Influence of Soil on Nematodes in Vineyards

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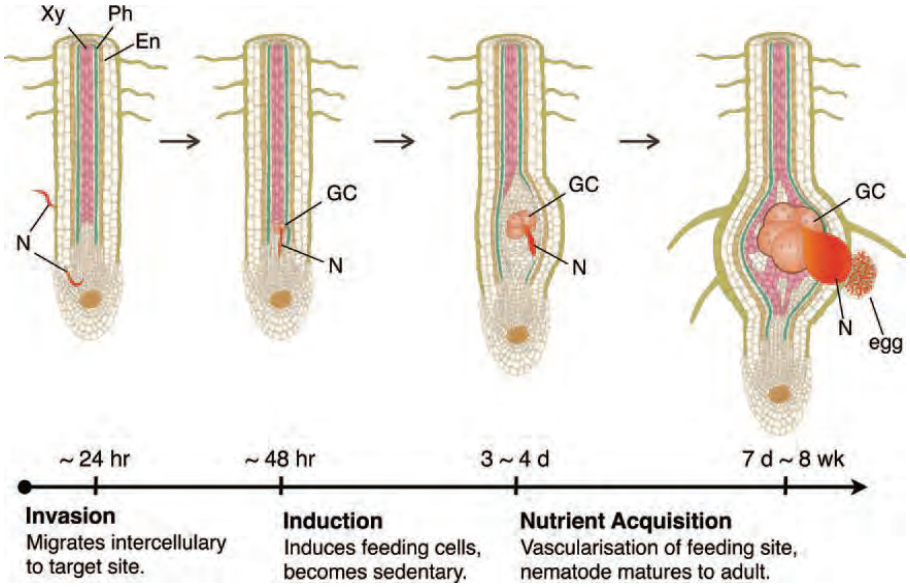
Nematode pests of WA vineyards

- Northern root-knot nematode (*Meloidogyne hapla*) – RKN
- Makes “giant cells”
- Strong metabolic sinks
- Disrupts normal water and nutrient pathway



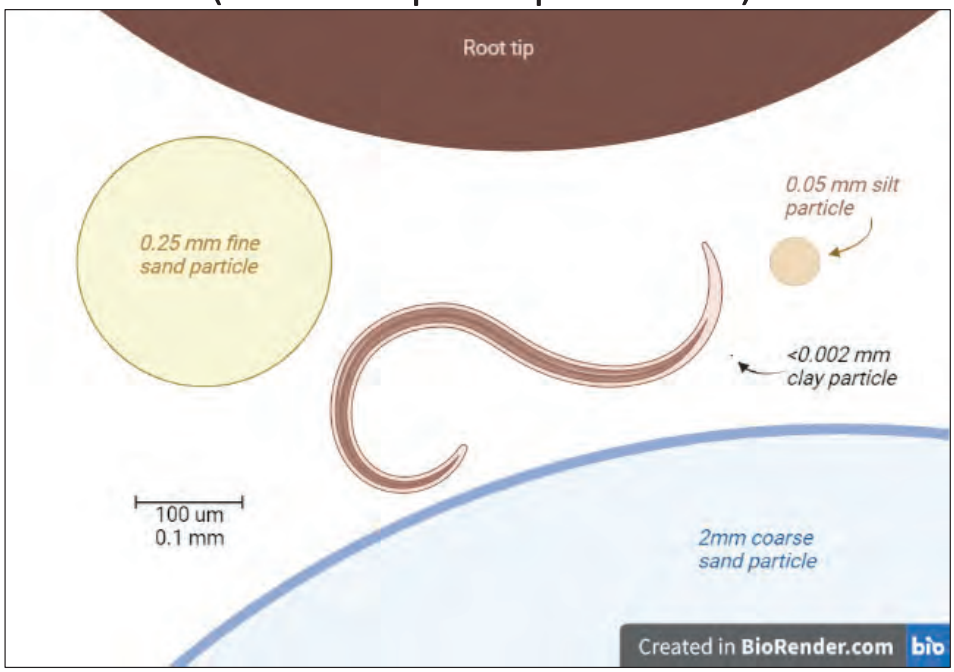
Bartlem et al 2013

Soil is a major component

- The plant roots and nematodes exist in the soil – that’s the playing field for infection
- RKN MUST find a host. They have to:
  1) detect where roots are
  2) move through the soil to the root
- The condition of the soil likely changes how effectively RKN can do those 2 things

