



Department of
Agriculture and Food



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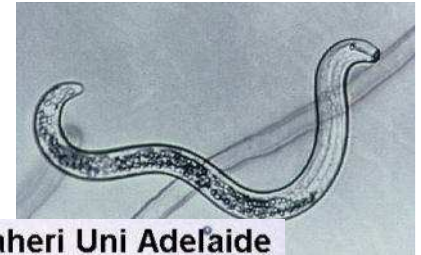
Root lesion nematode has a picnic in 2013

Dr Sarah Collins

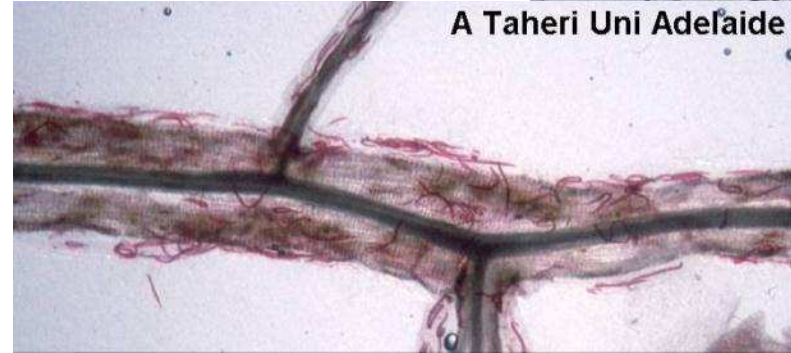
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RLN...Where is it? What is it?



A Taheri Uni Adelaide



- Migratory endoparasite
- Concentrated in top 15cm
- Dehydrate and survive over summer in dry soil & roots
- Become active after rain and invade roots
- Multiple breeding cycles per season (at least 3)



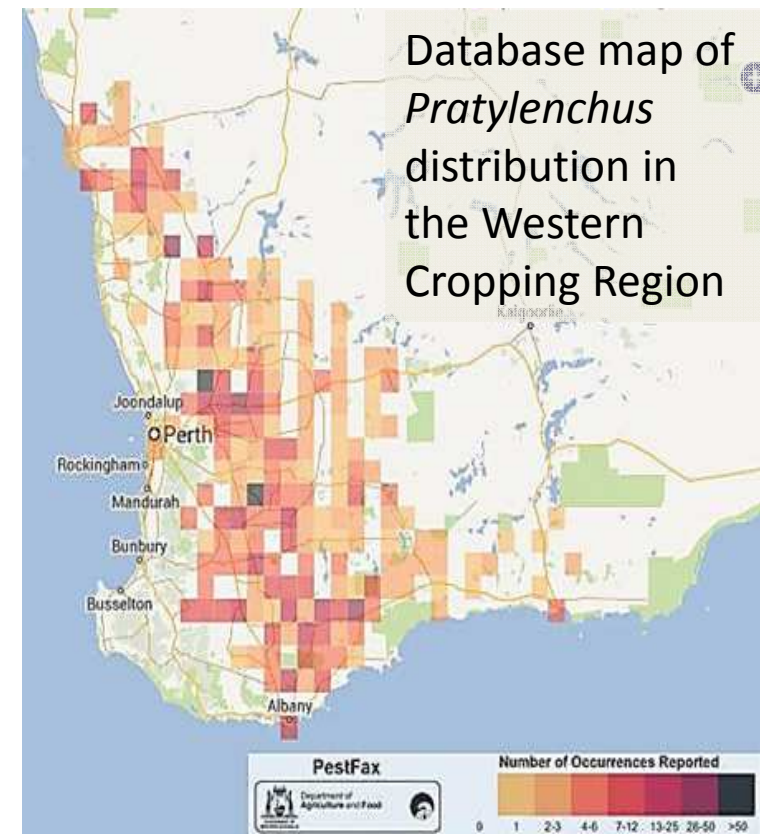
Why care if RLN is in your paddock?

