RELATIONSHIP BETWEEN *ALTERNARIA RADICINA* SOIL POPULATION DENSITY AND CARROT BLACK ROT

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Alternaria radicina is a seed- and soil-borne pathogen that causes black rot of carrot tap roots and black rings on the root crown. The *A. radicina* population density in spring was determined in carrot field soils to investigate the relationship between soil conidial populations and black rot levels in summer. In each of 15 carrot fields, four randomly selected 30 m² plots were used for soil sampling to a depth of 5 cm in September. *Alternaria radicina* population densities (cfu/g soil) were determined using a soil dilution method and selective agar. Black rot disease incidence was expressed as the number of infected plants/m of row, and severity was assessed using a 0 to 4 rating scale. *Alternaria radicina* soil population density (33–233 cfu/g soil) correlated positively ($P < 0.01$) with black rot severity ($R^2 = 0.84$) and incidence ($R^2 = 0.82$). In Canterbury, disease incidence (10–90%) and severity (0.78–2.18) of black rot varied with the soil population density and their average score was 58.7% and 1.61, respectively. Soil-borne inoculum therefore has a major role in the development of black rot infection.

EFFECT OF FUNGICIDAL TREATMENTS ON SEVERITY AND INCIDENCE OF ELSINOE LEAF SPOT OF APPLE

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The effectiveness of seven products, suitable for organic pipfruit orchards, on reducing incidence and severity of Elsinoe leaf spot was examined. Novel products, potassium carbonate and a saponin-containing *Yucca schidigera* extract, were first tested at different concentrations in the laboratory, using poison plates and poison slides. Increasing concentrations of both products resulted in decreasing *Elsinoe piri* conidium germination on agar plates and glass slides, as well as decreasing size of germination tubes. Conidium germination was significantly reduced compared with controls when the concentration of potassium carbonate or the *Y. schidigera* product was 0.1% or 2.5%, respectively, or higher. In a glasshouse, different rates of products were applied to potted 'Royal Gala' trees, prior to inoculation with conidia of *E. piri* (2×10^5 conidia/ml). Disease incidence and severity were significantly reduced when trees were treated with lime sulphur (1% and 2%), a low concentration of products containing *Y. schidigera* extract (2.5%), copper hydroxide (0.009% and 0.019% copper), sulphur (0.16%) or a low concentration of potassium carbonate (0.5%), compared with the control. However, a different saponin-containing product, and high concentrations of potassium carbonate (1%) and a *Y. schidigera*-containing product (5%) did not reduce disease incidence or severity. In fact, 1% potassium carbonate significantly increased disease severity, compared with the control.