



Can young trees with major root loss from HLB respond profitably to reducing sting nematodes?

What are the most effective ways to manage sting nematodes?









Sting nematode (Belonolaimus longicaudatus)

- First recognized as widespread pest of young trees during freezes of 1980s-90s.
- Large size, adapted to coarse, sandy soil.
- Feeds at root tip, causes stubby root symptoms.
- Moves downward when soil dries.
- Very wide host range, including many weed species.



Can young trees with major root loss from HLB respond profitably to reducing sting nematodes?



Trees responded to damage:

- First by adjusting root-shoot imbalance
- Thereafter, vegetative growth was prioritized



Can young trees with major root loss from HLB respond profitably to reducing sting nematodes?

- Nematodes damage roots trees respond with reduced growth above ground leaf, twig and branch death.
- Reduce nematodes trees respond first with increased growth at expense of fruit?
- Unlike a single event of canopy pruning, the nematode damage is mitigated but not terminated.
- HLB remains unaffected







What are the most effective ways to manage sting nematodes?



Non-host cover crops for sting nematode in row middles

- Sunn hemp (Crotalaria juncea)
- Velvetbean (Mucuna deeringiana)
- Perennial peanut (Arachis glabrata)





What are the most effective ways to manage sting nematodes?



Tree-row nematode management

- Vydate[®] L (oxamyl; ACH inhibitor MOA; LD₅₀ 5.4)
- Nimitz®
- (fluensulfone; Unknown MOA; LD₅₀ 671) Velum[®] Prime (*fluopyram; SDH inhibitor MOA; LD*₅₀ >2000)
- 3 unregistered chemicals
- Untreated controls

Each nematicide applied to 8 plots of 4 trees/plot Sting nematodes managed spring and fall in all treated plots









Sting nematode population density in 2019-2020 (combined spring and summer measurements)

- Modest nematode reduction
- All but one chemical combination treatments (top panel) tended to reduce the nematodes
- Several chemicals are promising based on nematode levels measured following the spring or fall treatments (bottom panel)





- To the extent that the nematicides reduced the nematode numbers the growth of trees responded positively.
- Total fruit production of these 4year-old trees was <40 boxes per acre.
- Number of fruit was inversely related to nematode control and to tree growth.







3000

2500

2000

٥

Conventional

Perennial peanut

Trunk cross

- Perennial peanut in row ٠ middles reduced sting nematodes by 94% compared to middles with native vegetation.
- Where weed incursion was • noticeable in peanut plots, the reduction was 85%.
- As in the nematicide trial the ٠ trees tended to be larger with more fibrous roots in treatments of peanut or oxamyl, but no significant effects.





 As in the nematicide trial, tree growth appears to be at the expense of fruit production in these young trees.



After two years

Sting nematode management in HLB affected trees indicates modest, but positive affects on tree growth.

As with any management tactic on non-bearing and early-bearing trees, determining profitability requires long term evaluation.

- Shift from vegetative to reproductive growth?
- Increased size, increased tolerance (healthier, greater transpiration, force nematode downward)?
- Increased importance of roots in row middle as tree grows?

Additional management tactics for these concomitant diseases?



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Young grove with heavy sting nematode infestation

- Uncovered trees planted in fall 2017.
- Covered trees planted in summer 2019.
- Photo taken in fall 2020 (covered trees were half age of uncovered trees).

Would nematode damage be as great on covered as on uncovered trees? (Would the covered trees be more tolerant?)

Would nematode management increase growth of covered trees more than that of uncovered trees?

Would nematode management following removal of protective covers be more profitable than if trees were never covered?









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Protective tree covers that prevent psyllid feeding will also prevent weevil egg laying. These covers have increased tree growth tremendously.

What happens when the covers are removed?

