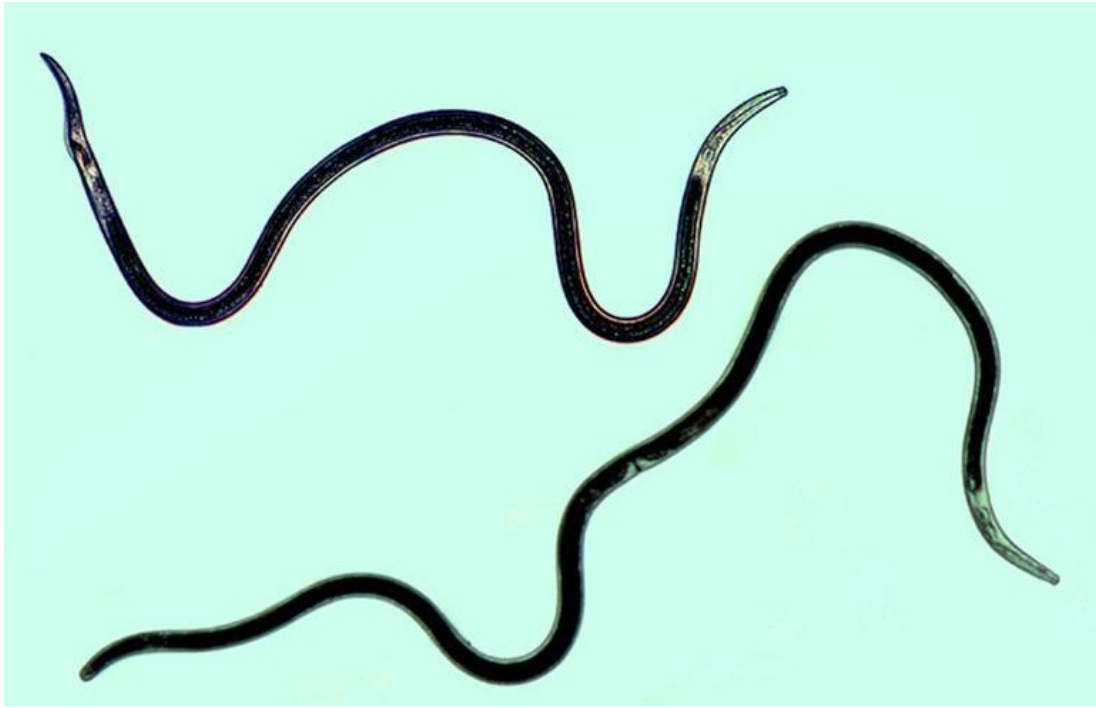
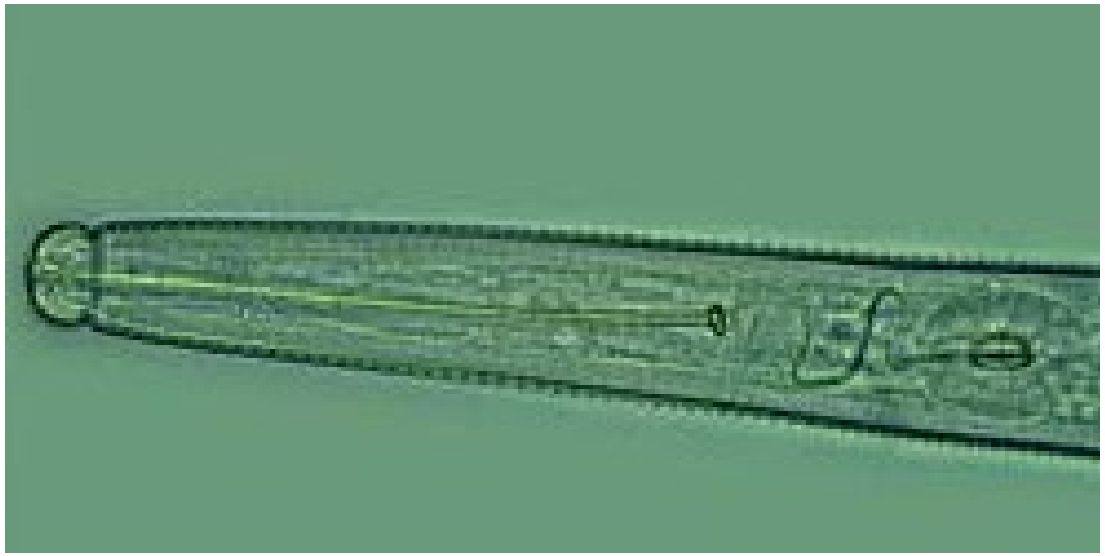
Sting Nematode

