

Achieving Real Water Savings in Irrigated Agriculture

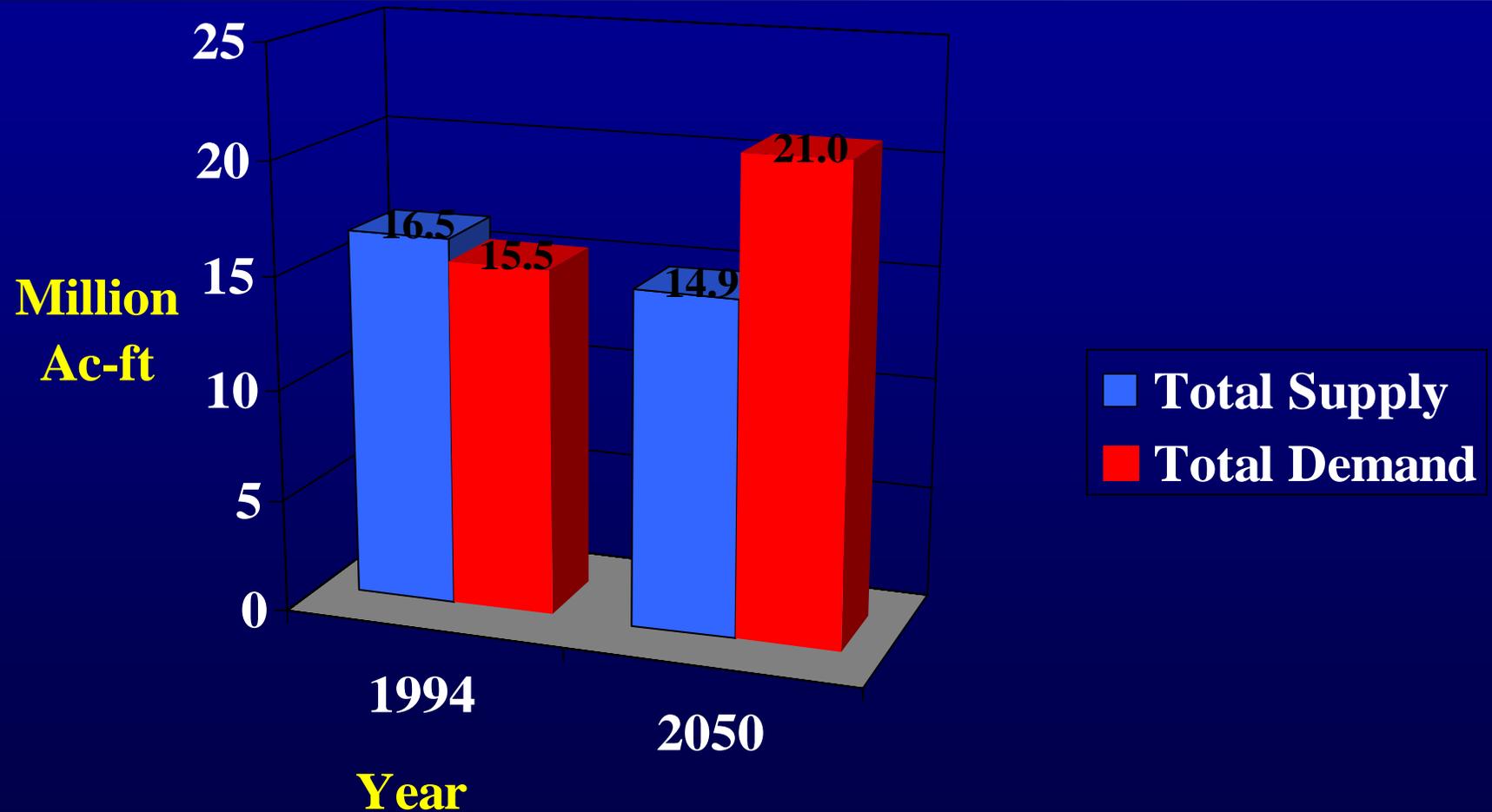
Edwards Aquifer Authority Symposium
“From Sole Source to Integrated Resource”

