Title Evaluation of *Pseudomonas syringae* strain ESC-11 for biocontrol of crown rot and anthracnose of banana

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Abstract

Pseudomonas syringae strain ESC-11 and 250 μg/ml each of thiabendazole (TBZ) and imazalil reduced crown rot of banana caused by *Fusarium* aff. *sacchari* by 30–36% and 83–86%, respectively, in laboratory experiments. Four field trials performed in Costa Rica varied in treatment combinations. In field trials 1 and 2, 125 and 250 μg/ml each of TBZ and imazalil + 0.5% or 1% alum (aluminum ammonium sulfate) and ESC-11, and 250 μg/ml each of TBZ and imazalil + 1% alum reduced rot and mold. ESC-11 alone or with 0.5% alum significantly reduced rot and mold in field trial 2. In trial 3, 50 and 100 μg/ml of TBZ alone and with ESC-11 reduced mold. In trial 4, 125 μg/ml each of TBZ and imazalil and ESC-11, and 300 μg/ml each of TBZ and imazalil reduced rot, and 50 and 125 μg/ml each of TBZ and imazalil and ESC-11, and 300 μg/ml each of TBZ and imazalil reduced mold. In three field trials, there was no significant difference among treatments for latex staining. In field trial 2 only, combinations of TBZ, imazalil, and alum with or without ESC-11, reduced anthracnose, caused by *Colletotrichum musae.* The complex of crown rot fungi, order of treatment application, effect of alum and fungicides on ESC-11, concentration of ESC-11, and level of disease may contribute to the variation in crown rot and anthracnose control by ESC-11. Though ESC-11 alone was not effective in reducing disease, further testing in combination with low rates of fungicide should be done.