Impacts and management



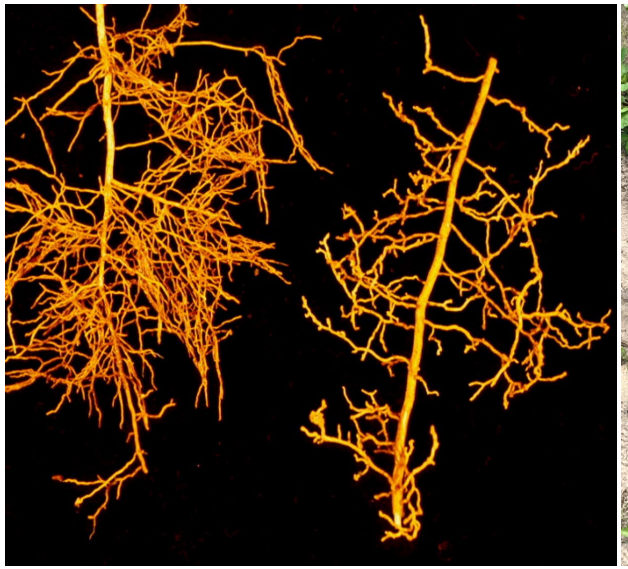


Larry Duncan, UF/IFAS CREC

Images courtesy Jon Eisenback, VPI

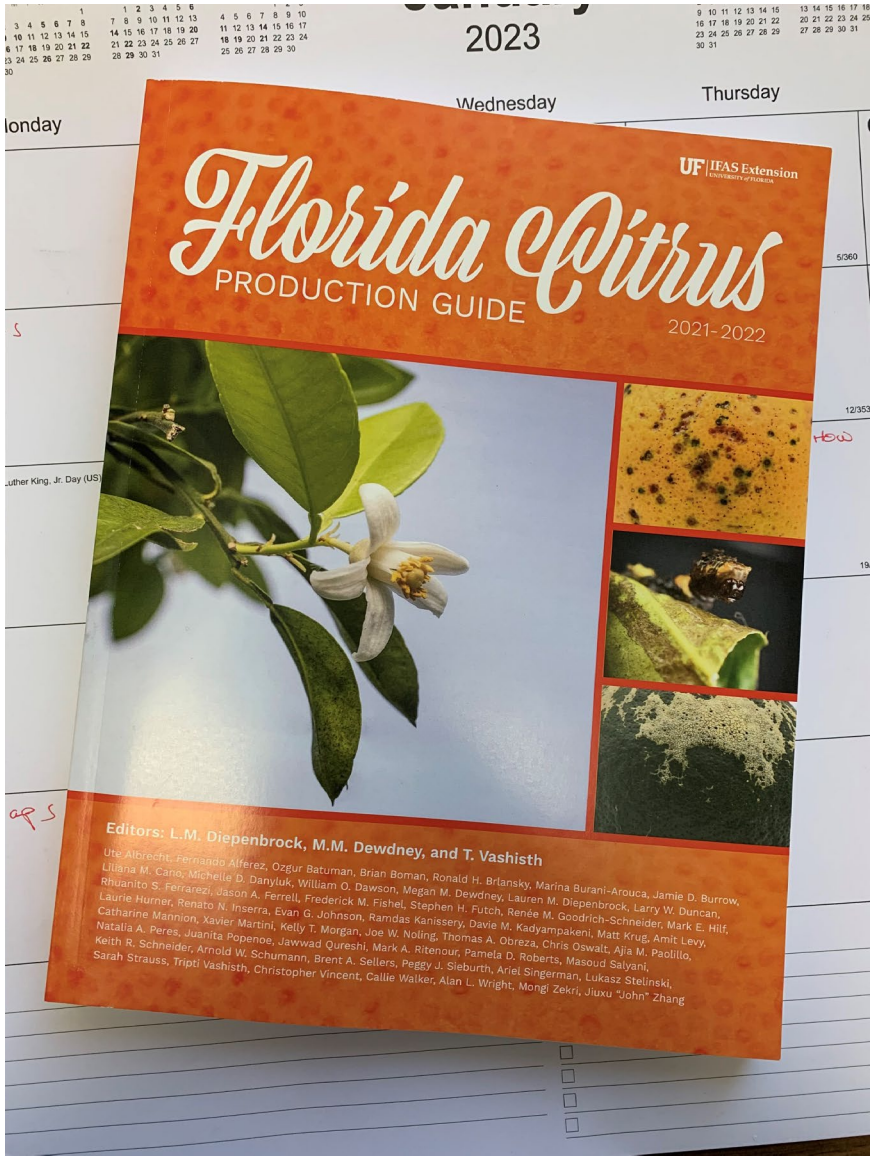
Sting nematode

- First recognized as widespread pest of young trees when replanting following the freezes of 1980s. Now replanting is in response to HLB.
- Large nematode, 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.



Sting nematode IPM

- Sanitation
- Resistance/tolerance
- Cultural
- Chemical/Biological



