This presentation premiered at WaterSmart Innovations

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Question:

What is America's Largest Irrigated Crop?

Hint: It's not corn, and you water it for a living.

Outdoor water use estimated to be 7.8 billion gallons per day.*

Estimated that 50% of water applied by irrigation systems is wasted!*

50/50 chance that Lake Mead will be dry by 2021!**

***EPA WaterSense**

**** Water Efficiency magazine August 2008**

Industry First Response: SMART Controllers

- **Save water by only applying the amount of water needed**
- Use real time conditions to determine the amount of water that needs to be applied to the landscape
- Control runoff with cycle/soak capabilities
- Take the guesswork out of “timer” scheduling
- Eliminate the need to make seasonal adjustments
- Improve plant health by not over saturating the soil, depleting oxygen and leaching nutrients through the soil structure

ET Controllers

Moisture Sensor Controllers

SMART Controllers for large sites

- Advanced features and scheduling
  - Water windows, event days, cycle/soak
  - Flow sensing capabilities
  - Two-wire installation
  - Centralized communication
- Water management reporting
- ET or Soil Moisture based
- Advanced software for centralized programming and site mapping

Manufacturers of SMART Controllers

BASE·LINE™ IRRIGATION SOLUTIONS

TORO®

WM Weathermatic®

Hunter®

RAIN BIRD®

CALSENSE®

EWING

Reality Check!

Up to 50% of water lost to…

Water To The Dry Spot!

Action Audits!

- What is an Action Audit?
- What can be learned from an audit?
- How does this information lead to water savings?

Irrigation Efficiency

- Efficiency; Maximizing outputs while minimizing inputs.
- The best irrigation efficiency is achieved when most of the water that is applied to the landscape is utilized by the plants being irrigated. Improved irrigation efficiencies result in:
  - Reduced water use and lower water costs
  - Improved plant health; fewer wet or dry spots
  - Runoff reduction
  - Reduction of deep percolation water loss
  - Reduced fertilizer and chemical requirements

IA estimated DU by sprinkler type and system quality

Sprinkler Type	Excellent (Achievable)	Good (Expected)	Poor (If lower than this, consider not scheduling)
Rotary	80%	70%	55%
Spray	75%	65%	50%

Why is the Distribution Uniformity value important?

- The DU calculation tells us how evenly the water is being applied by the sprinkler system, 100% DU being perfectly even.
- At 50% DU, twice the amount of water needed to keep grass green is being applied. At 70% DU, 1/3 more water is being applied than necessary.
- **THERE IS A STRONG CORRELATION BETWEEN DU AND WATER USAGE!!**

