

Occurrence Of Root and Hypocotyl Diseases In Western Australian Lupin Crops

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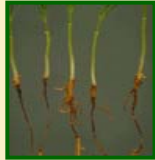




Introduction

- What are the major root diseases in WA
- Recent survey results
- Comparison with earlier surveys
- Conclusions



Rhizoctonia bare patch

Major seedling root diseases in WA

Symptom	Disease	Pathogen	Hosts
	Pleiochaeta root rot	<i>Pleiochaeta setosa</i>	Lupins
	Rhizoctonia bare patch	<i>Rhizoctonia solani</i> (ZG1)	All agricultural plants
	Rhizoctonia hypocotyl rot	<i>Rhizoctonia solani</i> (ZG3 and ZG4)	Legumes
	Rhizoctonia root & hypocotyl rot	<i>Rhizoctonia solani</i> (ZG6)	Legumes
	Eradu patch	<i>Rhizoctonia</i> sp.	Lupins and barley

Rhizoctonia root rots



Eradu patch



Pleiochaeta root rot



Rhizoctonia hypocotyl rot

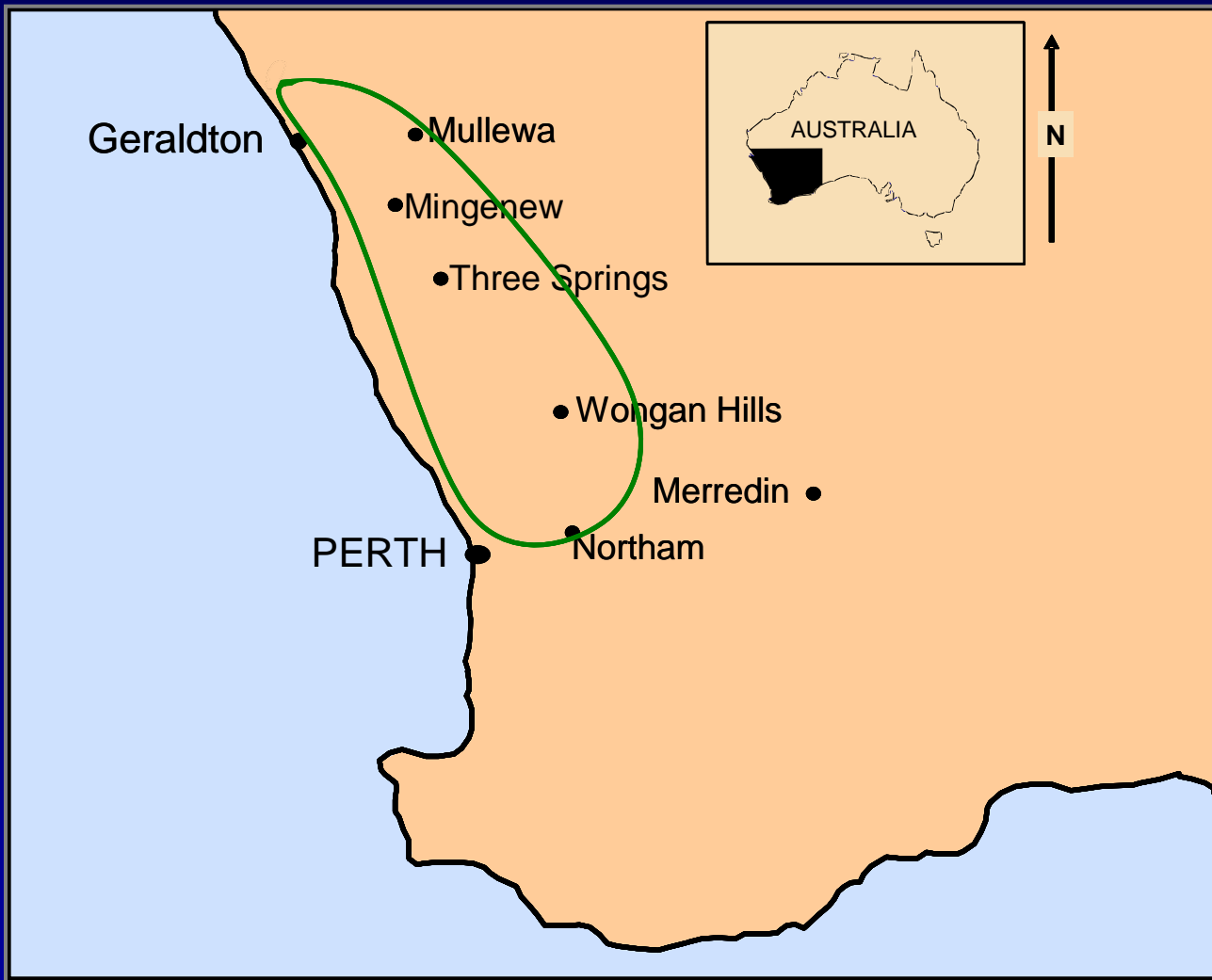


Root disease survey 2004-05

- Determine the incidence of root rot in WA northern agricultural region lupin crops
- Compare with previous surveys in similar region



Survey zone - Northern agricultural region



Methods

- 120 commercial narrow leaved lupin paddocks
 - 71 in 2004 and 49 in 2005.
