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PRODUCTION OF ANNUAL AND ALTERNATIVE CROPS FOR FORAGE

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Annual crops can be a valuable part of the normal farm operation. They are used to provide supplemental forage when perennial forage production is low. Additionally, under drought conditions, these annual crops may be the only choices available for emergency sources of forage. There are also several alternative crops available that can be used as forage crops. This report provides some general information concerning these crops and also presents specific agronomic information in the form of a table.

Annual Crops

Foxtail Millet. Many types are available including Common, German, Siberian, and Hungarian. Siberian is drought-tolerant and finer-stemmed than most of the other types, and is recommended for hay production. The optimum planting date is late May through June, although in emergency situations it can be seeded as late as mid July. It makes better hay crop than pasture because of its shallow rooting and slow regrowth characteristics. Prussic acid poisoning is not a problem with this crop.

Pearl Millet. This crop is grown primarily in the Southern Great Plains. Limited information is available on the forage production of this crop in South Dakota. The plant is leafy, regrows well, and yields about the same as sudangrass. Because of these characteristics, it is best suited for pasture. It has relatively thick stems and may be difficult to cure as hay. Prussic acid poisoning is not a problem with this crop.

Oats. Can be used for hay or silage. Use varieties that are medium to late-maturing and adapted to local conditions. May be difficult to properly pack in

the silo when harvested at late maturity stages. Forage quality is dictated by maturity stage when harvested. For highest quality, harvest at the boot stage. For higher yields, delay harvest until the milk stage. This crop may contain high levels of nitrate if grown under drought conditions.

Oats-Field Peas. Limited information is available on the performance of this mixture in South Dakota. Data from Illinois indicate that inclusion of field peas increases crude protein content 2-4 percentage units over oats grown alone. Can be used for hay or silage, although the peas may prolong the curing process. This mixture is recommended for use on a limited acreage until further research is conducted in South Dakota.

Oats-Hairy Vetch. Limited information is available on the performance of this mixture in South Dakota. Data from Indiana indicate that inclusion of hairy vetch increases crude protein content 1-2 percentage units over oats grown alone. Can be used for hay or silage, although the hairy vetch may prolong the curing process. This mixture is recommended for use on a limited acreage until further research is conducted in South Dakota.

Sudangrass. This crop offers flexibility because it can be used for pasture, hay, or silage. If the first cutting of hay is taken at the early heading stage, a second cutting is possible, or the regrowth can be grazed. Sudangrass has faster regrowth than any of the millets or other sorghum species. The variety 'Piper' has been developed to contain very low levels of prussic acid.

Sorghum-Sudangrass Hybrids. These hybrids are the most numerous of the various types of sorghum. Most of these are available as commercial hybrids. They are high producing crops, but more than 50 percent of their yield usually comes from their stems. This crop has slower regrowth than sudangrass and is best suited for green chop or silage. They can also be cut for hay, although curing may be slow. Use of a crimper is recommended.

Forage Sorghum. These sorghums are usually tall growing, and mature late in the growing season. They are often called "cane" or "sweet sorghum." They have sweet and juicy stems, and many have relatively small grain heads. This crop is best suited for silage. Grazing of forage sorghum is not recommended. The crop contains high levels of prussic acid and can be dangerous to graze even when plants are completely headed, especially when young shoots are present.

Alternative Crops

Soybeans. This crop was first introduced into the United States as a forage crop. It is difficult to cure and properly put up as hay. The best use of this crop is silage. Can be used in emergency situations. Dry matter yields from a 1989 study at SDSU ranged from 1.5 tons per acre at Highmore to 2.1 tons per acre at Beresford.

Cowpeas. This crop is grown primarily in the southern United States for human consumption. It is also known as "black-eyed peas." Recent research conducted at SDSU indicates that this crop is adapted to South Dakota and can be used for forage. Dry

matter yields in 1989 ranged from 1.9 tons per acre at Highmore to 3.1 tons per acre at Beresford. This crop has the same general characteristics of soybeans, and the best use is silage. An advantage of cowpeas is that seeding costs are low, ranging from \$2 to \$5 per acre.

Mungbeans. This crop is grown primarily in Oklahoma and Texas as a silage crop. Recent research conducted at SDSU indicates that this crop is adapted to South Dakota conditions and can be grown for forage. Dry matter yields in 1989 ranged from 0.8 tons per acre at Highmore to 1.8 tons per acre at Beresford. These yields are lower than cowpeas and they appear to have less potential as a forage crop. Seeding costs are also low for this crop, ranging from \$2 to \$5 per acre.

Rape and Turnips. These crops are grown primarily on the east and west coast states as a late summer or fall pasture. Limited information is available on the potential of these crops in South Dakota. It has been documented that these crops cause sunburn on light-skinned animals.

Teff. This crop is currently being marketed as "Dessie Summer Lovegrass". It has rapid seed germination and seedling development, and is adapted to dry climates. It can be grazed or hayed five to six weeks after planting. Forage yields have ranged between 1.3 and 5.3 tons per acre in trials conducted at SDSU. It is a shallow-rooted crop and plants may be pulled out of the ground when grazed. Teff does appear to have fast regrowth after cutting.

TABLE 1. PRODUCTION INFORMATION FOR ANNUAL AND ALTERNATIVE CROPS

Crop	Use	Planting date	Seeding rate	Harvest stage
Foxtail Millet	Hay Pasture	Late May-June	15-20 lb	Hay: early heading Graze: 6-8*
Pearl Millet	Pasture Hay Silage	Late May-June	15-20 lb	Graze: 18-24* Hay or silage: heading
Oats	Hay Silage	Early spring	2 bu	Milk to early dough
Oats-Field Peas	Hay Silage	Early spring	1.5 bu oats 35 lb peas	Oats in milk to early dough
Oats-Hairy Vetch	Hay Silage	Early spring	1.5 bu oats 35 lb vetch	Oats in milk to early dough
Sudangrass	Pasture Hay Silage	Late May-June	20-25 lb	Graze: 18-24* Hay: early heading Silage: dough stage
Sorghum-Sudan	Silage	Late May-June	20 lb	Dough stage or after frost
Forage Sorghum	Silage	Late May-June	5-8 lb	Dough stage or after frost
Soybeans	Silage	Late May-mid-June	2 bu	Early podding
Cowpeas	Silage	Late May-June	80 lb drill 30 lb rows	Early podding
Mungbeans	Silage	Late May-June	20 lb drill 6 lb rows	Early podding
Rape or Turnips	Pasture	May-June	4-6 lb	Graze: 8-10*
Teff	Hay Pasture	Late May-June	4-8 lb	Hay: heading Graze: boot