

# Quantitative PCR and histopathological assessment of cereal infection by *Fusarium pseudograminearum*.

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# Crown Rot

- Crown rot (*F. pseudograminearum*)  
~ \$100 million per annum



## Aims

- Examine cereal tissues affected by *Fp* crown rot using visual and qPCR rating methods
- Microscopically observe *Fp* growth through cereal tissues

# Determining Host Resistance

- Resistance assessed visually
  - Brown discolouration of internodes

Internodes



- qPCR assay amplifies *Fp* Translation Elongation Factor  $\alpha$  DNA

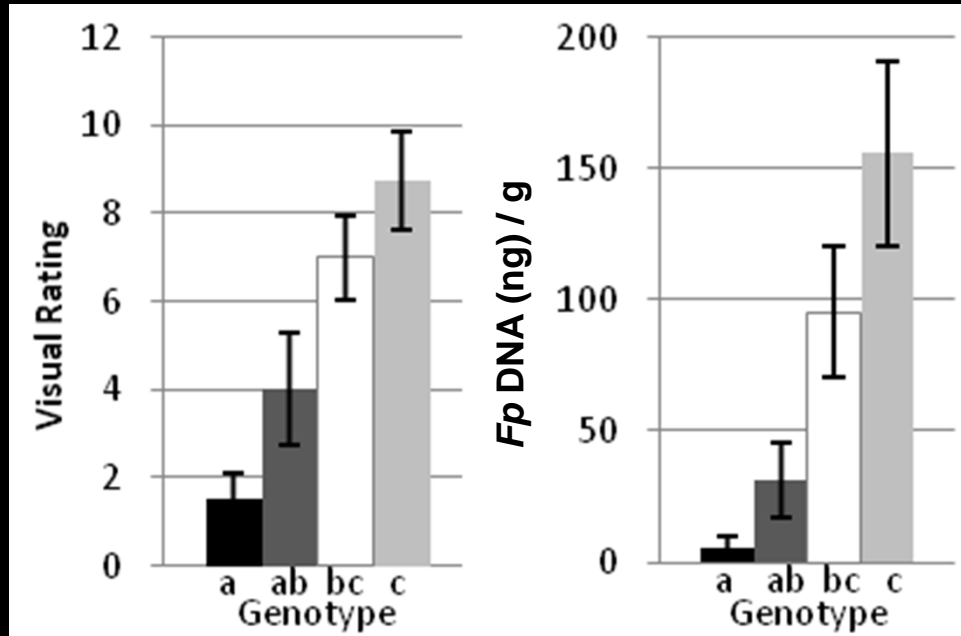
# Crown Rot of Adult Plants

- 16 and 22 weeks after planting (WAP)

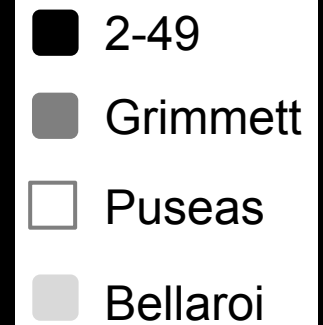
<u>Genotype</u>	<u>Species</u>	<u>Crown Rot Resistance</u>
<b>2-49</b>	<i>T.aestivum</i>	<b>Partially Resistant</b>
<b>Grimmett</b>	<i>H. vulgare</i>	<b>Moderately Susceptible</b>
<b>Puseas</b>	<i>T.aestivum</i>	<b>Susceptible</b>
<b>Bellaroi</b>	<i>T.turgidum durum</i>	<b>Very Susceptible</b>

