Water Usage in a Changing Climate

Crop Usage

- Vegetable row crops loss approximately 5400 gals of H_2O/acre/day.
- Approximately 27,160 gals of H_2O to provide an inch of water/acre.
- Evaporation loss in Maine = approximately 0.18”-0.21”/day in July (Very weather dependent).
- Approximately 1”-2” of water per week

Water loss in production systems

- **Water lose through evapotranspiration, soil infiltration, surface evaporation**

Factors affecting water loss

- Bare vs covered soil
- Time to canopy closure
- Leave structure

- Cultivation: tillage
- Soil Health: organic matter

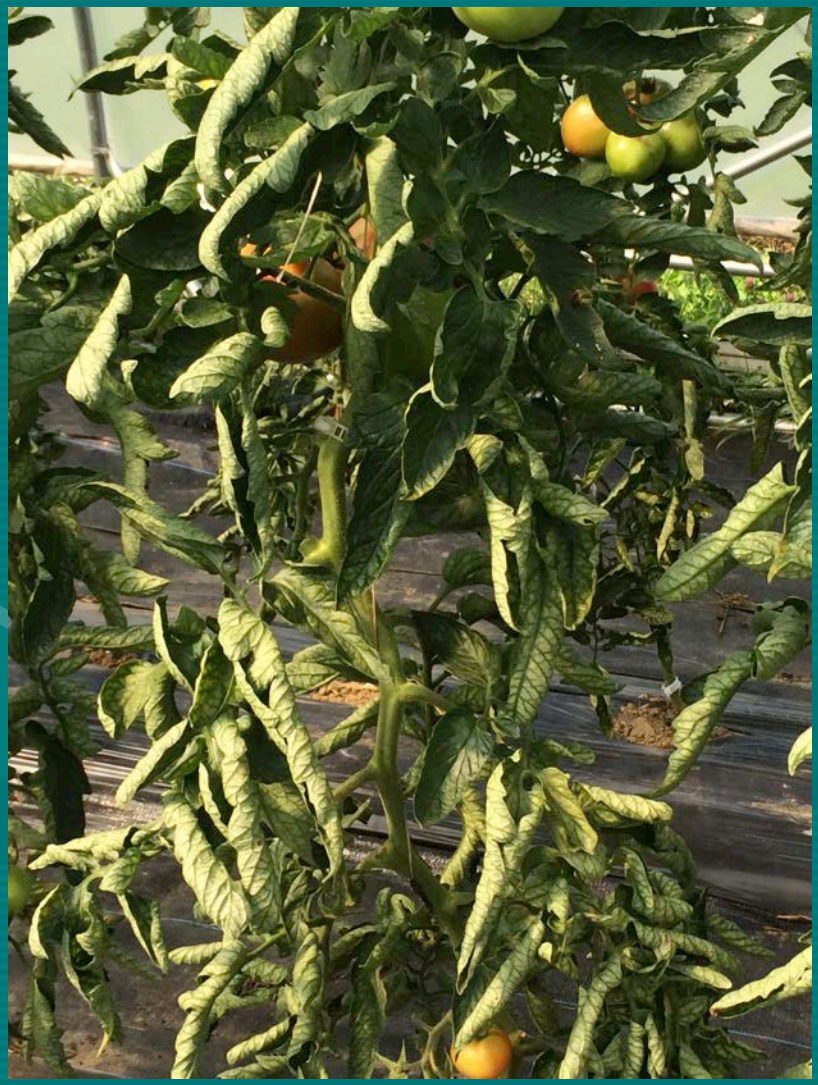
Water Stress

- Reduces yield and quality of crops.

- Stress Caused From:
  - Inconsistent watering
  - To much
  - To little
  - Shallow watering
    - Root formation

Blossom End Rot: caused by inconsistent watering

How do you know when to irrigate?



- Everyday?
- Set and forget it?
- Every 5 or 7 days?
- Whenever the plants look like this?

When do you irrigate?

