

Soil-borne pathogen survival in strawberry fields



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and other Ventura County, CA growers,
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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)



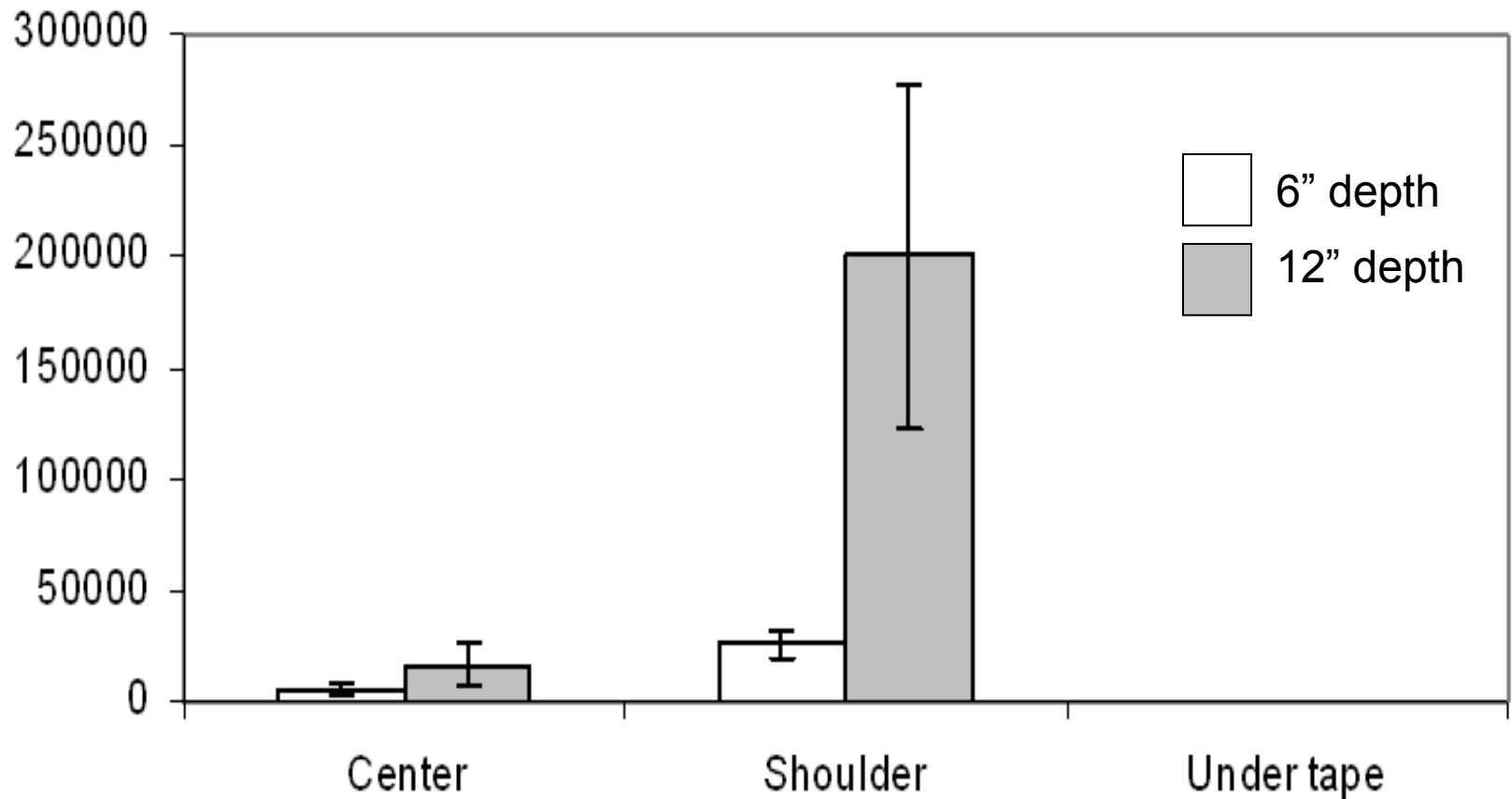
Drip fumigation : dieback on bed sides

- Less fumigant distributed?
- Dryer/greater stress?

