

What else can we do with Anaerobic Soil Disinfestation?



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Effective ASD = C-source + water + plastic mulch

- Need C-source uniformly mixed
- Standard LDPE mulch – sufficient
- Black mulch as good as clear
- 3 inches of water - sufficient
- 3 weeks duration in summer

For C-source:

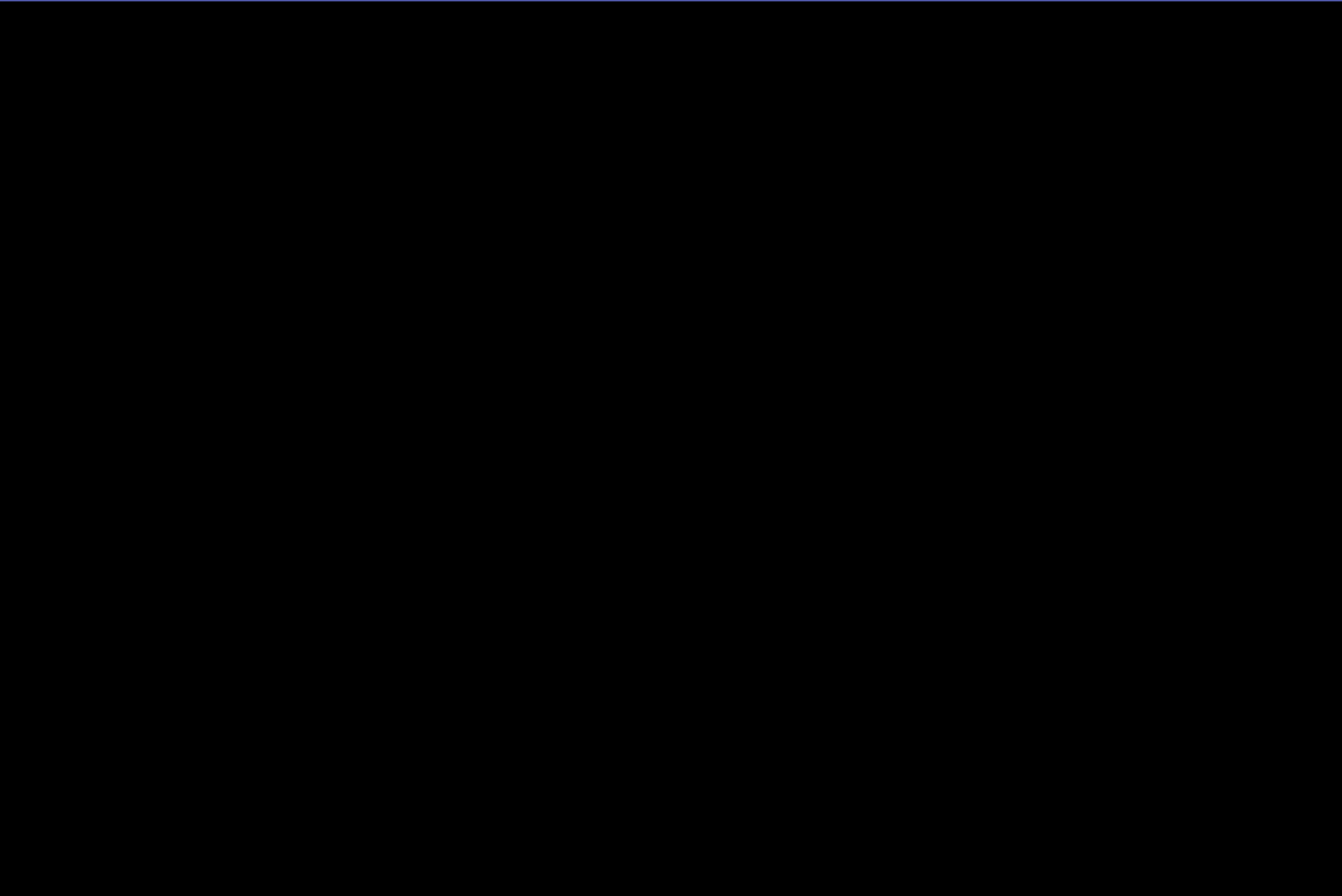
- Rice bran applied to beds: at least 25% less needed
- Apply Glycerin at 4% by volume via drip

For water:

