

Impact of Alternative Fungicides on Grape Downy Mildew Control and Vine Growth and Development

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Abstract

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Grapevine downy mildew (GDM) is one of the most serious diseases of grapevines. With limitations in the use of copper-based products imposed for organic agriculture by the European Union, research for alternatives is encouraged. The aim of this research was to follow a 2-year trial to evaluate the control of GDM using some alternative compounds, and to determine their effects on shoot growth, plant photosynthesis, and grape quality and quantity. Under low disease pressure, Bordeaux mixture, copper hydroxide, laminarin combined with low copper, and 0.5 and 0.8% chitosan had the lowest GDM incidence, reduced on leaves by 96, 95, 75, 56, and 81%, respectively, compared with the untreated control

in the last survey. With high disease pressure, Bordeaux mixture, laminarin combined with *Saccharomyces* extracts, and 0.5 and 0.8% chitosan had the lowest GDM incidence, reduced on grape by 86, 37, 66, and 75%, respectively, compared with the untreated control in the survey of mid-July. Chitosan at 0.8% lowered net photosynthesis, due to reduced stomatal conductance, leaf area, and dry weight, with no negative effects observed on the quantity of the grape berries and the quality parameters of their juice. Among the alternatives to copper, chitosan provided the best GDM protection and reduced the vigor of the vegetation, inducing physiological changes without negative effects on grape production.
