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

Sub-theme:

Theme 5: emerging innovations in phytosanitary systems

Title:

Infestation and management of fruitflies infesting African bird eye chili (Capsicum frutescens L.) in coastal Kenya

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Introduction

- African Bird Eye (ABE) Chili (Capsicum frutescens L.) is a crop with major impact on family income, unity, purpose
- It is a major source of income in coastal area
- It is highly labour intensive especially during harvesting period- which makes it more attractive to small scale farming
- It has minimal costs of production, making it more attractive to small holder farmers
- Market system is highly structured to contract farming by processors/exporters
- It is a more export commodity, with unlimiting market in Europe
- It has less phytosanitary challenges of export nature

Problem Statement

- Processors interests is the commodity: Quantity, Quality
- Quantity: Enough to support market; enough to break-even; enough to gain from economies of scale
- Quality: Ensure minimal losses during processing; guarantee quality product to consumers
- Challenge
  - Processors realized that ABE chili fruit once processed, it would have high losses- lots of skin/shell
  - It wasn't clear, but it was related to farm operations
  - Hence process of identification and reduction of the loss

Justification

- A lot of loss experienced by farmers at sorting stage
- Further loss to farmers after processing, with further reduction of payable quantities delivered
- Worsening economic prospects of many commodities still encourage ABE Chili growers to continue this trade
- There is therefore felt need and demand to manage the farm constraints that lower produce quality and quantity

