

Water Requirement of Irrigated Garlic

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Outline

- Introduction
- Project Overview
- Results
- Conclusions

Conclusions

- Water requirement for garlic 425 mm (16-17 inches)
- No difference in yield between 100 and 125% E_{t_c}
 - Significant difference below 100% E_{t_c}
- Peak K_c – 1.3

Introduction

- Shift in cropping patterns on west side of the San Joaquin Valley
 - Reduction in water supply
 - Loss of drainage water disposal capacity
- Short season low water requirement crops
 - Lettuce
 - Peppers
 - Garlic
- No water requirement data for vegetable crop grown in this area

Materials and Methods

- Replicated trial - split plot with 4 reps
 - 3 irrigation systems
 - Flood/drip
 - Surface drip (SD)
 - Subsurface drip – buried 20 cm (SSD) (8 inches)
 - 4 irrigation levels
 - 50, 75, 100, 125% of ETC
- Planted October 10, 2005 and Harvest July 12-18, 2006
- Sprinkled for germination



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M and M Cont'd

- Soil – Panoche silt clay loam
- Weighing lysimeter used to measure Etc
- Irrigation Management
 - Accumulate 1 mm ETC to irrigate Lysimeter and SSD
 - Accumulate 2 mm ETC to irrigate drip field (SD)
 - Flood/drip irrigated weekly equal to accumulated Etc
 - ETC accumulation modified by irrigation treatment
- CIMIS weather station used for reference ET
- Weighing grass lysimeter also used for reference ET
- Canopy cover measured with IR camera



