Eastern Gamagrass Provides Summer Forage

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The severe drought conditions that we are once again facing in much of Virginia has forced many of us to consider some alternative forages. Warm-season annuals like millet and sudangrass do thrive with hot summer temperatures but still require enough soil moisture to drill and establish. Many areas of the state haven1t had even that much moisture.

Warm-season perennials have always sounded good on paper, but establishment concerns have limited their use. However, we continue to hear success stories of producers who now swear by their perennial warm-season grasses.

Eastern gamagrass is a native warm-season perennial that has not received much attention in Virginia. It is tall-growing like switchgrass but considerably different in appearance and growth characteristics. Established plants can have crowns that approach 3 feet across; and stands with as few as 1 plant per square yard can be very productive. The stand can appear quite open when grazed or clipped short, but the same stands appear very dense when regrown because of the large number of leaves produced from each crown.

In 1997, we started experiments on two stands of "Iuka" eastern gamagrass that Dr. Dale Wolf had established several years earlier. In designing the experiments, we had several questions we wanted to address, including 1) how does eastern gamagrass respond to nitrogen fertilization?, 2) is eastern gamagrass sensitive to frequent and/or close cutting/grazing, and 3) can we manage eastern gamagrass for better forage quality without sacrificing persistence or a significant amount of yield?

With these questions in mind, we imposed several treatments. The experiment at the Kentland Farm near Blacksburg included two versus four cuttings per year and residual heights of five versus 10 inches. All treatments received 100 lb N/acre per year in split applications of 50 lb N/acre in early May and 50 lb N/acre in early July.

The experiment at the Northern Piedmont Agricultural Research and Extension Center at Orange included total season nitrogen rates of 0, 75, and 150 lb N/acre applied in split applications of 0, 38, and 75 lb N/acre in early May and early July. It also included two versus four cuttings per year. In both experiments, the four-cut treatments were cut about monthly beginning in early June. The two-cut treatments were cut in late June and late August.

Averaged over 1997 and 1998, four cuttings per year reduced total season yield 20% at Kentland and 38% at Orange compared to two cuttings per year (Figures 1 and 2). Residual height of cutting had a greater impact on total season yield with two cuttings than with four cuttings per year (Figure 2). With two cuttings per year, cutting to a 10" residual resulted in 23% less harvested yield over the season than cutting to a 5" residual; this reduction was only 16% with four cuttings.

Eastern gamagrass yield was very responsive to nitrogen fertilization (Figure 1). At Orange, application of 75 and 150 lb N/acre/year increased total season yields by 29 and 47%, respectively, in 1997; and 66 and 103%, respectively, in 1998, compared to the unfertilized controls.

Cutting frequency had a greater affect on forage quality than did nitrogen fertilization (Figures 3 and 4). At Kentland, four cuttings per year produced forage with 32% higher crude protein (10.0 vs. 7.6% CP, Figure 3) and 4% lower acid detergent fiber (39.8 vs. 41.5% ADF) concentrations than two cuttings. Surprisingly, residual height had no effect on quality of forage harvested (Figure 3). Neutral detergent fiber (NDF), a forage quality measure negatively related to dry matter intake potential of a forage, was unaffected by any management variable at Kentland, averaging 75%. At Orange, nitrogen fertilization increased season average crude protein concentration somewhat (Figure 4), but at the expense of increased NDF concentration (69.3, 71.4, and 72.0 % NDF averaged across cutting frequencies for 0, 75, and 150 lb N/acre, respectively, in 1998).

Don't be deceived by what appears to be generally low forage quality in this grass. Perennial warm-season grasses like eastern gamagrass are notoriously low in forage quality as measured by conventional laboratory analyses like crude protein, ADF, and NDF. Interestingly, animal performance generally far exceeds what would be estimated by looking just at forage quality results, so these results should be looked at comparatively, not to predict animal performance in terms of potential gain or milk production.

After two years, our data suggest that maximum yields of eastern gamagrass are achieved with infrequent cutting (two cuttings per year) to a low residual height. Our data also suggest that there is an economic yield response to using 150 lb N/acre/year on eastern gamagrass. Frequent cutting was the only management variable that significantly improved forage quality, and even then, only crude protein concentration was improved.

Even though frequent cutting reduces total season yields of eastern gamagrass, yields are still relatively high compared to other forages during the summer months. Thus, the quality benefit that we measured in addition to potential improvements in other measures of quality, palatability, and utilization may justify more frequent cutting and/or grazing in some livestock operations.

