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HERBAGE YIELD OF KYASUWA GRASS (*Pennisetum pedicellatum*) AS AFFECTED BY POULTRY MANURE RATES IN SEMI-ARID AREA OF ALIERO, KEBBI STATE, NIGERIA

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ABSTRACT
The effect of poultry manure rates on the establishment counts, fresh herbage and dry matter yield of kyasuwa grass (Pennisetum pedicelatum) was investigated during the 2021 dry season at the Orchard of Kebbi State University of Science and Technology, Aliero. Treatments consist of four varying poultry manure rates (0.00g/kg, 0.70g/kg, 1.40g/kg and 2.10g/kg) representing treatments 1, 2, 3 and 4 respectively, which were applied on four blocks consisting of three plots per block and each plot measuring (3m x 2m). The plots were laid out in a Randomized Complete Block Design (RCBD). Seeds of kyasuwa grass were sown manually at the rate of 5.6kg/ha for all the treatments by drilling method at a spacing of 30 cm (intra and inter row) and 50cm apart at planting depth of 1cm was used and covered with soil. The experiment lasted for 12 weeks during which plant establishment counts was done at 4 weeks after sowing, fresh herbage and dry matter yield were determined after harvesting at the end of the period. The results indicated that all the parameters measured were significantly ($p<0.05$) affected by the poultry manure rates. The highest plant counts (66.25%), fresh herbage (18.70t/ha) and dry matter (7.55t/ha) was obtained in Treatment 4 while the least plant counts (50.60%), fresh herbage (11.00t/ha) and dry matter (2.75t/ha) yield were recorded for the control treatment. The results suggested that kyasuwa grass responds positively to poultry manure application rates in the semi-arid zone of Kebbi State.

Key words: poultry manure rates, kyasuwa grass, herbage yield

INTRODUCTION
Among the factors affecting ruminant production in the tropics is low quantity and quality of feed particularly during the dry season period (Shapiro *et al*., 2015). Improvement and utilization of indigenous forage species in Nigeria is paramount to minimize feed shortage both in quality and quantity especially during the dry season period. Among the indigenous forage species is desho grass (*Pennisetum pedicellatum*) a native forage species of Ethiopia with different names in different countries of Africa. It is locally called kyasuwa in Nigeria (EPPO, 2014). The grass is drought tolerant and is used as feed for ruminant animals (FAO, 2010). The ability of desho grass as a drought tolerant makes it easily adaptable to tropical environments. It has potential to address some of the challenges of feed scarcity during the dry season, since it produces high dry matter yields of forage per unit area and ensures a sustained forage supply due to its multi-cut nature (Ecocrop, 2010). Kyasuwa grass is suitable for intensive management and can be sustainably cultivated on small plots of land. Asumare (2016) suggests that desho grass is both potential feed source and a means of soil conservation in the mixed crop-livestock production systems of Ethiopia.

Desho grass responds well to fertilizer application. It requires compost or manure of about 1,000-4,500kg/ha and 25-100kg/ha of urea fertilizer for establishment and maintenance (Danano, 2007). It is on this basis that the present study was to evaluate the fodder yield of *Pennisetum pedicellatum* as affected by poultry manure rates in the semi-arid area of Kebbi State.

MATERIALS AND METHOD
Study area
The experiment was conducted during the period of February to May, 2020 dry season at the Orchard of Kebbi State University of Science and Technology, Aliero. The area is located in the Sudan-sahelian

zone north-western part of Nigeria and lies between latitude $12^0$19'06''N and longitude $4^0$3'10'S with an average temperature and annual rainfall of 28.3^{0}C and 400mm respectively (ANON, 2012).

Field layout and Experimental Design

Treatment consisted of four poultry manure rates (0.00g/kg, 0.70g/kg, 1.40g/kg and 2.10g/kg) which were applied two weeks before sowing and laid out in randomized complete block design (RCBD) and replicated three times amongst four blocks. The land was prepared manually using hand hoeing. Gross plots measuring 13m x 11m (143m^2) were demarcated, four blocks separated by 1m between were laid out in an east-west direction containing three plots each (3m x 2m) separated by 0.5m within making a total of twelve plots. Seeds of kyasuwa grass obtained from National Animal Production Research Institute (NAPRI), Zaria were sown manually at the rate of 5.6 kg/ha for all the treatments by drilling method at a spacing of 30 cm (intra and inter row) and 50cm apart at planting depth of 1cm was used and covered with soil. Manual weeding with the use of hoe was carried out after establishment. Plant establishment counts were done at 4 weeks after sowing by counting the stands per treatment at 50cm apart. Harvesting was done manually using a sharp sickle at 12 weeks after sowing. Plants were harvested at the height of 5cm above the ground level.

