SMART Irrigation practices and NEW technology

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Product Manager – Contractor Controllers

The Intelligent Use of Water.™
Agenda

- The Intelligent Use of Water™

- Why should we be smart with irrigation?
  - Current Water Issues

- Becoming smart by knowing:
  - Where to apply water.
  - How to apply it.
  - When to schedule irrigation.

- Questions
The Intelligent Use of Water™
Current Water Issues

- **SUPPLY:** As the population grows, limited water sources strain to keep up with demand
- **COST:** The cost of water and the power to move it is rising annually
- **DELIVERY INFRASTRUCTURE:** In many cities, old water delivery systems designed decades ago to service much smaller populations are inflexible and difficult to maintain

Irrigation is a highly visible water use ... and usually the first to be regulated when water is scarce.
Current Water Issues

- Current politics of irrigation:
  - Water bans & restrictions
  - Tiered water rates
  - Lawn size and landscape restrictions
  - Mandatory irrigation audits
  - Contractor Licensing Requirements
  - Water meter requirements
  - Mandatory ET-based controllers
  - Water-efficient product rebates
  - Restriction on precipitation rates and the use of overhead irrigation in certain design conditions
Current Water Issues

- Automatic irrigation systems are one of the largest causes of over-watering:
  - The controller on the typical irrigation system is adjusted an average of 1-1/2 times per year and many are never adjusted
  - Controllers are typically set to apply the peak irrigation requirement of the year
  - The average automatic irrigation system applies 2 to 3 times the amount of water required by the landscape
Becoming smart by knowing: Where to apply water.

- Plant type
- Geometry
  - Spacing
  - Landscape layout (square, amoeba, etc.)
- Density
  - Sparse Plantings
  - Dense Plantings
Plant Type

- Grass (short, very uniform)
- Shrubs (tall, sparse planting)
- Trees (deep roots)
- Annuals (constant renovation)
Spacing

Stretched Spacing
Improper design, low distribution uniformity

Sprays at 100% plus spacing – not “head to head”
Spacing

Poor Spacing/Outdated Technology

“Donuts” — No close-in watering, poor distribution uniformity
Geometry and Density (Sparse Plantings)

- **Examples:**
  - Medians
  - Narrow planting beds
  - High traffic areas
  - Slopes

- **Solution: Point Source**
  - Watering of specific plants
  - Emitters (single and multiple outlet)
  - PC Modules / Bubblers
Geometry and Density
(Dense Plantings)

- **Examples:**
  - Narrow planting beds
  - Medians
  - Slopes

- **Solution:** Total Coverage/Broadcast
  - 100% Coverage is required
  - Micro-Sprays
  - Dripline
QUESTIONS?
Becoming smart by knowing:

**How to apply water.**

- **Sprays**
  - Traditional nozzles
  - Rotary nozzles

- **Rotors**

- **Drip**
  - Point Source
  - Inline Emitters

- **Root Watering Systems**
Spray Body-1800 SAM Series

- Built-in SAM check valve saves water and prevents erosion from low-head drainage.
- Helps prevent water hammer

Low head without SAM wastes water.
Spray Body
1800 PRS Series

- PRS ensures optimal nozzle performance at 30 PSI in high pressure system
- Eliminates fogging & misting
- Reduces costly accidents and property damage
- Restricts water loss by 70% if the nozzle is damaged or removed
1800 Nozzles

MPR
Fixed Arcs
Quality & Selection
5’, 8’, 10’, 12’, 15’ & Specialty Series

VAN / HE-VAN
Adjustable Arc
Versatile & Convenient

U-Series
Dual Orifice Design High Uniformity
8’, 10’, 12’ & 15’ Series

The Intelligent Use of Water™ — LEADERSHIP • EDUCATION • PARTNERSHIPS • PRODUCTS © Rain Bird Corporation
1800 High Efficiency

Rotary Nozzles
- Fixed Arcs
- Quality & Selection
- 13’ – 24’ adjustable radius

HE-VAN
- Adjustable Arc
- Versatile & Convenient
- 12' & 15' Series
(Best New Product – 2011 IA Show)
Rain Curtain™ Technology

- 3 key elements of Rain Curtain™ Technology:
  - Large Droplets
  - Superior Close-in Watering
  - Even Distribution

- All Rain Bird rotors use Rain Curtain™ technology!
Rain Curtain™ Technology

1 – Large Water Droplets
   – Larger water droplets are more wind resistant.
   – Assures that the water is delivered to the desired location.
   – A better design for “real world” conditions.

7005/8005 Series

Hunter 140
Rain Curtain™ Technology

2 – Effective close-in watering

- Each nozzle is specifically designed to gently deliver water directly in front of the rotor without causing seed washout.

- 3 Ports: close in (slower water), mid- and long-range ports
Rain Curtain™ Technology

3 – Even Distribution

- Avoids over-watering due to poor nozzle performance.
- Eliminates the need to use the “break-up” screw to create good coverage.
- A better design for “real world” conditions.

5000 Series

Hunter PGP
DRIP

Type 1
Point Source
DRIP

Type 2
Micro Spray
DRIP

Type 3
In-Line Emitter Drip Tube
DRIP

Type 4
Sub-Surface Dripline
RWS Root Watering Series
Root Watering Series (RWS)

- Designed for deep root watering and aeration
- Point source irrigation via drip and/or turf watering devices
- Minimizes water run-off
- Promotes tree survival during water restrictions and transplant shock
- Out of sight, maintenance free, efficient irrigation
QUESTIONS?
Becoming smart by knowing: When to apply water.