- Plants as indicators
  - Good rule of thumb-
    - "If the plants are wilted in the morning, time to water"
- Check the soil
  - Dig down in the soil profile
- Environmental conditions:
  - Evapotranspiration
    - Heat
    - Wind
    - Plant size

Tools to help determine irrigation timing:

- Rain gauge
- Soil Tensiometer
- Moisture meters
- Shovel
- Knowledge

Irrigation Methods

- High Pressure
- High volume

- Low pressure
- Low volume

Water Source

- Type
  - Domestic:
    - private well/public
  - Water Body
    - Pond/lake
    - Stream
- Amount
- Distance:
  - from water source to water use


Wobblehead Irrigation


Overhead Irrigation
Jamaica

Hose reel

Pictures with permission: Andrew Frankenfield

Ditch Irrigation: Idaho

Center Pivot Drip

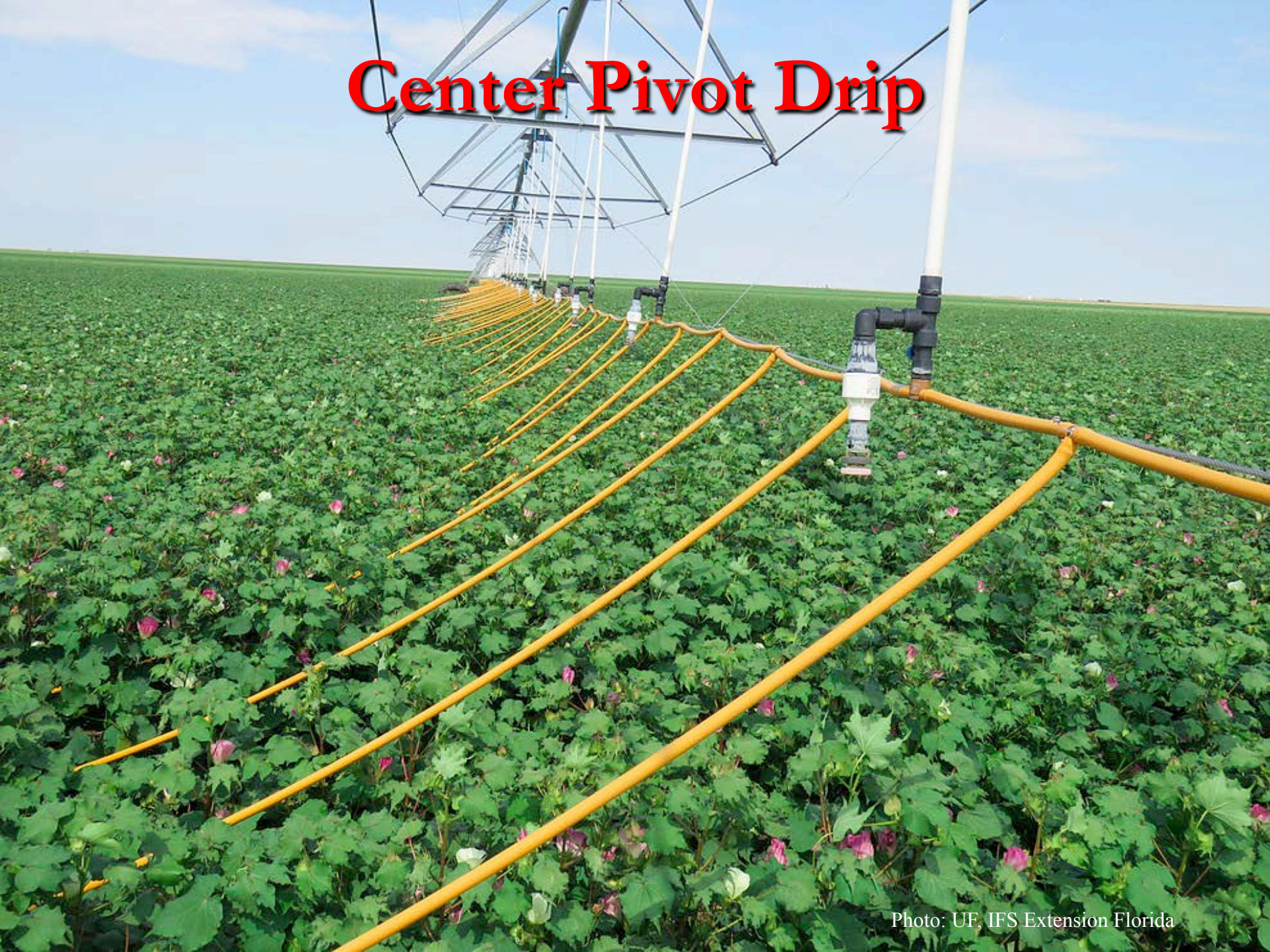


Photo: UF, IFS Extension Florida

Center Pivot

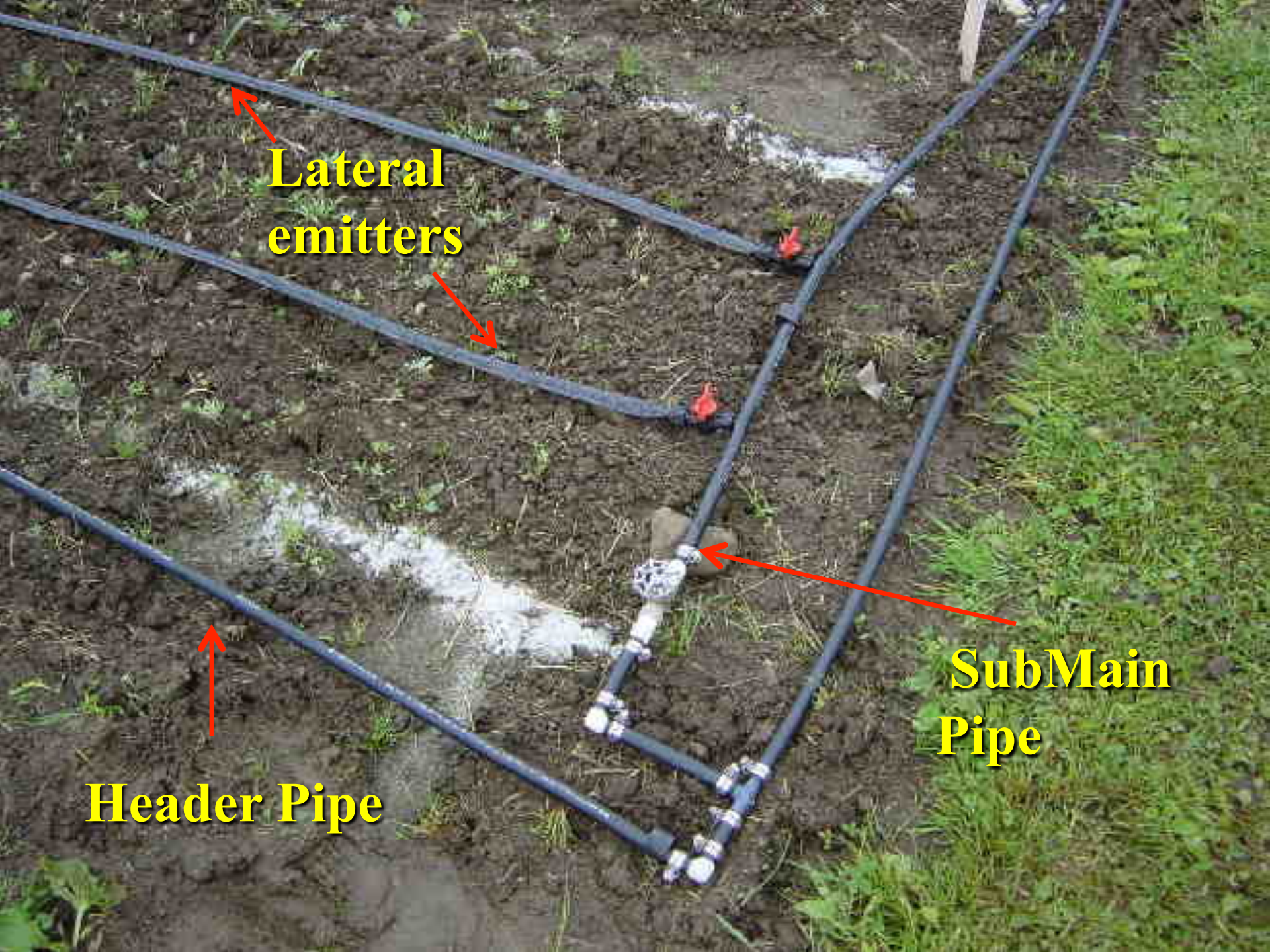
Photo: UF, IFS Extension Florida

Drip Irrigation

- Use 30-70% less water than overhead

- applies water slowly and evenly to the root zone
- crops grow evenly
- reduces weed emergence
- keeps the foliage dry
  - which prevents many diseases
- less fertilizer

Bacterial Spot


Lateral emitters
SubMain Pipe
Header Pipe

Drip Irrigation

- Uniform wetting pattern
- Targeted
- Consistent

Disadvantages

- Salts may accumulate in the containers or beds
- Insect and rodent damage
- Emission holes may become clogged
- Initial investment

Yummy

Emitters

- Adjustable drippers
  - 1-10 gph
- Button drippers (1/2-4 gph)
  - Pressure compensating
  - Working pressure
- Micro-sprinklers
  - 10-40 gph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Low tech/low cost methods

- Bucket method
- Milk jug
- Soaker hose


Water is a must!
LONDON

Ways to Conserve Water

- Mulch
- Weed free
- Hand weed
- Plant less
- Decrease the use of salt fertilizers

- Increase soil organic matter
- Loosen the soil surface
- Irrigation method and timing


Questions?