Soil-borne pathogen survival in strawberry fields

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2011-12 season

New locations with Fusarium and Macrophomina related die- back in Ventura county (total 14 confirmed locations in Ventura County)

Macrophomina and *Fusarium* in soil

Fumigants

- Provide protection for most of the season
- Higher rates tend to be more efficacious

Varieties

- Some tolerant to Fusarium, not to Macrophomina (Benicia ~ Camarosa = susceptible)

Studies of pathogen hosts, fumigant and variety performance in infested fields

http://ceventura.ucdavis.edu/Com_Ag/

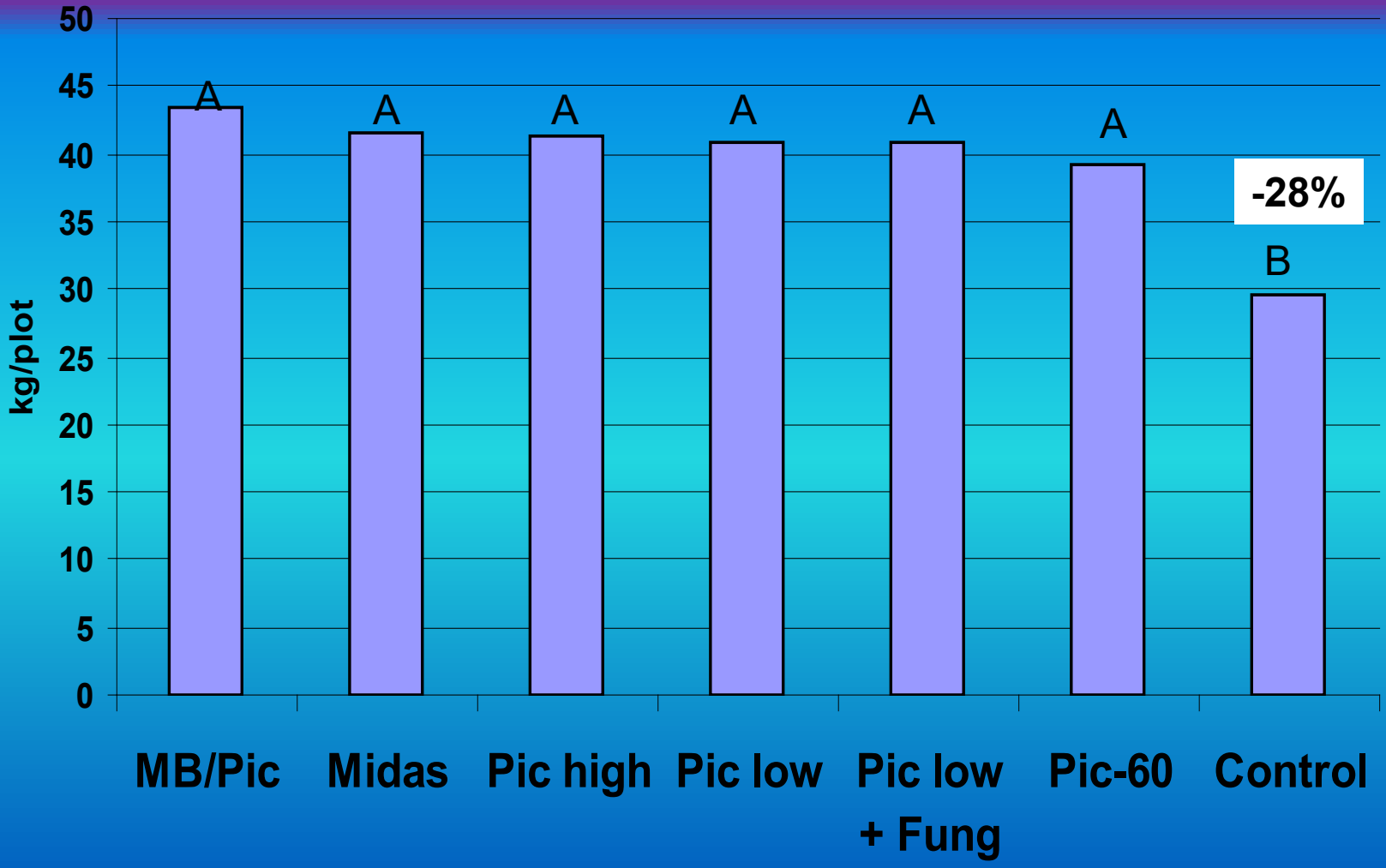
Vegetable and strawberry crop production

