TRICHODERMA CONTRIBUTION TO IPM STRATEGIES IN EUROPEAN STRAWBERRY

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The European Commission is contributing, within the FAIR Programme (project CT98-4140, 1999-2002), to promote natural, biological, physical and low-chemical control strategies for fungal pathogens as alternatives to methyl bromide (MeBr) and the use of chemical fungicides use in European strawberry cropping systems.

The objectives of this project are:

- To select naturally occurring strains of *Trichoderma,* active against the principal fungal pathogens *Collelotrichum*, *Phytophthora* and *Botrytis*, and to explore their use in laboratory and field conditions;
- To assess the efficacy and survival of selected *Trichoderma* strains in conjunction with solarization techniques, and to investigate the effects of their application to beneficial soil organisms;
- To develop novel biocides from *Trichoderma* proteins for the protection of strawberry fruit from pre- and post-harvest diseases;
- To explore the synergistic effects of the various control measures developed, and to rdesign integrated strategies for strawberry production with minimal chemical input.

There are three major novel strands to this project, involving synergies between different control measures. First, combinations of selected *Trichoderma* strains are being explored as soil and foliar additives, in order to increase the effectiveness and range of pathogen control. Secondly, biocontrol strains are being integrated with soil disinfection techniques (solarization, ozone application, etc). After an appropriate selection, *Trichoderma* strains can be compatible with both solarization and ozone disinfectation preferentially, allowing the maintenance of permanent pathogen-antagonistic soil systems. Thirdly, we have combined traditional *Trichoderma* biocontrol systems with novel antifungal agents derived from *Trichoderma* enzymes, which may be used as environmentally friendly foliar sprays or post-harvest treatments. We are also investigating synergies of biocontrol organisms and products with minimal doses of chemical control agents, to develop protocols which maximise control but minimize inputs. We are also identifying and promoting optimal control systems using components from our IPM spectrum, which should result in effective control of strawberry diseases on a long-term sustainable basis. The experimental processes will act as a model for developing environmentally friendly control measures for pests and pathogens of other MeBr-dependent crops.