Agronomic strategies for the control of late blight in organic productions systems

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Abstract

A range of agronomic strategies has been shown to reduce the incidence / severity of late blight development[5]. However, the impact of these strategies in organic systems has, to our knowledge not been quantified in the absence of copper use. Also, as a result of the availability of copper fungicides little attention has been focused on optimisation and integration of agronomic strategies in many regions of the EU. This paper summarises recent field trial results on the efficacy of agronomic strategies in organic production systems. The investigated strategies include:

(i) avoiding periods of high blight pressure (e.g. through early planting, chitting/sprouting of potato seed, use of early maturing varieties, precision irrigation systems) to allow faster establishment of crops[2].

In 2001 an experiment was carried out with two varieties, two planting dates and 3 chitting treatments (non-chitted, eye-emergence & fully chitted). The earliest planting date showed less disease for the more resistant variety, but this did not result in higher yields. The experiment will be repeated in 2002 and 2003.

(ii) avoiding excessive nutrient supply (especially of nitrogen) to crops in order to avoid susceptibility or increase resistance to late blight[3].

In a field trial in 2001 with different fertilisation regimes (chicken pellets and composted manure at 2 input levels and at various N:K-ratios) there were no significant diffferences in late blight development betwen treatments, but yields were significantly higher in especially the higher compost treatment, probably as a result of the differences in nutrient release between compost and chicken pellets. The trial will be repeated in 2002. Experiments with different rotational positions (N-rich and N-poor), will also be carried out, as well as experiments with foliar sprays and microbial soil inocula .

(iii) reducing periods of leaf wetness/high humidity in the stand (e.g. wider plant spacings, planting in parallel with the most common wind direction, minimum irrigation regimes[4].

In two experiments in 2001 with different plant densities and different planting configurations (2 or 3 rows per bed, or ridges at 75 or 90 cm distance) no differences in late blight development were found. The experiments will be repeatend in 2002 and 2003.

(iv) preventing incidence of primary inoculum sources (e.g. use of clean seed, removal of volunteer potato / potato dumps[6].

In 2001/2002 and in 2003/2004 the efficiency of putting pigs on the land after a potato crop for the removal of volunteer potatoes is tested.

(v) preventing tuber blight (e.g. early removal of foliage)[1].

In an experiment in 2001 with 3 defoliation methods (heating, flailing and a combination) and 2 irrigation regimes after defoliation no differences in tuber infection were found. The experiment will be repeated in 2002.

Particular emphasis will be on evaluating field trial data in the context of local agronomic practices, varieties used and environmental conditions.

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