

Insecticide Resistance Management (535)

Summary

- Mode of Action. Insecticides kill insects by attacking (i) nerves and muscle; (ii) growth and development; (iii) respiration; or (iv) their guts. IRAC, Insecticide Resistance Action Committee, divides insecticides into 34 groups based on Mode of Action.
- Development of resistance. It results from repeated use of one group of insecticide: heritable changes occur at the site of action or in enzymes that breakdown insecticides.
- Insecticide resistance management (IRM). Strategies are: (i) IPM; (ii) monitor and use insecticides according to need (threshold), not calendar; (iii) follow label instructions; (iv) alternate different groups (i.e. modes of action), with application in 'windows' according to generation time of the target pest; and (v) if practical, stakeholder coordination over large areas.
- IRM DBM, Fiji. The strategy is based on:
 - Bt aizawai (Group 11).
 - Awareness of IRM strategy (Bt sold with leaflet).
 - Recommending Bt aizawai in second 'window'
 - An IPM approach, integrating monitoring, thresholds, discouraging broad-spectrum insecticides (Groups 1&3), and rotating insecticides corresponding to DBM generation time (18 days).



Fig. 1 Leaflet provided with all sales of Bt aizawai. It provides information on the mode of action and benefits of Bt, how it should be prepared and applied and its place in the IRM strategy for diamondback moth.

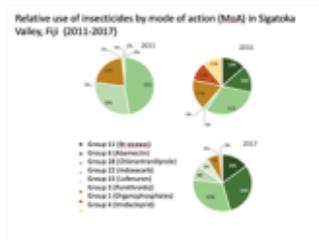


Fig. 4 Change in the use of insecticides with different modes of action before and after the implementation of the insecticide management strategy in the Sigatoka Valley, Fiji.

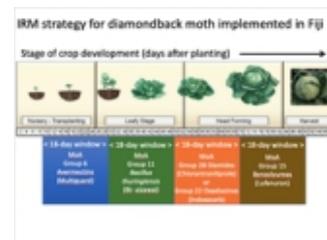


Fig. 2 Summary of insecticide resistance management strategy for diamondback moth in Fiji. "Windows" are time periods corresponding to the duration of the moth's life cycle. Insecticides with different modes of action are rotated in sequence to minimise the exposure of successive generations of the pest to insecticides that kill insects in the same way.

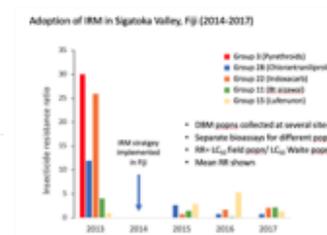


Fig. 3 Changes in the susceptibility of field populations of diamondback moth from the Sigatoka Valley, Fiji, to different insecticides following the adoption of the insecticide resistance management strategy (Resistance ratio = LC_{50} field population/ LC_{50} Susceptible population).

AUTHOR: Mike Furlong

Information from IRAC: www.irc-online.org; and from Atumirava F, et al. (2021). Development, implementation and monitoring of an insecticide resistance management strategy for diamondback moth in the South Pacific. VIII International Conference on Management of the Diamondback Moth and Other Crucifer Insect Pests, Shanhu, Tainan, Taiwan, 4-8 March 2019. Shanhu, Tainan, Taiwan: World Vegetable Center.

Produced with support from the Australian Centre for International Agricultural Research under project HORT/2016/185: Responding to emerging pest and disease threats to horticulture in the Pacific islands, implemented by the University of Queensland, in association with the Pacific Community.

Copyright © 2022. All rights reserved.



Web edition hosted at <https://apps.lucidcentral.org/pppw>