Sorghum Production in South Dakota

U. J. Norgaard

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Recommended Citation
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Sorghum production has increased in South Dakota from about 30,000 acres to 1,500,000 acres in 10 years. In the last two years sorghums have occupied about 10 percent of our entire cultivated acreage.

Since sorghum production is new to our farmers, there is need for much basic information about its production and utilization. This brief outline has been compiled to assist farmers make a success of sorghum production.

Good Varieties for South Dakota

FORAGE: For Entire State—Low Prussic Acid 39-30-S, Dakota Amber, Sudan Grass.
    For Southern Part—Rox Orange, Waconia, Leoti Red.

GRAIN: For Entire State—Sooner Milo.
    For Southern Part—Early Kalo, Colby Milo.

GRAIN & FORAGE: For Northern and Western Part—Improved Coes, Cheyenne Kafir.
    For Southern Part—Atlas.*

(*on well watered, warm fertile soils.)
Seed Bed Preparation

Seed bed preparation is very important. Seed should be planted in warm, mellow firm soil. The best time to control weeds is before planting.

In eastern part of the state this may be obtained by fall plowing with a couple spring discings and harrowing just before planting, or by early spring plowing and harrowing.

In the central and western part of the state sorghum is often planted with a lister. In light or sandy soils that warm up fast, listing and planting may be done in the same operation. In heavier soils it is best to blank list in late fall or early spring. When weeds begin to grow in spring the ridges should be leveled. At planting time the lister or two-row planter equipped with furrow openers should be run in the original furrows, but a little shallower than the first time. This method will provide mellow, warm, firm, moist soil in which good seed will germinate promptly. The furrow bottom should be as wide as possible. The slope of the furrow should be gentle to prevent danger of washing and covering during dashing rains.

Planting on the contour is highly recommended even on gentle slopes. Three years of evaluation studies at the Winner, S. D., Soil Conservation Service project show a significant increase in yield where sorghums were planted on the contour, in contrast to up and down hill planting.

Sorghum in Rotations

Sorghums follow other crops in rotation readily. However, since sorghums are heavy users of soil moisture it is well to exercise some care in choosing a crop to follow them especially when soil moisture is limited. For this reason farmers should avoid sowing winter wheat or winter rye on sorghum land. Spring planted small grains yield better than winter grains following sorghums. Crops which make most of their growth later in the season do relatively better. Corn, sorghum, and proso millet are examples of late spring seeded crops that can be used on sorghum land. Sorghum follows alfalfa or sweet clover better than corn since sorghum is less likely to “burn” than corn according to observations made in tests.

Rate of Planting

The rate of seeding is extremely important. The best rate of seeding depends on many factors. Because of this, stands are often too thin or too thick. The practice of seeding sorghums at a heavy rate per acre in order to make thinner stalks and a larger yield is disastrous when there is not enough moisture to support such a stand. All seeding should be made to permit a normal development of the plant. The following outline is a guide that will be helpful:

Spacing in the row, seed size and germination test are the three principal factors that determine the best rate of seeding. Grain sorghums spaced about 8-12 inches apart in rows 40 to 42 inches apart have been found to be about right for best results where moisture is fairly abundant. In the drier sections, wider spacings are advised. To check excessive tillering in order to produce more uniform maturing it is recommended to drop 3 to 5 seeds per hill, spacing hills about 18 inches apart on well watered land and about 24 inches apart on drier land. The rate of seeding of both methods described above require from 2 to 4 pounds of seed per acre.
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A full stand 6 inches apart requires 26,136 plants.
A full stand 8 inches apart requires 19,602 plants.
Large seeded sorghums have 12,000 seeds per pound.
Intermediate sorghums have 24,000 seeds per pound.
Small seeded sorghums have 36,000 seeds per pound.

Experience has shown that when laboratory germination test is 90 percent, field germination is about 60 percent. (Hence, always plant seed of high quality.)

