TECHNICAL INNOVATION FACTSHEET

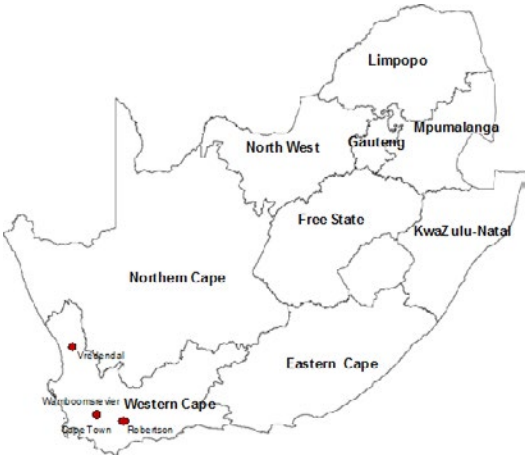
GRAPEVINE YELLOWS MANAGEMENT IN SOUTH AFRICA

Management strategies for aster yellows phytoplasma in grapevine in South Africa

■ THE PROBLEM ADDRESSED

Grapevine yellows threatening the grapevine industry

Grapevine yellows, such as "bois noir", "flavescence doreé" and aster yellows, are serious diseases of grapevine associated with phytoplasma presence that threaten grapevine production and international trade. These diseases lead to severely reduced yields and infected plants may decline and die. Grapevine production in three grapevine-growing regions of South Africa is threatened by the aster yellows disease that is associated with '*Candidatus* Phytoplasma asteris' (Carstens, 2008; Engelbrecht *et al.*, 2010). Apart from Africa, aster yellows phytoplasma has been reported in grapevine in Europe and North and South America. Worldwide South Africa ranks 9th in the production of wine with some 300,000 people directly or indirectly employed in the industry (SAWIS, 2015; OVI, 2019). Phytoplasmas rely on both their host plant and insect vectors for survival. They can spread in grapevine fields through vegetative propagation of infected plant material and insect vector species (leafhoppers, planthoppers and psyllids). In South Africa, the aster yellows disease is transmitted by the leafhopper *Mgenia fuscovaria* (Krüger *et al.*, 2011). Currently the management of grapevine yellows relies largely on the use of insecticides to control the insect vectors. However, insecticides are not always effective because they may not prevent the pathogen transmission in the short term, their use may not be sustainable due to negative effects on human health and the environment, or their use may not be feasible, for example in organic production systems. Improved knowledge of the aster yellows - plant host - insect vector pathosystem can be used to develop sustainable integrated management methods in addition to the chemical control of the insect vectors.



• Above: map of South African provinces and distribution of the aster yellows phytoplasma in the Western Cape province (red circles). Below: grapevine plant with symptoms of aster yellows disease (A); downward curling of the leaves in a white cultivar (B)

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THE PRACTICE/INNOVATION PROPOSED BY TROPICSAFE

Integrated management of aster yellows disease in vineyards

TROPICSAFE aims to develop new solutions to manage grapevine yellows based on improved knowledge of the biology of the associated phytoplasmas and insect vectors, epidemiology, development of reliable, cost-effective detection methods, and exploring crop resistance/tolerance. The results of surveys in South Africa on phytoplasmas in grapevine, alternative host plants and insects have been used to develop new sustainable and eco-friendly management strategies. These include reduction and adaptation of insecticide treatments to local climatic conditions, sanitation, management of reservoir plant species and alternative host plants of insect vectors that contribute to the spread of the diseases, and adaptation of agronomical practices.

HOW IS TROPICSAFE IMPLEMENTING IT?

A management plan for aster yellows disease in grapevine in South Africa

A management plan for aster yellows phytoplasma disease in South Africa has been developed for use by managers and growers. This includes early detection of infected plants, planting phytoplasma-free material, recommendations for leafhopper monitoring, management of reservoir plant species, and management of the insect vectors based on research carried out during TROPICSAFE project and previous research findings.

• Sampling of alternative host plants in the Western Cape, South Africa. Measurement of plant size (A), taking a photographic record (B), labelling and sampling the plant (C)

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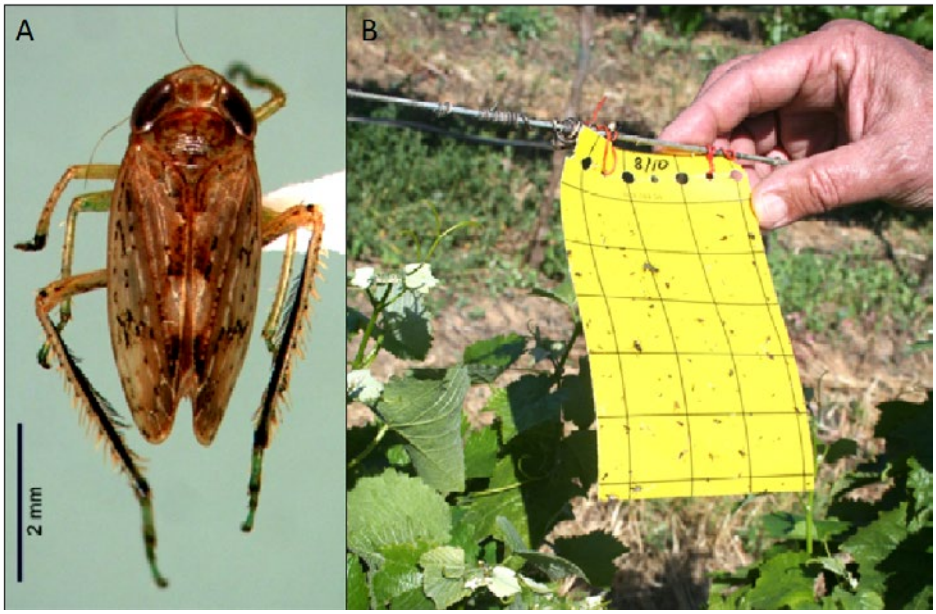
■ HOW IS IT WORKING?

Specific vineyards management

M. fuscovaria is active all year round. Nymphs and adults have been recorded on grapevine during the growing season and on weeds that might host the aster yellows phytoplasma during the remainder of the year. The recommended strategy is therefore to monitor the leafhopper not only through the growing season but throughout the year with yellow sticky traps. Management decisions and timing is based on the presence and population size of *M. fuscovaria*, grapevine phenology, and climate. Sanitation measures to prevent the disease spread include the planting of only aster yellows-free material, detection, marking and removal of infected plant material, such as shoots and infected plants. A further important measure is the removal of alternative host plants of aster yellows or of the insect vector. Weed management is essential as weeds from different plant families are infected by aster yellows phytoplasma or, when grapevines are dormant, they are hosts for *M. fuscovaria*. Insecticides for foliar application or soil drenches have been registered for the management of this insect vector. Insecticide applications according to the manufacturer's specifications are based on the presence of the insect vector in high risk areas or on its population size in lower risk areas.



• Monitoring the leafhopper vector *Mgenia fuscovaria* (A) (Michael Stiller) with yellow sticky traps (B)

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KEY WORDS

Integrated pest management, sanitation, alternative host plants, phytoplasmas, leafhopper vector

FURTHER INFORMATION

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AUTHORSHIP

Kerstin Krüger Department of Zoology and Entomology, University of Pretoria, Pretoria, South Africa kkruger@zoology.up.ac.za

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