Grain Sorghum - An Alternative Crop

- A full-season sorghum product will generally have greater yield potential than a short-season product.
- Early-season weed management is critical for a successful sorghum crop.
- Seed treatments and properly timed insecticide applications can control most insect pests of sorghum, but diseases can be difficult to control.
- Harvesting requires specific combine adjustments to avoid harvest losses.

Product Selection

When choosing a sorghum product, consider university or state yield trial results and seed company data. Choose a product that has performed well over multiple years and in multiple locations. Because full-season sorghum products yield greater than short-season sorghum, choose a product with the latest maturing date suitable for the location’s average growing season, the duration of moisture availability, and cropping sequence. Sorghum requires between 2,673 and 3,360 growing degree units (GDU) to reach maturity. In general, sorghum should reach physiological maturity (black layer) a week or two prior to the average date of the first killing frost. Consider planting two or more products that differ slightly in maturity to reduce the risk of yield loss due to adverse environmental conditions.

Full-season sorghum products tend to offer better standability, as the stalks tend to be larger than early-season sorghum. Another important characteristic to consider is resistance or tolerance to problematic pests and diseases.

Seeding Rates, Depth, and Row Spacing

Seeding rate recommendations vary considerably and should be determined based on the amount of predicted precipitation, the ability to irrigate, growing conditions, and seedling emergence rate. Final plant populations can range from 20,000 plants per acre in dryland conditions to over 120,000 plants per acre for irrigated fields (Table 1). Seedling emergence rates also vary and are assumed to be between 65 and 80%.

Lower plant populations can lead to tillering when adequate moisture is provided. Tillers may mature later and less uniformly than single heads. For this reason, higher plant populations and narrower row spacings are recommended for irrigated or high rainfall areas.

Optimum seeding depth for sorghum is around 1 inch, but can be as deep as 2 inches in sandy soils. Seeding deeper than 2 inches may reduce stands or delay emergence. Most grain sorghum is planted in 30-inch rows because the same equipment for corn and soybeans is often used. Narrower row spacings have not consistently shown better yield potential than 30-inch rows; however, narrower row spacing may be recommended for late planted sorghum because this type of spacing promotes quicker canopy closure for better moisture retention and weed control.

Weed Management

Early-season weed management is critical for successful grain sorghum production. Sorghum grows slowly early in development and even light weed infestations at this time can significantly reduce yields. A heavy infestation of grassy weeds in the first two weeks after sorghum germination may cause up to a 20% yield reduction. Fields should be free of weeds before planting. To avoid seedling injury, follow herbicide labels for sorghum preplant application rates and restrictions. Pre-emergence, residual herbicides, like Degree Xtra® or Warrant® Herbicide, can provide annual grass and small-seeded broadleaf weed control and are the foundation of weed control in sorghum. There are limited post-emergence herbicide options for grass control in sorghum. Johnsongrass and shattercane are related to sorghum and difficult to control in the crop.

Insect and Disease Management

The types of insect pests and the severity of infestations may differ throughout the growing season. Cutworm and wireworm are common pests that can be problematic early in sorghum development. These pests can usually be controlled with seed treatments or an insecticide application at planting. Greenbugs...
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and other aphids, chinch bugs, fall armyworm, and corn earworm may appear after seedling emergence. Late-season pests, such as sorghum midge, sorghum webworm, spider mites, and stink bugs, often appear around flowering and can remain through grain maturity. Insecticides applied during outbreaks can help to control all of these mid- to late-season pests. Some insect pests, such as billbugs and other beetles, are difficult to control once an outbreak has occurred. Preventative insecticide applications at the time of planting should be considered if these insects have been a problem in the past.1

Many types of fungi, and some bacteria and viruses cause diseases of sorghum seedlings, roots, leaves, stalks, and grain. Diseases are difficult to control after they develop. Therefore, the most inexpensive, efficient, and effective disease control procedures are preventive. Plant into fertile soils using high-quality seed with traits for good standability. Avoid planting into cool, wet soils.6 Scouting is an important element of insect and disease management. If an outbreak occurs, use the economic threshold specific to each pest to determine if and when to use chemical control. If the field has had a history of infestation of a particular insect pest or disease, plant resistant products if available and use crop rotation to reduce pest densities and disease inoculum.

Fertility

Grain sorghum has a similar need for nitrogen (N) fertilization as corn. A good guideline for sorghum following soybean is 1 pound of actual N per bushel of expected yield. For sorghum following corn or wheat, use 1.2 pounds of actual N per bushel of expected yield.4 Phosphorous and potassium requirements for grain sorghum are also similar to that of corn. Sorghum can be sensitive to fertilizer burn; therefore, a broadcast application should be thoroughly worked into the soil. For a row planting system, fertilizer should be placed 2 inches to the side and at or slightly below seed depth.

Harvesting

Grain sorghum can be slow to dry after reaching maturity. This may be problematic when sorghum is used as a late-planted rescue crop or when fall conditions delay harvest. Several chemical desiccants are available for pre-harvest use on grain sorghum. If applied when the grain is physiologically matured, at 25 to 35% moisture, sorghum yields are not adversely affected.7 Grain is at the correct moisture level when kernels at the bottom of the head (the last to mature) show an abscission layer (black layer) at the tip of the kernel.

Combine adjustments are critical to minimize harvest losses. Harvest losses are compounded by the fact that grain sorghum often ripens unevenly. The Grain Sorghum Production Handbook published by Kansas State University is a good resource for setting up the combine for grain sorghum harvest and recommendations for drying and storage.7

Double Cropping

A double-cropping system that alternates sorghum and an early maturing winter crop, such as wheat or triticale, can help to maximize annual dry matter production while simultaneously providing environmental benefits such as reduced erosion. Sorghum can be double-cropped for biomass production in northern climates with a shorter growing season and for grain production in southern climates with a longer growing season. The suitability of sorghum for a double-cropping system depends largely on the genotype. While full-season products tend to have greater yield potential in a single-cropping system, short-season products that can maximize dry matter production earlier in the growing season are best suited for a double-cropping system.4

Sources:

For additional agronomic information, please contact your local seed representative.