Sub-theme:

Farmer knowledge on pesticides, their use and effects.

Title:

Evaluation of pesticide residues in pigeon peas and its effects on honey bee floral resources in Machakos county.

Presented by:

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Introduction

- Pigeon pea (*Cajanus cajan*) is a legume crop cultivated in the semi-arid regions of Africa. In Kenya, it is mainly grown by small holder farmers in Eastern and Coastal regions such as Machakos, Makueni, Kitui, Meru and Embu.
- Kenya is the main producer of pigeonpea in East-Africa and the second highest producer in the world, after India.
- It is an important crop and currently the third most widely grown pulse crop after bean (*Phaseolus vulgaris*, L*)* and cowpea (*Vigna unguiculata* L. (Guy et al., 2001).
- Since pigeon peas is well adapted to dry climate, it is increasingly becoming an important crop for managing food security and nutritional insufficiencies due to frequent droughts brought about by climate change.
- The crop is rich in proteins which are crucial for nutrition security especially because over 40% of households in Sub-Saharan Africa are not able to afford sufficient animal proteins.

Introduction cont'

- The production of this crop has been constrained by various factors such as Pests, diseases, insufficient rainfall, environmental factors among others.
- Among the most common pests include Thrips, Aphids, Caterpillars, pod borers, leafhoppers etc. (Sujithra and Chander, 2014). Management has been through application of synthetic pesticides to reduce the losses.
- Unfortunately, its not clear whether farmers are aware of pesticide residues that may appear in the edible part of the crop and the effects of these chemicals on pollinators.
- To understand this, a survey was carried out to determine farmer knowledge on pesticides, their use and effects.

Problem Statement

- Crop pests cause serious economic, yield, and food safety problems (Beck *et al.,*2019)
- In an effort to control these pests, lots of chemicals are applied on crops (Shakeel *et al*., 2017) resulting to serious threats to animal and human safety
- Food contaminated with chemical residues presents numerous hazards to human health even when ingested in a small amounts (Stancu *et al*., 2020)
- Unfortunately, most locally consumed foods are not compliant with international MRLs standards and most farmers and agricultural food consumers lack information on possible chemical residues present in food consumed

Justification

- Most pesticides can be carcinogenic, mutagenic, immunotoxic, contributing to antibiotic resistance, cause reproduction failure among other detrimental consequences for consumers' health (Mendonça *et al.*, 2020)

- Since pesticides are intrinsically toxic and deliberately spread in the environment, regular monitoring of residues in food and the environment is important

- Therefore, this study aims at establishing the levels of pesticide residues on pigeon peas and determine its effects on bee pollinators

Objectives

General Objective

- To evaluate presence and levels of pesticide residues in pigeon peas and its effect on honey bee floral resources in Machakos county.

Specific objective

- Determine farmer knowledge and perception on insect pests.

- To establish awareness of pesticide residues and pesticide used in pigeon peas and their effect on pollinators.

Methodology

➢The survey was carried out in two Sub counties Mwala and Yatta of Machakos county where pigeon pea production is high and the agro climatic conditions reflect those of other main pigeon pea growing areas. In addition, these sub-counties were previously sub-divided into two vegetation classes (Low and medium) based on the Normalized Difference Vegetation Index (NDVI) during the baseline survey.

Methodology cont’

- In each region 16 main farmers selected during the baseline study in each sub-County were selected for data collection purposes.
- In addition, at least 5 more farmers neighboring the main farmer were also interviewed.
- The main information taken during the exercise included background information such as age, gender and occupation. In addition, pigeon pea varieties planted, period of farming, production constraints, management used, types of pesticides and knowledge of pollinators.

