



### **PRONTECH Research Summary Report:**

The product PRONTECH was tested in vitro, as to its anti - microbial activity against the common plant pathogenic fungi and bacteria.

#### **Methods**

Isolates of seven phytopathogenic fungi, (*Botrytis spp.*, *Pythium spp.*, *Fusarium oxysporum*, *Phytophthora infestans*, *Sclerotinia sclerotiorum*, *Sclerotium rofsii*) and three phytopathogenic bacteria, (*Xanthomonas campestris*, *Erwinia carotovora*, and *Agrobacterium tumefaciens*) were inoculated onto potato dextrose agar contained in Petri dishes. The potato dextrose agar contained five different concentrations of PRONTECH 0-4grams/Liter of solution. Plates were inoculated on 5/7/97 (experiment 1) and 5/25/97 (Experiment 2) and placed under light at room temperature. Four plates were inoculated per treatment. Fungal and bacterial growth was measured in millimeters and recorded at day 2 and day 6 post inoculation, Exp 1, and day 2 and day 9 post inoculation, Exp. 2.

#### **Results**

For all three of bacterial pathogens, no growth of any kind was observed on any of the PRONTECH treated plates (see enclosed data sheets).

For the seven fungi tested, there was a negative relationship between PRONTECH concentration and the growth of the fungus. For fungi such as *Pythium spp.*, *Phytophthora spp.*, and *Botrytis spp.*, there was zero to very little growth at the concentrations of 3 and 4grams of product / Liter of media. In the case of fungi such *Sclerotinia spp.* and *Sclerotium spp.*, there was minimal growth at the higher concentrations (see enclosed data sheets).

## Conclusions

Overall, the PRONTECH performed very well when tested in vitro against the ten plant pathogens. PRONTECH inhibited all bacteria growth in vitro and reduced the growth of the seven fungi significantly. At the higher concentrations the product inhibited all fungal growth.

If the in vitro tests are any indication, it appears PRONTECH could play a significant role in greenhouse grown bedding plants disease control. In vivo test need to be conducted.

EXPERIMENT 1	FIRST READING				
Pathogens	0	1	2	3	4
<i>Rhizoctonia solani</i>	1,1,1,1 cm	3,3,3,3 mm	1,1,1,1 mm	0,0,0,0	0,0,0,0
<i>Botrytis sp.</i>	4,4,4,4 cm	0,0,0,0	0,0,0,0	0,0,0,0	0,0,0,0
<i>Pythium sp.</i>	5,5,5,5 cm	6,6,6,6	0,0,0,0	0,0,0,0	0,0,0,0
<i>Fusarium oxysporium</i>	1,1,1,1 cm	3,3,3,3 mm	3,3,3,3 mm	.5,.5,.5,.5 mm	.5,.5,.5,.5 mm
<i>Phytophthora infestantans</i>	4,4,4,4 cm	1,1,1,1 mm	0,0,0,0	0,0,0,0	0,0,0,0
<i>Sclerotinia sclerotiorum</i>	1,1,1,1 cm	6,6,6,6 mm	3,3,3,3 mm	0,0,0,0	0,0,0,0
<i>Sclerotium rofsii</i>	2,2,2,2 cm	1,1,1,1 cm	4,4,4,4 mm	2,2,2,2 mm	1,1,1,1 mm
<i>Xanthomonas campestris</i>	0,0,0,0	0,0,0,0	0,0,0,0	0,0,0,0	0,0,0,0
<i>Erwinia carotovora</i>	0,0,0,0	0,0,0,0	0,0,0,0	0,0,0,0	0,0,0,0
<i>Agrobacterium tumefaciens</i>	0,0,0,0	0,0,0,0	0,0,0,0	0,0,0,0	0,0,0,0
Treatment Reading (Radial mm). All the measurements are in mm unless noted					

