Sub-theme:

MANAGEMENT OF POTATO CYST NEMATODES

Title:

EFFICACY OF ORGANIC AMENDMENTS IN THE CONTROL OF POTATO CYST NEMATODES UNDER GREENHOUSE CONDITIONS IN KENYA

Presented by:

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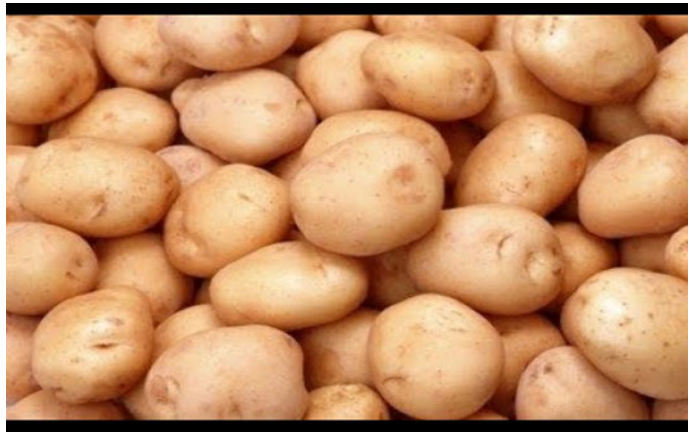
Introduction

- Potato (*Solanum tuberosum*) is an important crop owing to its potential to address food insecurity and poverty in most sub-Saharan Africa.
- Recent emergence/introduction of Potato cyst nematode (PCN) in Kenya presents a significant threat across its value chain



Problem Statement

PCN, an invasive and fast spreading pest which has a potential of causing approximately 80% yield losses in potatoes as well as stunted growth and early senescence which are mostly misdiagnosed as nutrient deficiency.

Since PCN has ability to survive for over 20 years as it awaits for its host, however, there are few to none of nematicides either synthetic or biological that are effective. Other management strategies, for soil sterilization seemed not practical since most potatoes are planted in open fields.

Justification

Potato cyst nematode (PCN) is a newly introduced invasive and fast-spreading pest of potato in Kenya.

Suppression of plant parasitic nematodes using organic amendments have been demonstrated by several studies. Given that organic amendments are commonly used by small scale farmers, their potential in managing potato cyst nematodes remain unclear under green house conditions in Kenya