- Very wide host range
- Numbers can become yield limiting quickly where conditions are right
- RLN is not effectively managed with one break crop if numbers are high
- Cannot be controlled but can be managed
- No effective nematicides



Root Lesion Nematode (*Pratylenchus*) in WA

- RLN in **~65%** of paddocks....
- **5.3M** ha!
- Yield limiting in 40%
- Yield penalties can be **\$20-60/ha**
- **\$190 million** p.a. across SA & WA



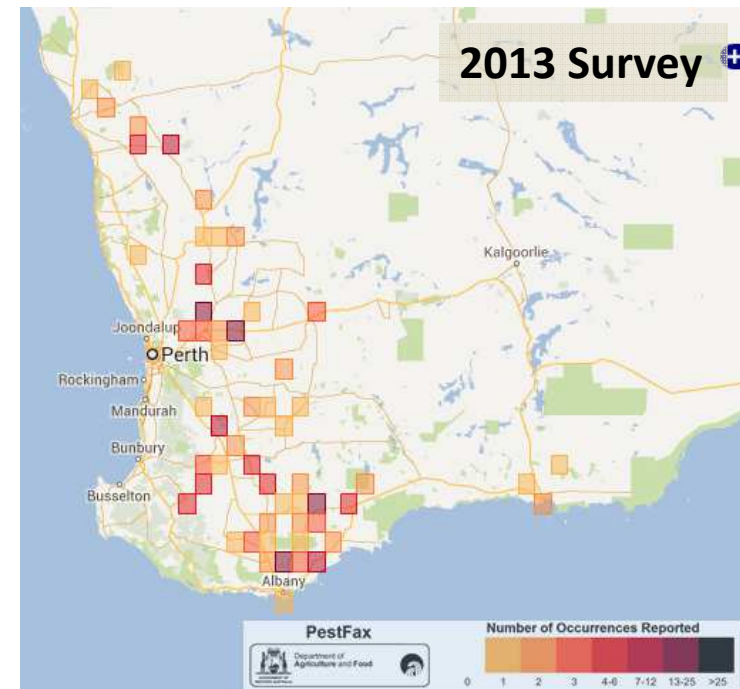
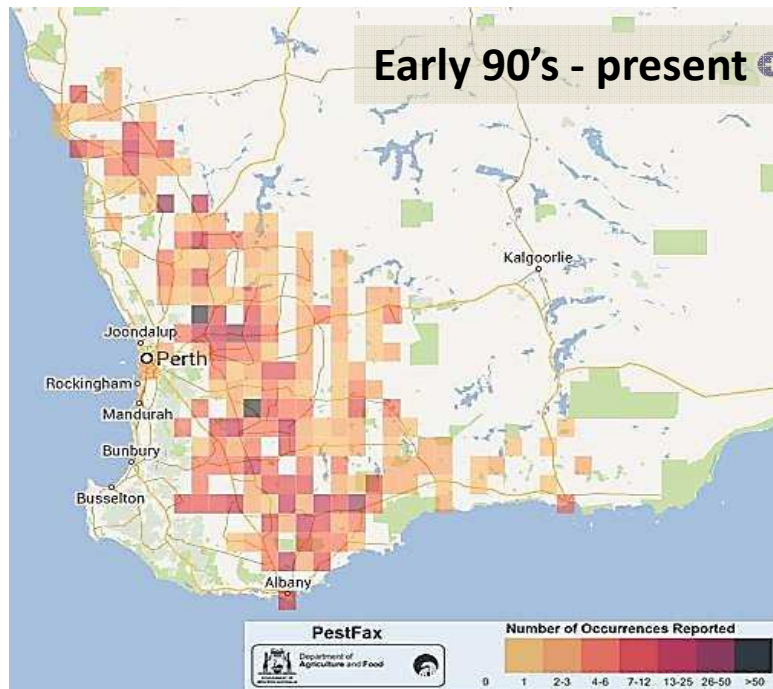
2013...Root lesion nematode's picnic

- **130** paddocks surveyed - DAFWA trial sites, 50 Focus Paddocks, AGWEST Plant Lab and in response to grower/consultant queries
- RLN identified in crops across **all cropping zones**
- RLN infestation in **90%** of the paddocks tested
- *Pratylenchus neglectus* and *P. teres* were the most common species in **68%** and **24%** of paddocks, respectively



Occurrence of root lesion nematodes in paddocks surveyed in WA

(Map adapted from Pestfax Database DAFWA).



