

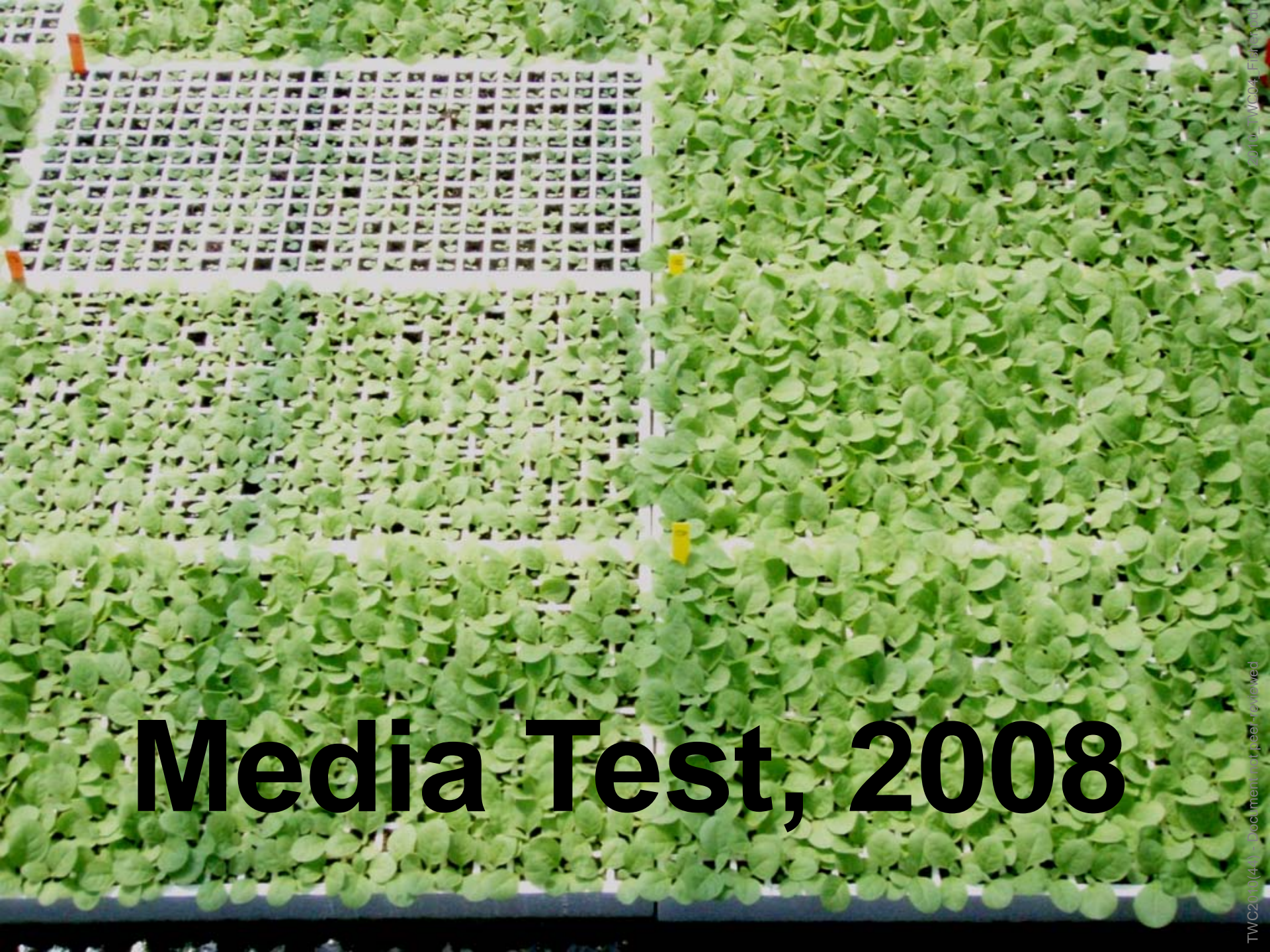
Investigation of causal factors in float media prone to spiral root induction

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Media Test, 2008

Spiral root incidence on different brands of media, 2008

<u>Brand of Media</u>	<u>Spiral Root, %</u>
Burley Gold	1.5
Carolina Choice	2.5
Carolina Silver	1.8
Premier Promix FPX	16.0
Premier Promix TA	1.5
Southern States	3.3
Speedling Fortified	1.2
Speedling Lite	1.1
Sunshine LT5	0.6
Sunshine Metromix	1.0