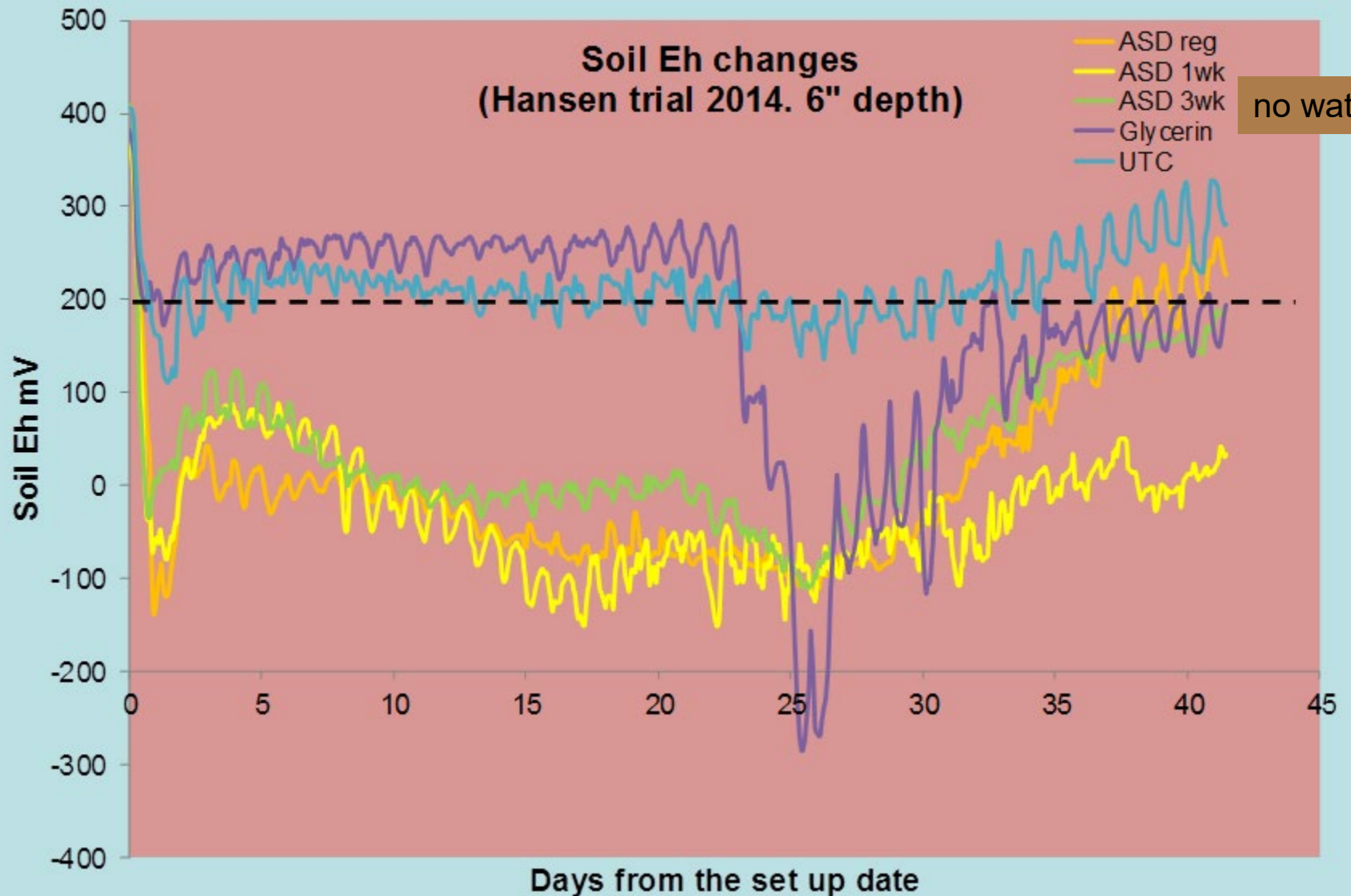
- Delay drip irrigation 1 wk after bedding
- Apply no water after bedding
- Drip-irrigate immediately



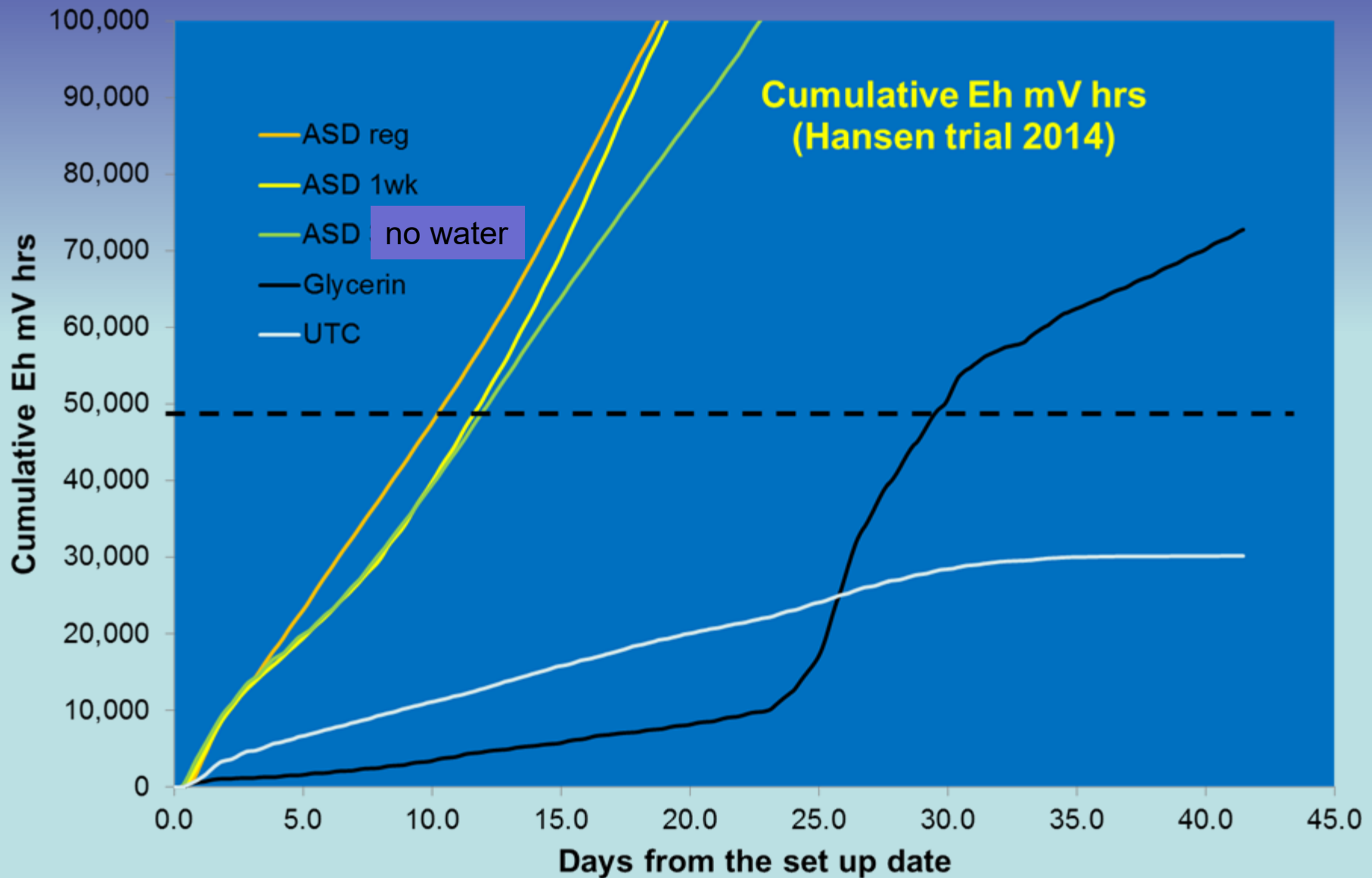
https://www.youtube.com/watch?v=wR_JdJuRdil&feature=youtu.be



