OBJECTIVES

MAXIMIZE WATER USE, MINIMIZE WASTE

• AUDITING THE PERFORMANCE OF AN EXISTING IRRIGATION SYSTEM
• HOW TO IDENTIFY AND MANAGE HYDROZONES
• HOW TO MANAGE IRRIGATION TO PREVENT RUNOFF
• EVALUATE WATER CONSERVATION EQUIPMENT FEATURES
• SEASONAL IRRIGATION STARTUP AND SHUTDOWN
MAXIMIZE WATER USE, MINIMIZE WASTE

DEFINITION OF AN IRRIGATION AUDIT

“PROCEDURE TO COLLECT AND PRESENT INFORMATION CONCERNING THE UNIFORMITY OF APPLICATION, PRECIPITATION RATE, AND GENERAL CONDITION OF AN IRRIGATION SYSTEM AND ITS COMPONENTS.”

IRRIGATION ASSOCIATION

MAXIMIZE WATER USE, MINIMIZE WASTE

• IMPORTANT TO UNDERSTAND
• SOILS – TEXTURE, INFILTRATION RATES, FIELD CAPACITY
• PLANTS – WATER NEEDS, SUN REQUIREMENT, SOIL REQUIREMENT
• HYDROZONES – MICROCLIMATES, SLOPE, PLANT WATER NEEDS, IRRIGATION STATIONS
• IRRIGATION CONTROLLERS – WATER BUDGET FEATURE, PROGRAMS, RAIN SENSORS, MULTIPLE RUNTIMES, SMART CONTROLLERS, RUNTIMES
• WASTING WATER – BROKEN/MODIFIED EQUIPMENT, PRESSURE, MULCH, BLOCKED SPRAY, LEAKS, AND MUCH, MUCH MORE!
MAXIMIZE WATER USE, MINIMIZE WASTE

GENERAL AUDIT STEPS
1. BEFORE YOU GO – KNOW WATER SUPPLY, WATER CONSUMPTION INFO, FIX OBVIOUS ISSUES IF POSSIBLE
2. WHO TO INVITE – CUSTOMER, PROPERTY MANAGER, WATER PURVEYOR
3. BEGIN WITH THE METER AND BACKFLOW
4. EVALUATE SOILS AND TURF ROOT DEPTH
5. CHECK THE IRRIGATION CONTROLLER SETTINGS
6. TURN ON IRRIGATION SYSTEM STATION BY STATION (ZONE BY ZONE)
7. PROVIDE SUGGESTIONS BEFORE YOU LEAVE

WATER METER

- CHECK FOR LEAKS
- DETERMINE RATE OF STATION WATER USE
BACKFLOW PREVENTION DEVICE

- Check for leaks
- Determine static pressure at the last test cock

PRESSURE REDUCER

- Check for leaks
- Know where it’s located
SOIL – TEXTURE AND ROOT DEPTH

DETERMINE SOIL TEXTURE
  • Ribbon method

DETERMINE ROOT DEPTH
  • DEEPER ROOTS = HEALTHY PLANTS; WATER LESS

SOIL – INFILTRATION RATE

COMPARE INFILTRATION RATE, PRECIPITATION RATE, AND STATION RUNTIMES

Taken from Certified Landscape Irrigation Auditor, Irrigation Association, 2004, pg. 69
SOIL – ROOT DEPTH AND RUNTIMES

REGARDING ROOT DEPTH

MAKING ROOTS GROW DEEPER

• PROPER NUTRIENTS (NPK – ESPECIALLY P)
• INFREQUENT IRRIGATION
• TURF – HIGH MOWING HEIGHT; SPECIES (TALL FESCUE)
• SUNLIGHT
STANDARD IRRIGATION CONTROLLER

- Water Budget – 100% Per Program
- Time and Calendar
- Start Times Per Program
- Rain Sensor - Where is it?
- Station Runtimes Per Program
- Days of Operation Per Program
- Programs A, B, C, and D