Strawberry

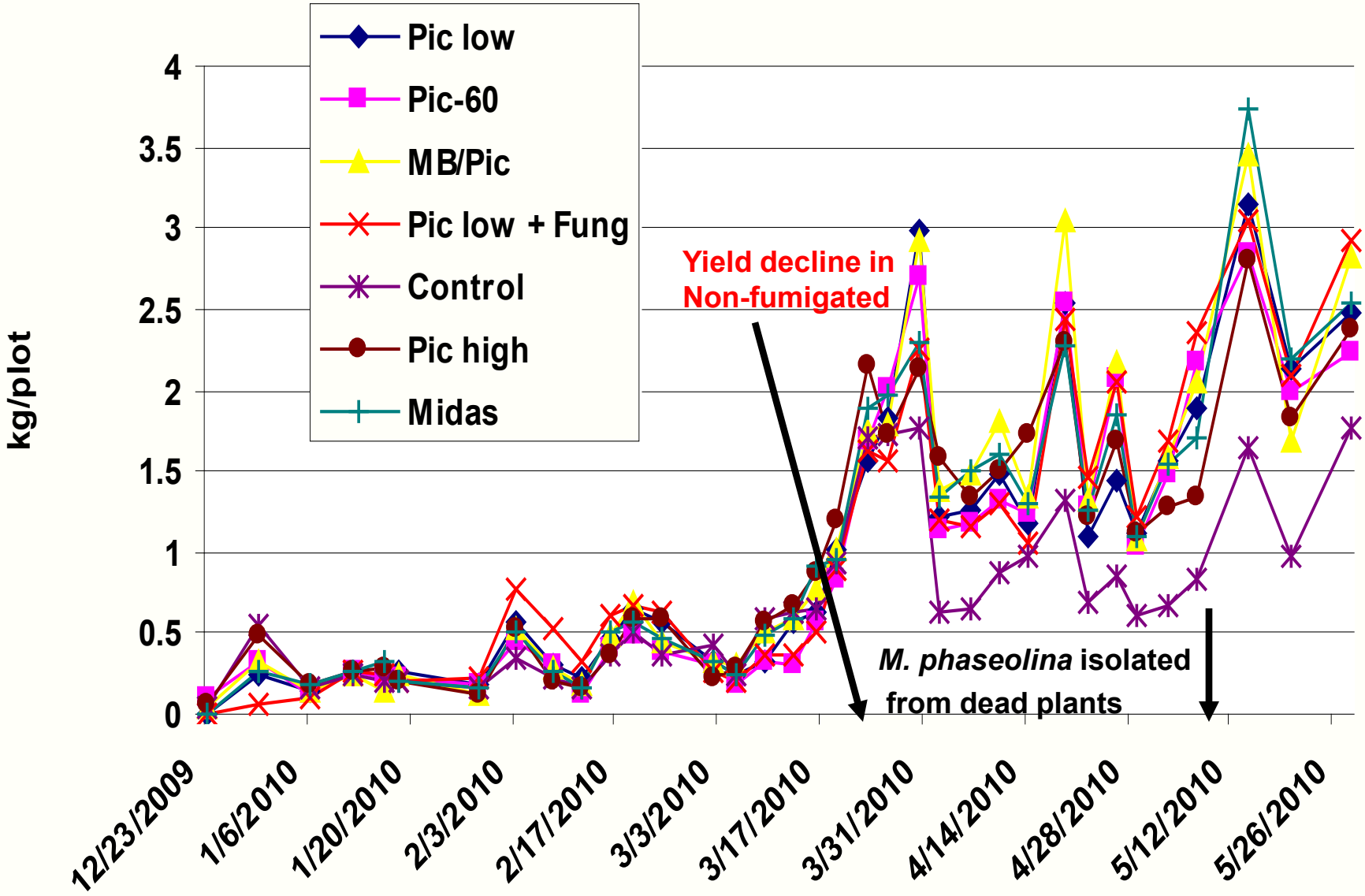
Recent Meetings

Fruit Yield, Ventura, 12/23/09-05/26/10

Camarosa, *M. phaseolina* isolated



Marketable yield, Ventura, CA