Anaerobic conditions



Anaerobic conditions



Dec 28, 2014



ASD/9t rice bran

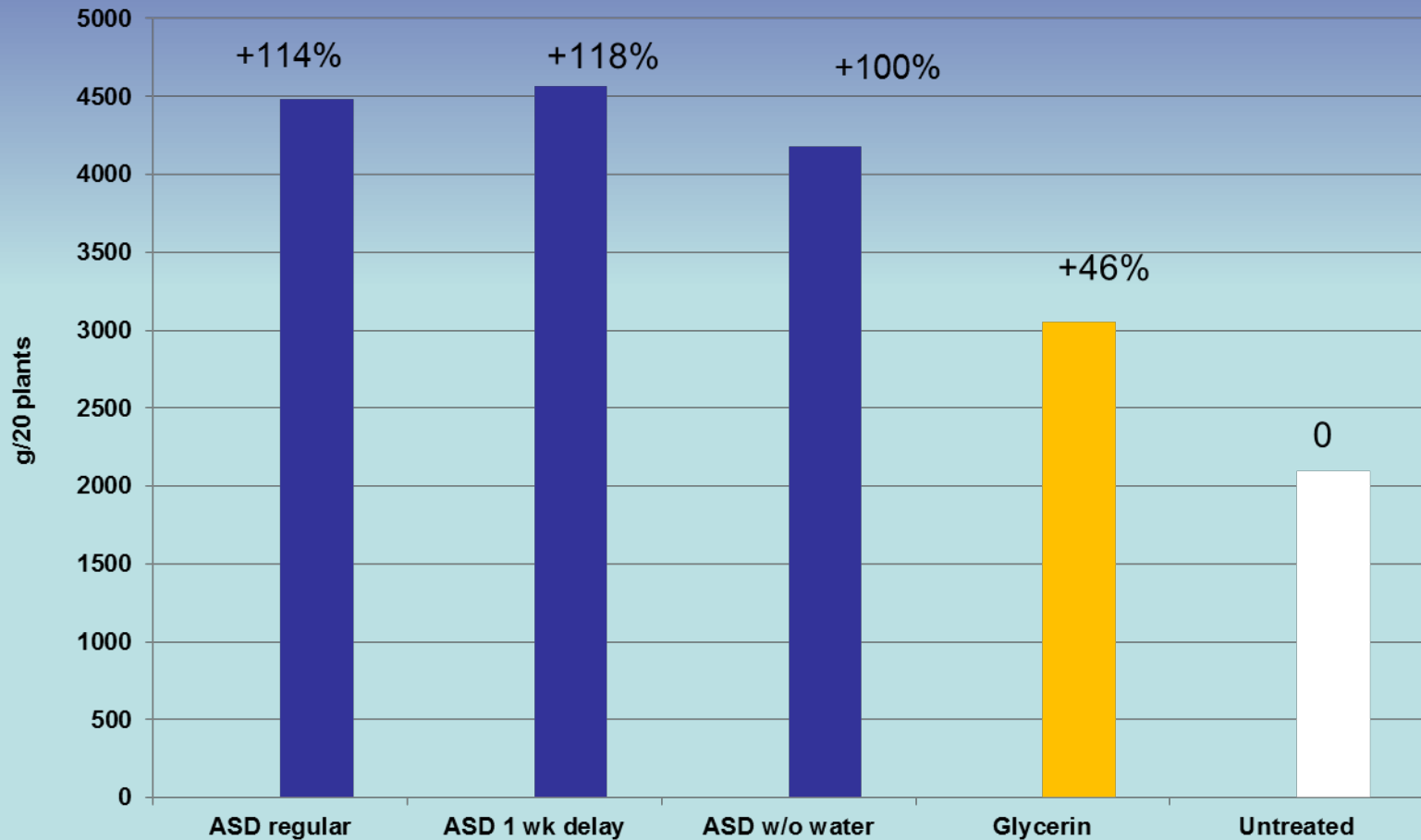


ASD/glycerin

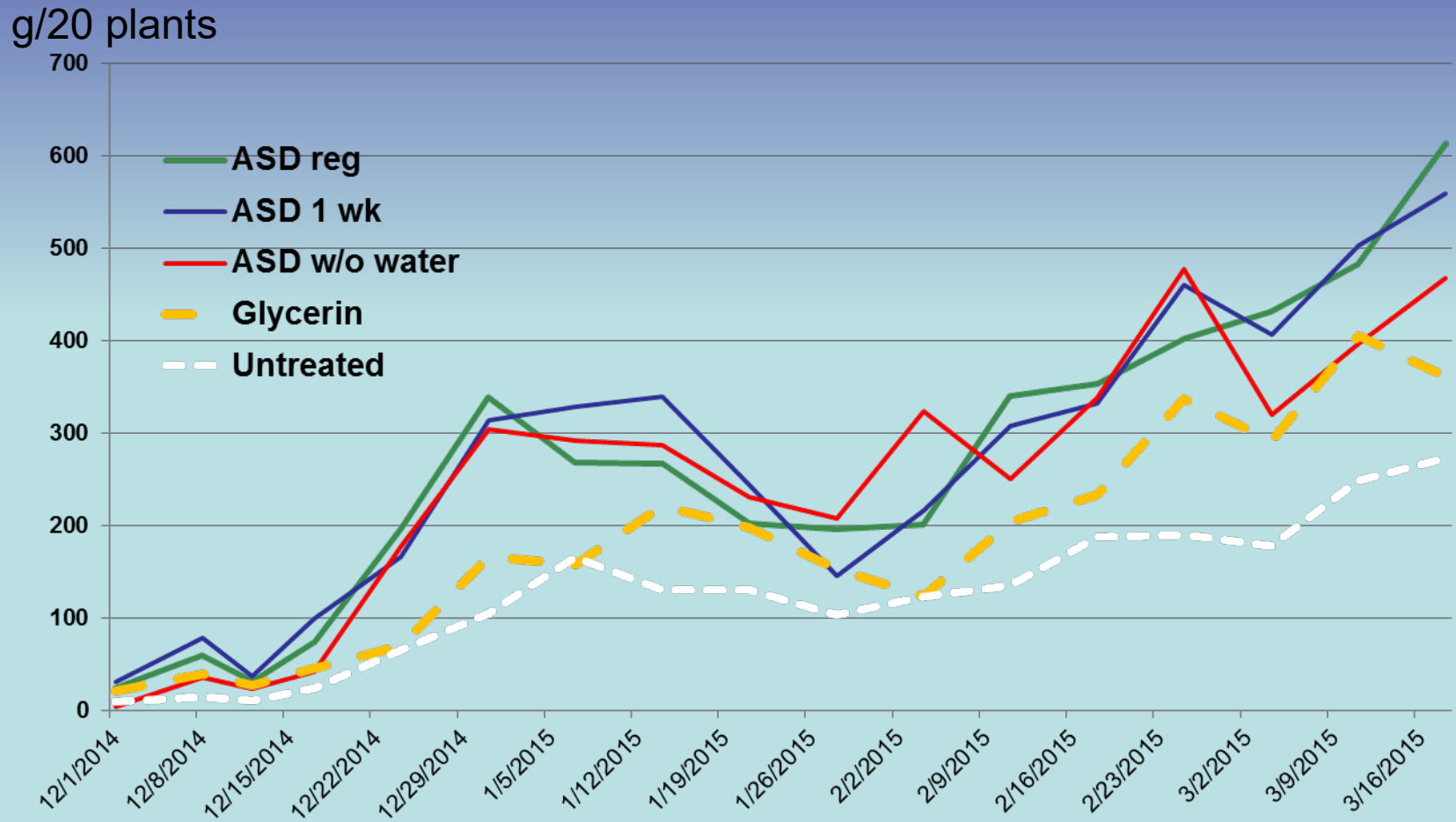


Untreated

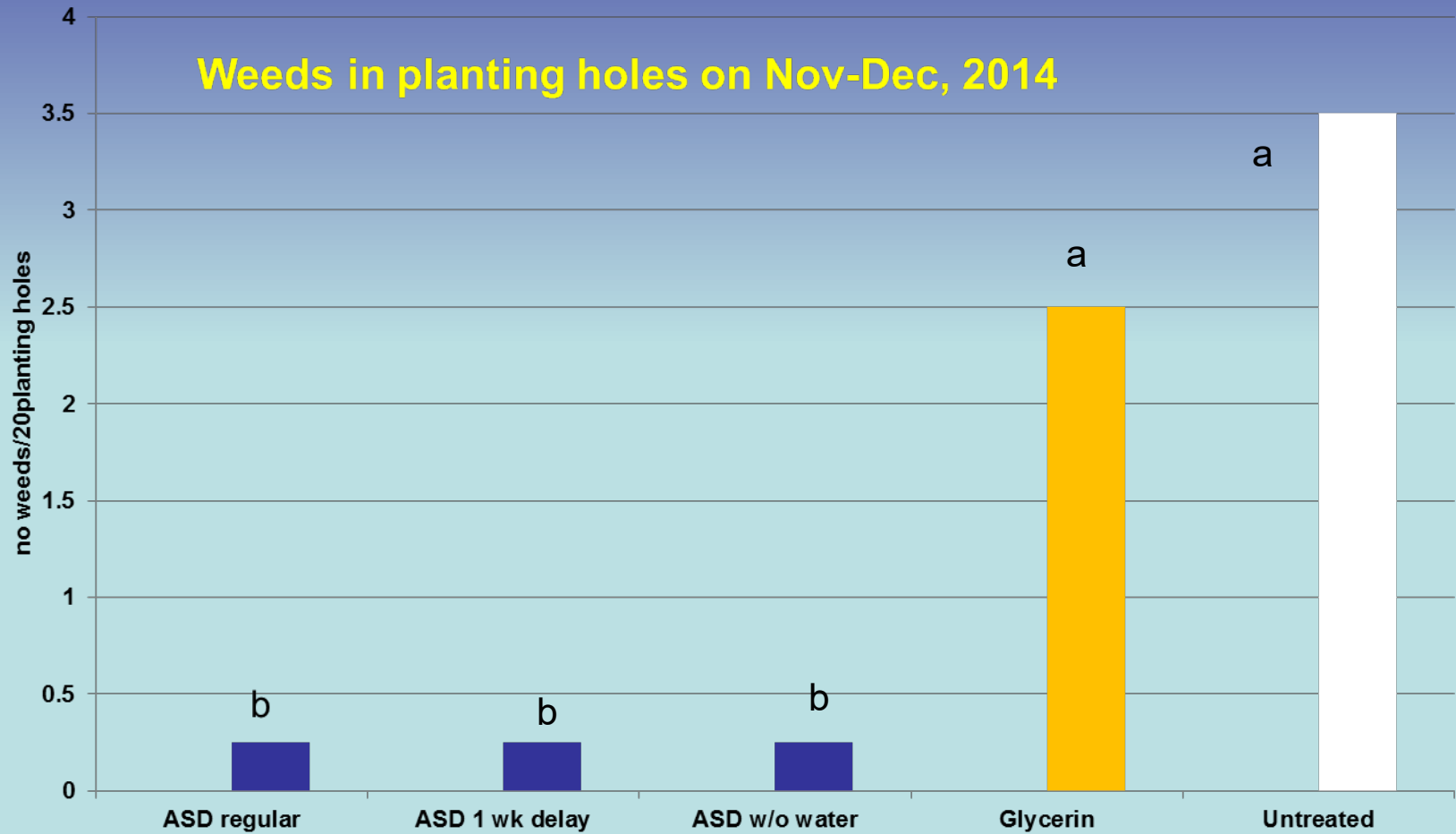
Early marketable yield: Jan-March



Early marketable yield: Jan-March