- Sampling 3-6 weeks after sowing (4-6 leaf stage).
- Total of 100-125 plants taken triangular transect of approximately 450 metres.
- All plants visually assessed for incidence of root and hypocotyl rots
 - random lesions for pathogen isolation

Root and hypocotyl rot incidence

Incidence	Root	Hypocotyl
Paddocks infected	97%	65%
Paddock average incidence*	10.2%	3.2%
Paddocks >10% incidence	40%	9%

Small difference between incidence in the two years
2004 - 11.1%, 2005 – 8.5%



Pathogens isolated

Pathogen incidence	Root	Hypocotyl
Sites with <i>R. solani</i> isolated	63%	81%
Sites with <i>P. setosa</i> isolated	73%	6%
Sites with Eradu-Patch	8%	-

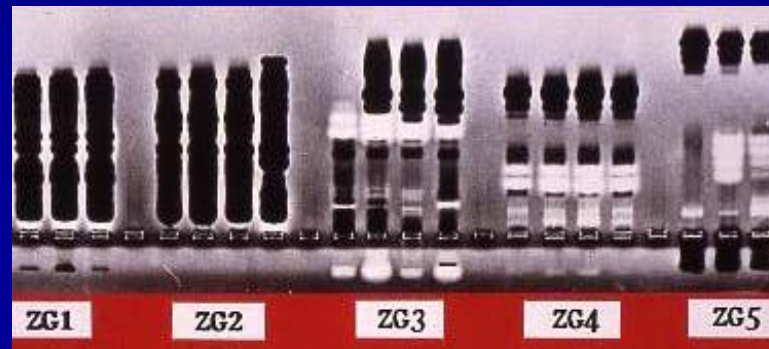
Pythium spp. and *Fusarium* spp. were isolated at low frequencies



Pectic zymogram groups of *Rhizoctonia* isolates

	ZG1	ZG3	ZG4	ZG6	Other
Hypocotyl (41*)	5	83	10	2	-
Root (25*)	24	72	0	4	-

* number of isolates tested



Conclusions from survey

- Root and hypocotyl diseases remain a fact of life for WA growers
- *Pleiochaeta* and *Rhizoctonia* are major pathogens
- Hypocotyl rot risk higher with legume pasture rotations
- Most soil types, including agronomically suitable soils, show similar response