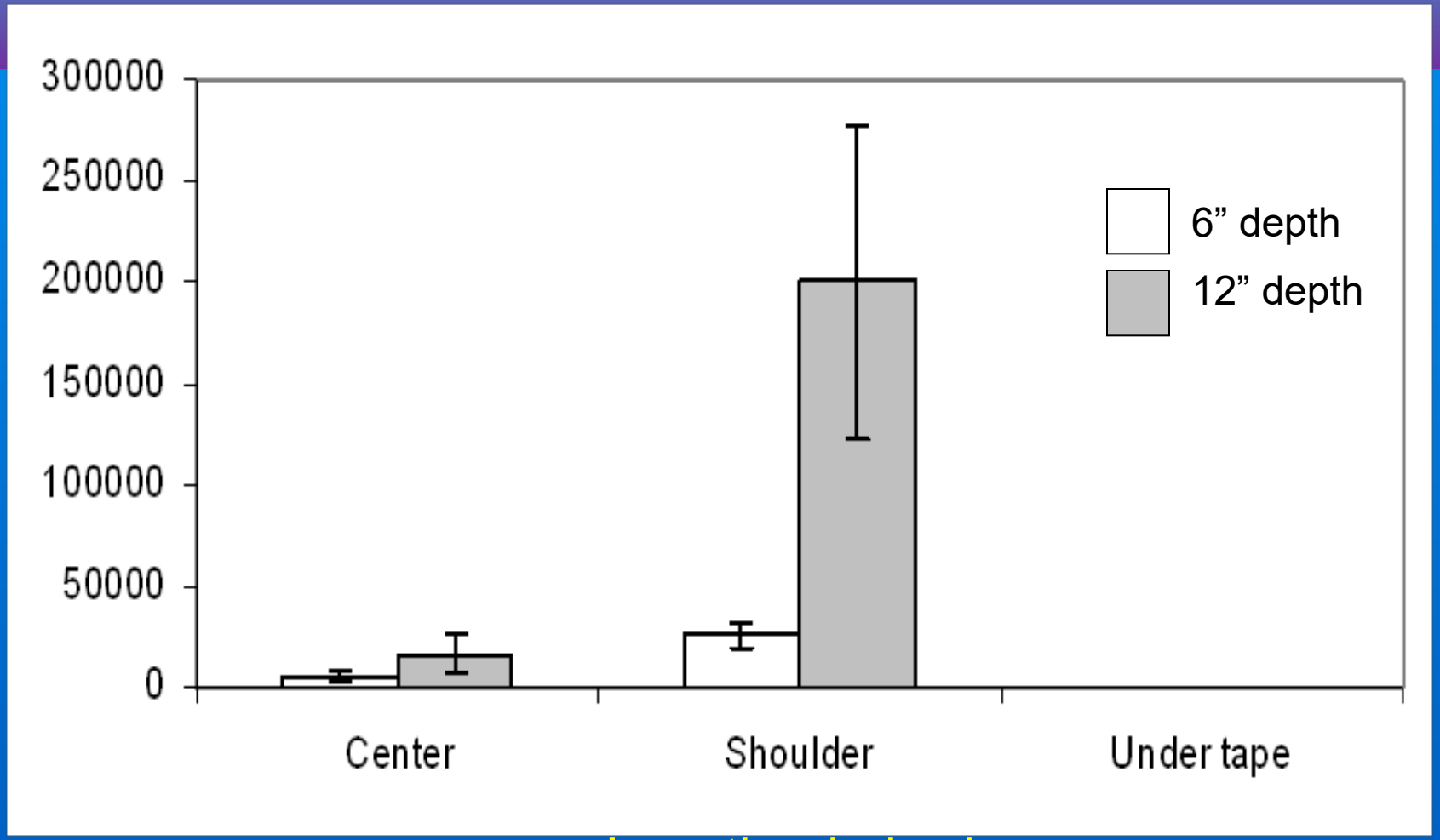
Drip fumigation :

dieback on bed sides

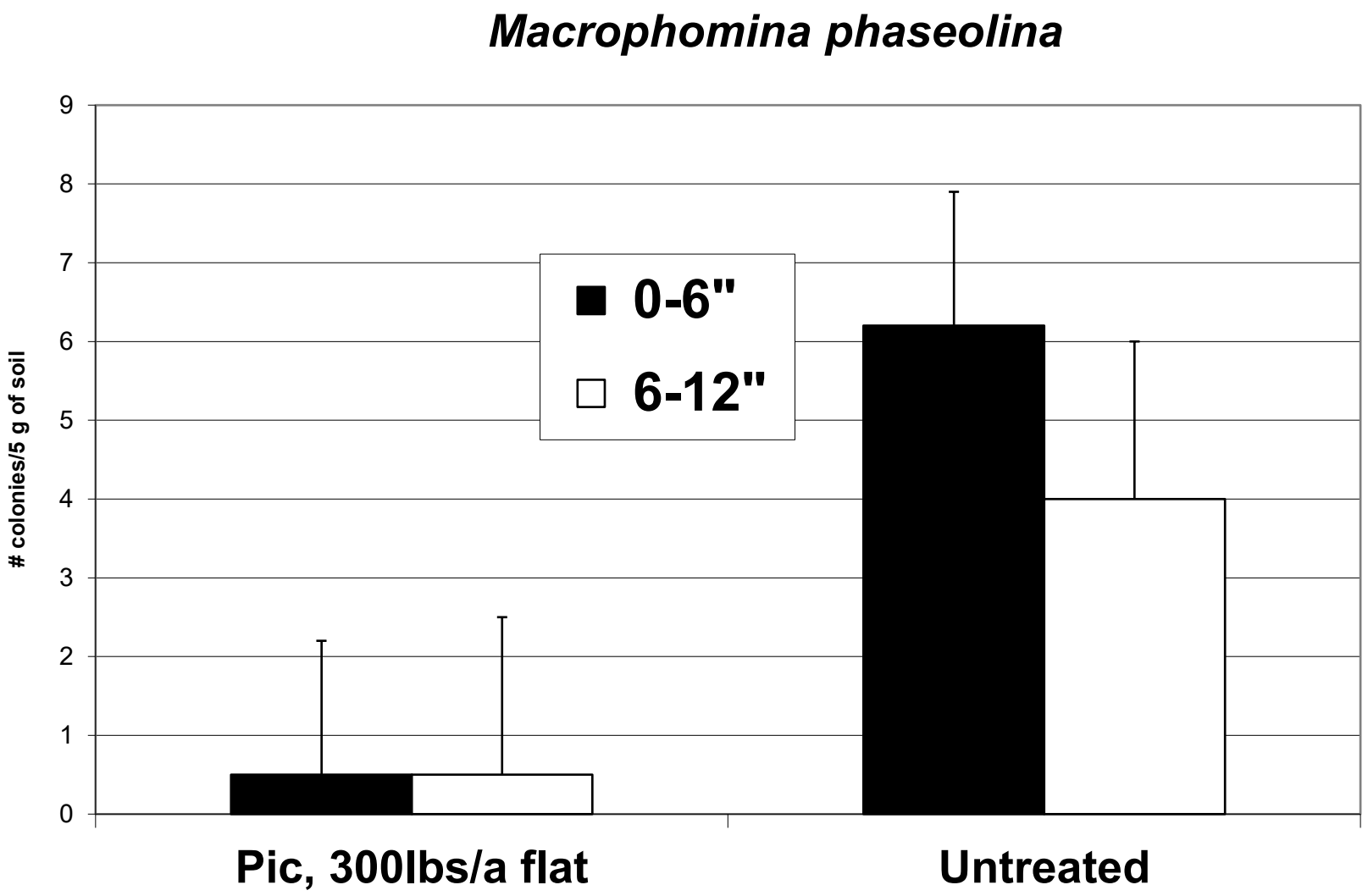
- Less fumigant distributed?
- Dryer/greater stress?

