

# 2 - Cultural Practices

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## Site Selection

Grain sorghum is adapted to be grown on a wide range of soils throughout Arkansas. Like many crops, grain sorghum will likely produce greatest yields on deep fertile well-drained loamy soils. Grain sorghum has an extensive root system and may be more tolerant than corn of soils with a shallow hardpan. However, don't expect soils that produce poor soybean or corn crops to produce a bumper crop of grain sorghum. The best soils for other crops will also produce the highest grain sorghum yields.

## Planting Date

Grain sorghum can be planted over a wide range of planting dates. However, in general it is recommended that it be planted as early in the spring as possible. Grain sorghum planting should be delayed until the soil temperature in the morning warms to 65°F 2 inches below the soil surface. Early planted grain sorghum takes advantage of ample rainfall that typically falls during the months of May and June and avoids excessive heat and drought that may occur in August. Early planting may also avoid some insect pressure such as sorghum midge, corn earworm and head webworms that are often associated with later planted grain sorghum.

Grain sorghum can be planted as a double crop following wheat harvest. Yields are generally lower than earlier planted grain sorghum and insect pests such as sorghum midge, corn earworm and head webworm are of greater concern in later planted grain sorghum and may need to be controlled with an insecticide. Late planting also delays harvesting which may lead to greater field losses due to wet conditions and greater potential for blackbird feeding of grain before harvest.

## Planting Depth

The ultimate goal is to plant the grain sorghum seed as shallow as possible and still obtain good soil to seed contact. When planting early in the spring when soils are cool and wet and rainfall is likely to occur soon after planting, a planting depth of 0.75 to 1 inch is best. Later in the season as soils warm the planting depth may be increased to a maximum depth of 1.5 inches. Planting deeper than 1.5 inches is not recommended.

Grain sorghum seedlings can emerge when the seed is planted deeper than 1.5 inches, but the seedlings are slow to emerge, and final stand numbers may be reduced. Before emergence the plant is totally dependent upon the food reserves in the seed from the endosperm for survival. Slow emerging plants risk depleting these reserves, which are important to early plant growth immediately following emergence. Planting into soils that are too dry for seed germination or are too wet for good seed furrow closure is not recommended and planting should be delayed until soil conditions improve.

## Seeding Rates

Recommended seeding rates will vary according to whether the crop will be irrigated or grown under dryland conditions. Under irrigated conditions, a population of 75,000 plants per acre is recommended. When determining seeding rate, assume that approximately 80 percent of the seeds planted will develop into a plant. For dryland conditions, a plant population of 50,000 plants per acre is recommended. Table 2-1 shows the number of seed required per 10 feet of row for various plant populations and row spacing. Table 2-2 shows the approximate pounds of seed per acre that would be required for various seeding rates.

If replanting is considered due to perceived low plant population, remember the grain sorghum plant has a tremendous ability to adapt to its growing conditions. Research conducted by neighboring states suggests that plant populations as low as 30,000 may result in slightly lower yields, but may not be low enough to warrant replanting. Grain sorghum is known for its ability to produce under moisture limiting conditions. Plant populations greater than necessary reduce the plants' ability to cope with moisture stress and produce plants with smaller stems which are more susceptible to lodging.

## **Row Spacing**

Grain sorghum can be planted in a wide range of row spacing, generally ranging from 6 to 40-inch rows. Grain sorghum will likely be planted using the same equipment as planting soybean, corn or cotton and row spacing will be dependent upon the equipment the producer is currently utilizing. Grain sorghum can also be planted using a grain drill which would allow for narrow row spacing, down to 6 inches. Taping or plugging every other or every third opener on a grain drill gives producers more freedom to change row spacing. Planting in wide rows (36 to 40 inches) will not likely maximize grain sorghum yields.

Research from other states has indicated that yields were maximized when using rows as narrow as 10 inches, especially when the crop was irrigated

or when conditions were favorable for high yields. When conditions were not ideal for maximum yields, such as in a dryland production system, row spacing had less of an impact on grain yield. Late planted grain sorghum, such as double crop following wheat may yield more when planted in narrow rows.

## **Hybrid Selection**

Many agronomic factors should be considered when choosing a grain sorghum hybrid. Yield is considered the most important factor in hybrid selection, but maturity, stalk strength and disease resistance are also very important criteria to evaluate. In general, a full season hybrid should be selected. A good full season hybrid will generally out yield a good early season hybrid, provided that conditions are equal and favorable for growth. If grain sorghum is planted extremely late, a shorter season hybrid may be required.

