University of California
Agriculture and Natural Resources

Making a Difference for California

EVALUATING DRIP IRRIGATED TOMATOES ON 80-INCH BEDS

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- CTRI
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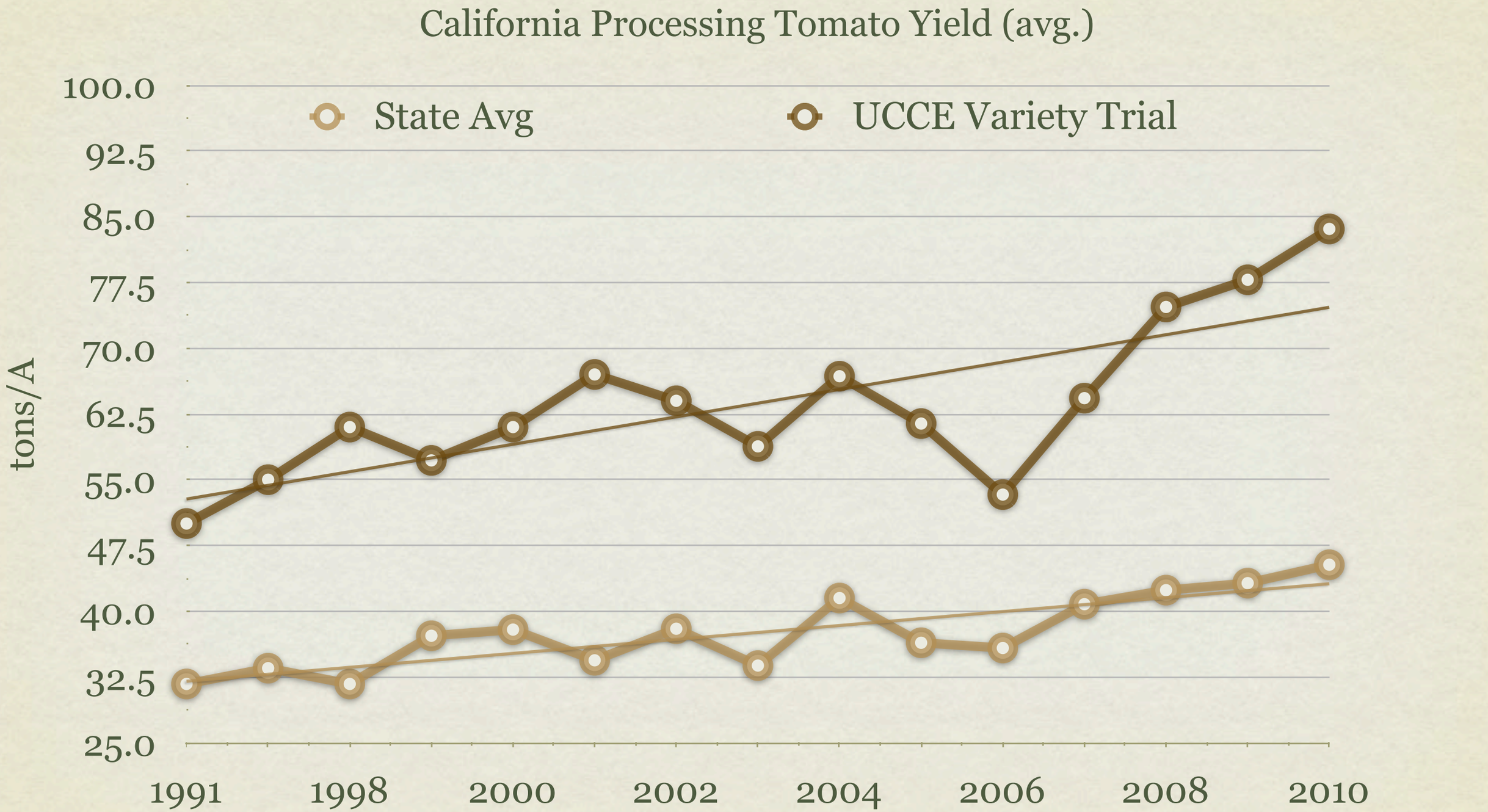
GETTING TO 100 T/A



