

# Management Strategies for Peach Tree Short Life

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# Definitions

Nematode: microscopic, nonsegmented roundworms

Nematicide: chemical used to kill nematodes

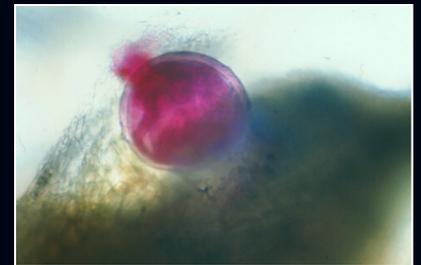
Fumigant: a volatile material that forms vapors which destroy pathogens (also weeds and insects); generally liquids which turn into gas; mainly used in soil

# Nematode Problems on Peach in the Southeast

- *Mesocriconema xenoplax*
  - Ring Nematode



- *Meloidogyne* spp.
  - Root-knot Nematode



- *Pratylenchus vulnus*
  - Root-lesion Nematode



# Root-Knot Nematodes

- ❑ Forms galls which disrupt normal water and nutrient uptake
- ❑ Results in altered host physiology (reduced root and shoot growth, leaf chlorosis, low fruit yield, poor fruit quality, and tree decline or death)
- ❑ Can result in crown gall as well

# *Meloidogyne* spp.



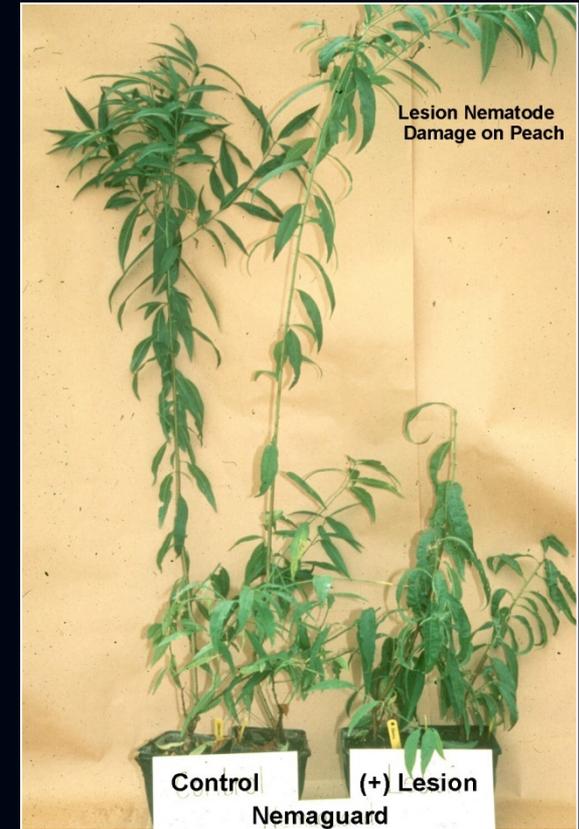
Stunting of 1-yr-old peach tree infested with *Meloidogyne* sp.



# Root-Lesion Nematodes

- ❑ Feed on the cortex of the root
- ❑ Damage and destroy roots
- ❑ Tree will eventually be stunted with small root systems

# *Pratylenchus vulnus*



Stunting of *Prunus* infested with root-lesion nematode (photos by M. McKenry or B. Jaffee)



# Dagger Nematode

- ❑ Mainly a problem in transmission of viruses, such as tomato ringspot virus
- ❑ Poor yields and stunted growth can be seen with heavy infestations



# *Mesocriconema xenoplax*

## 1. Peach Tree Short Life

[cold injury and (or)  
*Pseudomonas syringae* pv.  
*syringae*] (Nyczepir et al., 1983)

