SIKHALAZO

45th Annual Congress

Grassland Society of Southern Africa

www.grassland.org.za

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

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

students from other academic and research institutions and local communities surrounding the MNP.

NOTES:

PLATFORM PRESENTATION: SOIL SEED BANK CHARACTERISTICS IN RELATION TO RANGELAND DEGRADATION IN COMMUNAL AREAS OF THE EASTERN CAPE, SOUTH AFRICA

Mota S Lesoli[1#], Sikhalazo Dube[2] and Nomakhaya Monde[3]*

University of Fort Hare, [1]Department of Livestock and Pasture Science, [3]Department of Agricultural Economics, Extension and Rural Development, Private Bag X1314, Alice, 5700, email: lesolistar@gmail.com, [2] Council for Scientific and Industrial Research (CSIR), Natural Resources and the Environment, Ecosystems Processes and Dynamics Research Group, Building 4E Room 065, Meiring Naude Road, Brummeria, Pretoria, 0184

A soil seed bank is defined as seeds at or beneath the soil surface that are capable of germinating. Soil seed banks are important in ecosystems where grasses account for a large part of the vegetation. This has implications on the future vegetation recruitment of the new set of plants when germination conditions are suitable. The study consisted of two experimental units which were selected based on the grazing management history. The first unit was Phandulwazi Agricultural High School. The grazing management at this site was relatively controlled with the use of rotational grazing. Another experimental unit was Amakuze Tribal Authority (ATA). This tribal authority consists of six villages *viz*, Makuzeni, Gomro, Gilton, Guquka, Mpundu and Sompondo. These communities share rangelands of about 400 ha.

Five degraded sites were selected at the Amakuze Tribal Authority (ATA), and, for comparison, five non-degraded sites were selected at Phandulwazi Agricultural High School. At each site three line transects (100 m) were selected randomly and three surface soil samples were collected along the 100 m at intervals of 33.3 m. Soil seed bank samples were collected at the end of the growing season (September-October) after seed production. These can serve as an indication of viable seeds not germinated in the field during the season. The soil samples were collected at the depth of 3 cm, on a 0.25 m^2 area, and were spread over pine bark growing media in each plastic pot (21 cm depth and 24 cm diameter) to a depth of 2 cm. The pots were placed in the green house for three weeks. The seed germination data between the two sites was analysed with t-test (SPSS 1999).

The seed bank means were significantly different ($P<0.01$) between the (Amakuze Tribal Authority) degraded sites (5.7, SD = 4.8) and (Phandulwazi High School) non degraded sites (1.7, SD = 1.5). The minimum seed bank at the degraded sites was (0) with the maximum of (20) while for the non degraded sites it was (0) and (6) for the minimum and maximum respectively. The results imply that although some areas of the Amakuze Tribal Authority visually appear degraded, some seeds remain viable in the soil seed bank. This indicates that in the absence of disturbance, the vegetation of these degraded sites could be restored through germination of seeds available in the seed bank. Although the Phandulwazi rangelands are reported to be under relatively good management, the results imply that there were no sufficient rest periods for seed production in the management plan. The seed bank means were not significantly different ($P>0.05$) between the observation times of 24 weeks at the interval of 8 days after planting. The presence of viable seed in the soil seed bank indicates the potential for regeneration of grass after disturbance. This may reduce the probability of population extinction of plants and it is likely to be the major source in establishing aboveground vegetation following environmental changes such as rainfall.

NOTES: