J Nanomed Nanotechnol 2017, 8:7 (Suppl)
DOI: 10.4172/2157-7439-C1-062

Effect of nano organic materials sustainable control of powdery and downy mildew diseases on yield and quality of grapevines

Khairy Hassan Abd El- Rahman
Agricultural Research Center, Egypt

Powdery and downy mildew can reduce both yield and quality of the fruit produced from affected grapes. In years with wet spring weather, downy mildew can cause widespread devastation, Powdery mildew has been estimated to cost the world grape and wine industry about $60 million each year. Downy mildew and Powdery mildew may be controlled by a range of synthetic fungicides in conventional vineyards, synthetic fungicides are toxic to beneficial mites and insects, including natural antagonists and may contribute to environmental pollution and furthermore, fungicides residual are harmful to human health, the need to reduce environmental and ecological impacts in conventional viticulture, provide incentives for the development of alternative, environmentally friendly controls for powdery and downy mildew. The need to assess new sustainable strategies for powdery mildew control on a range of cultivars in various climatic regions, to assess effects of these strategies on yield and quality, to develop new materials for control of downy mildew was addressed in this research using of nano organic substance low molecular weight as a tool for controlling powdery and downy mildews. Experiment was carried out on superior grapevine cultivar during the seasons 2015-2016 to evaluate the efficacy of three concentrations of nano organic material of low molecular weight (NFA) to control downy and powdery mildew diseases compared with the recommended fungicides and their effects on plant growth, chlorophyll content, yield and quality of superior grapevines. Results revealed that all (NFA) concentrations significantly reduced disease severity of both diseases. The highest reduction in disease severity of downy mildew was recorded using 10 ppm of (NFA), which was more effective than the recommended fungicides. The significant effect of inhibition of powdery mildew diseases increased gradually with increased (NFA) concentration. At the same time, the reduction of diseases severity was greater than or equal to the recommended fungicides. Foliar application of (NFA) concentrations and synthetic fungicides increased significantly all morphological characters. The yield components (weight of bunch, berry weight, berry size, SSC, acidity and total sugar) recorded the same values with all (NFA) concentrations. NFA had direct effect on soil microbiology by increasing plant exudates, which enhanced the activity of microorganism. NFA at 15 ppm showed the highest increase in dehydrogenase and nitrogenase activity. This study revealed that the foliar application of (NFA) improved plant growth and yield quantity and quality as well as controlling powdery and downy mildews of superior grapevine cultivar. Additionally, NFA has the advantage as effective and environmental friendly agent (organic viticulture). The aim of the current research was to evaluate the use of Nano organic material extracted from wastes as an effective and low-cost alternative controlling powdery and downy mildew diseases in grapevines, beside improving quantity and quality of yield and enhancing soil microbial activity, prevent environmental pollution and production of healthy organic food.

kh11191@ymail.com