

Grain Sorghum Management

Introduction

- Interest in growing grain sorghum is increasing in many Eastern and Southern U.S. areas due to its many advantages:
 - Drought tolerance
 - Short growing season
 - Wide adaptation
 - Versatile planting dates



Planting Information

- Plant when soil temperatures reach 60 to 65 °F for 3 consecutive days (usually 30 days after last frost).
 - Mid April to May
 - Late May and early June plantings can lead to decreased yields, though interest in double-cropping later in season is also increasing.
- Marginal to poor ground: 80,000 – 90,000 seeds/acre
 - 4.8 seeds per foot in 30" rows
 - 3.6 seeds per foot in 22" rows
 - 3.3 seeds per foot in 20" rows
- Good ground: 90,000 – 100,000 seeds/acre
 - 5.5 seeds per foot in 30" rows
 - 4.0 seeds per foot in 22" rows
 - 3.6 seeds per foot in 20" rows
- Narrow rows on good ground: 100,000 – 110,000 seeds/acre
 - 4.4 seeds per foot in 22" rows
 - 4.0 seeds per foot in 20" rows
- Planting depth: 1" to 2" on a firm, well-drained seedbed.
 - **Do not plant over 3 inches deep.**
- Advantages of narrow rows
 - Better weed control
 - Increased yields

Growth and Development

- Grain sorghum growth and development stages can be estimated using Growing Degree Units, or GDUs (Table 1).

Table 1. Cumulative GDUs for grain sorghum development. *See illustration on next page for further explanation.

	Cumulative GDUs	
Growth Stage*	Short Season Hybrid	Long Season Hybrid
Planting		
Emergence	200	200
3 leaf	500	500
4 leaf	575	575
5 leaf	660	660
Panicle Initiation	924	1365
Flag Leaf Visible	1287	1470
Boot	1683	1750
Heading	1749	1890
Flowering	1848	1995
Soft Dough	2211	2310
Hard Dough	2508	2765
Black Layer	2673	3360

Soil Fertility

- Soil pH should be 5.7 or higher.
- A starter fertilizer is an option, but is a must if planting no-till.
- Apply P and K according to soil test recommendations.
- 120 to 150 pounds of N per acre is adequate to produce maximum yields.
- For heavy clay soils, increase N by 20 to 30 lbs/acre.
- Splitting nitrogen is advisable; apply one-third at planting and the remainder when plants are in the 4- to 6-leaf stage.
- Head formation takes place after the 8-leaf stage and adequate N is needed at that stage to produce maximum yields.

Irrigation Management

- Interest in irrigation in grain sorghum management is increasing. Base water applied on water availability, crop growth stage, and yield potential of the crop.
 - See irrigation recommendations by crop growth stage in Table 2 (Page 3).

