

Kansas State Agricultural College

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The Sorghum Crop in Kansas

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The sorghums are adapted to withstand heat and shortages of moisture. They are capable of lying dormant during long dry spells and then producing a splendid growth upon receiving rain late in the season. Sorghums readily adapt themselves to the conditions peculiar to Kansas and are among the most reliable and profitable summer crops to grow. They are quite as well adapted to almost every part of the State as corn, and, if grown, will be found to be very close competitors of corn even in the best corn sections, while in the western part of the State they produce larger yields than corn. In feeding value, their grain, hay, and silage compare favorably with other crops.

The general term sorghum includes not only those sweet sorts erroneously called "cane," but also the kafirs, milo, broom corn, and several others. Those having sweet juice are called saccharine sorghums, while those having a juice which is comparatively lacking in sweetness are called non-saccharine sorghums.

SACCHARINE SORGHUMS.

The saccharine sorghums are used for hay, silage, and sirup. Our best varieties are Black Amber, Orange, and Sumac. Black Amber is an early sort, and because of this fact it is especially well adapted to the western part of the State. Orange, a medium late variety, is extensively grown throughout the State. Sumac, a slightly later variety, is becoming very popular in central and southeastern Kansas.

NON-SACCHARINE SORGHUMS.

The non-saccharine varieties, are grown for grain, hay, and silage. Kafir and milo, of which there are many types, are the sorts grown most extensively in Kansas. Kafir may be successfully grown in all parts of the State, except in the extreme northwestern counties, where it is not a reliable grain crop. The Blackhull White is the most popular variety.

Milo is an early grain sorghum. It is adapted only to the western one-third of the State. Dwarf yellow is the only milo we recommend. Milo will mature in less time than kafir; it also stands more dry weather and is as good a yielder. In feeding value, kafir and milo grain, are about equal, but kafir fodder is the better. Experiments show that kafir or milo grain is about ninety per cent. as good as corn in feeding value.

SOIL REQUIREMENTS AND SEED-BED.

While the sorghums are adapted for growing on almost any kind of soil, they produce best on fairly heavy, well-drained loams rich in humus; but when grown in Kansas on gumbo, hard-pan, sandy, or other poor soils, they are more successful than most other crops.

These crops usually yield well with little care. A thin top-dressing of barnyard manure applied to the field previous to planting would increase the yields materially. Sorghums are excellent to plant on prairie sod or alfalfa sod. On land which has been cropped for a number of years, the sorghums need deep, thorough preparation of the soil. The lower part of

the seed-bed should be well settled and the surface soil quite loose. This condition can be best secured by fall plowing. If the land is apt to blow, instead of plowing, fall listing is advisable.

Early soil preparation stores up moisture, prepares plant food, kills weeds, and eliminates insects. No matter how the crop is to be planted or for what purpose it is being grown, early work on the field is absolutely necessary. The land will thus be prepared and ready for seeding while the soil is yet too cold to germinate sorghum seed but not too cold to germinate weed seeds. Cultivation of almost any kind will then kill the weeds and leave the ground in splendid condition.

TIME AND METHOD OF PLANTING.

Sorghum planting should be done late in May or early in June. Where the crop is for hay it is advisable to plant at least part of it later than this, so that it is not all ready to be harvested at the same time. If hay is desired, the seed may be planted with a wheat drill. In the western part of the State one to one and one-half bushels of seed an acre are required, while in the central and eastern parts about one hundred pounds of seed an acre are required for a fine quality of hay. In the drier parts of the State, row planting, in order to cultivate the crop, is greatly to be preferred to the above method. For planting in this way, one-fourth to one-half bushel of seed an acre should be used, according to soil and moisture conditions. With careful cultivation both before and after seeding the moisture will be saved for the crop. Farther eastward in the State seeding should be done at the rate of one-half to one bushel of seed an acre in order to produce fine hay when planted in rows. If light seeding is practiced, the crop will be coarse and difficult to handle. Heavy seeding, especially if on well-prepared soil, will give a crop of much finer and less watery roughage.