Results cont'

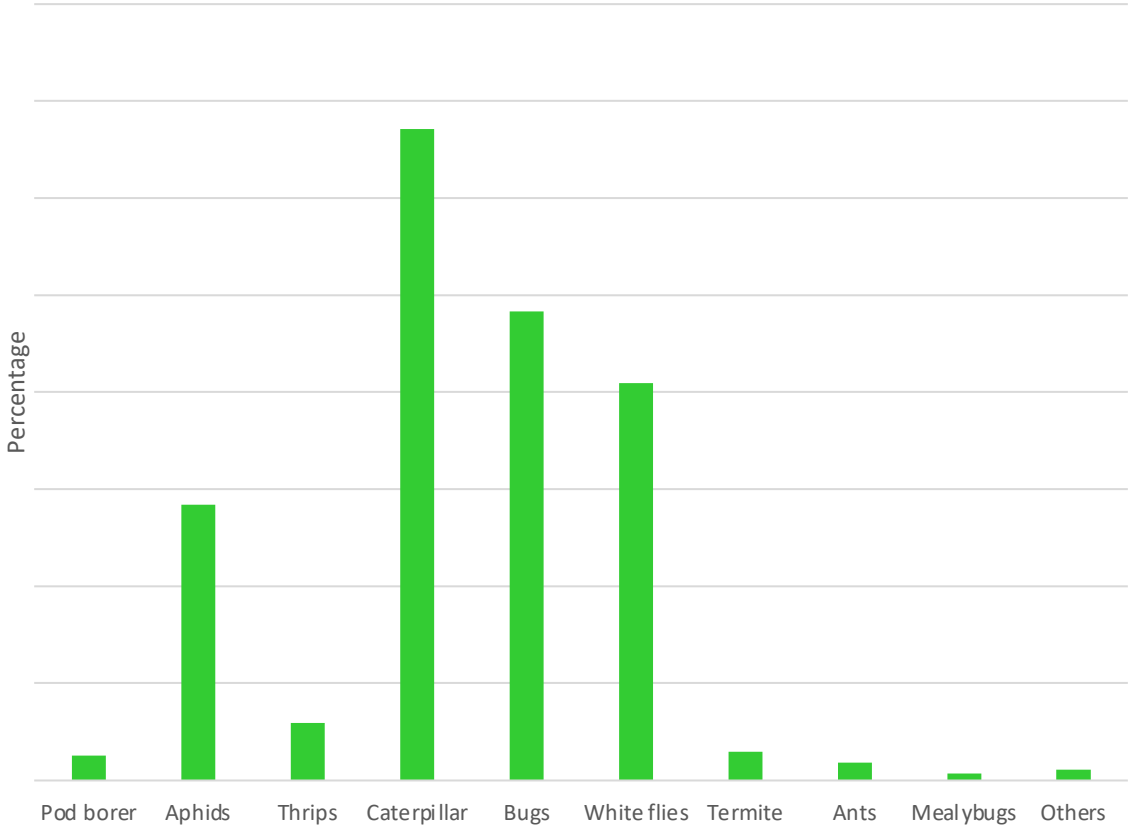

Fig 11. Major pests of pigeon peas

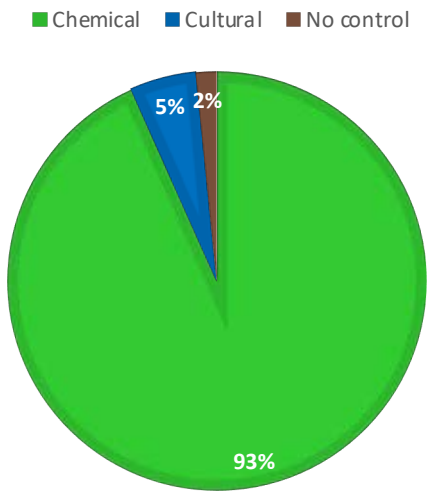

Fig 12. How they controlled the pests

Results cont'