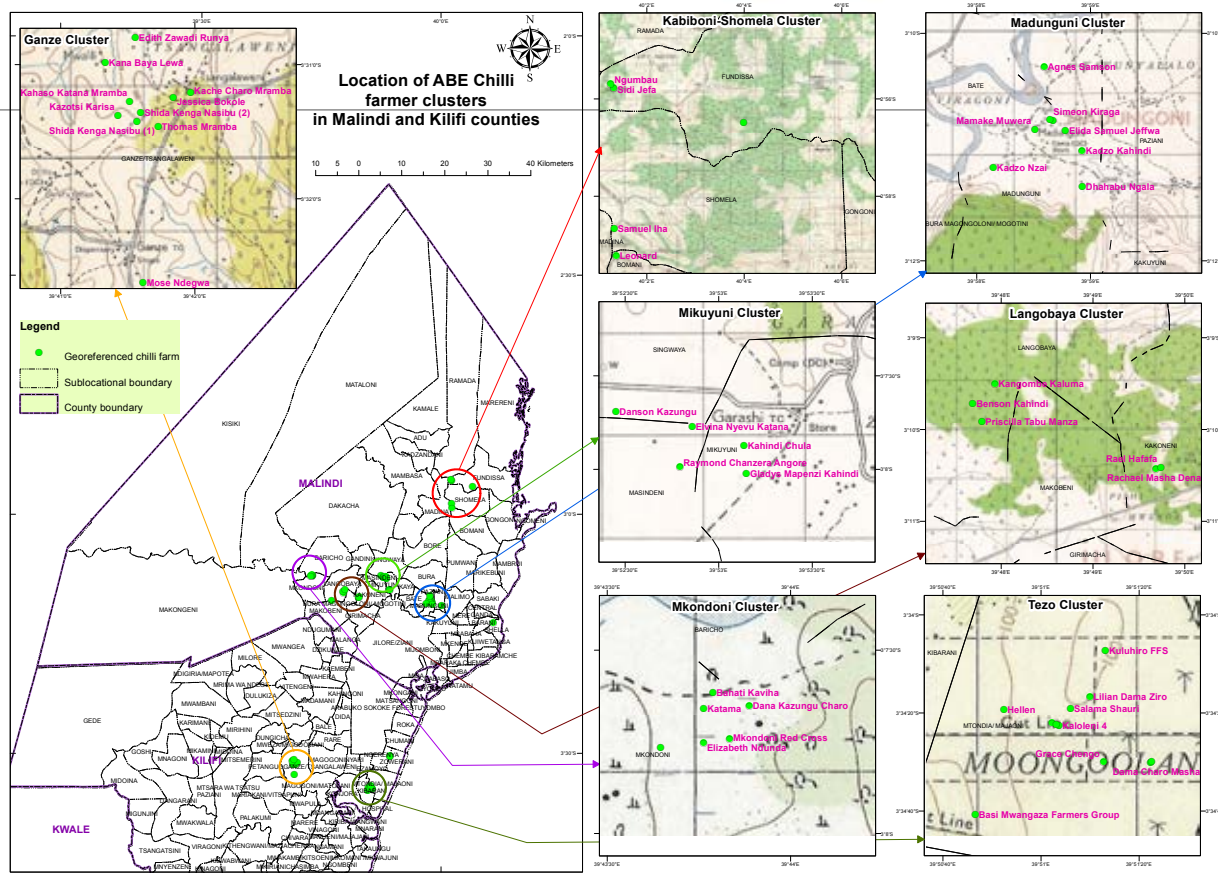
Objectives

- To identify responsible pest causing rotting of fruits

- To determine effective control measure

Methodology

- Target area: Kilifi county, which has
  - Contracted farmers
  - Processor (EKL)
  - Active input suppliers
- Objective 1: Survey carried out in Kilifi and Kwale counties, July 2015. Fruits collected and incubated to determine rot causes. Results informed Obj 2 trials
- Objective 2 approach
  - 5 Blocks
  - 5 treatments
  - A farmer as a plot
- Organization: based on market clusters by EKL



Methodology cont’

- Treatments
  - 1: AD device + Met 69 AD: 1 AD device per 200 m2, recharged with **1 gram** of Met 69 AD & applied every six weeks; Met 69 OD soil surface drenching using a total of **20 ml** of Met 69 OD; and; Met 69 OD foliar applications weekly using a total of **6ml** of Met 69 OD. Drenching and foliar applied using enough water for dispersion
  - 2: Half dose of treatment 1
  - 3: Double dose of treatment 1
  - Karate zeon (Lambda Cyhalothrin 50g/L)
  - Control: no applications
- Data collection
  - From fruiting (harvesting period) throughout- about 2 months
  - Fruits (500g) per week per plot with 250g separated for factory and lab incubation
  - Data collected for 2 seasons, July 2015- July February 2017

Results

Objective 1



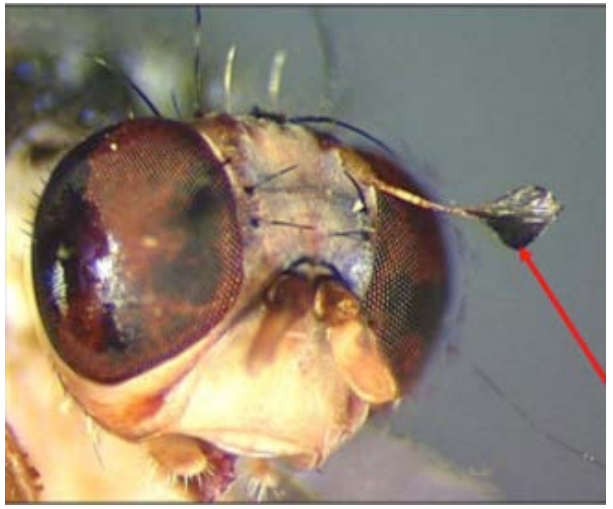

Incubation process

A *Ceratitis* fruit fly

Results cont’

Differentiating features that confirmed it is

Ceratitis capitata, the Mediterranean fruit fly



Characteristic formation of male bristle: Cephalic bristle flattened at apical end and dark

Scutella fusion: Scutella markings are largely fused

Results cont'

