

**1ST EASTERN AFRICA AGROECOLOGY CONFERENCE**  
TRANSFORMING FOOD SYSTEMS FOR RESPONSIBLE PRODUCTION,  
CONSUMPTION AND SOCIAL WELLBEING

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# Evaluation of Biopesticides for Traditional African Vegetables in Kenya

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# Introduction

- Traditional African Vegetables (TAVs) provide essential nutrients that promote good human health.
- TAVs are also produced commercially to meet a growing demand thus earning income to many small holder farmers.
- However production is limited by insect pests such as aphids (*Myzus persicae*), white flies (*Bemisia tabaci*) and diamond back moth (*Plutella xylostella* L.) that cause yield and quality losses.

# Introduction Cont'

- To control these pests and avert potential economic losses, farmers resort to a range of measures including spraying of synthetic chemicals.
- The undesired effects from the indiscriminate use of these chemicals include both human and environmental health concerns from pesticide residues, pest resistance and killing of beneficial organisms such as bees



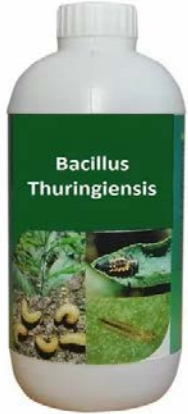
## An eco-friendly approach to manage insect pests on TAVs is much needed

Biopesticides made from naturally occurring soil microorganisms and plant extracts offer a safe and effective alternative solution

Therefore this study evaluated the efficacy of commercially available biopesticides against insect pests in kale, African nightshade and amaranth



# Materials and Methods



Six treatments (four biopesticides):

1. *Bacillus thuringiensis*,
2. *Metarhizium anisopliae*
3. *Beauveria bassiana*
4. azadirachtin 0.03%
5. one synthetic pesticide Lambda cyhalothrin
6. **One Control** (no treatment)

Three crops: amaranth, African nightshade and kale

## Materials and Methods cont'



- Each treatment had three replicates in a randomized complete block design.
- Treatment plots measured 2m x 2m with 1m separating them.
- Treatments were applied two weeks after transplanting and continued at weekly intervals for 9 weeks.
- The target insect pests evaluated were aphids and whiteflies.

## Data collection



- In Each plot, three inner rows and five random plants from these rows were sampled.
- Total number of adult aphids and whiteflies was recorded from the sampled plants.
- Leaf area damage was determined through visual examination on the same plants and estimated as a percentage of the total plants sampled.

## Data Analysis

- Data collected was subjected to analysis of variance and post hoc Tukey tests to determine any statistical difference across the treatments.



## Results and Discussions

### Aphid Pest Abundance

- Biopesticide treatments showed a similar effect to the synthetic pesticide in controlling aphids in Kale and Amaranth.
- In African nightshade, Aphid population was significantly higher in plots treated with *Bacillus thuringiensis*, *Metarhizium anisopliae* and Azadirachtin than in synthetic pesticide treatment.
- Only plots treated with *Beauveria Bassiana* showed similar effect to the synthetic pesticide.



## Results and Discussions cont'

### White fly abundance

- White fly abundance in kale plots treated with biopesticides showed no significant difference with plots treated with synthetic pesticide translating to similar control effect in these pesticides.