If plant lodging has been a problem in the past, growers should scrutinize a given hybrid's ratings for stalk strength, stalk rot and charcoal rot resistance and stay green ratings. These ratings can give a producer indications of the hybrid's ability to stand under adverse growing and harvesting conditions. If grain sorghum is grown in narrow rows, particular attention should be given to the lodging ratings, since narrow row spacing may be more prone to lodging.

**Table 2-1. Grain Sorghum Seeding Rate Information.**

Seeding Rate (seeds per acre)	Row Spacing (inches)								Final Population at 80% Emergence
	7	10	15	20	30	36	38	40	
	Seeds per 10 Feet of Row								
45000	6.0	8.6	12.9	17.2	25.8	31.0	32.7	34.4	36000
47500	6.4	9.1	13.6	18.2	27.3	32.7	34.5	36.3	38000
50000	6.7	9.6	14.3	19.1	28.7	34.4	36.3	38.3	40000
52500	7.0	10.0	15.1	20.1	30.1	36.2	38.2	40.2	42000
55000	7.4	10.5	15.8	21.0	31.6	37.9	40.0	42.1	44000
57500	7.7	11.0	16.5	22.0	33.0	39.6	41.8	44.0	46000
60000	8.0	11.5	17.2	23.0	34.4	41.3	43.6	45.9	48000
62500	8.4	12.0	17.9	23.9	35.9	43.0	45.4	47.8	50000
65000	8.7	12.4	18.7	24.9	37.3	44.8	47.3	49.7	52000
67500	9.0	12.9	19.4	25.8	38.7	46.5	49.1	51.7	54000
70000	9.4	13.4	20.1	26.8	40.2	48.2	50.9	53.6	56000
72500	9.7	13.9	20.8	27.7	41.6	49.9	52.7	55.5	58000
75000	10.0	14.3	21.5	28.7	43.0	51.7	54.5	57.4	60000
80000	10.7	15.3	23.0	30.6	45.9	55.1	58.2	61.2	64000
85000	11.4	16.3	24.4	32.5	48.8	58.5	61.8	65.0	68000
90000	12.1	17.2	25.8	34.4	51.7	62.0	65.4	68.9	72000
95000	12.7	18.2	27.3	36.3	54.5	65.4	69.1	72.7	76000
100000	13.4	19.1	28.7	38.3	57.4	68.9	72.7	76.5	80000
Linear feet of row per acre	74674	52272	34848	26136	17424	14520	13756	13068	

Table 2-2. Grain Sorghum Seeding Rate Based on Seeds per Pound.																		
Grain Sorghum Seeding Rates																		
Seeds per Pound	Seeding Rate (Seeds per Acre)																	
	45000	47500	50000	52500	55000	57500	60000	62500	65000	67500	70000	72500	75000	80000	85000	90000	95000	100000
	Pounds of Seed per Acre Required																	
11000	4.1	4.3	4.5	4.8	5.0	5.2	5.5	5.7	5.9	6.1	6.4	6.6	6.8	7.3	7.7	8.2	8.6	9.1
12000	3.8	4.0	4.2	4.4	4.6	4.8	5.0	5.2	5.4	5.6	5.8	6.0	6.3	6.7	7.1	7.5	7.9	8.3
13000	3.5	3.7	3.8	4.0	4.2	4.4	4.6	4.8	5.0	5.2	5.4	5.6	5.8	6.2	6.5	6.9	7.3	7.7
14000	3.2	3.4	3.6	3.8	3.9	4.1	4.3	4.5	4.6	4.8	5.0	5.2	5.4	5.7	6.1	6.4	6.8	7.1
15000	3.0	3.2	3.3	3.5	3.7	3.8	4.0	4.2	4.3	4.5	4.7	4.8	5.0	5.3	5.7	6.0	6.3	6.7
16000	2.8	3.0	3.1	3.3	3.4	3.6	3.8	3.9	4.1	4.2	4.4	4.5	4.7	5.0	5.3	5.6	5.9	6.3
17000	2.6	2.8	2.9	3.1	3.2	3.4	3.5	3.7	3.8	4.0	4.1	4.3	4.4	4.7	5.0	5.3	5.6	5.9
18000	2.5	2.6	2.8	2.9	3.1	3.2	3.3	3.5	3.6	3.8	3.9	4.0	4.2	4.4	4.7	5.0	5.3	5.6