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Efficacy of biological agents and synthetic insecticides to control fall armyworm larvae

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Fall armyworm [(*Spodoptera frugiperda*) (J. E. Smith) (Lepidoptera: Noctuidae)] is the most destructive pest of corn in Africa, the Americas and elsewhere, causing yield losses up to 100%. Resistance to many insecticides groups including *Bacillus thuringiensis* (Bt) has been reported. Thus, the efficacy of biological agents, synthetic insecticides and environmental friendly combinations between insecticides needs to be assessed. Our objectives were to evaluate the mortality of FAW larvae caused by two biological agents and six synthetic insecticides and three low-toxicity insecticides in combination with the biological agents. Larvae in fifth-instar from corn fields without insecticide treatment were collected in Lajas, Puerto Rico and placed in a 20 ml plastic cup containing a wheat-based artificial diet. 200 μL of insecticide solution at high dose were applied to each larva. Evaluations of larvae mortality were conducted from 24 to 96 hours. β-cyfluthrin, Bt and *Chromobacterium* spp. gave the lowest percentage of mortality (<15%) at 96 hours. *Steinernema carpocapsae* (SC) resulted in 37% mortality, while chlorantraniliprole, spinetoram and Bt+SC killed 39-61%, 60-75% and 81% of the larvae, respectively at 96 hours. However, the highest mortalities (>90%) were noted with chlorpyrifos, methomyl and spinetoram+SC at 48 hours and chlorantraniliprole+SC at 72 hours. Thus, the use of low-toxicity insecticides in combination with the entomopathogenic nematode SC was highly effective to control FAW larvae. Furthermore, no resistance was noted to chlorpyrifos and methomyl in this FAW population and both active ingredients might be used for FAW control.

Biography

Diego M Viteri is an Assistant Professor in the Department of Agro-Environmental Sciences at University of Puerto Rico. He has more than five years of experience in integrated pest management approaches to control pests in corn, pigeon pea, soybean and sorghum; genetics and breeding for resistance to biotic and abiotic stresses in common bean. He has worked with biological insecticides such as nuclear polyhedron virus and *Steinernema carpocapsae* alone and in combination with synthetic insecticides of different groups for the control of Lepidopteran pests. He is the author/co-author of more than 20 publications in North American and European journals.

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