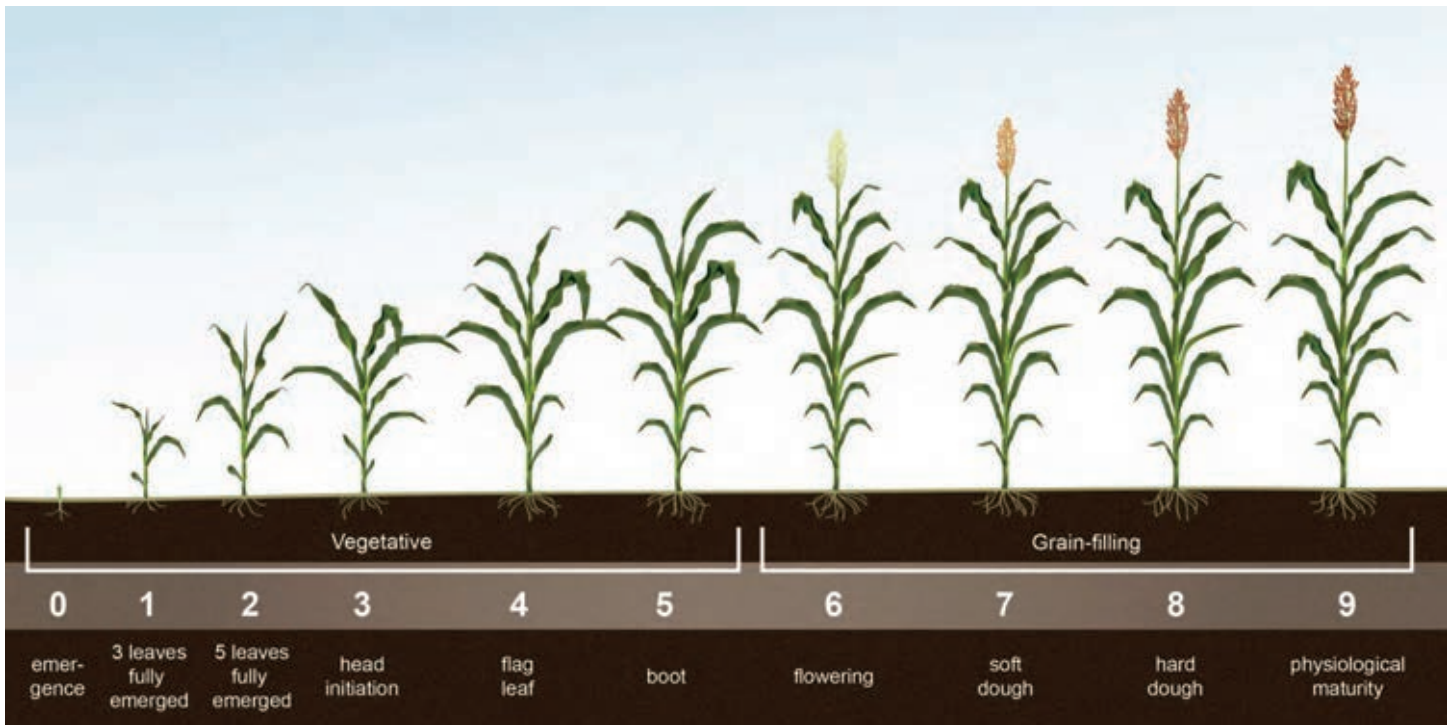


Figure 1. Grain sorghum growth stages.

Disease Management

- Use of foliar fungicides to manage diseases is increasing in grain sorghum production.
 - Many products are available; base your selection and rate decision on local recommendations and the product label.
- Fusarium head mold and stalk rot can be the most serious disease of grain sorghum.
 - Seed can be infected and cause significant yield loss.
 - Lodging from excess planting rates can create a problem.
 - Look for tolerant and less susceptible hybrids.
- Anthracnose can cause leaf spots, as well as head and stalk rot. Lodging, yield, and quality losses can occur.
 - Management practices include selecting tolerant hybrids, crop rotation, and good fertility.
- Charcoal rot causes problems with heads that fail to fill and plants that lodge later in the growing season.
 - Drought stress will intensify the problem.
 - Management practices include eliminating stresses that are within control, good fertility, and crop rotation.

Weed Control

- Best weed control practices depend on the predominant grassy and broadleaf weeds in your area and field. Base practices on your local extension and herbicide manufacturer guidelines, as indicated on the product label.
- Grain sorghum weed control programs are usually based around atrazine as the primary active ingredient.



Insect Management

- On full-season grain sorghum, one insecticide application may be sufficient, but in a double crop system, two applications is common (because worm pressure is much worse).
 - The main insect pests are corn earworms, fall armyworms, sorghum midge, and stinkbugs. Other insects may cause minor damage most years, but major damage on occasion.
 - Proper scouting and timely management is the key to preventing insect feeding damage.



Fall armyworm



Corn earworm

Table 2. Grain sorghum growth stages, example water use, and suggested inches of irrigation.

Sorghum Growth Stage	Days after Planting	Approx. Cumulative Heat Units after Planting (Medium-early hybrid)	Example Water ET per Stage (in)	Suggested Irrigation per Stage (in)
Seeded	0	0	1.1	1
Emerged	8	200	2.2	0
Rapid Growth				
3 Leaf	20	500	0.6	1
4 Leaf	23	575	0.8	0
5 Leaf	27	660	1.6	2
GPD	35	925	3.2	2
Flag	49	1,290	2.7	2
Boot	59	1,550	2.5	2
Reproductive				
Heading	67	1,710	0.9	1
Flower	70	1,850	3.5	2
Soft Dough	85	2,210	2.7	2
Hard Dough	98	2,510	1.8	None
Black Layer	108	2,700	3.9	None
Grain Harvest	136	3,100		None
		Total water use through hard dough based on ET: 23.6"		

Harvest

- Grain sorghum reaches maturity between 25% and 30% moisture.
- Typically, the ideal harvest moisture range falls below 20% moisture.
- Grain sorghum must be stored at 13% moisture or below.

Harvest Aids

- Desiccation is used with most sorghum as a harvest aid to help speed up maturity and control weeds that interfere with harvest.
- Sodium chlorate, applied when grain is less than 25% moisture, is often used as a harvest aid.
- One quart of Glyphosate is also used in some instances.

References

- Ciampitti, I.A., Diaz, D.R, and et al. 2014. Kansas Sorghum Management 2014. Kansas State Research & Extension Bulletin MF3046. <http://www.ksre.ksu.edu/bookstore/pubs/MF3046.pdf>
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