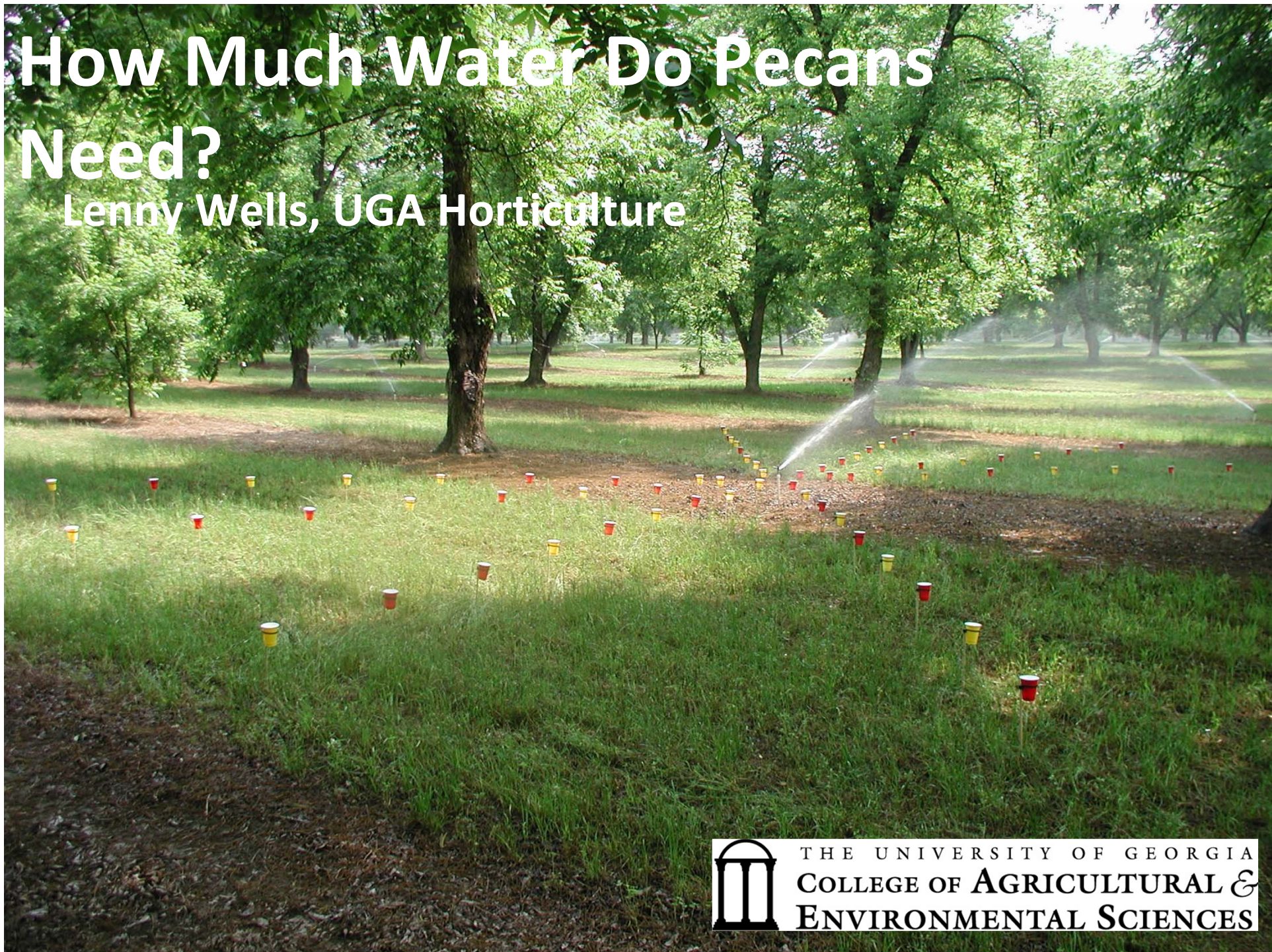


How Much Water Do Pecans Need?

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THE UNIVERSITY OF GEORGIA
COLLEGE OF AGRICULTURAL &
ENVIRONMENTAL SCIENCES

WHEN GROWING PECANS:
IF YOU HAVE TO CHOOSE BETWEEN
WATER AND FERTILIZER.....

CHOOSE WATER!