WEATHER-BASED IRRIGATION CONTROLLER

DATA DELIVERY METHODS
- ONSITE WEATHER STATION
- UPDATES THROUGH INTERNET
- INTERNAL SOURCE – ZIP CODE
- SOIL SENSOR
WEATHER-BASED IRRIGATION CONTROLLER

Standard Irrigation Functions

ZIP Code Feature
– For Solar Radiation or Temperature Data

Sprinkler Type – Precipitation Rates

Plant Type – Low, Moderate, High Water Need Rates

Soil Type – Infiltration Rates

More Or Less – Make Minor Adjustments For Other Factors

OTHER FACTORS
SLOPE
SUN EXPOSURE

PLANTS, SOIL, WATER RELATIONSHIP

Transpiration through open stomata

Xylem – carries water

Root pressure pushes water up the plant

WHAT IF...
SOIL WAS SATURATED?
CLAY SOILS?
SANDY SOILS?

Taken from “Botany for Gardeners”; Capon, Brian; 1990, pp. 143.
ZONE BY ZONE EVALUATION
SPRINKLER HEAD UNIFORMITY - HEAD-TO-HEAD COVERAGE

Example of sprinkler overlap patterns

Combined depth of application of overlapping sprinkler

Depth of application (inches)

Sprinkler

Sprinkler

Spacing between sprinklers (feet)

Taken from “Certified Landscape Irrigation Auditor”, Irrigation Association, 2004, pg. 55
ZONE BY ZONE EVALUATION
SPRINKLER HEAD UNIFORMITY - HEAD-TO-HEAD COVERAGE

Taken from "Certified Landscape Irrigation Auditor", Irrigation Association, 2004, pg. 50

ZONE BY ZONE EVALUATION
BROKEN PIPES (BUBBLES IN THE GRASS), HEADS, AND NOZZLES
ZONE BY ZONE EVALUATION
MISDIRECTED SPRAYS, OVERSPRAY, AND TILTED HEADS

ZONE BY ZONE EVALUATION
BLOCKED SPRAY DUE TO GROWING VEGETATION OR SUNKEN HEADS
ZONE BY ZONE EVALUATION

OTHER FACTORS TO WATCH FOR
LOW PRESSURE
HIGH PRESSURE (MISTING)
• psi: 30, 45, 60
LOW HEAD DRAINAGE
RUNOFF – CHANGE RUNTIMES;
  MULTIPLE RUNTIMES
DRIP - BROKEN LINES, MISSING
  EMITTERS, NO PRESSURE
  REGULATION, OVERSIZED
  VALVES
SATURATED LANDSCAPE AREAS
IS IRRIGATION NECESSARY

ZONE BY ZONE EVALUATION

HYDROZONING
DEFINITION – PLANTS WITHIN AN
  IRRIGATION ZONE HAVE THE
  SAME WATER REQUIREMENTS
  AND ENVIRONMENT
MICROCLIMATES – EXPOSURE, SOIL
  TYPE, ASPECT, BUILDINGS, WIND,
MATCHED PRECIPITATION RATES
BENEFITS – APPROPRIATE AMOUNT
  OF WATER USED, HEALTHY
  PLANTS, LESS WASTE
CHALLENGES – COST
ZONE BY ZONE EVALUATION

MULCH
LESS THAN 2 INCH LAYER OF MULCH CAN STILL ALLOW WEEDS TO GROW
ADDS ORGANIC MATTER
REDUCES WATER LOSS DUE TO EVAPORATION BY 33% (RESEARCH REFERENCED BY DR. BERT CREGG – MICHIGAN STATE UNIVERSITY)

WHEN ALL IS SAID AND DONE...

AFTER THE ZONE BY ZONE EVALUATION
SHARE PRIORITIZED SUGGESTIONS WITH THE PROPERTY OWNER/MANAGER
MAKE CHANGES TO THE IRRIGATION SCHEDULE
• www.iwms.org – Irrigation Water Management Society
• www.irrigation.org - Irrigation Association
WHEN IN DOUBT – 2 MINUTE RULE
SEASONAL STARTUP AND SHUTDOWN
*SEE HANDOUT*

QUESTIONS?

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