Visual symptoms in paddocks 2013



Survey results for 130 paddocks 2013

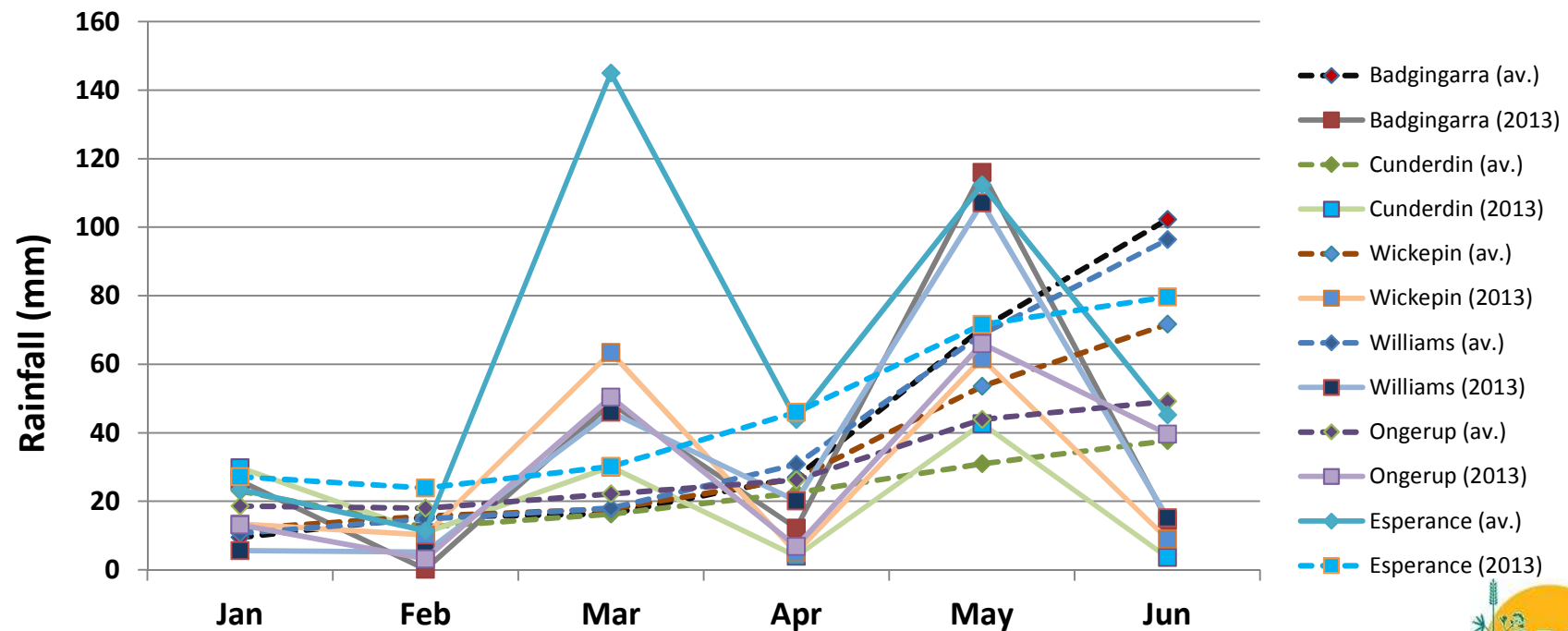
Severity of RLN infestation	Total	Number of paddocks ¹					
	paddocks	<i>P. neglectus</i>	<i>P. teres</i>	<i>P. thornei</i>	<i>P. penetrans</i>	No ID ²	No RLN
nil	13(10%)						13
<0.2/mL soil or 0- 200/g dry root	31 (24%)	19	7	0	0	11	
0.2-1/mL soil or 200-1000/g dry root	24 (18%)	26	8	2	0	0	
1-10/mL soil or 1000-10,000/g dry root	53 (41%)	37	14	6	2	0	
>10/mL soil or >10,000/g dry root	9 (7%)	7	2	0	0	0	
Tot. pdks with RLN	117 (90%)	89 (68%)	31 (24%)	8 (6%)	2 (2%)	11 (8%)	