Objective 2

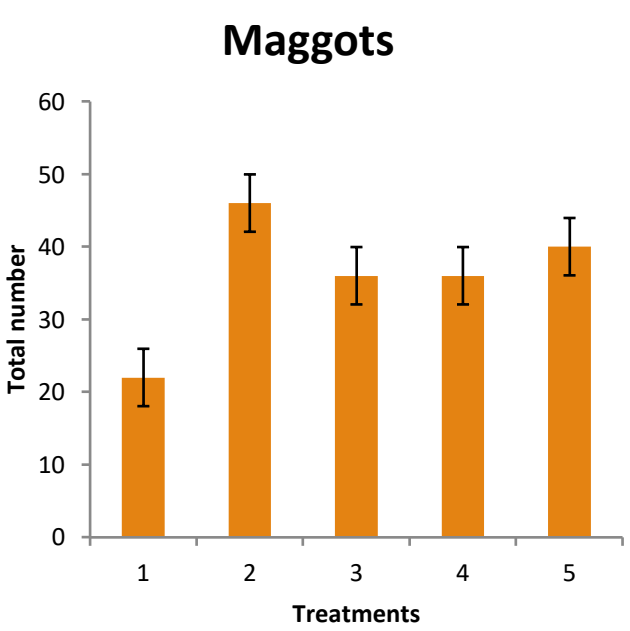
Factory Processed ABE chili fruits

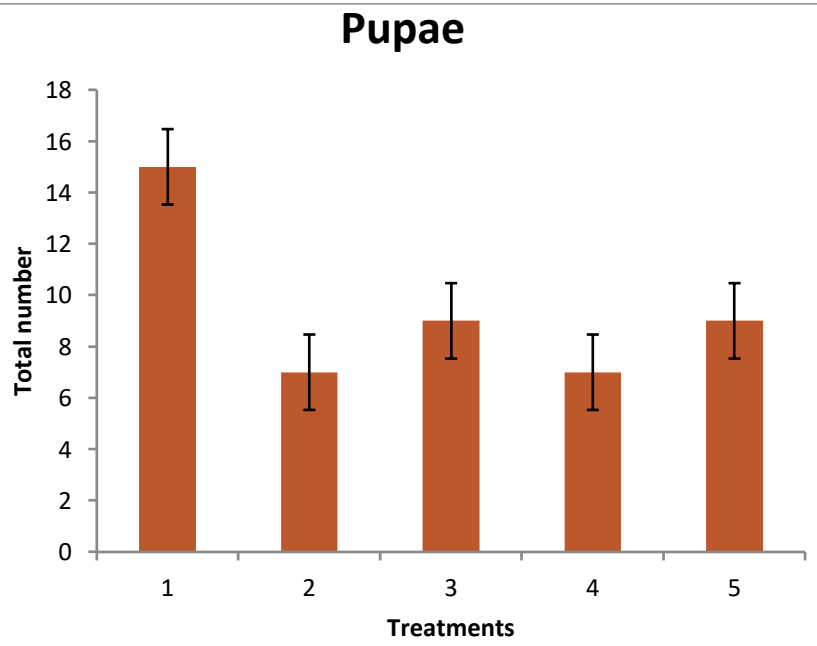
- Highest damage from Karate Zeon
- Control recorded lower damage- highly un explainable but possible due to the sorting process and low yields experienced

