



POSTER PRESENTATION: INVESTIGATING LONG -TERM EFFECTS OF FIRE FREQUENCY ON FIBRE CONTENT OF SELECTED KEY GRASS SPECIES IN WINTER AND SUMMER IN THE FALSE THORNVELD OF THE EASTERN CAPE

Mpumelelo Magawana# and Keletso Mopipi*

University of Fort Hare, Faculty of Science and Agriculture, Department of Livestock and Pasture Science, Private Bag X1314, Alice, 5700, email: kmopipi@ufh.ac.za

The effect of burning frequency on seasonal fibre content of five grass species was investigated using long-term trials at Fort Hare research farm. The ongoing trial was initiated in 1980 and treatments comprise annual, biennial, triennial, quadrennial, sexennial burns and a no burn control, each replicated twice on 50 m x 100m plots. Samples were collected in June and December 2009 for *Panicum maximum*, *Themeda triandra*, *Cymbopogon plurinodis*, *Sporobolus fimbriatus* and *Digitaria eriantha*, and analyzed for Acid Detergent Fibre (ADF) and Neutral Detergent Fibre (NDF). A 2-way ANOVA used to test treatment effects while LSD test was used for mean separation. Burning frequency and species significantly affected seasonal ADF ($P < 0.05$), but NDF was not significantly affected by treatment ($P > 0.05$) and there was no significant interaction ($P > 0.05$). ADF and NDF levels were significantly higher in winter than in summer for all species. ($P < 0.05$). Mean summer ADF for the annual, biennial and quadrennial burns were significantly lower ($P < 0.05$), while those of the triennial and sexennial burns did not significantly differ from the no-burn control. A similar trend occurred in winter, except for the quadrennial burn. In winter *C. plurinodis* (44.3%) had a significantly lower ADF ($P < 0.05$) than the other four, followed by *T. triandra* (48%), while *P. maximum* had the highest (49.9%), followed by *D. eriantha* (49.6%) and *S. fimbriatus* (49.5%) respectively. In summer, *P. maximum* (42.8%) and *C. plurinodis* (41.4) had significantly lower ADF than *S. fimbriatus* (44.7.5%); *D. eriantha* (46.0%) and *triandra* (46.2%) respectively. These results indicate that burning frequency can affect hemicellulose content of grasses.

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PLATFORM PRESENTATION: OBSERVATIONS ON TWO FIRE EVENTS IN THE KHAMAB KALAHARI RESERVE IN THE MOLOPO, NORTH WEST PROVINCE

P Hanno (J) Kilian#*

Khamab Kalahari Reserve, PO Box 2059, Vryburg, 8600, email: ecologist@khamab.co.za

Fires in arid savannas rarely occur compared to mesic savannas, however, that does not make them less significant. It has been previously observed that fires play an important role in the shaping of woodland structure, particularly as common species like *Acacia erioloba* and *Boscia albitrunca* are slow growing and long living tree species. The mortality rate and resprouting of woody species, after the occurrence of two fires on the Khamab Kalahari Reserve in the Molopo were investigated 5 months after the fire incidents. One fire event occurred at the beginning of the rainy season, and the other during the middle of the rainy season,. The response of the different woody species in relationship to their height and stem diameter was investigated. Very low mortality rates were evident in all woody species, even though species like *A. erioloba* are considered to be fire sensitive. This observation is contradictory to what was observed elsewhere in the Kalahari. Most woody species were sprouting from either the base or the stems and branches, indicating that the woody component in the Kalahari is better adapted to fire than what was generally believed. Irregular fires alone do not result in heavy woody component mortalities, but short fire intervals will likely result in higher mortality rates.

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POSTER PRESENTATION: LONG TERM EFFECTS OF BURNING FREQUENCY ON SOIL SEED BANK AND HERBACEOUS SPECIES DIVERSITY IN THE FALSE THORNVELD OF THE EASTERN CAPE, SOUTH AFRICA

Thembi V Mabuza^{1,2} and Keletso Mopipi^{1#}*

¹University of Fort Hare, Faculty of Science and Agriculture, Department of Livestock and Pasture Science, Private Bag X1314, Alice, 5700, email: kmopipi@ufh.ac.za, ²Agricultural Research Council, Animal Production Institute, Private Bag X2, Irene, Pretoria, 0062

The long-term effects of burning frequency on soil seed bank and herbaceous species diversity were investigated using long-term trials at the university of Fort Hare research farm. The trial was initiated in 1980 and treatments comprise annual, biennial, triennial, quadrennial, sexennial and no burn control, each replicated twice on 50 m x 100 m plots. Species composition was determined on vegetation using the step-point method, with 200 points per plot. Soil samples were collected from each plot at a 10 cm depth using a soil auger. From each plot, 250 cm³ of soil was spread evenly on pots containing growth medium and germination was conducted from January to April 2010. Emerging seedlings were counted and identified. ANOVA and LSD tests were conducted. Treatments had significant effect on species diversity (P<0.05), but did not significantly affect soil seed bank diversity (P>0.05). For standing vegetation, *Themeda triandra* was dominant on the annual, biennial and triennial burns, while *Melica decumbens*, *Sporobolus fimbriatus* and *Cymbopogon plurinodis* dominated on the quadrennial, sexennial and no burn treatments. *Sporobolus fimbriatus* dominated the seed bank composition across all treatments, with the highest abundance (85%) in the quadrennial burn and the lowest (48%) in the annual burn. *Pennisetum purpureum* and forbs (especially *Arctotis arctotoides*) also contributed significantly to seed bank composition. Generally, the standing vegetation was more diverse than the soil seed bank. A negative but insignificant correlation existed between vegetation and soil seed bank diversity (r = -0.33). Species diversity declined with burning frequency on standing vegetation. The biennial burn had the lowest mean diversity index (1.35) and the highest was in the quadrennial and sexennial burns (both 2.14), and these were significantly higher than all other treatments (LSD=0.50). Conversely, seed bank diversity increased with burning frequency, with the lowest diversity index recorded on the quadrennial burn (0.66) and the highest in the biennial burn (1.41), and all treatment means were not significantly different (LSD= 1.05). The study indicates that fire frequency alters species diversity, and to a lesser extent, soil seed bank diversity.

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