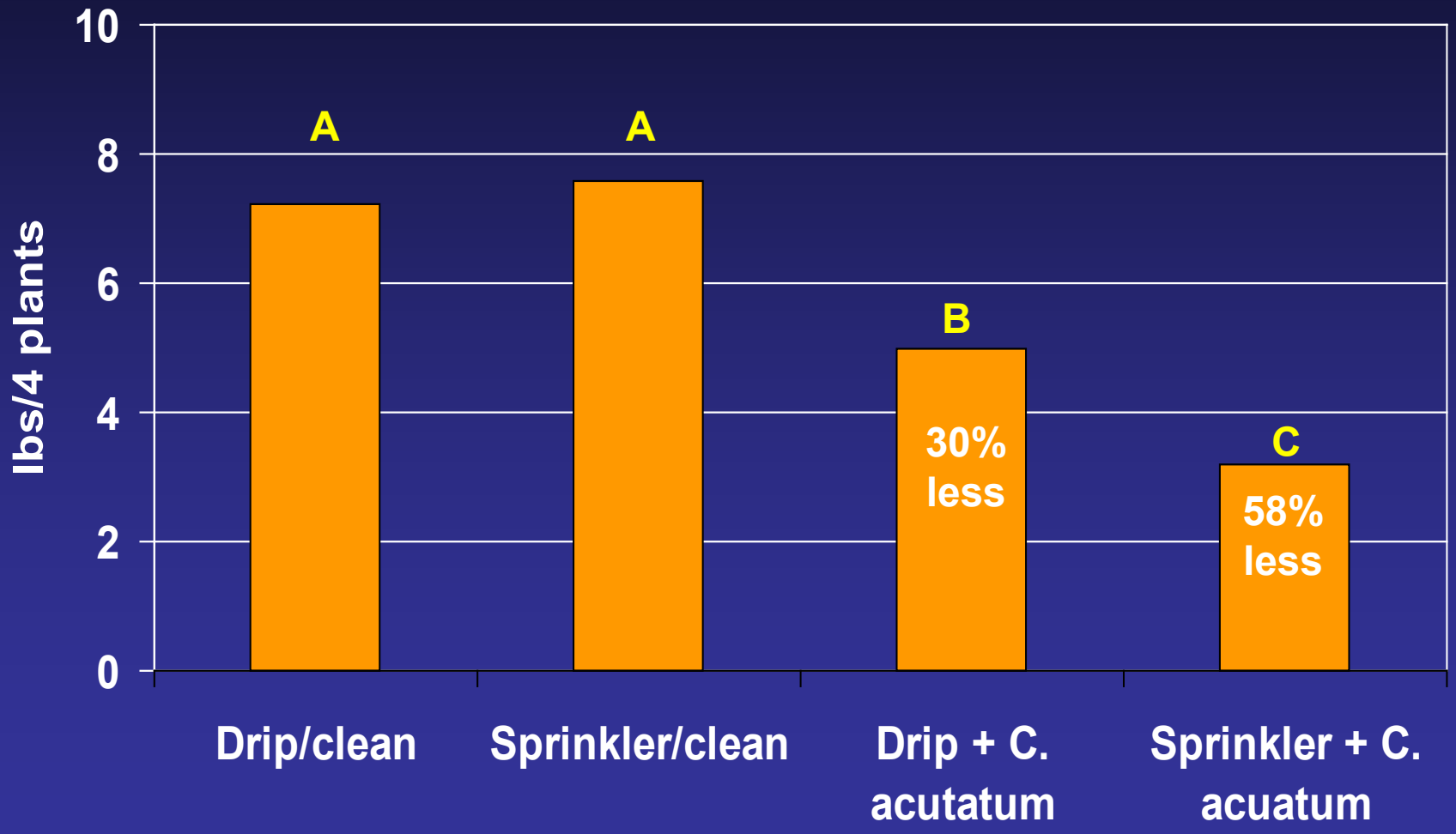
	Oxnard %	Watsonville %
'Clean' drip	15 A	1.25 A
'Clean' sprinkler	13 A	1.25 A
'Infected' drip	20 A	2.5 A
'Infected' sprinkler	40 B	7.5 B

* Numbers with the same letter are not signif different at *P*=0.05

Marketbale fruit yield



Marketable fruit yield, Jan.-June, 2007



Lesions on fruit?

Drip/clean = NONE

Sprinkler/clean = NONE

Drip + C. acutatum = NONE

Sprinkler + C. acutatum = **0.01lbs on 23 Jan**.

