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CC195 Sudan-Sorghum Hybrids for Forage Production

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SUDAN-SORGHUM HYBRIDS
FOR FORAGE PRODUCTION

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The new sudan-sorghum crosses (hybrids) have won a place on many Nebraska farms for forage production. On other farms, they just don't seem to fit as well as other crops.

The main reasons they have taken hold in a hurry are: (a) They grow fast -- especially in the early part of the season, (b) they have the excellent drought resistance that is characteristic of all sorghums, and (c) they haven't been counted against the feed grain base in the federal farm programs. Present rulings indicate they will not count against the feed grain base if they are harvested as pasture, hay or haylage (low moisture silage cut at immature stages of growth). Be sure to check with your local ASCS office for clarification.

Fast growth can be especially important in northern areas having a short growing season or in cases where late planting is desirable. Typical late planting situations might occur after a hail or if rain is received after an early summer drought. If soil moisture is adequate, sudan-sorghum hybrids could be planted after wheat is harvested.

Some factors that will determine how these crops will be used are: (a) They count as a depleting crop in 1965 if they are harvested as silage after the crop has headed. (b) They produce no more than recommended sudangrass silages when they are harvested frequently (5 or 6 times to simulate grazing) and when cut 2 or 3 times (just before heading) yields of sudan-sorghum crosses are likely to exceed those of sudangrass. (d) Sudan-sorghum hybrids produce less dry matter and less total digestible nutrients per acre than commonly used forage sorghums. (e) The nitrate and/or prussic acid content of the forage may be high enough to cause toxicity in animals and (f) a long wilting period and conditioning equipment may be required when the crop is harvested as hay or low moisture silage.

Feed value per pound of dry matter of these forage crops appears to be similar to sudangrass harvested in the same manner and at the same stage of growth. These crops are considerably lower than normal corn or forage sorghum silage in energy content per pound of dry matter. When harvested at immature stages of growth (30 to 40 days after planting) the protein content may be as high as 20% of the dry matter. When mature, the protein content may drop to 7% or even less.

The prussic acid content is usually higher than that of Piper or Wheeler sudangrass. Where the normal precautions recommended for grazing sudangrass have been followed, most sudan-sorghum crosses appear to be in the "safe to graze" range. Prussic acid is seldom a problem in hay or silage.

The nitrate content may be high during periods of rapid growth as is true of other forage crops. The producer who uses these crops needs to be alert to this possibility if he harvests or grazes the crop during this period of growth. Ensilaging forages containing high nitrates tends to reduce the nitrate content.

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USES OF SUDAN-SORGHUM HYBRIDS

Sudan-sorghum crosses have been used as pasture, green chop, hay, low moisture silage (cut at early stages of growth) and mature silage. The use of these crops will vary with the needs of the livestock program involved.

Pasture -- Nebraska, Kansas, Illinois and Arizona data indicate that the amount of dry matter produced per acre is no greater for the sudan-sorghum crosses than for sudangrass. These data were obtained under simulated grazing conditions where the plots were clipped frequently. In these tests, early yields were higher for the sudan-sorghum crosses. Total dry matter production was as great or greater for the sudangrass because of higher yields late in the season. A sudan-sorghum cross produced more tons of forage and was ready to graze earlier than sudangrass in South Dakota grazing tests. Sudangrass was preferred in their palatability trials.

The nitrate content of most forages is usually higher in the lower portion of the stalk. Thus, livestock should be removed when most of the leaves are gone or when the stalks are 6" to 10" high.

Pastures should be subdivided so rotation grazing can be practiced. Plants should be 18" to 24" tall before grazing to reduce the possibility of prussic acid poisoning.

Green Chop -- Green chopping will reduce trampling losses common in pasturing and field losses which occur when the crop is put up as hay. Because of its fast rate of growth, control of the quality and maturity of the forage fed is difficult. Costs of harvesting may be higher than for other methods because of the extra equipment and labor required.

Low Moisture Silage (haylage) -- If harvested before the head emerges, sudan-sorghum crosses will count as conserving acres in the 1965 government program. To make a satisfactory low moisture silage, this immature crop must be wilted before ensiling. If upright silos in good condition are used for storage, the crop can be wilted to 60% or less moisture content and stored without a preservative. If horizontal silos are used, a slightly higher moisture content may be necessary to get good preservation.

Silage -- Silage can be made by storing the crop at a more mature stage of growth. Because of the high moisture content silage made from direct cut forage is often sour and unpalatable. To correct this problem a preservative may be used, the crop can be left to mature, or it may be harvested after frost. If left in the field until the crop matures or freezes the moisture content will drop low enough to produce desirable fermentation, but lodging may be a problem.

Hay -- If cut when 30 to 40 inches high and cured properly, sudan-sorghum hay can be of good quality. It may have up to 20% protein and compare favorably with prairie or alfalfa hay in total digestible nutrient content. Yield of dry matter in some regions of Nebraska is higher than either prairie hay or alfalfa. Thus, some farmers are looking at sudan-sorghum crosses as a possible substitute for these crops. A hay conditioner is almost a must in harvesting these grasses for hay. Even then, it will take extra time to dry out the large, high moisture stalks.

