• Achieving Efficient Landscape/Turf Irrigation

• Dr. Cathie Lavis: Professor & Extension Specialist
clavis@ksu.edu

• Department of Horticulture, and Natural Resources: Kansas State University
Professional Stewards of our water: ask, do you—

• Understand plants, their water use, and soils?

• Develop quality designs, install correctly, and do routine maintenance?

• Understand how much water is being applied during a watering event and then schedule accordingly?

• Update older systems using devices/components that help conserve water?
Ask: what about soil infiltration rate?

- SANDY: 0.8”/hr
- LOAM: 0.5”/hr
- CLAY: 0.2”/hr

8 minutes—max. runtime for clay
18 minutes, max runtime for loam

Start

Precipitation Rate

INCHES PER HOUR

10 minutes
20 minutes
Does the contractor--

- **Understand**
  - pressure (psi), flow (gpm), velocity (fps)
  - sprinkler precipitation rate (PR)
  - observe site specifics
  - water saving components
  - distribution uniformity (DU) and efficiency
What about PSI?
System PSI too high
System psi too low
What about flow?

• How much water is going down per unit of time, precipitation rate (PR)?

• At least use the product catalog to figure PR.
Distribution uniformity (DU)

• How evenly water is applied over an area.
• Equal water on each square foot of soil surface would be 100%
  – the minimum acceptable for turf is ~70-80%
  – the average residential or commercial system is ~50% or less.
Factors Influencing Uniformity

- Pressure

- Wind direction and speed

- Mechanical nature:
  Sprinkler type, spacing, rotation speed, flow rate (gpm)
Uniformity & Efficiency

GOOD UNIFORMITY
(NEVER PERFECT)

Depth of Water

POOR UNIFORMITY

Depth of Water

EFFICIENT

Depth of Water

Good Timing

NOT EFFICIENT

Depth of Water

Poor Timing

Good run time of zone

Poor run time of zone
Watering efficiency = good system management

• **Influencing factors:**
  – Overspray/runoff
  – Zone runtimes
  – Broken sprinklers
Proper installation

• Critical for a cost-efficient, easily maintained, water conserving, long-lasting system.

• Too many contractors install without regard to safety, longevity, ease of maintenance & efficiency.

• As-built plans should always be provided to clients.
Watering more than the plants
Improper Sprinkler Installation

Too low

Too high

Correct
SYSTEMS NOT PROPERLY MAINTAINED
Cracked pipe
Incorrect Arc Adjustment
Simple adjustments make a big difference.
• Typical homeowners do not think about adjusting runtimes for seasonal changes. Does your contractor?
MOST PEOPLE DO NOT KNOW HOW MUCH WATER (PR) IS APPLIED DURING AN IRRIGATION EVENT
• Scheduling sprinkler runtimes without knowing the precipitation rate (PR) is like trying to estimate your arrival time without knowing how fast you are traveling.
PR rates are NOT equal

- High: 1.0 in/hr or more
- Medium: 0.5 to 1.0 in/hr
- Low: 0.5 in/hr or less
Catch-cans or calculate use nozzle performance charts
UPDATE OLDER SYSTEMS AND NEW SYSTEMS USING PRODUCTS NOW AVAILABLE TO HELP CONSERVE WATER
Update equipment

- Climate-Based Irrigation Controllers
- Rain or/ Soil Moisture Sensors
- Low Precipitation Rate Sprinklers
- High Application Uniformity Products
<table>
<thead>
<tr>
<th>Popular Water Savings Upgrades</th>
<th>Cost of Product*</th>
<th>Annual Gallon Savings</th>
<th>Annual Cost Savings</th>
<th>Return on Investment (ROI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controller Upgrade</td>
<td>$400</td>
<td>80,000</td>
<td>$400</td>
<td>1 year</td>
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<tr>
<td>Rain-Off Sensor</td>
<td>$120</td>
<td>24,000</td>
<td>$120</td>
<td>1 year</td>
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<tr>
<td>Ultra-Low Flow Toilet</td>
<td>$350</td>
<td>14,162</td>
<td>$70</td>
<td>5 years</td>
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<tr>
<td>High-Efficiency Clothes Washer</td>
<td>$1,500</td>
<td>8,176</td>
<td>$40</td>
<td>37 years</td>
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<tr>
<td>High-Efficiency Showerhead &amp; Faucet Aerator</td>
<td>$50</td>
<td>2,993</td>
<td>$15</td>
<td>3 years</td>
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<tr>
<td>Faucet Aerators</td>
<td>$9</td>
<td>1,752</td>
<td>$9</td>
<td>1 year</td>
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<tr>
<td>High-Efficiency Dishwasher</td>
<td>$500</td>
<td>1,250</td>
<td>$6</td>
<td>80 years</td>
</tr>
</tbody>
</table>

*Cost is for residential application and does not include installation cost.
Check valves prevent low head run-off
Sprinkler drain check valves

Check valves to control low head drainage.

Can save 1000s of gallons/year
Sprinkler pressure regulation

Non-Pressure Regulated

Pressure Regulated
Pressure Regulated Valves
Rain and Weather Sensors
Weather stations and SMART Controllers
Soil-based sensor (SMS)

- Monitor soil moisture level—like driving a car without a gas gauge

- When soil moisture levels reaches a critical low value, irrigation applied
Subsurface Drip vs. Sprays

SSDI

• Spray sprinklers
Inline Drip Wetting Pattern
In Summary—to water well—

• Gain an understanding of plant water use and soil
• Install quality designed systems
• Proper and routine system maintenance
• Update older systems; on new systems use devices to help conserve water
• Employ auditing practices to discover how much water is applied during a watering event, then schedule accordingly
THANK YOU