Factors affecting spiral root incidence

- Media packing density – O₂
- Greenhouse environment
- Pelletting material
- Dibble shape & depth
- Varietal differences
- Media formulation

Formulation

<u>Property</u>	<u>TA</u>	<u>FPX</u>
Sphagnum moss	85%	75%
Additive	15% Vermiculite	25% Perlite
EC	1.5	0.8
NO3-N	153	85
PO4-P	19	8
K	122	35
Ca	155	94
Mg	63	19
Application	Float system	Not for float system

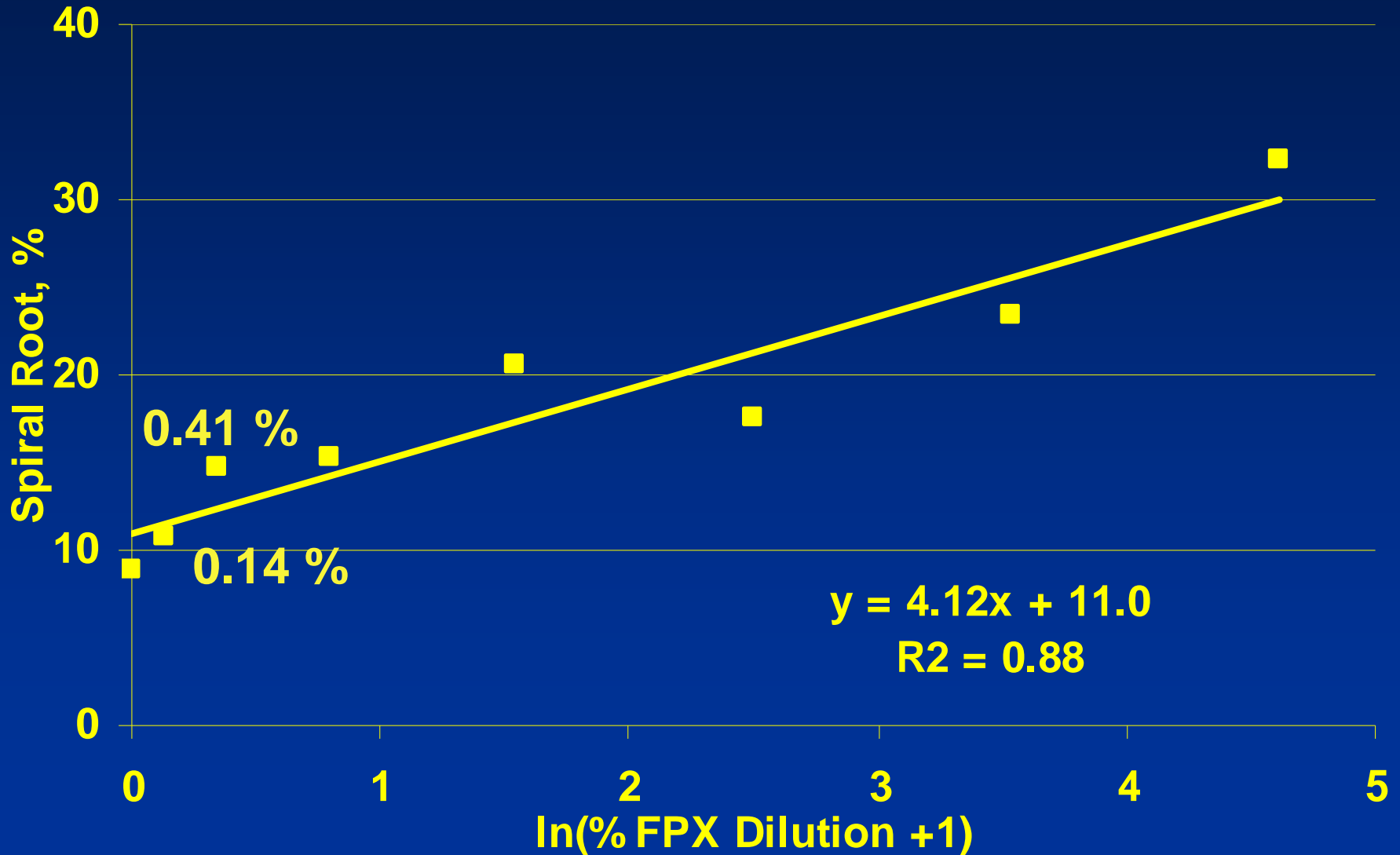
Objective

Determine the factor in FPX that causes elevated levels of spiral root

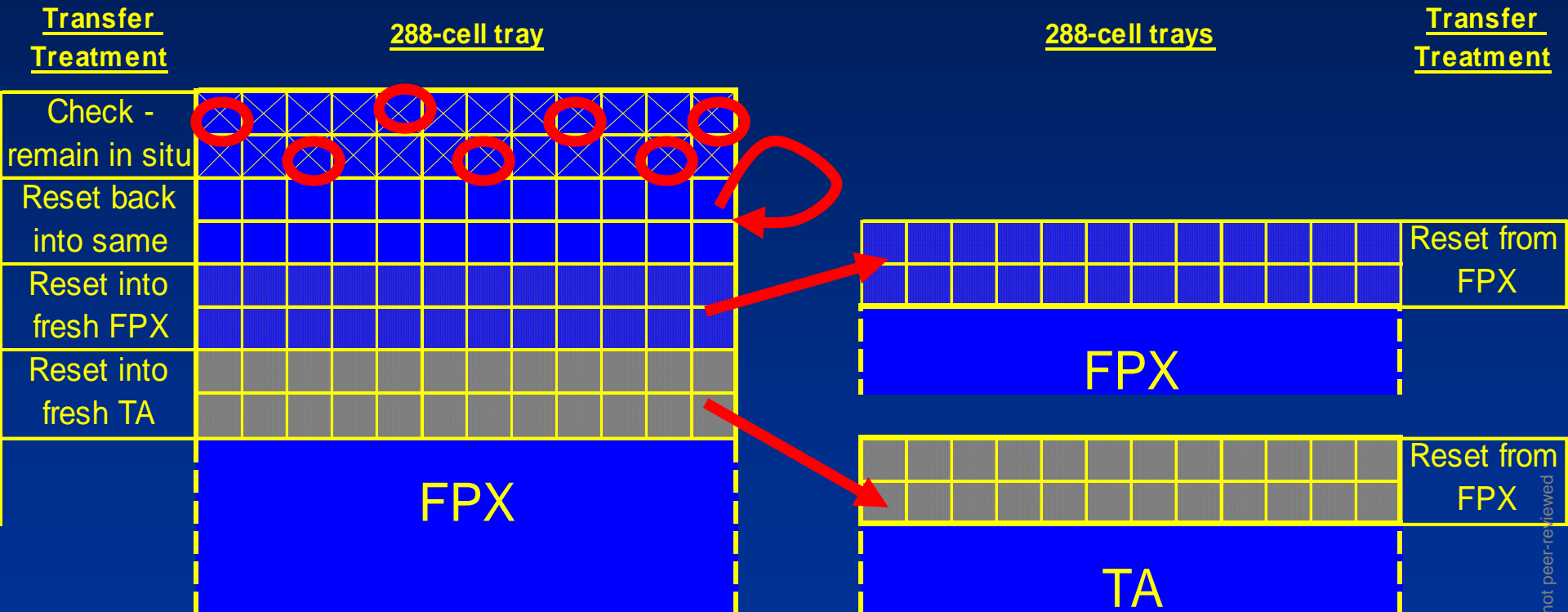
Acknowledge Premier Horticulture

for assistance in information, advice and material supplies in our use of FPX as a tool in this study