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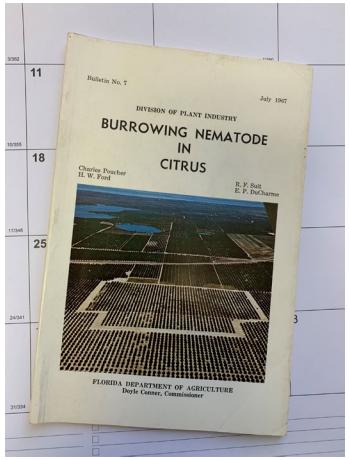
Nematode Rootstock Certification Program

- Citrus nematode
- Burrowing nematode
- Coffee lesion nematode



- *Not* Sting nematode because it is too widespread, unlike the others.
- Became a moot point when nurseries were all require to grow containerize trees

Sting nematode IPM

- Sanitation
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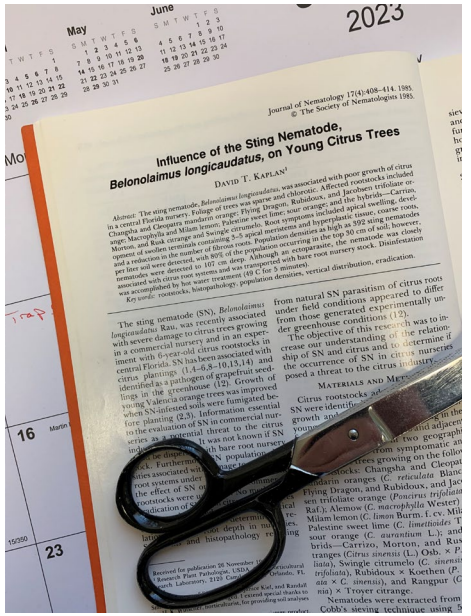
In a 1985 survey of common rootstocks, all were heavily infested and damaged by sting nematode.