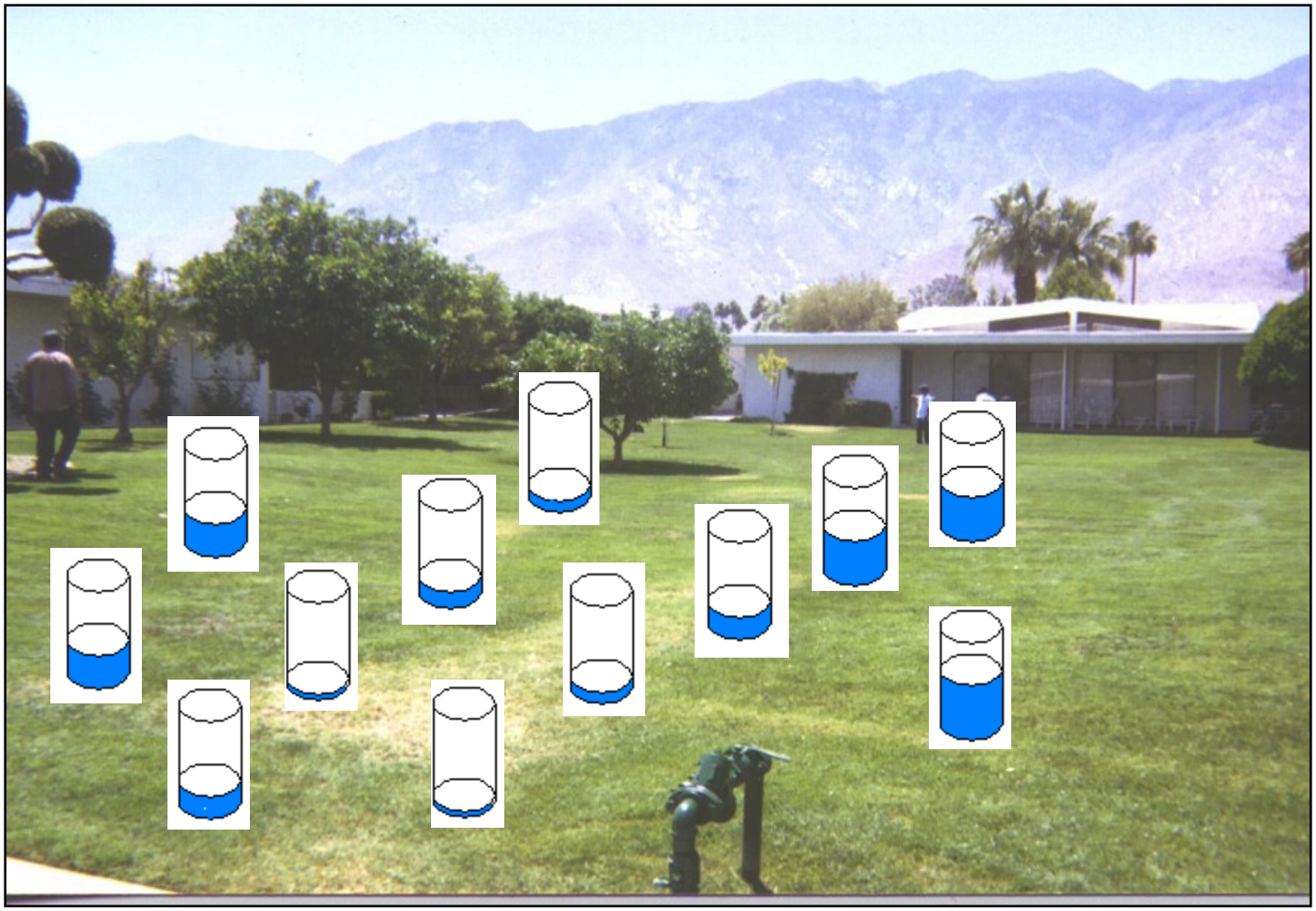
Poor Uniformity Reported At 2004 IA

Brent Mecham – Northern Colorado Water Conservancy District, Berthoud, CO

Paper: "Using Distribution Uniformity to Evaluate the Quality of a Sprinkler System"