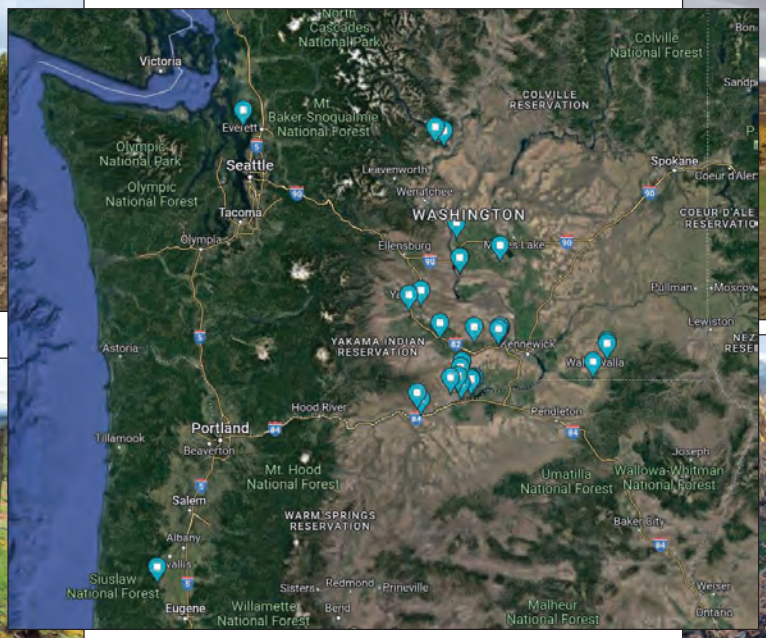
The soil environment (worm perspective)

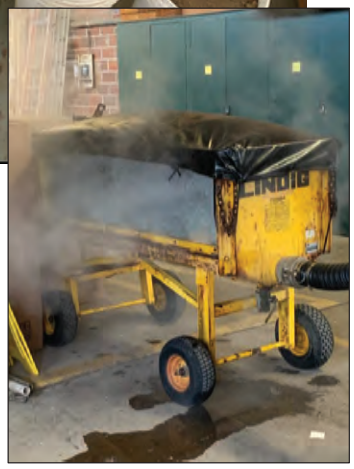
- Undulate through a water film in pore spaces
- Tend to be more of a problem in sandy soils
- Optimal movement at field capacity



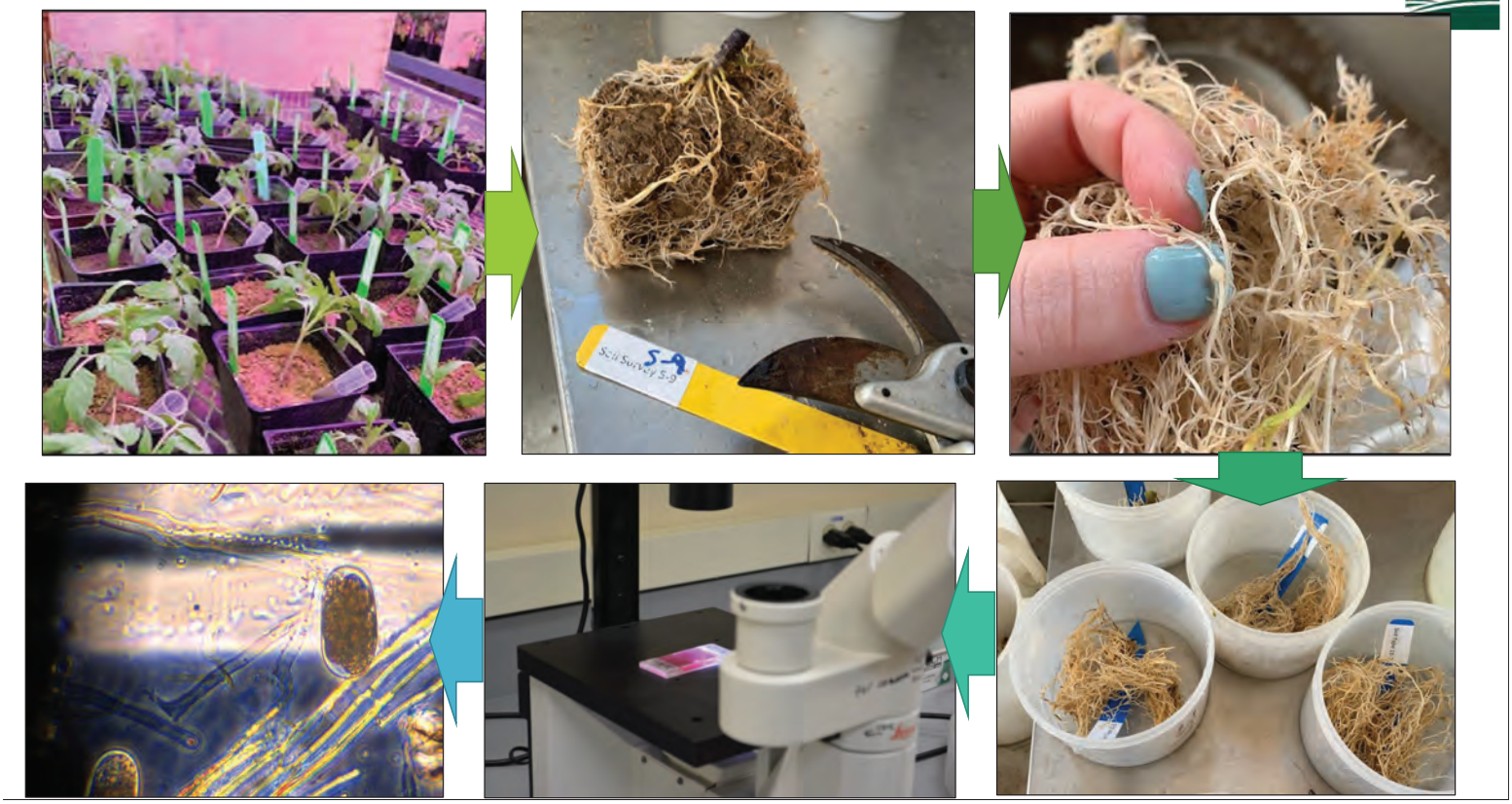
How does soil affect nematode parasitism?