EXPERIMENT 1	SECOND READING				
Pathogens	0	1	2	3	4
<i>Rhizoctonia solani</i>	4,4,4,4 cm	1,1,1,1 cm	1,1,1,1 cm	8,8,8,8 mm	5,5,5,5 mm
<i>Botrytis sp.</i>	5,5,5,5 cm	1,1,1,1 mm	0,0,0,0	0,0,0,0	0,0,0,0
<i>Pythium sp.</i>	7,7,7,7 cm	1,1,1,1 mm	.5,.5,.5,.5 mm	0,0,0,0	0,0,0,0
<i>Fusarium oxysporium</i>	4,4,4,4 cm	1,1,1,1 cm	1,1,1,1 cm	8,8,8,8 mm	5,5,5,5 mm
<i>Phytophthora infestantans</i>	5,5,5,5 cm	3,3,3,3 mm	1,1,1,1 mm	0,0,0,0	0,0,0,0
<i>Sclerotinia sclerotiorum</i>	2,2,2,2 cm	1,1,1,1 mm	6,6,6,6 mm	1,1,1,1 mm	0,0,0,0
<i>Sclerotium rofsii</i>	4,4,4,4 cm	2,2,2,2 cm	6,6,6,6 mm	3,3,3,3 mm	2,2,2,2 mm
<i>Xanthomonas campestris</i>	0,0,0,0	0,0,0,0	0,0,0,0	0,0,0,0	0,0,0,0
<i>Erwinia carotovora</i>	0,0,0,0	0,0,0,0	0,0,0,0	0,0,0,0	0,0,0,0
<i>Agrobacterium tumefaciens</i>	0,0,0,0	0,0,0,0	0,0,0,0	0,0,0,0	0,0,0,0
Treatment Reading (Radial mm). All the measurements are in mm unless noted					

EXPERIMENT 2	FIRST READING				
Pathogens	0	1	2	3	4
<i>Rhizoctonia solani</i>	3,3,3,3 cm	1,1,1,1 cm	9,9,9,9 mm	5,5,5,5 mm	3,3,3,3 mm
<i>Botrytis sp.</i>	5,5,5,5 cm	0,0,0,0	0,0,0,0	0,0,0,0	0,0,0,0
<i>Pythium sp.</i>	4.5,4.5,4.5,4.5 cm	5,5,5,5 mm	0,0,0,0	0,0,0,0	0,0,0,0
<i>Fusarium oxysporium</i>	3,3,3,3 cm	1,1,1,1 cm	8,8,8,8 mm	4,4,4,4 mm	1,1,1,1 mm
<i>Phytophthora infestantans</i>	5,5,5,5 cm	1,1,1,1 cm	5,5,5,5 mm	2,2,2,2 mm	1,1,1,1 mm
<i>Sclerotinia sclerotiorum</i>	3,3,3,3 cm	1,1,1,1 cm	3,3,3,3 mm	2,2,2,2 mm	0,0,0,0
<i>Sclerotium rofsii</i>	2.3,2.3,2.3,2.3 cm	1,1,1,1 cm	3,3,3,3 mm	3,3,3,3 mm	2,2,2,2 mm
<i>Xanthomonas campestris</i>	0,0,0,0	0,0,0,0	0,0,0,0	0,0,0,0	0,0,0,0
<i>Erwinia carotovora</i>	0,0,0,0	0,0,0,0	0,0,0,0	0,0,0,0	0,0,0,0
<i>Agrobacterium tumefaciens</i>	0,0,0,0	0,0,0,0	0,0,0,0	0,0,0,0	0,0,0,0
Treatment Reading (Radial mm). All the measurements are in mm unless noted					

EXPERIMENT 2	SECOND READING				
Pathogens	0	1	2	3	4
<i>Rhizoctonia solani</i>	5,5,5,5 cm	3,3,3,3 cm	1,1,1,1 cm	7,7,7,7 mm	6,6,6,6 mm
<i>Botrytis sp.</i>	1,1,1,1 cm	2,2,2,2 mm	0,0,0,0	0,0,0,0	0,0,0,0
<i>Pythium sp.</i>	4.5,4.5,4.5,4.5 cm	8,8,8,8 mm	2,2,2,2 mm	0,0,0,0	0,0,0,0
<i>Fusarium oxysporium</i>	5,5,5,5 cm	4,4,4,4 cm	1,1,1,1 cm	6,6,6,6 mm	3,3,3,3 mm
<i>Phytophthora infestantans</i>	5,5,5,5 cm	3,3,3,3 cm	1,1,1,1 cm	9,9,9,9 mm	5,5,5,5 mm
<i>Sclerotinia sclerotiorum</i>	5,5,5,5 cm	4,4,4,4 cm	2,2,2,2 cm	1,1,1,1 cm	9,9,9,9 mm
<i>Sclerotium rofsii</i>	5,5,5,5 cm	3,3,3,3 cm	6,6,6,6 mm	5,5,5,5 mm	3,3,3,3 mm
<i>Xanthomonas campestris</i>	0,0,0,0	0,0,0,0	0,0,0,0	0,0,0,0	0,0,0,0
<i>Erwinia carotovora</i>	0,0,0,0	0,0,0,0	0,0,0,0	0,0,0,0	0,0,0,0
<i>Agrobacterium tumefaciens</i>	0,0,0,0	0,0,0,0	0,0,0,0	0,0,0,0	0,0,0,0
Treatment Reading (Radial mm). All the measurements are in mm unless noted					