

New Biofumigation-Based Approaches to Sustainable Control of Soil-Borne Pathogens.

Control of soilborne pathogens such as *Verticillium*, has become a major problem in UK horticulture since withdrawal of the broad-spectrum chemical fumigant methyl bromide. EU legislation, such as the Sustainable Use Directive, encourage the replacement of conventional pesticides with biological alternatives, wherever possible.



Verticillium wilt of strawberry



Biofumigant brassica crop

In previous work funded by the Defra Horticultural LINK programme, potential biofumigant crops were screened in laboratory trials for their effects on reducing soil populations of *V. dahliae*. These included several brassica species known to produce isothiocyanates (ITCs), sudan grass, onion, lavender and the soil amendment, BioFence. The brassicas showed a good effect, but the most effective was lavender. Chemicals given off by the plant residues were characterised.

This current project is investigating the use of lavender waste and a microencapsulated formulation of the active compounds in lavender for control of *Verticillium* wilt. These will be compared with Biofence and chloropicrin, the only chemical currently registered for use in soil sterilisation for strawberry. The project is funded by the Technology Strategy Board (2010-2014) and partners with NRI are East Malling Research, Berry Gardens, K&S Fumigation, Eden Research plc, Tozer Seeds, CPM Retail and Sainsburys.



Collecting lavender waste

The lavender waste is dried and pelletised for easy application by hand or granule applicator. This can be applied to both conventional and organic farms.

The microencapsulated formulation is diluted with water and applied by tractor or through irrigation systems.



Pelletised lavender waste



Application of microencapsulated formulation

Trials are being carried out by strawberry growers in Kent, Hampshire, Cambridge and Peterborough of the individual formulations and combinations. As well as their effectiveness against *Verticillium* wilt, their effects on other soil-borne pathogens and non-target organisms will also be determined.

The project will provide optimised strategies for using these new products in practice under different levels of pathogen inoculum and various soil moisture conditions.