Sorghum Production in South Dakota

Cooperative Extension, South Dakota State University

Follow this and additional works at: https://openprairie.sdstate.edu/extension_fact
Sorghum Production in South Dakota

by Elmer E. Sanderson and Ralph A. Cline, associate Extension agronomists

Sorghum withstands drought, heat, and grasshoppers. It is one of our low risk crops, provided you select the early, adapted varieties and follow the necessary cultural practices. If you select a late variety, though, sorghum becomes one of the most risky crops you can grow.

Grain sorghum is a highly palatable feed for livestock. For lambs, dairy cows, broilers, and laying hens, it has about the same feed efficiency as corn. For beef cattle and hogs, however, corn is slightly more efficient. Grain sorghum is a carbohydrate feed and like corn, is most efficiently utilized by livestock when supplemented with protein.

Sorghum silage is excellent feed for dairy cattle, beef cattle and sheep. Forage sorghum silage contains less grain than well-eared corn silage and therefore, has slightly less value per ton as feed. The concentration of grain in grain sorghum silage exceeds that of forage sorghum and may exceed that of corn depending on the height of cut. The shorter growing grain sorghum produces fewer tons per acre. Cattle do not chew the seed in sorghum silage as thoroughly as they do corn grain.

Sorghum is a relatively new crop to many farmers and because it offers some special problems, you should make a thorough study of production practices and varieties. While experience is the best teacher, you can avoid many difficulties if you are aware of the problems involved.

SEEDBED PREPARATION

Proper seedbed preparation kills weeds, conserves moisture, and forms a firm, mellow, warm seedbed. Germination is faster in warm soil and more uniform in a firm seedbed. Sorghum seedlings grow slowly and do not compete favorably with weeds. Therefore a warm, firm seedbed and shallow cultivation immediately before planting are essential in seedbed preparation.

Plow in early spring or if necessary, early fall. Cultivate and firm the soil well before sorghum planting. Just before planting, disk shallow and harrow the land to kill all weeds and to have a level, firm seedbed.

If you use a lister, blank list in late fall or early spring. Blank listed rows should be pulled in, or filled in, before nosing out with a lister at planting time. A thorough preparation of the seedbed may increase your yield 50%.

SEED TREATMENT

All sorghum seed should be treated to control sorghum smut and to protect the seed and seedling against harmful organisms. Recommended treatments are Arasan and Captan applied at the rate of 2 ounces per bushel. Mix seed and treatment material thoroughly according to package directions.

TIME OF PLANTING

Sorghum is a hot weather crop. For this reason, you should delay planting until the soil is warm enough to insure good seed germination and rapid emergence of the plants. While sorghum can be planted as early as May 15 in some years, experience indicates that if planted too early, late germinating weeds like pigeon grass may become troublesome. The usual planting date is between May 25 to June 10. The exact time of planting is, of course, modified by seasonal variations and areas of the state. If you use an early grain variety such as Reliance, aim to have the crop planted not later than June 15 to produce a mature crop before a killing frost. A later variety would necessitate an earlier planting.

WEED CONTROL

Weeds can be a serious problem in sorghum. Proper seedbed preparation and early cultivation after the crop comes up are two important ways of controlling them. CDAA (trade name—Randox) can be applied pre-emergence at the rate of 4 pounds active ingredi-
Sorghum will tolerate up to one-third pound of 2,4-D ester or one-half pound of 2,4-D amine. Spray when sorghum plants are between 4 and 12 inches tall. Determine the height by measuring from the ground up to where the new leaf is emerging.

**SOIL FERTILITY**

Sorghum uses relatively high amounts of nitrogen and moderate amounts of phosphorus. It will respond to an application of either nutrient if supplies in the soil are low. Commercial fertilizer recommendations for corn will apply equally well for sorghum. The application of 30-60 pounds of nitrogen and 20-40 pounds of phosphate per acre, depending upon the soil fertility status, will normally furnish the nutrient requirements. Phosphate is best applied by a starter fertilizer in a ratio of 1-2-0 (1 part nitrogen to 2 parts phosphorus and 0 potassium), 1-3-0, or 1-4-0, while nitrogen can be applied either by plow down or side dressing. A soil test is always suggested as a guide in economic use of fertilizer.

The expression is often made that sorghum is "hard on the land." The principal reasons for this are the greater depletion of soil moisture and the temporary tie-up of available nitrate through the decomposition of plant materials high in sugar and starch. The nitrate tie-up can be overcome by adding a nitrogen fertilizer to the soil.