Sorghum for grain, seed, silage, sirup, or broom material should be planted in rows like corn, and cultivated; in fact, the crop is handled throughout about like corn. To plant sorghums in rows, either listing or surface planting may be practiced. For listed sorghums the ground must be warm before planting. Extreme deepness in listing should be avoided. For any method of planting, the land should have been worked several times between April 1 and June 1, to kill weeds and prepare the soil to stand without tillage during the early part of June, while the plants are too small for early cultivation.

CULTIVATION.

As soon as the plants start to grow, early cultivation is absolutely necessary. If surface-planted, the harrow should be used at least twice while the plants are too small to permit the use of other tools. The cultivator should be run deeply the first time over. The best cultivation for listed sorghum crops is done where the disk weeder is used.

The first work with the shovel cultivator should be deep and thorough, unless the only moisture in the ground is in only the top three or four inches, in which case cultivation should be shallow. Late cultivation should not be over three inches, deep, but can be kept up during the summer without disastrous results, unless the ground is dry below and the plants are living on surface moisture alone.

As soon as the plants are a foot or so high, the deepest cultivation may be given. It is especially important to tear up the middle of the rows thoroughly and fully before the plants are too large. If the crop has been planted with the lister, the ridges must be thoroughly broken up to a depth that will be equal to four inches below where the surface will be after the land is leveled. However, where the crop is listed, do not level the land until the plants have reached a height of more than two or three feet.

USES AND CARE FOR SPECIAL PURPOSES.

GRAIN.—All kafir and milo grain should be threshed and crushed or ground for feeding. As the grain is deficient in proteids, the ration should be well balanced with alfalfa, bran, cotton cake, or tankage. The grain is considerably injured in many threshers, and in order to save the cracked seed it is not always well cleaned by the thresher. When stored, the

cracked and dirty grain settles closely together, and heating may easily result. Lack of ripeness is supposed to add to the danger of heating. Thoroughly cleaning the grain will greatly lessen the danger of heating.

HAY.—Sorghum roughage and hay is good feed for maintaining mature animals. For growing stock it needs to be supplemented with the same general kind of feeds as should be used with the grain.

SEED.—Sorghums produce seed best when not planted too thickly and when a comparatively plentiful supply of moisture is available at and for a few weeks after heading time. A point to be most closely observed in seed production is the necessity for a comparatively thin but regular stand of plants in every row.

SIRUP.—For sirup production, a variety of sorghum should be used which is pure and which is adapted to the locality. Its length of growing season should be such as to allow it to ripen fully before frost. Thin planting is necessary. For sirup making, Kansas Orange is the variety most widely used in the State. Amber is frequently used on account of its earliness. Sumac, or Red Top, is to be recommended as a reliable variety for sirup production in most parts of the State.

CATCH CROPS.—All early-maturing sorghums are suitable for late planting. Early Amber and Dwarf milo are considered to be the best kinds for such use. As a catch crop of milo is usually cut before fully mature, its forage is very satisfactory in quality. Chinch bugs are very destructive to young sorghum plants; this fact may effect the practicability of using the crop in some cases.

SILAGE.—For silage or for coarse roughage, the crop is planted about as if grain or seed production were desired, the largest total acre-yield being the real aim.

For silage the sorghums ought not to be harvested until they are nearly ripe. At an earlier stage there is less dry matter an acre and also a very large proportion of water, which is not desirable. If the crop is fully ripe, the fiber is not as digestible as the unripe fiber. As a general rule, this class of crops gives a very large silage yield an acre. Owing to their high carbohydrate content, fermenting and heating in the silo will be very pronounced. Such silage is spoken of as "very acid," but this is not undesirable. Where the silo has been filled with corn, the sorghums may be used for the second filling after settling has taken place, because they will still be in condition for such use after the corn is too ripe.

PASTURE.—If pastured, sorghum plants that are checked, stunted, or killed during growth may be poisonous to live stock. Heat, drouth, or frost all seem to produce a similar effect. The hay is not known to be injurious; cutting and curing seem to make the poison harmless. It is not known whether putting poisonous sorghums in the silo will give a safe silage or not.

HARVESTING.