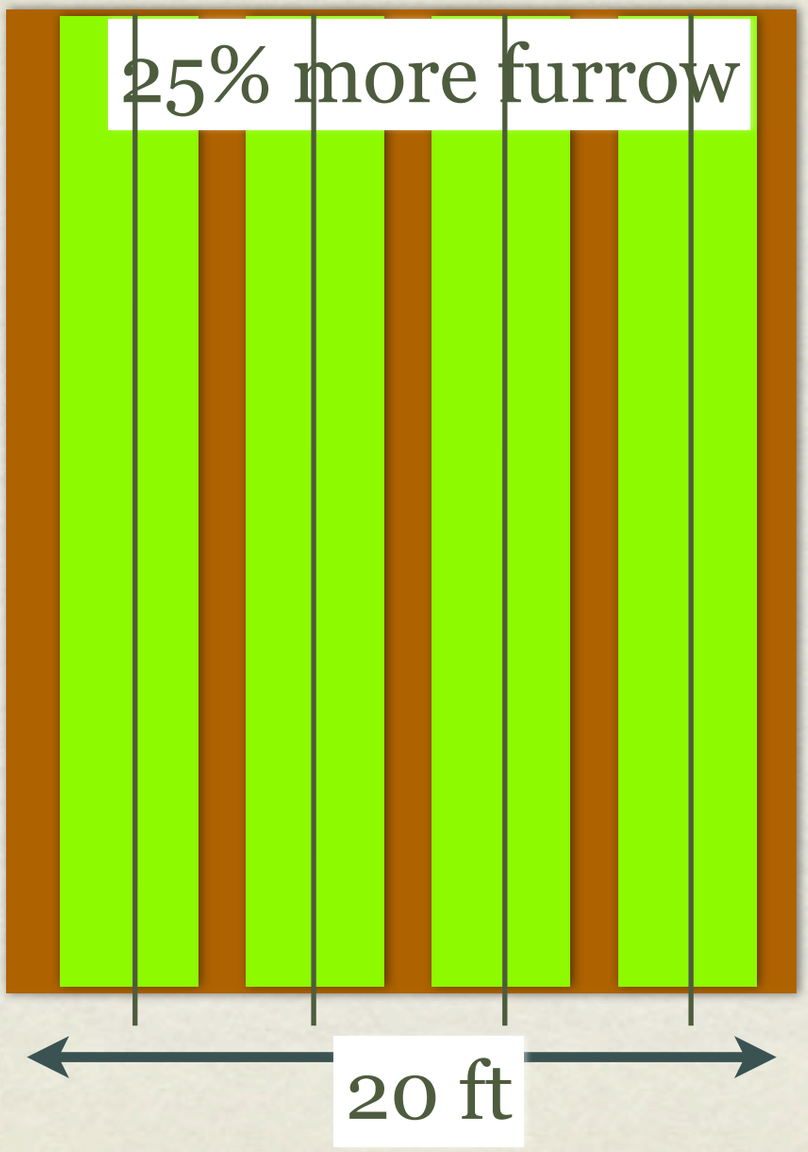
BACKGROUND

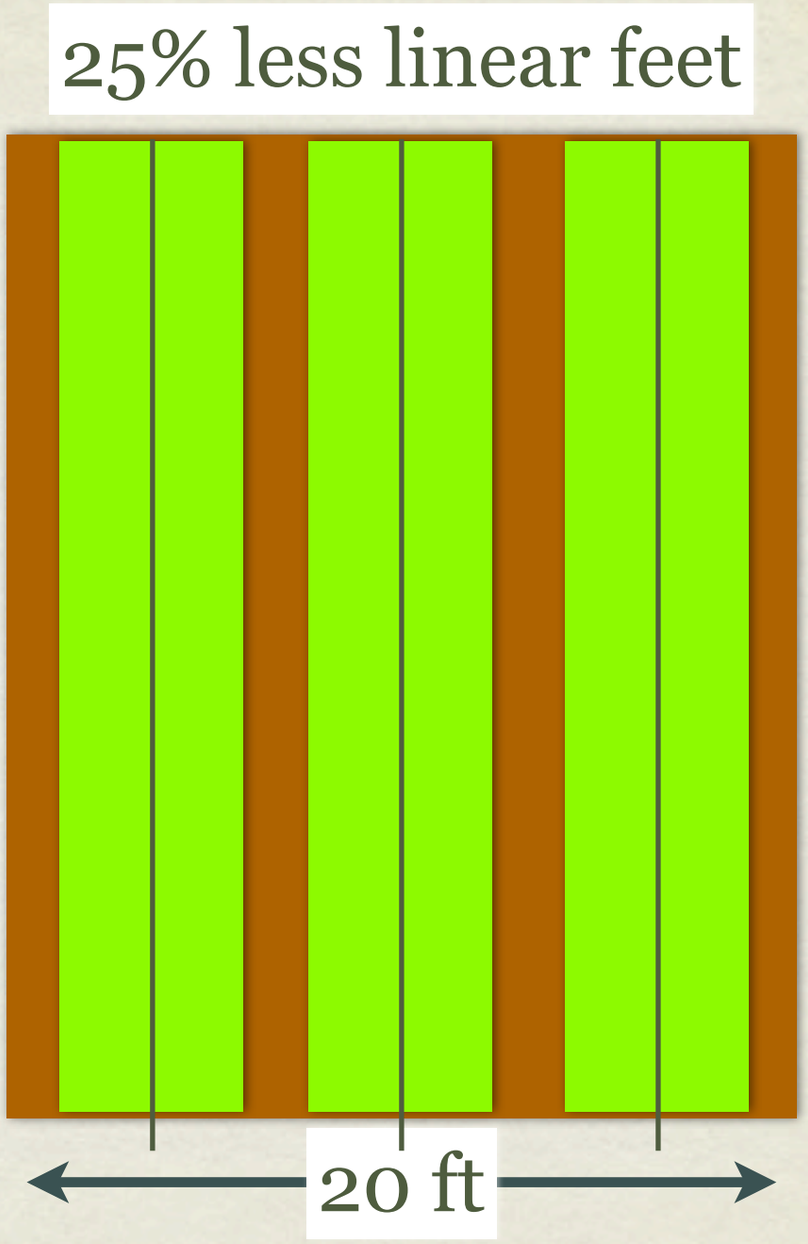
- Drip irrigation has increased substantially in the last 10 years
  - > 50% state acreage
- Benefits (yield) vs issues (cost, maintenance, and rotation limitations)

ROTATIONS (CENTRAL SJV)

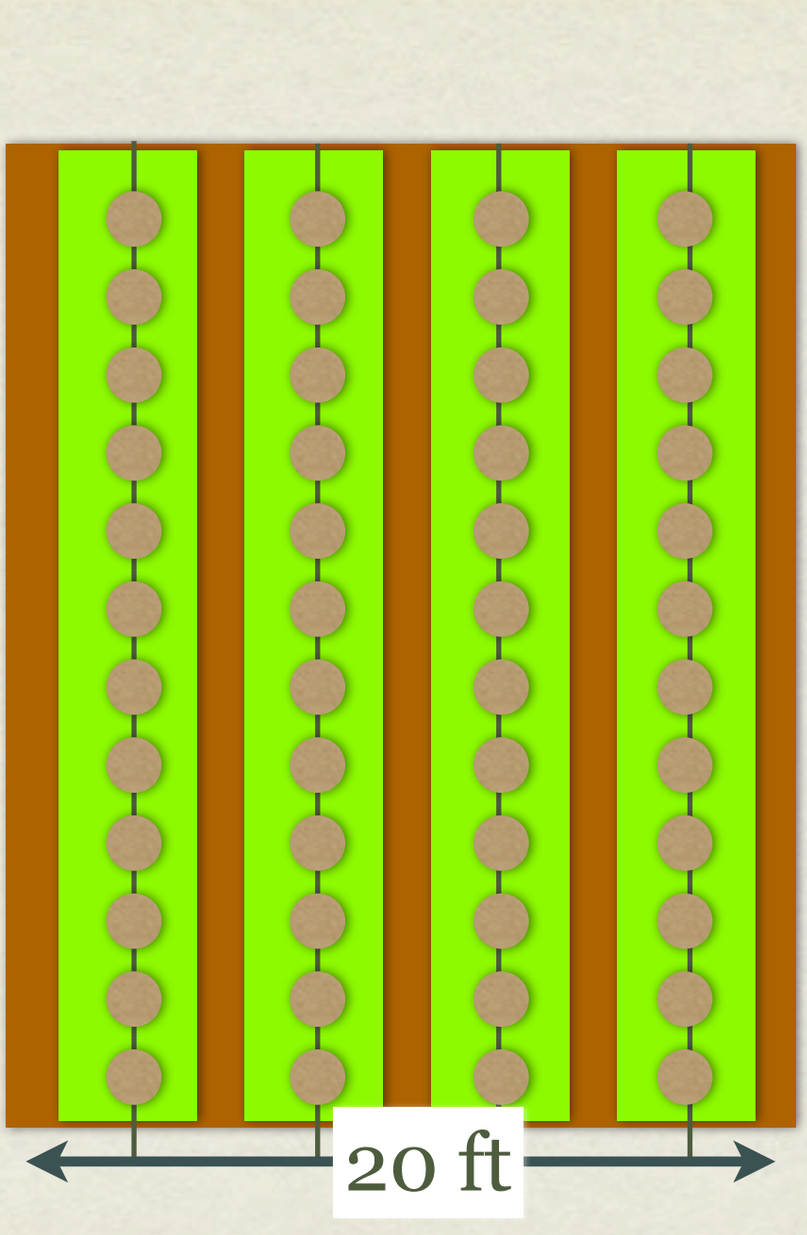
- tomato/cotton/corn on 60” (Merced) or 66” (Fresno) beds
- melons on 80”
- lettuce, cole crops, onions, garlic on 40”