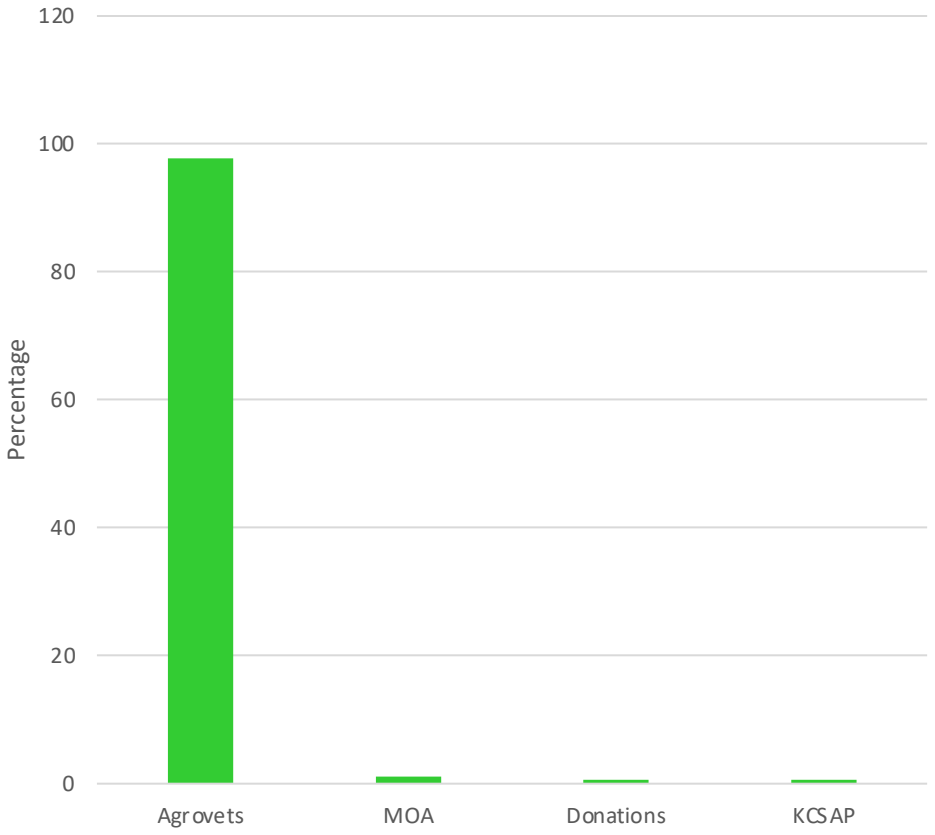

Fig 17. Source of the pesticide

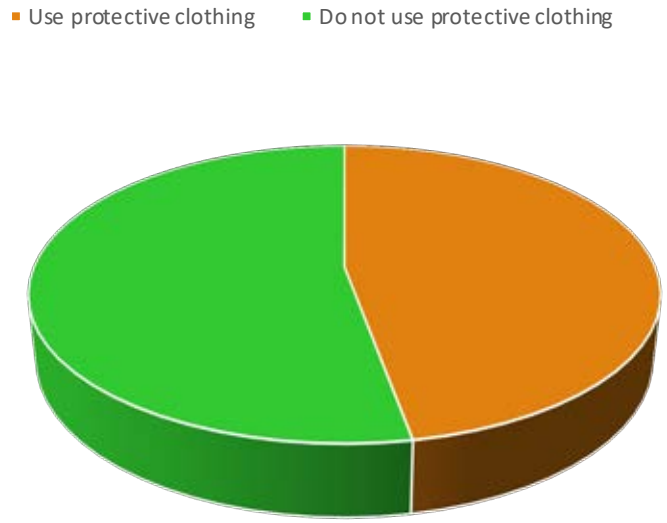

Fig 18. Use of protective clothing

Results cont’