CIMIS Station

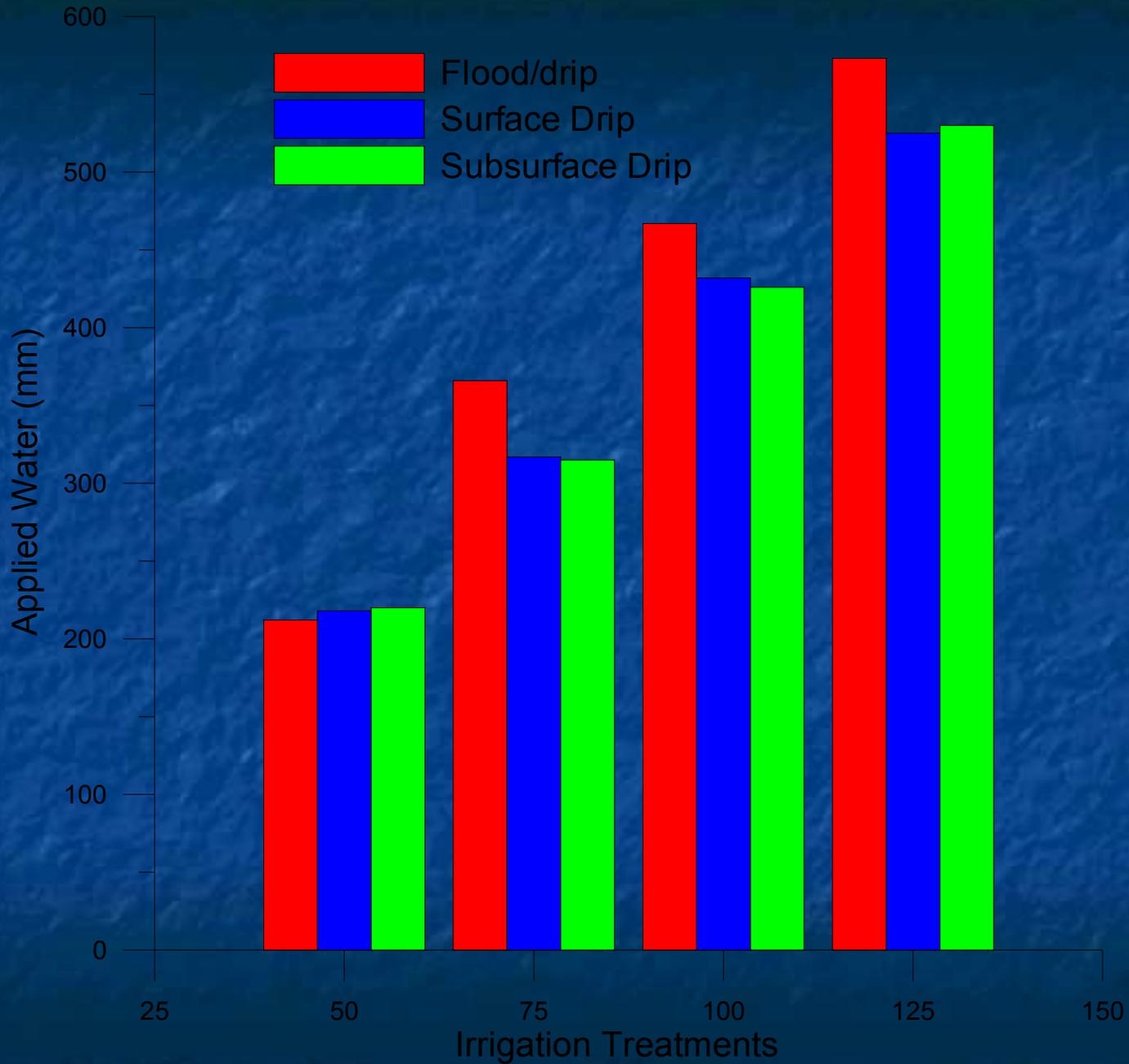
Grass Lysimeter

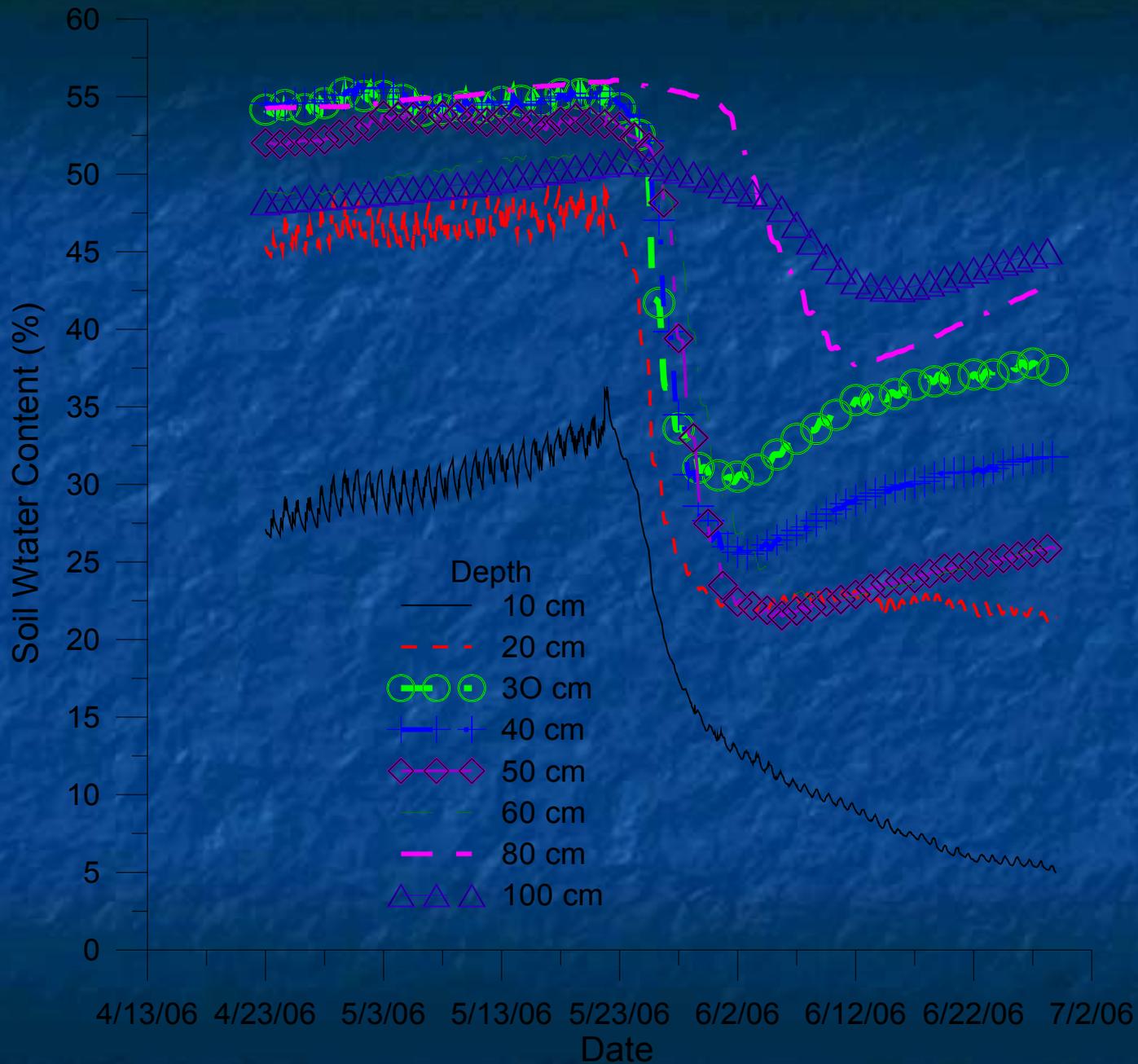


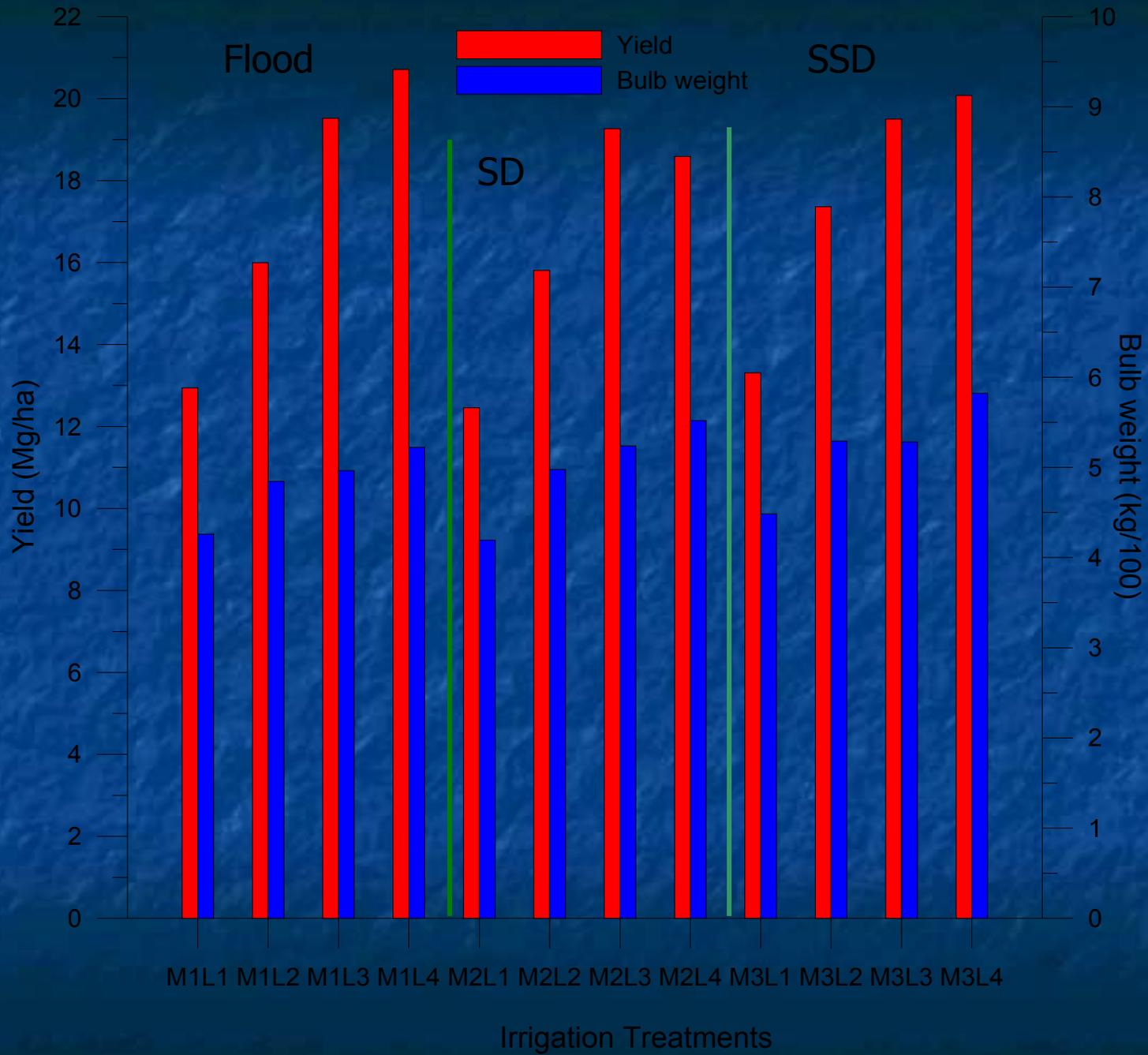
Photographing Canopy Size



Results







Market Yield, total weight, cull weight and soluble solids by irrigation level

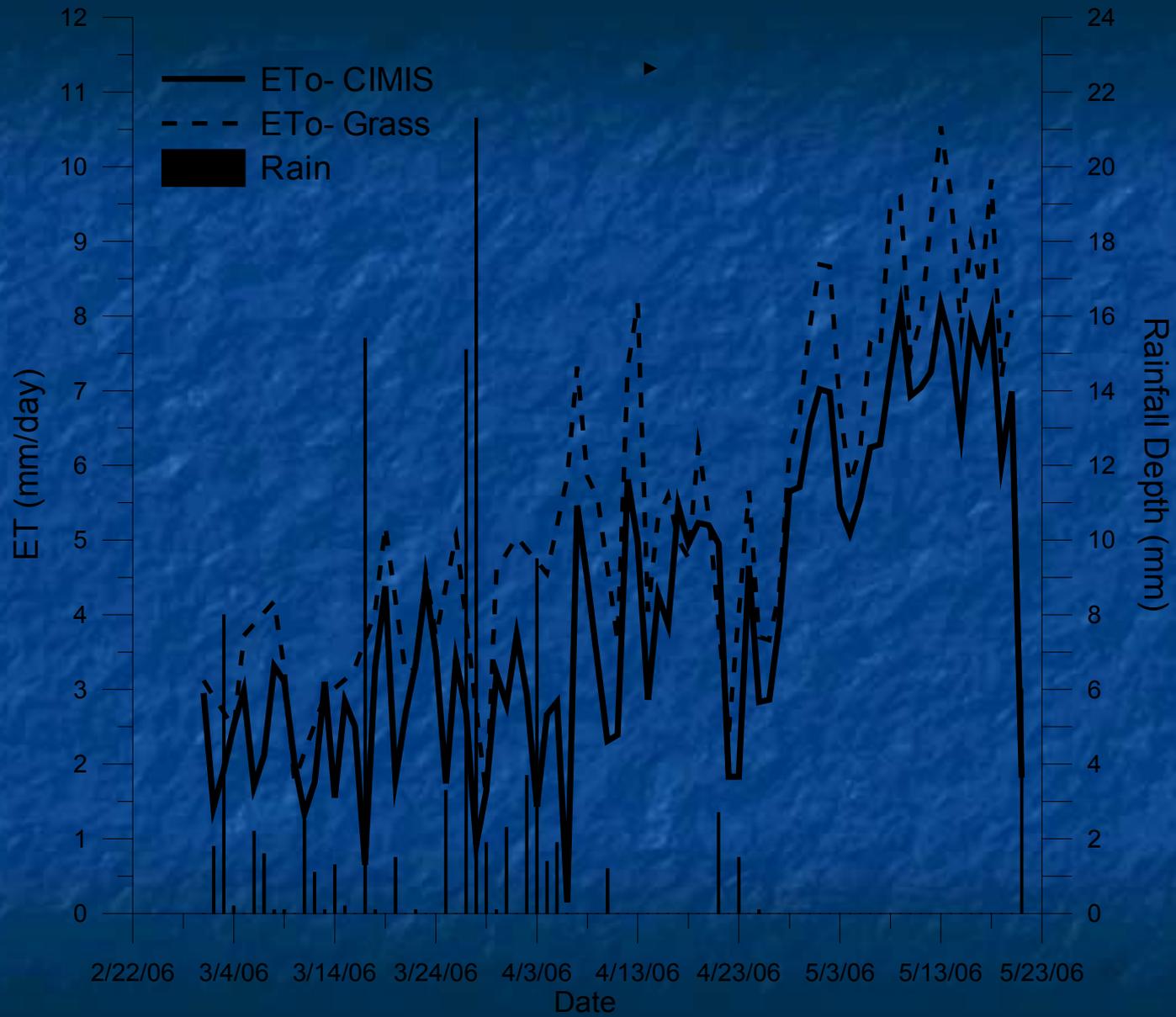
Irrigation Level % ET _c	Market Yield (Mg/ha)	Total Weight (Mg/ha)	Cull Wt (Mg/ha)	Soluble Solids (%)
50	13.15*	20.16*	1.29*	36.61*
75	16.70*	23.76*	1.09*	36.63*
100	19.80	26.95	0.8	35.86
125	20.17	27.65	0.87	35.12
SE	488	0.57	0.06	0.213

