Evapotranspiration and irrigation scheduling

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Irrigation scheduling

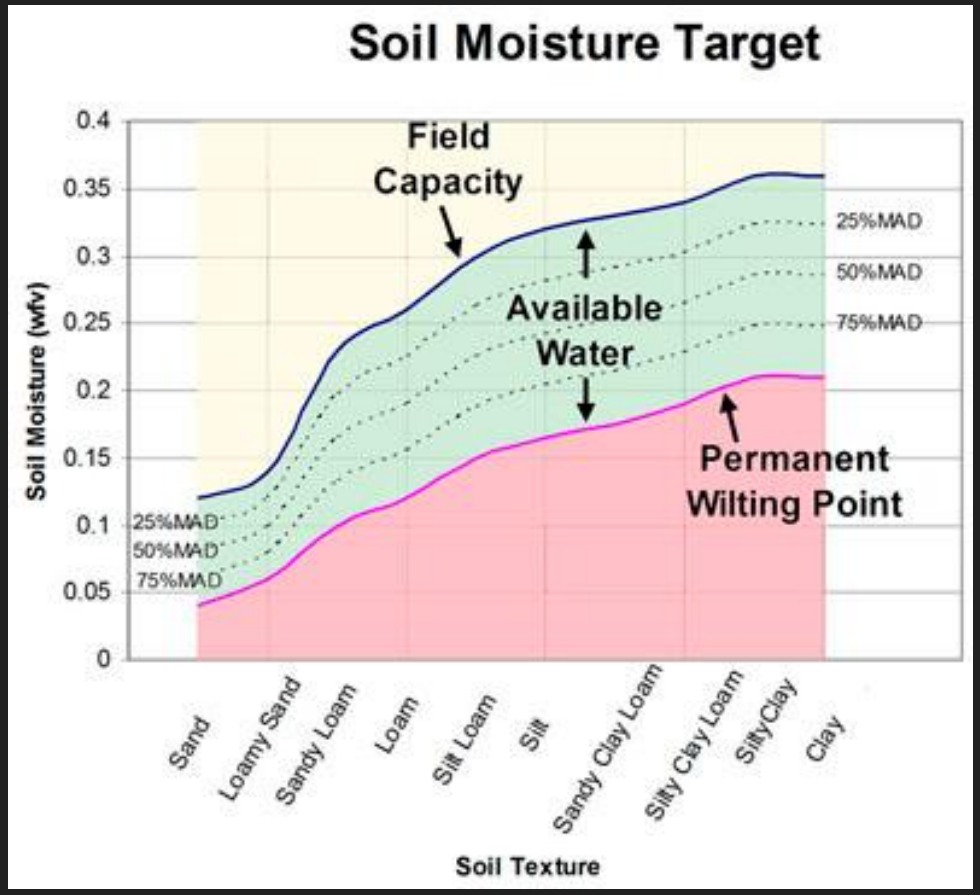
- Time, place, and amount

Credits: UF S.M. Gutierrez

Amount

- How much water is needed?
- What strategy do you want to use?
  - Fill to field capacity?
  - Fill to a deficit?

Field capacity or deficit irrigation



http://www.stevenswater.com/articles/irrigationscheduling.aspx

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Deficit irrigation

- Primed acclimation – targeted deficit irrigation to promote future resilience
- Continual deficit irrigation
  - Strategy to anticipate rainfall
  - Feel that current methods over estimate irrigation need

Scheduling

- Methods
  - Soil water content or soil moisture based
  - Evapotranspiration based

SMS based

Advantage:

- Measurement of water in the soil
- Can be integrated into controllers

Disadvantage:

- Point measurement
- Wires / electronics

Also – can use tensiometers

Soil moisture content

- Requires a sensor
  - Set a threshold or value of maximum depletion at which scheduled irrigation will occur
  - Sensor placement is critical
  - Research has shown significant water savings with this method (up to80% in some places with average savings approx. 30%)

Examples

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Next step

- EDIS documents on SMS (see handout)
- Discuss with local agent/specialist

ET based

Measures rainfall, estimates ET, calculates a soil water balance

Advantage:

- Data may be freely available
- Data easy to collect
- Can be integrated into controllers

