Protection of pruning wounds on greenhouse tomatoes by saprophytic microorganisms against infection by Botrytis cinerea

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L4-4 PROTECTION OF PRUNING WOUNDS ON GREENHOUSE TOMATOES BY SAPROPHYTIC MICROORGANISMS AGAINST INFECTION BY *BOTRYTIS CINEREA*

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Glasshouse production of tomatoes commonly involves the removal of leaves from the lower part of the stems at regular time intervals throughout most of the growing season. Stem lesions, resulting from infection by *Botrytis cinerea* on the pruning wounds, may eventually girdle the stems and kill the plants. This disease is common and represents a serious threat for production, even in the most sophisticated glasshouses, as it is difficult to control with conventional methods. With the objective of developing biological control methods, 175 isolates were collected from the microflora of pruning wounds on tomato plants and were screened for their antagonistic activity against *B. cinerea*. The first screening procedure relied on a leaf disk assay. Among all microbes examined, 21 bacteria, 4 yeasts and 6 fungi prevented infection of tomato leaf disks when inoculated 24 hrs before the pathogen. In the second screening procedure, those 31 antagonists were tested for their ability to protect pruning wounds on 10-12 week old potted plants in a growth chamber. Disease development was significantly reduced by 17 of the bacteria, 3 yeasts and 2 fungi. The level of protection conferred to the pruning wounds was greater than 80% for 10 of these antagonists. To validate further the leaf disk assay, 20 isolates rejected in the first screening step were also tested on whole plants. All failed to provide significant protection of the pruning wounds, and the index of protection was below 10% for 15 of these microbes. Some appeared to stimulate disease. Seven of the most efficient antagonists were included in greenhouse trials in 1993 and 1994. In 1993, all antagonists significantly reduced the colonization of pruning wounds and prevented the development of stem lesions. In 1994, the trials were more discriminating, as disease developed faster and more severely after artificial inoculations with *B. cinerea*. Two bacteria (a pseudomonad and an enteric bacterium) and a fungus (provisionally identified as *Fusarium* sp.) were most efficient in controlling disease. They were selected for further trials in 1995, in which their activity was compared to that of a fungicide (Sumico). The antagonists and the fungicide were applied to each pruning wound with a small hand sprayer, approximately 1 hour after inoculation with a strain of *B. cinerea* sensitive to the fungicide. All treatments significantly reduced the development of disease as compared to plants inoculated with *B. cinerea* alone. The fungal antagonist showed most perspectives for development as a biocontrol agent, as it achieved a level of protection similar to the fungicide.

Mots clés : Lutte intégrée, Lutte biologique, pourriture grise, cultures sous serre

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