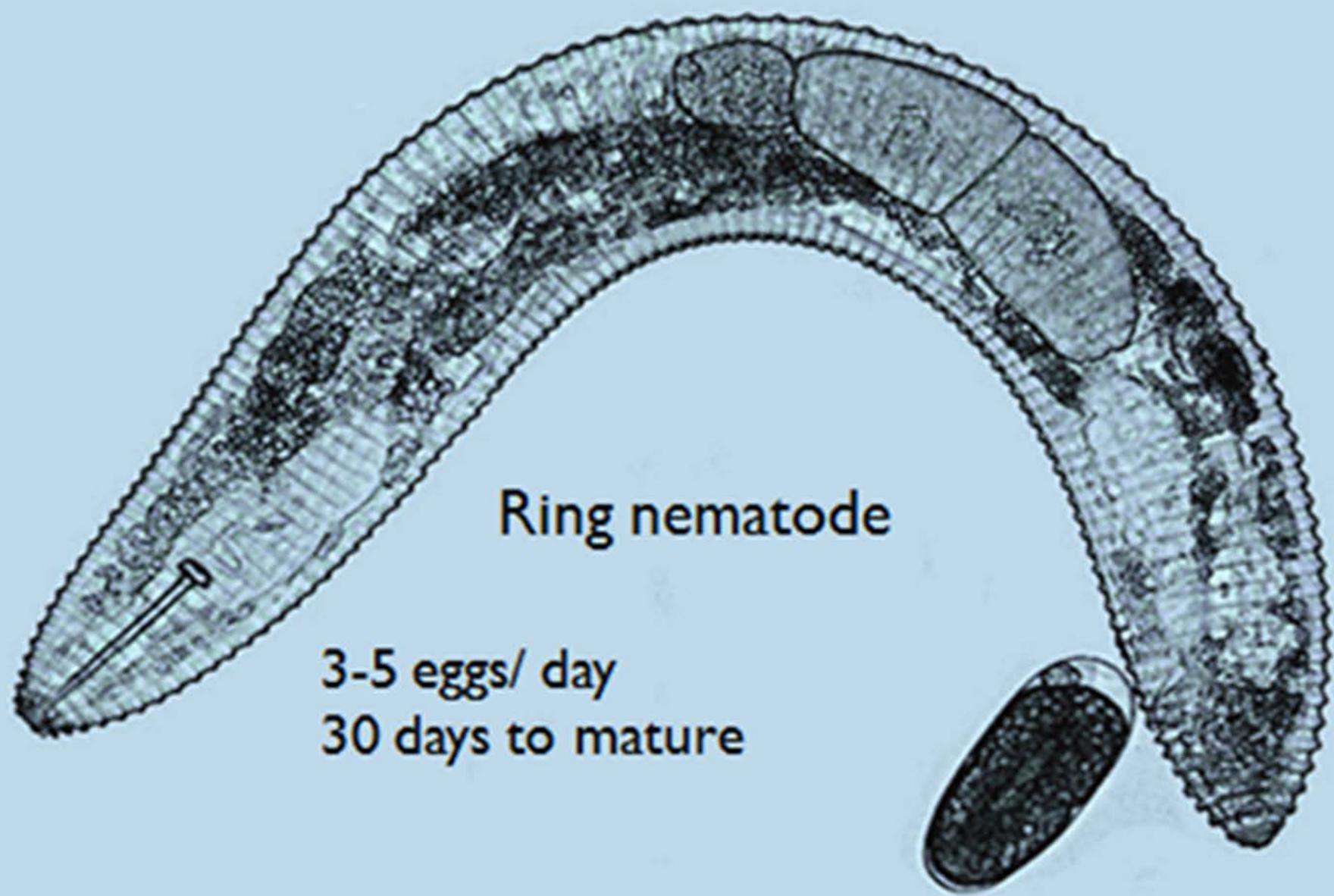


## 2. Bacterial Spot (*Xanthomonas arboricola* pv. *pruni*) (Shepard et al., 1999)



# Ring Nematodes

- ❑ Destroy feeder roots
- ❑ Predispose plant to other diseases
- ❑ Trees are less vigorous, less tolerant to drought stress, and have poor canopies
- ❑ Major predisposing factor for peach tree short life



Ring nematode

3-5 eggs/ day  
30 days to mature

Why do we have  
problems with  
nematode damage?

Failure to nematode test. The information gained from a nematode test can be a “lifesaver.” According to Georgia standards, only one ring nematode or root-knot juvenile per 100 cc of soil would indicate the need to treat with fumigants.

**A peach tree will simply not tolerate damaging nematode levels. Nematodes will result in death or reduced yields!**

- ❑ February-April (*December – March*) samples provide the most accurate assessments of ring nematodes.
- ❑ September-October samples give the best assessments of root-knot and root-lesion nematodes.

If nematode assays indicate the presence of root-knot, root-lesion or ring nematodes, it will be advantageous to fumigate the entire orchard site in the fall before planting. If the nematode assay does not indicate the presence of root-knot, root-lesion or ring nematodes, a 6-8 ft strip to be used for the tree row may be fumigated.

