

1 Water Use by Crops

Irrigated agriculture makes up 72% of Arizona's water use.

Water applied to crops is consumed mainly by evapotranspiration or “ET” – evaporation plus transpiration.

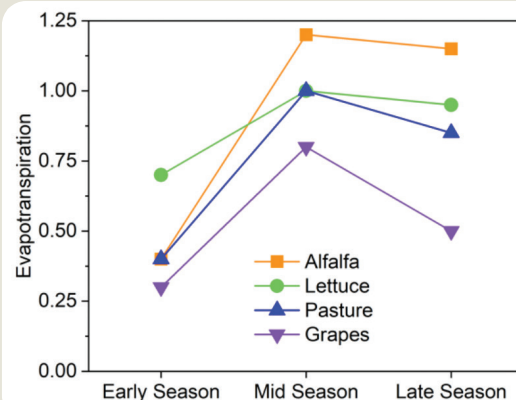
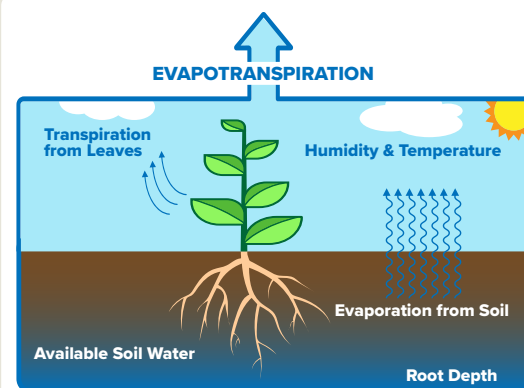
- Evaporation – when liquid water on the surface or in the soil transforms to water vapor
- Transpiration – when liquid water taken up by plants is ‘exhaled’ as water vapor (Plants ‘breathe in’ CO₂ and ‘breathe out’ O₂ and water vapor.)
- ET can be calculated from satellite data.

ET is an essential variable for calculating crop water needs. It depends on many factors, including local climate and crop type.

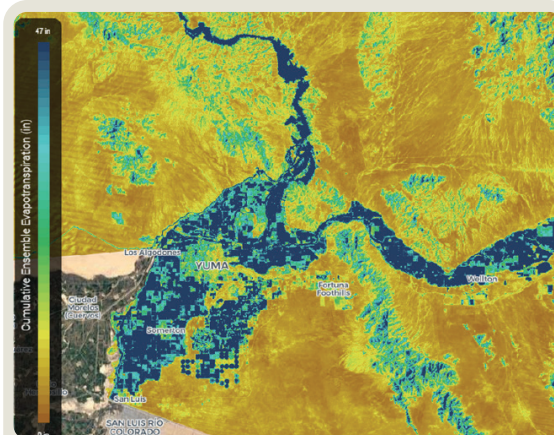
- $ET = ET_0 \times K_c$
 - ET_0 – Reference ET for a specific location dependent on local climate factors like temperature, humidity, and wind.
 - K_c – The ET coefficient unique to each crop at different growth stages.

Water is also used to leach away the salt left behind when water evaporates, because salinity reduces a plant's ability to extract water and nutrients from soil.

- Removing salt from irrigated fields is a significant portion of farmers’ water use.
- Leaching water carries salt down below the root zone and may reach the aquifer.



ET coefficients for common crops.



Satellite map of 2021 cumulative evaporation in the Yuma area. Source: OpenET.



Up to 99% of the water taken up by a plant is used for transpiration.