

Moringa stem biochar as a soil amendment to improve soil moisture retention

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Introduction

- South Africa is amongst the driest countries in the world, ranking number 30.
- Annual rainfall is below atmospheric evaporative demand.
- Thus, food and nutrition security are threatened due to the vast droughts.
- The decline in soil fertility in sub-Saharan African soils is linked to a direct decline in land productivity.
- Losses of soil nutrients through soil erosion by wind, water, and leaching of N and K are the main contributing factors to the decline in soil fertility.
- South Africa's topsoil has characterized by low organic matter content (>0.5 %).



Introduction

- Biochar is a carbon (C) rich product derived from the pyrolysis of organic material at temperatures (≈700 °C) Lehmann and Joseph, (2009).
 - It can sequestrate carbon while also giving other agronomic potentials, such as altering the nitrogen (N) and increasing biological nitrogen fixation.



Objectives

• Assess the water-holding capacity of a biochar-soil mixture at different rates.

Materials and methods

 The experiment was conducted at ARC-VIMP and was set up using a complete randomized design (CRD) with five treatments replicated three times. Five biochar rates were used as treatments (0, 25, 50, 75 and 100%).

Biochar feedstocks



Neem syringa (*Melia* azedarach)





Lantana (*Lantana camara*)



Bugweed (Solanum mauritianum)

Moringa (*Moringa oleifera*)

Materials and methods

Biochar was prepared through pyrolysis.



Materials and methods cont...



0%

25%

50%

75%

100%

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