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Emergency Feed Crops for South Dakota

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Emergency Feed Crops

Small Grains—Corn

For South Dakota

Sorghums—Millets

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Sorghums Thrive in Variety of Soils

Plant Millet Seed About 1 Inch Deep

Will Mature Crop of Grain in Sixty Days — Soil Should Be Moist

The Millets are shallow rooted and heavy feeders, so a soil rich in humus and available plant food near the surface is very desirable. A rich loam is best for millet but the crop will grow on a wide variety of soils. The seed bed should be fine and firm and reasonably free of weeds. The soil must be warm and it should be moist when the seed is planted.

Seeding Millets

Millets must have warm weather so the seed should not be planted until after corn planting time. The crop may also be planted at later dates, as late as June 20th if there is sufficient moisture. When good seed is used, from 15 to 20 pounds per acre of the foxtail millet is sufficient and from 20 to 25 pounds of the proso millet seed. Under the most favorable conditions a little more seed may be used, while under more adverse conditions some less may be plenty.

When proso millet is planted the seed should receive the standard formaldehyde treatment to prevent smut.

All millet seed should be planted shallow, about 1 inch deep in a good seed bed and never deeper than 1½ inches. The best method of planting is in close drills using a grain drill. The seed may be broadcast and then lightly disked or harrowed in but this does not give as uniform a stand and requires more seed per acre.

Harvesting

When the millet crop is harvested the foxtail varieties can be cut with a mower and then handled much like any other grass hay. For most farm animals it is best cut just after blooming and before any hard seeds have formed.

The proso millets are not hay millets but rather grain millets and are thus harvested when the seeds in the upper half of the heads are ripe. At this time the

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Part of the sorghum plot and crowd attending the Field Day on farm of Emil Balvin, Bon Homme county, September 20, 1933.

Similar plots will be planted on 42 farms in 21 different counties in 1934 by the Extension service in cooperation with interested farmers.

Write for Emergency Pasture Crop Circular

The small grains are not emergency crops in South Dakota. Sometimes they become such crops for the production of hay or pasture. This is especially true of winter rye for pasture. A complete and most practical discussion of the small grains for emergency pastures will be found in the Extension Circular entitled, "Emergency Pasture Crops" a copy of which may be secured by writing to the Extension Service, Brookings.

When the small grains are planted for hay their culture is the same as for the production of grain. Sometimes a little more seed is planted. They are harvested in the late milk or early dough stage and cured like any other grass hay. Oats is the best emergency small grain hay crop for South Dakota.

Corn for the production of grain and fodder is regularly planted in all parts of the state. As an emergency feed crop it can well be greatly increased by planting it especially for fodder or silage. Corn contains no poison like the grain sorghums. It cannot, however, stand prolonged drouth like the sorghums and then recover upon receiving more moisture.

Seed Bed Should Be Fine, Firm, Mellow

Necessary to Select Land That Is Reasonably Free From Weeds

The methods practiced in growing the sorghum crops have much to do with the yield and quality of feed secured. Sorghums thrive in a variety of soils. The fertile, rather sandy loam soils are best. Heavier soils produce fair to good crops if they are not too wet. Sorghums are more tolerant of alkali in the soil than most crops.

Some of the most important factors in successful sorghum production are: The seed bed, variety and vitality of seed, date and rate of planting and cultivation.

The Seed Bed

A good seed bed must be prepared for all of the sorghum crops.

Really no later work can take the place of a well prepared seed bed. A well prepared corn seed bed is good for the sorghums, except that it could well be firmer. The sorghum seeds are much smaller than corn, especially the Sudan and thus they need even a better seed bed. This means one that is fine, fairly firm, with the soil warm, mellow and in good tilth. The piece of land selected for a seed bed should be clean, that is free or reasonably free of weeds. The sorghums grow slowly at first, therefore the young plants should not be made to compete with many weeds. It is advisable to kill as many weeds as possible before planting the sorghum seed.