Effect of location in bed on fumigant efficacy

DRIP-FUMIGATED with Piclor 60, 300lbs/a

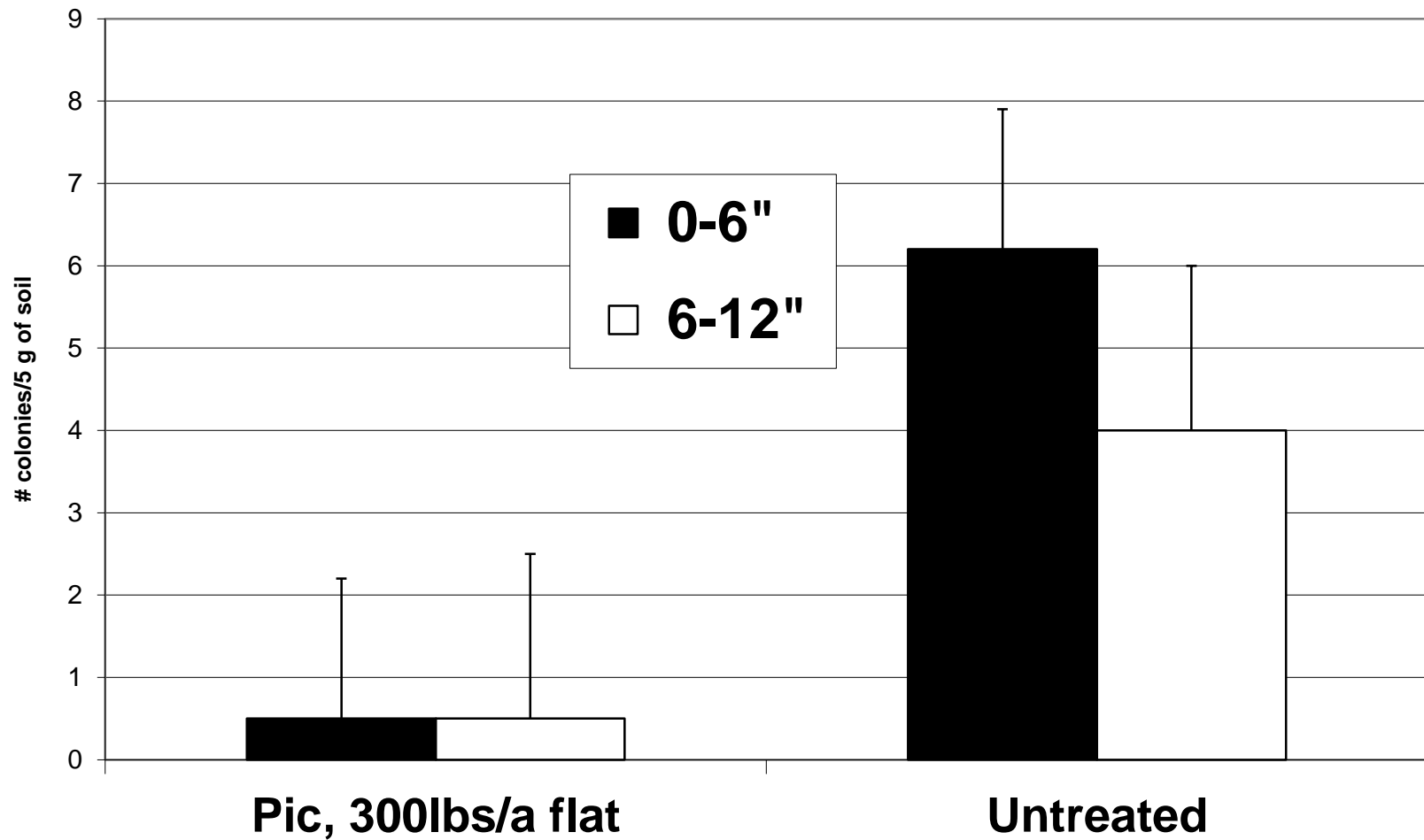
Fusarium: Spores per gram of soil