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Figure 1. Effects of Cutting Frequency and Nitrogen Fertilization on Total Season Forage Yield of Eastern Gamagrass at Orange, VA. (NPAREC 1997-98 Average)

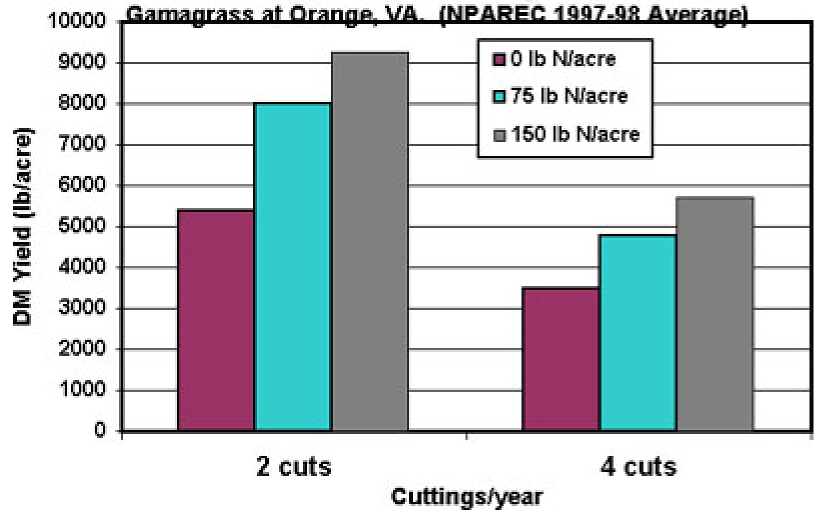

Figure 2. Effects of Cutting Frequency and Residual Height on Total Season Forage Yield of Eastern Gamagrass at Blacksburg, VA. (Kentland Farm 1997-98 Average)

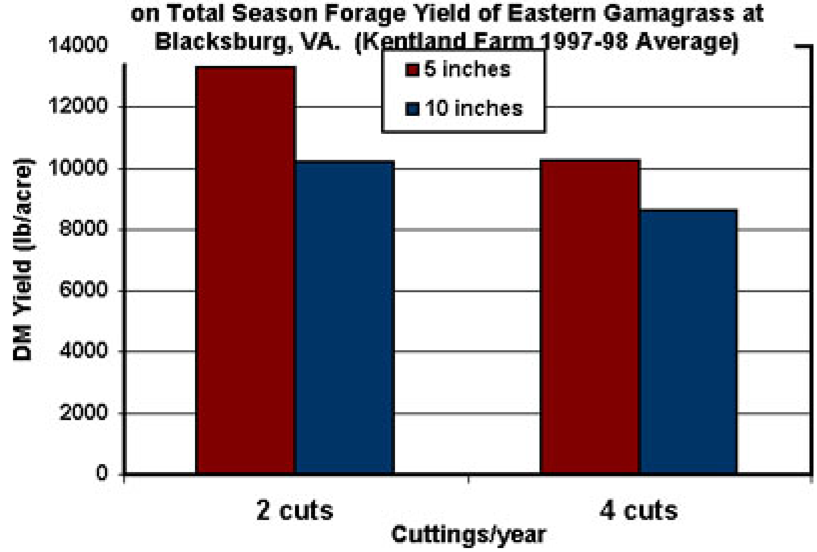

Figure 3. Effects of Cutting Frequency and Residual Height on Season Average Crude Protein Concentration of Eastern Gamagrass at Blacksburg, VA. (Kentland Farm 1997-98 Avg.)

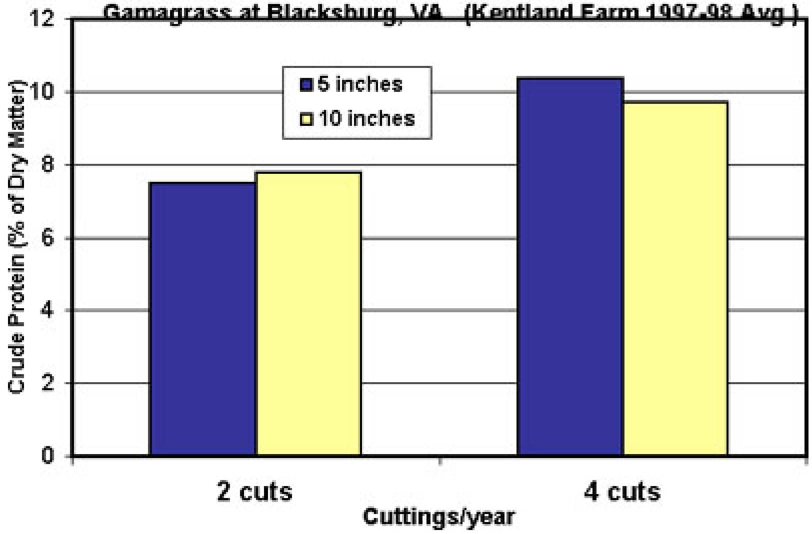

Figure 4. Effects of Cutting Frequency and Nitrogen Fertilization on Season Average Crude Protein Concentration of Eastern Gamagrass at Orange, VA. (NPAREC 1998 Data)