

Atmometer Preparation

USE DISTILLED WATER ONLY AND PROTECT FROM FREEZING

1. Remove top (ceramic cup) from Atmometer. Remove tube and stopper from cup.
2. Pour distilled water into ceramic cup to pre-charge and fill main body of Atmometer (about half a gallon).
3. Create siphon on end of tube with finger and replace rubber stopper on ceramic cup. Avoid allowing air to enter the system, too much air in the system and atmometer will not work.
4. Put top back on the main body taking care not to allow air into the system.
5. Fill Atmometer to zero. Excess can be bled off by detaching the sight tube at upper end and draining until the level is within. Squeeze tubing at bottom of sight tube to get an accurate meniscus reading.
6. Install bird wires. Experience has shown that 4 bird wires or flags on wires will deter birds better. Drill pilot hole in top to hold extra bird wires. Canvas can be removed and cleaned; use only distilled water to clean. Canvas must be kept clean for Atmometer to provide an accurate estimation of Evapotranspiration.



After Irrigation

Reset both rings just after the end of every irrigation when a full soil profile is known.

Choosing a Location

Atmometer measures evapotranspiration (ET) and this is impacted by the vegetation near the Atmometer. Atmometer should be installed in open areas near field edge, away from dusty roads, water, ditches, etc. Best location is at field edge in grass. Do not install in an area devoid of vegetation. Install above crop canopy and at least 39 in above the ground, road sign posts work well.

AG1293

Atmometer Operation

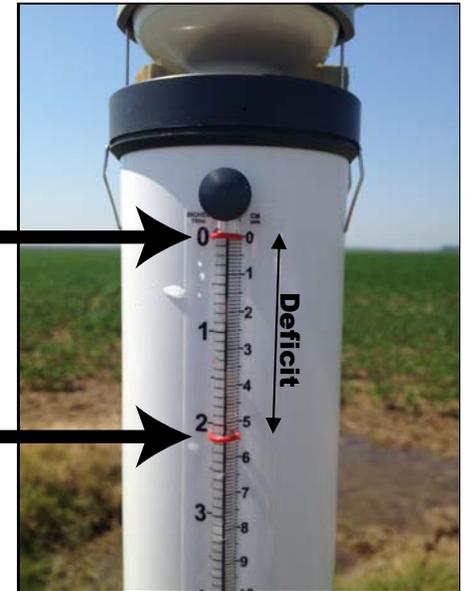
Difference between rings is the deficit or available soil water.

Set top ring to liquid level just after irrigation or rain. This is the reference point for a known full soil moisture profile.

Set second ring to deficit depth. This ring is the trigger point for irrigation.

Account for Rainfall

Slide this ring down to add effective rainfall. For example if a one inch rain is experienced, and half of the rain is absorbed and half runs off, then slide ring down, 0.5" to add moisture to the soil profile.



Scheduling Irrigation using an Atmometer (ET Gauge) for Arkansas Corn

Table 1. Allowable Deficits-Corn

Predominant Soil	Flood, Furrow, Border (inches)	Sprinkler/Center Pivot (inches)
Clay	1.75	1.25
Silt loam w/pan	1.5	1.0
Silt loam wo/pan	2.0	1.5
Sandy loam	1.75	1.25
Sandy	1.5	1.0

Use alfalfa ET reference #54 canvas for this chart.

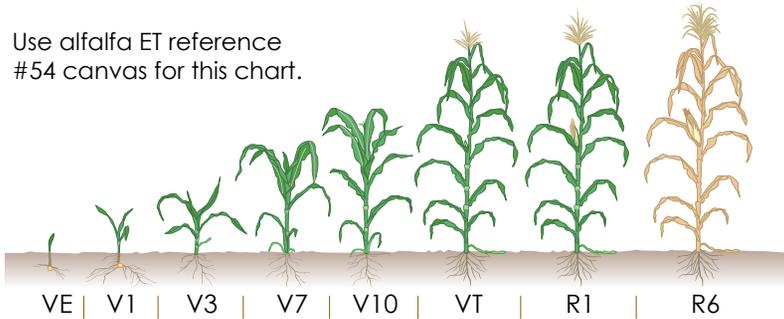
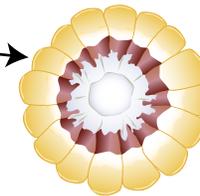


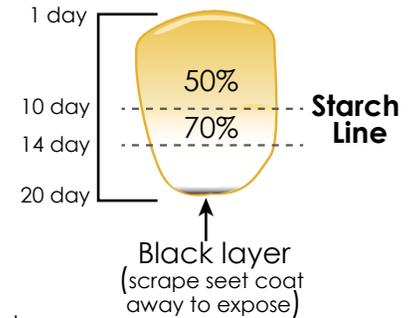
Table 2. Atmometer Setting *Set Atmometer to this value based on soil type*

Growth Stage	1	1.25	1.5	1.75	2
V2	9.2	11.5	13.8	16.1	18.4
V4	5.1	6.4	7.7	9.0	10.3
V6	2.7	3.4	4.1	4.7	5.4
V8	1.9	2.4	2.8	3.3	3.8
V12	1.4	1.7	2.1	2.4	2.8
V14	1.1	1.4	1.6	1.9	2.2
V16	1.0	1.2	1.4	1.7	1.9
VT Tasseling	0.9	1.2	1.4	1.7	1.9
R1 Silking	0.9	1.2	1.4	1.7	1.9
R2 Blister	0.9	1.2	1.4	1.7	1.9
R3 Milking	0.9	1.2	1.4	1.7	1.9
R4 Dough	0.9	1.2	1.4	1.7	1.9
R5 Begin Dent	1.0	1.2	1.4	1.7	1.9
R5 Full Dent	4.9	6.1	7.3	8.5	9.7

At beginning dent or about 90 days, check starch line. Break an ear of corn in half. Inspect the top half of the ear. Terminate irrigation when starch line reaches 50% for furrow irrigation and 70% for sprinkler systems from top of kernel and good soil moisture.



Inspect top half of ear



Step 1. Select Allowable Deficits based on soil type and irrigation system (Table 1).

Step 2. Select deficit based on growth stage of crop (Table 2). Set upper orange ring on gauge sight tube to water level just after last irrigation or when the profile is full (such as a rain that fills the soil profile and brings deficit to zero). For example for furrow irrigated clay soil at the V12 stage, the deficit is 2.4 inches. As growth stage changes, adjust deficit accordingly on the atmometer.

Stage	Stage Title	Days	Description
V2		5	Two fully developed leaves with collars
V4			Four fully developed leaves with collars
V5-V16			V5-V12, leaves and collars easy to identify. V12-V16 is hard to stage, new leaves appear every 2-3 days until VT.
VT	Tasseling		Lowest branch of tassel visible. Silks may be visible on husk.
R1	Silking	65	Silks have emerged from trop tip of ear on most plants. Critical for moisture stress
R2	Blister		Endosperm milk turns thick and Pasty. Kernel is visible. Critical stage for moisture stress.
R3	Milking		About 20 days after silking, kernel turns yellow. Silks are brown.
R4	Dough		About 26 days after silking, kernel endosperm has a dough or past like substance.
R5	Beginning Dent	90	Dent on top of kernels, and starch line has started progressing from top of kernel towards tip.
R5	Full Dent		Dent on kernels, starch line fully across. Water demand decreases substantially terminate irrigation during this stage.
R6	Black Layer or Full Maturity	125	Kernels have reached maximum dry weight. Kernel moisture about 35%. Stress at this stage does not impact yield.

Chart developed by C.G. Henry and Jason Kelly