

# Regional District of Nanaimo Team WaterSmart Drip / Micro Workshop

June 2009

## Overview

- Irrigation System Anatomy
  - (controllers, backflow, valves, sprinklers)
- Items Required (pipe & fittings)
- Pressure and Elevation
- Drip / Micro Systems
  - Scheduling and precipitation rates
  - What new and what is coming
  -

## Water Source

- City Main:
- Location where the typical irrigation system gets it's water
- The connection is usually deep
- 2 feet is code in B.C.
  - but they can be deeper

## WATER METER



## Manual Control Valves

### Gate Valve



### Ball Valve

## Backflow Prevention Devices

- DC - Double Check Assembly
  - Prevents backflow and back siphonage
  - One per system
  - Most common usage is for irrigation systems



## PVC Piping



## SOLVENT CEMENT

- Work a medium layer of cement into the fitting socket
- Avoid puddling cement in the socket
- On pipe do not coat beyond the socket depth or allow cement to run down into the pipe beyond the bell



### ■ Note



- Too much cement and primer will cause damage to the pipe and will cause a failure of the system.

## Poly Pipe



## Poly Fittings



## *Irrigation Controllers - Operation*

### Spray Sprinklers

Spacing 10 feet – 15 Feet

Typical Precipitation Rate

1.25 – 2.75 Inches per hour



## Sprinkler Heads

- Rotary head (Rotors)
- Gear – Small - Mid-range - Large
- Ball Drive
- Impact – Small - Mid-range - Large



## Micro Irrigation



### Sprinkler Types

- Micro

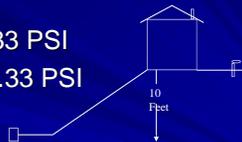
Typical  
Precipitation  
Rates

1.75 – 2.75  
inches per  
hour

## Introduction to Hydraulics

■ 10 feet of elevation

- Up we lose – 4.33 PSI
- Down we gain - 4.33 PSI



## Drip / Micro Systems

- Drip, or micro-irrigation, technology uses a network of plastic pipes to carry a low flow of water under low pressure to plants

## Drip / Micro Systems

- Works well with Water-wise gardening drip irrigation.
- Odd-shaped and narrow areas are easily irrigated with drip systems.
- Puts the water at the root zone of the plant material



## Drip / Micro Systems

- 90 percent efficiency verses sprinkler systems about 70 percent efficient.
- Less loss of irrigation water due to wind
- Drip irrigation stretches water supplies and may be exempt from water restrictions imposed during drought.

## Drip and Micro Spray Irrigation

- Drip irrigation equipment can easily be installed.
- Low pressure, low flow equipment
- Some specialty equipment required

## Drip and Micro Spray Irrigation

### Advantages

- Delivers water slowly
- Immediately above, on or below the surface of the soil.
- Minimizes water loss due to
  - runoff,
  - wind
  - and evaporation.

## Drip and Micro Spray Irrigation

### Advantages

- Can be operated during the windy .
- Mold spots , or rotting of siding and fences experienced with overspray from sprinkler irrigation is eliminated
- Pavement deterioration associated with sprinkler irrigation runoff is eliminated.



## Drip and Micro Spray Irrigation

### Advantages

- Adaptable and changeable
- Drip systems can be easily expanded to irrigate additional plants
- Emitters can be simply exchanged or removed
- Emitter lines eliminated or repositioned.

## Drip and Micro Spray Irrigation

### Disadvantages

- If emitters are poorly placed, root development may be restricted
  - far apart or too few in number
- Water seeping at ground level is hard to see and makes it difficult to know if the system is working properly

## Drip and Micro Spray Irrigation

### Disadvantages

- Regular maintenance inspections are needed to maintain system effectiveness
- Clogs are much less likely with filtered water and proper pressure regulation

## Drip and Micro Spray Irrigation

### Disadvantages

- Drip tubing can be a tripping hazard especially for animals and children
  - cover with mulch
  - fastened with wire anchor pins every 2 to 3 feet.
- Drip lines can also be easily cut while doing landscape maintenance.

## Sprinkler Heads

### Micro Sprays

- 15 – 25 PSI
- Coverage – small area
  - up to 6'
- Precipitation Rates
  - 0.75 – 2.25 inches/hr
- Must filter the water to avoid contamination



