

Enterprise Guide for Southern Maryland: Grain Sorghum Production

This fact sheet is one in the series Enterprise Guide for Southern Maryland, providing information about alternative agricultural enterprises for farmers.

Because of the declining tobacco market in Southern Maryland, many farmers are considering alternative agricultural enterprises to supplement their incomes. One such alternative enterprise is growing grain sorghum.

Selecting a Variety

When choosing a variety of grain sorghum, read carefully the accompanying dealer information to determine how much tannic acid the variety produces. Do not plant varieties that produce grain containing over 3 percent tannic acid. Those types that have white or cream-colored seed coats are low in tannin. Some of the bronze-colored seeds are also low in tannic acid. Use only certified hybrid grain sorghum seed. This seed will help prevent the introduction of undesirable weed seeds. Choose seed treated with fungicides to prevent early seedling diseases, especially if you plant early in cool soils.

If you are using an acetanilide herbicide such as Dual or Lasso, treat the seed with a safener to avoid injury. Since these herbicides are part of the most desirable weed control program, make a special effort to obtain safened seed from your dealer.

Choosing a Site

Selecting the proper site for growing sorghum is very important. Although grain sorghum grown on narrow row spacings will respond to irrigation like corn, grain sorghum will also grow in dry soils. Choose a field with controllable weeds. If the weeds in a field cannot be controlled by sorghum herbicides, do not plant grain sorghum unless you plan to use wide rows. In selecting a site, consider the problem of bird injury to the sorghum crop. Avoid sites near marsh areas where blackbirds or other grain feeding birds live.

Preparing to Plant

Grain sorghum does especially well on silt-loam soils that have a history of unreliable corn yields (what we often call "white oak land" in Southern Maryland). Before planting grain sorghum, have your soil tested. The soil pH level should be in a range suited for growing corn. In some regions, grain sorghum is sensitive to low soil pH (probably because of toxic-free aluminum levels) so try to maintain pH levels

above 5.8. If soil test values show medium or higher levels of phosphorus and potassium, do not add phosphate or potash. If soil test values are low for phosphorus or potassium, use the current recommendation for corn production. Grain sorghum is reasonably tolerant of low fertility, so reduce your production costs by holding fertilizer inputs to a minimum. Apply nitrogen at planting time in one application.

Growing the Crop

When Should I Plant the Crop?

Do not plant grain sorghum before the middle of May. For best results, wait until after several days of very warm day temperatures and mild night temperatures so that the soil temperature is at least 65 to 70° F. You can wait to plant grain sorghum until late June, but May plantings will generally produce much better yields. Grain sorghum can be double-cropped with barley or wheat, but yields are likely to be much lower than for full-season production systems.

How Much Row Space Should I Allow?

The amount of space you allow between crops is important for best production. Use 10-inch row spacings rather than 30-inch row spacings. Narrow row spacing will help increase yields and reduce the head lodging caused by late brood European corn borers. Narrow rows also make combining easier and reduce trash in the grain. Wide rows do offer the possibility for cultivation if weeds become a problem but the disadvantages probably outweigh this factor.

How Many Acres Should I Plant?

Under all Agricultural Stabilization and Conservation Service (ASCS) programs, grain sorghum acreage is counted the same as corn. If you are in the government program, be sure to check with your ASCS office to make sure the amount of sorghum you wish to plant does not disrupt your eligibility.

What About Seeding?

Seed Size. Grain sorghum seed size varies widely among hybrids. Current hybrids may have from 10,000 to 20,000 seeds per pound. For this reason, do not plant seeds on a pound-per-acre basis but rather on the number of seed per row foot. If you plant early in the season when soil temperatures are below 70°F, or when temperatures are 80°F and above, expect that about 85 percent of the seeds will grow.

Planting Depth. Plant the seed no more than 1 to 1½ inches deep. For 10- and 20-inch row spacings seed at about 5 to 6 seeds per row foot to obtain a final population of about 4 plants per row foot. On 30-inch row spacings or greater plant 7 to 8 seeds per row foot to obtain a final plant population of about 6 plants per row foot. If drill-seeded on 7-inch rows, the seeding rate should be 3 to 4 seeds per row foot.

Amount of Seeds. To determine the number of pounds of seed required to plant each acre, follow the guidelines in Table 1. To determine how much seed you need, multiply the number of seeds per foot of row by the multiplying factor for your particular row spacing plan. Then divide that number by the number of seeds per pound. If you prefer an equation, use the following:

$$\frac{\text{Number of seeds per foot of row} \times \text{Multiplying factor}}{\text{Number of seeds per pound}}$$

For example, if you used 10-inch row spacing and 5 seeds per row foot, you would multiply 5 by 52,272 which equals 261,360 seeds per acre. Then divide by 10,000 seeds per pound and your answer will be 26.1 pounds of seed per acre. If you have any questions about determining the amount of seed you will need per acre, contact your county Extension agent.

Table 1. Seed quantity

Row spacing	Multiplying factor
7	74,674
10	52,272
15	34,848
20	26,136
30	17,424
36	14,520

Controlling Pests

Before you consider growing grain sorghum as an alternative crop, you should be aware of the types of pests that may harm the crop as well as how much it will cost.

