SOURCES OF RESISTANCE TO FOLIAR DISEASES OF LETTUCE

D. NETZER and D. GLOBERSON

Div. of Plant Pathology and Div. of Seed Research, ARO, The Volcani Center, Bet Dagan

Downy mildew (*Bremia lactucae*) and Stemphylium leaf spot (*Stemphylium botryosum* f. *lactucae*) are the two main foliar diseases of lettuce in Israel. The latter, rarely found in other countries, has become widespread in Israel and has affected the quality of the lettuce and its export potential as well. Breeding programs for the development of a Cos-type lettuce, resistant to downy mildew and *Stemphylium*, were started in 1969 and 1972, respectively.

Recently, a Cos-type lettuce, resistant to all local races of *B. lactucae*, was released. It resembles in size and taste that in use commercially. Its resistance derives from cv. 'Mildura' with the *R 3,4* genotype for resistance. None of the local races encountered so far contains the genotype *3,4* for virulence (V-genes). Nevertheless, breakdown of the incorporated resistance will soon occur, as has been experienced in Europe in the last decade. A new source of resistance to downy mildew was discovered among the wild species of *Lactuca* in Israel. Specimens of *L. saligna*, collected in various regions of Israel, were either resistant or segregated in their reaction. Based on the segregation ratios of the progenies in the F_2 and F_3 of the crosses between *L. saligna* and *L. sativa* (Cos-type), resistance is due to a recessive scheme and apparently constitutes a different pattern from that described in the literature.

Sources of resistance to *Stemphylium* have not been reported. In our screening tests, none of the 63 cultivars and lines of lettuce has shown resistance. *L. saligna* specimens were found to be resistant and were crossed reciprocally with *L. sativa*. Results obtained so far indicate also a recessive inheritance of resistance, and absence of linkage either with susceptibility to downy mildew or with undesired morphological traits deriving from the wild species.

ACQUIRED RESISTANCE OF TOBACCO TO POWDERY MILDEW

TOVA SADON and YIGAL COHEN

Dept. of Life Sciences, Bar-Ilan University, Ramat Gan

Tobacco plants previously inoculated with *Pernospora tabacina* (=PT) acquired complete resistance against the powdery mildew agent *Erysiphe cichoracearum* (=EC). Resistance was stable under all environmental combinations at which the pathogens could develop. Growth of EC was stopped at any developmental stage upon inoculation of the plants with PT. No inhibition of PT by EC was observed. Microscope examinations revealed that conidial germination of EC occurred on PT-inoculated leaves, but germ-tube elongation did not. Conidia of EC germinating on water agar (2%) produced longer germ-tubes than those germinating on PT-infected leaves, indicating the possible involvement of inhibitors. β-ionone (whose derivative, the self-inhibitor quisone, was found by Leppik *et al.* in PT- infected leaves) inhibited germination of EC on water agar (ED_{90} = 100 μg/ml) but not conclusively on tobacco. Heat treatments (24 h at 35°C) given to PT-infected plants halted any further development of PT, and hence enabled EC to produce pustules on such plants, indicating that actual viability of PT is a prerequisite for EC inhibition. A series of compatible and non-compatible pathogens failed to induce a similar inhibition of EC on tobacco. Thus, inoculating tobacco with CMV, TMV (both induced systemic reaction), *Pseudoperonospora cubensis, Phytophthora infestans, Helminthosporium turcicum* or *Alternaria solani* (induced minute lesions) did not prevent normal development of EC.

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