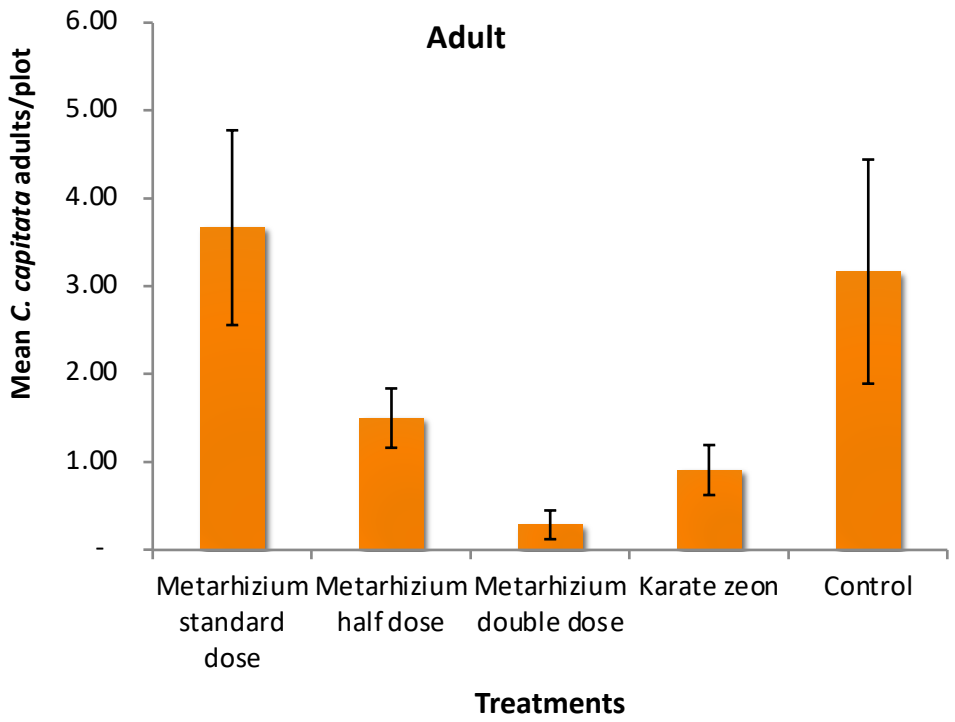
Mean number of fruits damaged by C. capitata across treatments

Treatment	Description	Means
3	Metarhizium double dose	3.061a
5	Control	3.809ab
1	Metarhizium standard dose	4.529bc
2	Metarhizium half dose	5.244c
4	Karate zeon	5.294c
P value		<0.001
LSD		0.5930

Results cont'

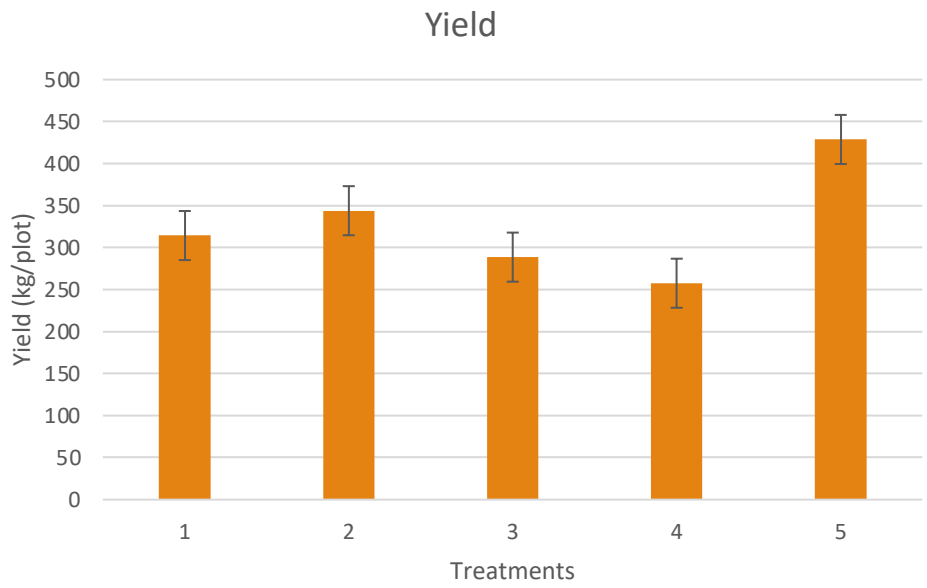






Conclusion

- First report of this pest in the country infesting ABE chili
- Biocontrol can effectively manage the pest
- Long term plan, including interlinkages of the industry, farmers and processors can yield better management of pests
- Phytosanitary challenges need not just address export of pests but also matters of farmer needs



Recommendations

- Encourage effective biocontrol strategies
- ABE Chili is a smallholder enterprise, with major annual incomes that can support farmers
- Strong investment in ABE Chili production systems can help farmers, including aspects of pest management

Acknowledgements

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