# Crown Rot of Adult Plants

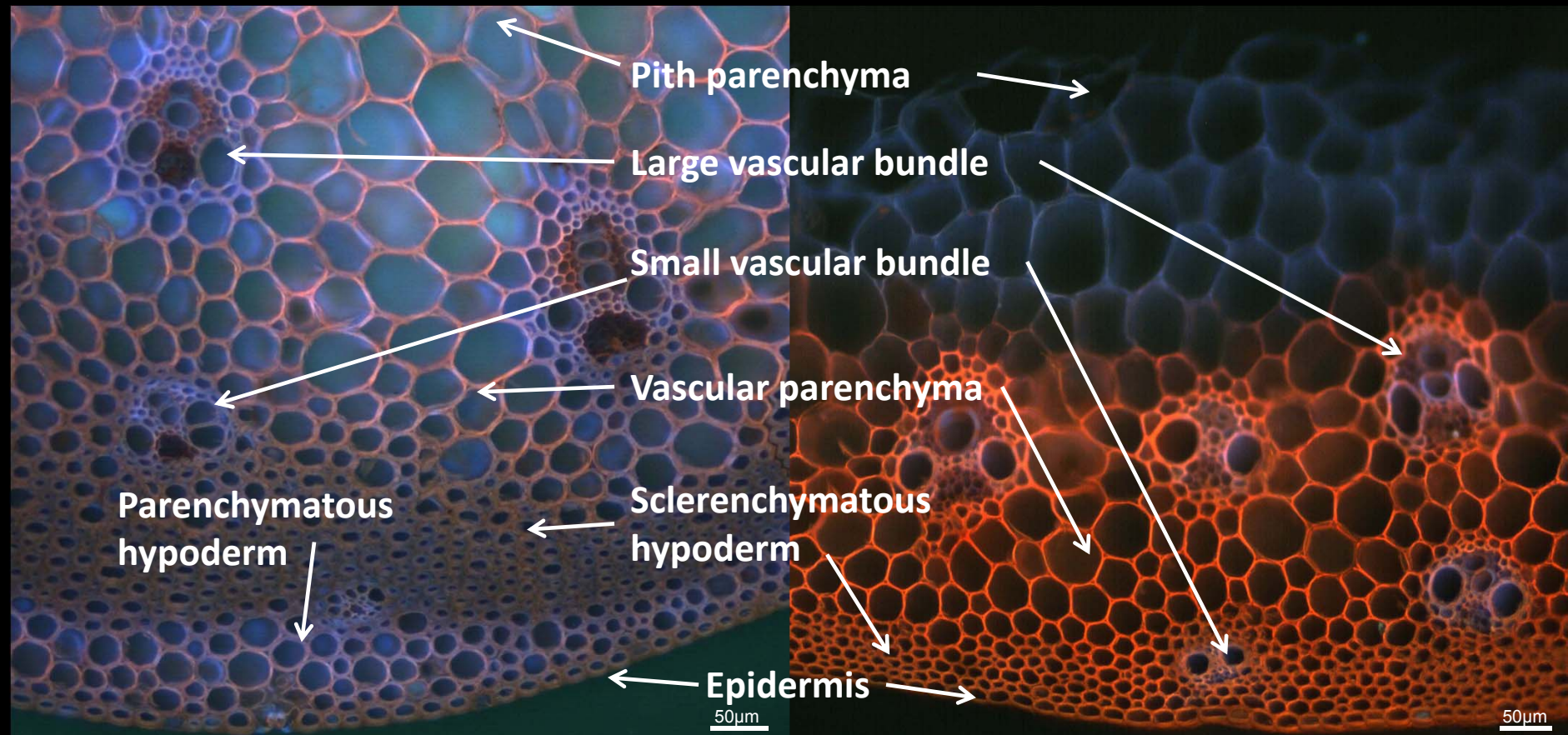
16 WAP  
Anthesis



Pearson's  $r$   
0.86



# Stem Tissue Types