The Seed

It is of vital importance to plant the best varieties and to know the vitality or germination of the seed. These are points that every grower can largely control and unless they are followed, all other operations may be done properly but the results will be very discouraging. Absolutely nothing can take the place of the right kind of seed in the sorghum crops.

Sorghum seed can be quite properly

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Sorghums Will Thrive In Variety of Soils

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compared to seed corn. We have many varieties, strains and hybrids in corn seed. They range from early maturing to very late. They may be pure or they may be badly mixed. They may be of high germination or they may be low. Such can be and too often is the case with sorghum seed, the sweet sorghums or "cane", the grain sorghums and also Sudan grass.

All sorghums cross easily. They are like corn in this respect. The seed also gets mixed in the various operations connected with threshing the crop. Nearly all of our present supplies of sorghum seed come from the sorghum country in Kansas and farther south. The kinds best suited to those states are not often the best for us. Thus seed dealers must be careful in buying their seed supplies. Those buying seed to plant have a right to the best seed available and they should inquire about the variety, purity and germination of the lots offered to them.

All sorghums whether for dry fodder, silage or grain must reach near maturity if they are to be of the greatest feeding value. This means that the variety planted should be early enough to reach such a state of maturity.

Sorghum seed is often of low germination. This is most often true of northern grown seed unless it is of the earliest varieties. Everyone purchasing such seed should insist on the germination test. If the seed is of low germination and it must be used, then the planting rate can be made accordingly.

The varieties now known to be the best for South Dakota are named in another article.

Seeding Sorghums

Sorghum seed should not be planted until the soil has thoroughly warmed up and all danger of frost is past. A good general guide to go by is to plant from one to two weeks after the usual time for planting corn. The sorghums can of course be planted late, sometimes as late as July 10 to 15 and still produce some forage if there is sufficient moisture and frosts do not come too early in the fall.

Treating the Seed

All sorghums are attacked by the kernel smut. When the sorghums are to be used only for hay and no seed or grain is to be harvested, then seed treatment is not necessary. If, however, seed is to be harvested, then the seed that is to be planted should be treated. Copper carbonate is recommended, especially for the grain sorghums, using 2 ounces per bushel of the dust that contains 50 per cent of copper. If the dust contains only 25 per cent of copper then 4 ounces per bushel should be used. Ceresan can also be used.

Formaldehyde can be used if one pound of full strength is added to 30 gallons of water. The seed is placed in loose sacks and put in this solution for one hour. The seed is then spread out to dry and then planted. This method is for Sudan grass and the sorgos which have the hull attached.

The Amount To Plant

The amount of seed to use per acre and the method of seeding, whether in cultivated rows or by drilling or broadcast, all go hand in hand. In nearly all cases the sweet and grain sorghums are planted in rows to be cultivated. In the drier areas of the state and to save seed costs, Sudan is at times so planted. When the sorghums are planted in rows 42 inches apart the seeding rates, with seed of 85 to 90 per cent or better in germination, should be:

Sweet Sorghum	4 to 6 lbs.
Grain Sorghum	3 to 6 lbs.
Sudan Grass	4 to 6 lbs.

The final seeding rate must in all cases be determined by the man planting the seed since he alone will know its germination, size, purity, the planting and soil conditions, location in the state and usual rainfall, purposes for which the crop is to be used, etc. The small seeded grain sorghums like the kafirs do not require as much seed as the larger ones such as feterita and milo.

When close drilled or broadcast the seeding rates are much higher, ranging from 30 to 60 pounds for the sweet sorghums and from 15 to 25 pounds for Sudan grass. If the Sudan grass is not too expensive, and especially for pasture use, as much as 30 pounds per acre is desirable. In this method of planting as well as with the row method, the same factors must also be considered.