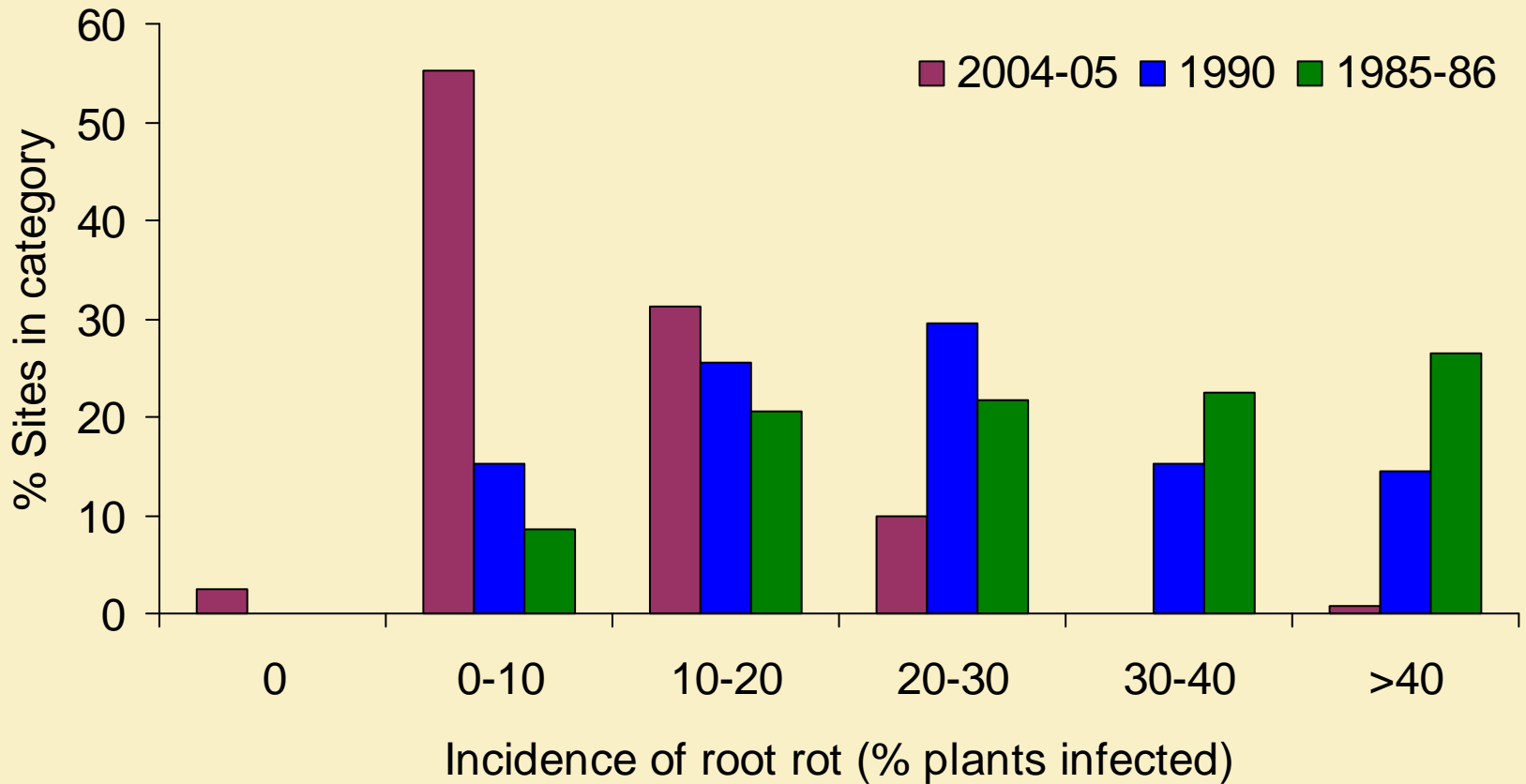
Previous survey comparisons

- Two major surveys in similar areas
 - 1985-86, Sweetingham
 - (150 sites)
 - 1990, MacLeod
 - (125 sites)

Root and hypocotyl rot incidence

Survey year	Root	Hypocotyl
2004/05		
Paddocks infected	97%	65%
Paddocks >10% incidence	40%	9%
1990		
Paddocks infected	100%	98%
Paddocks >10% incidence	83%	51%
1985-86		
Paddocks infected	100%	86%
Paddocks >10% incidence	91%	12%

Distribution of incidence of root rot in individual paddocks in 3 surveys



Why has root rot incidence reduced

- Pathogens remain similar
- No consistent trend in variety response over time
- Rotation slowly widening but less so on suitable soils
- Better understanding of factors contributing to risk
- Significant changes in crop sowing and crop establishment techniques



Conclusions

- Root and hypocotyl rot incidence has reduced over the past 20 years
- Widespread catastrophic losses uncommon
- Root disease still impacts on lupin production
- Must be vigilant against introduction of new pathogens



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