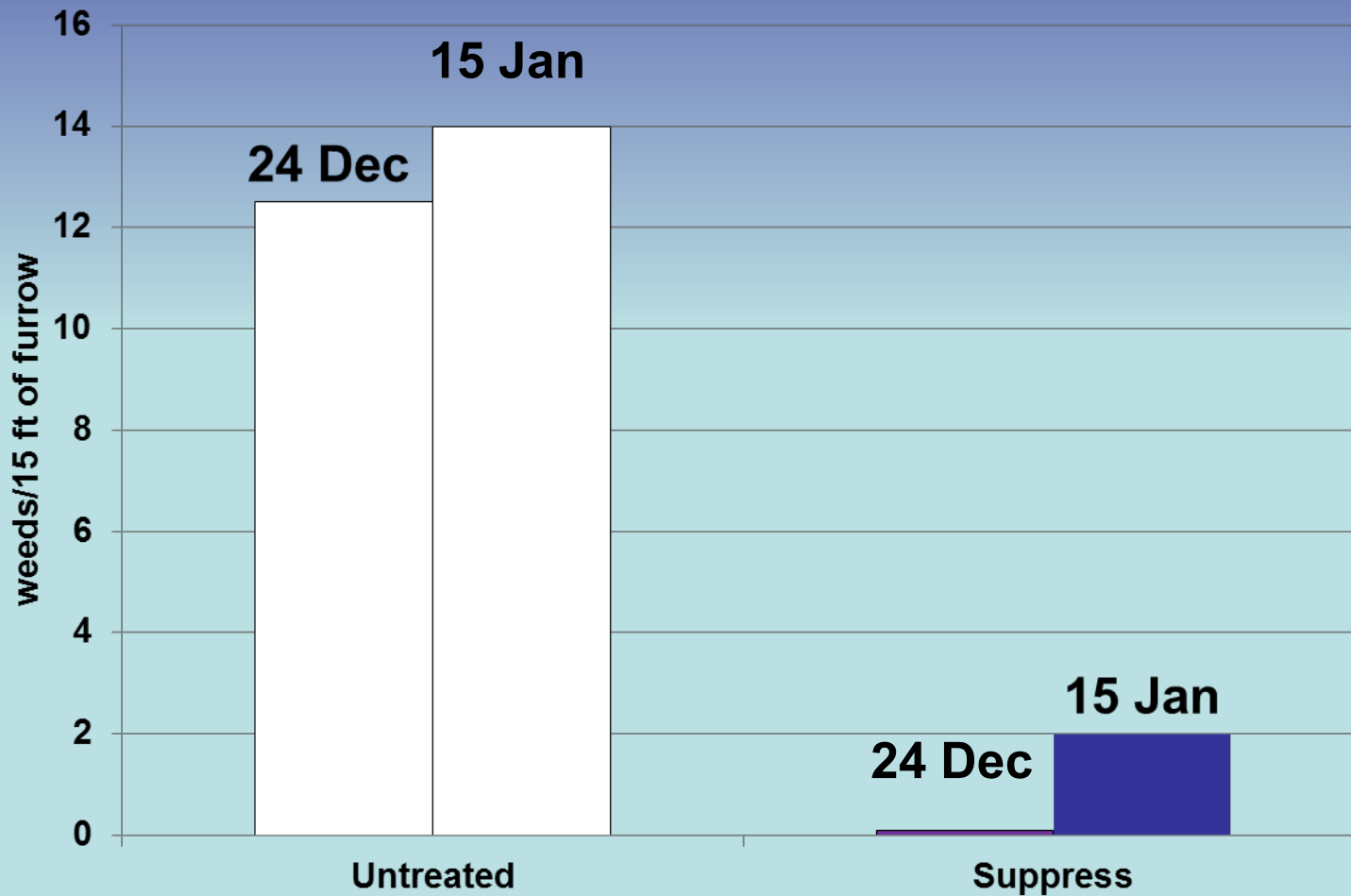
Weeds



Difficult weeds



'Suppress' in furrows at 12 fl oz/gal



3 days after treatment

Untreated



Suppress at 12 fl oz/gal



Suppress at 12 fl oz/gal

3 days after treatment



3 weeks after treatment



What is the mechanism of
action?
(how can we make sure ASD
works?)

Effect of ASD-induced volatiles on *Fusarium oxysporum* f. sp. *fragariae*

Volatile Compound	Colony radius (mm)	
	<i>Fusarium oxysporum</i>	<i>Pythium ultimum</i>
Water (control)	3.4ab	11.3a
Decanal	3.6a	3.95cd
Dimethyl trisulphide	3.0b	1.65e
Ethyl-1-hexanol	3.5ab	2.4ed
Ethanol	3.5ab	5.55b
Nonanal	3.3ab	4.55cb

