

GROWTH PERFORMANCE, CHEMICAL COMPOSITION AND SILAGE QUALITY OF  
NAPIER (*PENNISETUM PURPUREUM*) AND GUINEA (*PANICUM MAXIMUM*) FODDER  
IRRIGATED WITH BIO-DIGESTER SLURRY

BY

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## ABSTRACT

The objectives of study were to determine the growth performance, chemical composition and silage quality of Napier (*pennisetum purpureum*) and Guinea (*panicum maximum*) fodder irrigated with bio-digester slurry. Poultry and cattle bio-digester slurry and borehole water were used to irrigate the fodder at Maila and Nthabalala respectively. Two treatments of irrigation with or without bio-digester slurry were used in a complete randomised block design. Napier cuttings with three nodes were planted, two nodes in the ground and one above ground level at an angle of about 30 - 45°. Sterilized Guinea grass seeds were sown at the rate of 3 kg/h at a depth of 1 cm. The Panicum grass was banded in rows spaced at 75 cm apart and then after germination were thinned to 75 cm within the row. Turkey's procedure was used to compare treatment means. The slurries were characterised by mineral B, Cu, Mn and Mo mineral deficiencies. Mineral content in poultry and cattle slurry was N>K>Mg>P>Ca. Micronutrients were significantly ( $P < 0.05$ ) low ( $< 30$  ppm) in bio-digester slurry. Irrigating the fodder with bio-digester slurry or borehole water only did not affect ( $P > 0.05$ ) number of tillers, leaves per plant, the height of the grass and the longest leaves length (in cm) and yield of the Napier and Panicum fodder. The stage of maturity at harvesting affected ( $P < 0.05$ ) the quality of the Napier fodder. Napier fodder ash, nitrogen detergent fiber (NDF) and acid detergent fiber (ADF) increased ( $P < 0.05$ ) with maturity. Napier fodder dry matter (DM) increased while CP decreased ( $P > 0.05$ ) with increase in the stage of maturity. Panicum fodder DM and ash increased with maturity until late stage of maturity while Crude protein (CP) decreased ( $P > 0.05$ ). Ash, NDF and ADF increases with maturity though they were not statistically significant ( $P > 0.05$ ). Panicum fodder was not ensiled because it failed to establish well at Nthabalala and at Maila because both Napier and Panicum were grazed by cattle from the surrounding village. Ensiled Napier fodder from Nthabalala with four additives replicated four times did not differ significantly ( $P > 0.05$ ) in their physical properties. The DM, CP, NDF, ADF and ash contents did not differ significantly ( $P > 0.05$ ) of all the silages. All the silages were of good quality except the control with a pH value of 6.2 which is a reflection of low quality silage. The minerals were not significantly different except for Mn in maize that was significantly higher of all the silages. After six weeks of ensiling, the pH was 3.5 – 4.5. It was concluded that application of bio-digester slurry as nitrogen fertilizer had positive effect on CP of the Napier fodder at late stages of maturity. The additives (molasses, sugar and maize) were added at 10% of the total weight of the chopped material and had a positive effect in the fermentation quality of silage.

**Key words:** Napier, Panicum, bio-digester slurry, fodder, irrigation, silage