

Trial EcoBac: Control of *Phytophthora* in Jalapeño Pepper

Product:	EcoBac	Trial setting:	Field
Crop:	Jalapeño Pepper	Location:	Chihuahua, Mexico

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Objective:

Control of *Phytophthora capsici* in field crops of Jalapeño Peppers

A preliminary set of trials at a nursery demonstrated the feasibility of controlling the fungi *Phytophthora capsici* in bell peppers with the addition of the bacterial probiotic formula BP01. This formulation was patented and is manufactured in the USA by Ecomicrobials Inc. as EcoBac. The objective of the following two trials was to evaluate the efficiency of EcoBac controlling *Phytophthora capsici* in jalapeño peppers (Mitla) planted in the field.

Methods

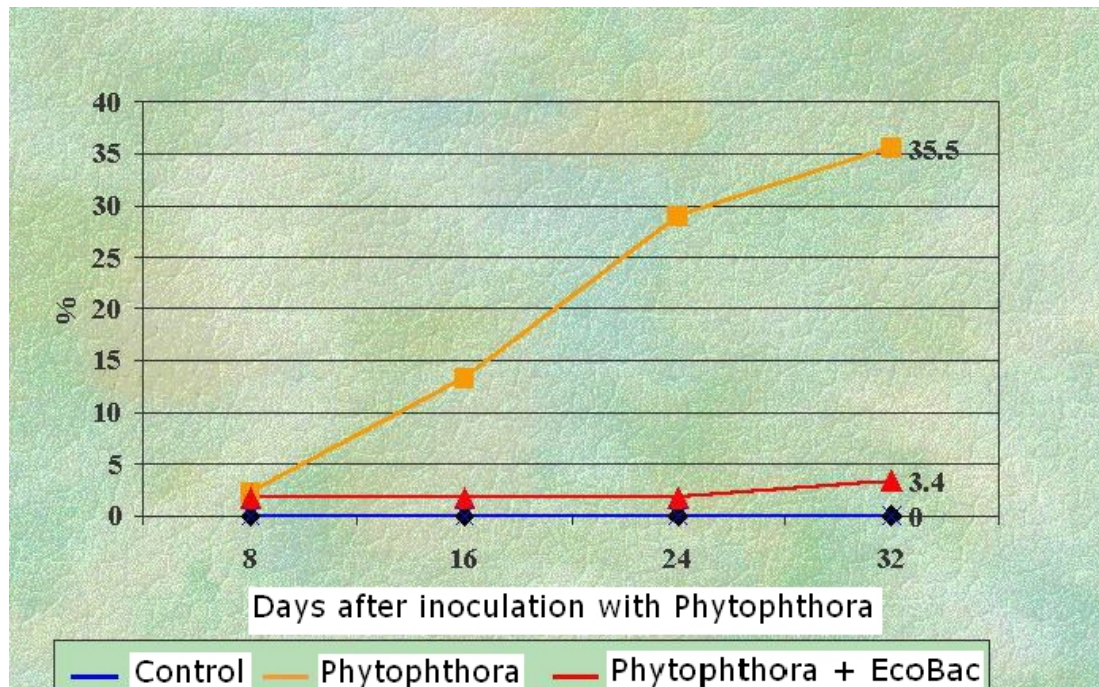
A field with slightly alkaline sandy loam soil and low organic matter content was used for this trial. The soil was amended with a 150-80-0 urea-based fertilizer. Seven-meters-long beds were built every 80 cm. Jalapeño pepper seeds were planted in nursery trays and grown for 5 weeks; then they were planted at a density of 3 plants per meter. The field was flood irrigated before planting, at planting, and then every 10 days for a period of two months, then was drip-irrigated twice a week, at a rate of 3 liters per drip hole per irrigation. Weeding was carried out manually every two weeks. Three treatments were set: untreated control, treatment with inoculated pathogen (*Phytophthora capsici*) and treatment with both inoculated pathogen (*Phytophthora capsici*) and biocontrol agent EcoBac. EcoBac was applied 8 times at a rate of 2 liters per hectare (0.2 gallons per acre). EcoBac had a concentration of 1×10^{11} cfu per liter (3.785×10^{11} cfu per gallon), so every application consisted of 2×10^{11} cfu per hectare (7.6×10^{10} cfu per acre). EcoNutrient was dissolved in water and added with EcoBac. The proportion of EcoNutrient application was one pound per gallon of

EcoBac. EcoBac was applied on days 48, 51, 55, 58, 62, 65, 69, and 72 after planting. *Phytophthora capsici* was prepared as described in "Nursery trial of peppers"; however, this time the fungal contents of three Petri dishes were re-suspended in one liter of water and 100 ml were inoculated per bed. *Phytophthora capsici* was inoculated in the field on day 62 after planting, the same day of the fifth application of EcoBac. Three beds were set as replicates per treatment. The experiment was run twice. Thirty-two days after the inoculation of the pathogen (day 94 after planting) percent incidence of disease was determined.

Results

Results of the first experimental run are presented in Graph 1.

Graph 1. Mortality of bell peppers due to *Phytophthora capsici* and its biocontrol with EcoBac



Briefly, control plants had no mortality. Plants cultured in the soil inoculated with the pathogen had 35.5% mortality after 32 days of exposure. Plants cultured in the soil inoculated with both *Phytophthora* and EcoBac had only 3.4% mortality. The data was analyzed by ANOVA followed by Tukey's test to determine differences between treatments. There were no statistical differences between the treatments in the first sampling; however, in all the following samplings there were significant differences ($P < 0.05$) between the *Phytophthora* and the *Phytophthora* + EcoBac treatment, as

well as between the *Phytophthora* and the Control treatment. No significant differences were determined between the Control and the *Phytophthora* + EcoBac treatment as one of the *Phytophthora* + EcoBac beds had no mortality.

Results of the second run are presented in Photograph 1 (plot inoculated with *Phytophthora capsici*, and Photograph 2 (plot inoculated with *Phytophthora capsici* and treated with EcoBac). All pepper plants grown in soil inoculated with *Phytophthora* died, whereas none of the pepper plants that were under the *Phytophthora* + EcoBac treatment died.

Photograph 1



Photograph 2