Therefore, in order to allow for (1) variation in laboratory and field germination tests (2) unsatisfactory seed bed preparation and (3) other losses; it is usually necessary to sow from 2 to 3 times as much seed as the theoretical amount necessary.

Example: Sooner Milo is large seeded with 12,000 seed per pound. A full stand 8 inches apart would require about 19,602 plants or about 1½ pounds of seed if every seed developed. However, for reasons given above, one should plant more than 1½ pounds. The exact amount should be determined by considering the probable losses that occur in field germination.

Forage Sorghums may have one plant for each two to six inches depending on moisture supply, usually requiring six to ten pounds of seed per acre.

**Planting Plates**

Do not use corn plates. Use plates made especially for sorghums. For large seeds like Feterita and Milos, holes should be 9/32 to 1/4 inch; for intermediate size seed use holes 3/16 inches in diameter and for small seeds use holes 11/64 of an inch in diameter for single seed dropping. For hill seed dropping use plates with the holes made to drop the exact number of seeds desired per hill.

**Date of Planting**

The best growing temperature for sorghums is about 92 degrees. No growth takes place under 65 degrees. In South Dakota, therefore, sorghums cannot utilize our entire frost-free growing season and the crop should be planted at the earliest possible date after soil is thoroughly warm and in good tilth, so that it can mature before the cool period starts in September. In general it may be said that South Dakota sorghum season is from June 1 to September 10.

**Depth of Planting**

Sorghum is very sensitive to depth of planting. One and one-half inches deep is about right. If planted shallower, surface soil may dry out before germination can take place. If planted too deeply, seedlings may fail to come up. If possible, always plant seed in moist soil so it will sprout immediately. If moisture level is too far below surface use furrow-opener on planter. This will enable grower to plant seed 1½ inches deep in moist soil, insuring prompt emergence.

**Seed Treatment**

Many South Dakota farmers lose 25 percent or more of their grain sorghum crop from smut. A standard treatment for kernel smut of sorghum is Copper Carbonate, using three ounces of the dust to each bushel of seed. When Copper Carbonate is used, be sure to mix seed and dust thoroughly in revolving mixer. All sorghum seed should be treated.
Storing

Do not store sorghum grain which contains more than 14 percent moisture. Spoilage may be largely avoided by:

(1) growing early maturing variety
(2) avoid cracking the grain in threshing
(3) avoid introduction of bits of stalks containing moisture in the threshed grain

Production of Pure Seed for Planting

1. Look out for volunteer sorghum plants in field.
2. Raise seed on plot isolated 40 rods from any other sorghum.
3. Harvest with row binder before frost when 95 percent of seed is hardened. (Look for soft seed on lower part of north side of head. This part of head ripens last.)
4. Cure in shocks at least two or more weeks before threshing.
5. Sack at machine at time of threshing.
6. Clean and grade, removing all cracked and immature seed before storage.
7. Store in sacks permitting free circulation of air around sacks. Pile criss-cross so air may go under and around them.
8. Weed out any off-type plants in the field.
9. Seed handled as directed above will usually germinate above 85 percent which is the only kind worth planting. Producers of certified seed should follow these directions closely.

Summary

1. Use seed of early adapted varieties, testing 90 percent or over.
2. Prepare mellow firm seed bed.
3. Treat seed for smut, but look out for seed injury. Follow directions carefully.
4. Plant after ground warms up. Sorghum needs warmer soil than corn.
5. Use sorghum planter plates of proper size: Small seeds, 11/64 inch; intermediate seeds, 3/15 inch; and large seeds, 9/32 to 1/4 inch.
6. Seed to secure stand of plants 6 inches to 8 inches apart in rows 40 to 42 inches apart, or better, use 3 to 5 seeds per hill.
7. Plant about 1½ inches deep in moist soil. Use furrow opener if necessary.
8. Protect young sorghum field from grasshoppers by use of poison bran mash.
9. Cultivate same as for corn.
10. Harvest for fodder when seed is in medium hard dough stage.
11. Harvest for silage when fairly mature.
12. Cut for grain using hand method, row binder, header, row header or combine as fits individual needs.
13. Thresh when dry—when grain has 14 percent or less moisture.
15. When producing pure seed for planting use special care in planting, harvesting, threshing and storing.
Short History and Description of Common Sorghum Varieties