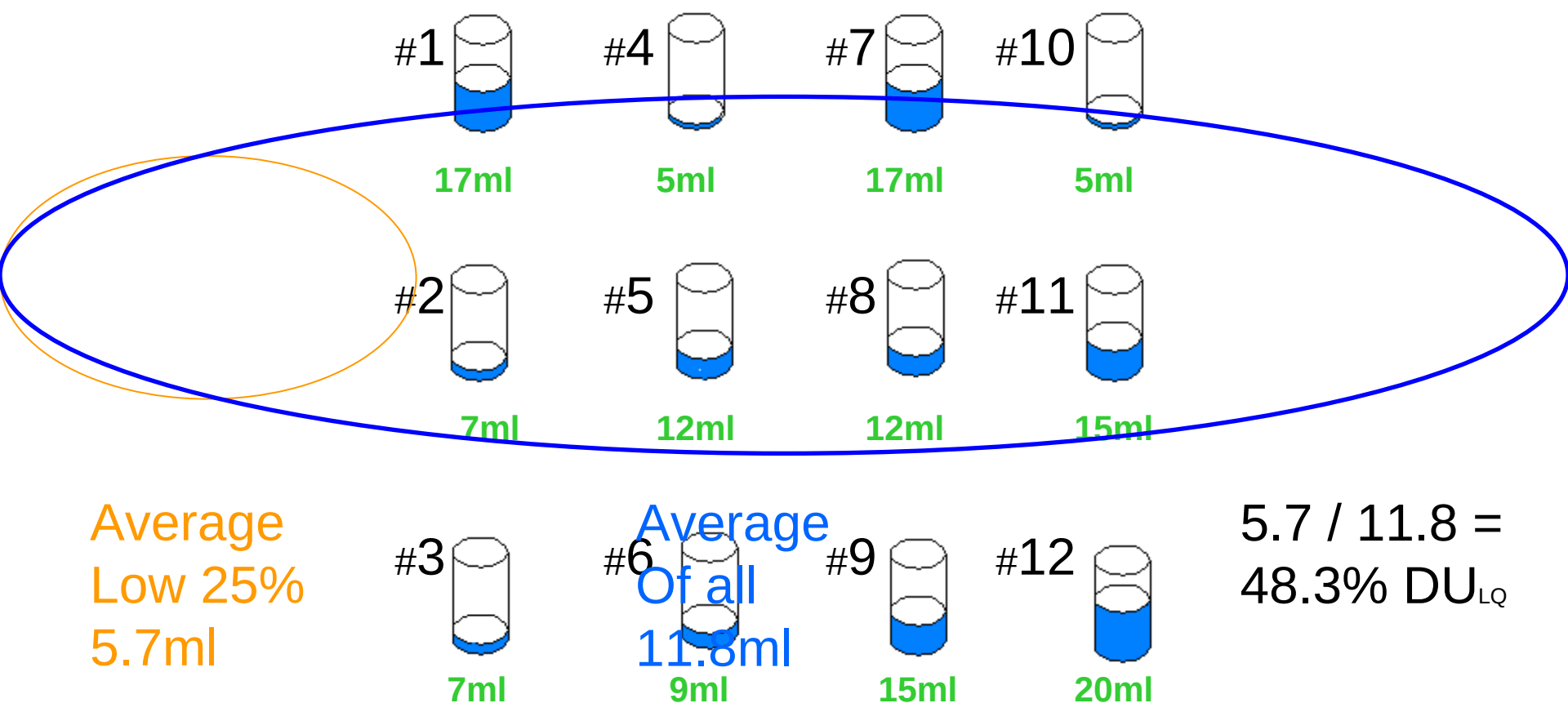
"With over 6800 audits used to measure how well the typical sprinkler system performs it appears that the average DU_{LQ} is about 50% no matter what type of sprinkler head is being used."

Audits Determine Uniformity & Net Precipitation Rate



These values are used to determine watering schedule

Analyze Data



Average
Low 25%
5.7ml

Average
Of all
11.8ml

5.7 / 11.8 =
48.3% DU_{LQ}

Big deal...get to the point!

The average Las Vegas ETo is .31 inches per day (April-September)

- What is the weekly water requirement?

  .31”/day x 7 = 2.17”/week

  If the irrigation efficiency (DU_{LQ}) = 48%
  2.17”/week / .48 = **4.52”/week**

  If the DU_{LQ} is increased to = 70%
  2.17”/ week / .70 = **3.1”/week**

Savings on 1 acre of turfgrass = 38,340 gallons/week

Benefits of Increased Efficiency

- **Property Owner**
  $4 / 1,000 gallons
  4 acres irrigated turf (15’ spray heads…750 heads)
  saving 153,360 gallons / week
  saving $613 / week
  saving $2,453 / month
  saving $14,722 / year (irrigating 6 months)

1 time investment for efficiency gains =

$9,600*

***Replace spray nozzles with MP Rotator type technology at $12/head**

MP Rotator Technology

- The MP Rotator applies water at approximately 1/3 the rate of spray heads at a much higher uniformity.

