

Control of *Verticillium* in tree nurseries through biological soil disinfestation

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Verticillium wilt caused by *V. dahliae* is a serious problem in tree nursery industry in the Netherlands especially in the production of street trees and roses. The only effective way to control *Verticillium* wilt in nursery stock is to prevent the plants from being infected. *V. dahliae*, however, is widely spread in agricultural fields in the Netherlands. Therefore effective methods to eradicate the fungus from soil are strongly needed. The withdrawal of most soil fumigants due to their negative environmental effects enhanced the interest for non-chemical techniques in the control of *Verticillium* and nematodes.

In 2009 PPO started a long-term field experiment to test (anaerobic) biological soil disinfestation (BGO) as a method to control *Verticillium dahliae* and the nematode *Pratylenchus penetrans* in tree nursery soils. As a comparison several other treatments were carried out including growing marigold (*Tagetes patula*) combined with the application of compost, biofumigation with Sarepta or Indian mustard (*Sinapis juncea*), a fallow treatment, chemical soil disinfestation with Metam-Sodium, and finally growing white clover (*Trifolium repens*) that was expected to increase both *V. dahliae* and *P. penetrans* in the soil, since clover is a good host for both pathogens.

The treatments were applied in 2009 to two experimental plots on different soil types. In 2010 and 2011 on these plots a test crop of roses (on sandy soil) and *Acer platanoides* (on clayey soil) were grown to investigate the effectiveness of the different treatments. In this paper the effects of the different treatments on disease incidence and growth of the test crops and on the soil populations of *V. dahliae* and *P. penetrans* will be discussed. It is concluded that on sandy soils BGO may be an effective way of controlling *Verticillium* wilt in nursery stock. However, on clayey soils the remaining pathogen populations were of such a level that susceptible hosts still may be infected. Further investigations to improve the method on clayey soils therefore are needed. A field test with the application of BGO in a commercial nursery on a sandy soil has been started.