September 20, 2001

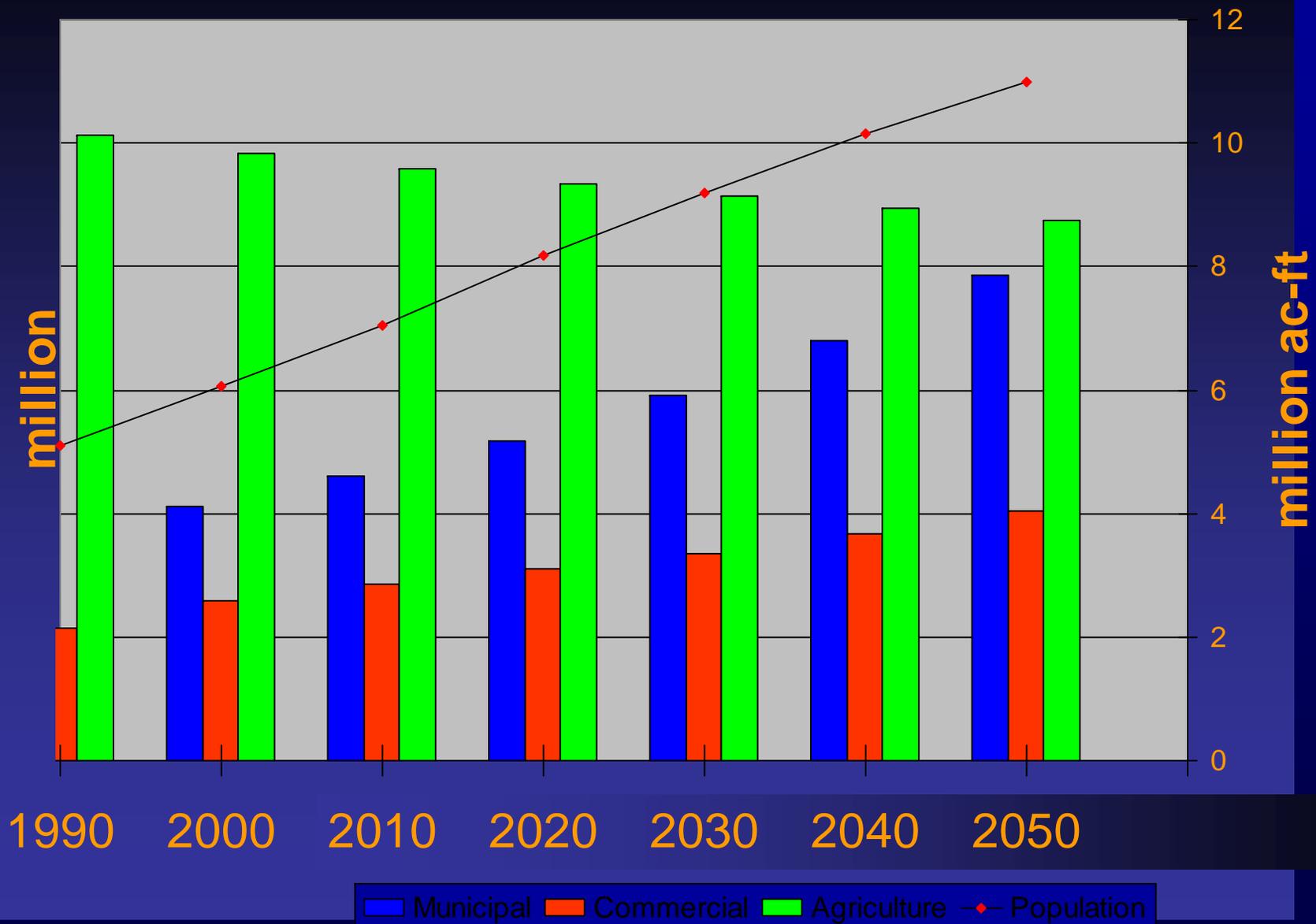
Guy Fipps

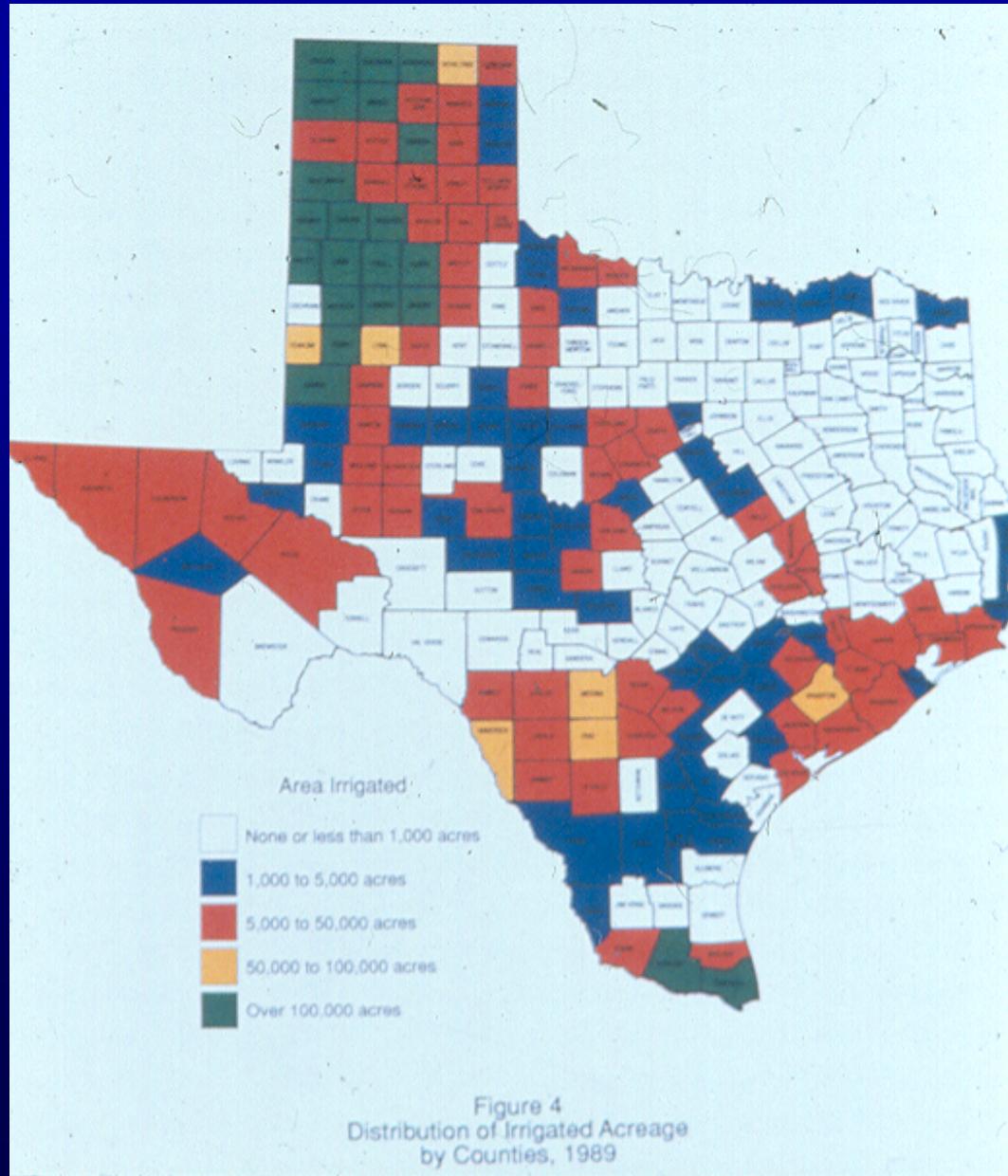
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Total Water Supply and Demand



Population and Water Demand







Regional Water Planning Groups

Basic Problem:

How do we free up water from irrigation
without disrupting
agricultural and rural economies?

Where does the water savings come from?

Improvements in:

- technologies
- water management

Where does the water savings come from?

Technology Improvements:

(1) application methods

(2) water delivery methods

Where does the water savings come from?

Technology Improvements:

(1) application methods

surge flow irrigation, LEPA, drip irrigation

(2) water delivery methods





Where does the water savings come from?