Effect of location in bed on fumigant efficacy

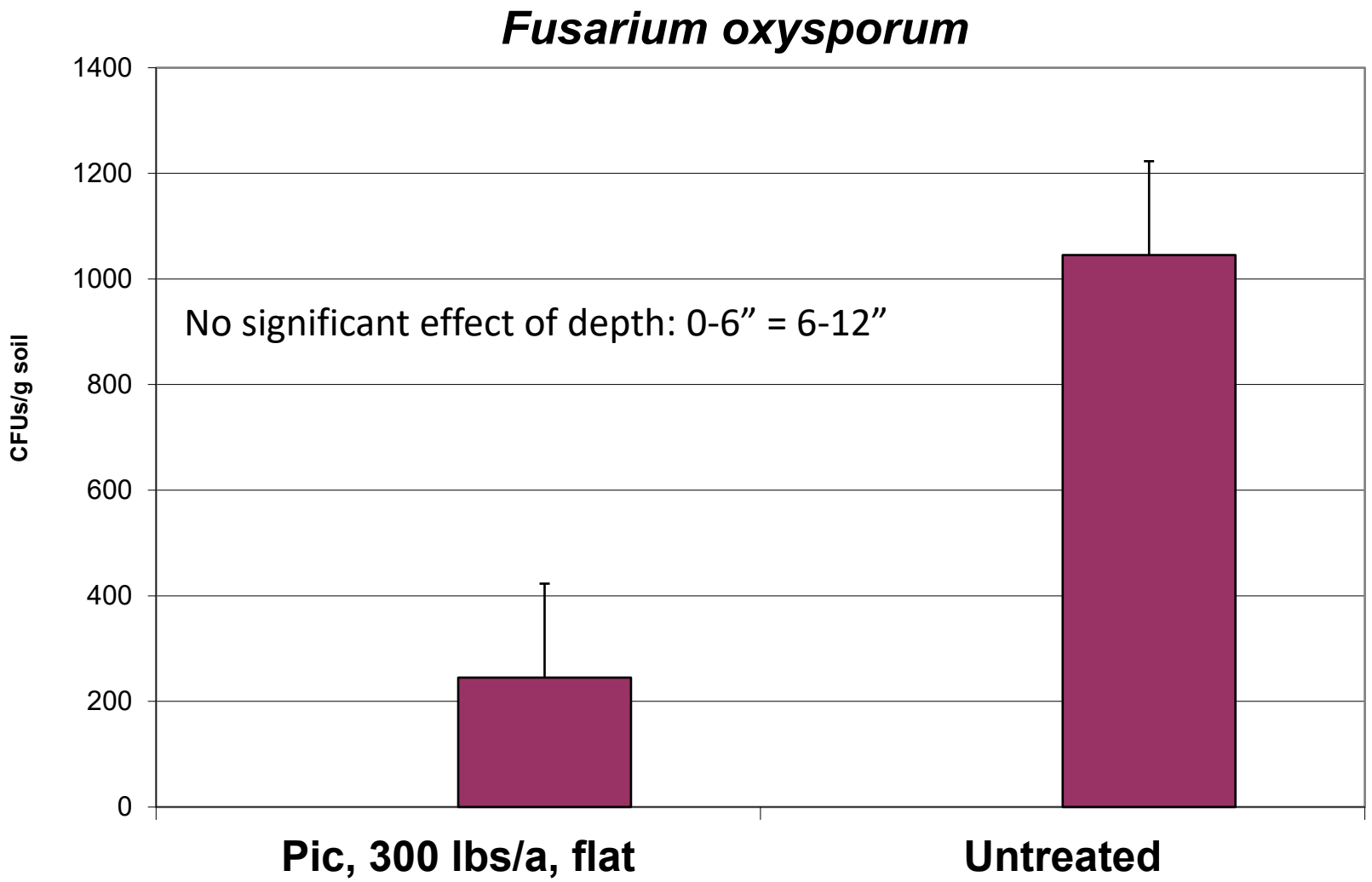
DRIP-FUMIGATED with Pic lor 60, 300lbs/a



FLAT-FUMIGATED, Pic 300



FLAT-FUMIGATED, Pic 300



Macrophomina (CFU/5 g soil) after 300 lbs of Chloropicrin flat fumigation

- **Non-fumigated: 75% samples**
- **Fumigated: 33% samples**
- **Soil clods: 0%**