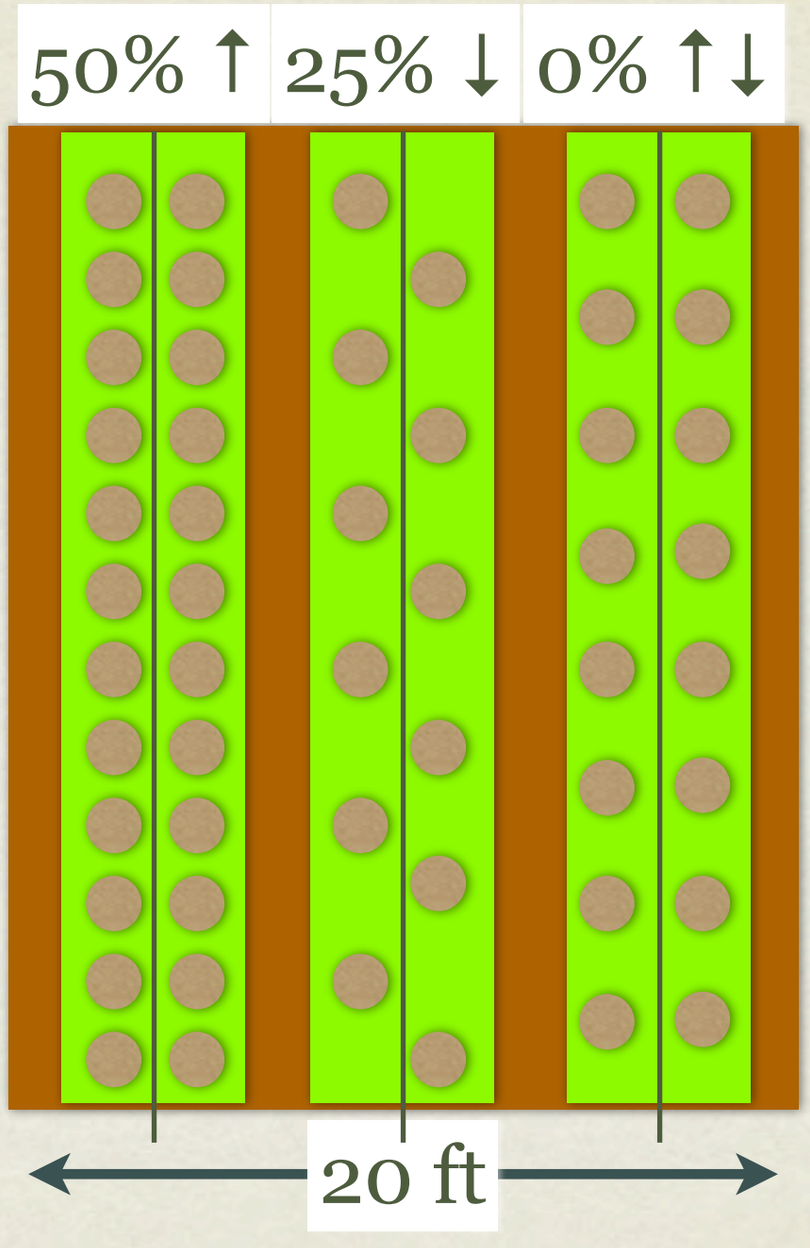
BED AND DRIP LINES





PLANT SPACING





DOUBLE-ROW 80” BEDS

- 1 drip line per bed
  - reduced installation cost
  - limit rotation possibilities?
- 2 drip lines per bed
  - increased $$
  - increased rotation options
- ↑ plants, ↑ yields?
- Equipment & harvest configuration

OBJECTIVE:

Compare yield, economics, and flexibility of processing tomatoes on standard 66” beds to 80” beds with different plant populations and drip systems.