Location in bed

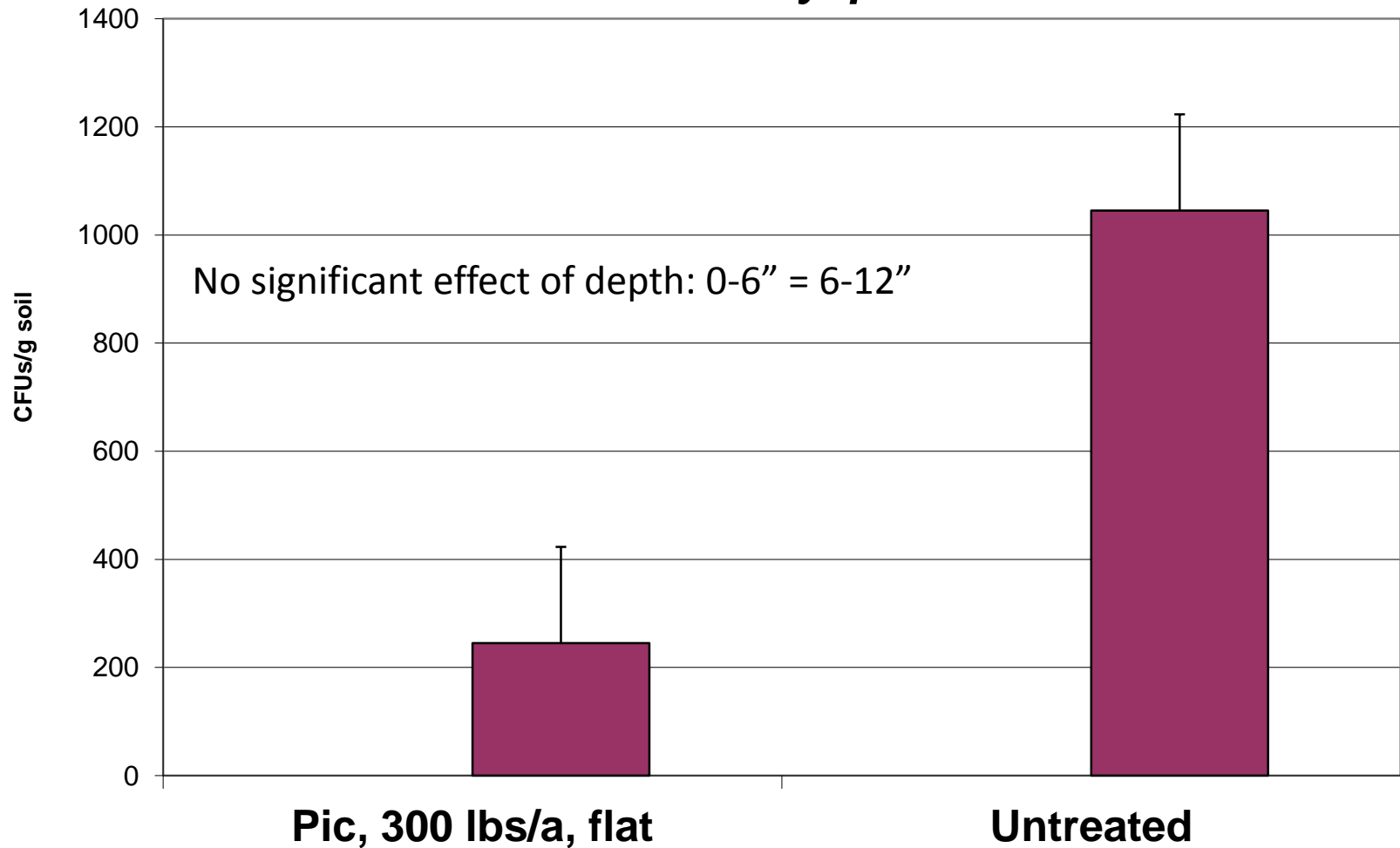
FLAT-FUMIGATED, Pic 300

Macrophomina phaseolina



FLAT-FUMIGATED, Pic 300

Fusarium oxysporum

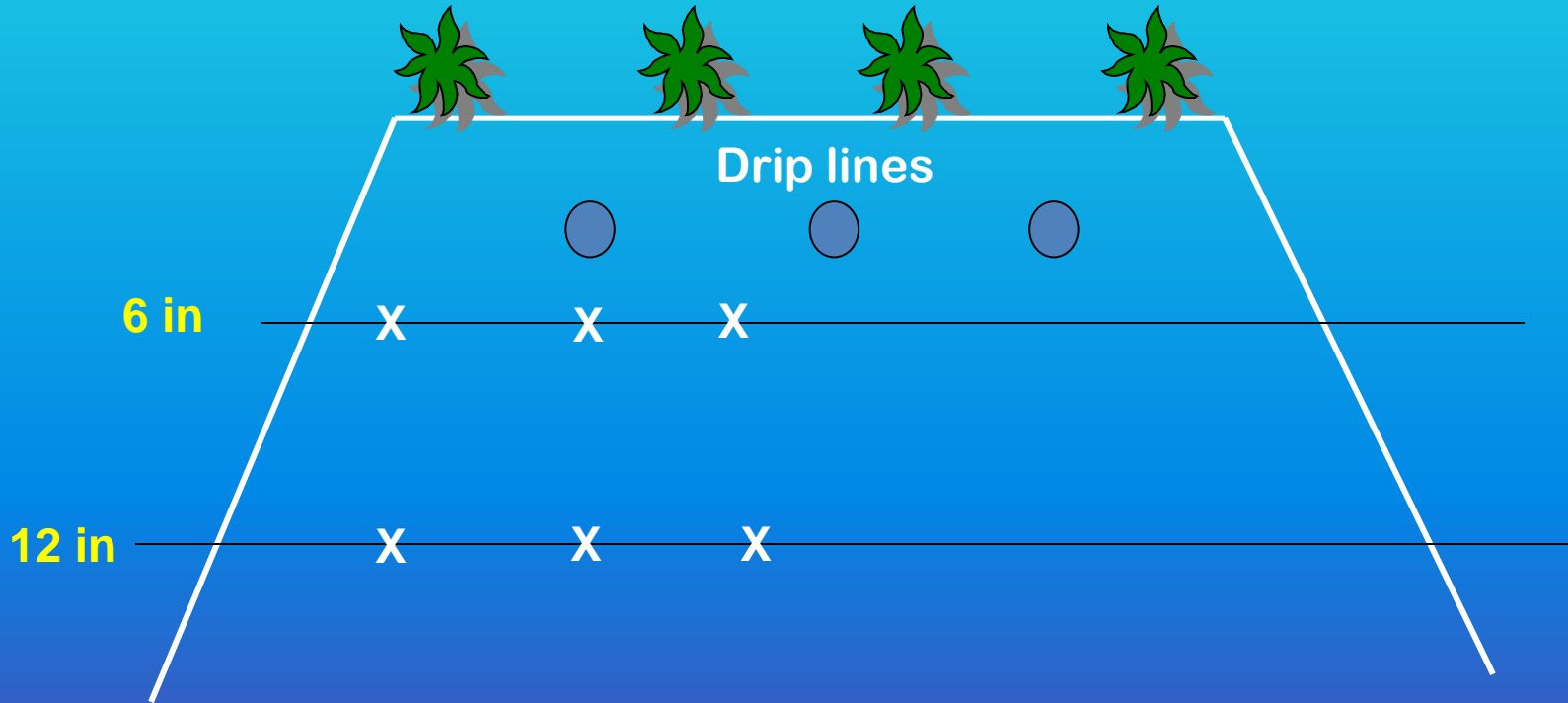


Flat fumigated with 350lbs MB:PIC 50:50

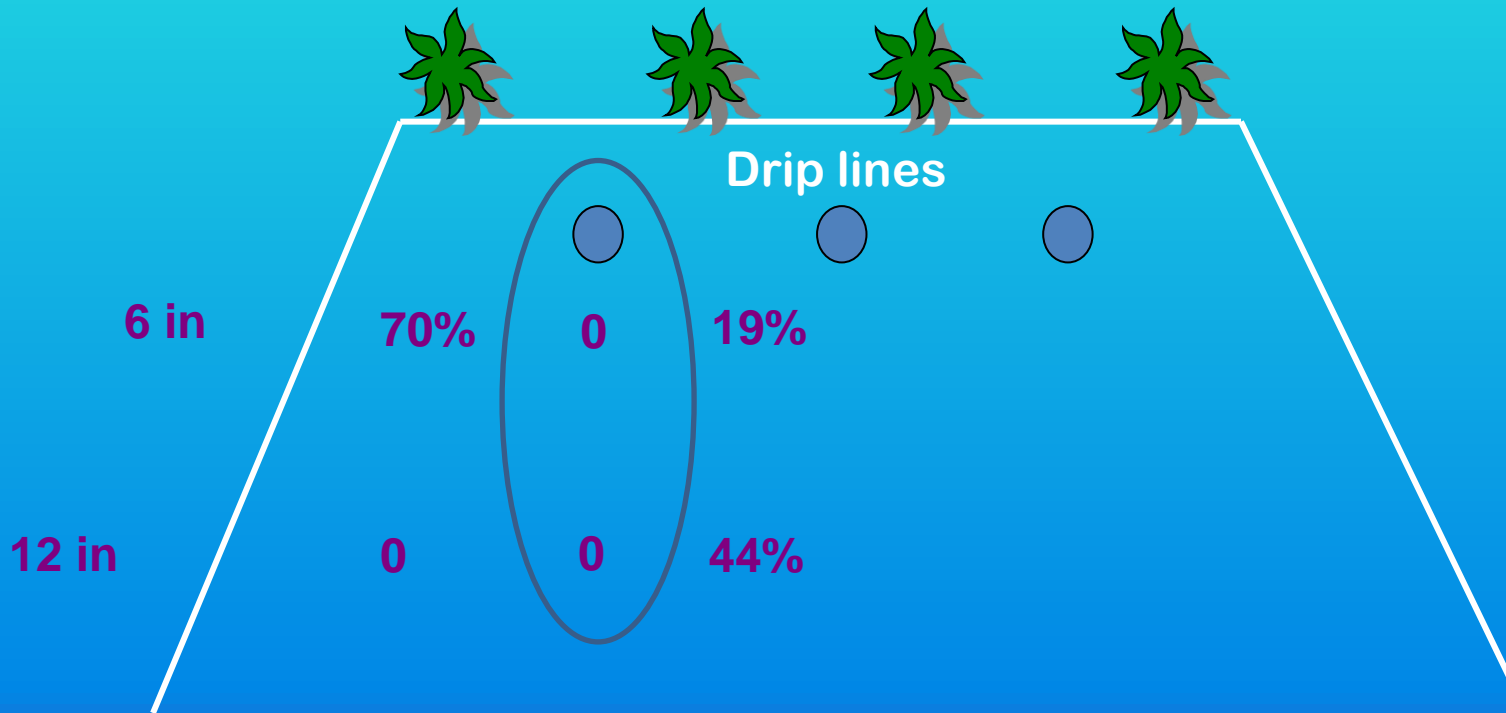
Macrophomina phaseolina isolated in 2011 and 2012



