Control of Bean Rust using Antibiotics Produced by Bacillus and Streptomyces species - Translocation and Persistence in Snap Beans

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ABSTRACT: Antibiotic culture filtrates produced by Bacillus (CA5) and Streptomyces spp. were tested for translocation and persistence when applied on snap beans inoculated with rust (Uromyces appendiculatus) in greenhouse pot experiments. The antibiotics were applied on the first trifoliate leaves and translocation was assessed as the number of rust pustules on non-treated leaflets or trifoliates while persistence was assessed as the number of rust pustules on rust infected plants at different times after antibiotic treatment. The treatments were replicated three times, each replicate consisting of a pot containing three plants. Antibiotics from both Bacillus and Streptomyces were found to have up to 100% trans-lamina and leaflet-to-leaflet translocation but no significant trifoliate-totrifoliate translocation. The antibiotic culture filtrates also retained significant rust control for up to 10 days after application on the bean plant. However, no significant rust control was found on the plants after 16 days of treatment. The study indicated that the antibiotics produced by antagonistic Bacillus and Streptomyces species possess systemic activity that can persist within the plant for over one week. These metabolites are potential bean rust control products that could be incorporated in integrated disease management programs.