**METHOD OF PLANTING**

Sorghum, grain or forage, should be planted in rows. Plant at a depth of 1 inch in heavy soil and 1½ to 2 inches in sandy soil. A corn planter or lister is the most common seeding equipment. A corn planter with furrow-opener attachment is the ideal method. The furrow-opener assures uniform depth of planting, places the seed in moist soil, and immediate emergence of the seedling is obtained. If you use a lister, list shallow rather than far in soil.

A grain drill can also be used to plant the seed in rows 36 to 42 inches apart. With a 11- to 14-foot drill, four rows can be planted. Bore a hole in a stub 2 x 4 and fasten the stub in drill box above the hole from which the grain is to be seeded. Insert a funnel in the hole in the 2 x 4. An 8-inch funnel will hold about 2½ pounds of seed. A small gas funnel, which holds more seed, can be used. The rate of seeding is calibrated by the same method as with a corn planter (as described later in this discussion).

**RATE OF PLANTING**

There is considerable difference in seed size between varieties and sometimes within the same variety. The seed size will influence the pounds of seed to plant per acre. For a grain sorghum variety with intermediate seed size, such as Reliance, use 3 to 5 pounds of seed per acre (4 to 7 seeds per foot) in low rainfall areas and about 4 to 6 pounds per acre (6 to 9 seeds per foot) in higher rainfall areas. Forage sorghums are usually planted a little thicker, from 8 to 12 pounds per acre.

**SORGHUM PLATES FOR CORN PLANTER**

Sorghum stands are often either too thin or too thick. To obtain satisfactory yields, a uniform stand is important and therefore care must be taken in using the right planter plates. For intermediate size seed varieties like Reliance, it has been calculated that the pounds of seed planted per acre amount to approximately two-thirds the number of seeds dropped per foot. Example: If six seeds are dropped per foot, the rate of seeding is 4 pounds per acre.

Use plates with holes large enough to hold three, four, or five seeds per hole. If holes are too small, they can be bored out to the desired size. Some planter plates have rounded notches around the outer edge of the plate. If these notches are too small, they can be enlarged with a rat-tail file. When fitting the seeds into the holes for testing, be sure they are packed in tightly. All seeds that will go in at least halfway should be counted because a seed that is halfway in a hole will be dropped by the planter.

Holes should be countersunk from the under side. Cut out at an angle of about 30 degrees. The upper edge of the holes should be countersunk very slightly or just enough to take away the sharp edge. Use false ring, if necessary, to prevent leakage and cracking of small seed.

**CALIBRATING THE PLANTER**

Because of the large variation in sizes of sorghum seed, even within the same variety, no "rule of thumb" in planting directions is absolutely reliable. Calibrate the planter each year as follows: (1) Block the drive wheel off the floor. (2) Turn drive wheel five complete revolutions, catching the seed in a pan. (3) Count the seed in the pan and divide the number of seeds by five times the circumference of the drive wheel (in feet). This gives the number of seeds planted per foot.

**RECOMMENDED VARIETIES**

Rancher and 39-30-S are two early, low prussic acid forage sorghum varieties that are well adapted to the entire state. Rox Orange, Leoti Red, and Norkan are later maturing varieties and should be grown only in the southern part of the state.
Reliance and Norghum are the two standard early combine grain sorghum varieties recommended for the entire state. The yielding ability of the two varieties is very similar but Reliance stands better, especially after a frost. For this reason Reliance is a more popular variety than Norghum.

SD 102 is an extra early grain sorghum variety developed by the South Dakota Experiment Station. It was derived from complex crosses and repeated colchicine treatment, resulting in a true-breeding line. The variety yields as well as Reliance and is appealing to the eye. SD 102 matures 3 to 5 days earlier and has shorter plants with more open and faster drying heads than Reliance. Heads of SD 102 extend well above the leaves which helps in combine harvesting. Its grain has a brown-rust color and is of medium size. Standability is about like Norghum. This variety produces 2 to 5 tillers when planted thinly, but tillers and main stalks mature simultaneously.

Dual is a dual-purpose sorghum variety developed by the South Dakota Experiment Station to be grown for grain or forage. Dual is a large-seeded, open-headed, leafy variety with sweet, juicy stalks. It matures slightly later than Reliance, plant height is usually 12 to 20 inches taller. Dual produces a palatable forage and high grain yield which makes it suitable for bundle feeding or for concentrated silage. The standability of Dual is quite erratic, but when harvested for forage, this is not usually a problem.