METHODS

1. Std 66” bed w/buried drip, single row plants
2. 80” bed w/single buried drip, double row plants
3. 80” bed w/two buried drip lines, double row plants
4. 80” bed w/single drip, following fallow bed

A. Same amount of water for trts 1 - 3 (107% Et).
   a. lower flow rate for double row tape
   b. similar cut-off date
B. Plant spacing split plots of 6, 8, 10, 12 thousand plants per acre
C. Measure yield, PTAB fruit quality, economic analysis

METHODS

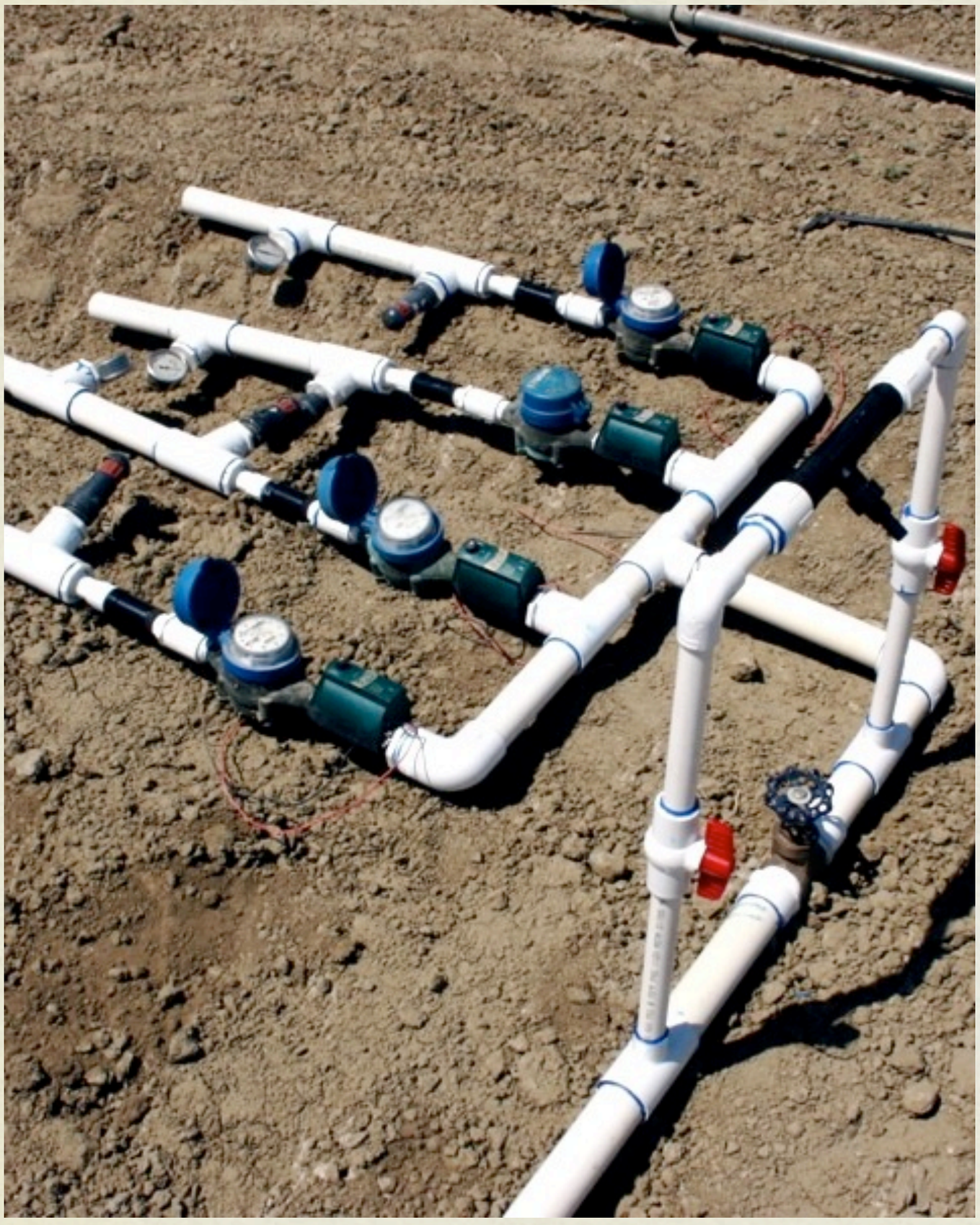
- Location WSREC.
- RCB split plot, 3 beds x 300 ft. ~ 1.5 acres
- Mechanically transplanted, good stand numbers
- TSWV moderate to severe
- machine harvest middle bed

