



## LEAFROLL CONTROL STRATEGY

### 10.3 RELEASE OF NATURAL ENEMIES OF MEALYBUGS IN THE SOUTH AFRICAN WINE INDUSTRY

#### 10.3.1 Natural enemies of mealybugs commercially available from service providers:

A combination of two wasps, i.e. *Coccidoxenoides perminutus* and *Anagyrus pseudococci*, as well as a beetle, i.e. *Cryptoalaemus montouzieri*, can be used for the biological control of mealybug in South Africa.

#### 10.3.2 How is mealybug controlled by these insects?

Both wasps parasitize the mealybug by laying their eggs inside the insect at certain stages of its life cycle. *C. perminutus* parasitize during the early stages of the mealybug lifecycle, whereas *A. pseudococci* parasitize at the later, more mature stages of the mealybug. The beetle, *C. montouzieri*, feeds on the mealybug during any stage of the lifecycle, including the egg stage.

#### 10.3.3 Determination of percentage of mealybug infestation in a block

Grapevines are physically monitored for the presence of mealybugs by inspecting five grapevines per plot ("vakkie") of 20 random plots per hectare. When mealybugs are found on two grapevines, the infestation is 2%. If there are seven infested grapevines, the infestation is 7%, etc. These thresholds only apply to wine grapes. The beneficial insects should be released as close as possible to the infected area or grapevines so that the insects can target these areas first.



*C. perminutus*



*A. pseudococci*



*C. montouzieri*

### 10.3.4 Classification of green, yellow and red blocks according to the infestation percentage

The following classification is used in the industry to describe the degree of infestation and to recommend a control strategy:

Green blocks are considered low infestations or preventative situations. 0-2% infestation is used as a threshold for this classification on wine grapes. Yellow blocks are considered medium infestations and 2-5% infestation is used for classification on wine grapes. Red blocks are considered high infestations and problem blocks. 5+% infestations are used as thresholds for this classification on wine grapes. Chemical control is occasionally recommended to help the natural enemies with control and give them a head start.

### 10.3.6 Release quantities for the respective classifications and the costs for the 2015/2016 season

Table 1: Recommended release quantities and cost per hectare for different classifications

Classifications	Infestation level	Recommended release amount/ha			Cost/ha*
		<i>C. pseudococci</i>	<i>A. perminutus</i>	<i>C. montrouzieri</i>	
Green blocks	Low	12 000	250	100	R 799.69
Yellow blocks	Medium	12 000	500	200	R 1 266.79
Red blocks	High	12 000	750	250	R 1 622.27

\* Cost/ha excludes VAT and courier cost

The release of natural enemies on wine grapes in the Western Cape starts in October until the first week in November. Release dates are influenced by whether the growing seasons is early or late. Releases may extend up to January. See Table 1 for the recommended release quantities and costs per hectare for the different levels of infestation.

The costs of the respective classifications vary from season to season. The above mentioned costs include all the insects which are released throughout the season.

The same beneficial insects are used for all the categories – only the release quantities will differ.

### 10.3.5 Method and distribution of releases within the block

The respective beneficial insects each come in unique packaging, which contributes to better distribution and ease of handling. The distribution of the beneficial insects within the block correlates with the distribution of mealybug infestation. The beneficial insects can be released at hotspots or evenly distributed throughout the infested block. Insect releases can also be adjusted during the growing season by releasing at the problem areas as they arise. Wind direction during the release of the beneficial insects is important to consider.



A. perminutus packaging



C. pseudococci packaging



C. montrouzieri packaging



Packaging as delivered to producer.

Images page 1: B. Jonker, Du-Roi. Images page 2: C. Schutte & R. Stolk, IGWS

This research was funded by



Department of Viticulture and Oenology, Stellenbosch University  
Author: Prof Gerhard Pietersen, University of Pretoria / ARC-PPRI