

GAMAGRASS – AN ALTERNATIVE SILAGE CROP

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ABSTRACT: Corn is the primary silage crop for dairy cows in Mississippi, however alternative crops can be produced in Mississippi and other states. At the North Mississippi Branch Experiment Station, a joint study with the Jamie L. Whitten Plant Material Center (PMC) was initiated in 2001. This study was undertaken to determine if: (1) Eastern gamagrass could be established as a perennial forage grass and sustained as a permanent source of silage (2) to compare dry matter yield and forage quality in Eastern gamagrass to corn silage. Many hybrid silage corn varieties have been developed and evaluated, however disadvantages exist when using corn for silage, such as annual establishment cost and soil loss on conventionally tilled sloping cropland. Eastern gamagrass, a native warm season perennial grass, may be a more sustainable silage production system that would reduce soil erosion and establishment costs. Our results indicate that Eastern gamagrass can be easily established and harvested for silage using conventional silage equipment. Eastern gamagrass yielded 22,114 lb dry matter per acre compared to corn silage of 16,039 lb dry matter per acre. Forage quality samples were not available at the time of this report.

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MATERIALS AND METHODS: In April of 2001 plots of 9062680 eastern gamagrass were established vegetatively from transplants received from the PMC . They were planted in four rows, 18 feet long with row spacings of 38 inches. Within the row, the transplants were spaced one foot apart. Fertility for all three replications was applied so as to maintain a soil pH of 6.0-6.5 and P and K at medium levels. Nitrogen was applied at 50 pounds per acre after plants were established and actively growing. No harvest data was taken on these plots in 2001. In late February of 2002, the gamagrass plots were burned off using a drip torch, allowing for new spring growth. On 4/3/02, a Pioneer corn silage hybrid, 32K61, was planted in a randomized complete block design consisting of 4 thirty-eight inch rows 18 feet in length, replicated 3 times. All corn planting was randomized within the study site of the gamagrass plots. Corn plots were sprayed with conventional herbicides for optimum weed control and fertility levels for production levels of 150 bushels per acre. On 4/4/02 all gamagrass plots received 60 pounds of nitrogen per acre in the form of ammonium nitrate. The first harvest of gamagrass was taken on 6/17/02 when approximately 50 percent of the reproductive stems were in the boot stage of maturity. Plots were machine harvested with a sickle mower and chopped 3/8 to 1/2 inch with a

silage harvester. Biomass from each plot was weighed and a sample was taken for dry matter analyses. Three sub samples were taken from each plot and put into a plastic bag for ensiling. Air was removed from these bags with a vacuum pump and sealed prior to ensiling. Corn plots were harvested on 8/5/02 with a two-row forage harvester. Biomass from the corn plots was weighed and sub samples taken for ensiling. Gamagrass was harvested again on 9/11/02 and the same sampling techniques were observed. Yield data and dry matter percents are shown in (Table1).

RESULTS AND DISCUSSION: It appears that Gamagrass has the yield potential for a silage crop as compared to corn (Table 1). The yield of the first cutting of gamagrass was eighty-eight percent of that of corn. However, the second cutting of gamagrass was forty-nine percent of corn yields. The total dry matter yield of gamagrass is one hundred and thirty eight percent of corn yields. Lower yields might be expected in the second cutting of gamagrass plots due to lack of soil moisture. Within the sixty plus days between cuttings of gamagrass rain amounts totaled less than six inches. There was no statistical differences observed within the total yield of corn and gamagrass plots. Total yield of both forages showed to have no statistical difference. Forage quality analyses are being used to compare the two forage crops however as this article is being written the lab results are not available. It is a fair and safe assumption that accession 9062680 Eastern Gamagrass can and most likely out yield corn due to its multiple harvest. Further testing needs to be continued to evaluate the sustainability of the gamagrass species.

TABLES:

Table 1. Yield and Dry Matter Percent of Silage Forages

Forage Crop	Dry Matter Yield (lbs. / ac.)			Dry Matter (%)	
	1 st cut	2 nd cut	Total	1 st cut	2 nd cut
Gamagrass	14,194	7,920	22,114	42.2	36.0
Corn			16,039	45.9	
LSD (0.05)			NS		