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

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"

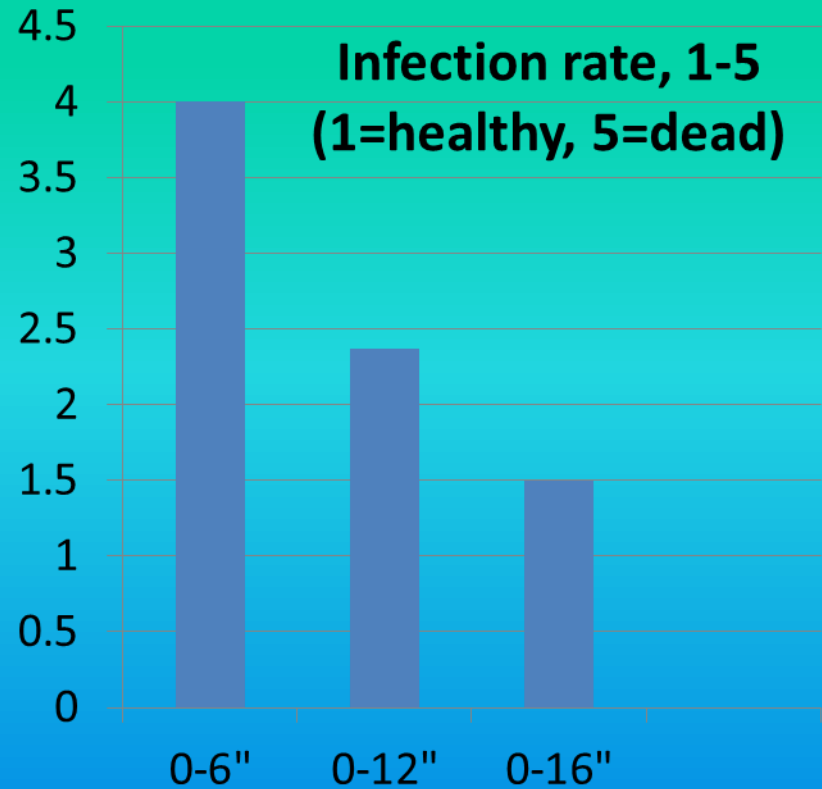
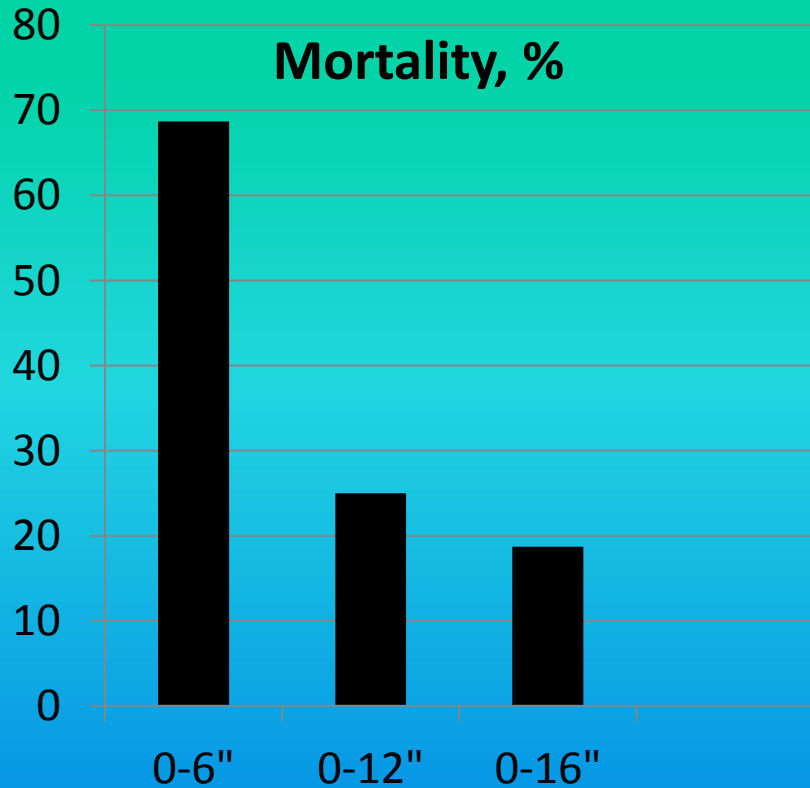