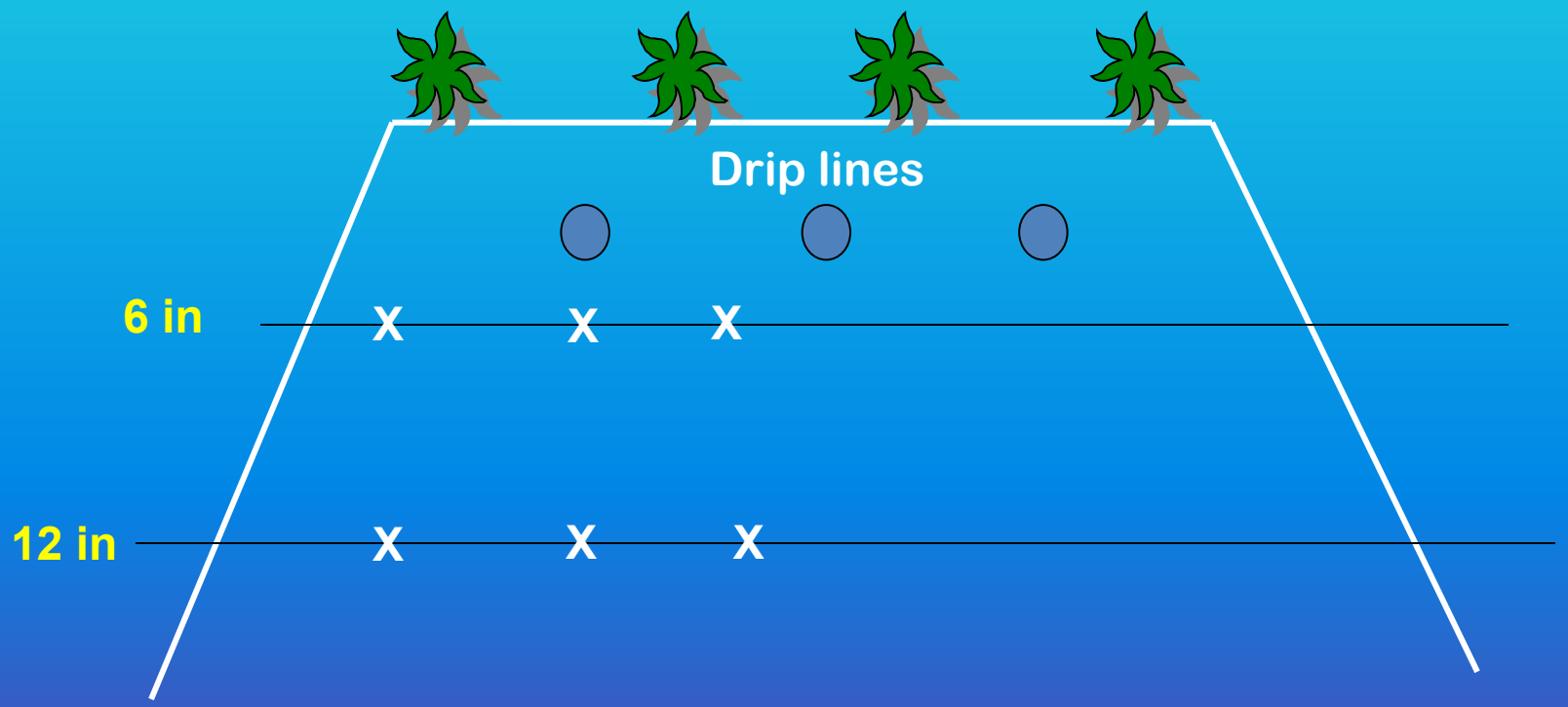
Flat fumigated with 350lbs MB:PIC 50:50

Survival of *Macrophomina* after fumigation in Israel

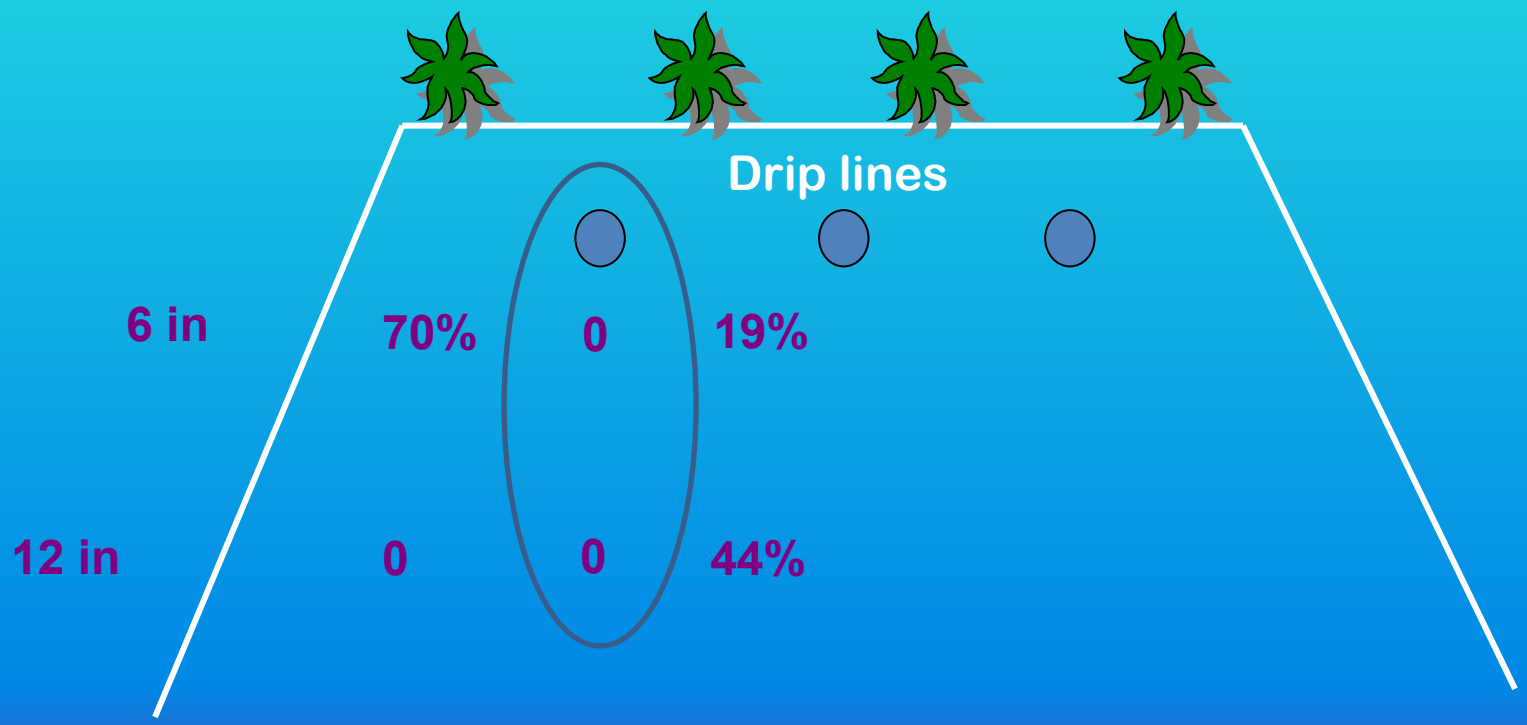
Freeman, et al.

Treatments	Crowns (%) at 30 cm
Control	**60 a**
MB 45lb/a	**10 b**
MS 40 lb/a	**5 b**
MS 70 lb/a	**5 b**
Chloropicrin 180 lb/a	**45 ab**
Chloropicrin 360 lb/a	**30 ab**