Weeds

Be sure to consult the chemical label for application and safety instructions before making a weed control application. Contact your local county Extension agent if you have questions concerning weed control. Table 2 lists some herbicides that may be helpful.

Table 2. Weed control for grain sorghum crops

Preplant or Preemergent Herbicides		
Herbicide	Rate/A	Remarks
Dual 8E Atrazine 4L	1-2 pt 1-1.6 qt	Use Concept as a safener.
Bicep 6L	1.8-2.4 qt	Use Concept as a safener.
Lasso Atrazine 4L	2 qt 1-1.5 qt	Use Screen as a safener.
Lasso + Atrazine Premix	3-3.5 qt	Use Screen as a safener.
Ramrod Atrazine 4L	2-2.9 qt 1-1.4 qt	No safener is needed.

No-Tillage

Add Gramoxone at the rate of 1.5 to 2.5 pt/A with one of the above preemergent combinations.

Postemergent Herbicides		
Herbicide	Rate/A	Remarks
2,4-D amine	01.5-1 pt	Apply after crop is 6" tall, but before crop is 15" tall. After crop is 8" tall, postdirect with drop nozzles.
Banvel	0.5 pt	Apply before crop is 15" tall or up to 25 days after emergence, whichever comes first. Use drop nozzles if crop is over 8" tall.

Diseases and Insects

Many diseases can reduce the yield and quality of grain sorghum. These include seed and seedling disorders such as: anthracnose (resistant varieties); fusarium stalk rot and head blight; mycotoxins; and some plant nematodes. You can control these diseases by treating the seed with thiram, captan or PCNB. Planting in well-prepared seedbeds in warm soil, avoiding excessive plant populations, and rotating away from sorghum or sorghum-related crops such as corn will help reduce disease pressure. Soybeans and grain sorghum work well in rotation, reducing disease, insect and nematode pressures on each crop.

Many insects can potentially harm grain sorghum. These include: armyworms, earworms, borers such as European corn borer (ECB), sorghum midge and chinch bugs. Only late brood ECB's are serious pests in this area. ECB's damage the panicles (seed heads) of grain sorghum, causing either grain loss or large amounts of trash to be harvested with the grain. Scout your fields at regular intervals to detect the presence of pests and to prevent them from multiplying.

Birds

Birds may also be a problem for grain sorghum. To prevent birds from damaging sorghum, plant early-maturing sunflowers along areas where birds may enter grain sorghum fields. The sunflowers serve as a trap crop. You can also install acetylene cannons in fields during the grain maturation period and harvest sorghum immediately when mature, to reduce bird damage. If grain sorghum is left in the field for a long period of time after grain maturity, birds can severely damage the crop.

Harvesting, Storing and Drying the Sorghum

Harvesting grain sorghum can be a problem because of the amount of wet green trash frequently left in the grain by the combine. You can reduce this problem by running the combine at a height so that as little trash as possible enters it and by using narrow row spacings. Another possibility is the use of a dry-down agent such as Defol (sodium chlorate) which kills the sorghum plant and allows quick drying. For more detailed information, see the list of publications at the end of this fact sheet.

**Estimated Cash or Variable Cost Per Acre
(Low weed pressure--moderate fertility soils)**

Grain Sorghum--Conventional Tillage (100 bu/A)

Seed	\$ 6.00
Nitrogen (50 lb)	13.50
(assumes phosphorus (P) and potassium (K) on soil test medium or high)	
Lime (1/3 ton)	10.00
Herbicide	
(1 pt Dual)	6.00
(1 qt Aatrex 4L)	2.00
Fuel & Oil ^a (5.6 gal x .90) + 15% (5.6 gal x .90)	<u>5.80</u>
Total	\$43.30

**Estimated Cash or Variable Cost Per Acre
(High weed pressure - low fertility soils)**

Grain Sorghum - Conventional Tillage (100 bu/A)

Seed	\$ 6.00
Fertilizer (50N-50P-50K)	30.00
Lime (1/3 ton)	10.00
Herbicide	
2 pt Dual	12.00
1½ qt Aatrex 4L	3.00
Fuel & Oil (5.6 gal x .90) + 15% (5.6 gal x .90)	<u>5.80</u>
Total	\$66.80

Returns

Drought Year--80 bu x \$2.00	\$160.00
Top Year -- 130 bu x \$2.00	\$260.00
Net on Low Fertility Soils - Top Yield	\$193.20

^a This figure was calculated by multiplying the cost for fuel (5.6 gal/A x \$.90/gal) by 15%. Experience has shown that oil and grease cost about 15% of the fuel cost.

Selected References for Further Reading

S. Gunasekaran and T. H. Williams. *Harvesting, Drying and Storage of Grain Sorghum*. Fact Sheet No. 108. Cooperative Extension Service, University of Delaware, Newark, Delaware.

S. Gunasekaran and T. H. Williams. *Grain Equilibrium Moisture Content Fact Sheet No. 106*. Cooperative Extension Service, University of Delaware, Newark, Delaware.

Note: The information in this fact sheet is adapted from the Cooperative Extension Service publication "Grain Sorghum Production Recommendations for Delaware" (May 1987) by Richard Taylor, Extension crop management specialist and professor of agronomy, and Frank Webb, Extension weed science specialist, both of the University of Delaware.

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