Irrigation Water Management

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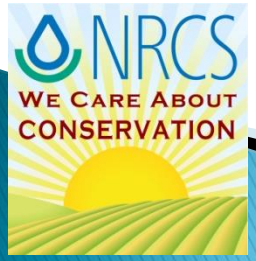
Purposes

- Improve irrigation efficiency
- Minimize soil erosion
- Decrease degradation of water
- Manage salts
- Manage micro-climate
- Reduce energy use

Over Irrigation

- Yield loss
- Diseases

  (ie. phytophthora root rot & verticilium wilt)
- Nutrient losses from leaching & runoff
- Weed infestation
- Power or water cost
- Environmental concerns
  - Soil erosion/pesticide losses
  - Ground & surface water contamination



Under Irrigation

- Yield loss
- Weed infestation
- Increased insect problems

Terminology

- Saturation
- Field Capacity
- Available Water Holding Capacity (AWC)
- Maximum Allowable Depletion (MAD)
- Permanent Wilting Point
- Deep percolation
- Infiltration Rate/Permeability

Evapotranspiration (ET)

Combination of

- Transpiration – water lost through the plant
  - Varies based on crop stage, temperature, wind speed
- Evaporation – loss of water from the soil
  - What changes can be made to reduce evaporation?

Scheduling

- Soil Moisture by Feel
- Checkbook method
- On-site measurements

Soil Moisture By Feel

- http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs144p2_051845.pdf

Checkbook method

- Info needed
  - Crop Root zone
  - Soil Water Holding Capacity
  - MAD for the crop
  - Water applied at each irrigation
  - Daily ET

Example

Crop	Alfalfa
Root Zone	google
Soil Type	Web Soil Survey
Water Holding Cap.	Web Soil Survey
MAD	google
Water/Irrigation	Design/ application
ET	AZMET

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Example

Crop	Alfalfa
Root Zone	4-6 ft
Soil Type	Anthony Fine Sandy Loam
AWHC	.12 in/in (7.2 in)
MAD	50 % or 3.6 in
Water per Irrigation	2.5 in

When irrigation system applies less than MAD amount, you don't want to deplete the soil less than can be replaced with and irrigation.

ET

Jan	Feb	Mar	Apr	May	June
1.8	3.3	4.8	6.4	6.3	8.4
July	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**
7.1	6.2	5.2	3.5	2.4	1.7

- AZMET provides daily, weekly, or monthly totals
- monthly average = divide the inches/ month by the number of days in the month
- EX. June
  - 8.4/30 = .28 in /day ET

Checkbook

Date	Available	Subtract ET	Add Irrigation	Add Precipitation	Total
6-14	3.6	.28	0	0	3.32
6-15	3.32	.28	0	0	3.04
6-21	3.04	1.68	0	0	1.36
6-25	1.36	1.12	0	0	.24
6-26	.24	.28	3.6	0	3.56

Date	Available	Subtract ET	Add Irrigation	Add Precipitation	Total
6-14	2.5	.28	0	0	2.22
6-15	2.22	.28	0	0	1.94
6-21	1.94	1.68	0	0	.26
6-22	.26	.28	2.5	0	2.48

On Site Technology

Tensiometers

Electrical Resistance

CIR Photography

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