

Antagonistic Effects of *Bacillus* Species in Biocontrol of Tomato *Fusarium* Wilt

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ABSTRACT *Fusarium solani* is the causative organism of *Fusarium* wilt of tomato (*Lycopersicon esculentum* Mill). Four *Bacillus* spp identified as *B. amyloliquefaciens*, *B. cereus*, *B. pumilus* and *B. subtilis* were tested for biocontrol activities *in vitro* as zone of inhibition and *in vivo* as percent disease control and disease incidence. The result from *in vitro* analysis showed that *B. amyloliquefaciens* inhibited the growth of *F. solani* the most by 95.2% while *B. cereus* had the highest growth of *F. solani* and inhibition of 55.7%. *B. pumilus* and *B. subtilis* showed inhibition of 70.46% and 82.1% respectively and were significantly lower ($p=0.05$) than the control with 100% *F. solani* growth. *In vivo*, *B. cereus* had the least disease incidence and highest percent disease control (18.75% and 81.2%). This was significantly different from the control (100% and 0%), *B. amyloliquefaciens* (25% and 75%), *B. pumilus* (37.5% and 62.5%) and *B. subtilis* (37.5% and 62.5%). Also, growth parameters like shoot and root length from treatment with *B. cereus* (38 mm $\pm$ 1.47 and 31 mm $\pm$ 1.22) were significantly longer ($p=0.05$) compared to the control. This result shows that these four *Bacillus* spp are very effective biocontrol agents and should be harnessed for further biocontrol applications.