Pecans and Water

- Pecans have a very efficient water transport system
- Developed ability to avoid stomatal closure under high temps with adequate water
- Pecans are very inefficient users of water
- Require large amounts of water to support optimal growth and fruit production

Pecan Water Use

- Pecans extract most of their water from the upper 32 inches of the soil profile
- Need 60” of water per year
 - In the SE, rainfall can account for 50-67% of needs
- Pecan trees can use as much as 350 gal/day
- Greatest demand is during August/September
- Pecan Irrigation systems are designed to be supplemental to rainfall
- At 12 trees per acre, Drip/Microjet system capacity should be 3600-4200 gallons/acre/day

Pecan Irrigation Systems

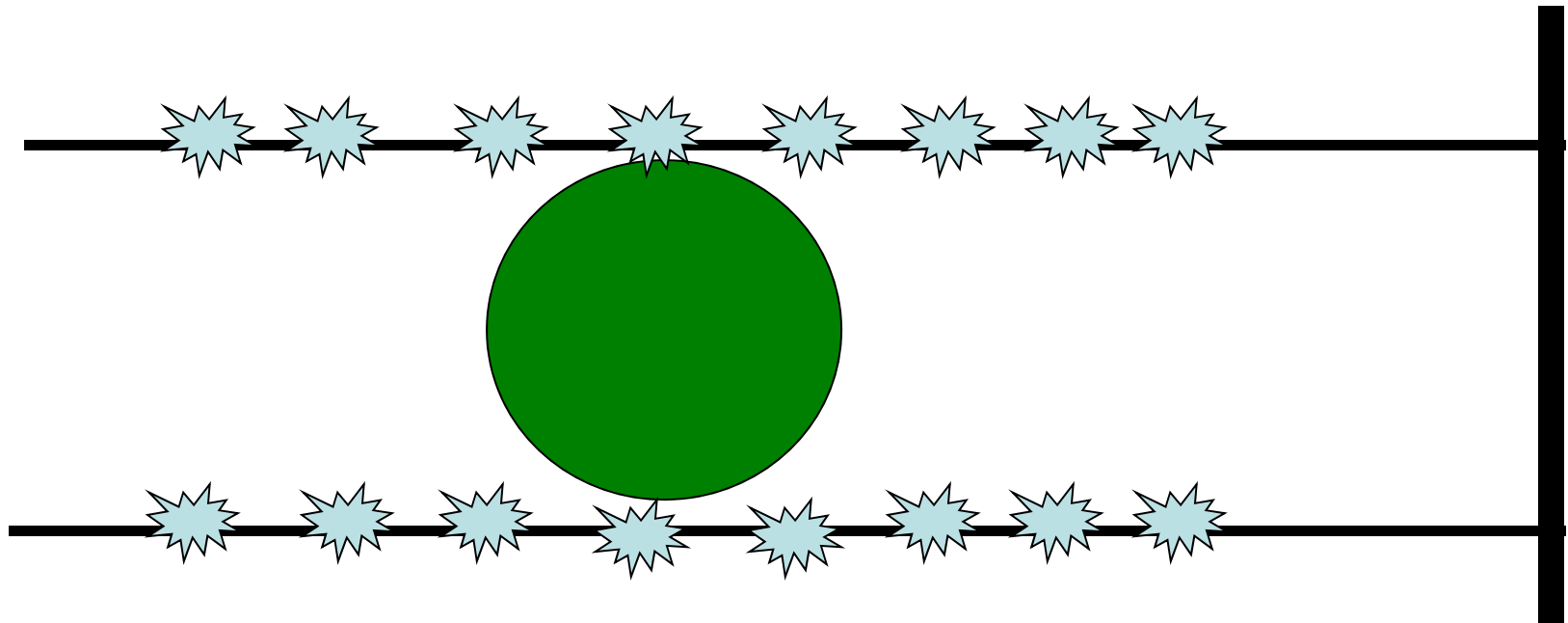
- Solid Set
 - Expensive
 - Poor water use efficiency
 - Water large area quickly



- Sprinklers often in every other middle
- Pump capacity should be at least 75 gpm/A

