

Field Testing of Potential New Fungicides for Control of Phytophthora Root and Crown Rot of Chile Pepper

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Abstract

*Root and crown rot and blight of chile peppers is caused by the soil-borne plant pathogenic fungus *Phytophthora capsici*. The root and crown rot phases of the disease are favored by saturated soil conditions, while rainfall accompanied by wind helps initiate the blight phase. The purpose of this study was to evaluate potential new fungicides for disease control. Some treatments of Aliette and Fluazinam as well as Ridomil tended to reduce the incidence of disease in this trial. However, the high variability in disease incidence among the replicates of each treatment prevented the demonstration of statistically significant differences in this study. We hope to repeat this trial next year and achieve more definite results.*

Introduction

Severe root and crown rot and foliar blight on chile peppers (*Capsicum annuum*) is caused by the soil-borne pathogenic fungus *Phytophthora capsici*. The incidence of the disease in southeastern Arizona is increasing and is a major disease problem on this crop in New Mexico as well. In Arizona, the crown and root rot phase can first appear on isolated plants early in the growing season. Additional plants become infected during each subsequent furrow irrigation. As the plant canopy develops and covers the row, the aerial blight phase of the disease may occur with the onset of summer rainfall during July and August. During this time, stems, leaves and pepper fruit are most frequently attacked by the pathogen.

Effective control of *Phytophthora* root and crown rot on chile peppers in Arizona has remained elusive. Currently, no commercial varieties of chile pepper are resistant to this disease. Metalaxyl (Ridomil) is a fungicide registered for use on peppers, but consistently effective disease control has not always been achieved with this material. Additional fungicides are known to be effective in controlling diseases caused by *Phytophthora* on other crops, but their potential value for control of *Phytophthora* root and crown rot on chile pepper is unknown. A field trial was initiated in Cochise County in 1993 to test the efficacy of these potential new fungicides for disease control.

Materials and Methods

This fungicide trial was conducted in a commercial chile pepper field in Cochise County. Treatments were replicated five times in a randomized complete block design. Each replicate consisted of 20 feet of row with 36 inches between row centers. Treatment rows were separated by single nontreated rows. Fungicide treatments were applied with a CO₂ backpack sprayer that delivered 100 gallons/A at 35 psi. Preplant fungicide treatments were applied to plots on April 7. A preplant irrigation subsequently was applied to all plots, then chile pepper seed

was planted later in the month. Fungicide treatments also were applied June 30 and September 1, 1993. Furrow irrigation was used for the duration of the study. Final disease severity was measured October 13 by recording the percentage of chile pepper plants that were showing symptoms of *Phytophthora* stem and root rot.

Results and Discussion

The findings of this study are presented in Table 1. Some treatments of Aliette and Fluzinam as well as Ridomil tended to reduce the incidence of disease. However, the high variability in disease incidence among replicates of each treatment prevented the demonstration of statistically significant differences. We hope to repeat this study next year and avoid some of the high variability in disease incidence encountered this year. The data presented suggest that fungicides may be an important management tool in the future for *Phytophthora* stem and root on chile pepper.

1993 PHYTOPHTHORA ROOT AND STEM ROT OF CHILE PEPPER FUNGICIDE TRIAL

Treatment	Rate	Application dates	Total % of plants diseased
Untreated control	—	—	26
Fluazinam 50WP	1 lb ai/A (soil)	Apr 7	15
Fluazinam 50WP	2 lb ai/A (soil)	Apr 7	24
Fluazinam 50WP	3 lb ai/A (soil)	Apr 7	0
Fluazinam 50WP	2 lb ai/A (soil)	Apr 7, Jun 30	23
Fluazinam 50WP	3 lb ai/A (soil)	Jun 30	2
Aliette 80WDG + Potas. carbonate	a) 0.75 + 0.45 oz prod. per 1000 ft of row (soil) b) 5.0 + 3.0 lb prod./A (foliar)	Apr 7 Jun 30, Sep 1	30
Aliette 80WDG + Potas. carbonate	a) 1.5 + 0.9 oz prod. per 1000 ft of row (soil) b) 5.0 + 3.0 lb prod./A (foliar)	Apr 7 Jun 30, Sep 1	4
Aliette 80WDG + Potas. carbonate	5.0 + 3.0 lb product/A (foliar)	Jun 30, Sep 1	0
Aliette 80WDG + Potas. carbonate	2.5 + 1.5 lb product/A (soil)	Jun 30, Sep 1	6
Aliette 80WDG + Potas. carbonate	5.0 + 3.0 lb product/A (soil)	Jun 30, Sep 1	7
Ridomil 2E	4.0 pints/A (soil)	Jun 30, Sep 1	16