

2012 Mid America Horticultural Trade Show

Trends in Landscape Irrigation

Timothy Malooly CIC, CLIA, CID
 2008 EPA WaterSense Irrigation Partner of the Year
 President, WaterMolton Inc. www.watermolton.com

Technology Efficiency & Green Construction
 Business Opportunities
 Stormwater Management
 Industry Maturity

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Trends in Landscape Irrigation

First, a little background...

"All the water that will ever be, is right now."

National Geographic, October 1993

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First, a little background...

- 3 percent of the earth's water is freshwater
- 1% of freshwater is easily accessible surface freshwater

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Water for food agriculture...

We can all agree that water for food and drinking is the highest priority

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The U. S. industrial economy...

- According to the U.S. Geological Survey in 2005, 93% of industrial water is fresh water but only 18% of all fresh water is used for industrial purposes...
- ...An estimated 18,200 million gallons

Source: <http://ga.water.usgs.gov/edu/wqin.html>

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Trends in Landscape Irrigation

The U.S. urban landscape

- What about the urban centers? Where is it going?**
- In the U.S., Landscape care accounts for a large percentage of outdoor water use
- EPA estimates that 50% of landscape irrigation water is wasted, on average

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The U.S. urban landscape





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The U.S. urban landscape





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So, let's talk about the trends...

...and business opportunities...

- Technology
- Efficiency
- Green construction
- Stormwater Management
- Industry Maturity





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Trends in Landscape Irrigation

Trends in Irrigation Technology



- Climate-Based Irrigation Controllers
- Weather Sensors
- Low Volume Equipment
- High Application Uniformity Products
- Efficient Features....



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Trends in Irrigation Water




- Reclaimed Water
- Rain-water Harvesting
- De-Sal Water
- Gray Water
- Rebates for Water Saving Products or Practices
- Regional and National Programs




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Efficiency - Trends in Irrigation Design Considerations




- **Efficiency:** is the ratio between how much water the plant beneficially uses compared to how much water the irrigation system applies. Proper design is and scheduling are the key elements in water efficiency.
- **Uniformity:** relates to how evenly the water is applied over an area. Equipment selection, placement and maintenance primarily affect uniformity; scheduling as well (ex. avoiding high wind).



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Efficiency - Trends in Demand for Uniformity








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Efficiency - Trends in Demand for Uniformity

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Efficiency - Trends in Demand for Uniformity




- What affects uniformity?
- Pressure, design responsibility, installation responsibility
- Uniformity is generally mechanical in nature
 - Sprinkler Type
 - Sprinkler Spacing
 - Sprinkler Rotation Speed
 - Sprinkler Flow Rate (gpm)




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Efficiency - Trends in Uniformity & Efficiency




GOOD UNIFORMITY
(NEVER PERFECT)



Depth of Water

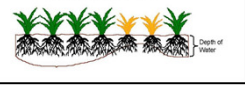
EFFICIENT



Good Timing

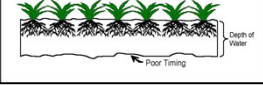
Depth of Water

POOR UNIFORMITY




Depth of Water

NOT EFFICIENT



Poor Timing


Depth of Water




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Efficiency - Trends in Uniformity & Efficiency



- Measurements of uniformity...
- Coefficient of Uniformity (CU)
 - Originally created for measurements of crop production
- Distribution Uniformity (DU)
 - Uniformity measurement of audit
- Scheduling Coefficient (SC)
 - Run time multiplier based upon sprinkler profile (sprinkler profiles); also referred to as a Scheduling Multiplier





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Efficiency - Trends in Uniformity & Efficiency

...system audits...

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Efficiency - Trends in Uniformity & Efficiency

- Calculate the Average of all catchments
 - Fifteen (15) catch cans have the following amounts:
 $12+18+13+14+10+9+18+20+23+22+20+15+19+15+16 = 244 \rightarrow 244 / 15 = 16.27$
 (average of all catch cans)
- Distribution Uniformity is the average of the **lowest 25%** of measurements, divided by the average of all the measurements
 - 15 measurements $\rightarrow 15 \times 0.25 = 3.75$; use the smallest 4 measurements.
 - $9+10+12+13 = 44 \rightarrow 44 / 4 = 11$ (average of lowest 25%)
 - $11 / 16.27$ (overall average) = 0.68
 - System is **68%** efficient

DEFENSIBLE DATA YOU CAN USE TO JUSTIFY RETROFIT OR REMODEL OF A "BAD" OR POORLY MAINTAINED SYSTEM

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Trends in Green Construction

- The "Green Movement" demands efficient irrigation...
- ...when landscape irrigation is "allowed"...