SD 441 is a hybrid grain sorghum developed and released by the South Dakota Experiment Station. It is a cross between Reliance ms and SD 102. The grain is a bright rust color and has a good test weight. The kernels are larger and the plants are slightly taller than Reliance. The heads extend well above the leaves facilitating an easy and clean harvest. The open heads are fast drying. SD 441 standability is better than Reliance. It has high yield potentials under dryland conditions and is adapted to the area where Reliance is grown.

SD 451 is a hybrid grain sorghum developed and released by the South Dakota Experiment Station. It is a cross between Martin ms #1 and SD 102. The grain has a rust color and the kernels are larger than those of Martin. The plant height is shorter and the heads are somewhat more compact than Reliance but are fast drying. The heads extend well above the leaves, a desirable characteristic for combine threshing. The standability is good. Its performance is good and since it is about 5 days later than Reliance, is best adapted to the area south of U.S. Highway 14 across the state.

SD 252F is a dual purpose hybrid sorghum developed and released by the South Dakota Experiment Station. It is a cross between Martin ms #1 and Dual. The reddish colored kernels are large, like those of Dual. The seed germinates fast, producing strong, large, sturdy seedlings which have a short seedling dormancy. This characteristic enables it to compete better with weeds. The hybrid is taller than Dual, producing sweet, juicy, leafy stalks. The standability is superior to Dual and maturity is from 5 to 7 days later than Dual. It is a high yielder in both grain and forage but grows too tall for a combine grain sorghum. It is well adapted to the entire state for fodder and silage.

R.S. 501 is an early hybrid grain sorghum recommended for South Dakota. It was developed by the Nebraska Experiment Station. It is a cross between male sterile Combine Kafir 60 and Norghum. R.S. 501 is about 2 to 3 days later than Reliance and grows 8 to 12 inches taller than Reliance. Its greater height and large heads make it susceptible to stalk breakage, especially under drought conditions. The seed is light red and the head is open and spreading. The grain yields have been superior to the yields of Reliance and Norghum.

R.S. 608 is a hybrid grain sorghum recently developed and released by the Nebraska Experiment Station. It is slightly earlier than R.S. 610, about 4 inches shorter, has better lodging resistance, and has a more open head. The seed is reddish-yellow. The yield record is similar to that of R.S. 610. R.S. 608 is recommended for the southern area of the state.

R.S. 610 is one of Nebraska’s medium-height hybrid grain sorghums. It is about 3 days earlier in heading than Martin and can be grown in the very southern areas of the state. The heads are rather compact. R.S. 610 is a high yielding variety but has a tendency to lodge.

There is considerable interest in both forage and grain hybrid sorghums. Several commercial varieties are available and are proving quite satisfactory. Because of limited tests, the Experiment Station is not in a position to make fair recommendations on these commercial varieties. According to experimental tests, in general the early to medium early varieties are superior to the late ones in yield and quality of grain.

**HARVESTING**

Most grain sorghums in the important sorghum growing areas are harvested with a combine while still standing. This method involves less manual work and can be used under most conditions. The crop must be
ripe and the moisture content of the seeds below 13%. Drying equipment is desirable for sorghum production because you can combine the crop when the moisture content is higher (16 to 18%) and before the danger of the sorghum plants breaking over or lodging.

Harvesting with a grain binder and shocking, to allow the seed to dry out in the shock, is a satisfactory method, but it involves more labor. This method is especially good where a seed crop is being produced because stored sorghum seed should contain 12% or less moisture in order to assure high germination.

In the threshing operation, with either the combine or the threshing machine, reduce cylinder speed by one-half of that for wheat to prevent cracking of the seed. Remove concave teeth as necessary. Use the same riddles and sieves as for barley.

Forage sorghum to be harvested as fodder can be cut with a binder, when the seed has reached dough stage. This gives the largest yield of nutrients per acre. For silage, cut when in the medium hard dough stage to prevent too great an acidity and too high moisture content of the ensilage.

**STORAGE**

Take extreme care in storing grain sorghum. Cracked kernels and pieces of stems and stalks in combined grain will increase the danger of heating and spoilage. Removal of such inert materials before grain is binned can reduce moisture content of the grain. Commercial sorghum grain should be stored at 13% moisture content or less. In case of grain for seed purposes, keep the moisture content below 12% for safe storage.