PLANTING

Rate of Planting -- Little research has been done to determine best planting rates for sudan-sorghum crosses. For best results, the rate of planting and the planting method should be related to the available moisture and contemplated use of the crop. The planting rate should probably be a little higher than that used for regular forage sorghums but somewhat less than that used for sudangrass. The following suggestions may be helpful:

<u>Condition</u>	<u>Lbs./a (in rows)*</u>
Areas with ample rainfall or irrigation	10 - 12
Areas with less favorable moisture conditions	6 - 8
Areas with limited moisture	5 - 6

*Use the same rate per acre for medium or wide row spacings. -- Increase the planting rate by 50% for broadcasting or drilling.

When to Plant -- Plant 1 to 1½ inches deep in a firm, moist seedbed when the soil temperature reaches 60° F or somewhat earlier than this if the 5-day weather forecast calls for temperatures above normal. This could occur anytime from the 10th of May on in eastern Nebraska but somewhat later as you proceed west across the state. Sorghum is a warm weather crop and most rapid growth will take place when soil temperatures are warm. Midsummer plantings can also be made if there is adequate moisture.

How to Plant -- Use a drill or row crop planter. For grazing, plant in narrow rows (20" to 24") and use a rather heavy planting rate. This facilitates irrigation and reduces waste from trampling as livestock usually walk between rows when they graze. Drilling is preferred if the crop is to be used as hay.

FERTILIZING

Phosphorus -- Because of their fast growth, sudan-sorghum hybrids need an abundance of mineral nutrients. Phosphorus is especially important. Where soil phosphorus is very low but the nitrate level is normal or high, the prussic acid content of sudan, sorghum or their hybrids is likely to be abnormally high. When soil phosphorus is adequate, this abnormal build-up of prussic acid does not occur.

Soil tests should be made to determine whether phosphorus fertilizer is needed. Soil samples should be taken several weeks before the crop is to be planted. Phosphorus fertilizer should be applied unless soil tests show that the soil is "medium" or above in this element.

If the crop is planted with a row crop planter having a fertilizer attachment, use 30 lb/a of available phosphate (P₂O₅) on "low" phosphorus soils or 40 lb/a on "very low" phosphorus soils. The same rates apply if a combination grain and fertilizer drill is used for planting.

If equipment for row or drill application of fertilizer is not available, the phosphate should be broadcast and disked in before planting. For broadcast application use 40 lb/a of available phosphate (P₂O₅) on "low" phosphorus soils; for "very low" phosphorus soils apply 70 pounds per acre.

Nitrogen -- The available nitrogen should be enough to ensure fast but not excessive growth. An excess supply of soil nitrate should be avoided because it tends to increase the nitrate content of the forage.

Nitrogen fertilizer is not needed if sudan or a hybrid is planted on land just plowed out of alfalfa or sweetclover. If the field has been heavily manured or has been manured several times in recent years, nitrogen fertilizer is not needed. Where neither manure nor a legume has been used, the amount of nitrogen needed may vary considerably.

The need for nitrogen will depend on the soil moisture supply and expected growth of the crop. Examination of soil moisture should be made by means of a soil probe or auger. See Extension Circular 55-700 on estimating soil moisture conditions. Soil tests for nitrate production are also helpful in determining nitrogen needs in relation to soil moisture. Where the sudan-sorghum hybrid follows corn which was generously fertilized last year, the amount of nitrogen fertilizer needed this year may be less than is usually needed for corn. Nitrogen needs may range from 40 lb/a for average moisture conditions on non-irrigated land of medium fertility in eastern Nebraska to 20/a for average moisture on soils of medium fertility in western Nebraska.

Where there is subsoil moisture to support continued growth, 40 to 80 pounds of nitrogen per acre may be applied. If the crop is used for pasture, the nitrogen fertilizer may be split. Apply 40 pounds at or shortly after planting and the remainder in midsummer. Animals should be taken off the pasture for a day or two during and after topdressing, to prevent them from getting any of the fertilizer.

Where the crop is irrigated and used for hay or green chop, apply 30 to 40 pounds of nitrogen after each cutting.

In the few instances where sodbound (nitrogen hungry) brome is plowed and planted to a sudan-sorghum hybrid, there will be severe nitrogen deficiency unless a generous amount of nitrogen fertilizer is applied.

Potassium -- Nebraska soils usually have enough potassium and magnesium for all crops. The standard soil tests include the test and recommendation for potassium.

Iron -- Sudan-sorghum hybrids probably will be iron deficient on high lime soils where sorghum usually is iron hungry. An effective, dependable iron fertilizer for high lime soils has not yet been found. If the crop in an early stage shows iron hunger (bright yellow color of new leaves) spraying with a 1% ferrous sulfate solution may encourage faster growth.

Zinc -- Sudan and sorghum are somewhat less sensitive than corn to zinc deficiency. Where top soil has been recently removed, sudan-sorghum hybrids may grow slowly because of zinc hunger. This is especially likely where phosphate fertilizer has been applied. Zinc deficiency may be remedied by mixing a zinc carrier with the phosphate before application. Five pounds of inorganic zinc or two pounds of organic zinc per acre are usually enough. See Agronomy Tips 146 for zinc carriers and recommendations.

Sulfur -- Some sulfur deficiency may be possible in light colored sandy soils although the extent to which sulfur hunger affects sudan-sorghum growth is not known. Where sulfur is needed, mixed fertilizers containing worthwhile amounts of this element are available. If the crop is irrigated, the irrigation water may contain enough sulfur. Consult Extension Circular 65-164 regarding sulfur in Nebraska soils and crops.

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