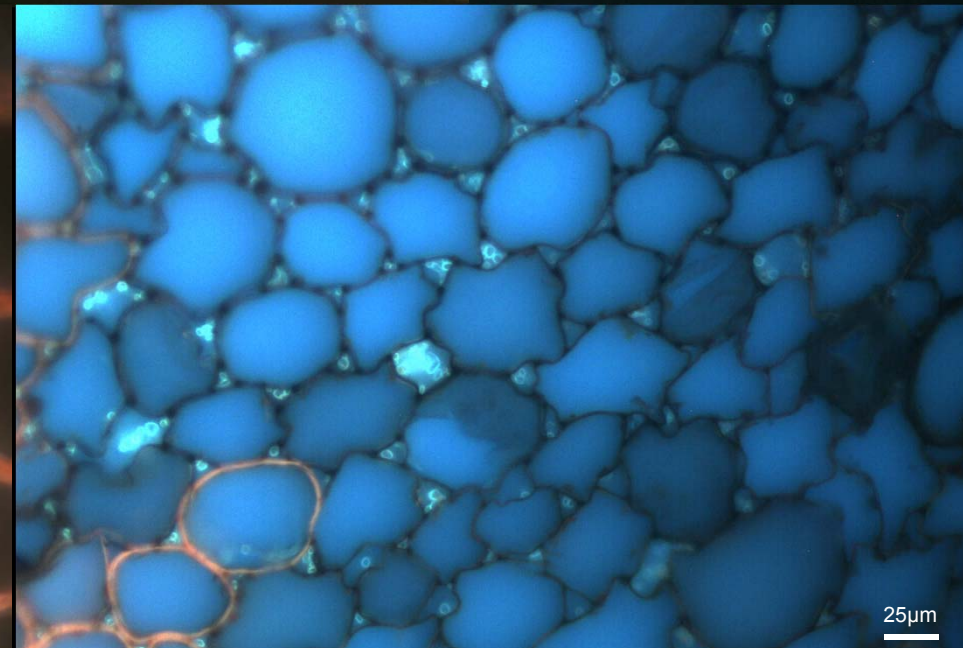
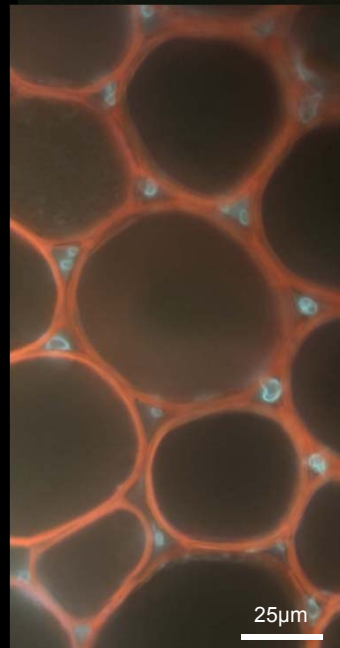
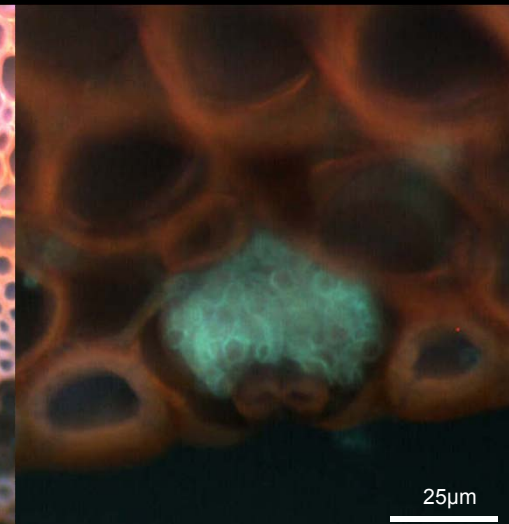
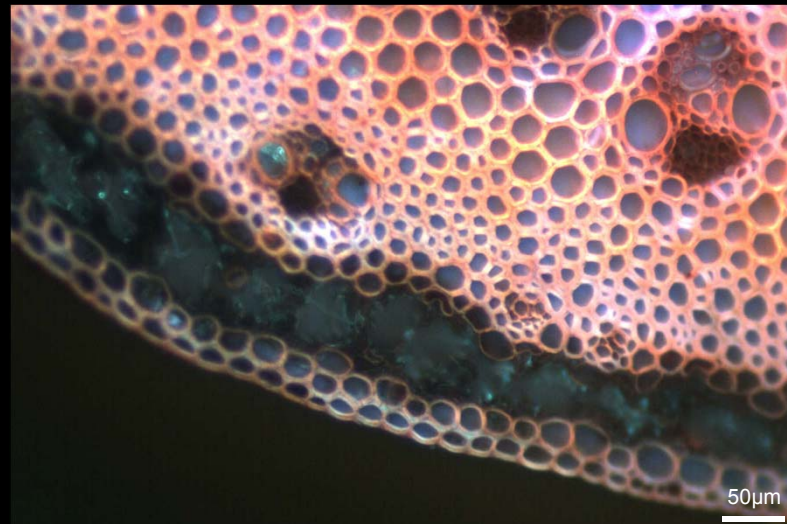




