

Corn Soybeans and Grain Sorghum Irrigation Basics

Author: Angela McClure, Extension Corn and Soybean Specialist [No Comments](#)

Temperatures are heading up and even west TN is finally experiencing a break in rainfall. It is time to take stock of crop growth stages, make any last minute repairs to irrigation equipment and irrigate our corn. We also need to decide how early to begin watering soybeans and any sorghum under a pivot.

Corn benefits greatly from irrigation and it is important to start irrigating early enough so that soil moisture levels are not depleted, putting you in catch-up mode later on. April-planted corn, between V9 and V13, is already in the critical period of rapid growth and ear size determination. In years with average rainfall, it is adequate to irrigate until the $\frac{3}{4}$ milk line. In dry years, we need to water to black layer. Few irrigation systems can meet the maximum water usage of corn around silking which can exceed 2.0"/wk, therefore, it is important not to fall too far behind close to pollination and grain fill.

Critical periods for corn water use using the checkbook method of irrigation:

Growth stage	Importance	Est. crop water use
Seedling corn	Early vegetative growth	Not usually needed
V9 – V12	Rapid vegetative growth	1.75"/wk
V12 – V17	Ear length determined	2.0"/wk
V17 – R2 (blister)	Ear size potential	2.3"/wk
R3 (milk) – R6 (black-layer)	Grain filling period	1.75"/wk*

* Corn irrigation may not be needed past $\frac{3}{4}$ milk line. Under hot, drought conditions producers may benefit from watering until black layer.

For soybeans, apply water if needed to get a stand or incorporate residual herbicides. Our old recommendation was to begin irrigating on schedule at full bloom (R1), however work done at Milan (good rainfall years of 2014-2015) has shown that holding off irrigation until closer to R3 has not hurt yields. Delayed irrigation may also reduce crop height (potentially less lodging) and reduce potential for early disease. In west TN we have had a wet spring, and this delayed start should hold for April and May planted beans. For June planting and in central TN where dry weather came early, consider adding some water at bloom to keep soil moisture levels from becoming extremely dry. Shut water off at full seed stage (50% of pods have touching seed). Adding water beyond R6 may actually cause reduced yields from disease and lodging.

Critical periods for soybean water use using checkbook method of irrigation:

Growth stage	Importance	Est. crop water use
V3 – R1 (begin bloom)	Rapid vegetative growth	1.0"/wk*
R1 (begin bloom) – R3 (begin pod)	Pod count set	1.4"/wk
R4 (full pod) – R6 (full seed)	Seed size set	2.0"/wk

* Rainfall is usually adequate until soybeans are at R3 unless dry spring occurs

Grain sorghum is our most drought tolerant crop but does respond to water when weather turns dry. It is important to not overwater early season but try to irrigate prior to and at boot stage and at bloom if needed. Late season irrigation is usually not recommended due to head disease issues and interference with dry down.

Critical periods for grain sorghum water use using checkbook method of irrigation:

Growth stage	Comments	Est. crop water use
Early growth	First 30 days after planting	0.35 to 0.7 “ per week
Rapid vegetative growth	30 to 60 days after planting	0.7 to 1.4” per week
Preboot	Head swells inside the flag leaf prior to heading	1.4”/wk
Boot and Flowering	Water once during bloom	1.75 to 2.1”/wk
Grainfill to Maturity**		1.75 to 0.7”/wk (declines closer to maturity)

**Terminate irrigation when >75% of sorghum heads are at hard dough and soil conditions are adequate