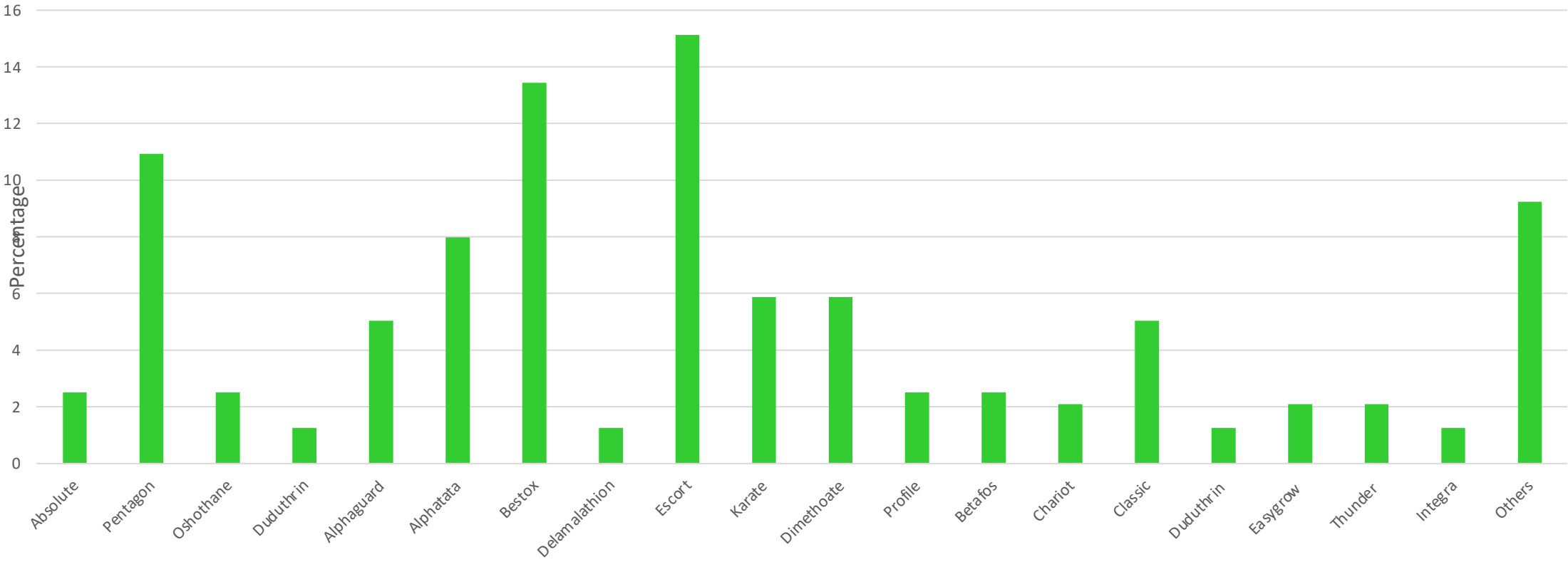

Fig 13. List of pesticides used by respondents in controlling pests in pigeon peas

Results cont’

