Monitoring for the coconut bug and prediction of economic damage

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The coconut bug is very difficult to monitor visually. Branch shaking and knock down spraying yielded poor results because of this insect's intrinsic ability to move away from any perceived source of danger. Unlike shield bugs who are relatively clumsy fliers these insects do not drop to the ground when disturbed. They are agile, unobtrusive fliers and their brown coloration blends very well with the environment especially in shady orchards. The aim of this report is to provide growers with some basic feedback regarding damage thresholds based on fruit phenology. Aspects regarding monitoring and economic threshold levels will be dealt with in a future report.

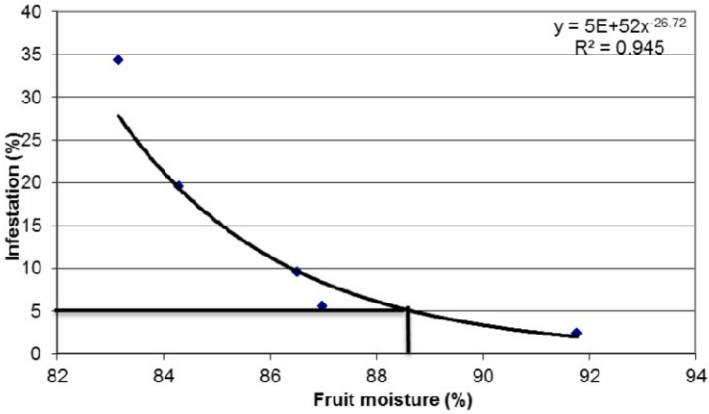

Fig. 1 The relationship between fruit moisture content and the percentage infestation of the coconut bug on avocadoes (cv. Pinkerton) during the 2010/11 season.

Materials and methods

A population survey of the coconut bug was conducted in a severely infested mixed cultivar orchard at the ARC/ITSC in Nelspruit. The survey was initiated just after flowering during 2011 and continued until February 2012. Due to the stealthy habits of the coconut bug, it was not feasible to monitor the orchards visually. Approximately 250 fruit (cv. Pinkerton) were randomly selected each week from 5 trees (50 fruit/tree x 5 trees = 250 fruit). All fruit were then inspected *in situ* for coconut bug damage.

Ten fruit were also randomly selected and fruit moisture content was additionally determined according to the standard recommended method of Swarts (1976).

Results

Previous reports by Schoeman *et al.* (2011) and Schoeman *et al*. (2010) suggest that fruit phenology plays an important role regarding the quantification of the susceptibility status of avocados to coconut bug damage. These reports indicate that damage is generally low during the first few weeks after flowering but increase almost exponentially from early January onwards.

When damage incidence was compared in other important commercial host plants, a similar pattern (low incidence during the early season with a significant increase in damage during the late season) became evident. Mizell *et al*. 2008 also suggested that these insects are generally discriminative feeders and that the phenological stage of the fruit normally dictates the severity of attack. With the difficulties of monitoring for this insect in mind, it was therefore decided to investigate the relationship between coconut bug infestation and fruit maturity (moisture content).

According to Figs.1 and 2 there were strong positive relationships between these two parameters during both the 2010/11 and 2011/12 production seasons. Edwards & Heath (1964) suggested 5% as the general

maximum level of insect damage that can be tolerated before chemical intervention becomes necessary. According to Fig. 1 the fruit moisture percentage during

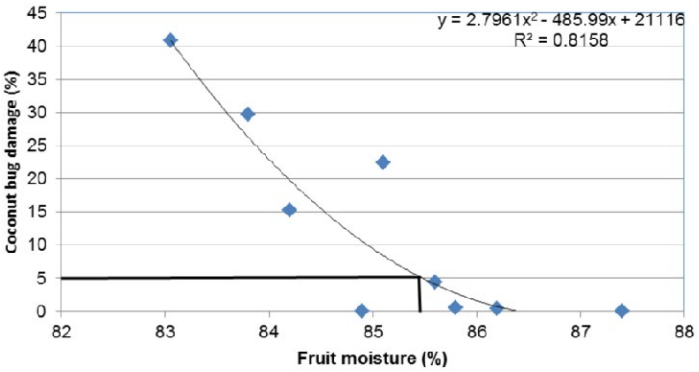

Fig. 2. The relationship between fruit moisture content and the percentage infestation of the coconut bug on avocadoes (cv. Pinkerton) during the 2011/12 season.

2010/11 at 5% coconut bug damage was ±88.5%. This compares favourably with a fruit moisture percentage of ±85.5% during the 2011/12 season.

Degree days were then calculated with the DEGDAY computer program from flowering until damage levels reached 5%. During the 2010/11 season 383.2 heat units were required to reach this threshold. This compared favourable to 370 degree days required for the 2011/12 season.

Conclusions and practical implications for farmers

1) Due to its stealthy habits, the coconut bug is very difficult to monitor.

2) The coconut bug is a fussy feeder and although it may damage fruit during the early season, it only becomes a real economic problem during the second part of the season.

3) Monitoring for damaged fruit is currently the only real alternative but damage is very hetero-geneously distributed in an orchard. Most of the damage occurs along the perimeter of an orchard where it borders other commercial host plants (Litchis, macadamias, mangos and guavas) or natural vegetation.

4) The aim of this research was to shed some light on the seasonal occurrence of damage based on the phenology of developing fruit.

5) In cases of severe infestations, chemical intervention could be applied when fruit (cv. Pinkerton) reached ± 87% moisture or when ±377 degree days have been accumulated since main flowering. For most orchards these levels would probably too early. It should however, be regarded as an important milestone because scouting after this date should be intensified especially on farms with a history of coconut bug infestations.

These recommendations will be further refined during the 2012/13 season.

References

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