- Changsha mandarin
- Cleopatra mandarin
- Flying Dragon trifoliate orange
- Roubidoux trifoliate orange
- Jacobson trifoliate orange
- Alemow
- Milam lemon
- Palestine sweet lime
- Sour orange
- Carrizo citrange
- Morton citrange
- Rusk citrange
- Swingle citrumelo
- Rubidoux x Koethen
  Rangpur x Troyer



Rootstock tolerance

- None reported in older, conventional lines.
- CRDF trials with newer and experimental UF and USDA rootstocks are ongoing

Rootstock tolerance

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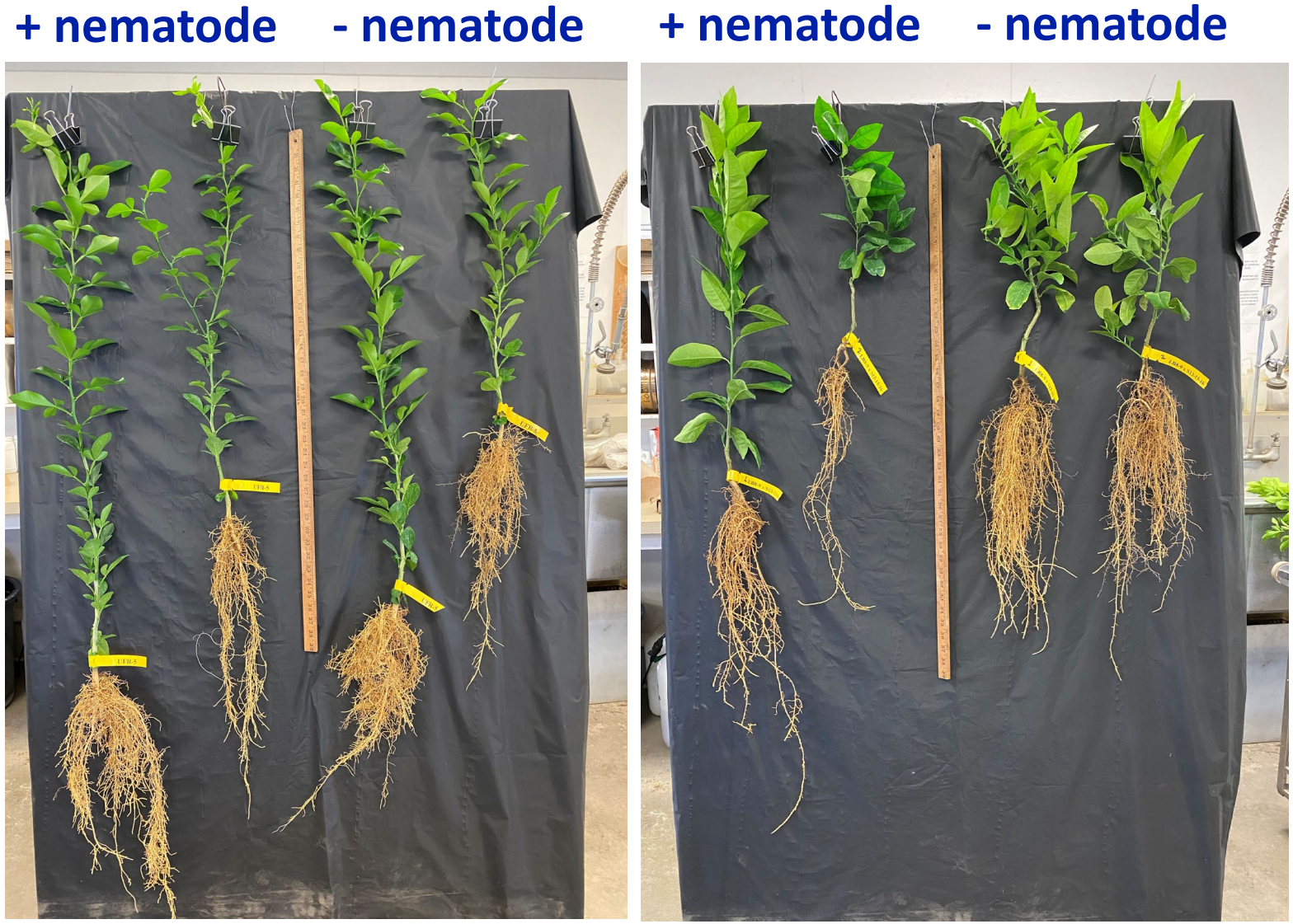
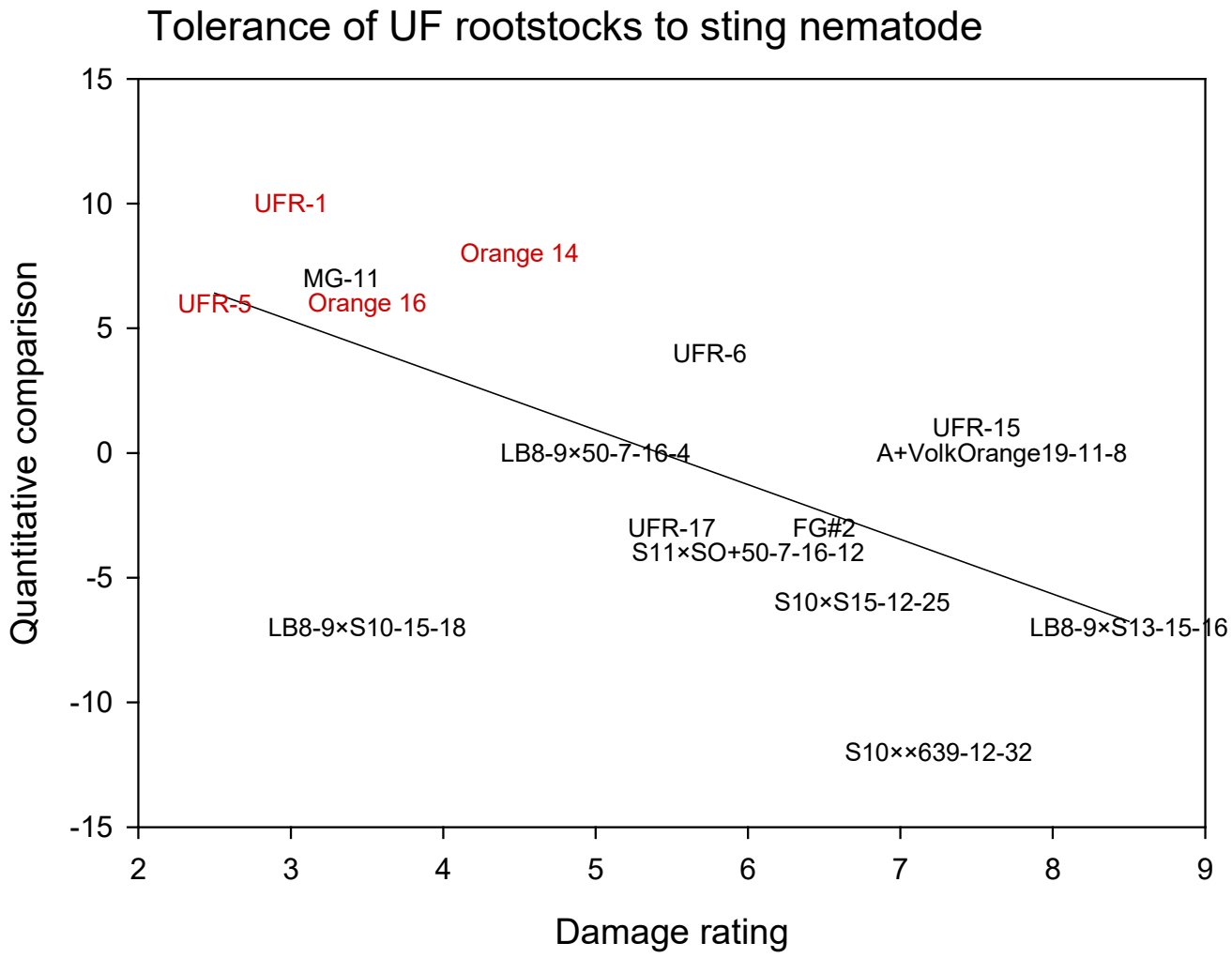
- To date some lines appear more tolerant (left) than others (right)