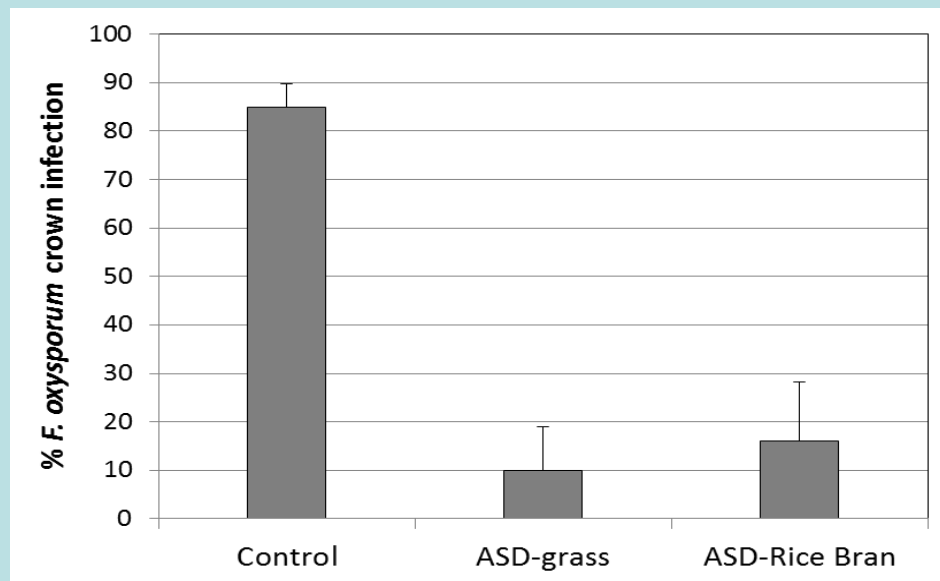
Hewavitharana & Mazzola, unpublished



Control



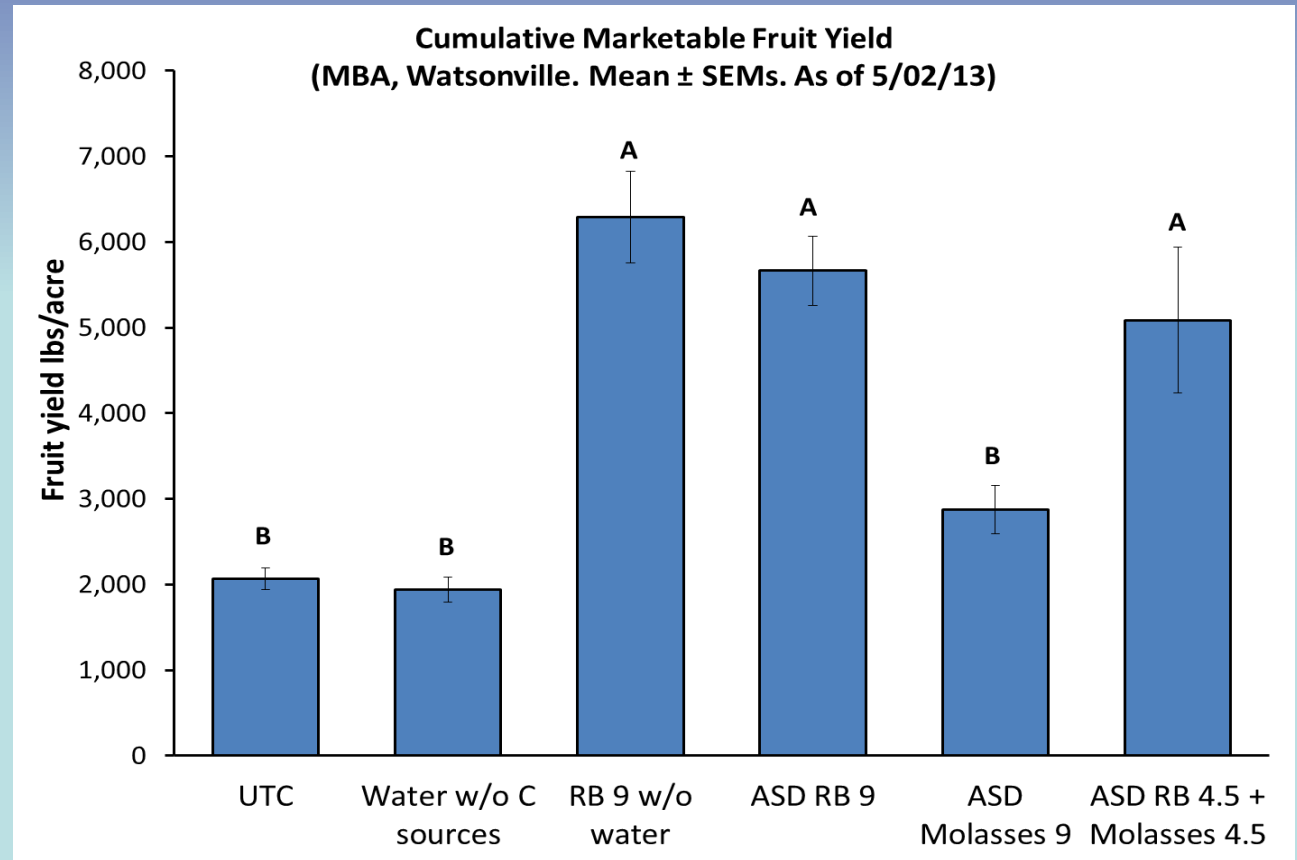
ASD-grass



Are specific biological transformations associated with ASD efficacy?

