Novel Strategies For The Control Of Fungal Crop Disease

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The paper will review recent research into the control of fungal diseases in organic potato production, with particular emphasis on the control of late blight (*Phytophthora infestans*). This will include an overview of the results from the first two years of the EU Blight-MOP programme and associated national government funded European studies, which have focused on the "Development of a systems approach to the control of late blight in European Organic potato production systems.

The selection of varieties with appropriate late blight resistance levels and desired sensory (and/or processing) was found to be the most effective way of controlling late blight (varieties with appropriate sensory quality for 4 European regions which do not require protection by Cu-fungicides could be identified). Improved agronomic protocols/strategies (improved fertility and irrigation management; pre-sprouting, volunteer potato removal and optimisation of planting densities) was shown to allow significantly increases in yield, but had little impact on blight (except for the use of tape irrigation which significantly reduced blight development compared to overhead irrigation). Most alternative treatments tested (plant, compost and sea weed extracts, organic acids, elicitors, biological control treatments) showed no or very low levels of activity against late blight (control by alternative treatments was always significantly lower than that of Cu-fungicide controls). However, protocols based on more frequent sprays with lower Cu-concentrations resulting in significantly lower total Cu-inputs (=6 kg/ha) were as successful in controlling the disease as the much higher doses recommended by the manufacturers (10-30 kg/ha).

Diversification strategies (strip intercropping with cereals, growing alternating rows of resistant and susceptible varieties and/or variety mixtures) can for some combinations of varieties or intercrops provide higher yields and/or reduce foliar blight epidemic development, but such approaches may be difficult to introduce into commercial practice (except for potato crops grown for processing).

The review will include descriptions of

(i) other approaches for the control of fungal diseases in organic production systems, which were developed for other crops, but may be applied to seed-borne, soil-borne and foliar potato diseases and

(ii) the recently started EU Integrated Project (IP) on: *"Improving the quality and safety and reduction of costs in the European organic and 'low input' food supply chains"*, in particular aspects of the IP targeting disease control and/or potato production.