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LEAFROLL CONTROL STRATEGY

13. CONTROL OF LEAFROLL SPREAD FROM EXTERNAL SOURCES

The presence of a large number of leafroll infected grapevines at the edges or corners of a vineyard with a smaller number of infected plants towards the middle or opposite side of the vineyard (Fig. 1) is a good indication that leafroll spread is by virus-carrying mealybugs from a source external to the vineyard.

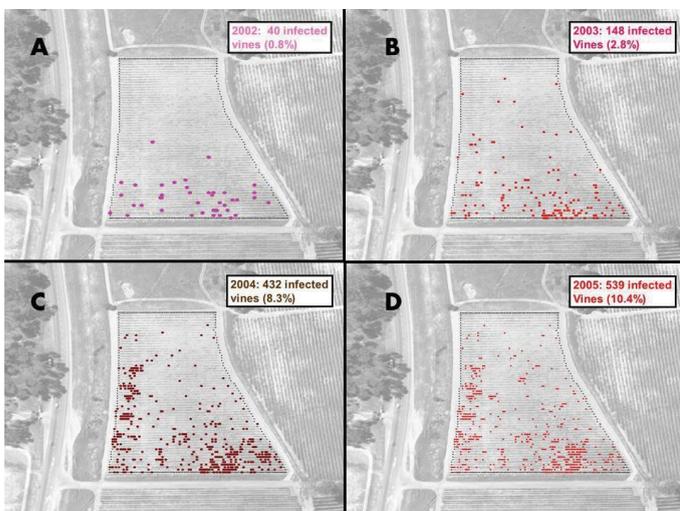


Figure 1: Aerial image showing clear progression of leafroll infection (colored dots) entering the vineyard from the bottom from a leafroll source external to this vineyard (primary spread) followed by short distance grapevine-to-grapevine spread within the vineyard (secondary spread). (Image: G. Pietersen, ARC-PPRI)

The external source will always be a leafroll infected grapevine or vineyard and the means of spread will always be a virus carrying (viruliferous) mealybug or possibly scale insects.

If the external source is close enough, the mealybugs are able to cover the distance on their own, but they can also be blown in on leaves (Fig. 2), or the crawlers (the first stages of the mealybug lifecycle) themselves can be blown in by the wind. If the external source is further away, the mealybugs enter with the aid of people, vehicles and implements (tractors, trailers, harvesting machines).

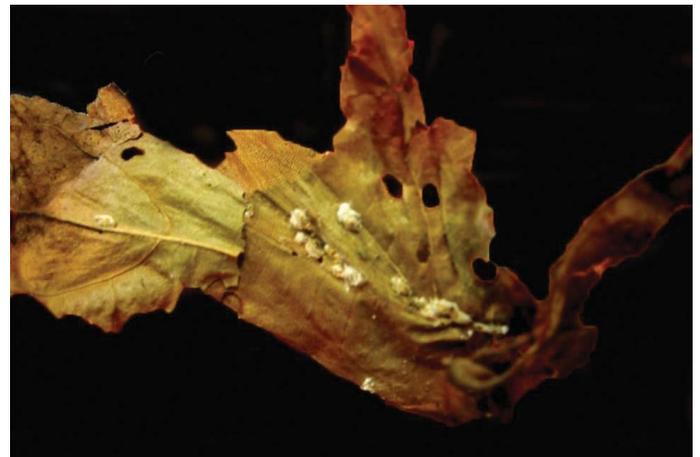


Figure 2: Mealybug egg sacs on senescing leaves blown by the wind (Image: Adapted by G. Pietersen, ARC-PPRI. Original image: Vititec).

Measures to reduce this type of spread:

- Control mealybugs in highly infected vineyards near new vineyards, so that they cannot spread the disease to the new vineyard
- Plant as far away from old, infected vineyards as practically possible
- Plant upwind (prevailing summer winds) of old infected vineyards where possible (even though the extent of wind dispersal of mealybugs has not been quantified).
- Establish large blocks (as close to a square shape as possible) rather than small blocks with high edge to inner grapevine ratios.
- Consider wind-rows between vineyards, to reduce the number of wind-blown mealybug crawlers and leaves from infected vineyards reaching healthy ones
- Avoid disposal of grapevine components or grape-bunch residues near vineyard blocks.

- Categorize vineyards on an estate based on their leafroll status. Ensure that all activities involving laborers and implements are done in the youngest, least infected blocks first, and then move to older, infected blocks (especially during summer months, when mealybug crawlers are present). (Fig. 3)



Figure 3: Categorize vineyards according to the level of leafroll infection in them. Always try to work in the healthiest vineyards with laborers and implements first, before working in more infected vineyards. Avoid moving from infected to healthy vineyards. (Image: G. Pietersen, ARC-PPRI)

- If it is unavoidable for workers to work in infected vineyards and then moving to healthy vineyards, prevent the spread of virus carrying mealybugs on their clothes by having changes of overalls between vineyards. (Fig. 4)



Figure 4: Avoid working in leafroll infected vineyards before going to healthy vineyards. Alternatively change the overalls of workers if they have been in leafroll infected vineyards as they will be spreading viruliferous mealybugs to young vineyards. (Image: G. Pietersen, ARC-PPRI)

- Remove virus carrying mealybugs on vehicles and implements coming from leafroll infected vineyards by washing the implements down with mild detergents. (Fig. 5)



Figure 5: Clean implements with high pressure water and mild detergents before entering healthy vineyards, especially if implements have been in leafroll infected vineyards prior to that. (Image: G. Pietersen, ARC-PPRI)

When applying the above strategies, make the assumption that older white-berried cultivar vineyards are leafroll infected (since one cannot easily distinguish between infected and healthy grapevines based on symptoms only).

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