



**FINAL YEAR PROJECT REPORT**

**Assessing the Impacts of Rice Biochar on Bacteria  
Affected Soils for Tomato Cultivation Under Different  
Irrigation Conditions**

Case study of Busitema Subcounty, Busia Uganda.

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## **ABSTRACT**

Cultivated tomato (*Solanum Lycopersicon L.*) is one of the most important economic vegetable crops in Uganda. However, it is susceptible to bacteria wilt which is one of the major pathogens that constrain its production and productivity resulting into economic loss due to less yield produced. The use of rice biochar constitutes the key control tactics for management of bacteria wilt of tomatoes in Uganda. Therefore, this study was conducted to assess the impacts of rice biochar on bacteria affected soils for tomato cultivation under different irrigation conditions.

Water conservation is the use and management of water for the good of all use. Conservation of soil and water resources is important for sustainability of agriculture and environment. Soil and water resources are under immense pressure due to ever increasing population thereby ensuing growing demand for food and fiber. Emphasis on the use of drip irrigation system which water saving since it drips directly at the location of the plant hence minimizing water wastage.

This is the methodology which entails the project description, research study area methods and procedures. The experiment was carried out at Busitema university demonstration site with three treatments i.e ETc, 3mm and 2mm and four replications under 200g of rice biochar in an open field in a completely randomized design for a period of six (6) months. It aimed at assessing the impacts of rice biochar on height, yield, root frequency impact and number of bacteria affected plants under different irrigation conditions.

There was a gradual increase in height for all treatments after the two weeks of transplanting up to the end of the season. However, a greater height was observed under ETc at 85.64cm compared to 2mm and 3mm at 78.75cm and 78.75cm respectively. Much greater quantity of yield was observed under ETc because the plants received the adequate amount of water with biochar application and especially in the second week of harvesting since it was maximum flowering stage. ETc registered the least number of bacteria wilts affected plants by 50% compared to 2mm and 3mm by 63% and 54% since biochar increases the pH of the soil hence suppressing the bacteria wilt.

It's observed that biochar application with adequate water especially at ETc can reduce bacterial wilt in affected soils for tomato cultivation compared to the 2mm and 3mm since it's the crop water requirement and does not expose the crops to water stress hence high yields making it the best option.

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**DECLARATION**

I **MUKYALA MARTHA** hereby declare that the information in this proposal report is out of my effort under the guidance of Mr. Bwire Denis and Madam Nabunya Victo. It has never been presented to any institute of higher education for any award.

Signature.....

Date.....

## **DEDICATION**

I dedicate this proposal report to my parents and sister Babirye Joan, FAWE Uganda for their financial support towards my Education. May the good lord bless you always.

**APPROVAL**

This proposal project report has been submitted to the department of Agricultural mechanization and irrigation Engineering of Busitema University with approval of the following

University Supervisors

Mrs. Nabunya Victo

Signature.....

Date.....

Mr. Bwire Denis

Signature.....

Date.....

## **ABBREVIATIONS**

AFDB:	African Development Bank
CRD:	Completely Randomized Design
DI:	Deficit Irrigation
DIS:	Drip Irrigation System
EC:	Electrical Conductivity
FiBL:	Forschungsinstitut for Boilogischen Landbau
GPS:	Global Positioning System
PH:	Potential of Hydrogen
SOC:	Soil organic Carbon
TDR:	Time Domain Refractometer

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