¹Number does not sum to total number of paddocks sampled as some paddocks contained more than one RLN species.

²No adult nematodes in sample, therefore RLN species cannot be determined.



Why the RLN picnic?.... Rainfall leading into 2014



Why the RLN picnic?...pasture leading into 2013 season

Resistance of pasture cultivars to *Pratylenchus neglectus* in a glasshouse trial

Cultivar	Species	Resistance Rating ²
Mauro biserrula	<i>Biserrula pelecinus</i>	S
Casbah biserrula	<i>Biserrula pelecinus</i>	S
Caprera crimson clover	<i>Trifolium incarnatum</i>	S
Cefalu arrowleaf clover	<i>Trifolium vesiculosum</i>	S
Sothis eastern star clover	<i>Trifolium dasyurum</i>	S
CFD27 bladder clover	<i>Trifolium spumosum</i>	S
2002ESP4 biserrula	<i>Biserrula pelecinus</i>	S
Coolamon sub clover	<i>Trifolium subterraneum</i>	S
Machete wheat	<i>Triticum aestivum</i>	S
Nitro Plus Persian clover	<i>Trifolium resupinatum</i>	S
Frontier balansa clover	<i>Trifolium michelianum</i>	S
Dalkeith sub clover	<i>Trifolium subterraneum</i>	S
Caliph barrel medic	<i>Medicago trucatula</i>	S
Urana sub clover	<i>Trifolium subterraneum</i>	S
Santiago burr medic	<i>Medicago polymorpha</i>	VS
Prima gland clover	<i>Trifolium glanduliferum</i>	VS