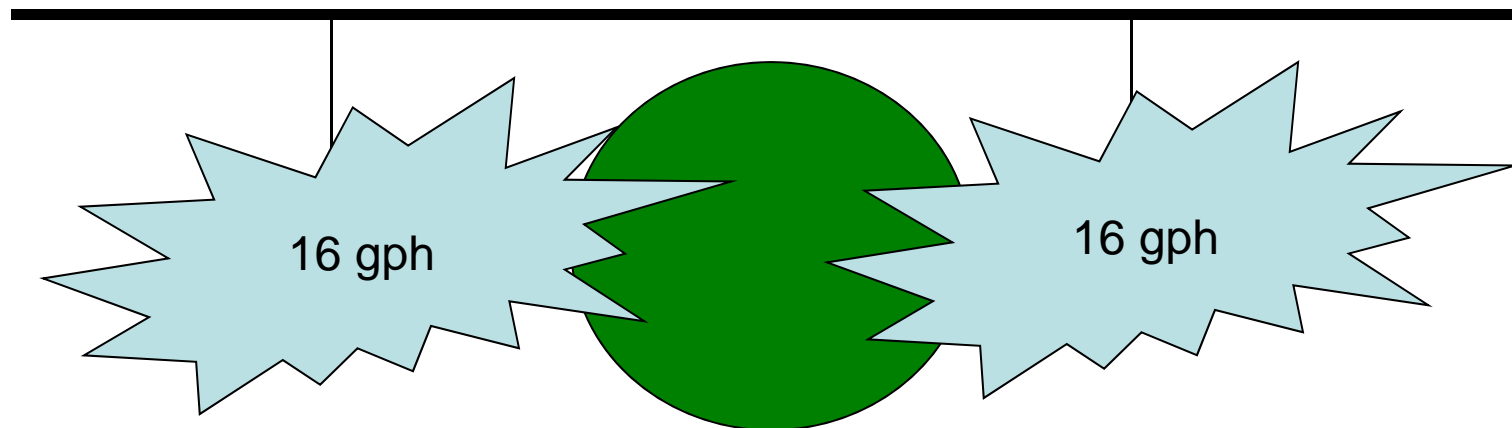
Drip Irrigation

- Lateral lines normally 6-8 ft from tree
- Most emitters used are 2 gph
- 8-16 emitters per tree



Pecan Irrigation Systems

- Microjet
 - Same benefits as drip
 - Larger wetted area
 - Best system for establishment of young trees



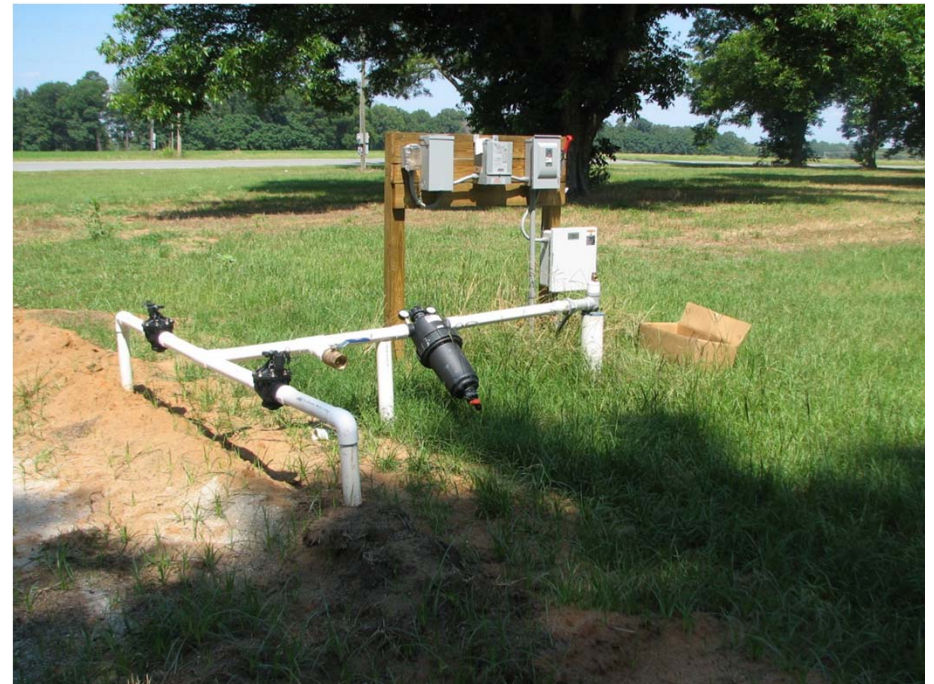
- Trees can translocate water from roots in moist soil to those in dry soil
- The pecan tree's water needs can be supplied by wetting only a portion of the root zone
- A single line can be as good as or better than a line on each side with the same number of emitters