The Depth To Plant

It is best to plant all sorghum seed shallow if there is moisture available. About 1 inch is proper except when it is necessary to go a little deeper to reach moist soil, such as in the drier and more open soils.

The Method of Planting

When planted in rows the corn planter with sorghum plates is most often used. The regular corn planter plates should not be used. The grain drill may be used by stopping up the required number of drill cups to give the proper space between the rows. This is a good machine to use because it permits of even planting, an important point.

In close-drilled or broadcast plantings the grain drill is preferred to any method of broadcasting the seed on the surface and then disking and harrowing it into the soil.

In the drier parts of the state it is usually possible to secure a higher yield of fodder from row plantings than from close-drilling or broadcasting. In the central and eastern parts Sudan grass is most often planted in close drills or broadcast. The sweet sorghums are usually planted in cultivated rows throughout the entire state but may be close drilled or broadcast in the regions of greatest rainfall and on the lower and richer fields.

Cultivating Sorghums

All sorghums planted in rows must be cultivated. Considerable of this work can be done before planting the seed by proper disking and harrowing. Sorghums grow slowly at first so everything should be done to see that the weeds do not overcome the young sorghum plants. The ordinary drag harrow may have to be used before the plants come up. Such a cultivation may even be necessary to break up a packed and crusty surface, following a hard rain, so that the young sorghum plants can come up. The field may have to be given a blind cultivation and then cross harrowed soon after the plants are up. It is best, however, to kill as many weeds as possible before the seed is planted and also see that the seed bed is well prepared so that the seed will germinate quickly and the young plants grow fast enough to get ahead of the weeds.

Harvesting the Crop

The sweet sorghums should be allowed to become fairly mature—seed in the hard dough stage—before they are harvested. The largest tonnage of dry matter is thus obtained, the fodder or silage will be of a better quality and more palatable, the danger from poison less, there will be less shrink and the fodder will keep better. The actual harvesting is much the same as for corn. The bundles should, however, lie on the ground for a while to cure before being placed in small shocks. The bundles must not be stacked until they are well cured and then preferably in narrow stacks. If drouth prematurely dries the crop, then the grain binder may be used.

Sudan grass planted in rows may be harvested with the corn binder or grain binder depending upon the growth of the plants.

The grain sorghums planted in rows are harvested in different ways but mainly with the corn binder. This is especially true when the stalks are to be used for fodder. Growers interested in this subject can obtain a copy of Farmers' Bulletin 1577, "Harvesting Grain Sorghum," from the Extension Service, State college, Brookings.

The sweet sorghums and Sudan grass planted in close drilled rows or broadcast are harvested either with the mower and rake or the grain binder. If the grain binder is used then the bundles should be left to lie for a time to cure and then handled the same as small grain. If the mower is used the crop should be cut in dry weather and the hay left in the swath until the leaves begin to dry, then raked and cocked. From here on it is handled like any other hay.

Sudan grass is cut for hay from the time it starts heading until fully headed. The kind of season, whether wet or dry, the scarcity of feed, the danger of loss from grasshoppers and even other factors all enter into the decision as to when Sudan should be cut. Drilled or broadcast, sweet sorghum should be allowed to form seed before it is harvested.

The stalks in both the sweet sorghums and sudan grass retain their moisture for a much longer period than the leaves, so when the leaves look well enough cured for the hay or fodder to be stacked or put into the barn, it is always well to carefully examine the stalks.

Four Big Classes Of Sorghum Crops

Many Different Varieties Are Included Under Each of These Classes

There are four big groups or classes of sorghums:

1. Sorgos or sweet sorghums, commonly but incorrectly called "cane" and planted for fodder or syrup.
2. Grain sorghums or feterita, the milos, kafirs and the many crosses planted for grain.
3. Grass sorghums or Sudan grass, planted for hay and pasture.
4. Broom corn planted for its brush for the making of brooms.

There are many varieties of sorghums. It is not intended to name all of them in this circular but rather to name a few and to thus try and get them properly placed.

