

ABSTRACT

Ph. D Thesis

**EFFECTS OF FLUORESCENT PSEUDOMONADS ON THE CONTROL OF
VERTICILLIUM WILT (*Verticillium dahliae* KLEB)
AND PLANT GROWTH OF COTTON**

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The study was undertaken to determine the effects of fluorescent pseudomonads which were isolated from the rhizosphere of cotton plants and weeds in the cotton growing areas of Aydın province, on the control Verticillium wilt and plant growth of two cotton varieties (Sayar 314 and Acala Maxa) between 2004 and 2006. A total of 59 antagonistic bacteria consisting of 41 from weeds and 18 from cotton plants were selected and 32 *Verticillium dahliae* isolates were collected from infected cotton plants. 30 out of 59 isolates inhibited mycelial growth of *V. dahliae in-vitro*. Fifteen isolates selected were screened for the effects of plant growth and Verticillium wilt on potted cotton plants. In 2005 and 2006, randomized block design field trials with four replicates were conducted by seed bacterization with four fluorescent pseudomonads isolates (FP 22, FP 23, FP 30 and FP 35) including *Serratia plymuthica* (strain HRO-C48). The data for disease intensity on leaves and the incidence in each plot were evaluated during the stage of 5-10 %, 50-60 % and 75 % cotton boll opening and after harvest in both years. Field trials indicated that seed bacterization with antagonistic bacteria induced a significant reduction of the disease incidence and severity of Verticillium wilt compared to untreated control. Based on observation of foliar symptoms, the percentage of effectiveness of seed bacterization averagedly ranged from 33 % to 45 % in 2005 and 22 % to 25 % in 2006. Seed bacterization also caused significant increase on seed cotton yield (12 %-17 %) in 2005 but there was no significant difference in yield in 2006. Significant negative correlations were also found between Verticillium wilt and Nodes above white flower (NAWF), seed cotton yield, kernel weight, fiber strength and Spinning content index (SCI).

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Pseudomonas, biological control, seed cotton yield, Aydın