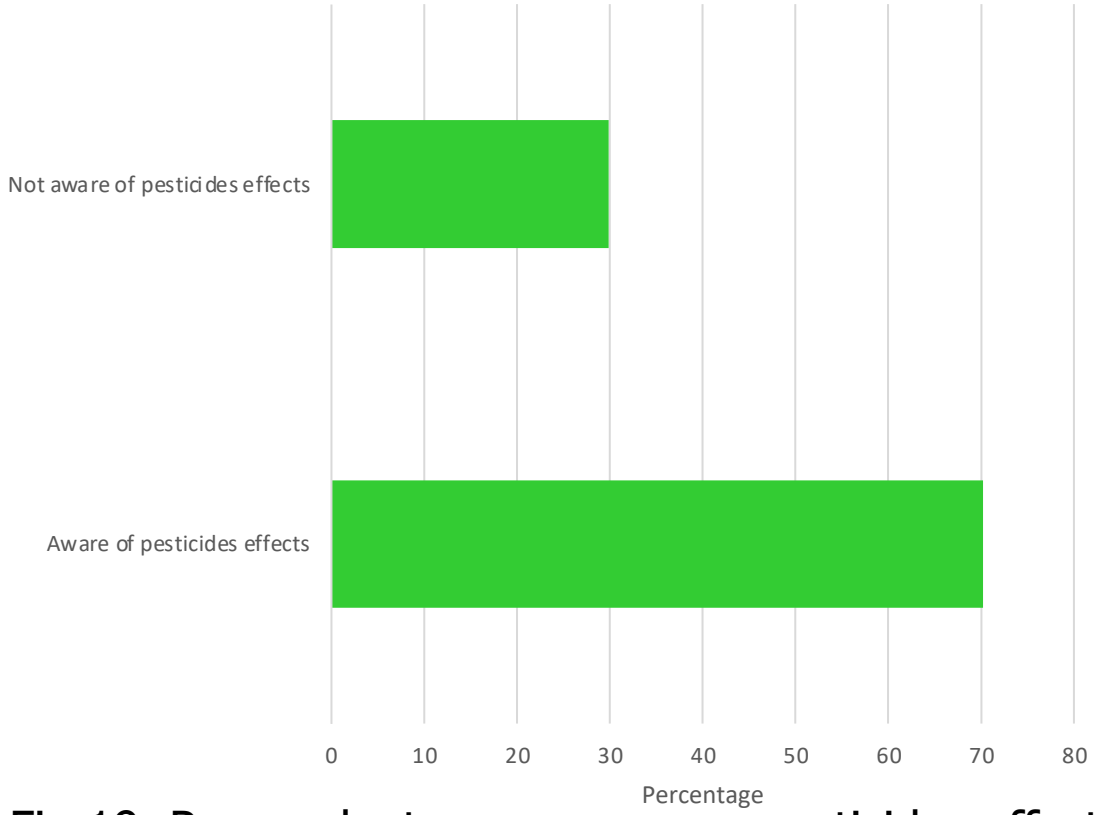

Fig 19. Respondents awareness on pesticides effects

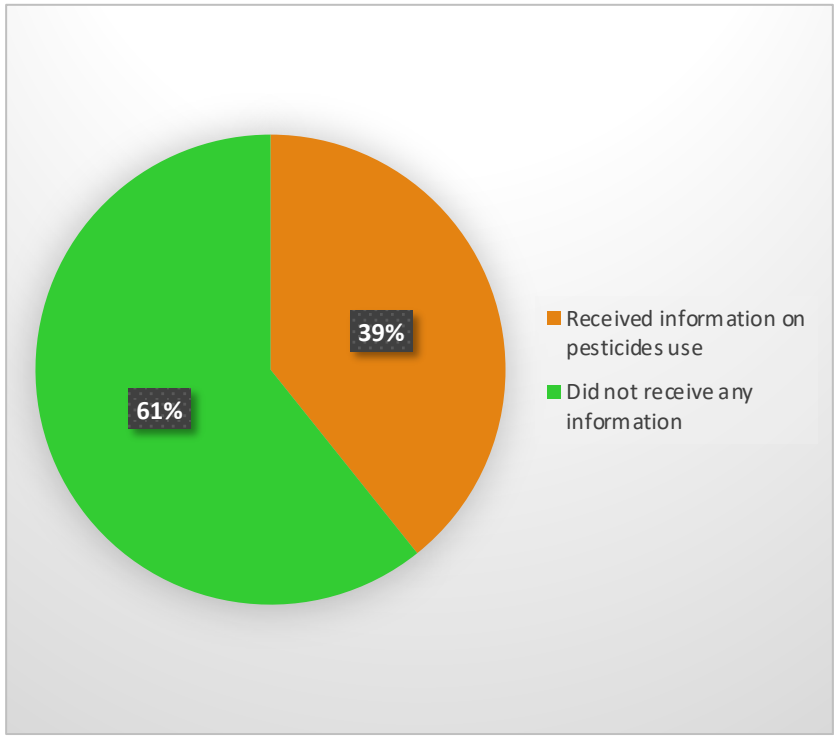

Fig 20. Receipt of information on pesticides use

Results cont'

