Contrasted responses of Botrytis cinerea strains developing on tomato plants grown under different nitrogen nutrition regimes

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The nutritional status of a plant is known to influence its susceptibility to pathogens. In the case of *Botrytis cinerea* the role of nitrogen fertilization of various host plants on disease development appears to be variable. A study was carried out to characterize possible variability associated with strains and inoculum density of *B. cinerea* in its ability to infect leaf-pruning wounds and to develop stem lesions on tomato plants as affected by the nitrogen input.

To this end, one-month old plants were subjected to five differential fertigation regimes with nitrogen inputs varying from 0.5 to 20 mmol.L^{-1} NO_3^-, all other major nutrient elements being kept constant, at the following levels: 11 mmol.L^{-1} K, 3.5 mmol.L^{-1} Mg, 3.5 mmol.L^{-1} Ca and 1 mmol.L^{-1} P. The pH was adjusted to 6 in each treatment by addition of H_2SO_4. Plants were grown under those regimes for 3-4 weeks prior to inoculation.

Six strains differing in their aggressiveness to tomato were compared. They all had similar reaction patterns *in vitro* in response to differential nitrogen levels. In tests on plants, overall disease severity was lower for all strains on plants with higher nitrogen inputs, regardless of inoculum concentration. However, differences among strains were observed in the effect of plant nitrogen nutrition on infection and on lesion expansion. Disease onset was delayed on all plants with higher nitrogen inputs, but the response was greater for strains with lower aggressiveness on tomato. The highest contrast among strains was observed with the colonization of stems. The daily rate of stem lesion expansion decreased with increasing nitrogen fertilization levels for the more aggressive strains, while it increased for the less aggressive strain.

Hypotheses to explain these results will be discussed in light of the possible physiological effects of nitrogen fertilization on nutrient availability for the pathogen in the host tissue and of possible production of defence metabolites by the plant.