EPIDEMOLOGY OF VERTICILLIUM WILT OF COTTON IN GOLESTAN PROVINCE: EFFECT OF VERTICILLIUM WILT ON QUANTITATIVE AND QUALITATIVE CHARACTERS OF COTTON ON YIELD*

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Abstract
Verticillium wilt incited by Verticillium dahliae Kleb. is one of the destructive diseases of cotton in Golestan Province. In order to determine the effect of disease on the quantitative and qualitative characters of cotton yield and the phenotypic and genotypic correlation between characters of cotton plant yield and its tolerance to Verticillium wilt, 1500 plants were selected and grouped into five categories based on the rate of disease severity. In each group, 100 plants were selected and evaluated for rate of seed germination, quantitative and qualitative characters of yield, and weight of 1000 seeds. Characters were evaluated using SAS software based on a completely randomized block design with four or five replications. Fifty cotton cultivars of Gossypium hirsutum with different characteristics were planted in a completely randomized block design with four replications in infected and non-infected soil. Then the disease indexes of yield, boll weight, early maturity, sympodial length, monopodial number, monopodial length of each cultivar were measured. The correlation between characters were then evaluated using SAS and Gen.cor software. The results showed Verticillium wilt reduces the rate of seed germination, boll weight, yield, ginning turnout, weight of 1000 seeds, plant height, number of leaves, number of bolls, number of nodes, oil percentage in wet seed, elongation, fiber fineness, length of fiber, fiber strength, fiber uniformity and percentage of oil in dried seed. The results also showed positive and significant genetic correlation between disease index and sympodial length (0.34), monopodial number (0.63) and monopodial length (0.69)., and negative and significant genetic correlation between disease index and boll weight and total yield. Positive and significant phenotypic correlation was also found between disease index and monopodial (0.31). There were also negative and significant correlations between the disease index, sympodial length and boll weight of (-0.21 and -0.18). The infected plants had less monopodial numbers and boll weight than healthy plants. Therefore, tolerant cultivars had more monopodial and sympodial branches and longer sympodial length than sensitive cultivars.

Keywords: Verticillium wilt, Epidemiology, Cotton, Verticillium dahliae

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