

Effect of Reducing Urea Application on Maize Yield and Stylo Nodulation in a Maize-Stylo Mixed-Stand Forage System

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The influence of reduced urea application on biomass of hybrid fodder maize (*Zea mays* L. cv. Veera) yield and nodulation in stylo (*Stylosanthes guianensis*) in a maize-stylo mixed-stand was investigated. The experiment was conducted as a randomized complete block design with four urea levels; 425, 383, 340, and 0 kg/ha representing 100%, 90%, 80%, and 0% of the recommended rate. All treatments received 100 kg/ha TSP and 50 kg/ha MOP. In field experiment, stylo was sown (410,000 plants/ha) a month before establishment of maize (111,000 plants/ha). The same treatments were applied in a pot experiment. Forage sampling was conducted at the tasseling (VT) and dough (R4) stages of maize. In the field experiment, plant weight (PW) and dry matter yield (DMY) of maize were measured. In pots, stylo root nodules were counted. Regardless of fertilizer treatment, fodder maize reached VT and R4 stages at 8 and 10 weeks, respectively. At R4, maize recorded higher ($P < 0.05$) PW (197 ± 12 - 243 ± 2 g/plant) and DMY (10.99 ± 0.64 - 13.50 ± 0.10 MT/ha) than at VT (105 ± 5 - 128 ± 8 g/plant; 5.83 ± 0.30 - 7.12 ± 0.42 MT/ha). Reduced urea application decreased ($P < 0.05$) PW and DMY, but no significant difference ($P > 0.05$) was observed between 100% and 90% rate at VT (125 ± 3 vs. 128 ± 8 g/plant) or R4 (243 ± 2 vs. 217 ± 8 g/plant). Correspondingly, DMY did not differ ($P > 0.05$) at VT (6.97 ± 0.16 vs. 7.12 ± 0.42 MT/ha) and R4 (13.50 ± 0.10 vs. 12.08 ± 0.46 MT/ha). Stylo nodule number increased as urea decreased, with the highest ($P < 0.05$) value at 0% urea (394.5 ± 29.5 and 451.7 ± 36.9 nodules/plant at VT and R4). Nodule numbers did not differ ($P > 0.05$) between stages. A 10% reduction in urea is feasible without compromising maize fodder yield while enhancing stylo nodulation in a maize-stylo mixed-stand forage.

Keywords: Dough stage, Dry matter yield, Maize-Legume intercropping, Tasseling stage

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