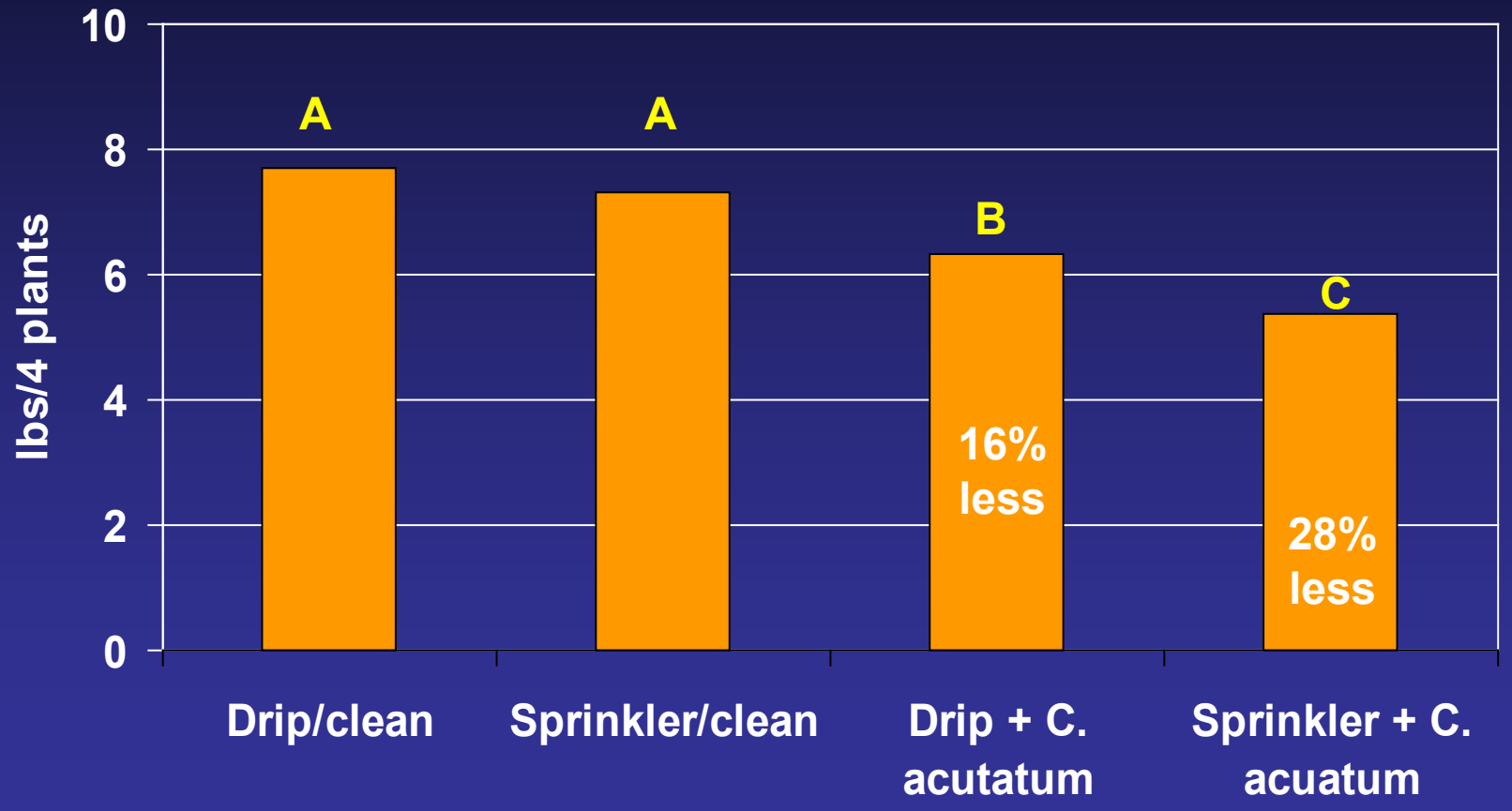
Things learned along the way

- Plants infected with *C. acutatum* in the nursery are generally asymptomatic
- 'Clean' drip and sprinkler in nursery produced similar number of daughters
- Movement of *C. acutatum* in both the sprinkler- and drip-irrigated plots: rainfall, physical movement.
- Bioassay for *C. acutatum* may underestimate the incidence of infected plants, but only by 10%. (tested with DNA sequencing and RT-PCR)

MORTALITY and PLANT SIZE: 2008

	Replants %	Plant size,cm² (live plants)
'Clean' drip	0 C	170 A
'Clean' sprinkler	0 C	172 A
'Infected' drip	6 B	117 B
'Infected' sprinkler	24 A	65 C

2008-2009, Oxnard CA



Using drip instead of sprinkler in the nursery

- In ‘clean’ system: produces equivalent amount of daughters with similar productivity
- In ‘infected’ system: reduces plant mortality and yield losses
- In general: saves water, fertilizer, ?pesticides, but requires investments in installation and management

Daughters infected with *C. acutatum*, %

	Either crowns or roots	Both crowns and roots
'Clean' - Drip	0 B	0 C
'Clean'- Sprinkler	2 B	0 C
Infested - Drip	78 A	29 B
Infested- Sprinkler	82 A	51 A

Even though daughters from infected mothers tested positive for *C. acutatum* in both nursery systems,

in production field daughters grown with drip CONSISTENTLY outperformed those grown with sprinkler.

Questions

Does inoculum density make a difference?

Does drip in nurseries limit the spread of angular leaf spot and other pathogens?

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