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Trends in Green Construction

- Some of the programs changing the industry are:
- U.S. GBC L.E.E.D.®**
 - Leadership in energy & environmental design
- Since 1998, more than 14,000 projects completed in 30 nations and all 50 U.S. states
- Seeks to encourage advancement and adoption of Sustainable development practices
- Uses a 4-tiered, point-based system to certify structures
 - Certified, Silver, Gold, Platinum



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Trends in Green Construction

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Trends in Green Construction

- Opportunities for Green Industry Professionals:
- Reclamation plantings & temporary irrigation
- High efficiency irrigation systems
- Stormwater management
- Green Roofs
- Alternative water supplies
- Shading for heat reduction
- Wastewater treatment wetlands
- High efficiency or low energy water pumping
- Material and waste minimization through design



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Trends in Green Construction



US EPA WaterSense®

- A voluntary partnership program of the U.S. EPA that is similar to EnergyStar®
- Promotes the value of water and helps Americans make smart decisions regarding water use and water-using products.
- Aims to increase the advancement and adoption of water-efficient products and services.



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Trends in Green Construction



- Partners
 - > Manufacturers
 - > Retailers and Distributors
 - > Water Utilities, Communities and other Non-profits
 - > Certifying Organizations
 - > Certified Professionals
- Products (plumbing, irrigation)
- Irrigation Certification Programs
- New Homes Model Specification



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Trends in Green Construction

WaterSense outdoor water use goals...

- Increase Awareness of efficient Products and Services
 - > Make water efficiency an attribute of choice
 - > Partner with national and local organizations
- Improve Irrigation System Performance
 - > Promote efficient design, installation, operation and maintenance
 - > Promote high-efficiency technology
- Promote Water-Efficient Landscape principals



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Trends in Green Construction

WaterSense certification of irrigation professionals...

- Uses third-party certification programs that meet WaterSense criteria.
- For irrigation professionals in three areas:
 - > System Design
 - > Installation and Maintenance
 - > System Auditors



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WaterSense labeling of irrigation components...

- The first-ever WaterSense labeled irrigation components will soon be available. After 5 years of work, manufacturers may now submit SMART controllers for testing against the final labeling criteria.
- It is highly anticipated that green-build programs and municipalities will call for installation of these products –by WaterSense Partners




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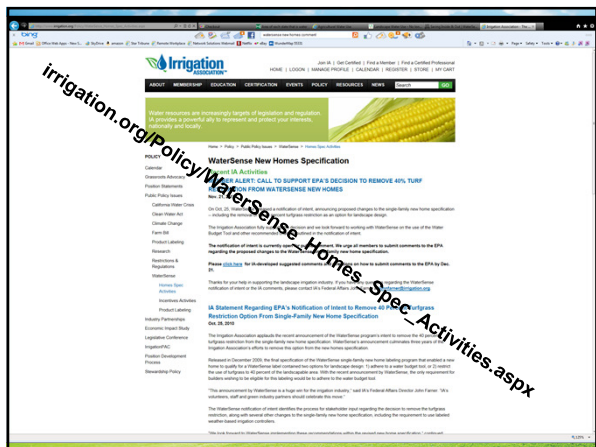
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WaterSense New Home Model Specification...

- Proposes specific opportunities for WaterSense irrigation partners




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irrigation.org/Policy/WaterSense_Homes_Spec_Activities.aspx

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Summary of some water-efficient focused programs

- Green Building Programs
 - WaterSense New Home Specification
 - USGBC's LEED certification system
 - Sustainable Sites Initiative
 - California's AB1881 –Model Water-Efficient Landscape Ord.
 - Presidential Executive Order 13423 – Greening of the Federal Government
 - NAHB's draft National Green Building Standard
 - ICC's IgCC – about to be released
 - IAPMO Green Code

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Trends in Landscape Irrigation

More about Industry Trends – Green Codes and More

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Simple guide* to: **Presidential Executive Order 13423**
Strengthening Federal Environmental, Energy, and Transportation Management

It is the policy of the United States that Federal agencies conduct their environmental, transportation, and energy-related activities under the law in support of their respective missions in an environmentally, economically and fiscally sound, integrated, continuously improving, efficient, and sustainable manner. Executive Order 13423 (EO) implements and builds on the Energy Policy Act of 2005 (EPAct05) and replaces previous Executive Orders, and establishes the following goals:

Energy Efficiency Improvement
Reduce facility energy use and resulting greenhouse gas 2% each year from FY 2006 through FY 2015 with a base starting point of FY 2003 or 2010 reduction by 2015.

