

## SARE Funded:

### Goat Friendly Pasture Project Report from Pulaski County Kentucky 2003

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**Purpose:** The purpose of the Goat Friendly Pasture Project has three major objectives. First, to evaluate thought-applied research and to demonstrate through Extension education techniques methods that reinforces to goat farmers the importance of forage and browse plants and their contribution to the economic sustainability of the meat goat industry.



Secondly, to integrate annual and perennial grass and legumes into a production system that maximizes the use of Kentucky 31 Tall Fescue.

Third, goat producers must learn to utilize innovative pasture management techniques as the primary tool for reducing gastro-intestinal parasite infections in goats.

**Method:** Twenty-four dry pregnant does were randomly allocated to 6-grazing paddocks. Four goats were placed into each grazing paddock. Goats in 3 of the paddocks were rotationally grazed (R) while the latter 3 were grazed without rotation (Non-R). The overall stocking rate was 9.6 animals/ acre. The stocking density for the rotated group was 49.5 animals/ acre. Stocking rate for each grazing sub-division or cell is calculated by dividing the number of animals grazing within a field sub-division.

The rotated groups were moved forward in rotation at 7-day intervals without access to the previously grazed section. This allowed time for the grazed pasture to regrow. At the same time, the non-rotated groups were grazed continuously without rotation and without allowing any regrowth time between grazing.

All goats were dewormed, weighted, body scored and assessed for anemia as well as sampled for gastro-intestinal parasite eggs two days before the start of the grazing study. All goats in the study grazed a sorghum sudangrass hybrid for 70 days. The hybrid was sod seeding into tall fescue on May 20 and was seeded at 60 lbs/acre. Two application of ammonium nitrate fertilizer was made at seeding (50 lbs N) and again at first grazing.

The study was started on July 7 –September 17. This would be considered the peak gastro-intestinal parasite infection period. All the does in the study were not dewormed or fed supplemental grain or concentrate during the 70-day grazing period. However, water and mineral were provided free choice.

**Results:** All does rotated and non-rotated, gained body weight. The non-rotated group gained 28.06 lbs for the 70-day trial. The average daily gain (ADG) for the non-rotated group was 0.40 lbs/day. On the other hand, the rotated group gained 23.33 lbs for the 70 days and averaged 0.33 lbs/day as ADG.

<b>Table 1</b>				
<b>Change in Weight Over Time for Goats Grazing a Sorghum Sudangrass Hybrid</b>				
Date	7/7/03	8/7/03	9/17/03	Total
Non-R	106.67	111.08	134.73	28.06
R	107.50	115.33	103.83	23.33

Goats in the study maintained an acceptable body condition (> 2.0 in a 1-5 scale see Table 2) throughout the 70-day grazing period.

Likewise, all does were observed to be only moderately anemic after 70 days without deworming (Table 4). Anemia was assessed by visual inspection of the mucus membranes of the eye and upper lip with 1 = pink and 3 = gray or anemic.

Table 3 illustrates the change in fecal egg counts per gram of feces (FECs) over the 70-day period. Initial counts were near 0 eggs/gm of feces. Egg counts increased overtime to 173.09 eggs per gram of feces (non-rotated) and 206.80 eggs per gram (rotated) at the end of the 70-day grazing period. All samples were analyzed and counted by the Wisconsin Direct Count Method.

<b>Table 2</b>				
<b>Change in Body Condition Score for Goats Grazing a Sorghum Sudangrass Hybrid</b>				
Date	7/7/03	8/7/03	9/17/03	Ave.
Non-R	2.83	2.88	2.91	2.87
R	2.50	2.17	2.33	2.51

These numbers indicate a need for treatment but are well below levels of great concern. FECs for goats grazing at high stocking rates during summer months (> 3 goats / acre) would commonly expect egg counts to be at least 500 eggs/g and could be as high as 1500 eggs/g (statement by

Dr. Gil Myers PhD, consulting parasitologist, Buffalo KY).

All test-does kidded within one to two months of the close of the 2003 study year. No adverse effects were observed due to treatment. The average kidding rate for all 24 females was 200%. All does appeared to lactate sufficiently.

