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SUDAN GRASS (*Andropogon sorghum* var.).

This grass is an annual belonging to the sorghum family. It was secured from Khartum, Sudan, in 1909, as the result of a search for the natural forms of Andropogon intermediate between the cultivated sorghums and Johnson grass. In leaf, stem, and seed characters Sudan grass resembles Johnson grass very closely, but it lacks the underground stems or rootstocks which make Johnson grass difficult to eradicate. In root characters Sudan grass is more like the sorghums and by several investigators it is thought to be the wild form of the common sorghums.

Description.—When planted in rows and cultivated on fairly rich soil it grows to a height of 7 to 9 feet and has stems one-fourth inch in diameter. Broadcasted it rarely exceeds 3 to 5 feet in height and the stems are much finer, one-eighth inch or less in diameter. The seed head is loose and open, like that of Johnson grass. The hulls or glumes are awned when in flower and often purplish in color, but the color usually fades to a light yellow when ripe, and most of the awns are broken from the seed in thrashing. The seed itself when thrashed closely resembles Johnson-grass seed, except that it is more plump; well-matured seed also has a greater percentage of hulled seed in it. In general, however, it can ouly be distinguished from Johnson-grass seed by the close scrutiny of a seed expert, and therein lies, perhaps, the greatest danger in the use of Sudan grass by the American farmer. Unscrupulous seedsmen will find it easy to adulterate it with Johnson-grass seed. This danger, however, will be present for only a few years, as it is much easier and cheaper to produce Sudan than Johnson grass seed. The danger of the future will come about in the use of Sudan-grass seed produced on land infested with Johnson grass, thus bringing about a natural admixture of the seed.

Climate and soil requirements.—Sudan grass is not particular about the soil, but it does best in a fairly rich clay loam. In sandy or poor soils the growth is rather weak and the yields low. Belonging to the sorghum family, it shares with the rest of this group the preference for a warm growing season. It will stand slight frosts, but continued cool weather iuterferes with its normal development, and this fact prevents its success in high altitudes. It is fully as drought resistant as the ordinary cultivated sorghums, and when grown in rows and given similar cultivation it can be relied upon to produce a crop of hay with very little rainfall. It has a short growing season, maturing for hay in about 75 to 80 days, and for seed in from 100 to 106 days from seeding time if the weather is warm. This quality allows of its use as a "catch crop" throughout the corn belt and extends its territorial limit north in the Great Plaius region to the north line of South Dakota and a like distance in all other regions characterized by hot summers. Excessive humidity such as is found in the Gulf coast region is injurious to Sudan grass, because it induces rust and other diseases which make its growth unprofitable. Rust-resistant strains are being developed to overcome this weakness.

Seeding.—Sudan grass should not be planted until the soil has become warm in the spring. Planting in cold soil only delays germination and dwarfs the early growth. It can be sown any time during the summer as a catch crop so long as 70 to 80 days intervene before the date of the first expected frost. Sudan grass can be sown in rows 18 to 42 iuches apart and cultivated like corn, or it can be drilled in with a grain drill or sown broadcast by hand. In the semiarid sections it is much more profitable to seed it in rows and cultivate, and even in the humid regions a small amount of cultivation appears to give added vigor to the plants. The rows should be as close together as the tools available for cultivation will permit. Where sugar-beet cultivators are at hand 18 or 24 inch rows are best, but in most cases the farmer will find it more convenient to place the rows 36 to 42 inches apart, so that he can use his corn cultivator. Seeded in rows 36 to 42 inches apart, 2 to 3 pounds per acre of good seed are sufficient. In rows 18 to 24 inches apart, 4 to 6 pounds, and drilled or broadcast, 16 to 24 pounds per acre are required, according to the rainfall.

Harvesting.—Sudan grass is easy to cut with a mower and cures readily, so that the haying process is much the same as that of millet or any other hay grass. Where it is harvested for seed an ordinary grain binder is best suited for handling the crop. When cut for hay, it is best to cut it just after full bloom, so that it will have as much time as possible for the second growth. After cutting, it reuews its growth promptly when moisture conditions are favorable, and in about 40 to 50 days another cutting is ready. The grass stools abundantly after the first cutting, and the second and third cuttings are very fine stemmed. In 1912 four cuttings were secured at Chillicothe, Tex. Ordinarily two or three cuttings may be expected from central United States southward, and one cutting north of the middle.

Utilization.—Sudan grass makes a very nutritious and palatable hay which is greatly relished by both cattle and horses and has no worse fault than its slight laxativeness. Yields of 2 to 4 tons per acre of cured hay are common, and under irrigation they run as high as 8 to 10 tous. Sudan grass can also be cut green and used as a soiling crop to good advantage. No data on its value for pasture have yet been secured, but, being an annual, it would have to be resown each season. The same care should be used in pasturing the second growth as is customary with the sorghums. In feeding value it is no doubt practically identical with the sweet sorghums, as the analyses show it to possess about the same percentages of the different food principles.

Remarks.—Sudan grass matures for hay in about the same length of time as millet and the yields are equal or better, especially where several cuttings can be secured. The quality of the hay is much superior to millet hay; therefore it is recommended as a substitute for millet as a catch crop.

As a hay crop for the southern Great Plains region it has no superior, and it gives promise of being of great value in all parts of the South except in the humid regions adjacent to the Gulf coast. Under irrigation three cuttings are obtained and the yields and quality of the hay are second only to that of alfalfa.

Owing to the high price of seed, seed production is at the present time a source of great profit. Actual yields of 500 to 1,000 pounds of seed per acre are reported. As the supply of seed becomes more adequate seed production should be limited quite largely to the North, where the land is free from Johnson grass. Sudan grass crosses quite readily with the cultivated sorghums, so that in seed production it is necessary to rogue the fields in order to remove these sorghum crosses, but when the field is to be used for hay the presence of crosses is not of any great importance.

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