

LEAFROLL CONTROL STRATEGY

10.1 QUANTIFYING MEALYBUG IN VINEYARDS

The vine mealybug, *Planococcus ficus*, is a key pest in South African vineyards. It causes direct damage to infested plants, including infesting grape bunches (Fig. 1) and through the excretion of honeydew which promotes the growth of sooty moulds. In addition, it is the most important vector of the grapevine leafroll virus.



Figure 1: Grapes infested with the vine mealybug (Image: M. Ferreira, University of Pretoria)

Natural enemies usually keep vine mealybug populations in check. However, in vineyards where they cause direct damage, effective management is important to keep mealybug populations below economic threshold levels.

Mealybug management generally includes monitoring, biological control, ant control and, as a last resort, chemical control. A single mealybug nymph can transmit the leafroll virus to a healthy grapevine plant; therefore, effective mealybug control is essential. Monitoring is used to determine if mealybugs are present.

10.1.1 Monitoring

Monitoring mealybug populations provides information on the presence of mealybugs in vineyards and population size. Monitoring data is used to make management decisions, for example, when and where control measures must be implemented.

A combination of pheromone traps and physical plant inspections should be used. Pheromone traps can determine when and where physical grapevine inspections are needed. Physical inspection indicates when management actions need to be taken.

10.1.2 Pheromone trapping and physical inspection

Pheromone trapping protocol

Pheromone traps

These traps use a synthetic female sex pheromone in their lures to attract winged male vine mealybugs. Vine mealybug pheromone capsules, yellow delta traps and sticky pads are commercially available. Depending on the product, pheromone capsules are replaced every three months.

Trap readings and trapping frequency

Adult winged male vine mealybugs are very small, and stereomicroscopes are used to count males (Fig. 2).

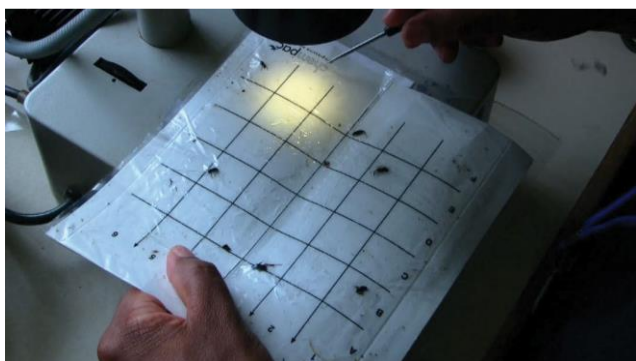


Figure 2: Counting adult male mealybugs on a sticky pad under a stereomicroscope (Image: R. Stolk, IGWS)

Pheromone trapping usually commences in October. When vine mealybug males are caught in traps, the number of males should be counted every second week until harvest. If no vine mealybug males are found on the sticky pads, they can be left in the traps until the next sticky pad change is scheduled. Pheromone trapping should continue on a monthly basis after harvest in commercial blocks with a history of high vine mealybug infestation.

Out-of-season pheromone trapping should continue in grapevine propagation and quarantine vineyard units throughout the year.

Pheromone traps should also be placed in new vineyards planted on soil where old established and mealybug-infested vineyards were removed.

One pheromone trap serves approximately 1 ha. If more than one trap is used, traps are placed 100 m apart to avoid interference.

The pheromone capsules are suspended just above the sticky bottom inside the trap (Fig. 3). Capsules covered with glue affect pheromone release and may not remain effective as long as they should. The trap is attached in or above the cordon region on the trellis wires (Figs. 4 & 5). The open ends of the trap should not be obstructed by leaves or shoots to allow for unhindered pheromone release and vine mealybug males to fly into the triangular opening of the yellow delta trap (Fig. 4).

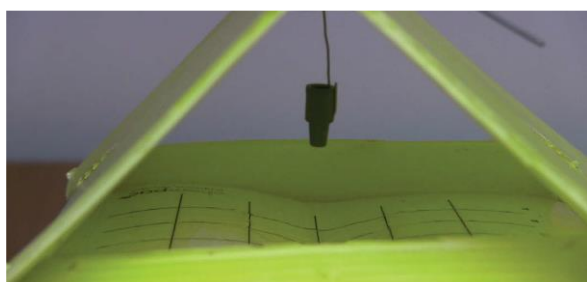


Figure 3: Pheromone capsule suspended above the sticky sheet at the bottom of a yellow delta trap. (Image: R. Stolk, IGWS).



Figure 4: Position of yellow delta sticky trap with *Planococcus ficus* (vine mealybug) pheromone lure. (Image: R. Stolk, IGWS)



Figure 5: Securely tied trap so it does not swing around in the wind. Open sides should not be obstructed by shoots or leaves. (Image: R. Stolk, IGWS)

Action thresholds, pheromone traps

- It is recommended that a trap count of 65 or more mealybug males over two weeks should be followed by physical vine inspection.

Physical inspection protocol

Physical inspection is essential when the action threshold for pheromone trap monitoring has been reached. For physical mealybug inspection, a plan of the specific vineyard block should be drafted with a clear indication of each row and the number of sections ("vakkies") per row. Twenty sections of the block, with five grapevines each spread throughout the block, should be randomly selected. All five grapevines in each section should be inspected where new growth is found, and the presence or absence of mealybugs on each grapevine should be recorded. A strong magnifying glass should be used to ensure that mealybug crawlers, which are very small, are not missed during inspections. The total number of infected grapevines indicates the percentage of vine mealybug infection for that specific block.

Action thresholds, physical inspection

- Vine infestation rates above 2 % warrant mass releases of commercially available natural enemies or control with chemicals.

- If infestation in the block is less than 2 %, but there is a spot with heavily infested grapevines, a spot treatment can be applied to prevent the infestation from spreading further.

10.1.3 Conclusion

Pheromone traps are used for mealybug monitoring in the integrated management of vine mealybugs. The extreme sensitivity of these traps helps to detect low populations of this species in vineyards, and the traps can therefore be used as a quarantine and early warning tool. Physical vine inspection is, however, necessary before control actions can follow.

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