Renewable Energy
Ensure that at least 1% of required renewable energy used comes from new renewable sources (placed into service after January 1, 1990), and if possible is generated on agency property for agency use. Energy is considered renewable if it is produced by solar, wind, biomass, landfill gas, ocean (tidal/river/ocean/thermal, hydrokinetic, geothermal, municipal solid waste) or new capacity at existing hydroelectric projects.

Water Efficiency Improvement
Reduce water consumption 2% each year from FY 2008 through FY 2015 with a base starting point of FY 2007 or 1994 for FY 2015 through life-cycle cost-effective measures.

Green Procurement
Use sustainable environmental practices, including acquisition of bio-based, environmentally preferable, energy/water efficient, and recycled content products, plus paper that has at least 20 percent post-consumer fiber content.

Toxic Reduction & Recycling
Reduce the quantity of toxic and hazardous chemicals and materials acquired, used, or disposed of plus implement cost-effective recycling programs to decrease solid waste.

Sustainable Buildings
Ensure that new construction, build-to-suit leased buildings and major building renovations comply with the Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings plus 10% of existing agency Federal capital asset building inventory is retrofitted to comply by FY 2015. Each year agencies must enter one sustainable building into the High Performance Federal Buildings Database.

Vehicle Energy Use
For agencies that operate a fleet of 20 motor vehicles (all full size plus) through FY 2015 with a base starting point of FY 2005, increase non-petroleum based fuel use 17% annually, and use plug-in hybrid vehicles (once available provided they are life-cycle cost effective).

Efficient Electronic Products
Ensure that 95% of electronic products purchased meet the requirements of the Electronic Product Environmental Assessment Tool (EPEAT) unless there is no EPEAT standard for that product, enables the Energy Star feature on 100% of agency computers and monitors or to the maximum degree based on mission needs, establishes and implements policies to extend the useful life of electronic equipment, and uses environmentally sound practices with respect to disposition of electronic equipment that has reached end of life.

The head of each agency shall implement sustainable practices covering:
 o Energy Efficiency
 o Greenhouse gas reduction
 o Water conservation
 o Acquisition
 o Reduction or elimination of toxic chemicals
 o High performance buildings

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http://www.tva.gov/abouttva/energy_management/document/simple_guide_eo_13423.pdf

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More about Industry Trends – Green Codes and More

Green Building Programs

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More about Industry Trends – Green Codes and More

Threshold Point Ratings for Green Buildings

Green Building Categories	MINIMUM	MEAN	GOALS	MAXIMUM
1. Chapter 6: Land Design, Prioritization, and Development	80	84	90	100
2. Chapter 8: Resource Efficiency	85	79	113	144
3. Chapter 7: Energy Efficiency	80	80	100	120
4. Chapter 9: Water Efficiency	54	56	61	60
5. Chapter 9: Indoor Environmental Quality	56	56	100	140
6. Chapter 10: Operations, Maintenance, and Building Owner Education	6	10	15	17
7. Additional Points from any category	50	100	100	100
Total Points	222	406	508	617

(1) In addition to the threshold number of points in each category, all mandatory provisions of each category shall be implemented.
 (2) For building with greater than 1,000 square feet (373 square meters), the number of points in Category 7 (Additional Points from any category) shall be increased in accordance with Section 6.1.5. The "Total Points" shall be increased by the same number of points.

<http://www.nahbgreen.org/NGBS/default.aspx>

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IS-IEDC , ICC and ASABE

The First-ever standard for Landscape sprinklers is being developed as we speak

What does this mean for the future of landscape irrigation?

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Final Summary...

There has been no better time to recognize and seize opportunity than now.
There has been no better time to lead by example than now.
There has been no better time to get involved than now.

The time is now.
Change is upon us.
Good economy or bad.

What we do individually and as an industry now, in the use of water resources will affect the future of the landscape irrigation industry, the greater Green Industry and the urban outdoor living environment for generations to come.

What's your choice?

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Where can you read more?


A few site references

- www.irrigation.org
- www.epa.gov/watersense
- www.iccsafe.org/cs/standards/IS-IEDC/Pages/Default.aspx
- <http://ga.water.usgs.gov/edu/nwater.html>
- www.iapmo.org
- www.nahb.org
- www.usgbc.org

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Thank You!







Questions?

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First, a little background...



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Public Policy



THE HYDRO-ILLOGICAL CYCLE

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graph TD; CONCERN --> PANIC; PANIC --> RAIN; RAIN --> APATHY; APATHY --> DROUGHT; DROUGHT --> AWARENESS; AWARENESS --> CONCERN;
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