transplanting

CHALLENGES 2010

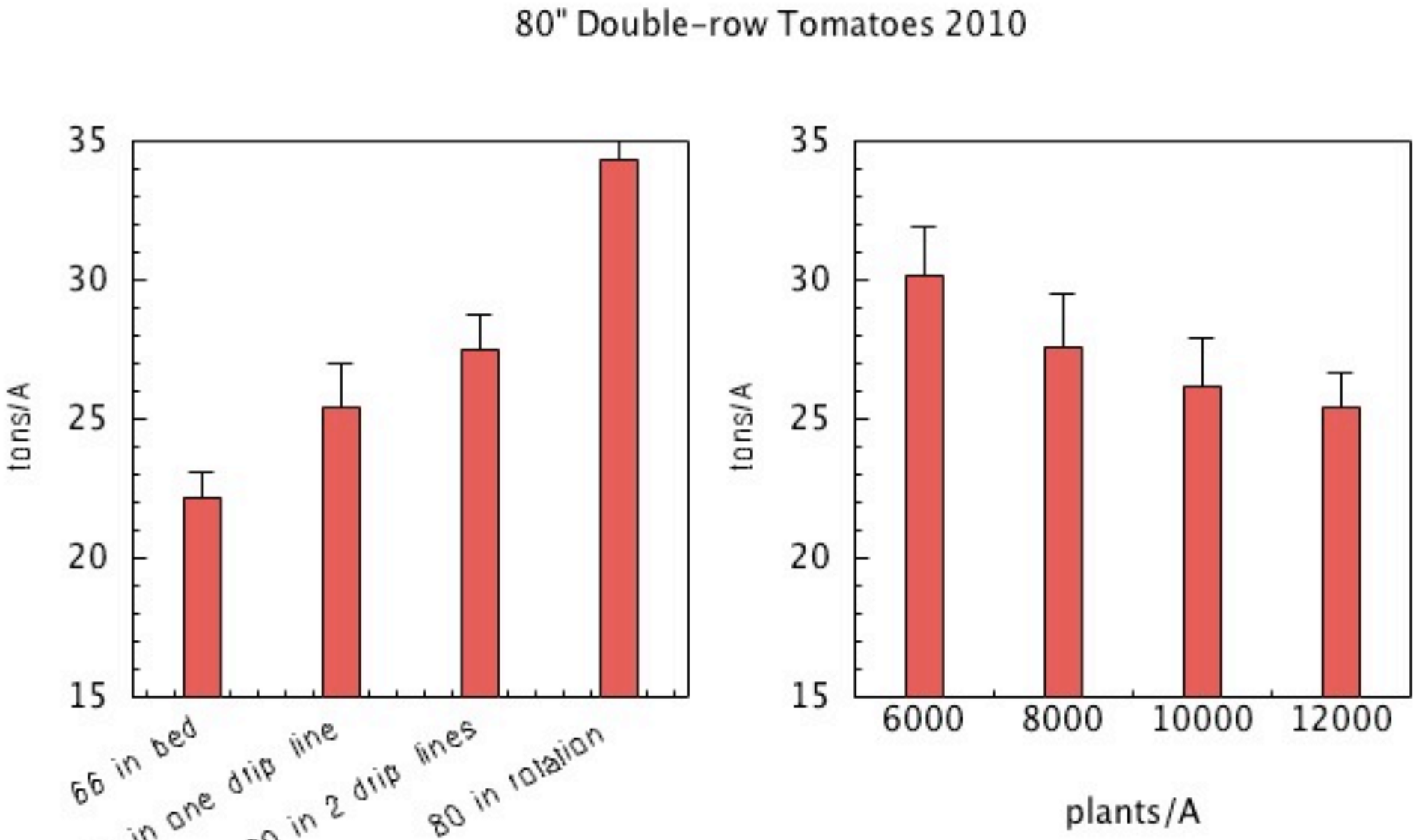
- irrigation system
- TSWV

RESULTS

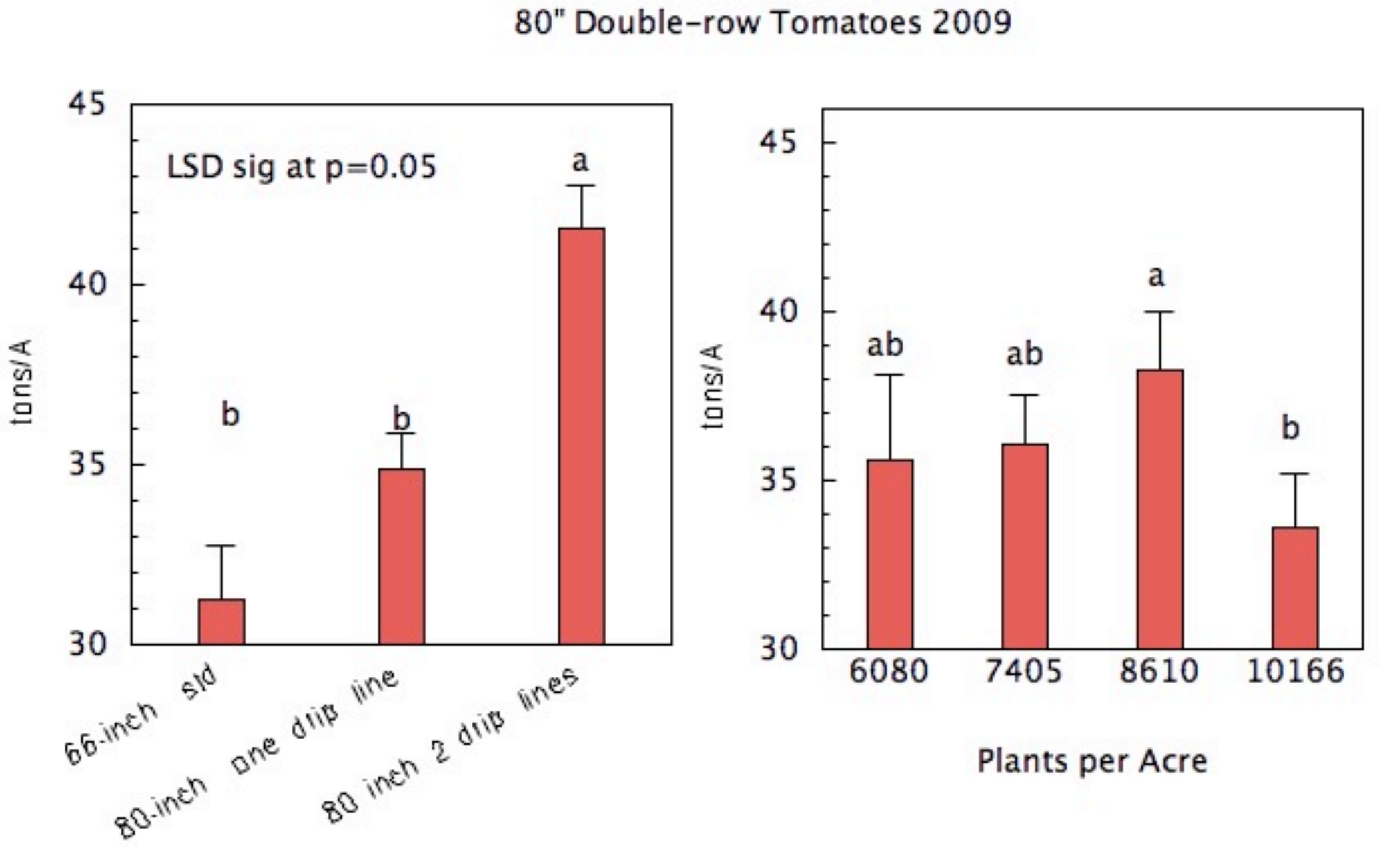


Treatment	Applied Water, inches
1. 66” beds	26.9
2. 80”, one line	27.2
3. 80”, two lines	25.7
4. 80”, rotation	26.8

