Seed Potato for Africa

ORGANIC SOIL AMENDMENTS A POTENTIAL BACTERIAL WILT CONTROL IN POTATO

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Introduction

- Kenya potato farmers experience yields at 6-10 t*ha^{-1} below potential yields of 35-40 t*ha^{-1}, bacterial wilt (BW) caused by *Ralstonia solanacearum* is one of the major causes of this yield loss.
- The disease is very destructive in potato production as there are no effective control measures available.
- This study was aimed at investigating the effect of soil amendment (SA) and inoculum density on the subsequent development of BW in field conditions over two seasons.

Problem statement

R. solanacearum being soil borne poses serious challenges in its management especially in already infected fields leading to reduced incomes to most potato farmers in the tropical and subtropical regions of the world, also increase in area under production cannot meet the growing demand for potato due to the continues spread of the disease.

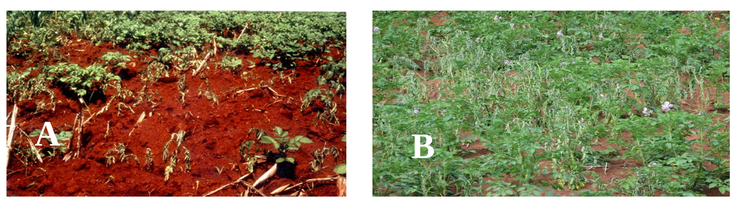

Figure 1. A and B showing potato fields devastated by bacterial wilt

Methodological Approach

- The trial was set up on station at the Kenya Agricultural and Livestock Research Organisation for two seasons.
- Nine treatments; Compost 10mm sized particles (C10) at three application rates (5t/ha, 2.5 t/ha and 1.25 t/ha), Neem kernel cake (N) at three application rates (1 t/ha, 0.25 t/ha and 0.125 t/ha), a combination of C10 and N at application rates (1.25t/ha and 0.125t/ha respectively), Plantmate and a Control, at two inoculum densities of 3.26 × 10^3 cfu/ml and 2.9 × 10^5 cfu/ml were laid out in a split plot design with four replications, inoculum density as main plot and SA as sub plots.

Figure 2. A and B showing BW on-station trial, B-showing harvest from one of the best treatments Plantmate and C-showing harvest from one of the control plots .

Results

- The results showed higher yields at 34 t*ha-1 at 10^3 cfu/ml for both Plant mate and (N) as compared to 1 t*ha-1 in the control, 29 t*ha-1 and 27 t*ha-1 at 10^5 cfu/ml for Plant mate and (N) respectively as compared to only 1 t*ha-1 in the control.
- The disease incidence was lowest in Plantmate by 13.8 and 24.7 at 10^3 cfu/ml and 10^5 cfu/ml respectively and Neem and by 20.9 and 27.5 at 10^3 cfu/ml and 10^5 cfu/ml respectively.

Table 1: Effect of soil amendments at different inoculum densities on bacterial wilt

Treatment	Total Yield (T/ha)		Disease incidence	
	10^3 cfu/ml	10^5 cfu/ml	10^3 cfu/ml	10^5 cfu/ml
C10 @ 1.25t/ha	23.7	22.2	29.4	35.3
C10 @ 1.25t/ha+N0.125t/ha	26.1	23.5	25.0	35.6
C10 @ 2.5 t/ha	22.2	23.4	23.4	31.3
C10 @ 5t/ha	22.6	17.7	23.8	28.1
Control	0.6	0.5	75.6	75.9
N @ 0.125 t/ha	25.9	21.6	21.9	35.9
N @ 0.25 t/ha	26.6	22.5	23.8	32.2
N @ 1 t/ha	33.9	27.4	20.9	27.5
Plantmate @ 1t/ha	33.6	29	13.8	24.7

Conclusion

- This study shows that Plant mate and (N) had a great potential in reducing losses caused by BW.
- Further studies on the mode of action particularly of the SA are currently underway.

This document was prepared as a contribution to GIZ/BMZ project. All persons and institutions involved in the project are gratefully acknowledged. The opinions expressed herein are those of the authors and do not necessarily reflect the views of their institutions.

'Tropentag 2016
Solidarity in a competing world - fair use of resources -'
September 18-21, 2016
University of Natural Resources and Life Sciences (BOKU Vienna)