Failure to treat with nematicides. Even in the absence of nematodes, as indicated by a soil test, we currently recommend that a 6-8 foot strip of soil be fumigated where the peach rows will run. This is because low levels of damaging nematodes may be difficult to detect, and we do not want to take chances. If one is planning to transplant trees in January or February, do not fumigate after Thanksgiving with Telone; residual Telone, especially on heavy soils, will often kill young trees if they are planted too close to the fumigation date.

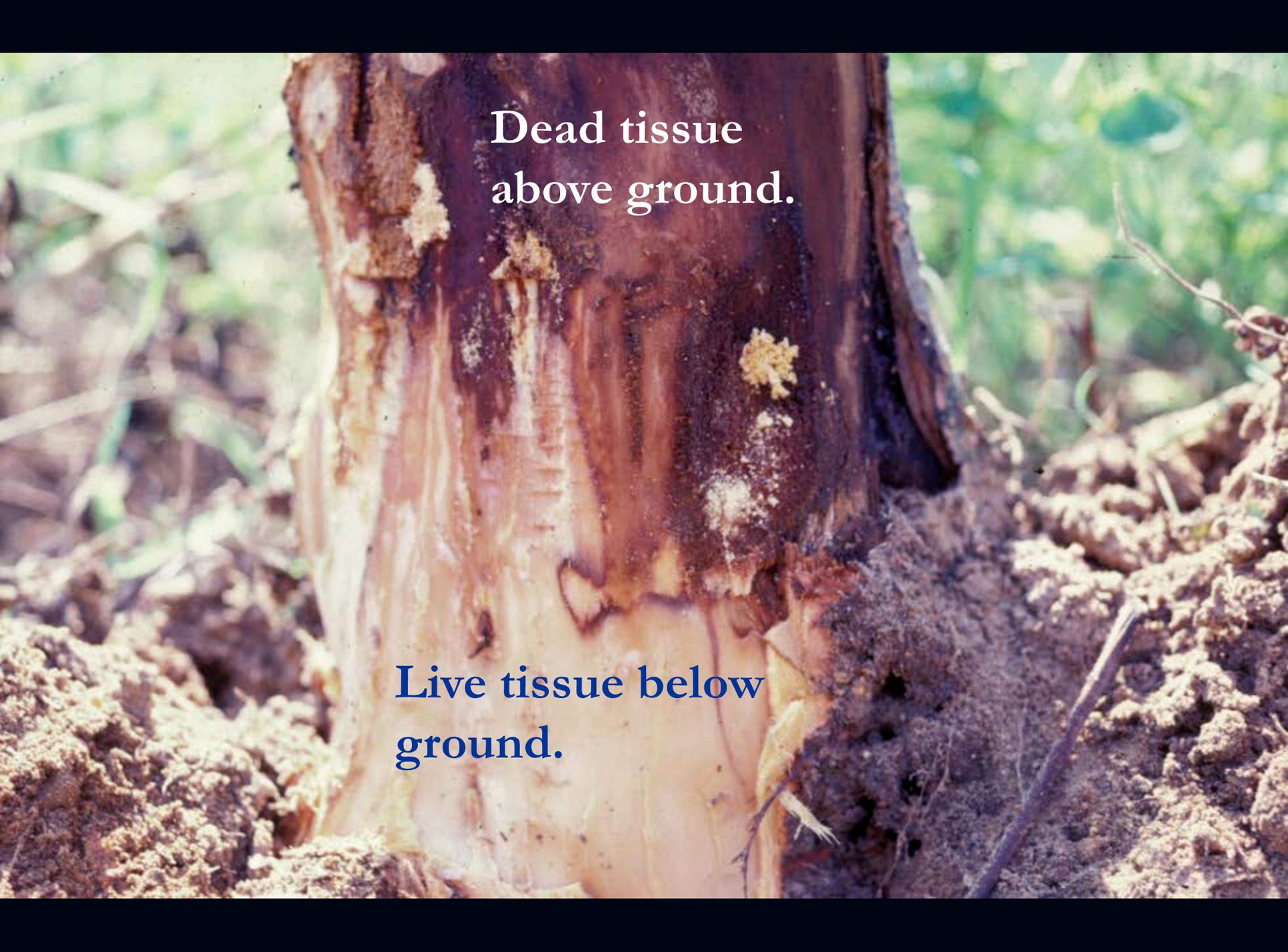
*Mesocriconema xenoplax* is the only plant-parasitic nematode studied to date that predisposes peach trees to PTSL.