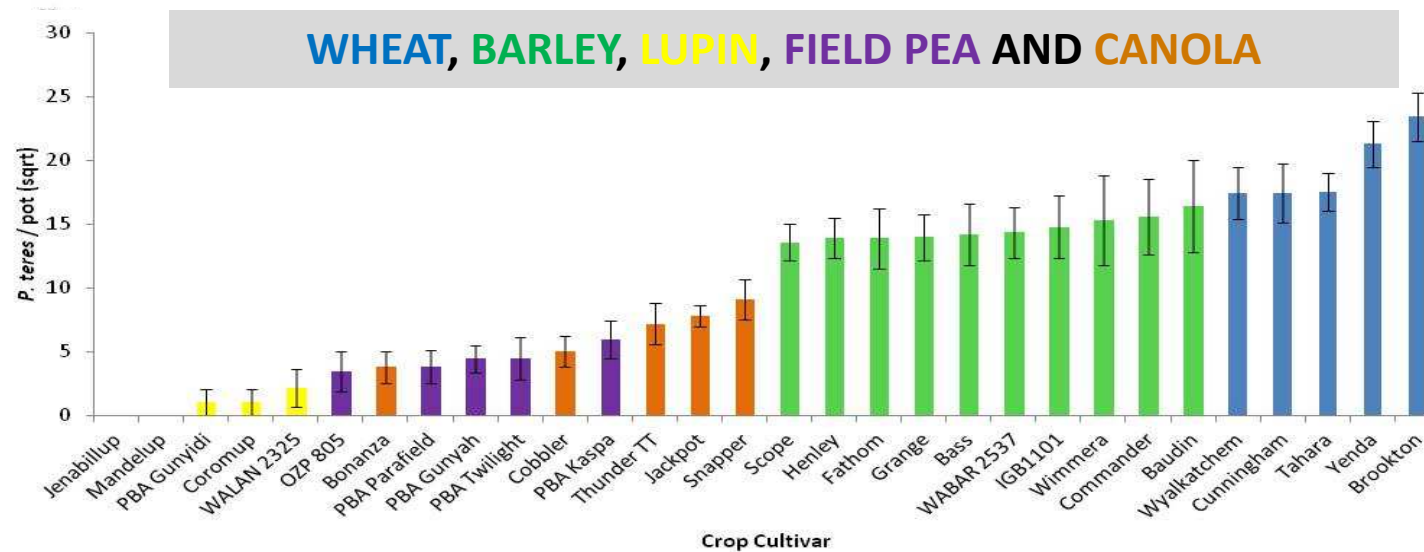
adapte
²R = re



Why the RLN picnic?.... Volunteer crops (weeds)

DAFWA Nematology 2013 GLASSHOUSE TRIALS

Crop and cultivar resistance data for rotational recommendations



What to grow for what RLN??

RLN species behave differently so know what you are dealing with!

- *P. teres* & *P. neglectus*—

- barley ↑↑
- wheat ↑↑
- Canola ↑
- lupin ↓
- field pea ↓

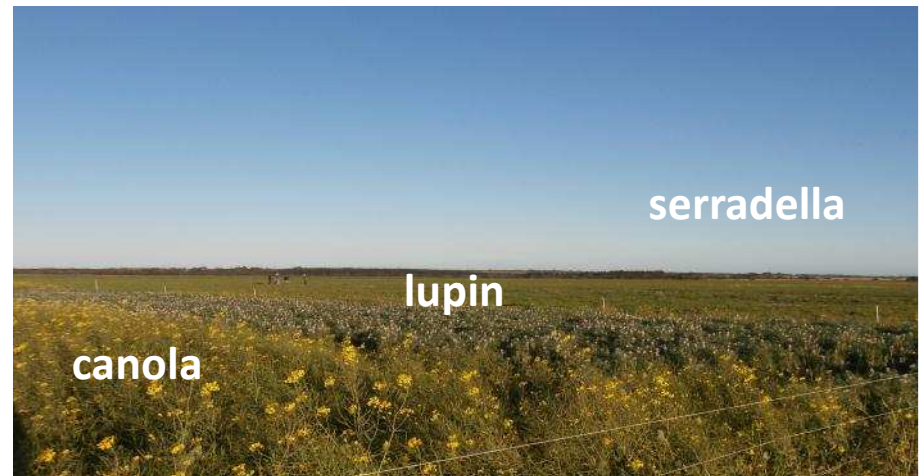
- *P. penetrans* —

- lupin ↑↑
- field pea ↑↑
- Canola ↑
- barley ↓
- wheat ↓



Sunny days in Esperance – working with crop rotation to reduce RLN

- Randomised block design with canola (cv. Cobbler) to \uparrow *P.teres* and lupins (cv. Jennabillup) to \downarrow populations.
- Rest of paddock = soft seeded serradella (cv. Cadiz)
- trial plots and area of serradella crop sampled to determine if nematode levels had been successfully manipulated



***P. teres* multiplication at Esperance trial site**

- Canola planted to increase RLN levels
- lupin and serradella planted to decrease RLN levels

Crop	<i>P. teres</i> /mL soil		Multiplication rate
	Beginning of season	End of season	
Canola	4	7	1.75
Lupin	5	2	0.40
Serradella	4	1	0.25



Key messages

- 2013 growing season favoured root-lesion nematodes and damage was widespread.
- RLN species in 90% of 130 paddocks surveyed & RLN high enough to cause between 15 and 50% yield loss in 48% of the paddocks
- Green bridge of volunteer crop species, pasture and weeds allowed RLN numbers to increase before crops were sown
- Plant stress from the prolonged dry spell in early winter also left crops more susceptible to RLN infestation