Effect on spiral root of dilution of FPX with TA



Spiral Root Induction - Transfer



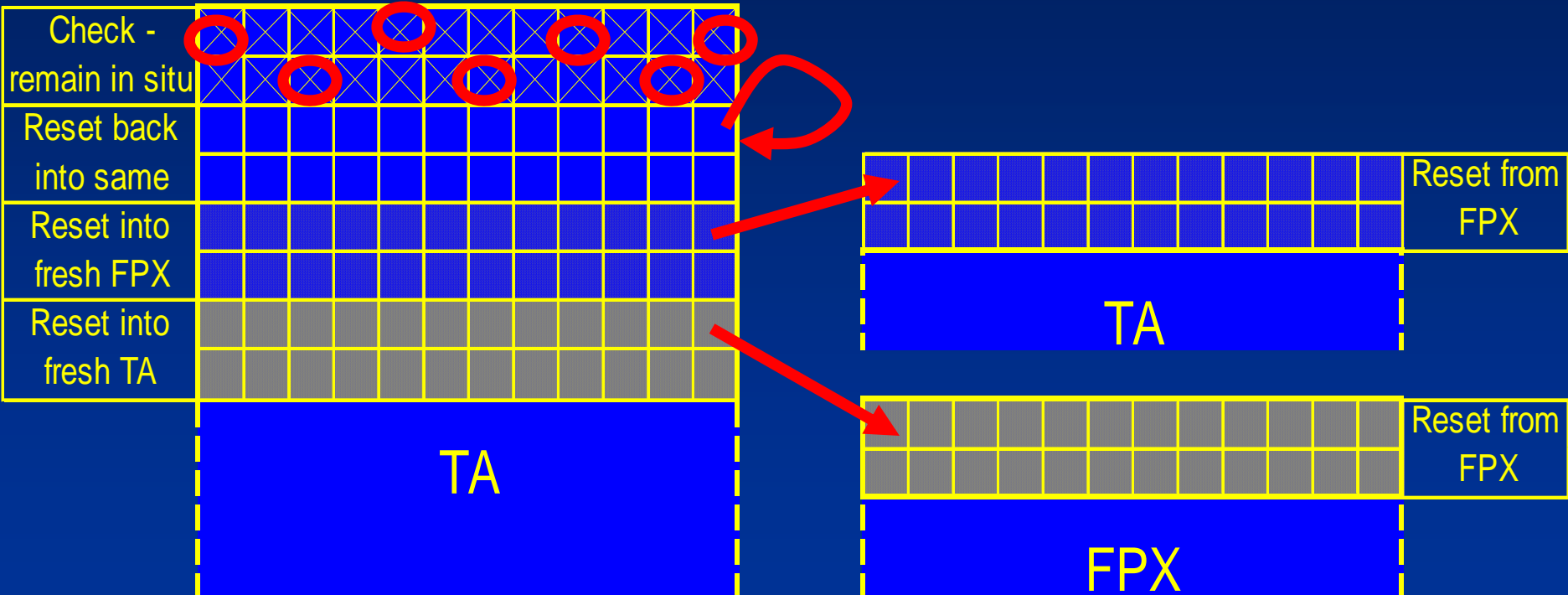
Spiral Root Induction - Transfer

Transfer Treatment

288-cell tray

288-cell trays

Transfer Treatment



Transfer at 3 DAS



Transfer at 6 DAS



Spiral Root Induction I:

Transfer between media at 3 das (counts at 16 das)

<u>Transfer Treatment</u>	<u>TA</u>	<u>FPX</u>
Left in situ	2	45
Displaced into same cell	2	51
Transferred from same media	5	64
Transferred from other media	9	41



Spiral Root Induction II: Double Sowing - Results

	<u>FPX</u>	<u>TA</u>	
Overall spiral root, %	41	22	
Difference (Obs - Exp) {	2 Normal	18	14
	2 Spiral Root	19	16
	1 Normal, 1 Spiral Root	-37	-30
Total Observations	481	496	
	p> 0.005	0.005	

Nutrient Effect - Results

<u>Media</u>	<u>Fertilizer</u>	
	<u>None</u>	<u>100 ppm 20:10:20</u>
FPX	44	36
TA	8	9

Biotic or soluble contaminant? - Method

Media:

TA

FPX

Media pre-treatment:

Fresh

Autoclaved

Float Water:

Fresh

FPX Filtrate

Test for soluble or biotic contaminant - Results

<u>Float water</u>	<u>Media Treatment</u>	<u>Media FPX</u>	<u>Media TA</u>
Fresh	Fresh	45	16
	Autoclaved	36	10
Filtrate from saturated FPX	Fresh	-	25
	Autoclaved	40	-

Particle Size Differences

<u>Media</u>		<u>% Retained on Sieve size, mm:</u>					
		<u>2</u>	<u>1</u>	<u>0.5</u>	<u>0.3</u>	<u>0.1</u>	<u>Pan</u>
7 other media	Min	11	23	20	11	6	3
	Max	21	47	26	21	15	7
	Mean	15	30	22	17	10	5
FPX		17	18	24	24	11	6
	P (t-test)	NS	**	NS	**	NS	NS