## Filter and Pressure Regulator



## Filter and Pressure Regulator

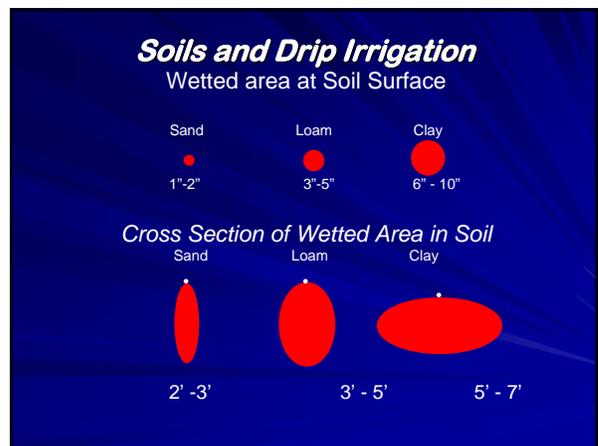
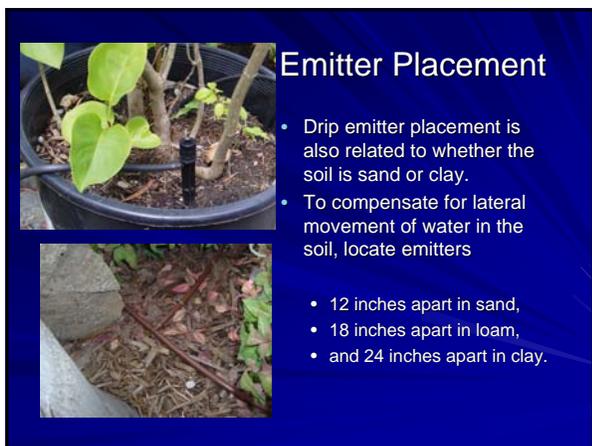
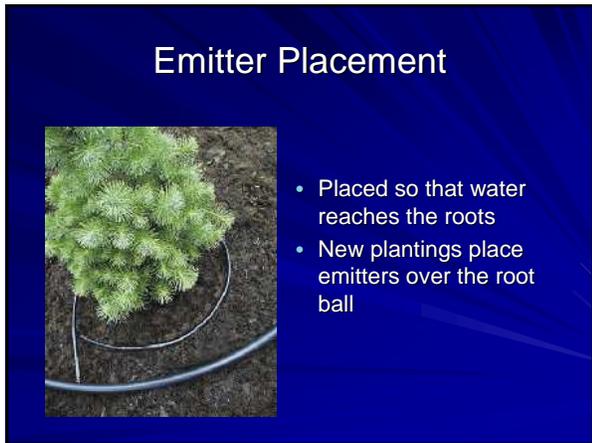


## Micro Sprinklers



## Micro Risers





## Scheduling

- Any irrigation system is only as efficient as the watering schedule used, and the maintenance done on the system
- If systems are set to water excessively
  - ❖ any system **including** drip can waste water.

## CONTROLLER

- **Tips for reducing water and costs of an irrigation system:**
- Know how to run the irrigation controller
- Adjust the watering times and the frequency based on weather conditions
- Install a rain shutoff device or soil moisture sensor

## Controllers



## Drip Control Zone



## Battery Controllers



## July is Water Smart Month for the Irrigation Industry

- So What can we do to be water smart
  - Program our Irrigation for systems seasonally
  - Understand and adjust our controllers
  - Check our system for breaks
  - Look as new technology for water savings

## Scheduling Irrigation



How Much is too Much ?

## Irrigation Controllers - Operation

We Irrigate to ET  
ET – Evapotranspiration Rate

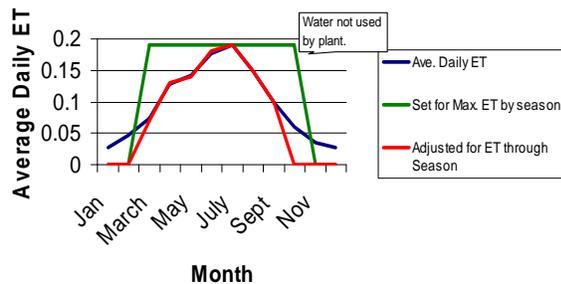
Can be measured by a weather station:

- Relative Humidity
- Air Temperature
- Wind Velocity
- Solar Radiation



## Controller Scheduling

### Scheduling to Evapotranspiration



## Irrigation Controllers - Operation

Soil texture and structure determines:

### Soil Infiltration Rate

Irrigation must be applied at rates slower than the soil infiltration

Sandy soils can absorb water quicker than clay soils

The maximum application rate is determined by the soil type

– Cycle often if runoff occurs



## CONTROLLER

- To eliminate runoff, cycle your clock to 2-4 start times
  - no longer than 5 minutes each
  - 1 to 2 hours apart to allow water to soak into the soil
- Develop a separate drip schedule for trees, shrubs and flower beds
- Aerate in the spring and fall to loosen soil and reduce runoff

## Irrigation Controllers - Operation



Landscape Irrigation  
SCHEDULING CALCULATOR



Landscape  
Calculator

helps to work  
outward from the  
landscape irrigation

■ FREE USE :

[irrigationbc.com](http://irrigationbc.com)

## Rain Shut-off Device



Basic Water Saving devices –  
Shuts off automatic irrigation in the event of Rain

## Irrigation Controllers - New Technology



■ New Sprinklers with more effective application of irrigation water



## Irrigation Controllers - New Technology

- Connect to the Web to transmit schedules over the Internet for contractor or Manufactures' advice and assistance
- Create automatic schedule for landscape/lighting
- Obtain online weather forecasts for zone adjustments using



## Irrigation Controllers - New Technology

### ET or Smart Controllers

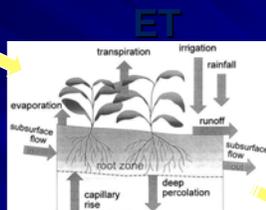
- Real ET for real plants
- Generates local ET from its own dedicated sensors
- True plant, soil, & sprinkler database
- Generates ET run times from scratch



## Irrigation Controllers - New Technology



ET SENSOR sees evapo-transpiration...



...ET MODULE knows crop coefficient, soil, slope, sun, and PR data for each station.



## Irrigation Controllers - New Technology

- Cost effective Solutions
- New controller Applications



***Irrigation Controllers - Check up***

- Verify the proper operation of each zone valve
  - manually activating it from the controller



**Controllers**



***Irrigation Controllers - Check up***

■ Too much



***Irrigation Controllers - Check up***

Controllers do not solve this problem!



***Irrigation Controllers - Check up***

Or This .....



Thank you

