Study checks progress towards eco-friendly pest management in South Africa

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Mangoes in particular are at risk from insect pests including the mango seed weevil. Credit: Pixabay

A new study published in the *CABI Agriculture & Bioscience* journal has reviewed progress made towards an eco-friendly insect pest management

approach in subtropical agro-ecosystems in South Africa.

The research, by lead author Dr. Tertia Grové of the Agricultural Research Council Institute for Tropical and Subtropical Crops, highlights how an integrated pest management strategy should aim to reduce Maximum Residue Levels (MRLs) caused by pesticide use to tackle pests on avocado, litchi and mango.

South Africa is a known exporter of subtropical fruits—exporting to markets in the European Union and the United Kingdom—but fruit production in the country is susceptible to various insect pests that can significantly contribute to yield losses.

These include litchi moth, Cryptophlebia peltastica (Meyrick) (Lepidoptera: Tortricidae) on litchi, and the citrus thrips, Scirtothrips aurantii Faure (Thysanoptera: Thripidae) and the mango seed weevil, Sternochetus mangiferae (Fabricius) (Coleoptera: Curculionidae) on mango.

In terms of avocado pests, for example, in 2019 the percentage loss of avocado fruit due to insect pests was determined at 12.58% according to the South African Subtropical Growers' Association.

Furthermore, with respect to the mango seed weevil, Dr. Grové highlights that this is an important pest and the economic impact is primarily based on the fact that it is a major phytosanitary pest, restricting access to new foreign markets and contributing to substantial rejections of fruit destined for existing export countries. She adds that a study conducted over two seasons in Limpopo indicated that 39.86% and 23.64% of 'Tommy Atkins' fruit were infested with mango weevil eggs if uncontrolled.

Twenty years ago, mainly broad-spectrum insecticides

(organophosphates and pyrethroids) had been registered for control of pests and progress was made in adopting eco-friendlier management approaches. However, the lowering of maximum residue levels for pesticides on food products by importing countries provide new challenges for growers.

Dr. Grové says that "the paper provides details on the important insect pests of subtropical crops and the current management strategies use for controlling these pests."

"An integrated pest management strategy should aim to use interventions that lower maximum residue levels. A challenge that still remains is the sucking bug complex on avocado and more environmentally friendly strategies used for suppression need to be developed."

She adds that an effective trapping system to monitor adult sucking bugs coming into the orchards will be important for effective management and the development and testing of mating disruption products, attract and kill products, and biological control products for litchi moth is important.

"Biological control products also need to be tested against citrus thrips on mango. The mango industry needs to find more environmentally safe suppression methods that can be used with sanitation to manage mango seed weevil as it is a pest of phytosanitary concern," Dr. Grové added. "The set of economic thresholds for the important pests also needs some attention. The use of botanical pesticides has not yet been tested on a large scale and could possibly contribute to the control of pests in the future."

Dr. Grové suggests that if insecticide application is needed, it is important to take the characteristics, applications and costs of insecticide into consideration. She also states that Insecticides application can cause

the development of resistance by pests and cause problems with residues on fruit and in the environment.

Dr. Grové says that "to minimize the reliance on insecticides is the best solution for a healthy environment. The lowering of MRLs in certain markets will increasingly place pressure on growers. An IPM strategy should therefore aim to use interventions that lower MRLs."

In concluding, she suggests that more eco-friendly options to tackle fruit pests can include bait techniques against fruit flies and natural chemical sulfur for the suppression of thrips, and mealybugs can be dealt with by the release of parasitoids and other natural predators.

More information: Tertia Grové, Progress towards an eco-friendly insect pest management approach in subtropical agro-ecosystems (South Africa), *CABI Agriculture and Bioscience* (2022). DOI: 10.1186/s43170-022-00112-8#citeas

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