Particle Size Differences - Method

Media

Trmt

FPX

Fresh Check
Reconstitute
Normalized

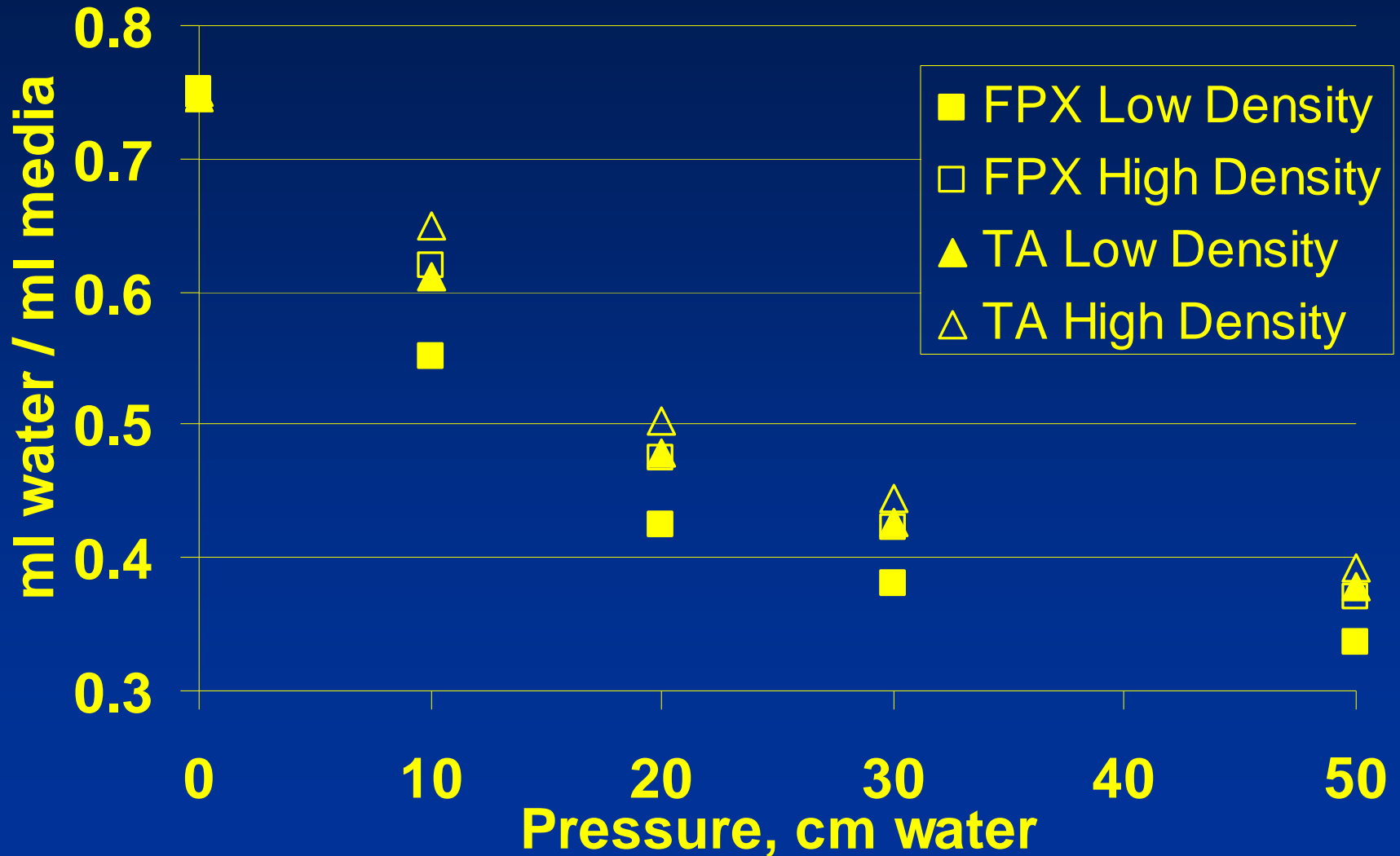
"Mix 7"

FPX Equiv
Fresh Check
Reconstituted
Coarse
Fine

Particle Size - Results

<u>Media</u>	<u>Trmt</u>	<u>Spiral</u> <u>Root, %</u>
FPX	Fresh Check	48
	Reconstitute	59
	Normalized	66
"Mix 7"	FPX Equiv	18
	Fresh Check	17
	Reconstituted	19
	Coarse	19
	Fine	11

Water retention curves for TA & FPX, each at two packing rates



Summary

- X-factor very powerful – to 0.14% dilution
- Induction as early as 3 das but continues at least to 9 das
- Effect is partially reversible
- Propensity for a cell to be more conducive than another

Summary

- Nutrient level a factor ?
- Biotic or soluble factor may be present
 - What?
- Particle size distribution is not the cause
- Water retention unlikely

Conclusion

- Still none the wiser
- Retest biotic / water soluble factor
- Size fractions of perlite ?

Acknowledgements

- Premier Horticulture
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