

Summer annuals for grazing:

A report of an on-farm demonstration

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Summer annuals can provide valuable grazing during July and August when most cool-season pastures are not productive. Additionally, they provide a good way to keep land productive while rotating to a fall-planted small grain or forage. Richard Clemmer- a Rockbridge County cattle producer- hosted a summer annual grazing project with Virginia Cooperative Extension, NRCS, and the Chesapeake Bay Foundation during the summer of 2014. In this project, an old sod was rotated into winter annual pasture and followed by summer annuals in order to transition back into perennial grass hay. The following paper details the project as it relates to summer annual selection and establishment, grazing, forage yield and quality, and feed cost savings.

Establishment

Several goals were considered when choosing forage species for summer annual pasture: the desire for quick-establishment to combat weeds, the ability of the forage to produce in hot, dry conditions, and the desire to provide good nutrition for growing calves. The following species mixtures and rates were drilled into tilled ground on June 1, 2014. 50 lbs./acre of nitrogen was applied at planting.

- 15 lbs. ‘Wonderleaf’ pearl millet + 4 lbs. forage brassica (\$32/acre)
- 12.5 lbs. BMR sorghum-sudangrass + 10.5 lbs. buckwheat (\$63/acre)
- 40,000 plants/acre ‘Mastergraze’ BMR corn (\$73/acre)

‘Mastergraze’ is a tillering corn hybrid suited to grazing. An herbicide program of 1 pint metolachlor and ½ pint atrazine per acre was applied preplant to the corn field.



Summer Grazing- with beef cows and 3 to 5-weight calves

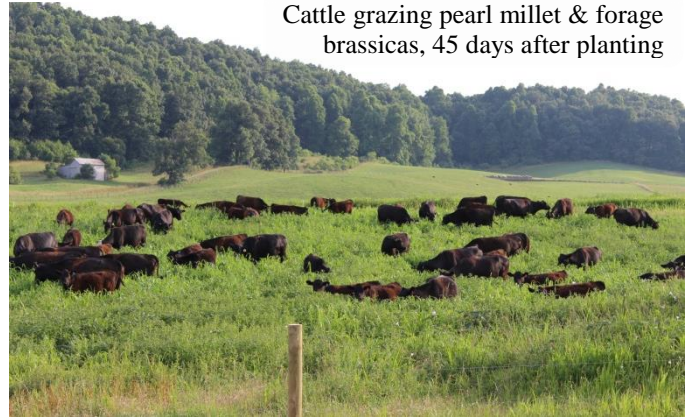
The pearl millet/brassica and sorghum-sudangrass/buckwheat mixtures grew enough to begin grazing by 35-40 days after planting. Buckwheat was in full flower at this point; pearl millet and sorghum-sudangrass were in the pre-boot stage. Corn was grazed at around 60 days after planting. Corn was tassling at this point. Rainfall during June and July was around 2”, with most occurring during June. Plants were grazed with no effort to leave stubble for regrowth, although with proper management multiple grazings are possible on the mixtures. Multiple grazings are not possible on corn. The following yield and quality values in table 1 were recorded just prior to grazing.

Table 1. Yield and forage quality of summer annuals.

	Yield/acre (lbs. DM)	Crude protein (%)	Digestible energy (% TDN)	Lbs. of crude protein/acre	Lbs. of TDN/acre
pearl millet & brassica	6123	26	78	1592	4776
sorghum-sudangrass & buckwheat	8712	21	79	1830	6882
‘Mastergraze’ BMR corn	7000	15	75	1050	5250



Moving fence in corn after clearing a path with the truck



Cattle grazing pearl millet & forage brassicas, 45 days after planting

The summer annuals were planted in blocks. 60 Cow-calf pairs strip-grazed around 2 acres at a time, lasting 2-3 days at each move. Cattle had constant access to fescue sod, and back-grazed to water. Grazed in this way, each acre of the summer annual mixtures provided about 200 cow-days of grazing (*i.e. each acre fed the equivalent of two hundred 1,000 lb. cattle for a day*). Comparing the measured yield to the actual grazing obtained by the animals, it is estimated that roughly 65% of the standing forage was utilized as feed- the rest was trampled.



Cattle grazing sorghum-sudangrass, 50 days after planting

The corn was grazed by the equivalent of 75 cow-calf pairs. The field was strip-grazed around 2 acres at a time. Cattle had constant access to fescue sod, and back-grazed to water. Grazed in this way, each acre of the summer annual mixtures provided about 150 cow days of grazing (*for example, 150 head weighing 1,000 lbs. each*). Comparing the measured yield to the actual grazing obtained by the animals, it is estimated that roughly 55% of the standing forage was utilized as feed- the rest was trampled or stalks were left standing.



Pearl millet & forage brassicas, 45 days after planting



Buckwheat/sorghum-sudangrass mixture



Cattle grazing corn, 65 days after planting

Table 2 shows the nutrient needs for different classes of beef cattle. All summer annual mixtures in this project exceeded animal nutrient needs for all classes of beef cattle.

Table 2. Nutrient needs of beef cattle. (NRC, 1996)

Animal Class	Dry matter intake (lbs./day)	% TDN (energy)	% Crude protein
cow: late gestation	25.0	55.7	8.7
cow: early gestation	27.5	58.7	10.0
first-calf heifer	23.8	61.4	10.7
6 wt. calf (2 lbs. daily gain)	14.4	68.0	12.1
dry cow	24.2	44.9	6.0

Several animal health items should be taken into account when grazing the species used in this project:

- 1) Brassicas (e.g. turnip, rape, radish) commonly have extremely high levels of protein. Excess protein in the diet must be metabolized and can represent a major energy cost to the animal, potentially causing a loss in body condition. Additionally, brassicas are high in moisture content and can cause loose manure. These concerns were managed in this project by including pearl millet in the mixture as an additional fiber source.
- 2) Sorghum- sudangrass contains a compound called dhurrin, which can break down to release prussic acid (hydrogen cyanide, HCN). This compound is highest in young plants. Therefore, it is recommended to withhold grazing until the plant is 18 to 20 inches tall. This also applies to regrowth following grazing or a drought-ending rain. Also, do not graze or green chop for 10 days after a killing frost. High levels of nitrogen can increase the likelihood of prussic acid poisoning as well as nitrate poisoning. Dark green plant growth often contains higher levels of prussic acid. Most prussic acid is lost during the curing process. Therefore, hay and silage are not usually toxic even if the original forage was. Do not leave green chop in a wagon overnight and then feed. The heat that occurs will release prussic acid and increase the likelihood of toxicity in the feed. Individual animals vary in susceptibility to prussic acid poisoning. Cattle are more susceptible than sheep. Animals receiving grain with the sorghum forage are less likely to be affected.

Summary

The ability to provide mid-summer grazed proved to be a valuable asset to animal nutrition and pasture management. Cool-season pastures that were historically overgrazed during summer received rest, and cows and calves that historically grazed pasture low in available forage and diminishing nutrition were able to graze actively growing forages of high forage quality. Additionally, the use of these summer annuals prepared the fields for a timely fall planting.

Notes:

BMR

Many corns, sudangrasses and sorghum hybrids are BMR (brown-midrib) traited. Brown midrib is a genetic mutation that results in low lignin levels in the plant. Resulting forage quality is significantly higher in palatability and digestibility (for example, a 5 point increase in IVTD 'in vitro true digestibility). The potential for increased lodging exists with BMR hybrids.