Growers like to harvest sorghum crops as late as possible in the fall so as to prevent injury by rain and heat. Late harvesting may also lessen the labor bill. For forage, the crop is harvested at the soft-dough stage, and for seed it is harvested at the hard-dough stage. The drilled hay-crops may be cut with a mower or with a grain binder. The row crops may be cut with a corn binder or they may be headed. There is a wagon-box attachment made which is a success when used for heading kafir. The ordinary small-grain header has been successfully used for topping kafir and milo. To do this, it is usually necessary to raise the platform and sickle-bar an additional four to eight inches by means of a plank.

Broom corn should be cut or jerked before it has become too woody. The best time is during the blooming period. The brush may be partly cured in the field, but this practice is decidedly a bad one.

SELECTION AND CARE OF SEED.

Sorghums easily cross-fertilize, and mixed seed is the result. Because of the irregular growth of the mixtures, pure seed is very desirable. Pure seed is sold at a good price and brings a good profit. Selected heads should be gathered before the regular harvest. Dry them and do not thresh them until planting time approaches. To improve the crop further, it is only

necessary to plant separate heads in separate rows and thus be able more easily to recognize the best-producing blood.

With kafir and milo, selection for earliness and grain-producing ability is needed. Broom corn should be selected for the desired height and for the quality of the brush. The sweet sorghums should be selected for forage strains that will be more leafy and stand up well. Some growers are endeavoring to increase the seed production of the forage sorghums, but unless the forage quality is also kept up, this effort is, useless. Good, viable sorghum seed can only be secured from mature plants. Plants grown for the production of hay, sirup, or brush must be harvested before the seed is ripe. Therefore, it is necessary to produce the seed of these kinds on special seed plats grown for seed production only and allowed to fully mature.

All kafir and milo for seed should be fanned and sacked as soon as it is threshed. In cleaning sorghums for seed, the fanning mill should be equipped with a sheet-metal sieve having a long, narrow slot instead of a round hole. The slot should be wide enough to let cracked grains through, but not whole grains. A square or round hole large enough for half-grains will pass whole grains also. Before planting, always test the seed for germination.

DISEASES.

There are two kinds of smut which injure sorghums: grain smut, which attacks each separate grain; and head smut, which attacks the whole head. If head smut is present in a field, it is of great importance that no seed be saved. Buy new seed.

Grain smut may be prevented by dipping the seed in a poisonous solution. Mix one pound of full-strength formalin with thirty gallons of water. Have the seed in burlap sacks, tie the sacks well, but have them only half or two-thirds full. Hang these bags in the formalin solution one hour and stir or move them about somewhat, then spread the seed out and dry it thoroughly. After it is completely dry, test it for germination, as the treatment may kill the seed if not carefully done.

CONCLUSION.

There are a few points in favor of these crops that should be emphasized. They are practically sure of making either hay, silage, or seed in Kansas every year, if handled in a similar way and under conditions that are favorable to corn. They stand more dry weather than does corn, and are especially adapted to central and western Kansas conditions, and should be grown on a larger scale. It is a fact that these crops are more largely grown in certain parts of the eastern half of the State than in the western half. Probably the chief reason for this peculiar condition lies in the fact that it is practically impossible to plant wheat in the sorghum fields with any success, and therefore the wheat farmers, do not grow sorghums.

Sorghums usually grow late in the fall. They remove water and plant food from the soil in large quantities much later than most of the well-known crops. The fields are necessarily left much drier than where early-maturing crops are grown. Until this lack of moisture is corrected, the soil is in a dry and unproductive condition. Warmth, air, and moisture are all needed to get the land into good tilth again. The land needs to be thoroughly plowed, and late-planted crops should be used there the next year.

After sorghums, small grains and other crops which need moisture during the fall and early spring suffer most. In all of western Kansas the sorghum fields should be put into fallow in the winter or spring and wheat sown on this fallow in the fall. This makes it possible to put wheat in on excellently prepared land. After wheat, plant some sorghum crop, such as kafir, milo, or saccharins sorghums for seed or for roughage, then fallow the land again and plant it to wheat.

Such a cropping plan allows the production of our two best dry-farming crops, with an opportunity after each harvest to store moisture at a very small expense before time to plant the next crop.