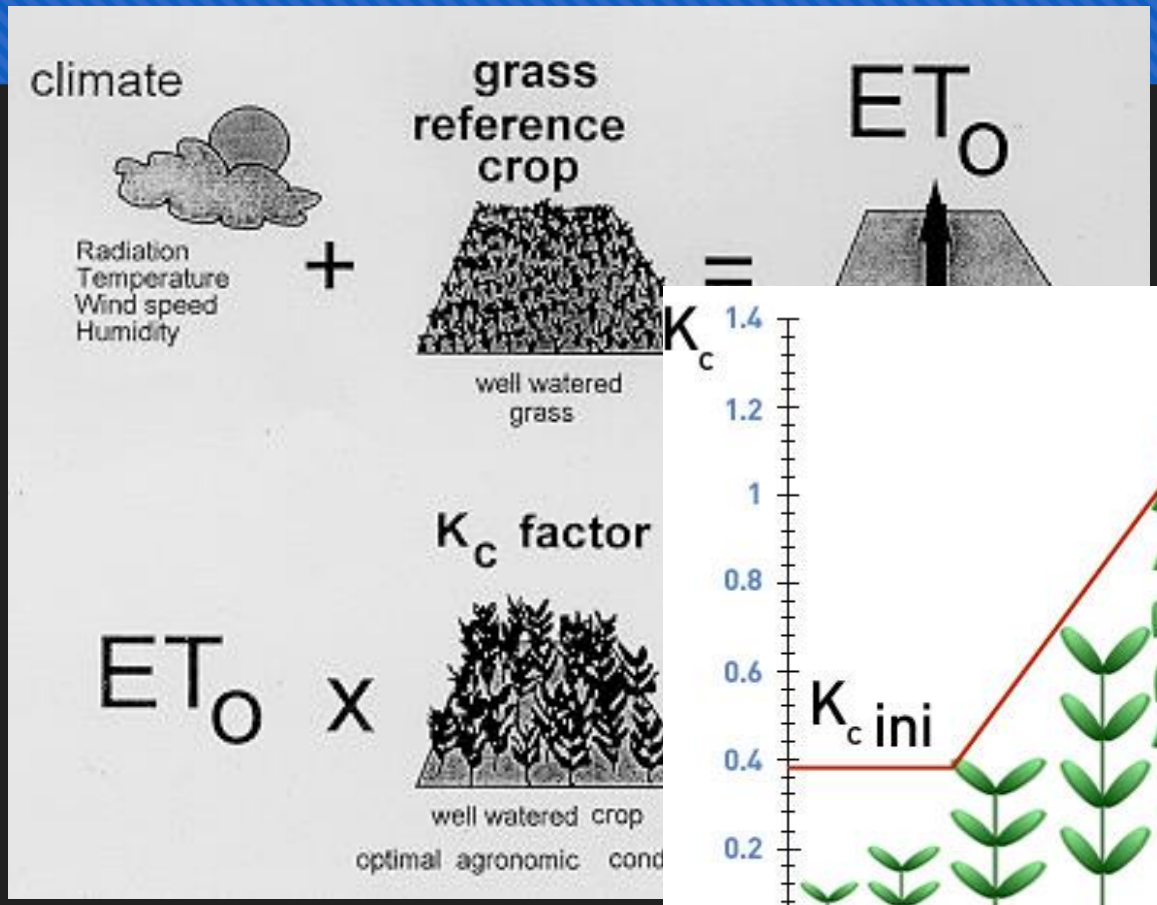
Disadvantage:

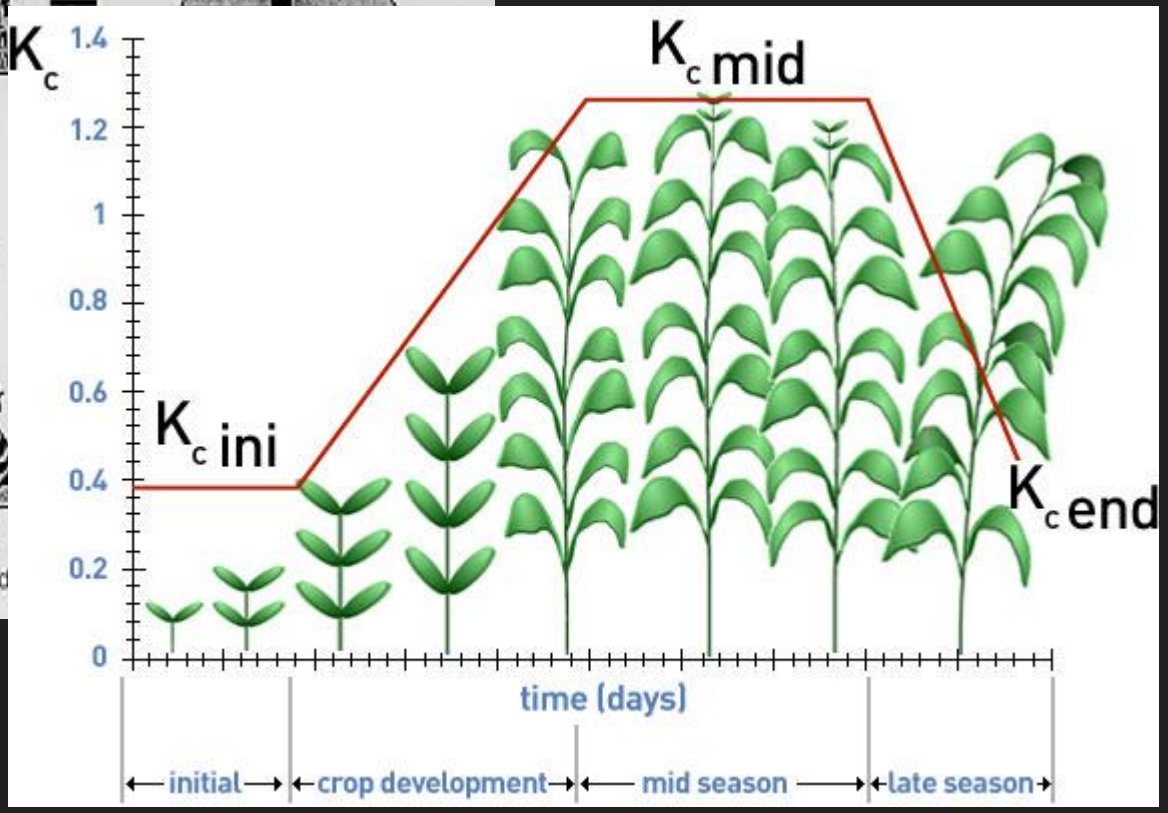
- Rainfall if not site specific may be incorrect
- Must know crop coefficient (Kc)