– Run Times
– Start Days
– Cycle and Soak
– Weather Sensors
Run Times (Application Rate)

Figure 1
Application Rates vs. Run Time
Run Times (Scheduling Factor)

Figure 2
Effect of Uniformity and Efficiency on Application Rate

1.6 in/hr (High Uniformity or Efficiency)

1.04 in/hr (Low Uniformity or Efficiency)
Start Days
Start Days
Using Managed Allowed Depletion

WATER REACHES SOIL IN TWO WAYS
- Rainfall
- Irrigation

WATER LEAVES THE SOIL THROUGH
- Evaporation
- Transpiration
Start Days
Using Managed Allowed Depletion

**Significant Advantages**
- Healthier landscapes
- Reduced run-off
- Stronger, deeper root systems

**Unmanaged Watering**
- Plant stress
- Run-off
- Over-watering
- Shallow roots

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MOISTURE

OXYGEN

Roots reach deeper
Cycle and Soak

30 min Run Time (continuous) without Cycle/Soak

Waste (run-off)

Figure 4
Only part of the applied water reaches the roots.

30 min Run Time (three 10 min cycles) with Cycle/Soak

Figure 5
All applied water reaches the roots.
Scheduling

ESP-SMT Smart Control System
ET Manager
ESP-LX Modular with ET Cartridge
ESP-LXD Decoder Controller
Wired Rain Sensor
Wireless Rain Sensor
Landscape Irrigation and Maintenance Remote (LIMR)
Central Control
WR2

- **Available as:**
  - Rain Sensor
  - Rain Freeze Sensor

- **Benefits of the WR2:**
  - Installs Faster
  - Easier to Use
  - Superior Reliability
Landscape Irrigation and Maintenance Remote (LIMR)

- Designed for usability, performance and reliability.

- Every feature will save you time and money in checking Rain Bird system operation and head alignment.

- Includes a simple interface and easy-to-follow, on-screen instructions allowing users to:
  - Run a system test
  - Activate a zone
  - Skip to any zone by entering its number
  - Run a program
ET Controllers
20% to 50+% Water Savings

ET Manager
Commercial grade retro-fit product

ESP-LXM Controller
Commercial grade, modular, ET controller

ESP-LXD Decoder Controller
Commercial grade, modular, ET-capable

IQ/Site Control/Maxicom
Residential or Light Commercial Smart Controller

ESP-SMT
Residential or Light Commercial Smart Controller
ESP-LX Modular Controller with ET Cartridge

- 4-48 stations
- Stand Alone or ET based with use of cartridge
ESP-LX Modular Controller Water Management Features

- 4 independent programs, ABC stack, D can overlap for drip or non-irrigation applications
- Custom, Odd, Even, Cyclical program day cycles with Custom day off
- 8 start-times per program
- Cycle+Soak™ by station
- Programmable Calendar Day Off and Rain Delay
ESP-LX Modular Controller Water Management Features

- Programmable delay between stations by program
- Sensor input, programmable by station, with status LED and active/bypass switch
- Seasonal Adjust % by program
- Global Monthly Seasonal Adjust
ESP-LXD Decoder Controller with ET Cartridge

- Two-wire control with Extra Simple Programming
- 200 station capacity – expand from 50 up to 200
- Stand Alone or ET-based with use of cartridge
ET Manager™

- A simple, low-cost means to use weather data to automatically control irrigation for any sprinkler system.
Soil Moisture Balance

Rain Bird ET Manager Cartridge
Irrigation Moisture Balance

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<th>Irrigation (in)</th>
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Moisture Levels:
- Saturation: 0.75
- Saturation Allowance Setting: 0.25
- Field Capacity: 0.50
- Total Irrigation Amount Setting: 0.50
- Allowed Depletion: 0.00
- Wilt Point: 0.50
ESP-SMT Smart Controller
ESP-SMT Smart Controller

- **On-site Weather Stationing – two factors of ET:**
  - Temperature
  - Rain

- **Three factors of historical data programmed in; referenced by zip code and date:**
  - Solar radiation
  - Wind speed
  - Humidity

- **Factors all this data via programmed equations to calculate reference ET**
ESP-SMT Smart Controller

- Zone by zone, site-specific inputs to calculate actual ET for your site
  - Slope, shade factor, soil type, plant type, density, root depth, sprinkler type.

- Factors in watering restrictions
  - Allowable watering days and times

- This controller calculates the irrigation schedule, without user guesswork as is traditional with time-based controllers
Central Control
Advantages of Central Control

- **PC Control/Scheduling**
  - Control multiple remote site irrigation systems from a single PC
  - Make changes to irrigation programs to schedule around site events

- **Labor Savings**
  - Eliminate travel to sites to make program changes
  - Efficient watering maintains proper plant growth reducing pruning etc.
Advantages of Central Control

- **Water Savings**
  - Utilize ET (Evapotranspiration) data or weather sensors to automate irrigation water application

- **Power Savings/Load Balancing**
  - Coordinate irrigation demand so pumps operate at peak efficiency
  - Coordinate activity between controllers on a site

- **Reporting**
  - Monitor irrigation system water usage, sprinkler run times, etc.
Rain Bird Landscape Irrigation
Central Control Products Family

Multi-Site

Larger Sites, Fully-Automatic Operation

Maxicom²

Single-Site

Smaller Sites, Semi-Automatic Operation

SiteControl

IQ
QUESTIONS?