- We can change a lot of things, but we can't really change our soil
- Is there a risk factor associated with the soil?
- How can we evaluate this?



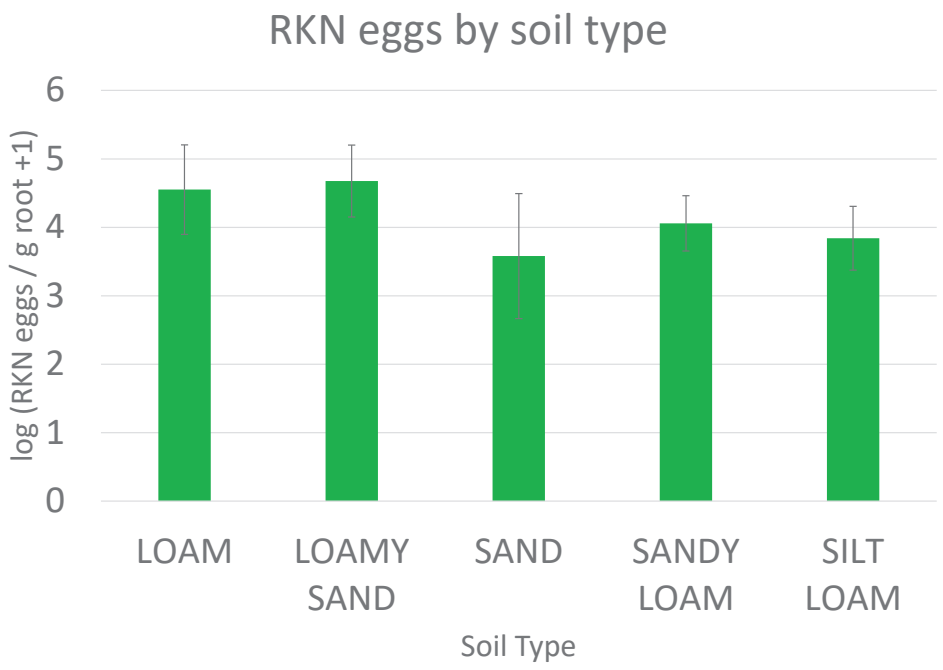


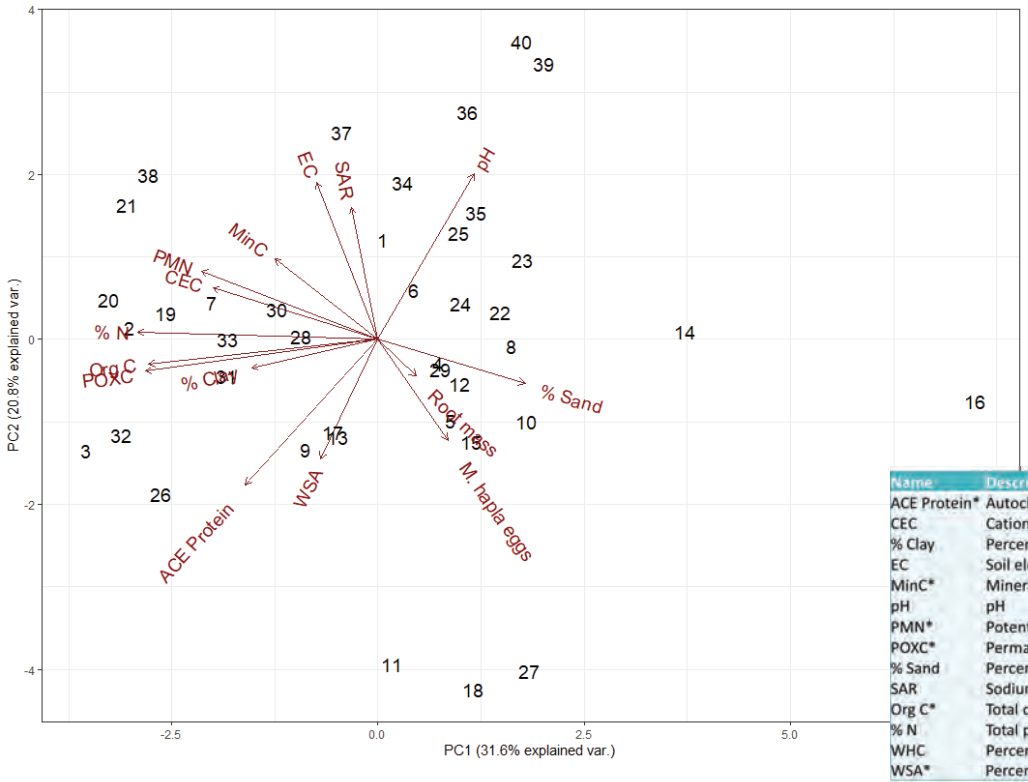
Name	Description
ACE Protein*	Autoclaved citrate-extractable soil protein
CEC	Cation exchange capacity
% Clay	Percent clay
EC	Soil electroconductivity
MinC*	Mineralizable carbon
pH	pH
PMN*	Potentially mineralizable nitrogen
POXC*	Permanganate oxidizable carbon
% Sand	Percent sand
SAR	Sodium adsorption ratio
Org C*	Total organic carbon
