PRIKTAI · HR-SOIL · SOIL & WATER BASICS

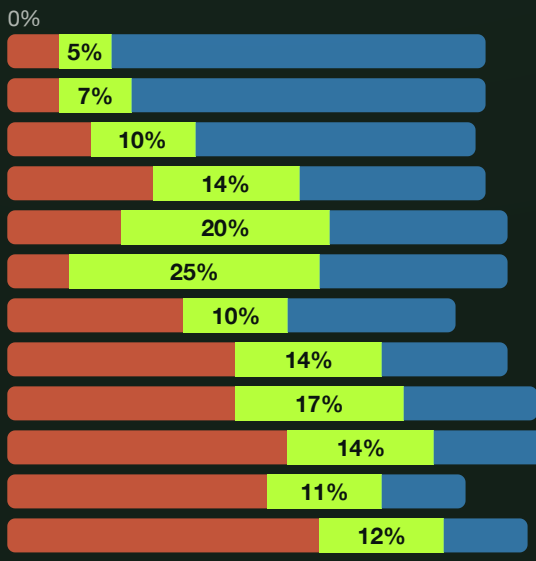
Every soil holds water differently
Watering by feel: too much or too little

Soils fall into **12 texture classes** (USDA). Each stores a different amount of water, and plants can use a different share of it.

Water in 12 soil types

% of soil volume (average, 2.5% organic matter)

Below wilting point — unavailable to plants · Plant-available water · Above field capacity — drains away in 1–3 days



	Wilting pt · Field cap. · Saturation
Sand	5 · 10 · 46
Loamy sand	5 · 12 · 46
Sandy loam	8 · 18 · 45
Loam	14 · 28 · 46
Silt loam	11 · 31 · 48
Silt	6 · 30 · 48
Sandy clay loam	17 · 27 · 43
Clay loam	22 · 36 · 48
Silty clay loam	22 · 38 · 51
Silty clay	27 · 41 · 52
Sandy clay	25 · 36 · 44
Clay	30 · 42 · 50

Saturation All pore space is filled with water, no air — roots cannot breathe.

Field Capacity Water the soil still holds after excess water has drained away by gravity.

Permanent Wilting Point Soil so dry plants can no longer extract water; they wilt and do not recover.

Available Water = Field Capacity – Wilting Point · Irrigate before more than half is used up.

Typical sensors vs HR-Soil

	Resistive (2 metal prongs)	HR-Soil (FDR principle)
Measures	Electric current flowing through soil between the prongs	**Soil dielectric constant (water ≈ 80 · dry soil ≈ 3–5)**
Fertilizer / salinity	Large errors, as fertilizer makes current flow more easily	**Less affected, plus an indicative EC value for fertilizer/salinity trends**
Durability	Bare metal in soil corrodes; readings drift over time	**Electrodes not in direct soil contact, no corrosion, for long-term burial**
Calibration	Frequent adjustment, unstable readings	**Stable readings, no frequent recalibration · can be tuned to your soil**
Depth	A single shallow point	**2 / 4 / 8 depths in a single probe**
Output	Rough moisture only	**Moisture + temperature at every depth; indicative EC for trends**

See water reach the roots
Track how deep water soaks

No overwatering
Save water, stop fertilizer leaching

No drying out
Irrigate before plants get stressed

Soil data: Saxton, K.E. & Rawls, W.J. (2006) Soil Sci. Soc. Am. J. 70:1569–1578, via SDSU Extension "How Soil Holds Water" (2024) · Average values; real fields vary with compaction, clay type and organic matter · Dielectric values are approximate.

☎ +66 83 567 0029 ✉ contact@priktai.com www.priktai.com/en/hr-soil.html