Rootstock tolerance

- None reported in older, conventional lines.
- Trials with newer and experimental UF and USDA rootstocks are ongoing.
- Relative root mass when challenged by nematodes compared to unchallenged root mass. Note that some of the promising rootstocks (red) have identical or near-identical ancestry.
- Will require field trials.



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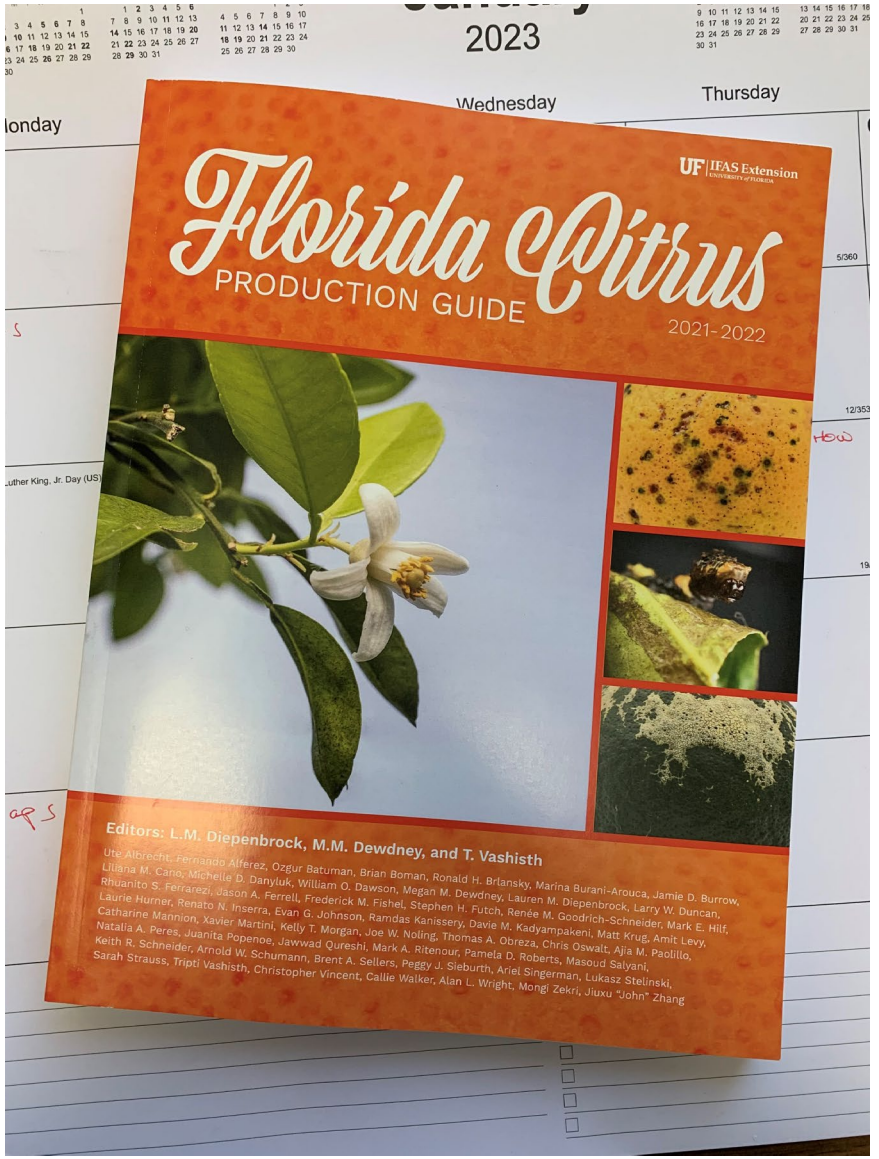
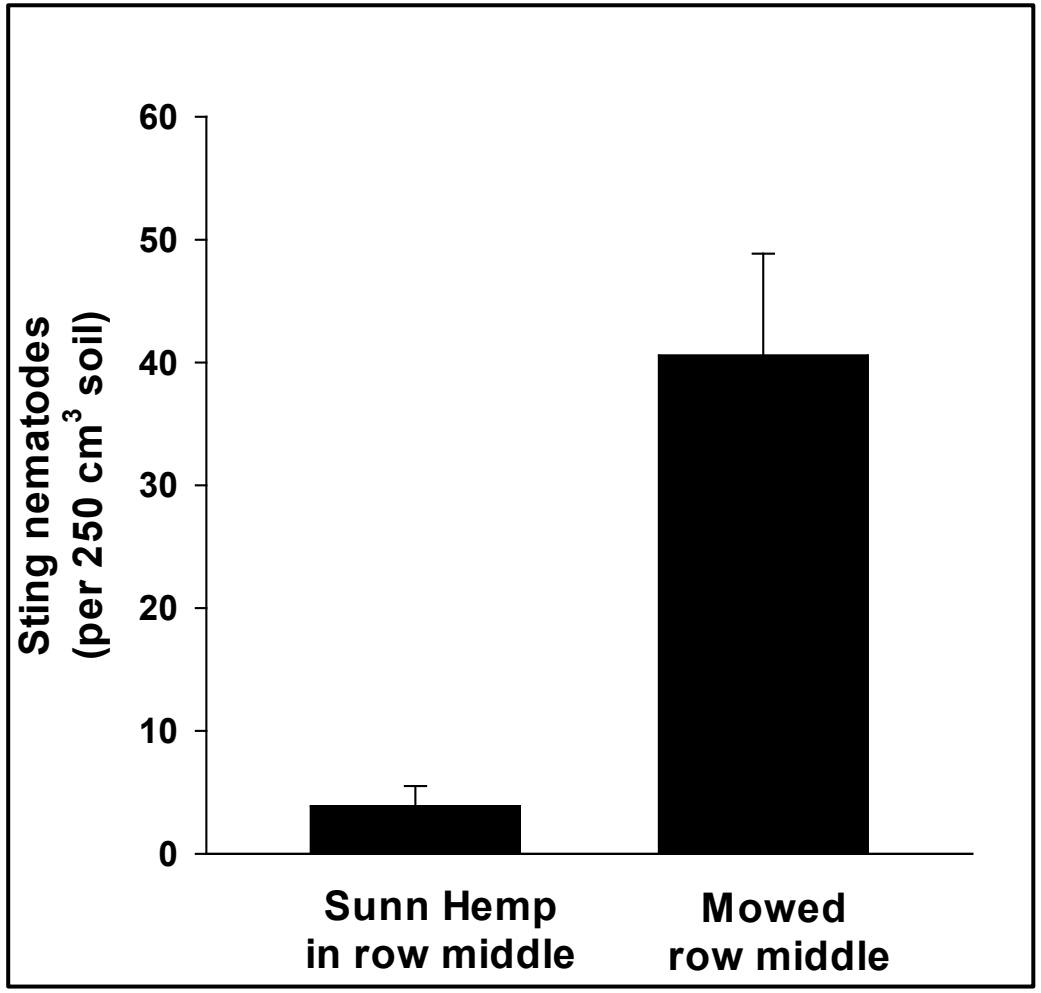