Infested crowns: stored in soil and then buried in beds prior to fumigation

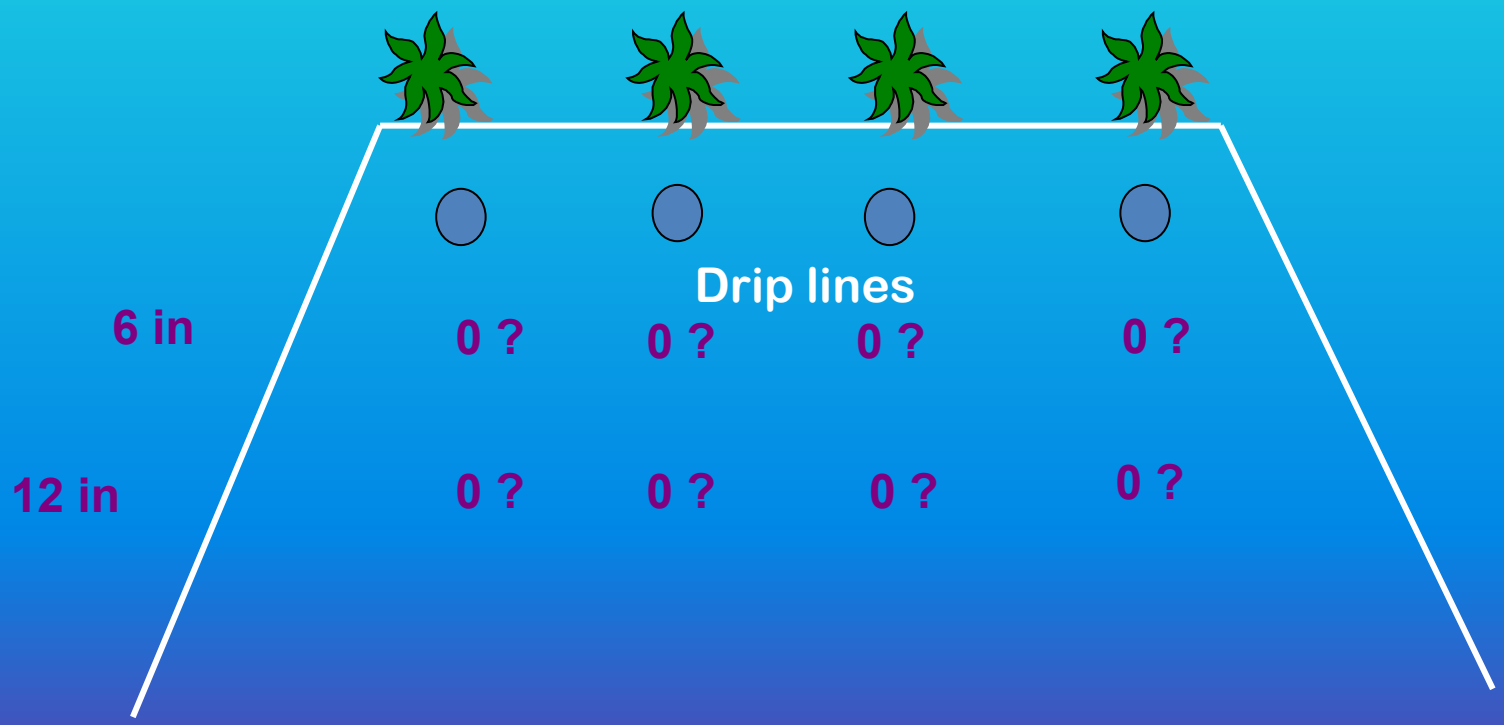


Macrophomina survival in infested crowns after 200 lbs/a InLine



96 % of crowns had *Macrophomina* sclerotia in crown tissue

Can 4 lines placed near plant rows improve efficacy?



INFESTED CROWNS REMOVED AT THE END OF THE SEASON

April 16, 2013

