

Using Summer Annuals in a Forage Program

by Dr. Gary Bates

Producing high quality forage should be one of the primary goals of any livestock producer. Usually perennial grasses are the preferred forage species on which to develop a forage program. Grasses such as tall fescue, orchardgrass, or bermudagrass tend to be cheaper to produce, and are at less risk of failure due to environmental pressure. There are situations when annual species can be a key part of a forage program. Most often, hot, dry conditions are a period of forage deficit for most operations, especially ones that are using cool-season grasses as their forage base. In this scenario, summer annual species can provide grazing during the summer.

The term summer annual includes several species of forage. The chart below illustrates the pros and cons of the species that can be used practically.

Planting summer annuals – All of these forages can be planted conventionally or no-till. Be careful to pay attention to planting depth. Smaller seeded species like teffgrass and crabgrass are easily planted too deep. If planting conventionally, make sure to cultipack the ground prior to broadcasting the seed, then cultipack a second time after seeding.

Fertilization – Be sure to go ahead and take a soil test now in preparation for planting the summer annual in May/June.

Fertilize and lime according to soil test results. For grasses, apply no more than 60 lb N per acre at planting, and then 45-60 lb after the first cutting, if moisture is not limiting. If being used for grazing, nitrogen rate can be decreased based on forage needs.

Toxicities - There are two potential toxicities that can occur with summer grasses.

Nitrate toxicity - Nitrate accumulation occurs because the plant continues to take up nitrogen through the roots, but drought conditions cause an inadequate water supply for rapid plant growth. Nitrates are accumulated in the plant for use in protein formation when adequate water becomes available.

When the animal consumes a plant with high nitrate levels, the nitrogen is converted from nitrate to a form called nitrite. These nitrites get into the blood stream and interfere with the ability of red blood cells to carry oxygen. Animals suffering from nitrate poisoning exhibit labored breathing, muscle tremors and staggering. Membranes of the eyes and mouth are bluish because of the lack of oxygen. Death can occur relatively quickly.

Prevention is the best way to deal with nitrate toxicity. If any pasture is suspected of having high nitrate levels, avoid grazing these pastures until seven to 10 days after an adequate rain. Hay that is suspected of having high nitrate levels can be analyzed.

Contact your local Extension office for more information.

Prussic acid poisoning - Prussic acid poisoning occurs when animals consume plants that contain high levels of prussic acid, a form of cyanide. Potentially toxic levels can develop in sorghum X sudangrass hybrids immediately after a frost. Pearl millet, teffgrass, and crabgrass do not produce prussic acid.

Prussic acid interferes with the ability of red blood cells to transfer oxygen. Symptoms include excessive salivation, rapid breathing and muscle spasms. Symptoms may occur within 10 to 15 minutes after the animal consumes the forage high in prussic acid.

If using sorghum X sudangrass hybrids, avoid grazing when temperatures begin to cool in the fall. This forage can be cut for hay, since prussic acid breaks down in 10-14 days. Even if hay is cut the day after frost, avoiding feeding this hay for 14 days will eliminate the danger.

Dr. Bates received his Ph.D from the University of Georgia and his M.S. and Bachelor's of Science from Louisiana State University. He joined the faculty of The University of Tennessee in 1993 as an Extension Forage Specialist. Dr. Bates's educational program emphasizes the practices needed for profitable forage production. Forage species selection, establishment, fertilization, harvest and storage are the major areas of his program.

Species	Pros	Cons	Seeding rate	Seeding depth
Sorghum x sudangrass	High yielding. Grazing or hay use. Can be planted earlier than most other summer annual grasses.	Prussic acid potential with fall frosts. Worst nitrate accumulator of summer annual grasses. Can grow 6 ft tall if not managed.	30 lb drilled	½ - 1 in
Pearl millet	High yielding. Grazing or hay use. No prussic acid potential.	Can grow 6 ft tall if not managed.	20 lb drilled	½ - 1 inch
Teffgrass	High quality. Fine stemmed. Very palatable.	Not as high yielding as SS hybrid or pearl millet. Can be pulled up when grazed due to shallow root system	8 lb	⅛ inch
Crabgrass	Easy to establish. Palatable. Good for grazing and hay.	Not as high yielding as SS hybrid.	4 lb	¼ inch
Cowpeas	High quality. Legume – no nitrogen required.	Usually need to be grown in mixture with SS hybrid, pearl millet or teffgrass.	75 lb	1 inch
Annual lespedeza	Can grow on low fertility soil. High quality	Not high yielding. Short-seasoned	25 - 40 lb	¼ inch