



## The Andrew W. Mellon Foundation

### ***MOAGI THOMAS KERETETSE***



I am from Taung in the North-West Province. I matriculated at Reivilo High School, and went to the North-West University (Potchefstroom campus) where I completed a B.Sc degree in Natural Sciences, with Zoology and Microbiology as my major subjects. Afterwards I studied for an Honours degree in Environmental Science. I did a project on Bioremediation of Soils contaminated with Hydrocarbons. I am currently pursuing an M.Sc degree in Botany at the University of Cape Town. My project is part of a research programme which investigates different hypothesis explaining the tree-grass coexistence in a savanna ecosystem. My project focuses on how different water treatments affect nitrogen mineralization in the soil, and how plants respond to differences in soil nutrient status. I have presented the results of my research at the Grassland Society of Southern Africa (GSSA) and the SAEON Graduate Student Network. I envision that I will be able to publish at least two papers from this work at the end of the study. Generally, I find ecological studies to be more intriguing and would like do more studies like that in the future.

I enjoy playing tennis and soccer for fun and a bit of exercise. I like reading and my favorite author is John C. Maxwell. I appreciate the art of poetry and also enjoy writing poems. I like going to church for spiritual fulfillment, which is an important part of my life.

## PROJECT ABSTRACT

### Changes in Plant Available Nitrogen with Changes in Available Water in a Mesic Savanna.

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Data on grass and tree growth in response to varying levels of soil moisture, coupled with data on available nutrients would inform us as to the importance of nutrients or water as a driver in savanna systems. Here we report the preliminary results of an experiment where various combinations of trees and grasses are exposed to different rainfall and competition treatments. Measures of available water and nutrients are determined under these different conditions.

The preliminary data shows that treatments with additional rainfall have higher mineralization rates than those treatments where rainfall is reduced. Furthermore, the data shows a seasonal pattern in mineralization rates, with the dryer season experiencing lower rates than the wetter season. The rate of mineralization peaks immediately after the spring rains and then shows a steady decline through out the season.

Treatments with different combinations of grass and tree also showed differences in mineralization rates. The grass treatments are wetter than the tree treatment due to increased infiltration and water retention. This also explains the high mineralization rates in the grass treatments. The data on grass biomass and tree radial increments shows that there is competition for water and nutrients, with grasses having a competitive edge in wetter treatments and trees showing a competitive edge in dryer treatments. These results suggest that it is a complex interplay between nutrients and water that are essential for plant growth in savanna systems.