	Yield	% Increase	\$ Value of Increase (@\$1.34/lb)	% Kernel	Nuts/lb
No Irrigation	803a	0	0	41.8a	65
1-sided Irrigation	2044b	64	\$1662.94	48.7b	54.5
2-sided irrigation	2045b	64.5	\$1663.94	50.3b	58

Worley, 1982

Costs of Drip Irrigation

- System Parts and Installation: \$800 per acre
- Well & Pump: 4" + 5 hp = \$6800
6" + 30 hp = \$34,000
- Operation Cost: \$40-\$60 per acre



Value of Fertilizer

Fertilizer Rate (lbs/acre)	Yield/Acre (lbs)	% Increase	Value of Increase (@\$1.34/lb)
0	1696	0	0
400 lbs biennially	1837	8.3	188.94
400 lbs annually	2211	30	690.10
800 lbs annually	1577	-7.0	-159.46

'Stuart'

Worley, 1974

Value of Irrigation

Water Application (Gal/Day/Acre)	Yield/Acre (lbs)	% Increase	Value of Increase (@ \$1.34/lb)
0	1034	0	0
1200	1374	32	455.60
3600	1761	70	974.18

'Stuart'

Daniel, J.W. 1982

Return on New Irrigation System

Example: 25 acre orchard

- Cost of new irrigation system: \$26,800
- Value of increase in production:
 $\$974.18/\text{acre} \times 25 = \$24,354.50$
- $26800 - 24354.50 = \$2445.50$ left to recover in year 2

- At increase of only \$455.60/acre, the cost of the system can be recovered in 3 years

Assumes \$1.34/lb.

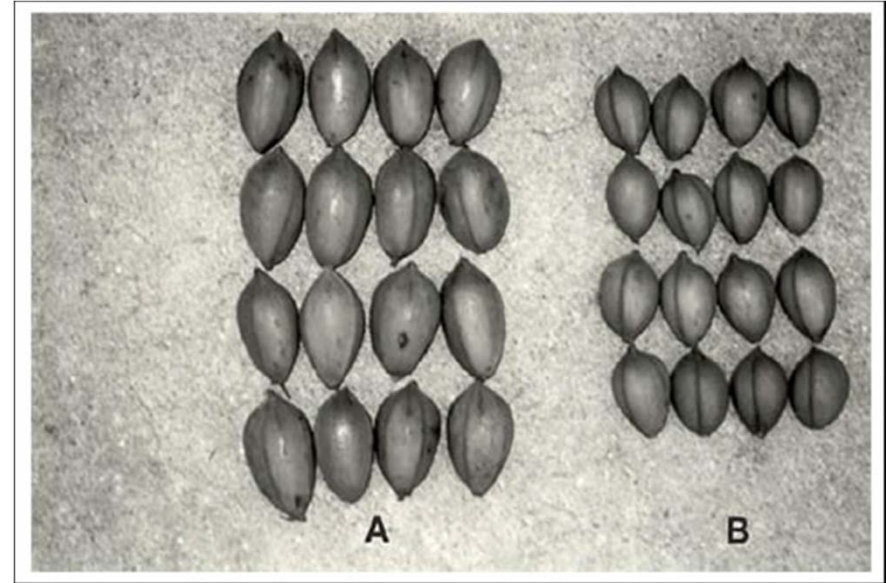
Return on New Irrigation System

Example: 100 acre orchard

- Cost of new irrigation system: \$54,000
- Value of increase in production:
 $\$974.18/\text{acre} \times 100 = \$97,418.00$
- $97,418 - 54,000 = +\$43,418$
 - Difference in 1200 gal capacity vs 3600 gal capacity = \$51,858
- At increase of only \$455.60/acre, the cost of the system can be recovered in 2 years
Assumes \$1.34/lb.