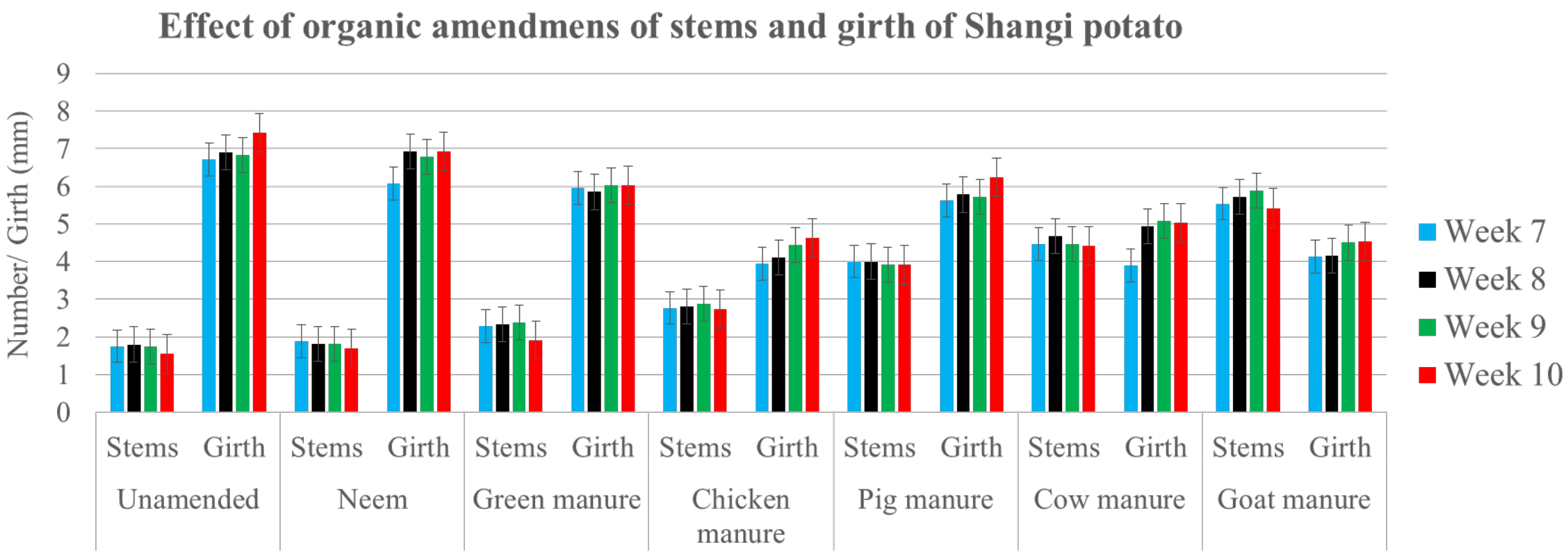
Objectives

To determine the efficacy of organic amendments in the management of Potato cyst nematodes under greenhouse conditions in Kenya

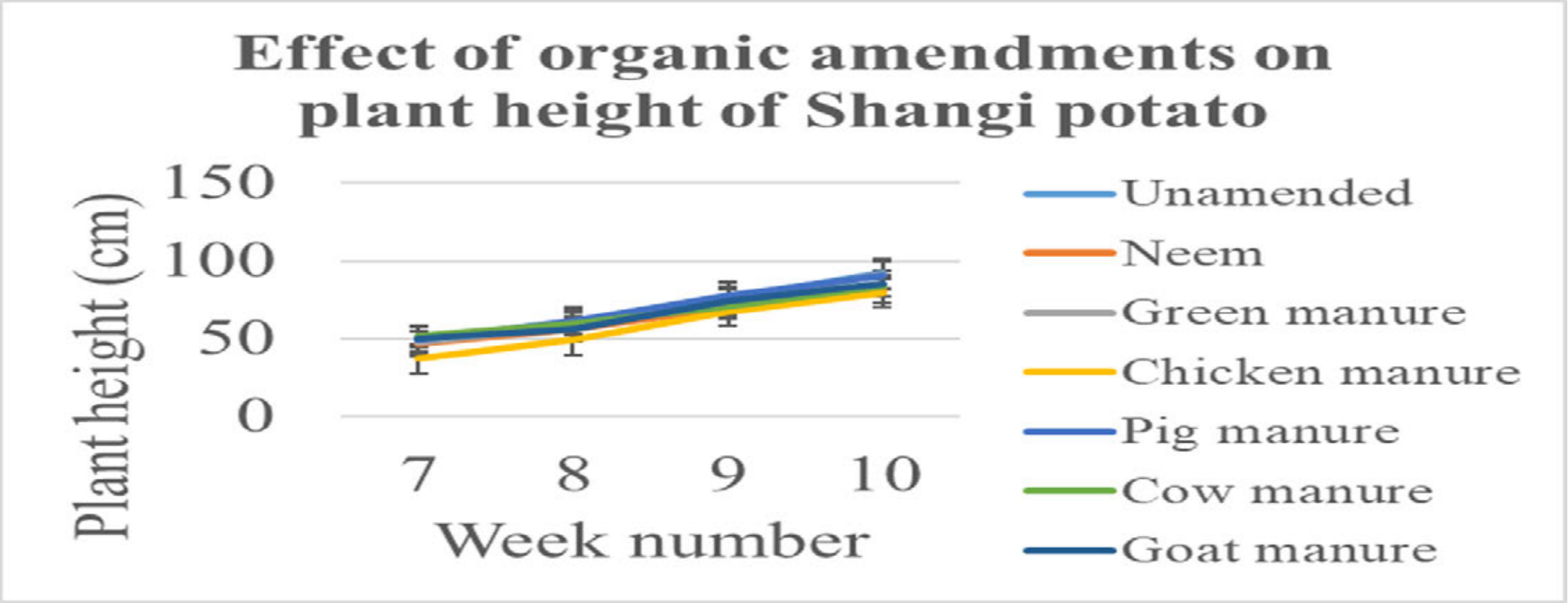
Methodology

GREEN HOUSE		
Sterile media	**Treatments** Animal manures-cow, goat, pig & chicken (20t/Ha). Green manures (45t/Ha). Neem extract (1ml/L of water). Unamended. *Arranged in CRD with 6 replications. * 50 cyst introduced after a week.	Data 1. Agronomic- number of stems, girth width & height. 2. Root mass & PCN counts