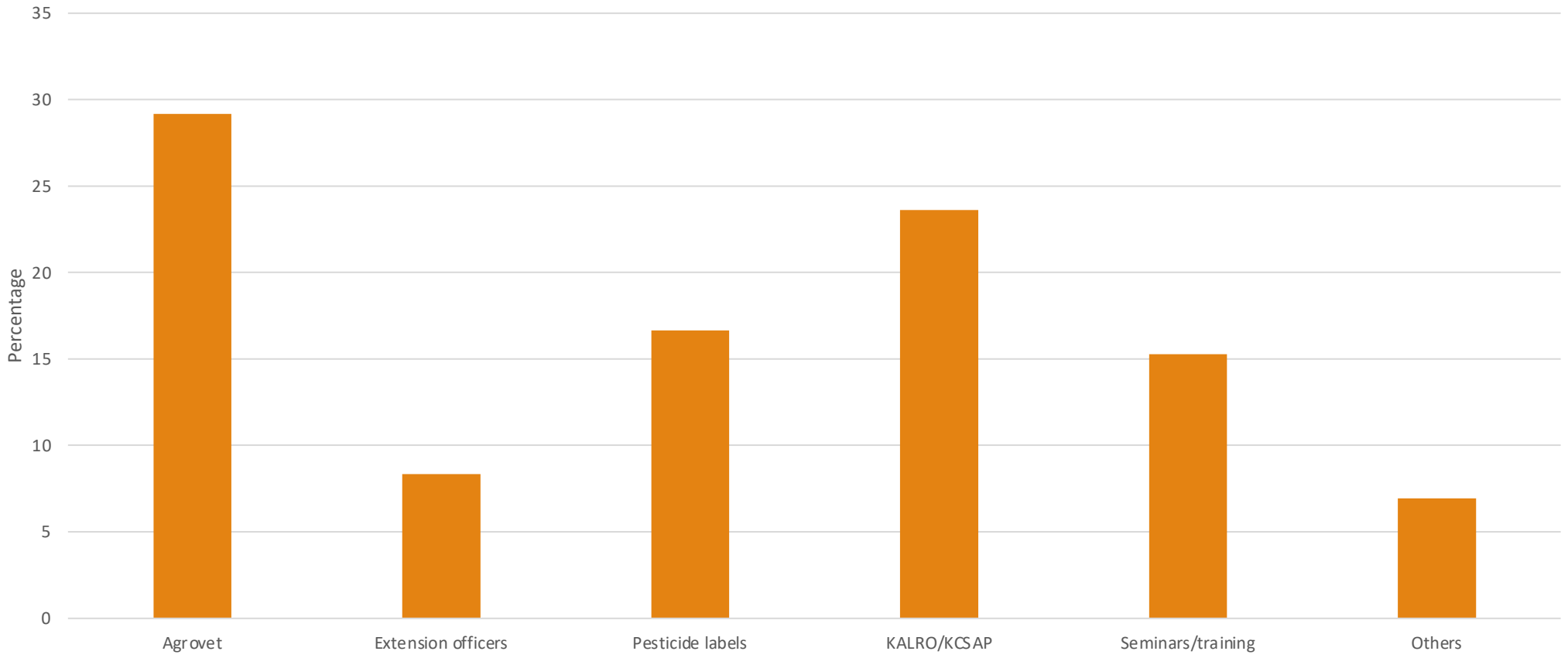

Fig 21. Source of the information received

Results cont’