1. SORGOS

Early Varieties

Black Amber, such as Minnesota and also Dakota Amber; Red Amber.

Medium Varieties

Leoti Red; Sumac, such as the Standard, also the early Sumac; Orange, such as Kansas also Western; Atlas a cross between sourless sorgo and Blackhull Kafir. The Waconia sorgo is also an Orange Sorgo.

Late Varieties

Honey, Gooseneck.

The Black Amber Sorgos are the earliest and have first place on the recommended list for South Dakota. The Red Amber comes next since it is a little later. The Waconia is recommended for the southern and southeastern parts of the state. Seed is commercially available of these kinds.

2. GRAIN SORGHUMS

The varieties of grain sorghums are divided into six groups: Kaoliang, Feterita, Milo, Kafir, Durra, Shullu. Of these six the first four are of importance in South Dakota.

Kaoliang—Altamont. A selection of brown Kaoliang. Very early. But little seed available commercially.

Feterita—Standard Feterita. Seed available commerically just as feterita.

Milo—Standard Milo and Dwarf Yellow Milo are the two of most commercial importance. Sold in South Dakota as Milo Maize; Wheatland Milo is in commercial production. It is low growing for harvesting with combine. Sooner Milo is an early type which shows some promise in this state. There are other varieties that are not yet in commercial production which are being tried in the state.

Kafir—Most of the Kafir sold in the state is sold as Kafir corn. In the grain sorghum belt there are many varieties of Kafir. The Standard and Western Black-

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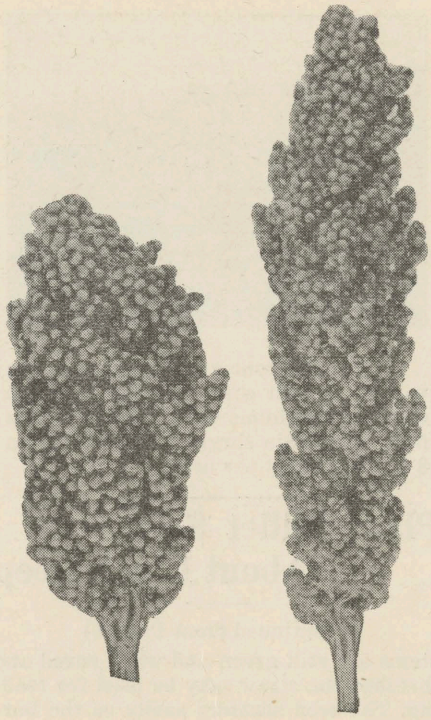
Grain Sorghum Heads



Feterita left, Grohoma right. Feterita is early and is recommended for South Dakota. This head was produced in 1933 and is fully matured. The Grohoma is too late for South Dakota and is not recommended for grain. The head was produced in 1933 and is only partly matured. Feterita in comparitive tests has yielded nearly twice as much grain as Grohoma.

Some History

In the spring of 1899 or just 35 years ago a series of tests including Amber "Cane", Kafir Corn, Kursk Millet and several varieties of Proso Millet were started at the Highmore Experiment Farm.

Thus an early start was made in testing the different emergency feed crops. Throughout this entire period of 35 years this Experiment Farm and also others in this state have served well to secure crop facts of value to South Dakota farmers and land owners.

It is always wise to learn what the State and Federal Experiment Stations have discovered about crop problems and usually best to follow their teachings in part, if not in full.

Your own State College through its Extension Service is anxious to help in the solution of many crop problems.

The sweet sorghums—"cane"—and the grain sorghums are NEVER recommended for pasture. Keep such crops under a good fence if possible.

Foxtail and Proso Are of Importance

Barnyard or Japanese Millet Is of Less Value to Farmers of South Dakota

There are two classes of millet of importance to South Dakota farmers. They are:

1. Foxtail Millets—The most important varieties of which there is seed available in commercial quantities are: German and Hungarian for the regions of the heaviest rainfall; Kursk, Siberian, Common for the drier parts.