ET

- Weather data needed
  - Can use remote or site collected data
  - Site collected rainfall improves method in Florida
  - Must know crop coefficient

Crop coefficient





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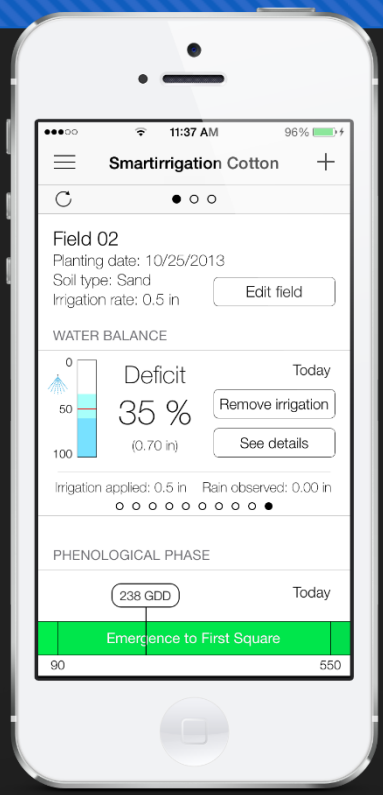
ET scheduling tools

- FAWN tools (Dr. Morgan will discuss)
- Smartirrigaton apps (smartirrigationapps.org)
- Commercial products (weather stations with ET estimation software)

Smartirrigation apps

- Avocado, citrus, cotton, strawberry, vegetable (tomato, cabbage, squash, watermelon)
- Coming: peanut
- Crop coefficients are built into the apps; weather data from FAWN



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Advantages of apps

- Easy to take with you, accessible
- Updated automatically
- Once set up, do not have to re-input information
- Kcs based on UF IFAS research for specific crop

Disadvantages of apps

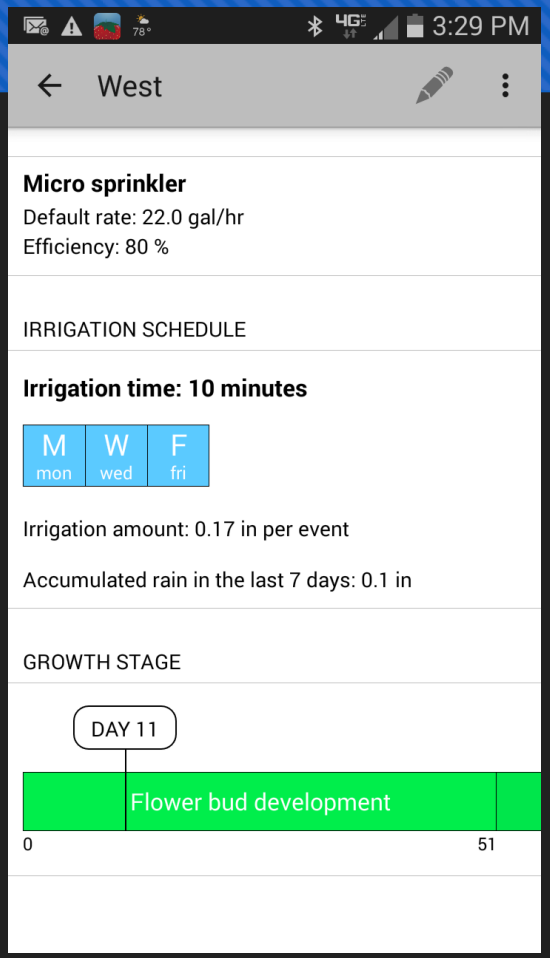
- Limited crops
- Rainfall is not part of the generated schedule and must be considered by the user

How do the apps work?