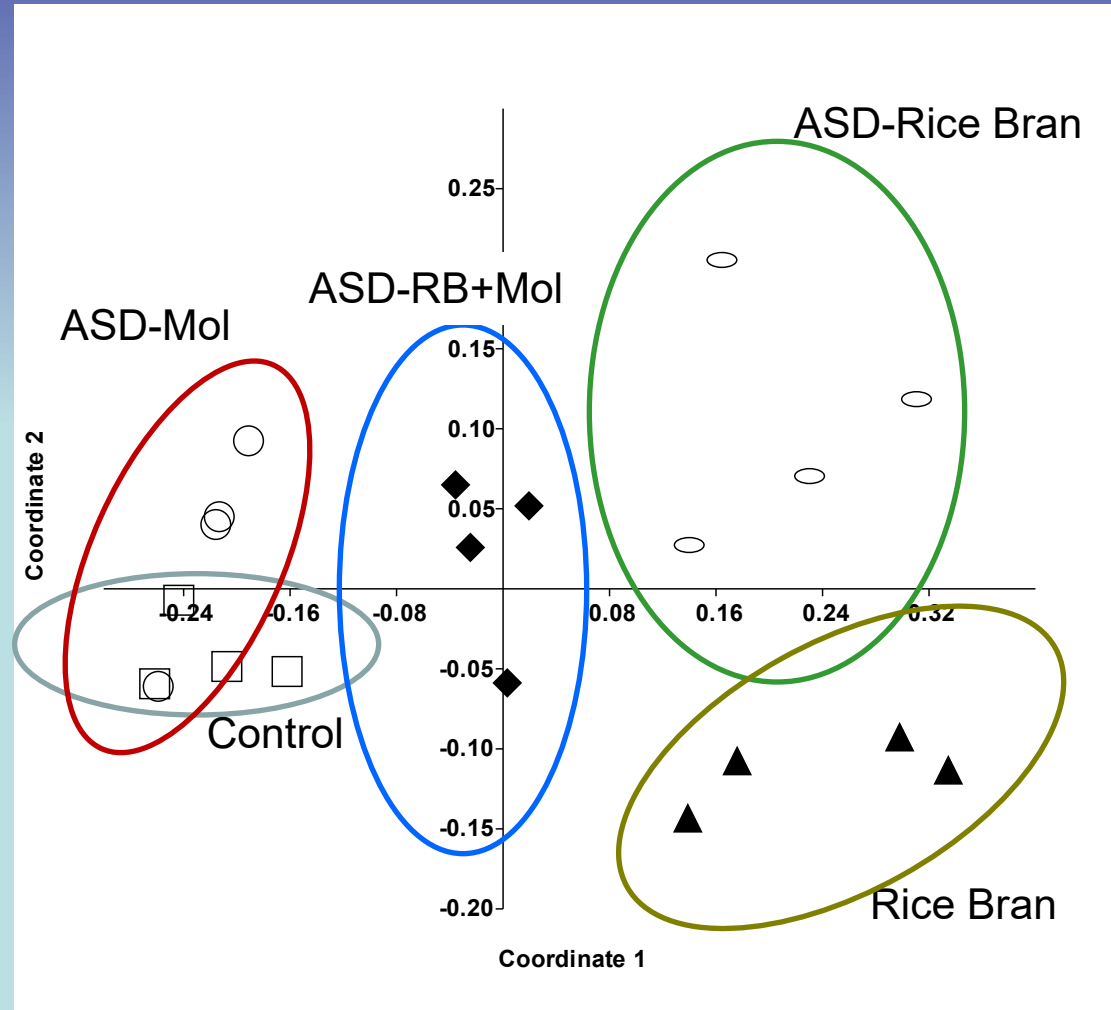
ASD Rice bran-significantly increased yields

ASD Molasses-no effect on yield



Are specific biological transformations associated with ASD efficacy?

