Effect of earthworm manure fertilisation on biomass production and mineral content of *Digitaria swazilandensis*

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Introduction Chemical fertilisers are expensive and can cause environmental contamination, affecting the biodiversity; it is therefore desirable to use organic manure that is cheaper and can be prepared on the same farm. Earthworm manure is the product of worms that transform organic matter (Salinas & Rojas, 1995), which improves the physical, chemical and biological properties of the soil (Pérez, 1993; Ravera & De Sanso, 1999). The importance of these improvements justifies the use of the worm humus in fertilisation programs in grasslands. Therefore, the objective of this experiment was to evaluate the effect of the earthworm manure on the biomass production and minerals concentration of *Digitaria swazilandensis*.

Materials and methods Plots of 2 x 5 m of *D. swazilandensis* sown three years before the experiment were used. The soil is sandy, low clay, low pH and medium fertility. A randomised design was used, with three repetitions and seven treatments (1 to 7): 0, 125, 250, 500, 750 kg/ha earthworm manure, respectively, 125 kg/ha earthworm manure + 700 kg/ha of 15-15-15 (N,P,K)and 750 earthworm manure kg/ha + 350 kg/ha of 15-15-15, respectively. Total, leaf, stem and weed biomass, as well as concentration of N, P, K, S and Ca were measured. Four samplings were carried out at 6 weekly intervals.

Results Biomass data are shown in Table 1 and mineral content in Table 2. There was no treatment effect ($P>0.05$) for any of the biomass variables, except stems ($P < 0.01$). Neither was there any effect ($P>0.05$) on mineral concentration, except for S ($P>0.01$). There were no significant differences ($P>0.05$) among treatments for weed biomass.

Table 1 Effect of the earthworm manure on the biomass of D. *swazilandensis*

	Biomass (kg DM/ha)			
Treatments	Total	Leaves	Stems*	Weeds
1	2004	945.75	879.42	61.67
2	2328	1149.58	910.83	33.33
3	2548	1254.42	1062.67	7.67
4	2536.3	1113.08	1244.42	43.33
5	2367.2	1194.33	881.50	47.00
6	3006.3	1325.33	1545.08	6467
7	1863.8	1062.58	1400.25	45.67

* ($P<0.001$)

Table 2 Effect of the earthworm manure on the concentration of minerals of *D. swazilandensis*

	Minerals (%)			
N	P	K	S*
0.99	0.26	1.51	0.63^{a}
1.17	0.25	1.96	0.48^{c}
1.04	0.25	1.74	0.53^{bc}
1.08	0.28	1.79	0.57^{ab}
1.07	0.28	1.84	0.54^{bc}
1.08	0.24	1.84	0.55^{b}
1.14	0.26	1.92	0.55^{b}

* ($P<0.01$)

Conclusions Although there was no treatment effect and the experiment was very short, a time effect was observed on the biomass production and on the mineral concentration (K and S). Also a time x treatment interaction was detected for S. It is recommended that experiments with earthworm manure should be carried out for longer periods of time.

References

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