Degree Day Estimation as a Warning Tool for Outbreaks of Grapevine Mealybug in Vineyards.

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What are Degree Days?

Insects are cold-blooded and their tempo of development is directly dependent on the ambient temperature. Heat accumulation, expressed as degree-days (°D), is widely used by entomologists to predict the outbreak of pest populations. The rate of development of the insect is determined at different temperatures and the amount of heat units or °D required to complete one generation is calculated. Information resulting from the use of °D models can be used as additional inputs in a pest management system for a key pest such as *Planococcus ficus* (Signoret).

Degree day model for grapevine mealybug

P. ficus requires 235 °D to complete one generation. The number of °D for the development of *P. ficus* usually accumulates rapidly from early October in most areas. In trials this was also the period during which *P. ficus* populations increased rapidly. There further appeared to be an indirect qualitative relationship between bunch infestation and cumulative °D. Degree days can be used as an additional tool for *P. ficus* management in vineyards.

As soon as 235 °D have accumulated at the beginning of the growing season, the movement of the first generation mealybug crawlers onto the foliage can be expected. If only vineyard inspection is used to monitor melaybug, this is the time to start monitoring. If pheromone traps are also used for monitoring, vineyard inspection should commence as soon as 235 °D have accumulated and the number of males per pheromone trap exceed the threshold value of 65 males per trap per two week sampling period.

Implementation of the degree day model on an experimental basis

Five grape growing areas were selected for the first phase of implementation of the model. Cumulative °D are calculated for each of these areas on a weekly basis and placed on the IPW website. When the number of accumulated degree days nears 235, it should serve as an early warning signal to producers. It should be noted that this information is supplied on an experimental basis and not be used as a stand-alone method for *P. ficus* management.

Tabel 1. Estimated °D for six grape growing areas

Grape growing area	**Station**	**Current Degree days (°D)**	**First generation (235 °D)**	**Second generation (470 °D)**	**Third generation (705 °D)**
Coastal	Nietvoorbij				
Swartland	Malmesbury				
Berg River	Backsberg				
Bree River	Slanghoek				
	Goree				
Hex River	Experimental farm				
Olifants River	Vredendal				