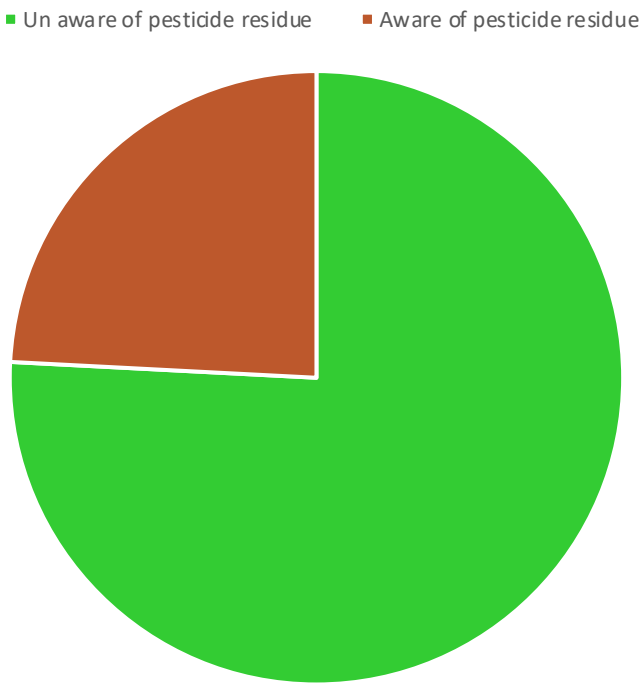

Fig 24 Pesticide residue knowledge

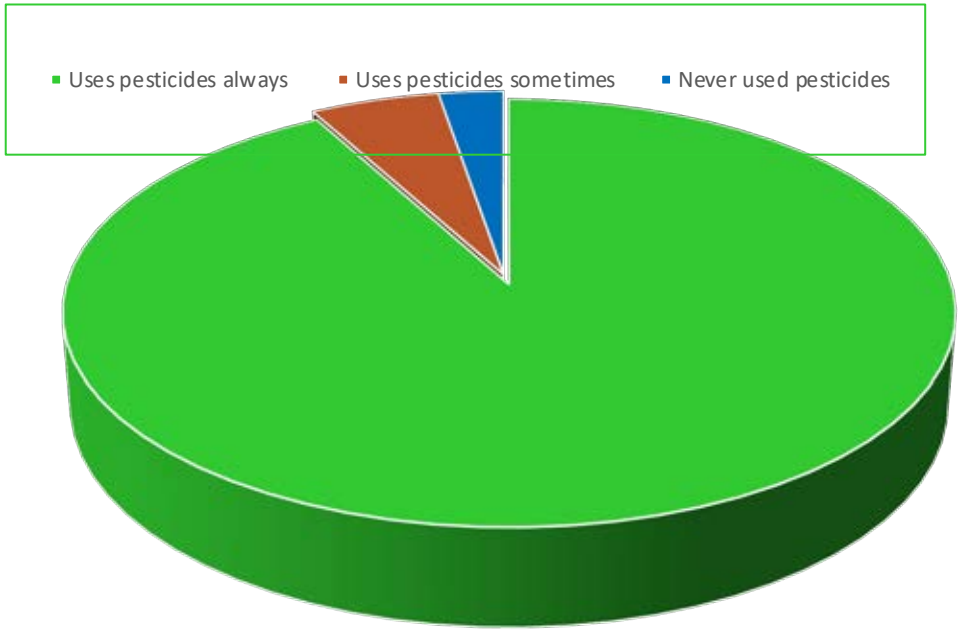

Fig 25. How often they used pesticides

Results cont’