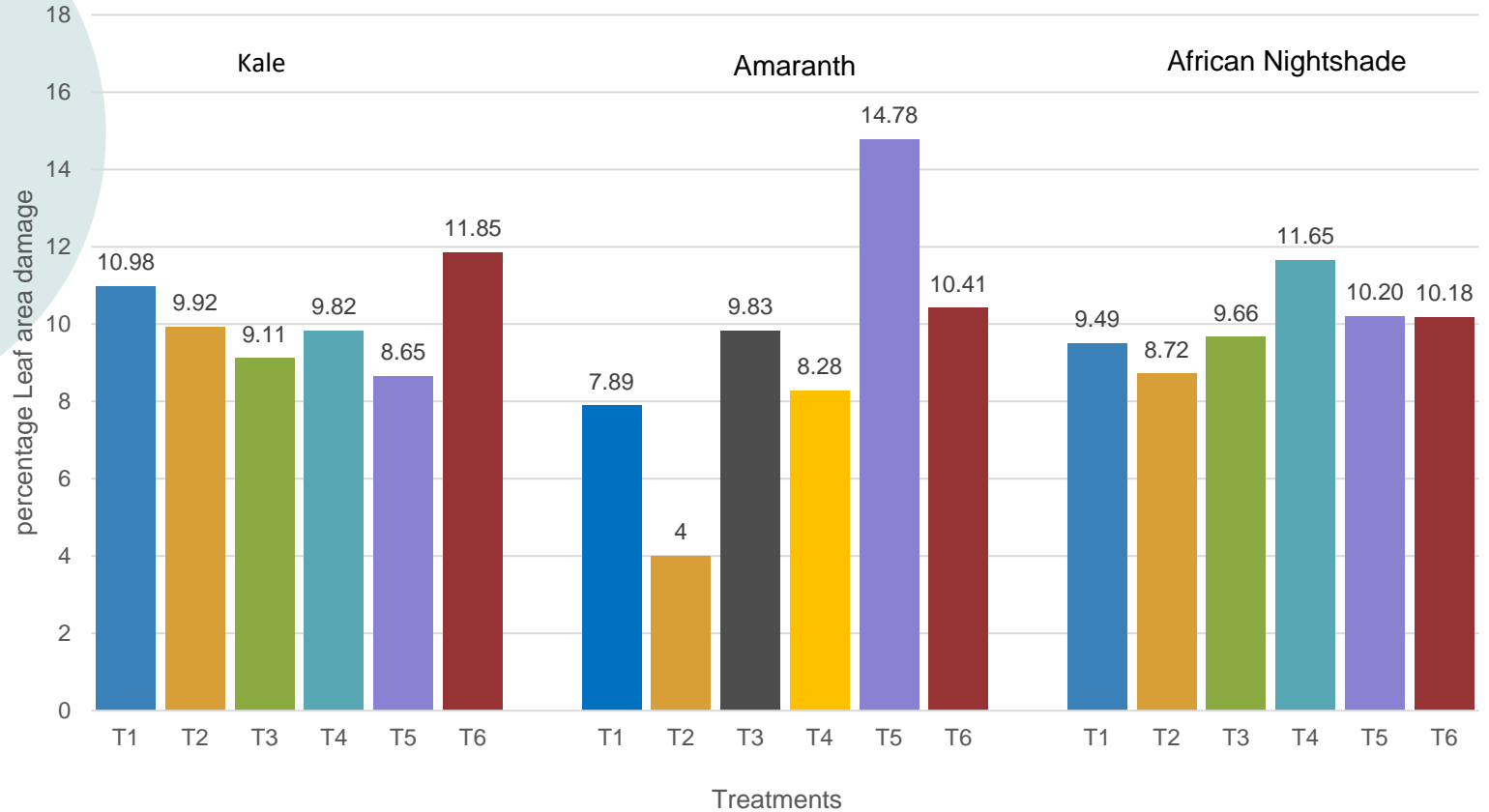
## Results and Discussions cont'

### Leaf area damage

- Figure 1 shows leaf area damage across different treatments in the three study crops.
- The leaf area damage in kale and African nightshade was statistically similar in all treatments.
- However, in Amaranth, plots treated with *Bacillus Thuringiensis*, *Metarhizium Anisopliae* and Azadirachtin showed significantly lower damage than synthetic pesticide



# Results and Discussions cont'



**Fig 1:** Mean Leaf area damage in different treatments

# Conclusion

The study shows that biopesticides are effective in managing the population and subsequent damage caused by insect pests such as aphids and whiteflies in TAVs

# Thanks!

ANY QUESTIONS?

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