Diagnostic Residential Project: making nematological upskilling possible!

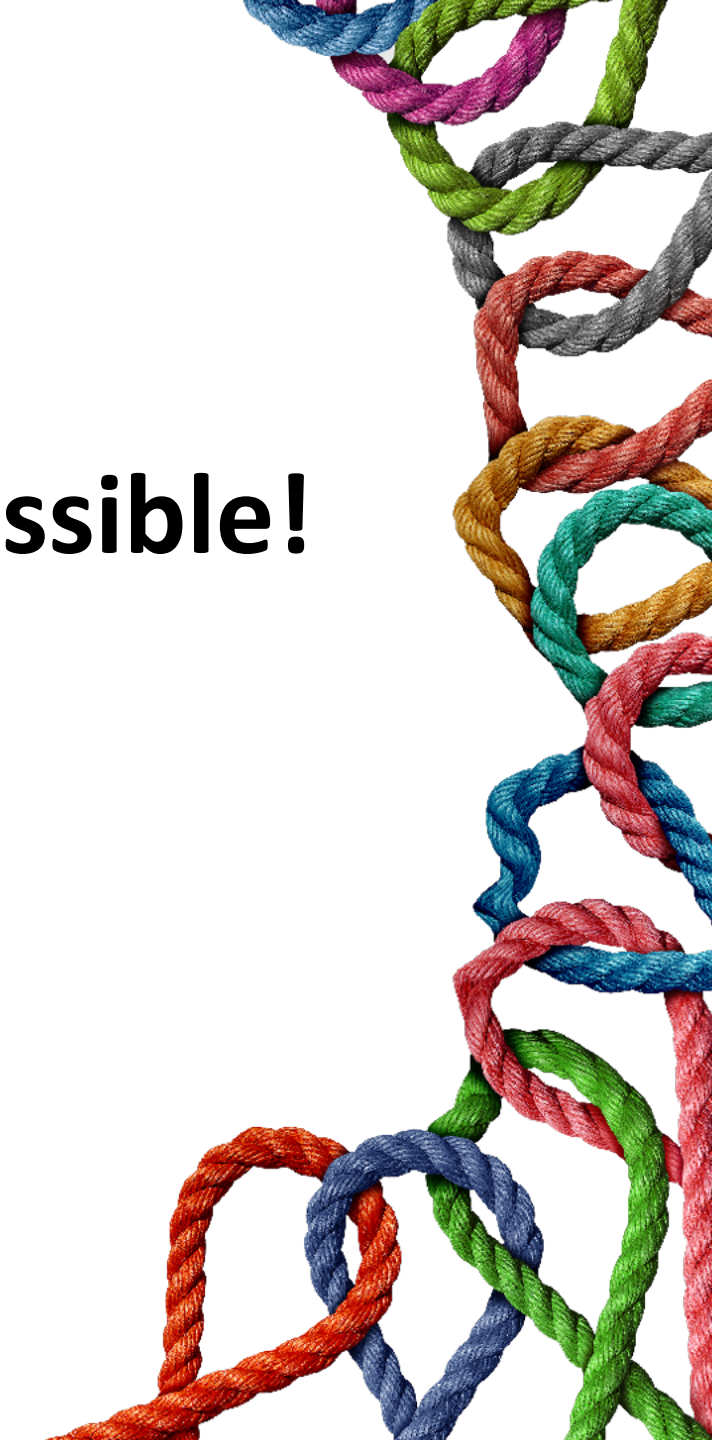
Duy Le

Cotton Pathologist

NSW Department of Primary Industries

ADSW 2023

9-11 MAY | CANBERRA



About me

- Completed PhD in *Pythium* in ginger
- Short year of postdoc in avocado pathology
- Join NSW DPI for cotton pathology since 2017

About cotton diseases

- Most fungal diseases: *Alternaria*, *Berkeleyomyces*, *Fusarium*, *Verticillium*, etc.
- No bacteria related disease at moment
- Bunch top only prevalent this 2022/23 season
- Reniform nematode only detected in central QLD

