INDUCED RESISTANCE IN WATERMELON (CITRULLUS VULGARIS), AGAINST WILT DISEASE CAUSED BY FUSARIUM OXYSPORUM F.SP. NIVEUM.

By

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ABSTRACT

Induction of resistance in watermelon plants against fusarium wilt caused by Fusarium oxysporum f.sp. niveum was studied. Inoculation of germinating seeds with 10^6 cfu/ml of biotic inducers i.e. air-borne fungi and non-pathogenic formae speciales of Fusarium oxysporum were tested. In other treatments resistance was induced by seed soaking in solutions of Cobalt as $CoSo_4$, and ethephon.

The most effective treatments in reducing the percentage of wilted plants in pot experiments, were F.o. niveum race 0, F.o. cucumerinum and Stemphylium sp., in addition to Co^{++} 0.5 ppm, ethephon 600 and 800 ppm, on Giza 1 cv. Two field experiments were carried out during 1991 and 1992 growing seasons in naturally infested soil, on Giza 1 cv. The most promosing treatments in pot experiments were applied, in addition to the Benlate treatment as a comparison. Results showed that all the tested inducers effectively controlled the disease. Their effectiveness withstood till the end of growing season. Remarkable reductions in disease incidence were obtained with treatments of ethephon 600, 800 ppm and Co^{++} 0.5 ppm, followed by F.o. cucumerinum and F.o. niveum race 0. Chemical inducers increased fruit weight/plant about 10 times of the untreated and more than 3 times of the Benlate treatment. Meanwhile, treatment of Stemphylium sp. was similar in its effect to the Benlate treatment. As for Gorma cv. The most effective treatments in reducing the percentage of wilted plants in pot experiments were F.o. cucumerinum; F.o. melonis, Stemphylium sp., Co^{++} 0.5 ppm ethephon 600 and 800 ppm. The most promosing treatments in addition to Benlate as a comparison were applied under field conditions. Two field experiments were carried out during 1992 growing season. Results showed that all the inductive treatments were effective in controlling fusarium wilt, increasing number of fruits/plant, seed-yield/feddan and weight of 100 seeds. The most effective treatments were chemical inducers and F.o. cucumerinum. Meanwhile, treatment of F.o. melonis and Stemphylium sp., were similar in their effect to the Benlate treatment. An additional foliar application with Co^{++} 0.25 ppm was applied after 60 days in one experiment. Statistical analysis indicated that this treatment had no significant effect. All inductive treatments stimulated chitinase activity before challenge. The most effective treatments were ethephon 800 ppm and F.o. niveum race 0. Challenging with the pathogen increased chitinase activity of the abiotic treatments, as determined after 24, 48 and 72 h.

Results of this investigation conclude that induction of resistance could be considered a practical and effective method for controlling wilt disease of watermelon. Large scale experiments on other cultivars is needed to recommend this method for controlling the disease at the commercial level.

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