**Discussion:** The following are comments that can be made from the observations recorded during the 70-day study.

If grazing goats do not have limited access to forage in a pasturing situation, goats will continuously consume emerging succulent regrowth and drastically reduce the carrying capacity of sorghum sudangrass. Conversely, goats that

<b>Table 3</b>			
<b>Change in Fecal Egg Counts for Goats Grazing a Sorghum Sudangrass Hybrid</b>			
Date	7/7/03	8/7/03	9/17/03
Non-R	0.64	27.89	173.09
R	0.18	11.33	206.80

graze forages by sections graze the forage down, top to bottom. They are then move forward in the rotation allowing time for regrowth to occur before regrazing.

Secondly, if grazing is not controlled in a pasture situation, goats will socialize at one location

in the field. Socializing areas are usually at the starting point of grazing. Short grasses and forbs growing in these socializing areas becomes a gastro-intestinal parasite infection source. On the other hand, goats grazing above the short grass, within grazing sub-divisions, avoid infection through avoidance of larvae ingestion.

Finally, goats grazing in rotation, within sub-divisions may become infected with

<b>Table 4</b>				
<b>Change in the Color of the Mucus Membranes</b>				
Date	7/7/03	8/7/03	9/17/03	Ave.
Non-R	1.67	1.00	2.09	1.59
R	1.58	1.00	2.42	1.67

gastro-internal parasites when the summer annual becomes limiting. Goats were observed grazing the short grass growing below the sudangrass when obvious over grazing had occurred. This observation was made late in the study after goats had gained weight and adequate daily dry matter alliance did not compensate for the weight gain.

The up-right growth habit of sorghum sudangrass appears to provide some degree of parasite larvae avoidance by the fact that the growth habit allows the goat to graze above the infection zone. Without the opportunity to grazing above the infection, zone (a zone usually 2 to 4 inches above the soil line) goats are forced graze low to the ground. Furthermore, better management of forage availability may drastically improve the avoidance advantage of the summer annual.

## Forage plant acceptability: planting ease, integration with fescue

The sorghum sudangrass hybrid, used in this study has many attributes relating to both quantity of dry matter need for an intensely managed 60 – 90 day grazing

Regrowth Period	Week 1	Week 2	Week 3
Lbs DM/ac	274.69	1763.45	2715.57
Stocking Rate	9.6 goats/ac		
Stock Density	49.5 goats/ac		

period during the mid-late summer period. Table 5 shows the rapid regrowth potential and excellent carrying capacity of the sudangrass when manage in a manner that allows regrowth to occur. Regrowth for weeks 1, 2 and 3 were 274.69, 1763.45, 2715.57 lbs of dry matter following grazing. Likewise, Table 6

illustrates that the sudangrass is stable in quality, indicated from the relative feed values (RFV), crude protein (CP), and total digestible nutrient readings taken from 1-3 week regrowth period.

**Preliminary recommendations:** These are preliminary recommendations gleaned from the 2003 grazing year. They are not met to be absolute, but may give some guidance for management.

Set daily forage allowance at 8-10% of the live body weight of the grazing animals. Secondly, keep foliage residue levels at 25% of the total plant foliage volume. This may help to keep the goats grazing high and reduce the amount of grazing close to the ground.

Set paddock residence time (time spent grazing on one location or cell) at 7 to 10 days and a return to graze regrowth at 14 to 21 day intervals. A minimum of four paddocks are needed but may not be utilized throughout the total grazing season. Therefore, grazing companions (steers, cows, horses) or haymaking is essential in controlling excess growth.



**Rule of Thumb:** Finally, based on the 2003 dry matter yields, 1/3 acre of sorghum sudangrass is needed for each acre of permanent cool season pasture (based on 3 does/acre).

**Table 6****Quality of Regrowth for Sorghum  
Sudangrass Weeks After Grazing**

Regrowth Period	Week 1	Week 2	Week 3	Ave.
RFV%	76.6	77.1	75.8	76.5
CP%	9.1	9.2	8.7	9.0
TDN%	49.5	50.3	49.4	49.7