Grape Phylloxera in Brazil

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Abstract

There are approximately 90,000 ha of grapes in Brazil including wine, juice and table grapes. American varieties (Isabella, Niagara, Ives) comprise the largest part of Brazilian viticulture being destined for wine, juice and table grape. In Southern Brazil, these varieties are produced mainly in non grafted vineyards. Grape phylloxera is common on the roots of these varieties however the insect is not regarded as a serious problem. Leaf galls are common on *V. vinifera* cultivars, particularly *Cabernet sauvignon,* and this infestation can be severe in some years causing defoliation. No information about insect damage on leaves in relation to vineyard production and longevity is available. New selections from a breeding program aimed at developing new hybrids for wine production are highly susceptible to damage from leaf galling phylloxera. When leaf galling is severe, growers spray pyretroid and neonicotinoid insecticides however, in many situations, secondary mites can also damage the crop as a consequence of the foliar broad spectrum insecticides application. Studies about the genetic diversity of grape phylloxera strains in Brazil and their association with vine damage and secondary fungal infection must be conducted to clarify the importance of this pest to Brazilian viticulture.

INTRODUCTION

The 90,000 ha of table, juice and wine grapes (*Vitis* spp.) in Brazil are located mainly in South Brazil (Rio Grande do Sul, Santa Catarina and Parana), Sao Paulo and Minas Gerais States where American varieties are predominant. These American varieties (Yves, Niagara, Isabella) are primarily used in the domestic table grape market or for processing (juice and wine) (Protas et al., 2006). *Vitis vinifera* production is an expanding activity in the Northeast region (Bahia and Pernambuco states) where table grape exporters are the most important segment of the industry (Torres, 2005) and in South Brazil, where wineries and winegrape vineyards are dramatically improving (Protas et al., 2006).

Grape phylloxera was introduced in Brazil with importations from a number of regions. Phylloxera destroyed the first generation of these plantings, which were planted own rooted *Vitis vinifera* (Gobatto, 1942). After this initial failure, vineyards planted with grafted *V. vinifera* and own-rooted American hybrids (*V. labruscana* and *V. bourquina*) varieties resistant to the insect proved to be more successful.

CURRENT PEST STATUS

Grape phylloxera has spread across most of the South Brazil Region, Sao Paulo and Minas Gerais States where grape production is based mainly on American hybrids (Botton et al., 2003). These hybrids are propagated on their own roots and phylloxera are commonly found on them, however the vines produce well even under phylloxera infestation. In general, phylloxera does not feed on or gall the leaves of *V. vinifera* cultivars. However, leaf galling is common, and occasionally severe, on leaves of *V.*

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vinifera cultivars in Brazil. This feeding behavior and damage does not affect vines as severely as the damage from root-feeding forms, but it can partially defoliate vines and increase the spread and incidence of phylloxera. This is potentially more serious if other factors are considered such as the use of moderately resistant American hybrids like Isabella and Niagara, which are known to be capable of supporting high phylloxera populations. Although phylloxera are not regarded as a serious problem in Brazil they do have the potential to become better-adapted and destructive to American hybrids.

Leaf damage occurs mainly in rootstock nurseries where the insect needs to be chemically controlled. In addition, the leaves of newly introduced rootstocks like VR O43-43 and O39-16 (*V. vinifera* × *V. rotundifolia*) are damaged by the pest.

In many situations, plant decline is observed associated with the root infestations of grape phylloxera in *V. labruscana* vineyards, however no information is available in relation to pest infestation and plant decline under Brazilian conditions. In these vineyards, soil fungi e.g. *Fusarium* spp. and *Cylindrocarpon destructans* are often found associated with grape phylloxera infestation on roots. Studies of the interactions between phylloxera feeding and fungi infection need to be conducted.

PEST MANAGEMENT

Most growers and nurseries of American hybrids (*V. labruscana* and *V. bourquina*) do not consider grape phylloxera as an important grape pest because they assume the American hybrids are resistant. However, as a preventive strategy, many American hybrid vineyards are planted using rootstocks e.g. 1103 Paulsen (*V. berlandieri* × *V. rupestris*), Solferino, SO4, 420-A Mgt. (*V. berlandieri* × *V. riparia*) and 101-14 Mgt. (*V. riparia* × *V. rupestris*), which protect plants from root damage. Many growers are now planting new hybrid grape selections from Brazil's breeding program seeking to improve wine quality for the internal market. These genotypes e.g. Lorena and Moscato Embrapa are highly susceptible to the leaf galling phylloxera. In these cases, growers spray insecticides mainly pyretroids and neonicotinoids (imidacloprid and thiamethoxan), to reduce pest populations (Botton et al., 2004). As a result of these applications, mite infestations (*Tetranychus urticae* and *Polyphagotarsonemus latus*) are often observed.

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