



## **Research Report**

**Title:** Evaluation of Powdery Mildew Treatment Protocols

**Location:** Japan

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**Crop:** Cucumber (Variety Hikari-3-gou-P)

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### **Abstract:**

The purpose of this study was to assess the fungicidal potential of Armorex<sup>1</sup> and Fungastop<sup>2</sup> in comparison to Quinomethionate<sup>3</sup> for treating powdery mildew (*Sphaerotheca fuliginea*) on cucumber plants. 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. Armorex had the highest average protective value of 90%, Quinomethionate had a average protective value of 53% and Fungastop at its highest concentration tested had a protective value of 25%.

### **Methods:**

Cucumber plants were grown in greenhouse pots to 3.5 true leaf stage and inoculated with *S. fuliginea*. Each pot received 20 ml treatment 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%; Quinomethionate at 21 ppm, 10.5 ppm, 5.3 ppm, and 2.7 ppm. Additionally, there was a control plot with no treatment. One day after treatment, all plants were inoculated with powdery mildew. 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.

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

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

<sup>3</sup>Quinomethionate is a chemical pesticide CAS# 2934-01-2

### Results:

Armorex had the highest average protective value of 90.8% compared to 52.7% for Quinomethionate and 6.25% for Fungastop. Table 1 shows the results of each treatment. However, at a concentration of 3.75% Armorex demonstrated a 93.33% protective value with no signs of phytotoxicity. Quinomethionate provided the second strongest average protective value while Fungastop provided a 25% protective value at its 1% concentration.

Material Concentration Disease Severity (%) Protective Value (%) Phytotoxicity				
Fungastop	1.00%	22.5	25	--
	0.50%	30	0	--
	0.25%	30	0	--
	0.13%	32.5	0	--
Armorex	15.00%	1.5	95	++
	7.50%	2	93.33	++
	3.75%	2	93.33	--
	1.88%	5.5	81.67	--
Quinomethionate	21 (ppm)	6.25	79.17	--
	10.5	6.75	77.5	--
	5.3	13.75	54.17	--
	2.7	30	0	--
Control		30		--

Table 1: Results of tests across all protocols

### Conclusions:

Armorex had the highest protective value of 95% of all 12 treatments at a 15% concentration with plants demonstrating signs of phytotoxicity. At a concentration of 3.75% Armorex demonstrated a 93.33% protective value with no signs of phytotoxicity. Quinomethionate provided the fifth strongest protective value of 79.17% while Fungastop provided a 25% protective value at its highest concentration tested.