# Adult Tissue Microscopy

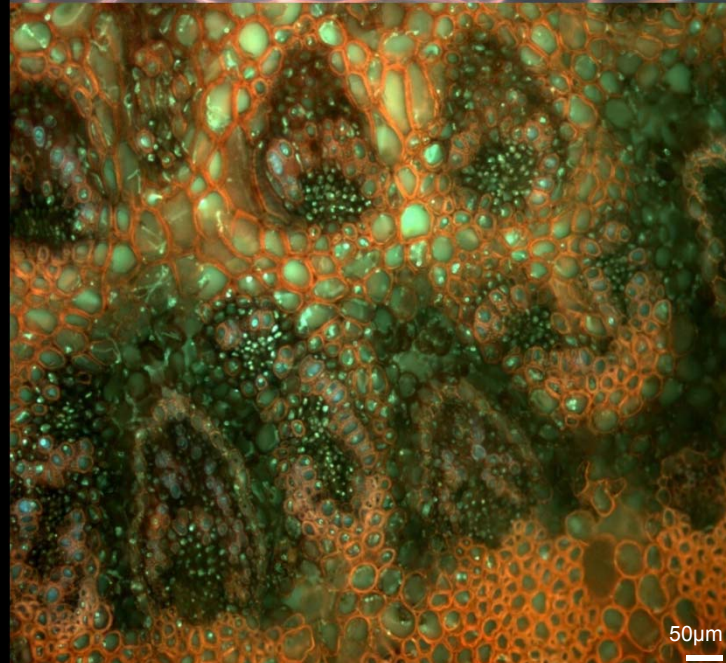
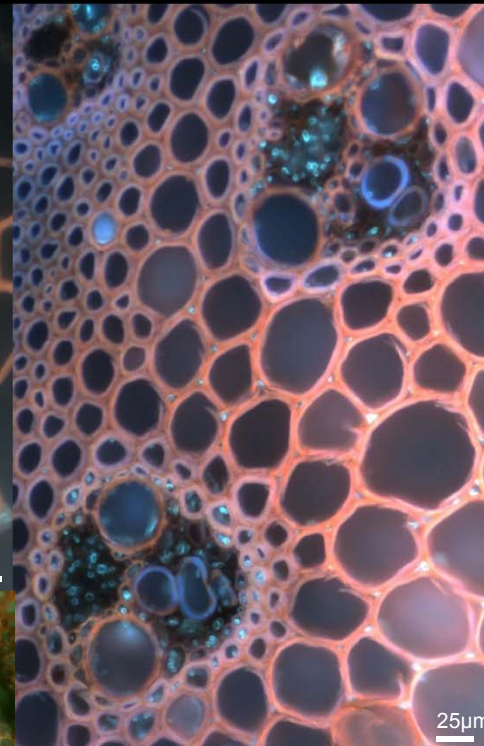
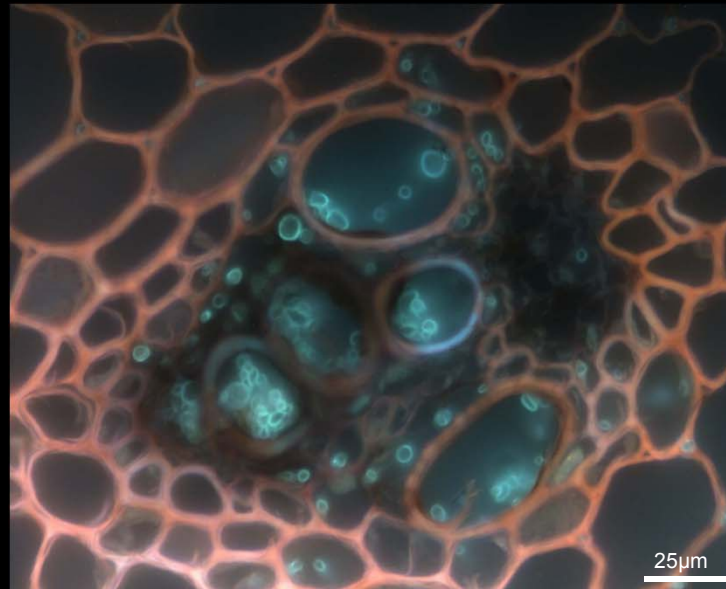
Safranin