39-30-S (Low Prussic Acid)—Inbred low prussic acid selection from Dakota Amber Sor­go. Work done at South-Dakota Experiment Station under the direction of Dr. A. N. Hume and Prof. Clifford Franzke, of the department of agronomy. Very early, leafy, uniform, 60 inches tall, juicy, sweet. First released to Agri­cultural Department of Brookings High School, Brookings, S. D.

Dakota Amber—Plants very early, 60 inches tall, juicy, sweet stem, tillers freely. Early strain of Minnesota Amber. Selection made at High­more Substation in 1903. Other selections made at Highmore, Belle Fourche station at Newell. Early dwarf strain isolated at Newell and named Dakota Amber. Distributed to farmers in 1915.


Waconia Sorgo—The Waconia Sorghum Mills, Cedar Rapids, Iowa, distribute an orange sorgo named Waconia. The company has regis­tered the name “Waconia” with the U. S. patent office and use it as their trade mark. It is a very sweet stalk sorghum making excellent forage or silage.

Sooner Milo—Dwarf Milo, very early, de­veloped in Oklahoma for catch crop. Cross be­tween Dwarf Yellow Milo and Early White Milo. Developed by J. B. Sieghlenger, Southern Great Plains Field Station, Woodward, Okla­homa. The earlier maturity of Sooner has ex­tended the area where Milo can be grown into higher, drier and more northern areas. First distribution was made in 1930. May lodge when over-ripe.

Early Kalo—An early selection from Kalo, a hybrid derivation which originated as a selec­tion from a cross of Pink Kafir and Dwarf Yel­low Milo at Fort Hays Experiment Station at Hays, Kansas. Normal height is about 36 inches. Likely to lodge when over-ripe.

Colby Milo—New combine type developed at Fort Hays Experiment Station, Hays, Kansas. Grows about 2 feet tall. Produces compact heads of brownish seeds. Not as early as Sooner Milo, but has stronger stalk permitting it to stand for combining.

Feterita—First distributed in 1910, intro­duced from Sudan, Africa. Early, drought re­sistant, smut resistant. Average height 5 feet. Stems slightly sweet. Tillers freely.

Cheyenne Kafir—A very early maturing white seeded sorghum. Grows about 5 feet tall. Adapted to low rainfall and short growing season. Fodder yield about the same as Black Amber. Becoming popular as a combination forage-grain sorghum. Appears to be one of the most dependable sorghums for drouth condi­tions.

Atlas Sorgo—A selection from a field cross between SOURLess Sorgo and Blackhull Kahir. Distributed to farmers in 1928. Height 6-8 feet. Variety has a sturdy, leafy stalk, juicy and sweet. Heads fairly compact, seeds white and palatable. The grain yield of Atlas in South Dakota is not dependable because of late matur­ity, but it is very popular as a forage crop where climatic conditions are favorable.

Improved Coes—A selection from U. S. Dry­land Field Station, Akron, Colorado. Medium height, stalks slender, semi-juicy, therefore rated as dual-purpose. The heads are long, erect and semi-compact. This variety shows some promise for those parts of the state where earli­ness is important. Grain is white and of high test weight.

Leoti Red Sorgo—This variety is of unknown origin. It has been grown for many years in Kansas. Tests in South Dakota have shown that Leoti is sufficiently early in maturity to be well adapted for favorable locations in the southern part of the state. Leoti produces forage of excellent quality.

Rox Orange—A variety of orange sorgo de­veloped by the Wisconsin Experiment Station. It is a high yielding sweet stalk sorghum which makes excellent forage or silage.