MP Rotator application rate:

.45” per hour

- Multi-stream, multi-trajectory rotating stream sprinklers produce higher uniformity.

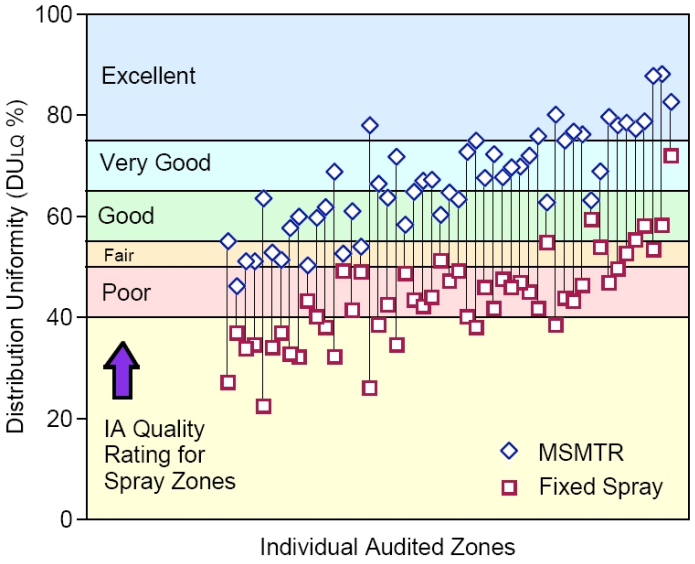


Figure 4. On average, DULQ improved by 23 points after conversion to MSMTR sprinklers.

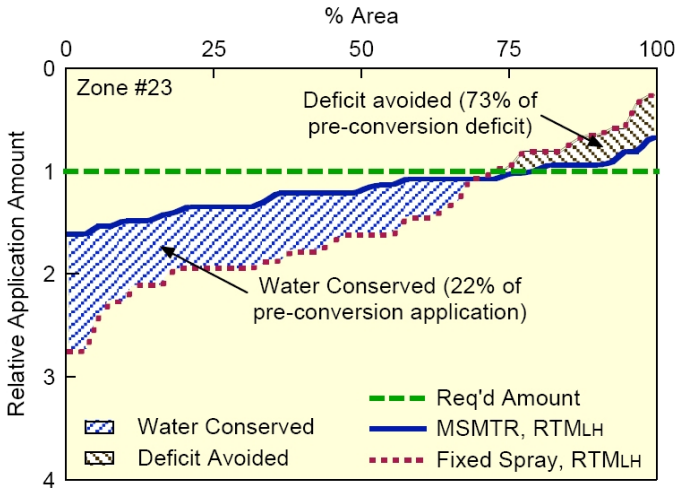


Figure 7. Water conservation (22%) and deficit avoided (73%) for the zone #23 conversion, assuming both pre- and post-conversion run times were set by RTMLH.

In a study conducted by Dr. Kenneth Solomon, 51 spray head systems were audited by independent auditors then retrofitted with MP Rotators and re-audited to measure the difference in the uniformity of water application.

“Performance and Water Conservation Potential of Multi-Stream, Multi-Trajectory Rotating Sprinklers for Landscape Irrigation”

