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Grassland Society of Southern Africa

www.grassland.org.za

45th Annual Congress

**19th to 23rd July 2010,
Kimberley, Northern Cape**

*Sustainable and Adaptive Practices in Range and Pasture
Systems, with an Emphasis on Arid regions*

Approximately five to eight Habitat Design Unit types are probably needed to design the benchmark habitat to functional optimality over the scales of the near-regional to the biome.

NOTES:

POSTER PRESENTATION: VEGETATION RESTORATION ON DEGRADED RANGELANDS THROUGH THE USE OF MICROCATCHMENT AND BRUSH PACKS IN THE COMMUNAL AREAS OF EASTERN CAPE

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Rangeland degradation results in declining functional capacity, increased poverty, and food insecurity. Major changes in rangeland surface morphology and soil characteristics have a drastic effect on the primary productivity of the rangeland ecosystem and, in turn, on livestock production. This suggests a need for interventions to halt land degradation and improve the functional capacity of communal rangelands. A study was conducted to evaluate ways to improve the current status of the degraded rangeland. The study was carried out at the Amakuze Tribal Authority located at S32°38', E 26°56' at an altitude of 672 m a.s.l. in the lowlands to 1800 m a.s.l. at the summit of Amakuze Tribal boundaries. Annual rainfall ranges from 700 mm to 1200 mm. The villages within this tribal area share rangelands of approximately 400 ha.

One degraded site (66 m x 34 m) was selected based on the visual degradation indicators' presence such as gullies, rills, pedestals, armour layer, solution notches, plant root exposures and sediment accumulation. Four plots of (30 m x 14 m) each were laid. In each plot 12 microcatchments were developed and two plots were planted with *Paspalum dilatatum* while the other two were planted with *Themeda triandra* seedlings within the microcatchments. In two plots, the microcatchments were covered with the *Acacia karroo* brush packs for both *Paspalum dilatatum* and *Themeda triandra*. The restoration performance of *Paspalum dilatatum* and *Themeda triandra* was estimated by counting the number of tillers and leaves, mortality and flowering rates, and tuft diameter in a four week interval. The data was analysed by means of one way ANOVA (SPSS 1999), the data was considered significantly different at $P<0.05$.

The tiller frequency was significantly different between the observation dates of the first week (4.4), second week (6.6), third week (14.2) and fourth week (16.6). The leaf frequency was also significantly different between the observation weeks. The flowering rate was significantly different between the first (0.0%), third (20.9%) and fourth week (28.9%). The tuft diameter was significantly different between the first week (0.0 cm) and fourth week (4.9 cm). The tiller number was significantly different between the microcatchment plots with brush pack (13.1) and the microcatchment plots without brush pack (7.2). The leaf number was also significantly different between the treatment plots. The mortality rates were significantly different between the plots with microcatchment and brush pack (10.4%) and plots with microcatchment without brush (28.7%). The percentage of the plants which produced the inflorescence was significantly higher on the plots covered with brush pack (21.7%) than the plots without brush pack (9.4%). The tiller number was not significantly different between species, however, the leaf number was significantly different between *Paspalum dilatatum* (26.7) and *Themeda triandra* (39.7). The mortality rate was significantly different between *Paspalum dilatatum* (12.2%) and *Themeda triandra* (25.2%). The rate of flowering was significantly different between *Paspalum dilatatum* (31.0%) and *Themeda triandra* (0.7%).

The results imply that vegetation restoration performance is determined by the length of time since planting and varies with grass species. The microcatchments covered with brush had good performance in terms of tiller number, leaf number, mortality rates and flowering rates. For the

purpose of vegetation restoration in the degraded rangelands, the performance and recovery depends on the species used, time length spend after restoration, provision of soil moisture through the use of microcatchment and brush packs.

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