EFAO 2018: Fusarium control in garlic

Is *Fusarium* infection in garlic reduced with a copper spray or biostimulant?





DISEASE & PEST CONTROL



Farmer-Researcher

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Project Timeline: May 2018- October 2018

In A Nutshell

Felicia grows nematode-free garlic, which she sells as clean seed. She'd like to prevent loss to *Fusarium* and tested a copper spray and biostimulant spray as potential ways to control the fungus.

Key Findings

- The dry conditions and good seed garlic led to low *Fusarium* pressure this year.
- Felicia found no difference in the proportion of garlic with visual signs of infection by weight of good garlic when she compared plots treated with copper spray, RhizoVital[®] spray and no spray.

METHODS

Design

RESULTS

Infection



Felicia planted garlic in mid fall 2017 in a 1-acre field made up of 21 raised beds. Each bed was 400 ft long, with 2 rows of garlic spaced 6-8 inches apart. She mulched the garlic with straw after planting.

To test the efficacy of two foliar sprays for *Fusarium* control, Felicia compared:

1. Copper, an organic fungicide (Cu)

2. RhizoVital[®], a biostimulant (RV)

3. No spray control (Ct)

To apply the spray, she divided the field into 5 replicate blocks, each 80' long and 7 beds wide (**Figure 1**). Within each replicate block, she assigned each 7-bed section to one of the two sprays or no spray control. She sprayed the copper spray on May 12 and the RhizoVital[®] on May 19.

Figure 1. Experimental design of Felicia's garlic patch. Copper spray (Cu); RhizoVital® (RV); and no spray control (Ct).

Bed and row length (feet)		Replicate	Beds 1-7	Beds 8-14	Beds 15-21
400	80	1	Cu	Ct	Ct
	80	2	RV	Ct	Cu
	80	3	Ct	Cu	RV
	80	4	RV	Cu	Ct
	80	5	Ct	RV	Cu

 Average % infected garlic in copper (Cu) plots at planting was highest, but there was a lot of variability. Therefore, Felicia detected no statistical difference in the % of infected garlic at harvest or planting (P>0.50; Fig. 2).



Figure 2. Percent of garlic with signs of infection from visual insection at planting and harvest. Bars are means and error bars represent standard deviation (variation).

- The DNA multiscan[®] confirmed the presence of 3 groups of microbes from a total of 30 groups tested:
 - high levels of 3 groups of Fusarium
 - high levels of 3 groups of Phythium
 - moderate levels of Rhizoctonia solani





Top: Garlic beds mulched with straw in winter; **Middle**: Mulched garlic beds in summer after emergence; **Bottom**: Weighing garlic from each section in tared bins; Brookston clay is hard to work!

TAKE HOME MESSAGE

Measurements

For each section, Felicia measured **infection** in two ways:

- 1. At harvest, she counted the number of garlic plants with no signs of infection
- 2. At planting in 2018, she cracked open 10 bulbs per plot to inspect for *Fusarium*

To confirm the cause of infection, Felicia sent 6 garlic bulbs for a DNA multiscan[®] at the University of Guelph.

She also recorded **garlic yield** by weighing the harvest of good garlic from each section.

• She also detected no differences in the weight of good garlic harvested between treatment groups (**Fig. 3**).



Overall, conditions were dry and *Fusarium* pressure was relatively low.

Felicia detected no effect of copper spray and RhizoVital® on her garlic yield.

Felicia is curious to try again in a year when *Fusarium* pressure is worse.

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