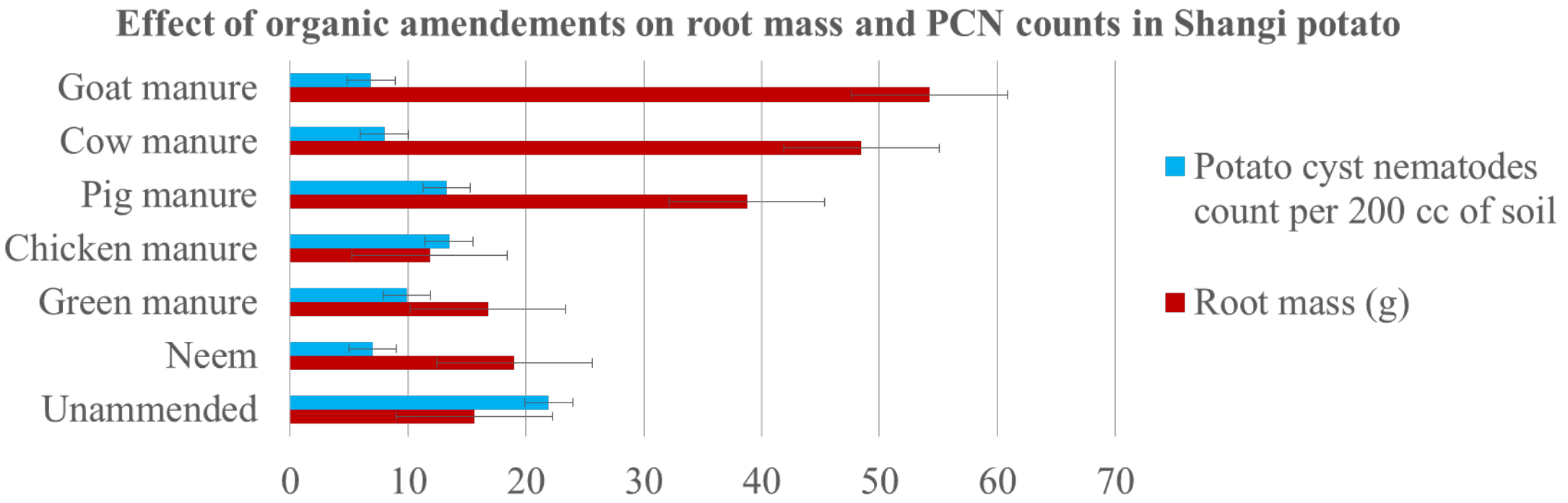
Results


Effect of organic amendmens of stems and girth of Shangi potato
Number/ Girth (mm)
0
1
2
3
4
5
6
7
8
9
Stems
Girth
Unamended
Neem
Green manure
Chicken manure
Pig manure
Cow manure
Goat manure
Week 7
Week 8
Week 9
Week 10

Results cont’



Results cont’



DISCUSSION

A significant reduction in number of cysts/g of soil was observed in the amendments used in the experiment compared to unamended soil. There was a significance increase in root mass of plants grown in soil amended with goat, cow and pig manure though green and chicken manure exhibited low root mass

Results by Nasr-esfahani (2002) showed that incorporation of chicken and goat manure (20 t/h) amendment with chemical fertilizer (N.P.K) effectively suppressed the growth of potato cyst nematodes, this study proved contrary by showing low efficacy of chicken manure compared to other organic amendments in the control of PCN due to the methodology used since chicken manure was directly incorporated into the pots without a chemical fertilizer (N.P.K)

DISCUSSION CONT'

Studies by Tenuta and Lazarowits (1999) showed that low level of organic carbon in the soil is critical to enhanced ammonia accumulation while high organic matter prevents accumulation of ammonia. High soil pH is also an important factor in the generation of ammonia.

Cow and goat manures have phosphorus and potassium which is healthy for the root system and sufficient supply enhances the development of healthy root system suppressing nematode infection. Hence number of cyst count was lowest in cow and goat manures as compared to chicken manure and pig manure

Conclusion

This study showed that all organic amendments were effective in the management of PCN

Recommendations

Application of animal and green manures at 20t/Ha and 45t/Ha, respectively, are recommended for the management of Potato cyst Nematodes

Acknowledgements

Theme: *"Enhancing Phytosanitary Systems for Healthy Plants, Safe & Sustainable Trade"*
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