2. Proso Millets— There are quite a number of varieties of proso millet. The most commonly advertised varieties or those that are available in commerical quantities are the Early Fortune, Hansen's White, Turghai. Other varieties are Tambov, Yellow Manitoba, Red Russian, Black Voronezh and still others grown only experimentally. The Early Fortune is the most common of the red-seeded prosos. It is extremely early maturing and usually produces lower yields than the Turghai, Tambov, Red Russian and Black Voronezh. The Yellow Manitoba usually matures too late for South Dakota. Most of the proso millet seed is, however, advertised and sold under such names as proso, hog millet, broom corn millet, hog or broom corn millet. In some sections proso millet is known as hershey millet.

There is a third class of millet of considerable less value to South Dakota farmers and that is the Barnyard or Japanese Millet, sometimes called billion dollar grass. Such millet is most often advertised as Japanese Millet or just Jap Millets.

Sorghums Not Entirely Resistant to 'Hoppers

The sorghums are generally thought to be resistant to the attacks of grasshoppers. This, however, is not entirely true.

Sudan grass is often considerably damaged by grasshoppers where they are abundant. Some of the grain sorghums, principally some of the milos, are attacked while other milos, feterita and kafir are eaten less frequently and many times if attacked, not seriously.

The sweet sorghums as a class escape quite generally. After reaching 8 to 10 inches they are practically immune to grasshopper attack. This is usually the case with kafir and some of the other grain sorghums.

Millets, including proso are not resistant nor resisting and this fact should be kept in mind when they are considered for planting in "hopper" infested areas.

Why Plant Millets

Millets are planted in South Dakota very largely as emergency or late sown catch crops. Millets are shallow rooted and really not drouth resistant. They require warm weather. They mature rapidly. They have a low water requirement but they are not able to recover from a period of drouth like the sorghums.

Millets are able to succeed in regions subject to drouth almost entirely because of their short growing season. Thus they are able to make in a short time considerable growth for forage purposes if there is moisture available and it is warm enough. At times they are thus able to get ahead of a drouth and as such might be called a "drouth-evading" crop.

There are two classes of millet of value to South Dakota farmers, namely the foxtail millets and the proso millets. As a class the foxtail millets are planted for hay and the proso millets for grain. The former as a class require more days to mature.

The proso millets have a place as an emergency grain crop in South Dakota but they cannot be expected to overcome severe drouth. If the seed can be planted in a well prepared, warm seed bed and it receives one or two rains of some real worth, falling at very opportune times to make a fair growth of stalks, it can be counted on to make some kind of a crop. This is because it grows so rapidly and it has the ability to come into head before all of the moisture is used up which generally means some seed or grain.

May Develop Poison

A serious disadvantage to the use of sorghums is the danger of prussic acid poisoning. In the southern states where the sorghum crops grow more naturally, less trouble is experienced than here in the north.

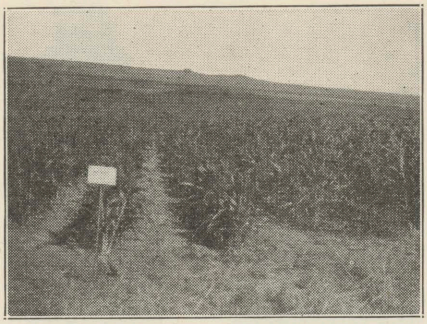
Whenever the normal growth of the sorghum plants is interrupted then it is most dangerous. Thus drouth, also frost causes more prussic acid to develop. As the plants approach maturity and especially as ripe seed appears they are seldom dangerous if the growth has been normal.

Well cured fodder is usually safe to feed. This is true if it has had a normal or nearly normal growth. Sorghum silage can be fed with safety.