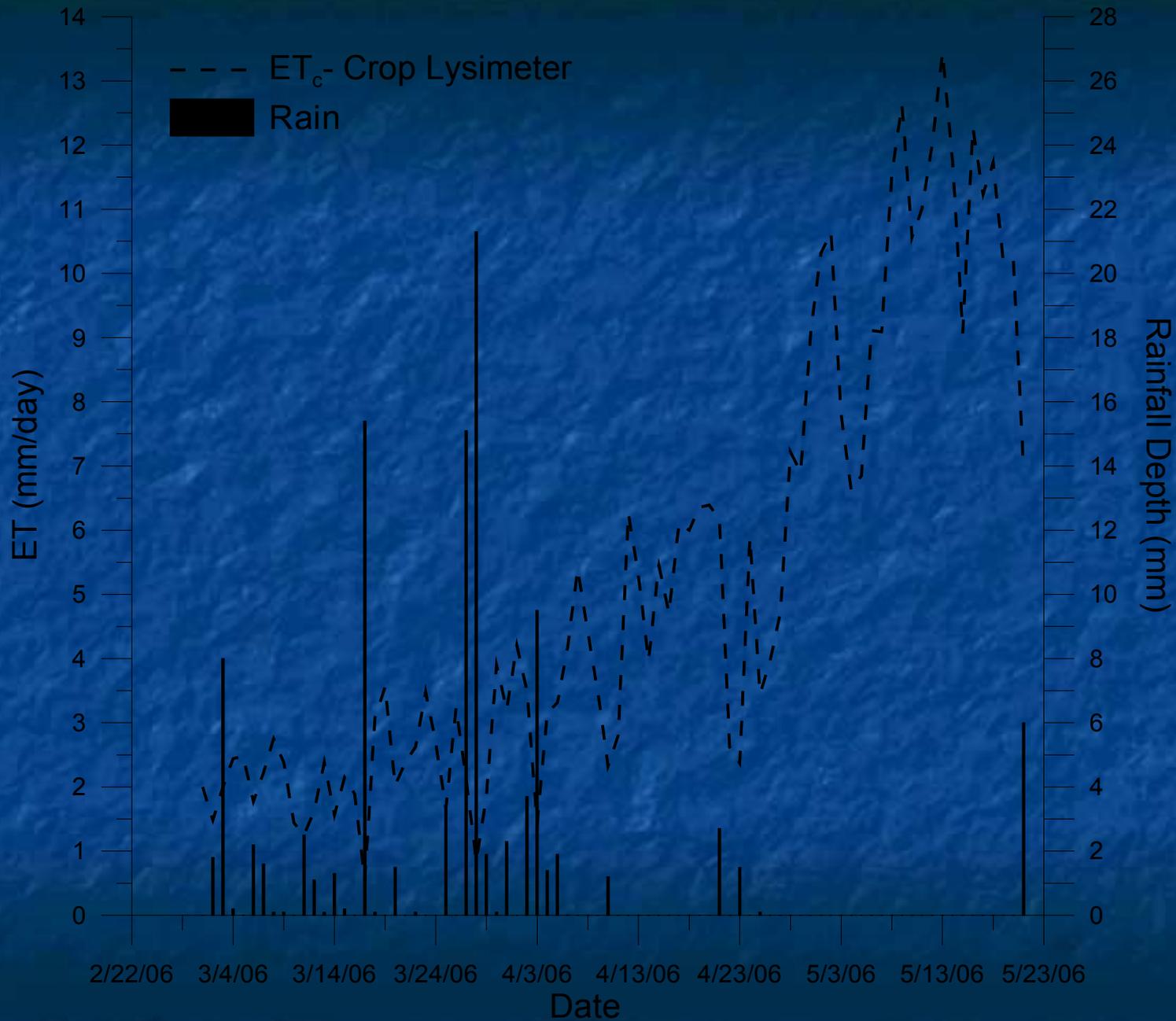
*Significantly < 100% ET_c by Dunnett's one tailed test (p<0.05)

