

**INFLUENCE OF PLANT DENSITY ON GROWTH, FODDER
YIELD AND CHEMICAL COMPOSITION OF SELECTED MAIZE
AND SORGHUM VARIETIES CULTIVATED DURING YALA
SEASON IN DRY ZONE OF SRI LANKA**

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by

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ABSTRACT

The present study assesses the influence of planting density on growth, yield and chemical composition of five selected maize (*Zea mays*) varieties (Bhadra, Maize hybrid 01, Maize hybrid 02, Jet 999 and Pacific 339) and two sorghum (*Sorghum bicolor*) varieties (Sugar graze and MI Sweet Sorghum) cultivated during *Yala* season in the Dry Zone of Sri Lanka. The experimental design was two-factor factorial complete randomized design with three replicates. Maize and sorghum were harvested at 50% silking and flowering stages, respectively. Plant growth and yield parameters were recorded. Chemical composition was determined. Leaf area index (LAI), fresh matter yield (FMI) and dry matter yield (DMY) were estimated. The LAI, FMY and DMY were influenced ($P<0.05$) by density, variety and variety & density interaction. The height and leaf number were influenced ($P<0.05$) by density and variety. MI Sweet sorghum at low density recorded the highest ($P<0.05$) plant height (241.53 ± 6.63 cm). Sugargraze recorded the highest ($P<0.05$) LAI at low (3.06 ± 0.40) and high densities (5.50 ± 0.57). Sorghum varieties were superior ($P<0.05$) to corn varieties in terms of FMY at both densities. Sugargraze (55.48 ± 5.19 MT/ha) and MI sweet sorghum (51.33 ± 5.59 MT/ha) recorded the highest ($P<0.05$) FMY at high density. At low density, Sugargraze recorded the highest ($P<0.05$) DMY (7.92 ± 0.34 MT/ha) followed by MI sweet sorghum (5.53 ± 0.20 MT/ha). Contrary at high density, MI sweet sorghum recorded the highest ($P<0.05$) DMY (8.36 ± 0.84 MT/ha) followed by Sugargraze (6.45 ± 0.66 MT/ha). Density alone influenced ($P<0.05$) on Dry Matter (DM), Neutral Detergent Fiber (NDF), Acid Detergent Fiber (ADF) and lignin contents, whereas variety alone influenced ($P<0.05$) on °brix value, DM, ash, NDF, ADF and lignin content. At low and high densities, MI hybrid 2 (6.83 ± 0.60 and 7.16 ± 0.33 , respectively) and MI sweet sorghum (6.66 ± 0.72 and 7.16 ± 0.16 , respectively) had the highest °brix values. The results confirmed that sorghum varieties; MI sweet sorghum followed by Sugargraze (*i.e.*, at 50% flowering) are superior to corn varieties (50% silking) in terms of fodder yield when cultivated at high density, in the Dry Zone, during *Yala* season. Greater °brix value of MI hybrid 2 and MI sweet sorghum indicates that the varieties are suitable for silage production.

Keywords: °Brix value, Dry matter yield, Fresh matter yield, Leaf area index