Bacterial Community Similarity: MBA Trial



NMDS analysis; Bray-Curtis similarity measure

Are specific biological transformations associated with ASD efficacy?

Mazzola, unpublished

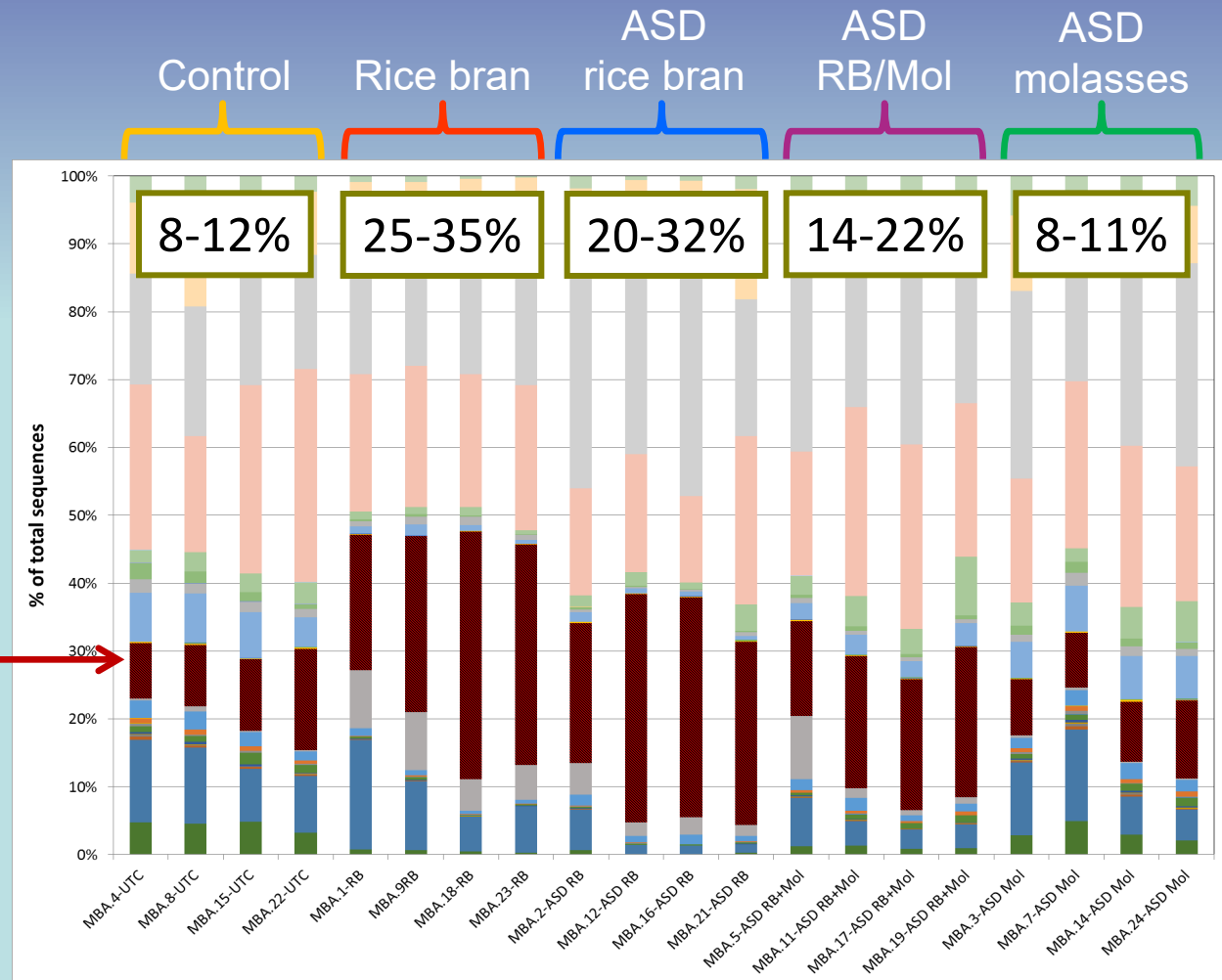
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Bacterial Community Composition Divided by Phyla and Class; MBA Trial

Treatment performance associated with relative abundance of *Flavobacteria* (facultative anaerobes) belonging to the genera:

Chryseobacterium,
Chitinophaga, *Cytophaga*,
Sphingobacterium, *Flavobacterium*



ASD

- C-sources that are cheap, abundant, local and cater to these microbial groups?
- Changes in soil physical properties over the season
- Since we don't eradicate the problems: intergrade ASD with other strategies (rotation, fumigation, varieties)

Acknowledgements:

- Jose Romero and Hector Gutierrez
- UC Hansen staff
- UCCE Master Gardeners
- CSC

