

Forage Extension Program

Warm Season Forages: Sorghum and Sudan Grass

by Dennis Cash and Mike Schuldt, MSU Extension

Continued dry conditions throughout Montana have created severe hay and grass shortages. Depending on winter and spring precipitation, we could experience continued forage shortages in 2001. For the past several years, there has been a significant increase in the production of small grains, such as hay barley and oats, for annual hay. These "cool season" crops fit well for most producers, because they can be seeded and harvested with conventional equipment in normal crop rotations. Further, these can be seeded in early spring to capitalize on spring moisture.

"These "cool season" crops fit well for most producers, because they can be seeded and harvested with conventional equipment in normal crop rotations."

Benefits of Warm Season Crops

Warm season forage crops, including corn, sorghum, sudangrass, sorghum/sudangrass hybrids, and millets, have not been widely grown in Montana. However, several Montana ranchers have experimented with these crops and gotten good results. These forage crops must be seeded after soil temperatures are consistently above 60o F. For most years, this is an advantage in Montana, because by mid- to late May, we have a better idea of the seasonal moisture situation for perennial pastures and hay ground. Plus working with later season crops helps distribute the farming workload. After establishment, warm season forages can be very productive on dryland. Compared to our small grain forages, warm season forages generally have a higher water use efficiency, meaning they yield more forage per inch of soil moisture. Depending on moisture, warm season forages can yield 1.5 to 6 tons of dry hay per acre.

Sudangrass and Sorghum

Sudangrass serves as an excellent pasture or hay crop, with its 3 to 5' height and slender (<1/2 inch), leafy stems. These characteristics make it well suited for pasture, dry hay, or silage. Forage sorghum was developed from grain sorghum, and this crop is suitable for silage, but not dry hay production. There are a number of sorghum/sudangrass hybrids available, which are very high-yielding and combine the leafiness and regrowth ability of sudangrass. These hybrids are excellent for silage or fall pasture, but not dry hay.

Tips for Growing These Crops

First, work with a local reputable seed dealer, as there are tremendous differences among varieties or hybrids for adaptation and maturity. Most of these forages require 60 to 90 days of frost-free weather with soil temperatures of 65 to 70o F. They generally require special seeding rates and management. One advantage of seeding later than small grains is that many annual weeds will emerge, and can be controlled by light cultivation or herbicides. However, coming out of a dry spring, the delay for warm soils can be risky in terms of precipitation probabilities after seeding.

Seeding Specs

Seeding rates vary from 5 to 35 pounds per acre, depending on variety (big differences in seed size), method of seeding, and intended use. For dryland production of forage sorghum or sorghum/sudangrass in Montana, seed in wide rows (21 to 28-inch) with 5 to 8 pounds per acre. Sudangrass can be drilled or broadcast at a seeding rate of 25 to 30 pounds per acre. Under irrigation, the seeding rates should be increased to optimize forage yield and quality. Seeds should be planted 1 to 1.5 inches deep into a firm seedbed.

Fertilizer Needs

With adequate moisture, these crops can be high-yielding, showing good response to nitrogen (N) fertility. Under irrigation, with a potential yield of 6 tons of dry matter per acre, the N recommendation is 100 to 125 pounds N (soil test plus fertilizer) pre-plant incorporated, then 40 pounds of topdressed N on the regrowth. No current recommendations have been generated in Montana, but a good guideline is to supply about 20 pounds of N per every ton of anticipated yield. Phosphorus and potassium requirements are similar to those of small grains.

Grazing, Haying, and Silage

Sudangrass is best suited for grazing or hay production. Sheep can be turned out when the crop is 12 to 14 inches tall, and cattle when the crop is 18 to 24 inches tall. Livestock should not graze the crop below about 4 inches to allow for fast regrowth. For optimum use, fencing should be used to set up a rotational grazing scheme. Sudangrass should be cut for hay in the heading stage, or for silage in the dough stage. Sorghum or sorghum/sudangrass are best suited for silage or fall grazing. Recently, several producers successfully made high-quality "baleage" from sorghum/sudangrass. The crop was cut and round-baled with net wrap, then individually wrapped in plastic bale bags while at about 50% moisture. This resulted in a very palatable and nutritious ensiled feed.

Potential Drawbacks

Aside from the high forage yield of these warm season crops, they also provide weed and disease control benefits. One disadvantage may be their deep water removal in the summer. Other potential drawbacks of these crops are nitrate and prussic acid toxicities. Many grasses can have high nitrate accumulations in the early stages of growth, and particularly during drought stress. Most MSU Extension Service county agents can provide a nitrate "QuikTest" on a representative sample of the crop prior to it being cut or grazed. Prussic acid (hydrocyanic acid, HCN) can accumulate in these crops from the breakdown of glucosides. The forage sorghums and sorghum/sudangrass hybrids tend to have higher incidences of prussic acid toxicity, and these should either be ensiled or NOT grazed until after a killing frost. There are commercial laboratories that can analyze for prussic acid concentrations, but sampling and timeliness are critical.