Mortality due to *M. phaseolina* after 200 lbs/a InLine with and without removal of last season' s infested crowns

At what depth do roots become infected?

In an infested buffer zone we replaced soil with fumigated soil :

0-6”, 0-12” 0-16”

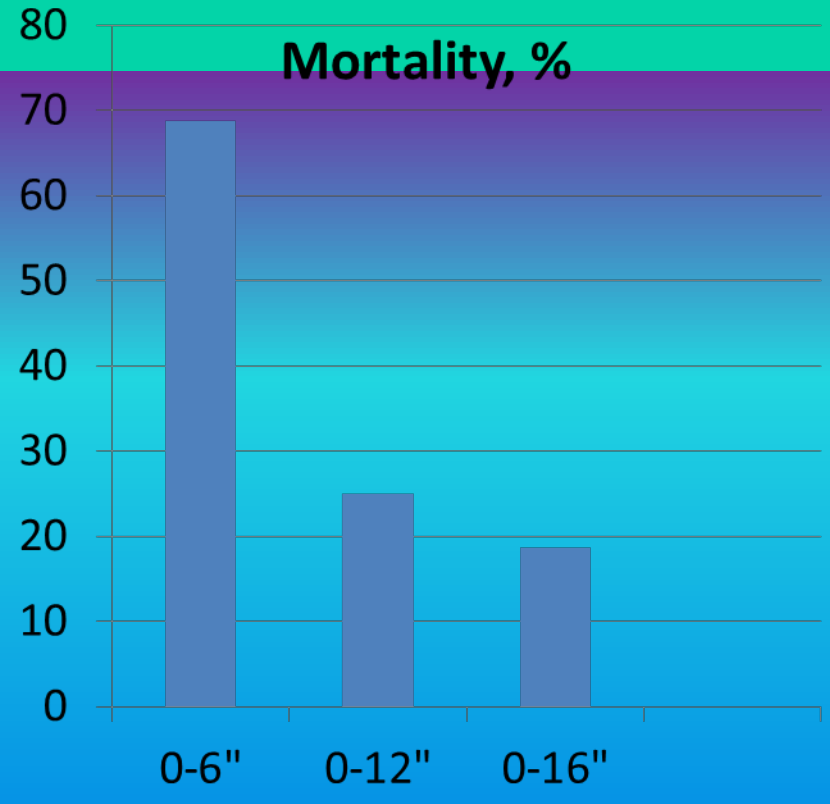
April 16, 2013

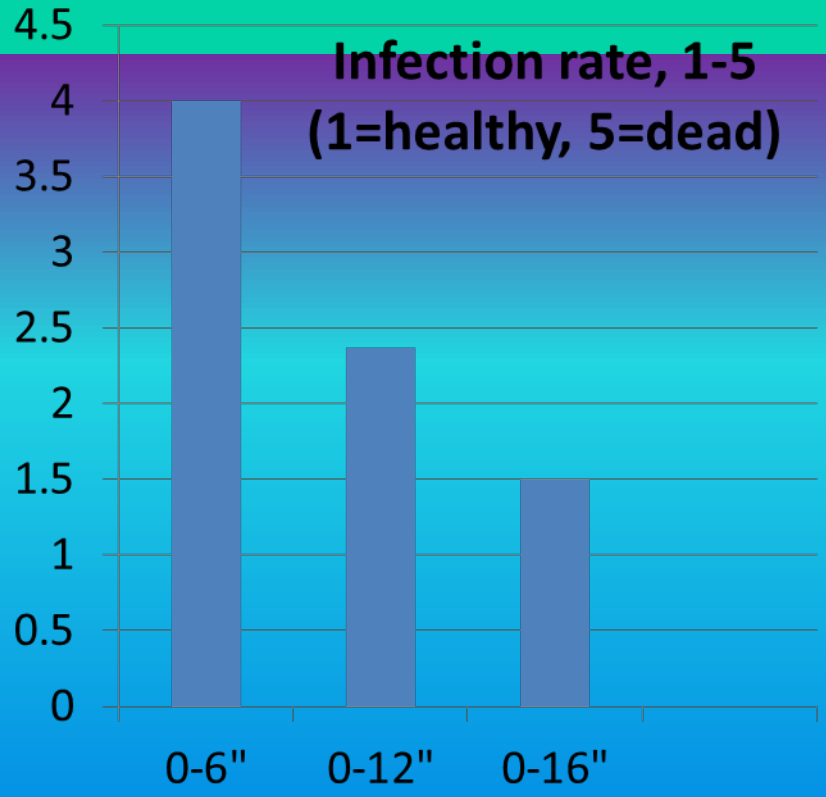
Planted in replaced fumigated soil 0-16”

