Efficacy of Virkon against Greenhouse Pathogens

W. R. Jarvis and S. D. Barrie
Agricultural and Agri-food Canada Research Station
Harrow Ontario Canada N0R 1G0

Objective

The efficacy of Virkon disinfectant was again tested, against a wider range of pathogens, including some bacterial pathogens.

Material and Methods:

The "Poison Agar Test" was employed for the fungal pathogens, as described previously (see study #1). There were two replicates per pathogen-Virkon concentration combination. Three bacterial pathogens were also tested:

- Clavibacter michiganense ssp michiganense (Canker)
- Pseudomonas syringae (Speck)
- Xanthomonas campestris (Spot)

The bacteria were grown on plates and adjusted in water to give a concentration of 10.8. One ml of these suspensions was added to nine ml of each of three concentrations of Virkon solution - 0.3%, 0.5%, 1.0%, plus a check. The tubes were agitated and after 10 minutes, two 0.1 ml samples from each tube were plated onto the appropriated agar plates to promote growth of the test organism.

This method was that of R. G. Clark and C. N. Hale at New Zealand DSIR.

Observations and Results:

The Virkon inhibited the growth of all the test organisms at the highest concentration used. The pathogens most sensitive to even the lowest concentration were Pythium aphanidermatum, Verticillium Dahliae and all three of the bacteria.

DISEASE	VIRKON CONCENTRATION		
	0.2%	0.5%	1.0%
Black Dot Root Rot (Colletotrichum coccodes)	++	-	-
Corky Root Rot (Pyranachacta lycoporoici)	++	-	-
Early Blight (Alternaria solani)	++	-	-
Fusarium Crown and Root Rot (F. oxysporum fsp radicislycopersici)	++	-	-
Fusarium Wilt (F. oxysporum fsp lycopersici	++	-	-
Gray Mold (Botrytis cinerea)	+	-	-

Verticillium Wilt			
(Verticillium dahliae)	-	-	-
Pythium Damping-off			
(Pythium aphanidermatum)	-	-	-
Rhizoctonia Damping-off			
(Rhizoctonia solani)	++	-	-
White Mold			
(Sclerotinia sclerotiorum)	++	-	-
Black Root Rot			
(Phomopsis sclerotioides)	+	-	-
Bummy Stem Blight			
(Didymella oxalicum)	+	-	-
Penicillium Stem Rot			
(Penicillium oxalicum)	++	+	-
Pepper Fruit and Stem Rot			
(Fusarium solani)	+	-	-
Bacterial Canker			
(Clavibacter michiganense fsp michiganense)	-	-	-
Bacterial Speck			
(Pseudomonas syringae)	-	-	-
Bacterial Spot			
(Xanthomonas campestris)	-	-	-

+++ growth comparable to check plate

++ growth beyond inoculum, but less than check

+ growth confined to inoculum

- no growth

Results and Conclusions:

Virkon has proven to be an effective disinfectant against a wide range of pathogens, including both gram-negative and gram-positive bacteria. Its low phytotoxic effects and quick biodegradation indicate that it would make a good substitute for the disinfectants currently in use - sodium hypochlorite and formalin.

All the above are fungi that cause diseases of greenhouse cucumbers and tomatoes, except the last three:

1. C. michinganensis (gram +ve)
2. Ps. syringae (gram - ve)
3. X. campestris (gram - ve)