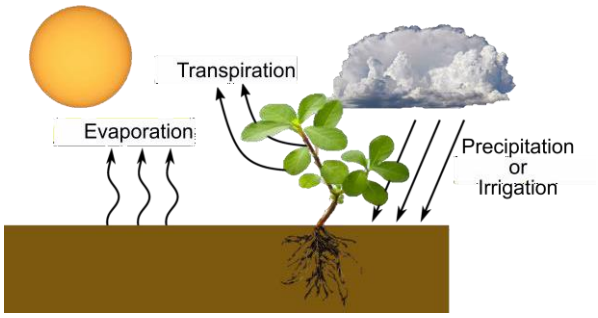
The Importance of Evapotranspiration in Your Agricultural Fields

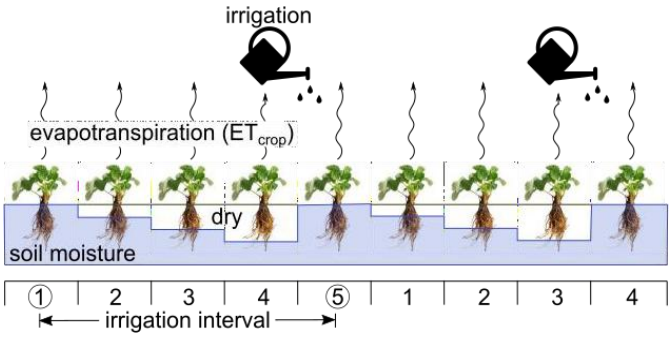
WHAT IS EVAPOTRANSPIRATION?



- Evapotranspiration (*ET*) is the combined water that is lost to the atmosphere from the soil through evaporation (E) and from the plant leaves through transpiration (T)

  E + T = evapotranspiration (*ET*)
- It is important to know how much water is available and how much water is being used in order to maximize the benefits of our water supplies.

WHAT IS THE ROLE OF IRRIGATION?



- Optimal irrigation will replace water lost through ET by adding water to the soil profile to meet plant water needs.
- ET and irrigation needs will vary throughout season and crop growth stage. Needs vary by crop and soil type and weather conditions.

To determine crop water need (demand), consider:

- ETc
- Weather
- Root development
- Crop growth stage

WHEN AND HOW MUCH TO IRRIGATE?

- To provide enough water to meet the crop needs and schedule irrigation, consider:
  - *Soils*: the amount of water a soil can hold depends on the soil texture and the amount of organic matter
  - *Crop*: crop water demand depends on temperature, solar radiation, crop growth stage, and depth of the roots
  - *Irrigation systems*: application rate and uniformity to avoid water losses (runoff, deep percolation and wind)

IRRIGATION SCHEDULING METHODS

How do I determine ETo and crop water demand?

- Weather-based: monitor weather conditions to determine the crop ET demand. Cumulative crop ET losses and the soil's storage capacity are required to determine how much water to apply
  - Weather Stations (e.g., AgriMet)

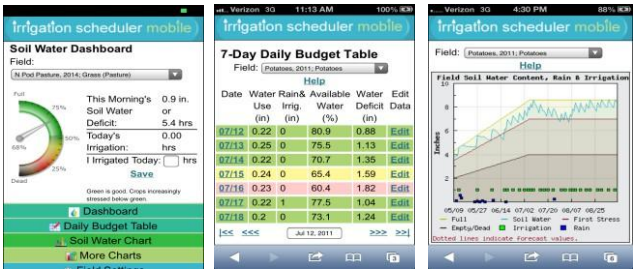
    https://www.usbr.gov/pn/agrimet/

    Select Crop Water Use and find crop water use tables (inches)

    To sign up for daily station reports email Jama Hamel (agrimet@usbr.gov)

  - WSU Irrigation Scheduler Mobile

    http://irrigation.wsu.edu/Content/Resources/Irrigatio n-Scheduling-Aids-Tools.php

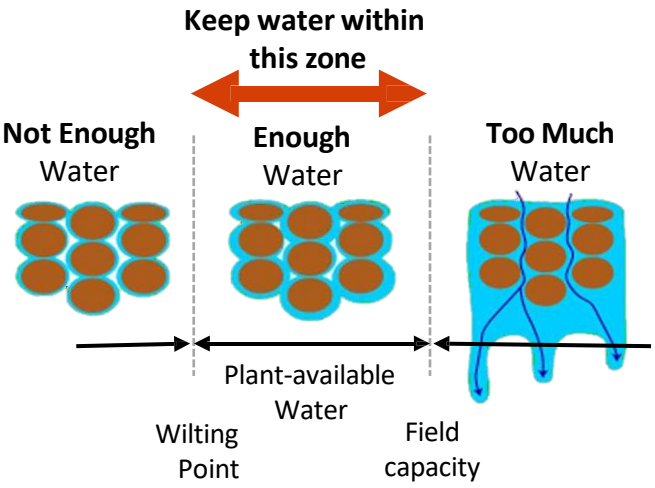


IRRIGATION SCHEDULING METHODS

- **Soil-based:** Monitor the amount of available water within the root zone as ET losses occur. Maintain moisture at least at the minimum level to avoid crop water stress. Sensors can be used to measure:
  - Soil water tension
  - Volumetric Water Content

Why measure soil moisture?

- Knowing how much water is available in the soil versus how much is needed by the crop provides information on when and how much to irrigate
- Helps make informed irrigation scheduling decisions resulting in improved crop yields and quality while increasing irrigation efficiency, conserving water, and reducing fertilizer, labor, and energy costs
- The soil moisture value is not enough for irrigation scheduling. The amount of moisture available for crops depends on several factors



- **Crop-based:** measure/infer plant water status to help identify early crop water stress.
  - Pressure bomb
  - Dendrometers

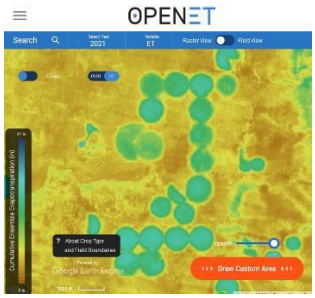
NEW EMERGING TOOLS FOR WATER USERS

- Reference evapotranspiration (ETo) is the measured ET from meteorological data for a reference crop (e.g., grass or alfalfa)
- Actual evapotranspiration (ETa) is the quantity of water that is actually consumed or removed from a field through ET (ETo multiplied by a crop coefficient, Kc) <For ideal conditions ET is equivalent to the Kc (crop coefficient) multiplied by ETo>
- Knowing ETa and ETo is important in determining strategies to conserve water

OpenET

- OpenET: A tool for effective water management that provides low-cost, reliable, and widely accessible ET data at the field scale to help:
  - Design locally driven water conservation and trading programs.
  - Develop more accurate water budgets, incentive programs and innovative strategies.
  - Optimize irrigation practices to maximize "crop per drop" and reduce costs for fertilizer, water, and energy.
- Website: https://etdata.org

What was the ET for my field from 2020 to now?



- Go to the Open ET link above:
- Click on *Data Explorer*, then click *Open the Explorer*
- Create new user if requested
- *Take a tour* to learn more about navigating the site.
- Enter town or specific address in search bar
- Zoom into level 12 to see field boundaries, then click on the field to get monthly time series of ET rate (inches) and volume (acre-feet)
- Download data displayed on graph to preferred format

Contact us!

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