Water Efficient Irrigation & Retrofits
Cutting water waste in landscape irrigation.

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Landscape Irrigation System

- The largest appliance – 50% of home’s use
- Overlooked and potentially wasteful
Interesting Fact

Based on over 2,000 irrigation evaluations, approx. 1/3 of irrigation water is wasted due to inefficient design and maintenance.
Improving Irrigation Efficiency

- Landscape
- Irrigation Install. & Control
- Irrigation Management
- Retrofitting to Micro
Water Use Zones - “Hydrozones”

Separate irrigation zones by plant water needs:

• **Shrubs** in mulched beds

• **Grass** – uses 2 to 3½ times more water than mulched shrubs
Join Plants Into 1 Landscape Bed
Eliminate Narrow Grass Strips
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Automatic Irrigation Controller

- Time-based only.
- Turns system on/off on pre-set schedule.
- No awareness of:
  1. Weather
  2. Seasonal changes
  3. Soil moisture
Improving Automatic Control

1. Rain Sensor – Keeps system off after adequate rainfall

2. Soil Moisture Sensor – Keeps system off if soil moisture is adequate

3. Weather Based Control – Instead of time based control
Use a Rain Gauge

Rain of ½ inch or more; skip irrigation.
Empty and clean often.
1. Rain Sensor

- Turns system off after adequate rain (Fla law on installations since 1991)
- Check often for proper operation
2. Soil Moisture Sensor

- Measures soil moisture in root zone.
- Overrides controller when soil moisture is above set point.
- Adjust to soil type.
UF Research on Soil Moisture Sensors

• Tested 4 brands of SMS in home landscapes.
• Compared to std. irrigation timer controllers.
• Results: 56% less water used and -
• No visual difference in turf quality.
3. Weather Based Control

Based upon real-time evapo-transpiration (ET) calculations:

- Temperature
- Humidity
- Wind
- Solar Radiation
Weather Based Control

• Requires weather data input (+/- $4 monthly sub.)
• Initial cost about $400 & up
• Tedious set up process
• UF research incomplete but looks promising
Lawn Sprinkler Types

Rotors for large, open areas

Sprayers for small, irregular areas
1. Sprayer
PR = 2”/hour

2. Rotor
PR = .5”/hour

Don’t mix sprayers & rotors in same zone!
Rotor Adapter available for spray heads. Precipitation rate comparable with rotors.
“Head to Head” Spacing
Install sprinklers so water from one sprinkler almost touches next.
See EDIS Bulletin 320.
Improving Irrigation Efficiency

Landscape

Irrigation Install. & Control

Irrigation Management

Retrofitting to Micro
Repair Broken Sprinkler Heads
Repair Leaks and Broken Piping
Clear Blocked Spray Patterns
Adjust for Minimal Over Spray
Adjusting the Irrigation Controller - 3 main settings:

1. What day to water?*
2. Start Time?*
3. Run Time?

* By WMD’s rules.
1. What Day to Water?

• Only on allowed day.
• BUT-only **as needed** (at first signs of wilt).
  Tricky on 1 day a week.
1. Use a Rain Gauge

If rain of \( \frac{1}{2} \) inch or more; skip irrigation. Empty and clean often.
2. Start Time?
Must follow WMD rules

• Generally - No irrigation during the day
• Only 1 complete irrigation
2. Start Time?

Less wind  Sunlight dries leaves
Less evaporation  Foliage already wet

• Best time to irrigate is **early morning**.
• To find start time:
  • add all run times together from step 3
  • subtract from sunrise time
3. Run Time (how long to water)?
Usually the most puzzling step

- ¾” of water per irrigation cycle.
- But controller settings are minutes, not inches of water.

What to do?
Short, frequent irrigations

Longer, less frequent irrigations
3. Run Time (how long to water)?

3/4 inch will water 8-9 inches deep.
(IFAS Recommendation)
Calibration Test

1. Mark ¾ inch depth line inside 6–10 cans.
2. Place cans randomly within a zone.
3. Run zone until water reaches lines (average).
4. Note watering time in minutes.
5. Set timer accordingly for that zone.
6. Repeat steps 1 – 5 for each zone.
Calibrate Each Zone
done with empty, straight sided cans
Can vs. Sprinkler Gauge
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The pathway to using micro-irrigation in the landscape is to water flowers, shrubs or trees separately from grass.
4 Types of Micro-Irrigation

- Micro-Sprayer
- Micro-Bubbler
- Dripper
- Drip Tubing
Retrofitting to Micro

Grass w/ sprayers

Shrubs w/ micro – irrig. connected to former spray zone
Point 1 (of 6)

Conversion materials are available:

- Change-over kits for pop-up sprayers (pictured on next two slides)
- Wide assortment of PVC/poly pipe fittings
Pop-up Sprayer Kit

- 1/2" NPT swivel outlet
- 30 psi pressure regulator
- 200-mesh filter
- Rugged, UV-resistant 1800 body
Multiple Outlet Device

- Unthread to access 200-mesh (75-micron) screen
- Unthread to access independent flow ports
- Union base nut permits removal from riser without tangling 1/4" tubing

Remove sprinkler and replace with MOD assembly.
Point 2
Plan for function & uniformity:

• Separate grass & shrub zones
• Each zone gets only the water needed
• No overlapping coverage between zones
Point 3

Best if entire zone is changed to micro-irrig.

• Micro-irrig. may have a different application rate than rotors & sprayers.

• Micro-irrig. operates on a different schedule.
Point 4

Include filtration and pressure regulation.

• Micro-irrig. uses tiny openings that can clog easily.
• Lake/pond water -- additional clogging problems.
• Operating pressure for micro-irrig. is 20 – 30 PSI.
Point 5  
Controller should have dual programs (allows diff. schedules)

• Conventional irrig. sch. on program A
• Micro-irrig. sch. on program B
Point 6

Water flow rate in zone may change

If zone flow rate is **much less** than original:

- Control valve may not work well at less than about 2 GPM.
- Local well & pump – may cycle on/off too quickly & burn out motor.
Summary

• Landscapes typically use up to 50% of residential water supply.
• Significant savings are possible by:
  • Properly plan & manage irrigation
  • Reduce thirsty plant area in landscape
  • Water shrubs and grass separately
  • Use micro-irrigation in shrub areas
Sources for Further Information:

Extension Publications: www.SolutionsForYourLife.com

Irrigation Manuf. Websites:
www.antelco.com
www.digcorp.com
www.mrdrip.com
www.mrlandscaper.com
www.hunterindustries.com
www.lrnelson.com
www.rainbird.com www.toro.com

Watering Restrictions: www.WaterMatters.org and local government
Questions?