The danger in feeding sorghums in South Dakota comes from the plants that are seriously stunted by drouth and which in such condition are eaten by livestock. Such plants even when quickly cured, or more correctly dried up, are at times thought to be poisonous. This is not likely true except in the most serious of cases.

The usual cause of trouble when harvested sorghum fodder is fed to livestock, comes about because the fodder is not thoroughly cured.

Sorghum Plot



Twelve different grain sorghums, one variety of dent corn, and two varieties of sweet sorghums were planted in this field. The grain sorghums yielded from 8 to 33 bushels per acre.

Plant Millet Seed About 1 Inch Deep

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stems are still green and when cured and threshed the straw may be used for feeding. The seed shatters easily so the harvesting must be done carefully and promptly. The grain binder is ordinarily used but the "combine" can also be used.

If the binder is used the bundles are handled much like any other grain crop but since birds and mice like the seed everything should be done to facilitate early threshing and storage of the grain. Care must be used in threshing not to hull too much of the grain. The legal weight for millet is 50 pounds per bushel but clean, plump proso seed will average 56 pounds per bushel.

The best varieties of proso millet mature from one to three weeks earlier than the foxtail millets and thus can be sown some later with a chance of obtaining a crop. At least 60 days should be allowed to make a crop. It has been known to make some seed or grain in even fewer days but such is largely the exception rather than the rule. Allow from 60 to 80 days for proso millet to mature seed and even some longer for the foxtail millets to produce the highest yields of the best hay.

Feeding Proso

The unhulled proso is very similar to oats in composition with a little higher feeding value for livestock. The grain is readily eaten by all classes of livestock. It should be ground before feeding except to poultry when it can be fed in unthreshed bundles.

Substitute Crops

The sorghum and millet crops are at different times both supplement and substitute crops. It is not the thought in this brief circular that they will displace our regular crops but during the more normal years will supplement them and during the more severe years will in part actually be substitute crops.

Why Plant Sorghums

The reason sorghums are recommended for planting in South Dakota is not because a season of low rainfall is necessary for their growth. The reason that some of the various sorghums are recommended for almost every year and especially so on the drier years, is because they are more productive than other crops under such conditions.

The sorghums are of greatest value in regions of uncertain and low rainfall because they can remain practically dormant, yet stay alive, during periods of drouth and then resume growth upon the coming of more moisture.

The sorghum plant also has about twice as many of the feeder roots as corn and is thus more efficient in securing moisture from the soil. Also there is not as great a leaf area from which moisture is lost to the air. These are the reasons that account largely for the sorghum plant's greater ability to withstand drouth.

Sorghums thrive in regions of heavy rainfall if the temperature is high enough. Sorghums do best where the temperature is uniformly high during the growing season. They are more exacting in their temperature than their moisture requirements. One reason why late maturing sorghums have matured in this state during recent years is because of our extra high summer temperatures.

Sorghums are by no means recommended to replace corn in South Dakota but there is a place for them in some areas during most years and at times over most of the state.

Four Big Classes Of Sorghum Crops

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hull are very likely the kinds that come into this state. As a class, except during favorable years, the Kafirs are too late in maturity to be recommended for the production of grain. The forage of most Kafir is better than that of Kaoliang, Feterita and Milo. If an early maturing kind can be secured it is likely to become a combination fodder and grain sorghum crop. Three Kafirs that are being tested in South Dakota are the Western Blackhull, Pink and Club.

Hybrids— There are many hybrids or crosses of the different grain sorghums such as Kalo and Early Kalo, crosses between Pink Kafir and Dwarf Yellow Milo. These have been tested in South Dakota and proven to be well at the head of the list. Others that are being tried are the Modoc and Greeley, crosses between Pink Kafir and Freed; Day Milo; Grohoma, likely a cross between some sorgo and feterita, but too late for the production of grain although in the southern part of the state it can be used for fodder.

Experience in feeding sorghums warrants the conclusion that maturity in these crops is of prime importance.