Data collection and Analysis

Plant establishment counts were done by counting the stands in each treatment. The herbage yield determination was done by cutting the fresh stands from each treatment at the height of 5cm above the soil level at 12 weeks after sowing using a weighing balance scale (kg) and later air dried until constant weight was recorded to estimate the total dry matter (DM) yield.

Data collected were subjected to analysis of variance using IBM-SPSS v25 (2017). Means separation was carried out with the use of Duncan Multiple Range Test.

RESULTS AND DISCUSSION

The mean stands establishment counts, fresh and dry matter herbage yield as influenced by poultry manure rates is presented in Table 1. There was a notable effects ($p<0.05$) of manure application on the plant establishment counts and yield of kyasuwa grass. Treatment (T4) with 2.10kg of poultry manure recorded the highest; plant counts (66.25%) fresh weight (18.70t/ha) and dry matter weight (7.55t/ha) as compared with T2 and T3 while the least; plant counts (50.60%), fresh weight (11.00t/ha) and dry matter (2.75t/ha) yield were recorded for the control treatment. It was generally observed across the treatments that the higher the manure rate the higher the parameters measured. The findings of the present study is in line with the report of Babaji (1996), Adebayo and Akoun (2000), Akoun (2004). These authors affirmed that manure application increase the nutrients status of the soil which leads to overall increase in the growth performance and yield of forage plants. Similar observation was reported by Pelzer *et al*. (2012) in an increased herbage yield of *Sorghum bicolar* when manure was added to the soil.

Table 1: Plant counts, fresh herbage and dry matter yield of *Pennisetum pedicelautm*as affected by manure rates

Treatments (g/kg)	Plant counts (%)	Fresh yield (t/ha)	Dry matter yield (t/ha)
0.00	50.60^d	11.00^d	2.75^d
0.70	60.10^c	15.55^c	4.12^c
1.40	63.00^b	17.10^b	5.32^b
2.10	66.25^a	18.25^a	7.55^a
SEM	0.495	0.215	0.950

abcd: means on the same row with different superscripts are significant ($p<0.05$)

CONCLUSION

The findings of this study indicated that kyasuwa grass (*Pennisutum pedicelatum*) responds positively to poultry manure application rates with the highest plant establishment counts, fresh herbage weight and dry matter yield were obtained in treatment 4.

REFERENCES

Adebayo, O and Akoun, J. (2000). Effect of organic manure and spacing on the yield and yield components of *Amaranthus cruenthus* in: 20th Annual conference proceedings of Horticultural Society of Nigeria. Umeh, V. C. and Fagbayide, A. (eds). Horticultural Society of Nigeria. Pp. 63-67.

Akoun, J. (2004). Effect of plant density and manure on the yield and yield components of common onion (Allium cepa L.) Vas. Nsukka Red. *Nigerian Journal of Horticultural Science*, 9: 43-48.

Asumare, B. (2016). Evaluation of the agronomic, utilization, nutritive and feeding value of desho grass (Pennisetum pecillatum). Ph.D Dissertation, Jimma University Ethiopia.

Babaji, B. A. (1996). Effects of plant spacing and nitrogen fertilization on growth and yield of garlic. MSc thesis submitted to postgraduate school, ABU, Zaria. Pp. 44-48.

Danano, D. (2007). Improved grazing land management in Ethiopia. In H. Liniger and W Critchley (Eds). Where the land is greater (Pp. 313-316). Bern, Switzerland: WOCAT.

Ecocrop. (2010). Ecocrop database. FAO. htt://ecocrop.fao.org/ecocrop/srven/home.

EPPO (European and Mediterranean Plant Protection Organization). (2014). PQR database. Paris, France: European and Mediterranean Plant Protection Organization http//www.eppo.int/DATABASE/pqr/pqrhtm.

FAO (Food and Agricultural Organization). (2010).guidelines on ecology. United Nations. Rome

IBM-SPSS. (2017). Statistically Package for Social Sciences. Inc. Chicago IL

KARDA. (Kebbi State Agricultural and Rural Development Authority). 2018. Kebbi State Agricultural and Rural Development Authority reports.

Pelzer, E., Bazot, M., Makowski, D., Corre-Hellou, G., Naudin, C., Al Rifai, M., Baranger, E., Bedoussac, L., Biarnes, V., Boucheny, P. (2012). Pea-wheat inter-crops in low-input conditions combine high economic performances and low environmental impacts. *European Journal of Agronomy*. 40, 39-53.

Shapiro, B. I., Gebru, G., Desta, S., Negassa, A., Nigussie, K., Aboset, G and Mechal, H. (2015). Ethiopia livestock master plan. ILRI Project Reports, Nairobi, Kenya: International Livestock Research Institute (ILRI).