April 16, 2013

Planted in replaced fumigated soil 0-6”

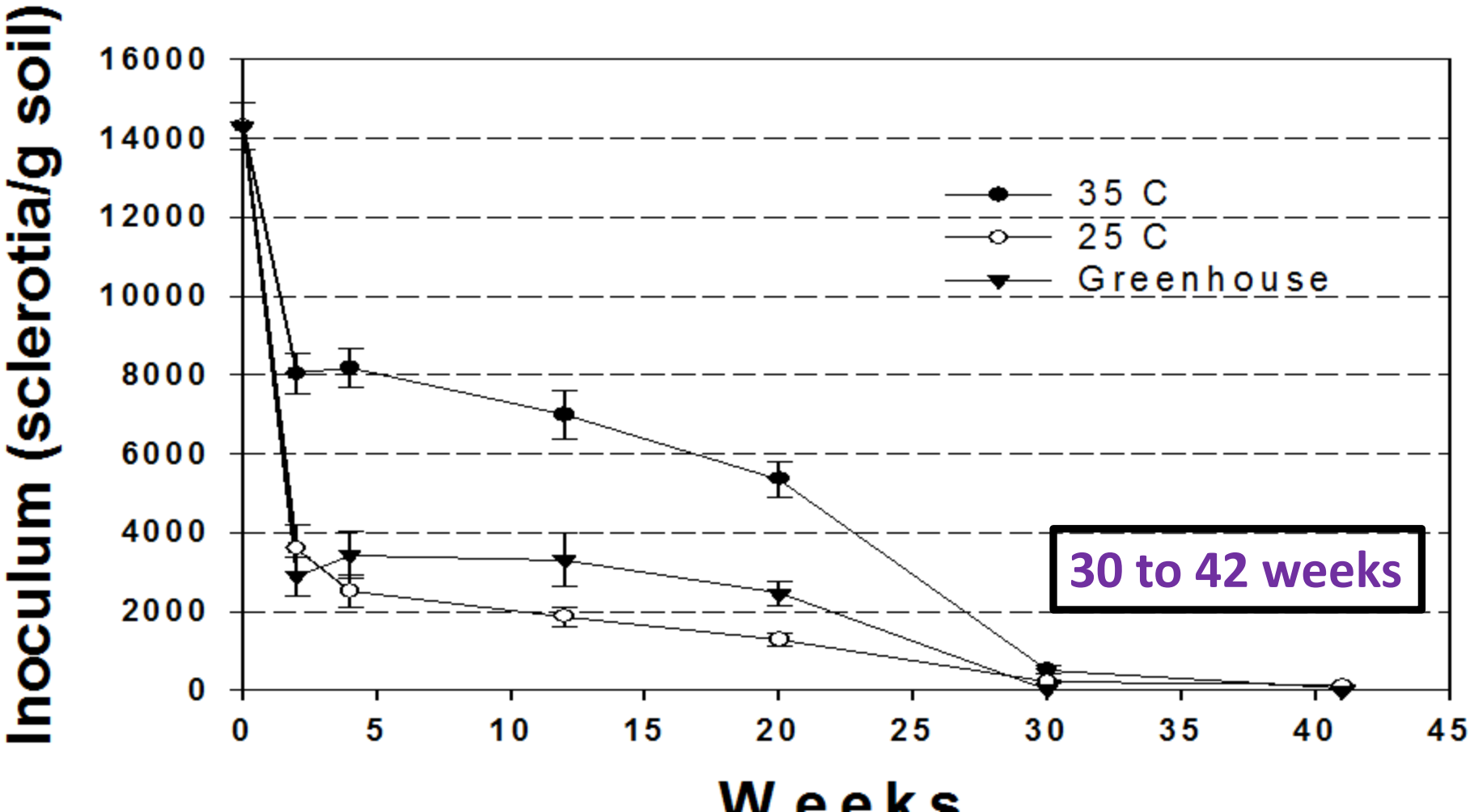
Replacement of soil in infested buffer zone with fumigated soil to 3 depths. May 5, 2013





Survival of Macrophomina under different soil temperature regimes

Freeman, et al



Hosts of *M. phaseolina*
~ 500 plant species

Brassica spp. (Cabbage),
Capsicum annum (pepper),
Citrus spp.
Lycopersicon (tomato)
Cucumis spp. (cucumber)
Fragaria sp., (strawberry)
Many field crops
Most legumes
Weeds (malva, fleabane, etc.)

Hosts of *F.oxysporum* f. sp. *fragariae*

Fragaria sp., (strawberry)

What about our coastal vegetable crops hosting *M. phaseolina?*

M. p. so far only seen on peppers but

NOT on : brassicas, lettuce, spinach, celery, cilantro, endive/escarole, radicchio from Ventura, Santa Barbara, San Louis Obispo, Monterey, or Santa Cruz counties.

(Koike and Gordon, in-progress results)

What is the level of Fusarium in soil here after 3 yrs of raspberries?