Other Advantages of Irrigation

- Increased Nut Size/Quality, Nut Retention
- Minimizes Shuck Decline/Sticktights
- Enhances shuck split
- Reduces Severity of alternate bearing
- Ability to inject fertilizer and systemic insecticides



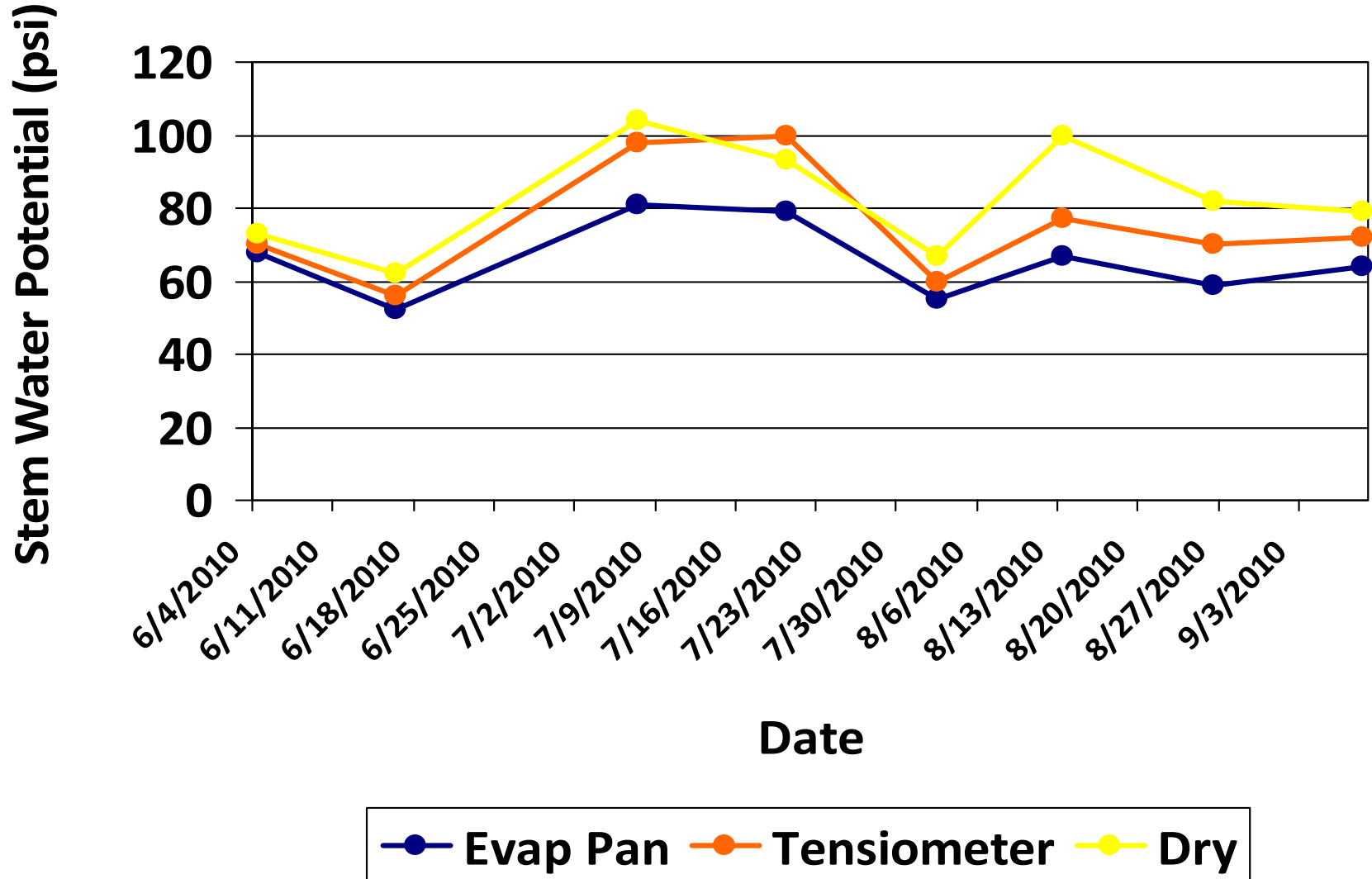
Pecan Irrigation Schedule

Month		Drip (%cycle) (hrs/day)			Sprinkler (inches/A/wk)
April		60	7.2		0.5
May		70	8.4		.75
June		80	9.6		1
July		90	10.8		1.25
August		100	12		1.5
September		100	12		1.5
October		90	10.8		1
November		60	7.2		0.5

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Tree Water Status 2010



Summary

- If you have to choose between water and fertilizer, choose water
- Water is key to many important processes involved in the development of a pecan crop
- Well capacity for pecans should be approx. 4000 gal/acre/day
- Irrigation provides the most immediate results and the fastest return on investment of virtually any management practice you can use