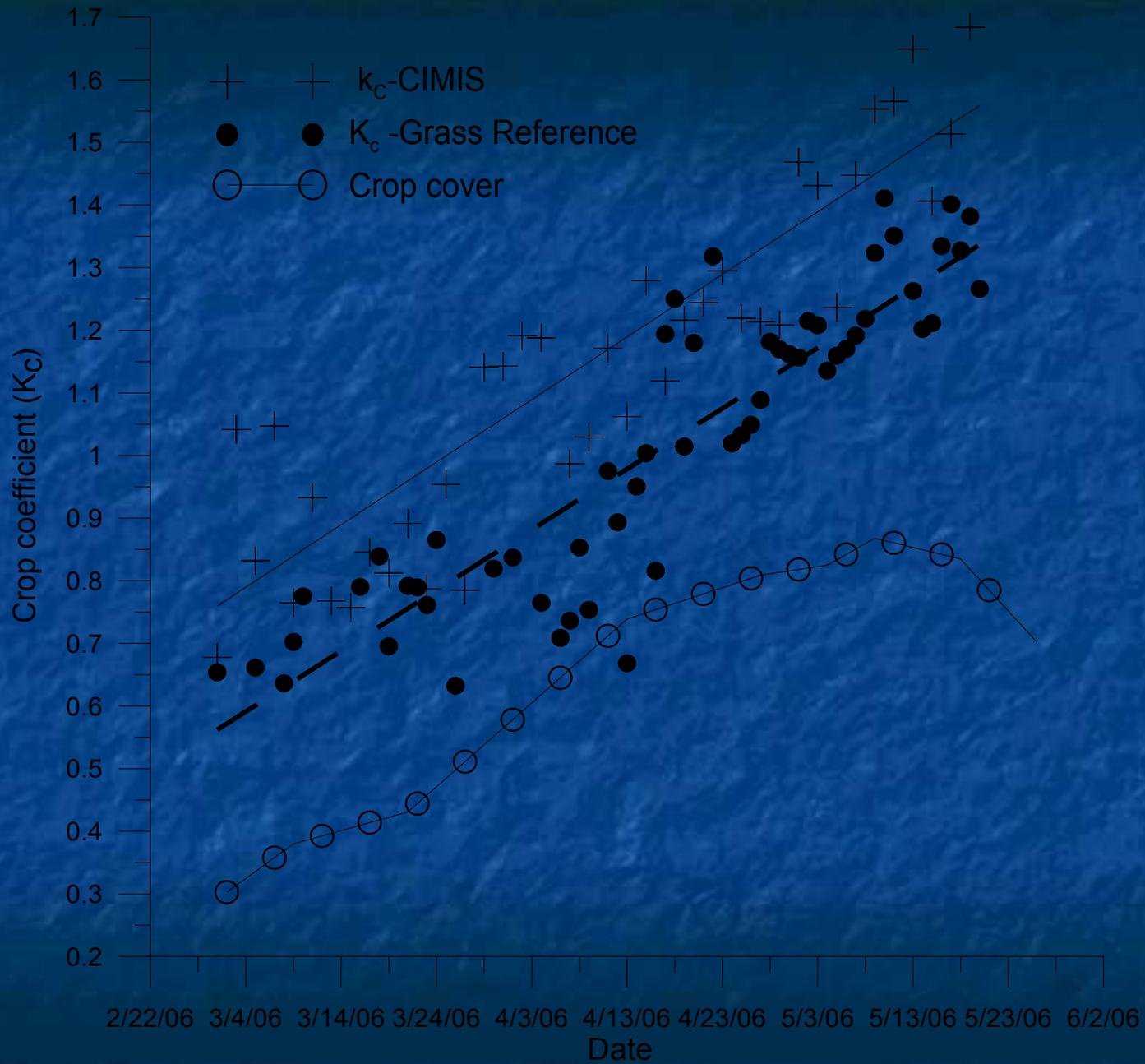
Soluble Solids and Bulb Weight by System

Irrigation Type	Soluble Solids (%) Mean	100 Bulb Weight (kg) Mean	SE (bulb weight)
Flood	35.94a	4.82a	0.31
Surface Drip	35.58a	4.98ab	0.44
Subsurface drip	36.89b	5.22b	0.31
SE (SS%)	0.18		

Means not followed by the same letter are significantly different ($p < 0.5$) by Tukey's multiple range test







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Acknowledgements

- Mr. Jim Gartung
- California Department of Water Resources
- California State University, Fresno –
Agricultural Research Initiative