



## Protein fractions of Marandu Palisadegrass Fertilized with Nitrogen Sources

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### INTRODUCTION

Marandu palisadegrass (*Brachiaria brizantha* cv. Marandu) is the most widely planted grass for forage production in Brazil. Although nitrogen (N) fertilization can increase forage productivity and quality, the high cost of commercial fertilizer has prompted the need to evaluate N sources that optimize forage responses.

The objective of this experiment was to evaluate crude protein (CP) fractionation concentrations of Marandu palisadegrass in response to N sources (urea, urea treated with urease inhibitor, polymer coated urea, ammonium sulfate, ammonium nitrate, ammonium sulphonitrate and control treatments).

### MATERIAL AND METHODS

The field experiment was conducted in Ilha Solteira, SP, Brazil (20° 21' S, 51° 22' W and 226 m) from Nov. 2012 to Jan. 2013. The experimental design was a randomized complete block design with four replications.

Fractions A of protein were determined after treatment with trichloroacetic acid at a concentration of 100 g L<sup>-1</sup>, as described by Licitra et al. (1996). Fraction B3 of protein was obtained by the difference between fraction A of protein and the value of the NADF and NNDF, while the true protein (fractions B1+B2 of protein) was obtained by the difference between fraction A of protein and the concentration of NNDF. Fraction C of protein corresponds to the NADF.

All parameters were analyzed statistically by means of using the Statistical Analysis System (SAS, 2004). The analysis of variance of the effects due to N sources was performed by ANOVA procedure and the level of significance of the F test was performed by Tukey test. It was used a significance level of 5% for statistical test.

### RESULTS AND DISCUSSION

Nitrogen sources showed no effect on protein concentrations associated with Fractions A (rapidly degradable) and B (potentially degradable) in all harvests. Average concentrations of the Fraction A during the 3 harvests were (313.2, 378.3 and 348.9 g kg<sup>-1</sup> of CP), respectively and Fractions B were (595.6, 522.2 and 540.5 g kg<sup>-1</sup> of CP), respectively in first, second and third harvest. For Fraction C (undegradable in the rumen), concentrations in the second and third were not affected by N sources and average concentrations were 106.6 and 124.2 g kg<sup>-1</sup> of CP, respectively. Concentrations of protein associated with Fraction C were affected by N sources in the first harvest, where the greatest concentrations were obtained with urea (Table1).

**Table 1.** Means, Coefficients of Variation (CV), Least Significant Difference (LSD) and Tukey test related to the crude protein (CP) fractionation concentrations (Fraction A, Fraction B and Fraction C) in three harvests of Marandu palisadegrass in response to nitrogen (N) sources

Source s of N (100 kg ha <sup>-1</sup> of N)	1° Harvest	2° Harvest	3° Harvest
	11/25/2012	12/28/2012	01/25/2013
<b>Fraction A (g kg<sup>-1</sup> of CP)</b>			
Control treatments	374.6 a	354.0 a	362.7 a
Ammonium nitrate	352.6 a	375.1 a	372.5 a
Ammonium sulfate	309.9 a	386.3 a	315.2 a
Ammonium sulphonitrate	332.6 a	367.6 a	333.3 a
Urea	255.1 a	391.2 a	365.7 a
Urea treated with urease inhibitor	249.8 a	366.3 a	350.7 a
Polymer coated urea	318.7 a	407.4 a	342.1 a
LSD (5%)	192.05	108.92	95.59
CV (%)	26.23	12.32	11.72
<b>Fraction B (g kg<sup>-1</sup> of CP)</b>			
Control treatments	538.6 a	533.2 a	523.2 a
Ammonium nitrate	549.4 a	525.7 a	554.8 a
Ammonium sulfate	555.4 a	505.1 a	548.7 a
Ammonium sulphonitrate	626.1 a	531.7 a	547.8 a
Urea	645.1 a	531.5 a	570.5 a
Urea treated with urease inhibitor	653.1 a	522.1 a	508.3 a
Polymer coated urea	601.5 a	506.3 a	530.5 a
LSD (5%)	174.67	113.85	121.03
CV (%)	12.55	9.33	9.58
<b>Fraction C (g kg<sup>-1</sup> of CP)</b>			
Control treatments	86.8 b	141.1 a	114.2 a
Ammonium nitrate	98.0 b	99.2 a	126.7 a
Ammonium sulfate	93.6 b	103.8 a	136.1 a
Ammonium sulphonitrate	90.5 b	101.2 a	118.9 a
Urea	144.5 a	103.1 a	104.7 a
Urea treated with urease inhibitor	97.1 b	111.6 a	141.0 a
Polymer coated urea	91.2 b	86.3 a	127.4 a
LSD (5%)	46.42	68.09	55.56
CV (%)	19.81	27.32	19.15

Means within column followed by the same letter are not different using the Tukey test ( $P > 0.05$ ).

### CONCLUSION

Urea may be the best option due to its lower cost and higher N concentration, since protein concentrations associated with the various fractions did not differ with the N source.

### REFERENCES

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