April 16, 2013

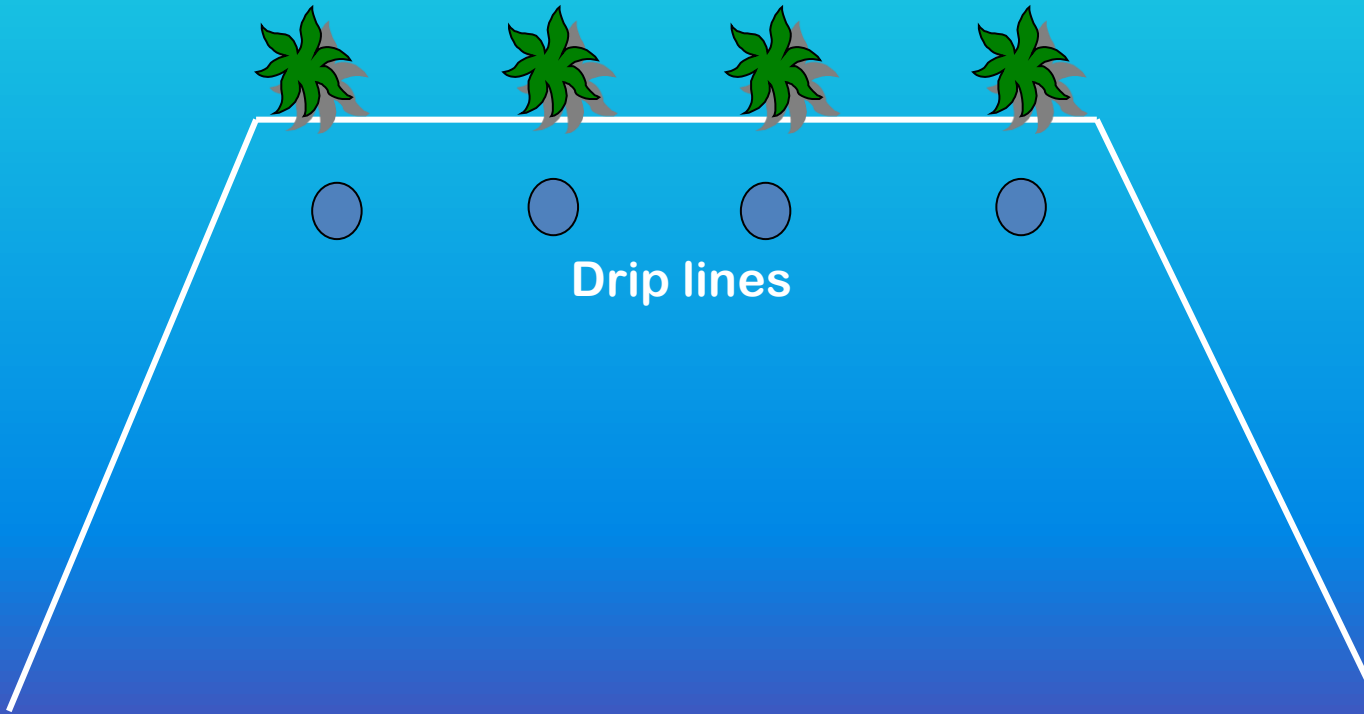
Planted in replaced fumigated soil 0-6"



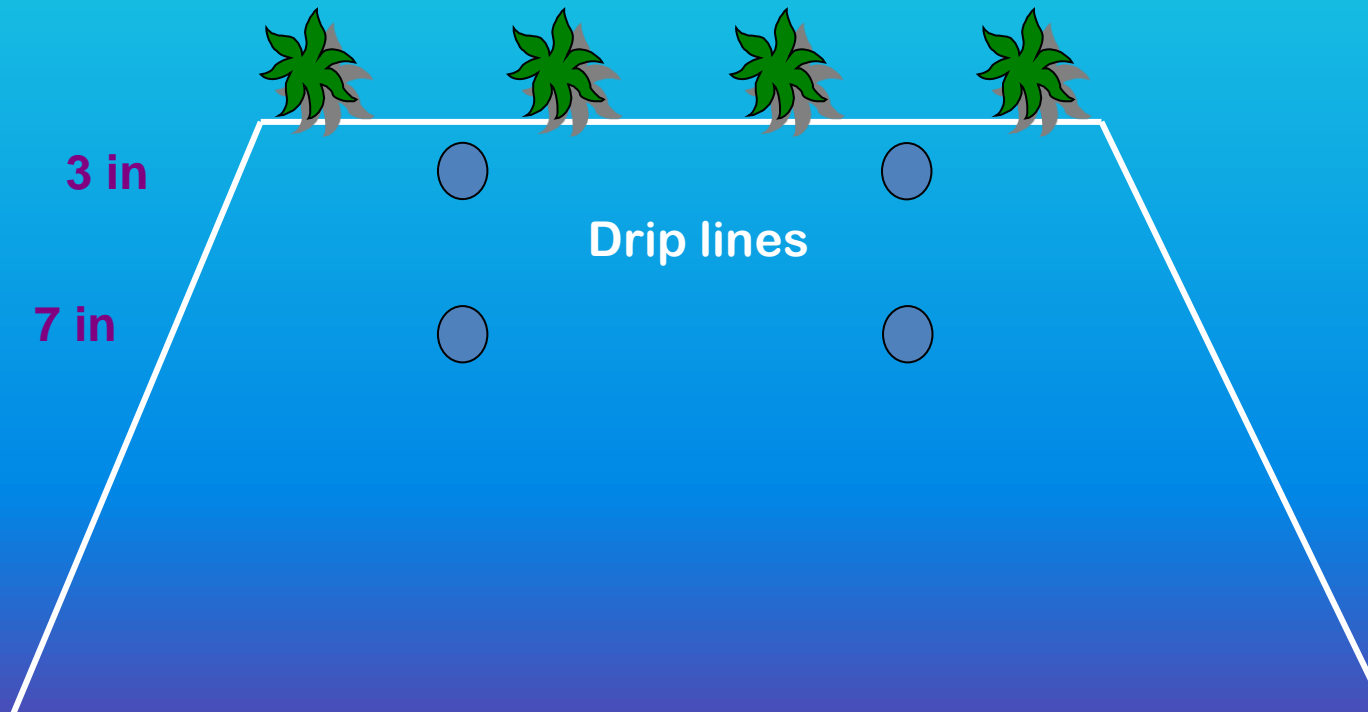
Replacement of soil in infested buffer zone with fumigated soil to 3 depths. May 5, 2013