Learning experience

- DPI hierarchy approvals up to DDG
- The host, Dr. Graham Stirling accepted with **one condition**

- The 1st trip for one in one training with Graham (Oct 22)
- The 2nd trip for masterclass in UQ, including molecular ID (Nov 22)
- The 3rd trip for revision (Mar 23)

Masterclass attendees at UQ

Follow up learning

RESULTS OF NEMATODE ANALYSES

Sample details: Sampled and extracted on 03/11/22, counted on 04/11/22 (29 h extraction)
Sample 1. Vegie, soil sample under garden beds growing garlic, Asian vegies, pumpkin and zucchini (from a friend garden)

Sample 2. Natural, soil sample across the fence, quite clay-y, not cultivated not lawn, only grasses and occasionally mowed.

Extraction method: One soil sample (200 g moist wt.) was processed for 2 days at 24-30°C on a Whitehead tray.

Results:

Plant-parasitic nematodes

Sample no.	No. plant-parasitic nematodes extracted/ 200 g soil					
	Spiral *Helicotylenchus*	Reniform ?	Stubby	Lesion *Pratylenchus*	Ring	Unknown
Sample 1	18	113	18	36	18	
Sample 2		169	0	0		94

Free-living nematodes

Sample no.	No. FLN/200 g soil	Approximate percentage of FLN in each trophic group				
		Plant associate	Bacterivore	Fungivore	Omnivore	Predator
Sample 1	2249	1.7	92.5	0.8		5.8
Sample 2	2550	0.7	98.6			0.7

Comments (Duy Le)

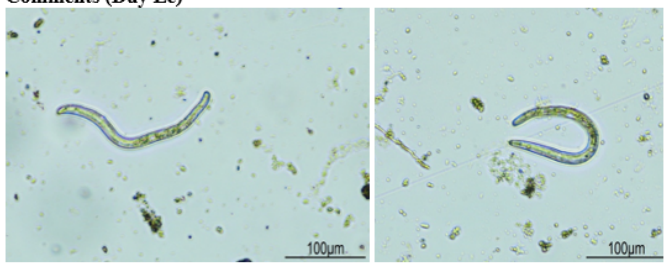


Figure 1: These are unknown to me, relatively small, round tail, quite fine stylet, no vulva found

Figure 2: Very much similar to last one, so I called these Reniform, could be R. parvus as you suggested since I did not see a male (or may be I did not know to to ID a male reniform ^.^)

Figure 3: I called this Helicotylenchus

Figure 4: I called these lesion Pratylenchus

Comments (Graham Stirling)
I think you have done reasonably well with these two samples.

Vegie

- You and I both found spiral, lesion and reniform. Also, your identifications in figures 2, 3 and 4 are correct.
- I found one stunt, whereas you did not. It is possible that Figure 1 is stunt, as the stylet looks about the right size and it has a round tail. However, it is very difficult to confirm the identity from your photographs.
- I did not find any stubby or ring

Natural

Follow up pilot research

- Previously Soil samples were only collected early in the season
- 12 targeted sites were sampled both early and late seasons
- Roots were also sampled
- Common parasitic nematodes: lesion, spiral, and stunt
- Mostly found in late season samples

Helicotylenchus sp.

Thanks

- Australian DAFF
- National Plant Biosecurity Diagnostic Network
- NSW DPI
- My host, Dr Graham Stirling
- My colleagues

Contact me at:

duy.le@dpi.nsw.gov.au or for some updates on

Australian Government

Department of Agriculture, Fisheries and Forestry

The National Plant Biosecurity Diagnostic and Surveillance Professional Development and Protocols Projects are coordinated and delivered by Plant Health Australia and are funded by the Department of Agriculture, Fisheries and Forestry.

The objectives of the Projects are to enhance and strengthen Australia's diagnostic and surveillance capacity and capability to identify priority plant pests that impact on plant industries, environment and the community.

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