Technology Improvements:

(1) application methods

surge flow irrigation, LEPA, drip irrigation

(2) water delivery methods

gated pipe, poly pipe,
pipeline replacement of earthen canals

Field Ditch



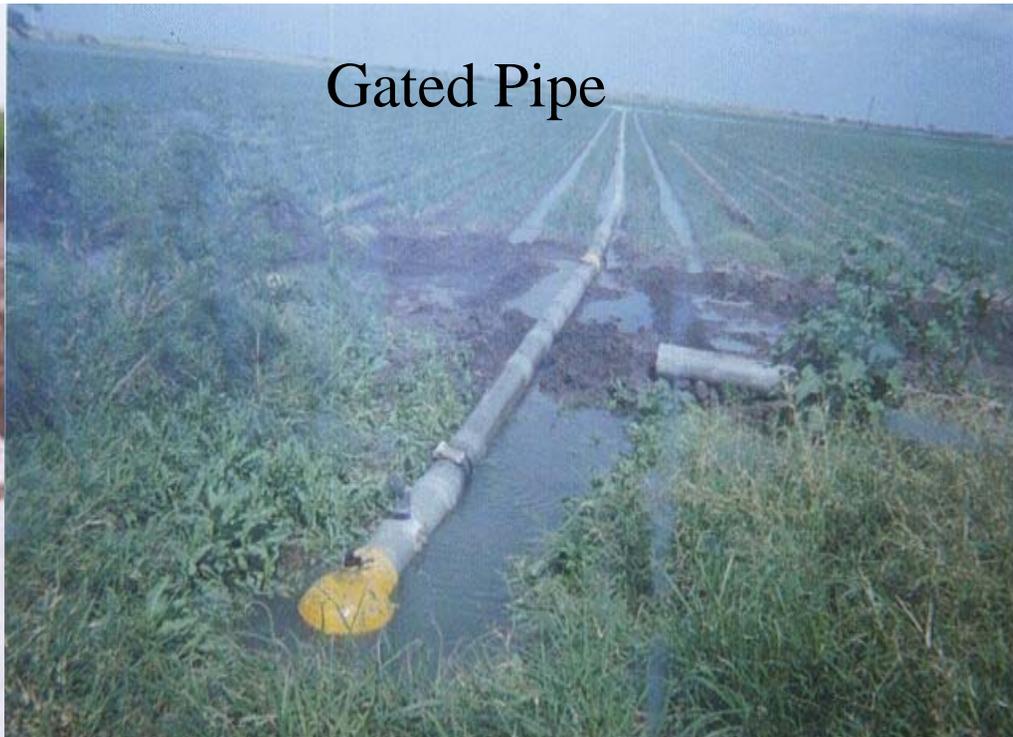
Siphon Tubes



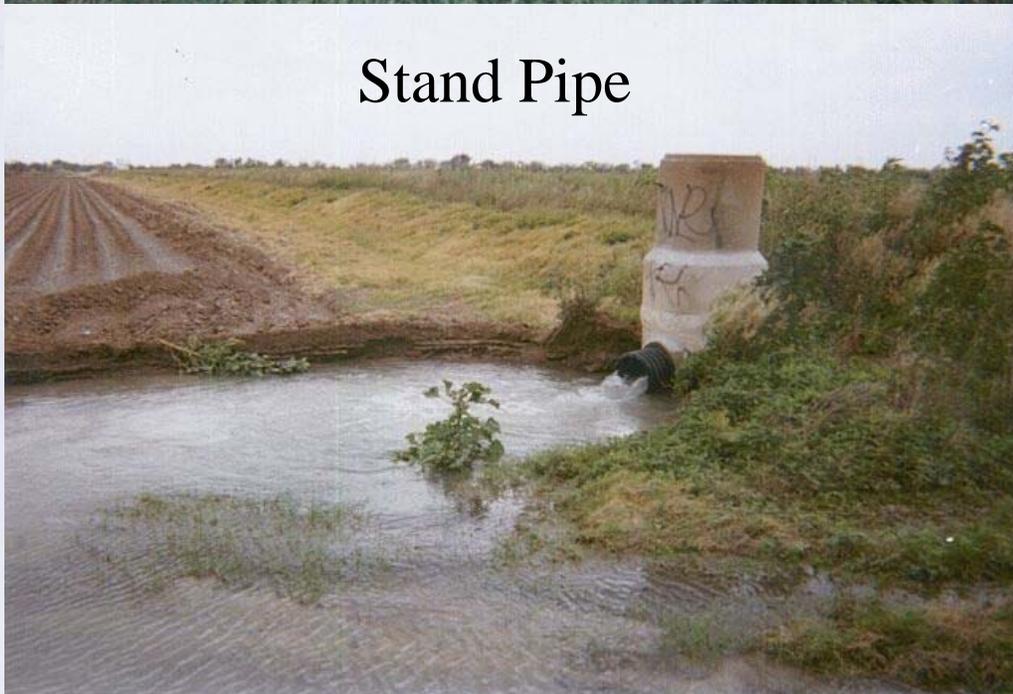
Polypipe



Gated Pipe



Stand Pipe



Where does the water savings come from?