- Download from play stores (iOS / Android)
- Register (accept notifications)
- Input irrigation, soil, site information
- Schedule generated every 15 days based on measured ET and crop coefficient

More information on apps

- http://smartirrigationapps.org/
- Vegetable & citrus app: Dr. Kelly Morgan
- Avocado app: Dr. Kati Migliaccio



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ET-based controllers

- Some ag products available
- Some landscape products can be applied

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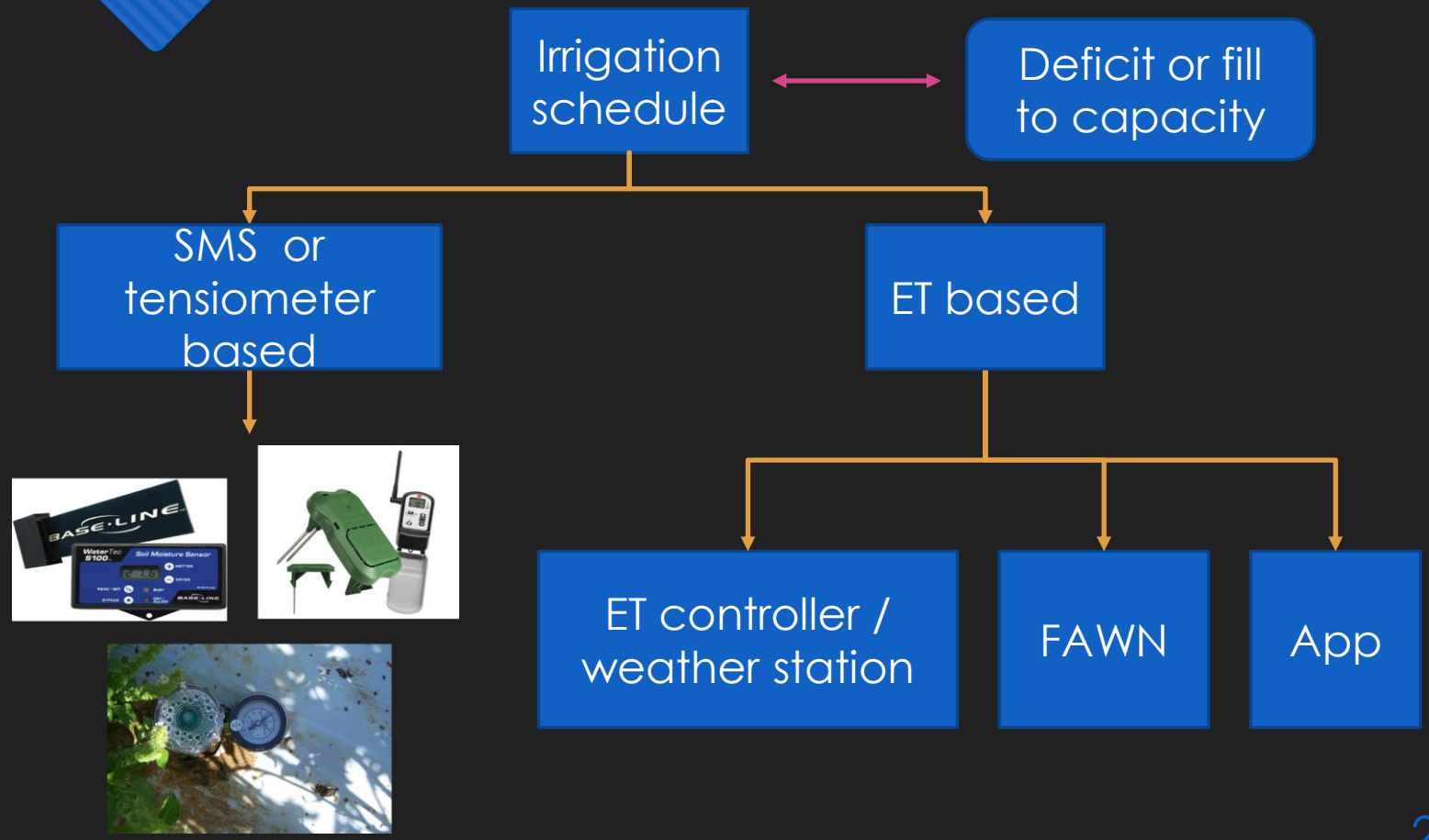
ET next steps

- Decide method (app, weather station, commercial product)
- EDIS documents (series by Kisekka)

Summary



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