

Economic Development, Jobs, Transport and Resources

A Potential Control Agent for Blackleg in Canola

From Red Wine to Benchtop

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The Blackleg Menace

Major disease in canola . phoma stem canker.
Caused by fungus *Leptosphaeria maculans*.
L. maculans has high evolutionary potential.
Breakdown of resistance in commercial lines.
Emerging reports of fungicide tolerance

Need to explore novel control agents!

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There's Something about Pterostilbene (PTS)...

COc1ccc(cc1)/C=C/c2ccc(O)cc2

Found in red wine, grape, red sandalwood.
Antifungal activity against crop pathogens.

Botrytis cinerea, Fusarium oxysporum, Sclerotinia sclerotiorum, Septoria nodorum, Plasmopara viticola etc.

Valued as a nutraceutical.

Anticancer, antioxidant, anti-inflammatory, neuro-protective etc.

Manuscript submitted to PLoS One.

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PTS vs. *L. maculans*

1. Effect on mycelial growth
2. Effect on conidial germination
- ~~3. Effect on cell membrane integrity~~

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Effect on Mycelial Growth

4 mm plug
1/8 V8 agar

Transfer

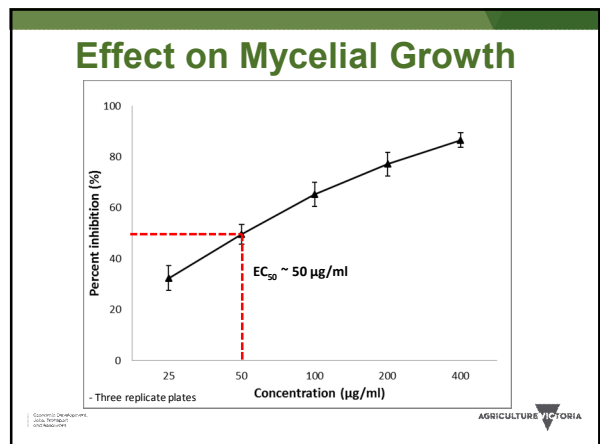
6 days
18°C

1/8 V8 agar + solvent
1/8 V8 agar + PTS

Measure diameter (mm)

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Effect on Conidial Germination

100 spores / ml

10 days
25°C in dark

2% Water agar + solvent
2% Water agar + PTS

Count number of colonies

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Effect on Conidial Germination

Condition	Number of Colonies
Control (solvent)	83.3 ± 6.1
50 µg/ml PTS	0
100 µg/ml PTS	0
200 µg/ml PTS	0

Sporistatic or Sporicidal?

Three replicate plates.

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Effect on Conidial Germination

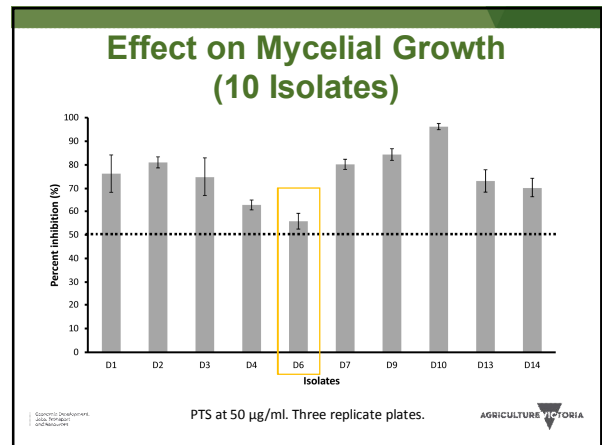
Solvent PTS

1 x 10⁷ spores/ml
+ Solvent
+ PTS (50 µg/ml)

1 x 10² spores/ml

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Canola Protection Assay

8-days old Westar seedling

Wounding

Inoculation
1 x 10⁷ spores/ml
+ Solvent
+ PTS (50 µg/ml)

14-DPI

Disease Scoring
Lesion size <3mm = Resistant
Lesion size >3mm = Susceptible

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Canola Protection Assay

Control (solvent) PTS

Isolate D3

Isolate D6

Isolate D9

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Summary - Pterostilbene

Shows potent fungicidal and sporicidal activities against a range of *L. maculans* isolates.

Protects susceptible Westar seedlings against blackleg infection.

Is a potential control agent for blackleg.

Thank You