Effects of Nitrogen Fertilization Management Practice on the Yield and Straw Nutritional Quality of Commercial Rice Varieties

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ABSTRACT

An experiment with treatments comprising of five nitrogen rates (0, 120, 160, 200 and 240 kg N/ha) was carried out to assess the effects of nitrogen fertilization management practice on the grain yield and straw nutritive quality in two commercial rice varieties; MR 211 and MR 219. Increases in nitrogen application was found to increase (P<0.01) the grain yield, total spikelets per square meter, number of spikelets per panicle and straw crude protein from 4.56% to a maximum level of 8.45%. It also decreased (P<0.05) the in vitro true dry matter organic digestibility (IVTOMD) from 59.1% to 55.14%, neutral detergent fiber (NDF) and acid detergent fiber (ADF). There were varietal differences in the straw nutritional properties, where MR 219 had higher NDF, hemicellulose and cellulose (P<0.05) concentration where as MR 211 had higher amount of acid detergent lignin (ADL) (P<0.01) and silica (P<0.05) in the straw. Between the two varieties, MR 219 is superior to MR 211 in view of the higher grain production and grain: straw ratio. The result from correlation between agronomic characteristics and straw nutritive quality implies that rice varieties with good agronomic characteristics have potential in yielding straws with better nutritive quality.