New York State Integrated Pest Management Program

Report to New York State IPM program 1999

Breeding and Characterization of Thrips Resistance in Cabbage

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Abstract:

Thrips (*Thrips tabaci*) are a major problem for cabbage growers in New York State, largely due to the ineffectiveness of chemical control. Comparisons between thrips resistant and thrips susceptible cabbage varieties have identified molecular polymorphisms that may be linked to thrips resistance. A total of 800 oligonucleotide primers were used to amplify DNA of resistant and susceptible varieties. The variety 'Fresco' which has shown the highest and most consistent levels of resistance to thrips was found to have high levels of genetic polymorphism differentiating it from other varieties studied. Comparisons between 'Fresco' and the thrips susceptible variety 'Bartolo' identified 136 primers amplifying polymorphisms: 69 in 'Fresco' (+), 50 in 'Bartolo' (-) and 17 potentially co-dominant polymorphisms present in both (+/-). These primers were used to compare DNA amplifications in three other varieties 'Brutus' a partially resistant half-sib of 'Bartolo', and 'Bronco' (partially resistant) with its susceptible half-sib 'Gideon'. Comparisons of polymorphisms between the five varieties identified 12 (+) polymorphisms exclusive to the highly resistant variety 'Fresco', 12 (-) polymorphisms present in all lines except Fresco and 3 (+/-) polymorphisms. A further 11 polymorphisms (5 (+) and 6 (-)) were identified between 'Fresco'/'Brutus' and the other three lines. The polymorphisms indicate genetic differences between thrips resistant and thrips susceptible lines. Selfed populations of the F_1 hybrids, and crosses between resistant and susceptible varieties will allow the association of molecular polymorphisms with thrips resistance in segregating populations. Crosses are also accounting for differences in maturity of varieties.

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