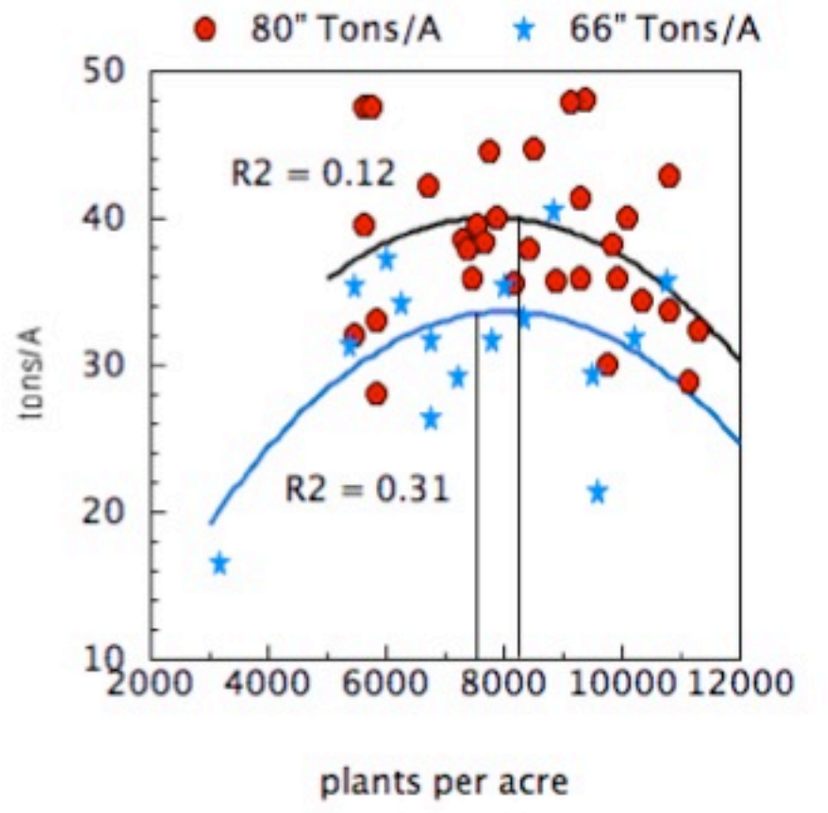
RESULTS: YIELD



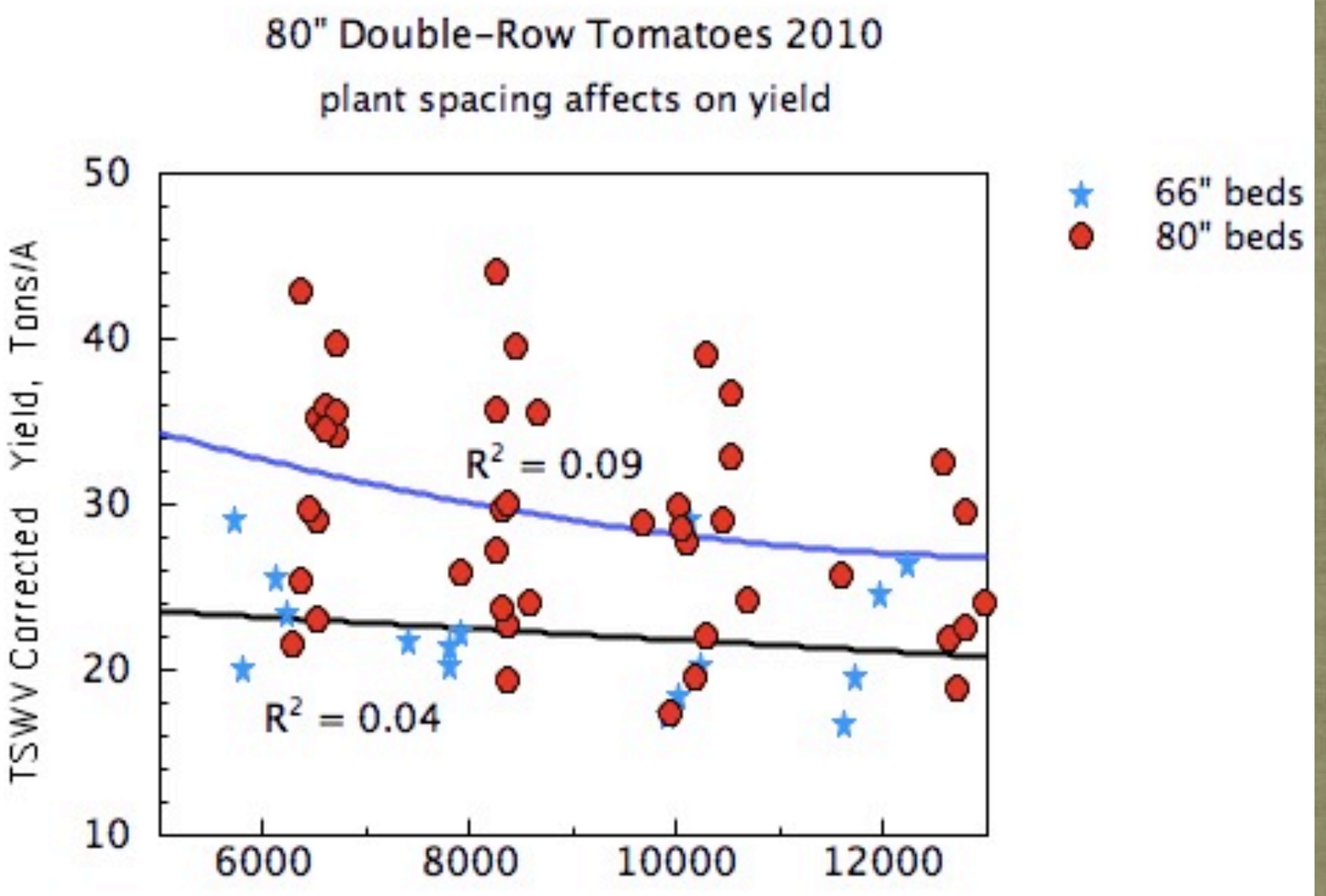
2009 YIELD


80" Double-row Tomatoes 2009
LSD sig at p=0.05
tons/A
45
40
35
30
a
b
b
66-inch sld
80-inch one drip line
80 inch 2 drip lines
ab
ab
a
b
6080
7405
8610
10166
Plants per Acre