# Peach Tree Short Life

- ❑ This is largely a stress-related disease.
- ❑ The presence of ring nematode is highly correlated with PTSL.
- ❑ Other factors are important, but nematodes are very, very, very important.
- ❑ Cold damage, *Pseudomonas syringae* pv. *syringae* (causal agent of bacterial canker), and *Leucostoma* spp. (causal agent of Leucostoma canker) combine to kill the above-ground portions of the tree.

# Peach Tree Short Life





**Dead tissue  
above ground.**

**Live tissue below  
ground.**





Guido Schnabel and Desmond Layne; Clemson University



Guido Schnabel and Desmond Layne; Clemson University



Guido Schnabel and Desmond Layne; Clemson University



# 10 Point PTSL Program

1. Lime to pH of 6.0 – 6.5 in the top 16 inches of soil.
2. Subsoil.
3. Fumigate when nematode samples indicate the need.
4. Use nematode free planting stock.
5. Use an appropriate rootstock.
6. Soil/foliar test and maintain proper pH after planting.
7. Prune after 1 February. Discontinue summer pruning by 15 September.
8. Avoid mechanical cultivation.
9. Post-plant nematicide if necessary. Assay soil annually.
10. Destroy all dead and dying trees.

# 1,3-Dichloropropene

- ❖ **Common Name: 1,3-dichloropropene**
- ❖ **Trade Names: Telone II**
- ❖ **Manufacturer: DowElanco**
- ❖ **Molecular Formula:  $C_3H_4Cl_2$**
- ❖ **Nematicide, fungicide, and herbicide**
- ❖ **Mixed with chloropicrin to form Telone C-17 and C-35 and Pic-Clor 60.**



## Pre-plant Crop Rotation Treatment

Crop rotation is used to starve nematodes by growing crops on which they cannot feed or reproduce. Rotating land with wheat for 3 years prior to establishing a peach orchard has been shown to be as effective as pre-plant methyl bromide fumigation in suppressing the ring nematode.

In addition to wheat, MaxQ tall fescue prevents two species of root-knot nematodes, *Meloidogyne incognita* and *M. hapla*, from multiplying, while also reducing *M. javanica*. MaxQ has also been shown to suppress root-lesion nematode populations.

If ring nematode is present, MaxQ would not be effective. Likewise, if root-knot nematodes are present, wheat rotations would not be effective.

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# Rootstocks in Florida

Cultivar	<i>M. incognita</i>	<i>M. javanica</i>	<i>M. floridensis</i>
Flordaguard	Resistant	Resistant	Resistant/ <i>tolerant</i>
Sharpe	Resistant	Resistant	Resistant
MP-29	Resistant	Resistant	Resistant
Nemaguard	Resistant	Resistant	Susceptible
Nemared	Resistant	Resistant	Susceptible
Okinawa	Resistant	Resistant	Susceptible
<i>Guardian</i>	<i>Resistant</i>	<i>Resistant/ tolerant</i>	<i>Resistant/ tolerant/ host (reaction may differ in FL)</i>

# Rootstock Comparison Guide

<u>Rootstock</u>	<u>Type</u>	<u>Vigor</u>	<u>Suckers</u>	<u>Yield</u>	<u>Fruit Size</u>	<u>PTSL</u>	<u>ARR</u>	<u>Mi</u>	<u>Mf</u>
Guardian	P	VH	H	H	Good	R	S	R	R/T
Lovell Halford	P	H	VL	H	Good	T	S	S	S
Nemaguard Nemared	P	VH	H	H	Good	S VS	S	R	S
Flordaguard	P	H	L	H	Good	~T	S	R	R/T
Sharpe	M	M	M	M	Fair	R	R	R	R
MP-29	MP	M	M	H	Good	R	R	R	R

Type: P=peach seedling, M=plum hybrid, MP=plum x peach hybrid

Suckers: H=high, M=medium, L=low

PTSL, RK and ARR: R=resistant, T=tolerant, S=susceptible; Mi=Meloidogyne incognita, Mf=M. floridensis

Vigor: H=high, M=medium

Yield: H=high, M=medium

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Questions