



Research Report

Title: Evaluation of Late Blight Treatment Protocols

Location: Japan

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Crop: Tomato

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Abstract:

The purpose of this study was to assess the fungicidal potential of Armorex¹ and Fungastop² in treating late blight (*Phytophthora infestans*) on tomato plants in comparison to Chlorothalonil³. Each product was applied at four dilution rates. The plants were evaluated for disease severity after the treatment and a protective value was established for each of the protocols. All three products had high efficacy against *P. infestans*. Armorex had the highest average protective value of 99%, Chlorothalonil had an average protective value of 93% and Fungastop at its highest concentration tested had a protective value of 94%.

Methods:

Tomato plants grew to the five true leaf stages in a greenhouse and were inoculated with *P. infestans*. Each pot received 20 mL of one of the following 12 protocols: Fungastop at 1%, .5%, .25%, .125% concentrations; Armorex at a concentration of 15%, 7.5%, 3.75%, 1.88%; Chlorothalonil at 16.5 ppm, 8.4 ppm, 4.2 ppm, 2.1 ppm. Additionally, there was a control plot with no treatment. One day after treatment all plants were inoculated with late blight. Disease severity was observed in each of the protocols and documented as a percentage. Protective value was calculated based on relative disease severity compared to the control.

¹Armorex is a minimum risk pesticide manufactured by Soil Technologies Corp. in Fairfield, IA USA

²Fungastop is an EPA 25(b) list antifungal and antibacterial product manufactured by Soil Technologies Corp. in Fairfield, IA USA

³Chlorothalonil is a chemical fungicide CAS# 1897-45-6

Results:

Table 1 shows the results for each treatment. Armorex had the highest average protective value of 99%, Chlorothalonil had an average protective value of 93%. Chlorothalonil demonstrated a protective value of 100% at a concentration of 8.4ppm and Armorex demonstrated a 100% protective value at a concentration of 15% with some signs of phytotoxicity. Fungastop provided a 93.89% protective value at 1%, its highest concentration.

| Material | Concentration | Disease Severity (%) | Protective Value (%) | Phytotoxicity |
|----------------|---------------|----------------------|----------------------|---------------|
| Fungastop | 1.00% | 6.07 | 93.89% | -- |
| | 0.50% | 9.42 | 90.51% | -- |
| | 0.25% | 22.58 | 77.26% | -- |
| | 0.13% | 46.45 | 53.22% | -- |
| Armorex | 15.00% | 0 | 100.00% | ++ |
| | 7.50% | 1.5 | 98.49% | -- |
| | 3.75% | 1.79 | 98.20% | -- |
| | 1.88% | 1.57 | 98.42% | -- |
| Chlorothalonil | 16.5 (ppm) | 0 | 100.00% | -- |
| | 8.4 | 0 | 100.00% | -- |
| | 4.2 | 0.67 | 99.33% | -- |
| | 2.1 | 22.5 | 77.34% | -- |
| Control | | 99.3 | | -- |

Table 1: Results of tests across all protocols

Conclusions:

Armorex demonstrated the highest average protective value with Chlorothalonil providing the second strongest results. On average, Armorex provided a 98.78% protective value while Chlorothalonil provided an average of 92.67%. At a 7.5% concentration, Armorex provided a 98.49% protective value without evidence of phytotoxicity. Fungastop also demonstrated efficacy particularly at values at 1% and 0.50% concentration without evidence of phytotoxicity.