CHLAMYDOSPORE WALL THICKNESS – IS IT THE KEY FACTOR IN THE SURVIVAL OF PHYTOPHTHORA CINNAMOMI IN AUSTRALIA?

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INTRODUCTION:

Chlamydospores are the asexual reproductive structures of Phytophthora cinnamomi first described by Rands in 1922. They are distinguished from hyphal swellings by a septum but this can be difficult to see. It is often stated in the literature that P. cinnamomi chlamydospores may be thin or thick-walled dormant structures but experimental evidence to support both these claims is limited and ambiguous. Most literature concerns thin-walled chlamydospores and there is little evidence for the existence of thick-walled chlamydospores. There is a significant lack of knowledge as to the actual role these structures play in the long-term survival of P. cinnamomi.

Thick-walled chlamydospores may have an advantage in survival over thin-walled chlamydospores by

- Protection from antagonistic microorganisms when the plant root no longer provides a buffered area (i.e. decomposition),
- Reducing desiccation by harsh environmental conditions,
- Allowing chlamydospores to exist dormantly.

Table 1: Known experiments showing proof of the existence of thick-walled chlamydospores

<table>
<thead>
<tr>
<th>Experiment</th>
<th>Ref.</th>
<th>Proof?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlamydospores formed thicker walls than usual in susceptible avocado roots in non-sterile soil.</td>
<td>2</td>
<td>Spores not germinated for confirmation of identity</td>
</tr>
<tr>
<td>Production of thick-walled chlamydospores (1.0–1.5µm) in lupin roots buried in moist field soil.</td>
<td>1</td>
<td>Confirmed identity through germination</td>
</tr>
<tr>
<td>Thick-walled chlamydospores (1.0–2.6 µm, average 1.75 µm) in naturally infested soil.</td>
<td>3</td>
<td>Confirmed identity through germination</td>
</tr>
</tbody>
</table>

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