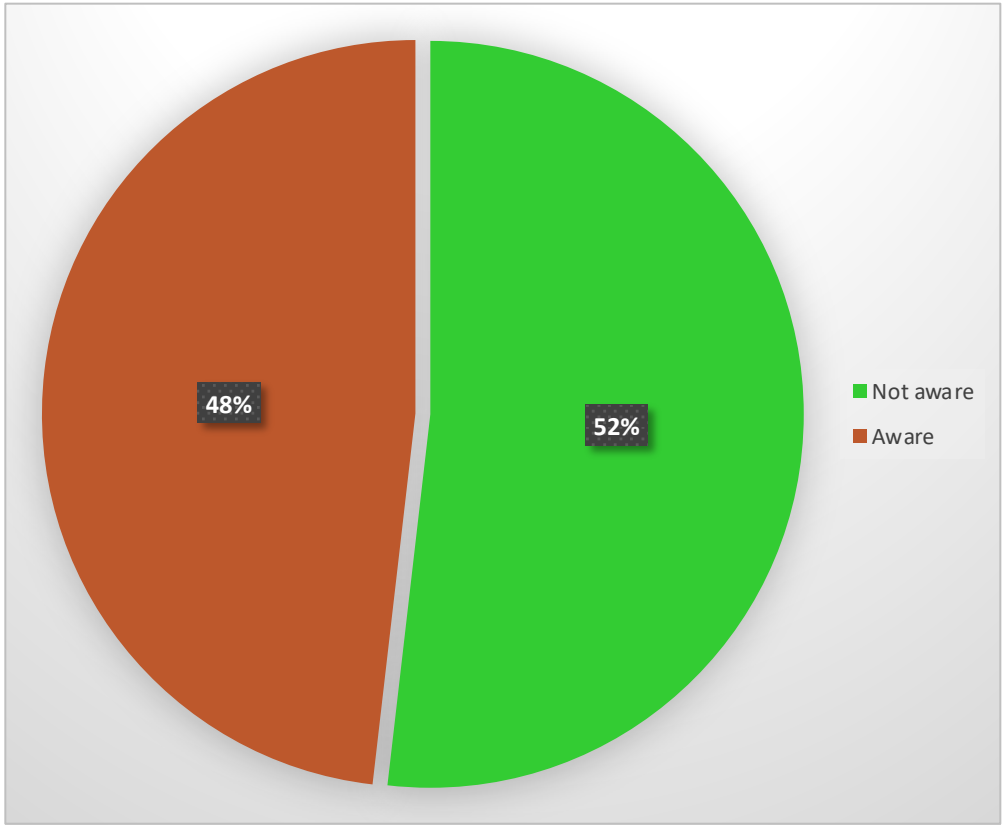

Fig 30. Knowledge of effects of pesticides on pollinators

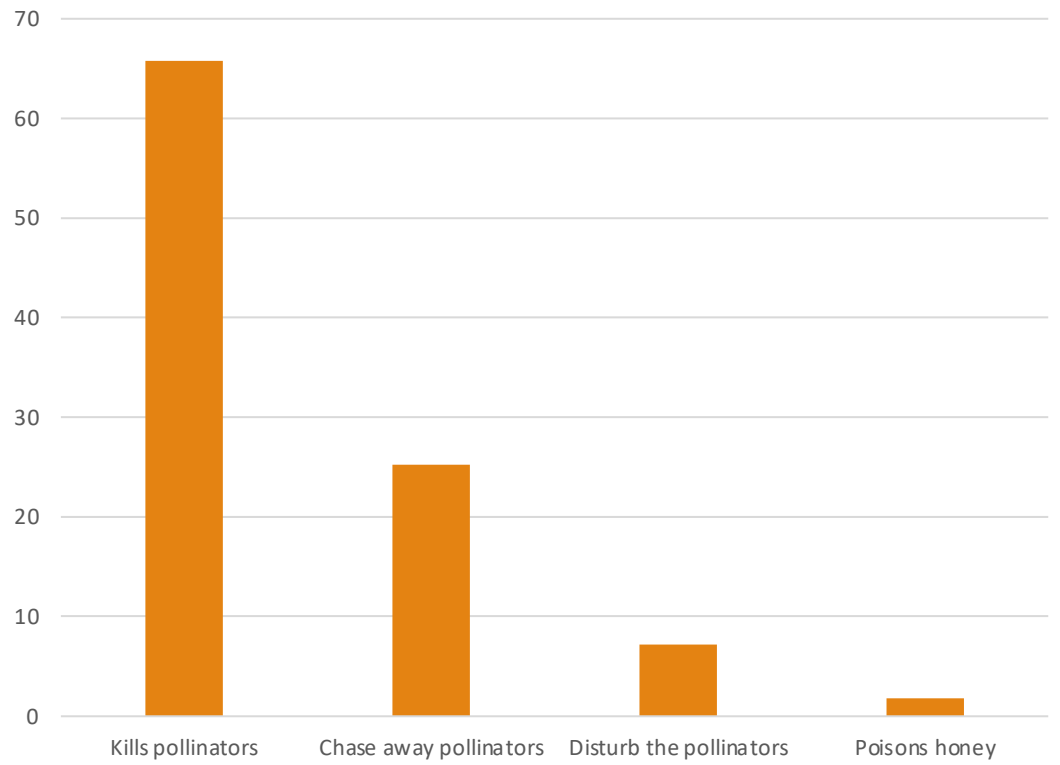

Fig 31. Effects of pesticides on pollinators

Conclusion

- There are several pests that constraint production of pigeon peas in Machakos County.
- Farmers are struggling with management of these pests using a wide range of pesticides without knowledge of the danger associated with excessive use. farmers in Machakos are not fully aware of the lethal effect of pesticides use on their health and that of the pollinators.

Recommendations

- Capacity building for all the farmers in the area on pest management, pollinator management and pesticide application and disposal.

Acknowledgements

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