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Biological control of grey mould of tomato

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Grey mould, incited by *Botrytis cinerea*, is the cause of serious losses in tomato grown under greenhouse conditions in the mediterranean area.

During the past three years, attempts at controlling the disease have been made, in Northern Italy (Liguria) and Southern France (Provence) in two areas important for the production of tomato by applying microorganisms selected for their antagonistic activity against *B. cinerea*.

In Italy, two strains of *Pseudomonas fluorescens* biovar 5, (the wild type selected in France and a rifamycin resistant mutant), four strains of *Trichoderma harzianum*, applied as a mixture and two strains of *Candida pulcherrima* were tested and compared with chemical fungicides for their efficacy to protect the fruits.

In France, the aim was to protect pruning wounds to avoid the development of stem lesions, the most devastating grey mould symptom in heated glasshouses. Six trials were conducted to test the efficiency of three microorganisms (a strain of *P. fluorescens* biovar 5, an enteric bacterium and a strain of *Fusarium* sp.) in experimental greenhouses with cultural practices as close as possible to a commercial situation. In the last four experiments, these three biocontrol agents were compared to a fungicide and to a strain of *T. harzianum* selected in Italy .

In Italy, all the tested biocontrols agents, applied as foliar sprays, did significantly reduced disease incidence, in the presence of an infection of average severity. The best results have been shown by the strain of *Pseudomonas* resistant to rifamycin. Significant similar results were provided by the wild type and by the the two strains of *Candida*. *Trichoderma* provided a still significant but lower disease control. The good activity shown by the tested biocontrol agents can be explained with their good survival capability in the phylloplane.

In France, *P. fluorescens*, the enteric bacterium and *Fusarium* sp. succeeded to reduce the percentage of stem lesions on the tomato plants during all growing seasons in experimental conditions very conducive to *B. cinerea*. Protection indices as high as 81% were obtained. The efficacy of *T. harzianum* was quite similar to this of the three previous biological agents. However, the best protection was obtained with the fungicide, in this case diethofencarb and carbendazim. A study of the survival of these microorganisms showed that they were able to persist on the petiole stubs where they were applied. One month after inoculation, their population was at a level similar to that on the day of inoculation.