Can 4 lines placed near plant rows improve efficacy?



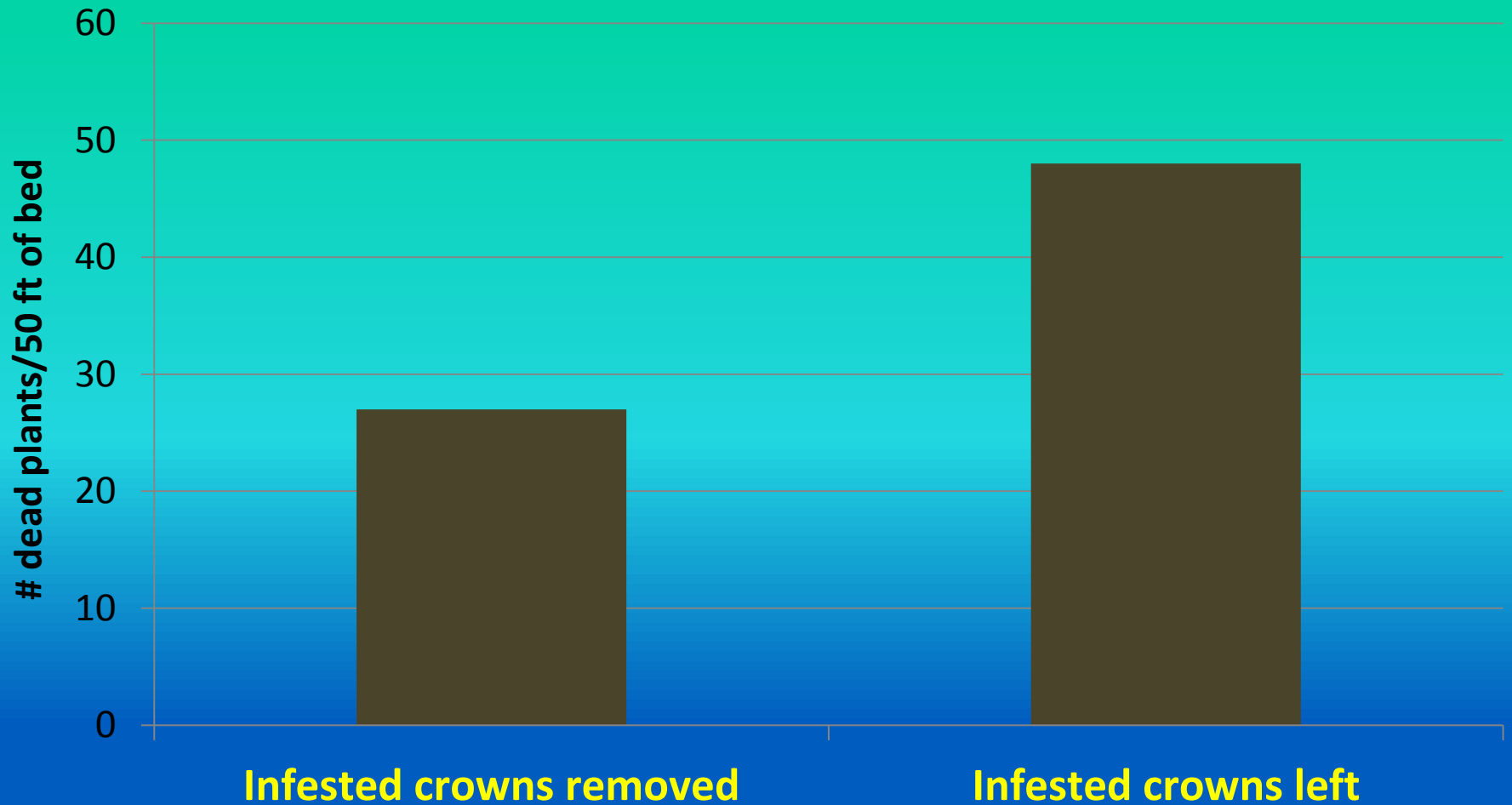
Can 2 lines (deep) + 2 (shallow) improve fumigant distribution and efficacy?