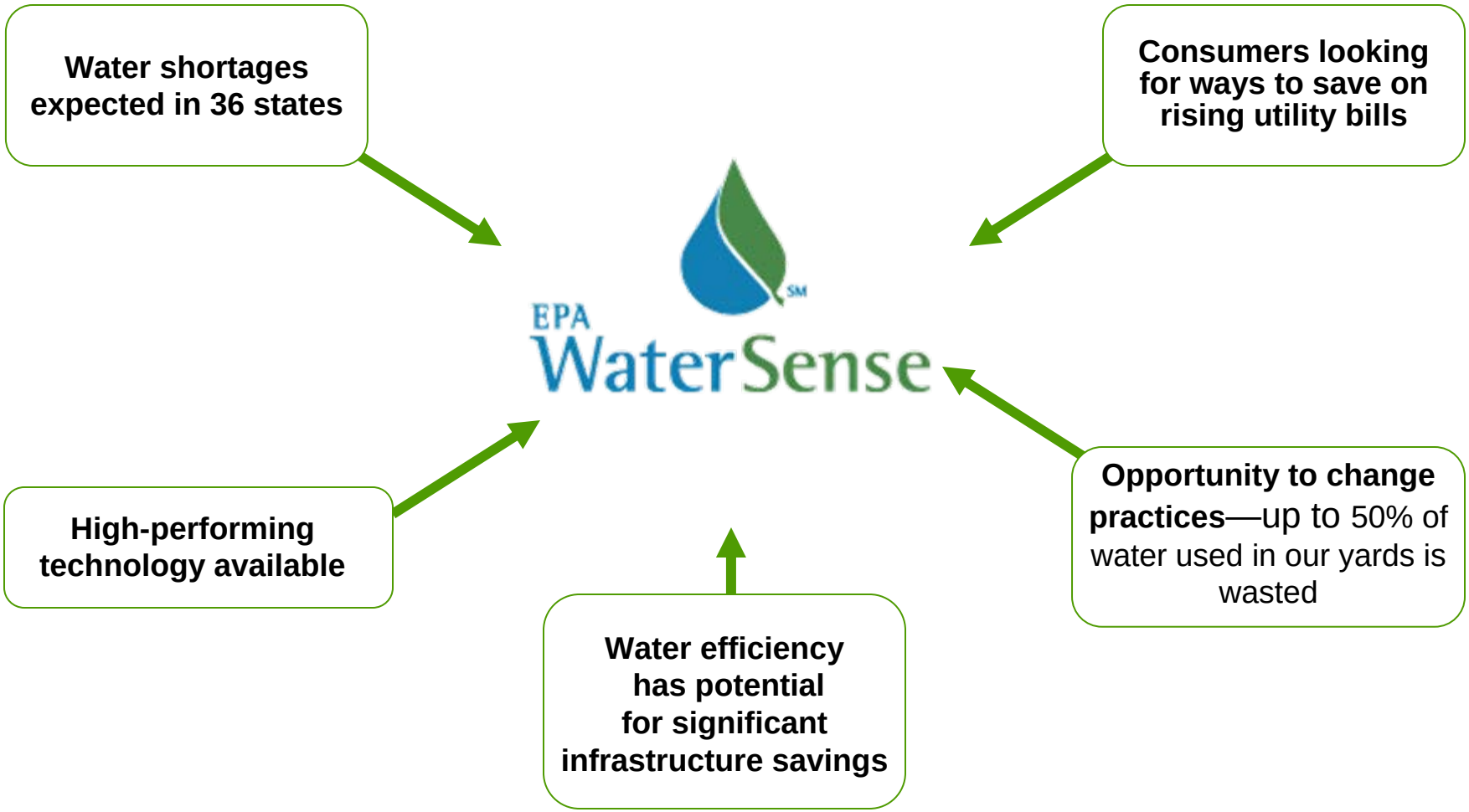
Kenneth H. Solomon, Joseph Kissinger, Greg Farrens, Jim Borneman

Conclusion:

For the audits reported here, (MP Rotator) sprinklers did achieve higher uniformity than fixed spray heads…Conversion to (MP Rotator) sprinklers increased average DU_{LQ} from 44% to 67%, and the average quality rating from Poor to Very Good. (MP Rotator) sprinklers achieved lower run time multipliers than fixed sprays…Average RTM_{LH} decreased from 1.65 to 1.29. Higher uniformity can lead to reduced water applications and deficit avoidance, improving turf appearance while using less water.

Conversions from fixed spray to (MP Rotator) sprinklers have the potential to conserve water…For the audits reported here, and assuming a mid-range pre-conversion management regime the median conservation achieved was 30% of the pre-conversion applied amount.

Need for Water Efficiency



THANK YOU.

For more information,
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