Water Management:

Where does the water savings come from?

Water Management:

Irrigation Based on Scientific Methods

Where does the water savings come from?

Water Management:

Irrigation Based on Scientific Methods

- Eto (PET)
- soil moisture measurement
- plant status (infra-red sensors...)
- direct measurement (stem flow gage...)
- water metering/measurement

Technology Improvements

Centered around the improvement of
irrigation efficiency

or

“the reduction of losses”

Technology Improvements

Irrigation efficiency

- application efficiency
- distribution efficiency
- conveyance efficiency (canal systems)

SPRINKLER METHOD

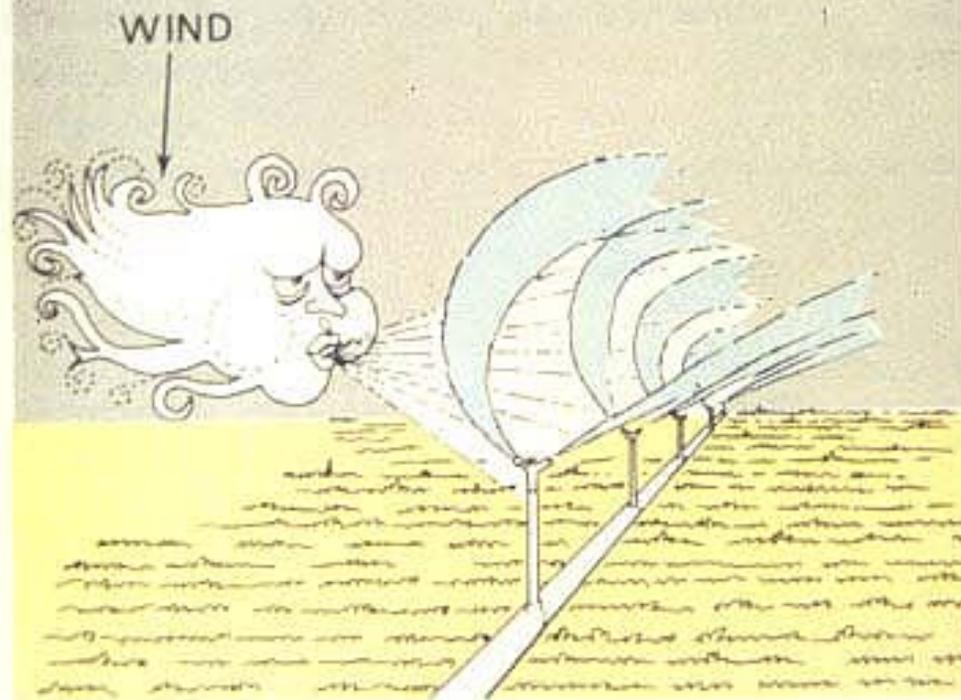


FIGURE 58. How wind may distort the distribution pattern of sprinkler irrigation.





Concrete Canal ID12

Soil type: Sandy clay loam

Overall Rating: 6.1

Loss Rate (gal / ft² / day): 5.39

Loss Rate (ac-ft / mi / yr): 141

Water Management Improvements

Centered around
a change
in human behavior



Water Management Improvements

*Often, improved technology
cannot compensate for
poor water management*



Technology Improvements

From a regulatory perspective:

Technology Improvements

From a regulatory perspective:

- Are easy
- Primary requirement - significant \$

BUT, good design of systems is vital...

Water Management Improvements

From a regulatory perspective:

Water Management Improvements

From a regulatory perspective:

- Are difficult
- May require significant \$ (such as ET Networks)
- Requires significant support for education and demonstration programs



Achievable Water Savings

Depends on

- where you are now
- water supply or pumping rate
- farm economics
- incentives
- financial support
(cost share, low interest loans, etc.)
- education programs
- technical support

Achievable Water Savings

Technique	Expected Water Savings	
water metering/measurement	0 – 15%	
poly pipe/gated pipe replacement of field ditches	5 – 20 %	
improved technology	10 – 30 %	
high water management	10 – 40 %	