**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

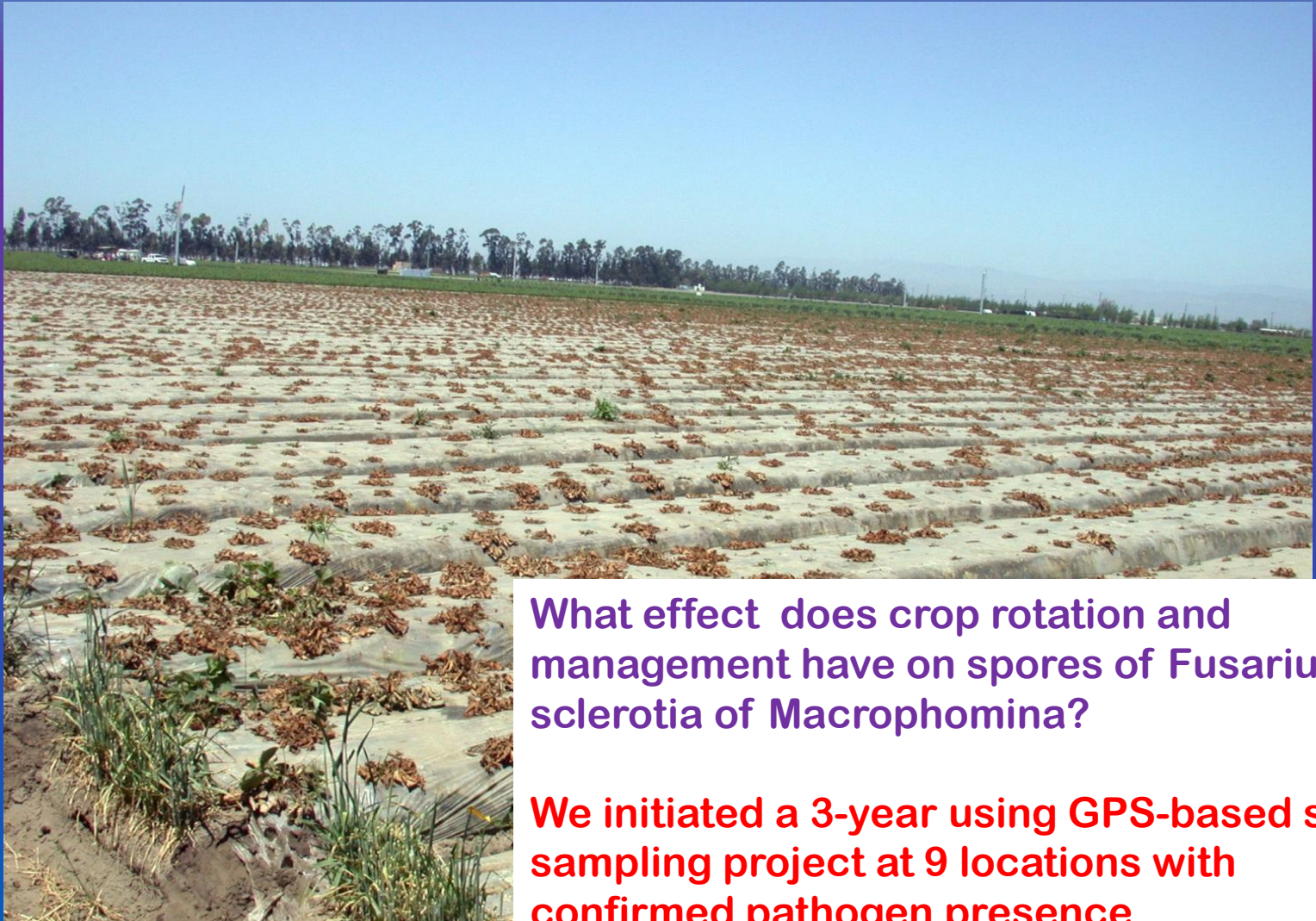


How finely do the infested crowns have to be broken down to allow fumigants to kill pathogens inside the crowns during soil fumigation?

We buried infested crowns either whole or cut to 1/2, 1/4, or 1/8 of original size and buried and retrieved from a flat-fumigated field



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



What effect does crop rotation and management have on spores of *Fusarium* and sclerotia of *Macrophomina*?

We initiated a 3-year using GPS-based soil sampling project at 9 locations with confirmed pathogen presence