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Effects of Powdery Mildew (*Oidium neolycopersici*) Epidemics on Host Dynamics of Tomato (*Solanum lycopersicum* L.)

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Abstract

Oidium neolycopersici causes powdery mildew on all aerial parts of tomato excluding the fruit. Severe infections lead to leaf chlorosis, premature senescence and marked reduction in fruit size and quality. Currently, it poses a significant threat to glasshouse-grown tomatoes and is also of increasing importance on field-grown tomato crops.

Epidemics of powdery mildew (*O. neolycopersici*) and their effects on host dynamics of tomato (*Solanum lycopersicum*) were investigated under controlled greenhouse experiments using the susceptible tomato cultivar Hildares F1. Fully established tomato transplants were artificially inoculated by blowing conidia from an additionally heavily diseased plant hence inducing an even distribution of the disease on the healthy plants. Temporal disease progress as well as host growth dynamics (leaf area, plant height, leaf number) were monitored on leaflet basis and compared with non-inoculated plants raised in a separate greenhouse compartment.

Progress curves of proportion disease severity (DS) and disease incidence (DI) were well described by a three parametric logistic growth function with a maximum disease severity and disease incidence on a plant basis of 0.6–0.65 and 0.85–0.9 respectively. A substantial effect of powdery mildew epidemics on host growth was particularly discernible in terms of healthy leaf area (HLA) from a comparison of inoculated and non-inoculated treatments. Heavy disease epidemics lead to a pronounced defoliation of the affected leaves with a perspective leaf area loss of 52–68 %. However, other host growth parameters such as plant height, total leaf number as well as total leaf area formed were not significantly affected by the artificial inoculation.

Keywords: Defoliation, disease epidemics, healthy leaf area, host growth, tomato

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