Solophenyl flavine



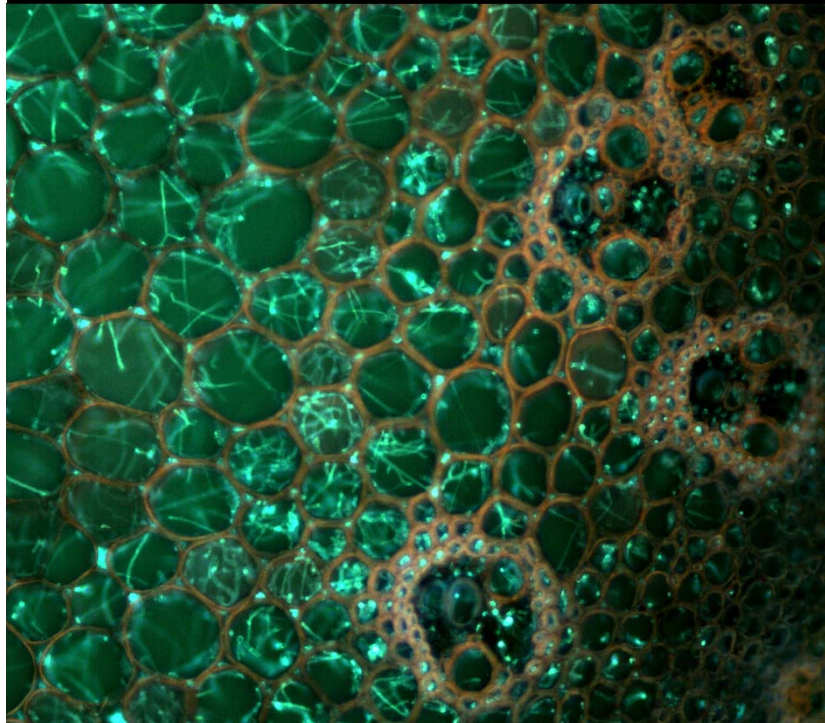
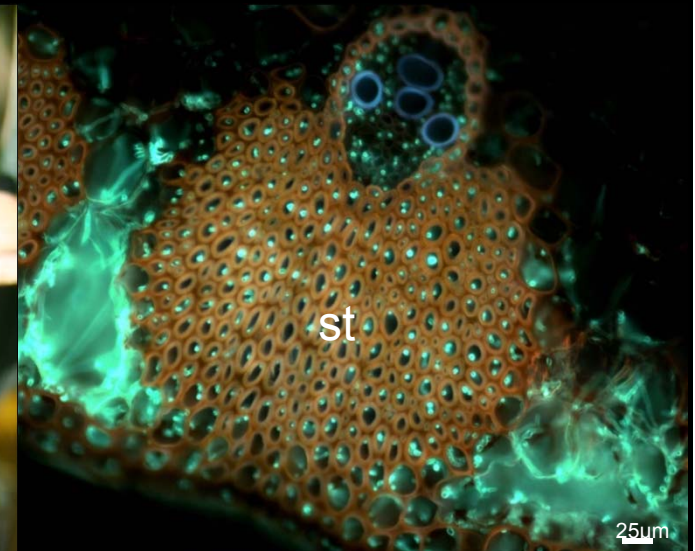
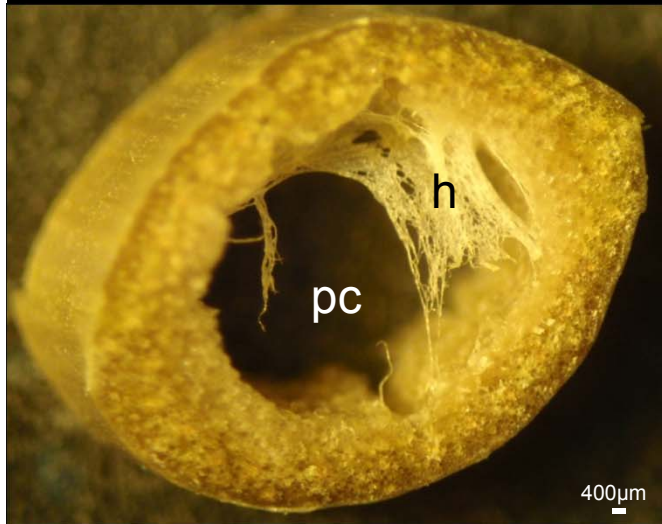
Knight and Sutherland (2011) Plant Pathology