% N	Total percent nitrogen
WHC	Percent water holding capacity
WSA*	Percent water stable aggregates



Texture

- Previous studies - sandy loam
- No difference by soil type





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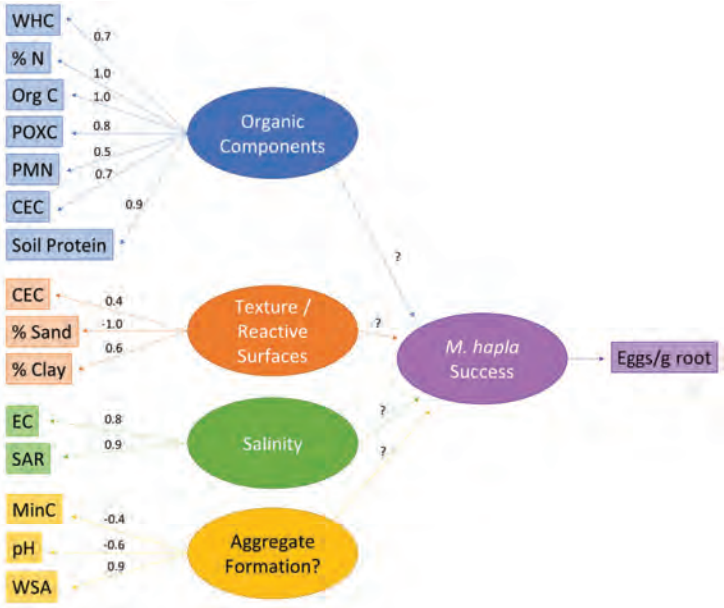
Pitfalls of working with tomato

Some soils had 0 eggs

So – it's still unclear

- It's not as simple as it appeared at first glance
- % sand explains some, but not all
- Other factors are still unclear
- Going forward – other types of analysis



Zasada Lab
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