RESULTS: PLANT SPACING

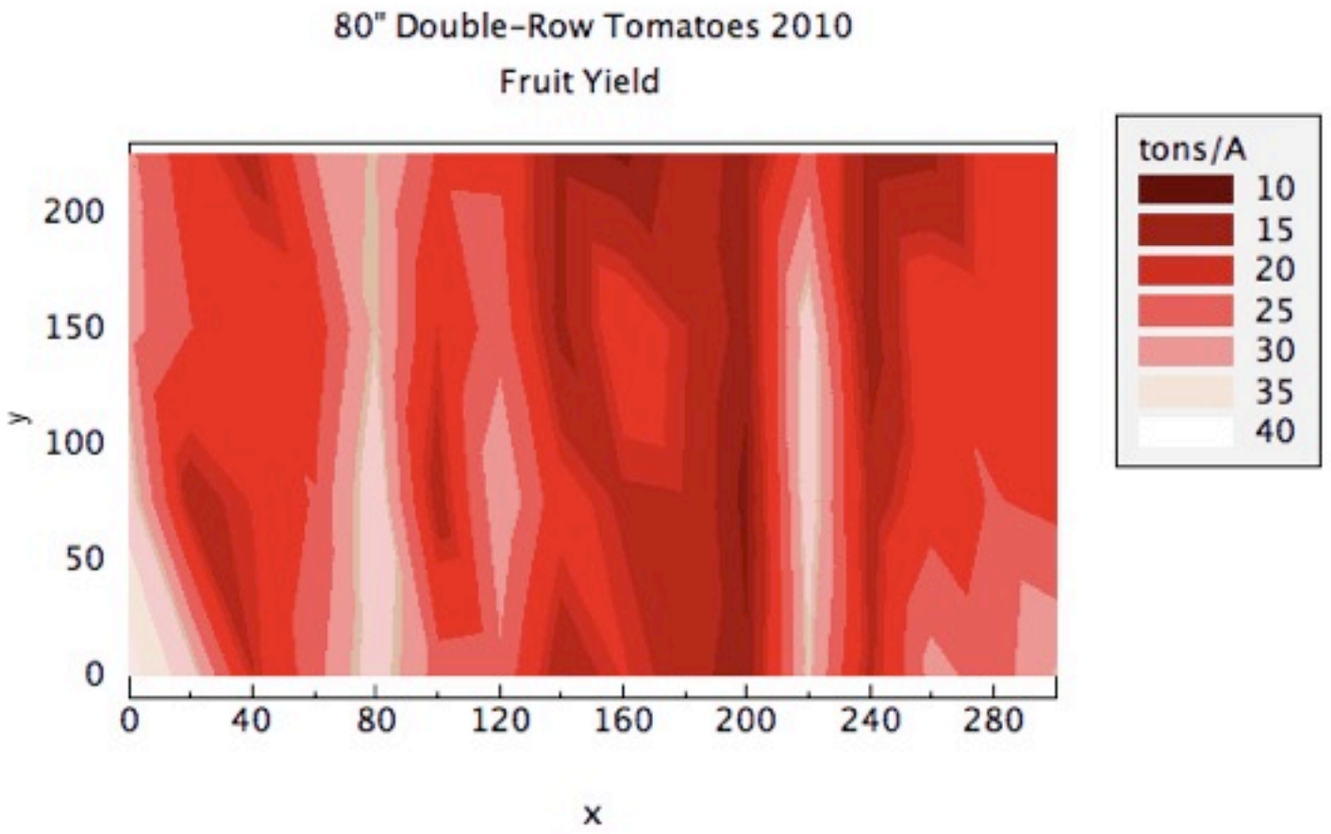


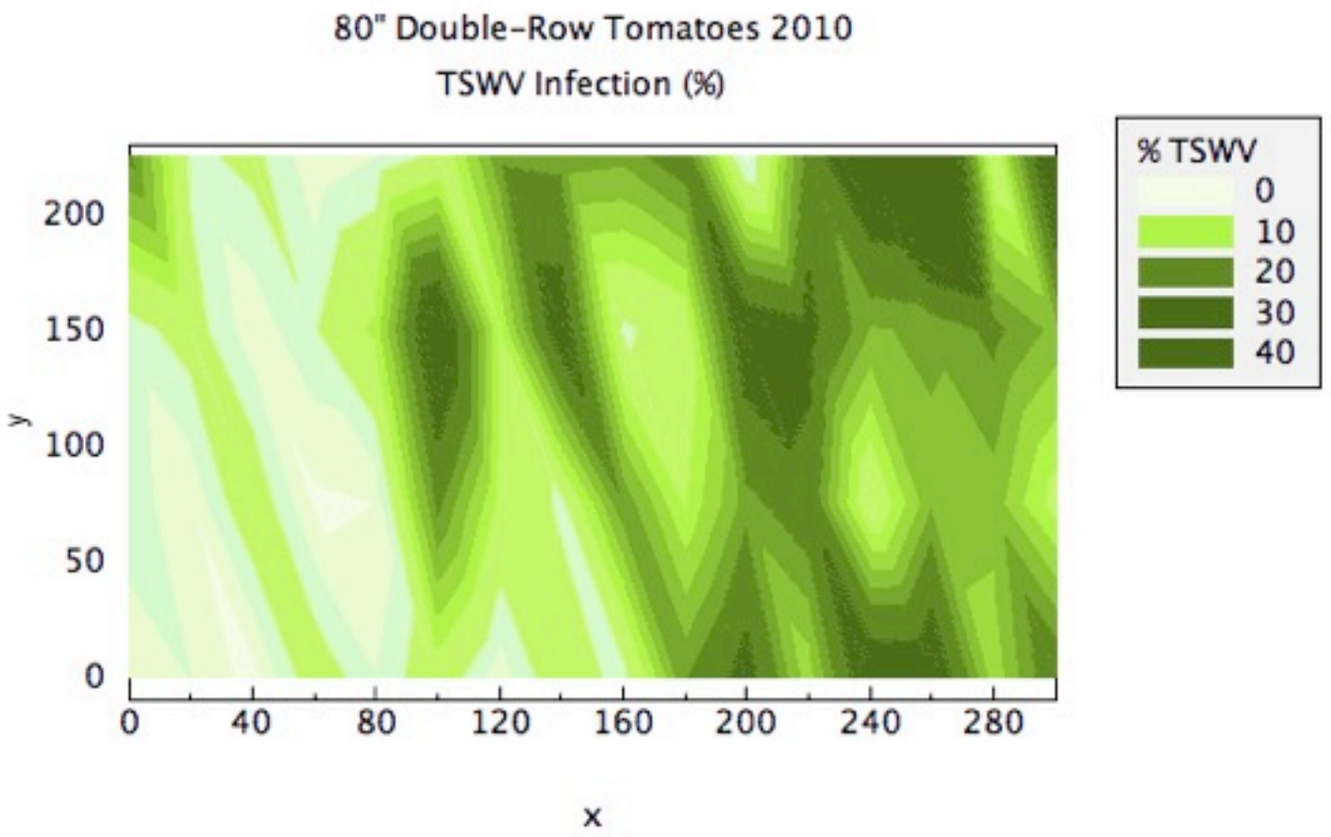
2009



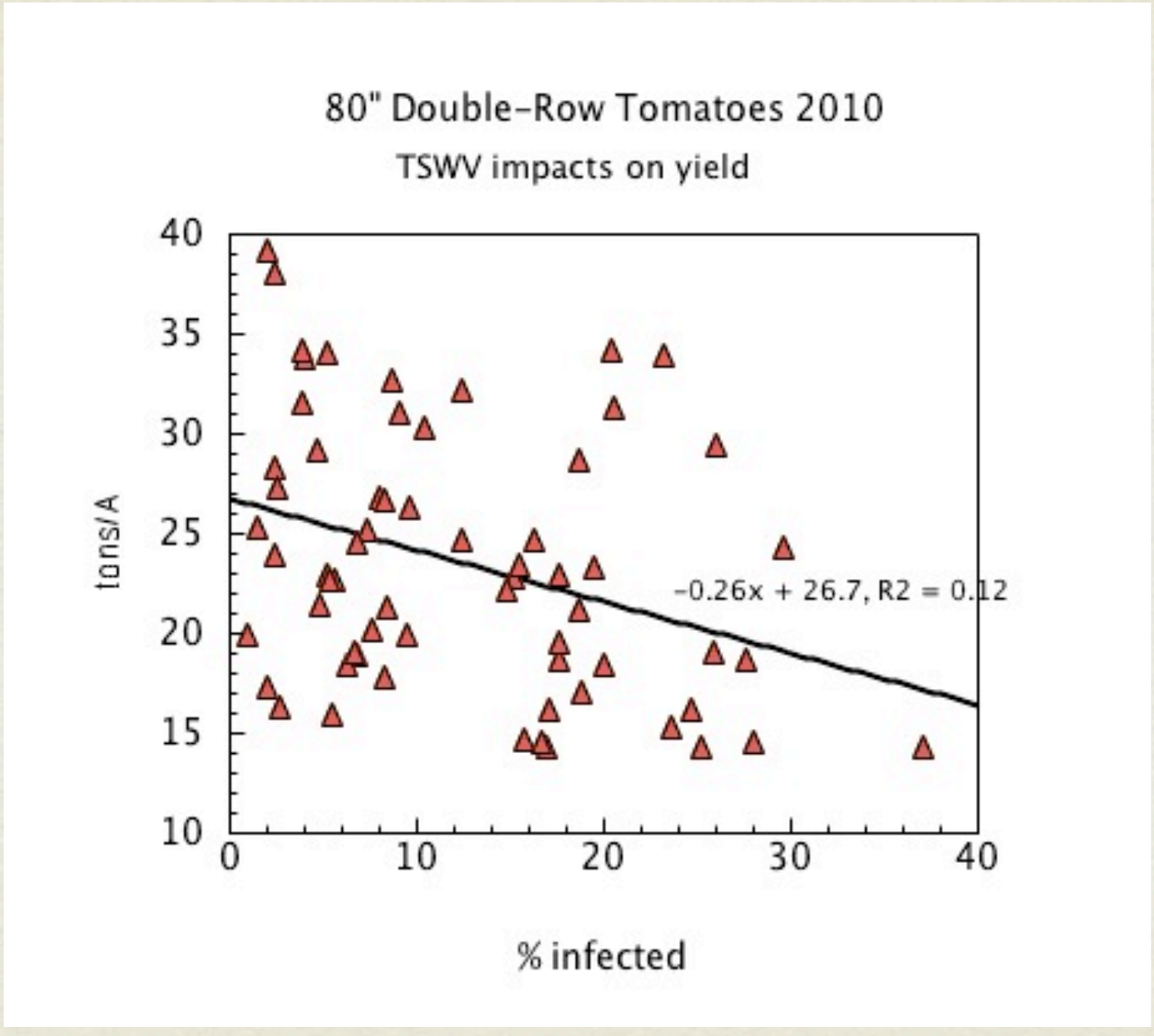
2010

IMPACTS: TSWV





IMPACTS: TSWV



FRUIT QUALITY

	color	Brix	pH	red %	green %	rot %	sun-burn %
AVG	25.6	5.66	4.41	61.4	8.2	18	12.4
F test bed	NS	NS	NS	NS	3.4	NS	NS
F test spacing	NS	NS	NS	NS	NS	NS	NS
Bed x spacing	NS	NS	NS	NS	NS	NS	NS

ECONOMIC ANALYSIS

trt	plant cost	drip line	yield	gross $ ($61.50)	net $/A
1. 66” std	x ($350)	y ($160)	22	$1353	$1353 - 510 ($843)
2. 80” one line	1.10x	0.75y	25	$1538	1538 - 505 ($1033)
3. 80” two lines	1.10x	1.5y	27	$1661	1661 - 625 ($1036)
4. 80” rotation	1.10x/2	0.75y	34	$2091/2	1045 - 312 ($733)

SUMMARY

- 2 years of data suggest there are potential economic benefits to the 80” system.
  - yields improved, no loss of fruit quality
  - 2 drip lines vs 1: deficit irrigation?
  - benefit of rotation?
- double row 80” beds seem to need slightly higher plant populations (~ 10%)

PROPOSED TREATMENTS 2011

1. Std 66” bed w/buried drip, single row plants
2. 80” bed w/single buried drip, double row plants
3. 80” bed w/two buried drip lines, double row plants
4. Rotation. 80” bed w/ single drip (fallow, tomatoes, melons…)

A. Increased amount of water for trts 1 - 4 (115% Et).
   a. new tape
   b. lower flow rate for double row tape
   c. similar cut-off date
B. Plant spacing split plots of 4, 6, 8, 10 thousand plants/A
C. TSWV resistant variety
D. Improved weed management
E. Measure yield, PTAB fruit quality, economic analysis

THANK YOU

Questions?