

Louisiana has battled through one of the hottest, driest summers on record in 2023. These extreme conditions have caused steep declines in quantity and quality in grazing and hay pastures which has resulted in the taking of drastic measures for many producers. In response to the shortage of hay production, many cattle producers have resorted to baling and feeding rice straw as a source of forage to cattle.

As feeding rice straw as a source of forage to cattle is an unconventional practice, 52 samples of multiple varieties of rice straw were collected across the state and analyzed for necessary nutrient values such as dry matter, protein, fiber, minerals, and energy value. The samples were then compared to 13 grass forage samples that were baled at the same time. The goal of this study was to determine any significant nutrient value differences in rice straw (varieties) compared to grass forages that were baled at approximately the same time.

Average nitrogen rates per acre that were reported with rice straw samples ranged from 90 to 165 units of nitrogen per acre (average of 134.3 units of nitrogen per acre). Average nitrogen rates that were reported with grass forage samples ranged from 0 to 100 units of nitrogen units per acre (average of 39.4 units of nitrogen per acre).

Two forage harvesting methods were employed when baling rice straw. One method was baling foliage material that directly exited the combine during rice harvest, while the other method was cutting rice stubble after harvest and combining it with foliage material that directly exited the combine during rice harvest. The harvesting method could affect the quality of the rice straw samples and that information was not gathered with each sample submission.

Figure 1 is a table comparing nutritive values of sampled grass forages (Bahia and Bermuda) and rice straw varieties. Each cultivar listed had multiple replications.

Figure 1.

Mean comparisons by cultivar

Cultivar	Crude Protein, %DM	Total Digestible Nutrient, %DM	DM Intake, % body weight	Relative Forage Quality
Bahia	7.71AB	56.78AB	2.08AB	96AB
Bermuda	7.84A	62.37A	2.52A	129A
CLL16	3.51C	46.43C	0.96C	36C
CLM04	2.80C	49.54BC	1.23C	50C
Cheniere	4.58BC	52.64BC	1.55BC	68BC
Jasmine	3.25C	49.36C	1.20C	49C
Jupiter	3.70C	49.62C	1.27C	52C
PVL03	4.01C	50.75BC	1.40C	58C
7321	3.69C	47.98C	1.14C	45C
P- value	< 0.0001	< 0.0001	< 0.0001	< 0.0001

† Analysis was done by proc Glimmix of SAS.

‡ Cultivars or species such as brown top, CL111, CL153, Mermentau, and Mixed grass were eliminated from the comparisons due to a lack of replications.

§ Mean comparisons were done by Tukey's multiple tests.

With each sample that was submitted, nitrogen applications were gathered. Crude protein (CP) is a measure of the amount of nitrogen (N) in a forage. Total digestible nutrients (TDN) is an estimate of all digestible organic nutrients (protein, carbohydrates and fat) of a forage that are available to the animal. Dry matter intake (DMI) is the amount of feed an animal consumes per day on a moisture-free basis.

Relative forage quality (RFQ) is an estimate of how much available energy a non-lactating animal will obtain daily from a particular forage if it is all that is fed.

Figure 2 is a table of submitted rice straw samples that show units of nitrogen applied and how it correlates with crude protein values, total digestible nutrients (TDN), dry matter (DM) intake, and relative forage quality (RFQ).

Figure 2.

Mean comparisons by N fertilizer

Units of N	Crude Protein, %DM	Total Digestible Nutrient, %DM	Dry Mater Intake, % body weight	Relative Forage Quality
90	2.63A	48.01A	1.10A	43A
118	2.55A	49.05A	1.17A	47A
120	3.88A	46.83A	1.02A	40A
125	3.89A	50.24A	1.30A	54A
130	2.50A	47.19A	0.99A	38A
140	4.14A	49.74A	1.34A	54A
145	4.60A	51.99A	1.51A	65A
150	2.85A	49.04A	1.21A	48A
160	2.50A	47.11A	1.00A	39A
165	2.65A	48.57A	1.09A	44A
P- value	0.0154	0.1165	0.0618	0.0913

† Analysis was done by proc Glimmix of SAS.

‡ N fertilization rates of no-replications and non-rice straw samples were eliminated from the data.

§ Mean comparisons were done by Tukey's multiple tests.

This information may be considered by producers in winter forage decision making.

When comparing nutritive values of rice straw to grass forages (as shown in Figure 1), it is evident that rice straw will likely contain less crude protein, energy (TDN), and have a lower relative forage quality. This indicates that producers will likely need to supplement with an additional commodity or commodities to meet the nutrient requirements of beef cattle. While rice straw alone will not meet the nutrient requirements of most beef cattle, it can be incorporated into a ration as a cost-effective commodity. Agents and specialists with the LSU AgCenter can assist in determining nutrient requirements of your herd, as well as formulating a ration.

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