

COLEACP PIP



New pests and
invasive diseases

Papaya Mealybug

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A Small Flat White Soft Bodied Insect is Spreading
Across Countries (*Paracoccus marginatus*)



PIP is funded by the European Union



FOR SUSTAINABLE DEVELOPMENT OF
THE ACP HORTICULTURAL INDUSTRY

Document produced by PIP, with the technical assistance Milly Kyofa-Boamah, Ministry of Food and Agriculture, Plant Protection and Regulatory Services Directorate.

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Photos 1,3,4 : Dale E. Meyerdirk, USDA APHIS PPQ, Bugwood.org

Photo 9 : Miller, D.R. and Miller, G.L. 2002. *Proceedings of the Entomological Society of Washington*, 104

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PIP is a European cooperation programme managed by COLEACP. COLEACP is an international network promoting sustainable horticultural trade. PIP is financed by the European Union and implemented at the request of the ACP (Africa, Caribbean and Pacific) Group of States. In accordance with the Millennium Development Goals, the global objective is to: «Maintain and, if possible, increase the contribution made by export horticulture to the reduction of poverty in ACP countries».

This publication has been produced with the assistance of the European Union. The contents of this publication are the sole responsibility of PIP and COLEACP and can in no way be taken to reflect the views of the European Union.

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A Small Flat White Soft Bodied Insect is Spreading Across Countries (*Paracoccus marginatus*)



Look out for this harmful pest

Papaya mealybug can cause a major problem in agricultural and ornamental ecosystems. They cause damage to a wide range of plants (e.g. cassava, papaya, guava, tomato, eggplant, cotton, jatropha, etc.) and found on nearly every part of their hosts (leaves, stems, fruits, etc) and if not well managed can cause huge damage.



1
Crinkled plant



2
Damaged leaves



3
Damaged plants



4
Dead plant



5
Sooty mould

Papaya mealybug

Where is it found?

Papaya mealybugs (*P. marginatus*) originated from Mexico. However in the past few years they were introduced in West African sub-region and spreading fast. This species was first observed in Ghana and has now spread to neighboring countries (Benin, Nigeria, Togo, Gabon, etc.). This pest presents a risk to a wide range of agricultural crops as well as wild plants.

How is it introduced?

P. marginatus can be imported on a wide range of fruits, vegetables and ornamentals. Papaya mealybug can also be transported by humans, animals and strong winds.

How does it look like or how to identify the pest?

Papaya Mealybugs are found on parts of papaya plants, on leaves, stem and fruits. They are small, flat white soft bodied insects measuring 1-4 millimeters long. Immature (crawlers) mealybugs crawl from plant to plant. Females are wingless (see Fig 8 + 10), their bodies covered with white, cottony or mealy waxy coating. On the plant they look like tiny white balls. They have segmented or outlined bodies with well developed legs. Adult females are yellow, 2.2 mm long and 1.4 mm wide and immobile. Males are winged and can fly (see Fig 9). Adult males are pink but appear yellow in the first and second stage of their development. Body is 1.0 mm long. They have no mouth parts in their adult stage; therefore they do not feed. Females and immature papaya mealybugs feed on various parts of plants (leaves, fruits and stem) by inserting their mouth parts into the leaf, fruit and stem and sucking the sap (see Fig 11). They lay their eggs in ovisac (Fig 12) - not visible to naked eyes.



6

Infestation on leaf



7

Fruit infestation



8

Female



9

Male



10

Female



11

Mealybug feeding



12

Ovisac

Where and how do I send a sample of papaya mealybug for identification?

Samples should be sent to the National Plant Protection Organisation (NPPO) in your country. If no experts are available at the NPPO then send samples to the International Institute for Tropical Agriculture (IITA), Benin. Heat-treated samples in 80% ethanol can also be sent to the Insect Information Service, Natural History Museum, London, for identification.

What do I do at national level when the mealybug is identified?

The ministry concerned should quickly raise awareness and set up surveillance systems. Form papaya mealybug management committee where applicable. Organise farmer forum to inform the farmers about the newly introduced pest and the way forward. The roles of the various public and private organisations in papaya mealybug management must be clearly established.

Public sector and private organisations must have financial as well as human resource available for the management of papaya mealybug. Develop a technical cooperation programme where funds are not available and request for support from Food and Agriculture Organisation of the United Nations. Determine its spread and preferred hosts. Develop technical guide on identification and its management (leaflets, brochure, fact sheets, posters, etc.).

What do I do at local (community) level when the mealybug is identified?

Form papaya Farmer Based Organisation (FBO). Meet regularly to discuss mealybug issues. Establish internal quarantine on planting materials and fruits in their locality. Farmers should receive bioagents instead of using chemical pesticides on the papaya farms.

What damage do mealybugs cause to the plant?

Immature and adults suck sap from leaves, stem and fruits. While sucking sap they inject a toxic substance into the leaf, fruit and stem, resulting in chlorosis, leaf deformation or crinkling, early leaf and fruit drop, withering and death of plants (see figs 1, 2, 3, 4, 5, 6 and 7). Foliage and fruits may be covered with sticky honeydew resulting in growth of sooty mould (fungus) (see Fig 5). Severe infestation can kill the entire plant (see Fig 4). The honeydew (sweet, syrupy material) excreted by the mealybug results in the formation of black sooty mould, which interferes in the photosynthesis process and causes further damage to the crops. Heavy infestations are capable of rendering fruit inedible due to the buildup of thick white waxy coating and undesirable quality due to the black sooty mould.

How do I prevent the introduction of mealybugs on my farm?

Buy seedlings that are free from papaya mealybug. All imported known host plants should be treated prior to import. Imported fruits and vegetables must be thoroughly inspected and only released when found to be free from papaya mealybug. Keep a good look out. Monitor your crops throughout growing/production season. Control ants that tend and move them from plant to plant during growing/production season. Destroy affected parts at the beginning of infestation. Prune heavily infested branches to control pest. Conserve natural enemies. Avoid excessive spraying and use of broad-spectrum pesticide, since they may kill the natural enemies. Spray with recommended biopesticide where available.

How do I control papaya mealybug on my farm?

You can use biological control agents or biopesticides. Bioagents such as *Acerophagus papayae* and *Anagyrus loecki*. They are natural enemies (parasitoids). They lay their eggs in the mealybug and complete part of their lifecycle in them. *A. papayae* lays its eggs in the second instar of the mealybug while *A. loecki* lays its eggs in the third.





A. papayae



A. loecki

To be informed about registered pesticides, please consult the department responsible of registering pesticides within your country.

For Bio-Pesticide registration contact the Ministry responsible for pesticide registration in your country.

No spraying of pesticides at released sites since bioagents are very sensitive to chemicals and strong scent kills them. Avoid setting bush fires in bioagent release sites as smoke is toxic to bioagents. After *A. papayae* and *A. loecki* have been released on the farm their effect is seen after nine weeks (9) to twelve (12) weeks so patience is required to achieve optimum control.

Why use Biopesticides?

These products usually have broad modes of action on pests; this avoids resistance problems. No restriction entry interval so greater flexibility for cultural practices. No harvest restriction so total flexibility. Contain natural products which do not have residue concerns. The first biopesticide has been registered in Ghana for the control of papaya mealybug. Its trade name is Campaign and on sale to farmers in Ghana. Campaign contains *Metarhizium anisopliae* - an insect killing fungus.

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1 Mango Bacterial disease

2 *Tuta absoluta* (Meyrick)

3 Papaya mealybug

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Printed on FSC-certified paper with environmentally friendly solvent-free inks.
Publication date : February 2013