# Adult Tissue Microscopy

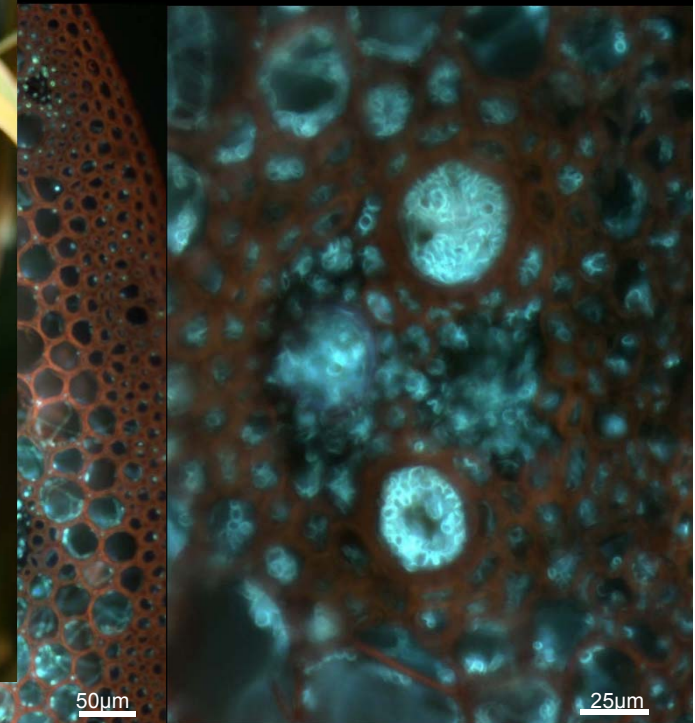




# Adult Tissue Microscopy



50µm



50µm

25µm

# Summary

- Strong correlation between IN discolouration and *Fp* DNA at 16 WAP
- Significant differences in *Fp* DNA quantity between R and S cereals at 16 WAP
- *Fp* colonises all cell types
  - vascular tissues colonised



# Questions?