Sting nematode

Non-host cover crops

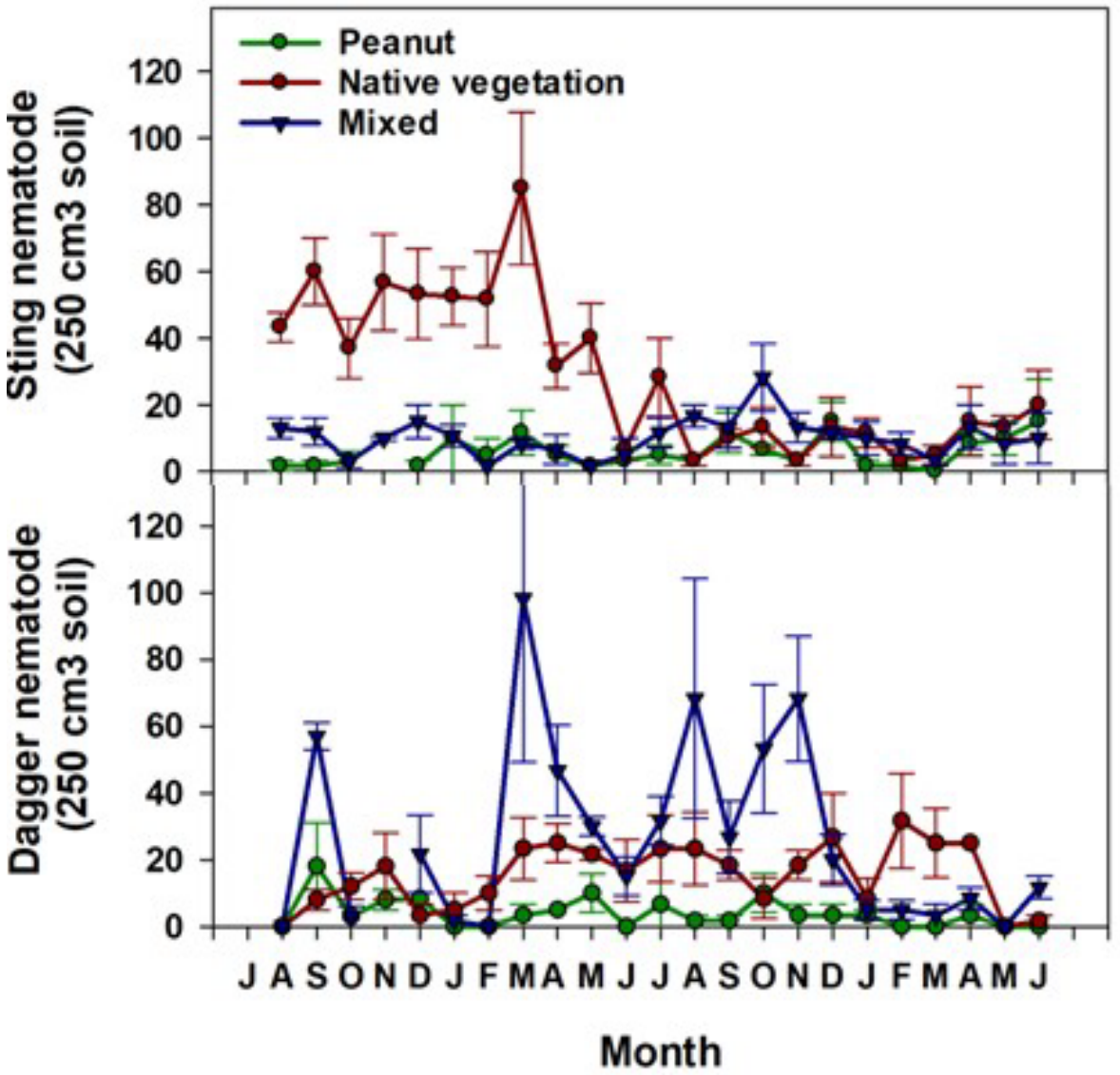
- Sunn hemp (*Crotalaria juncea*) can suppress sting nematode prior to planting.
- Not practical for row middle management.
- Excellent green manure.



Sting nematode

Non-host cover crops

- Perennial peanut (*Arachis glabrata*) can suppress sting and dagger nematode in row middles.
- Establishes slowly, requires initial irrigation.



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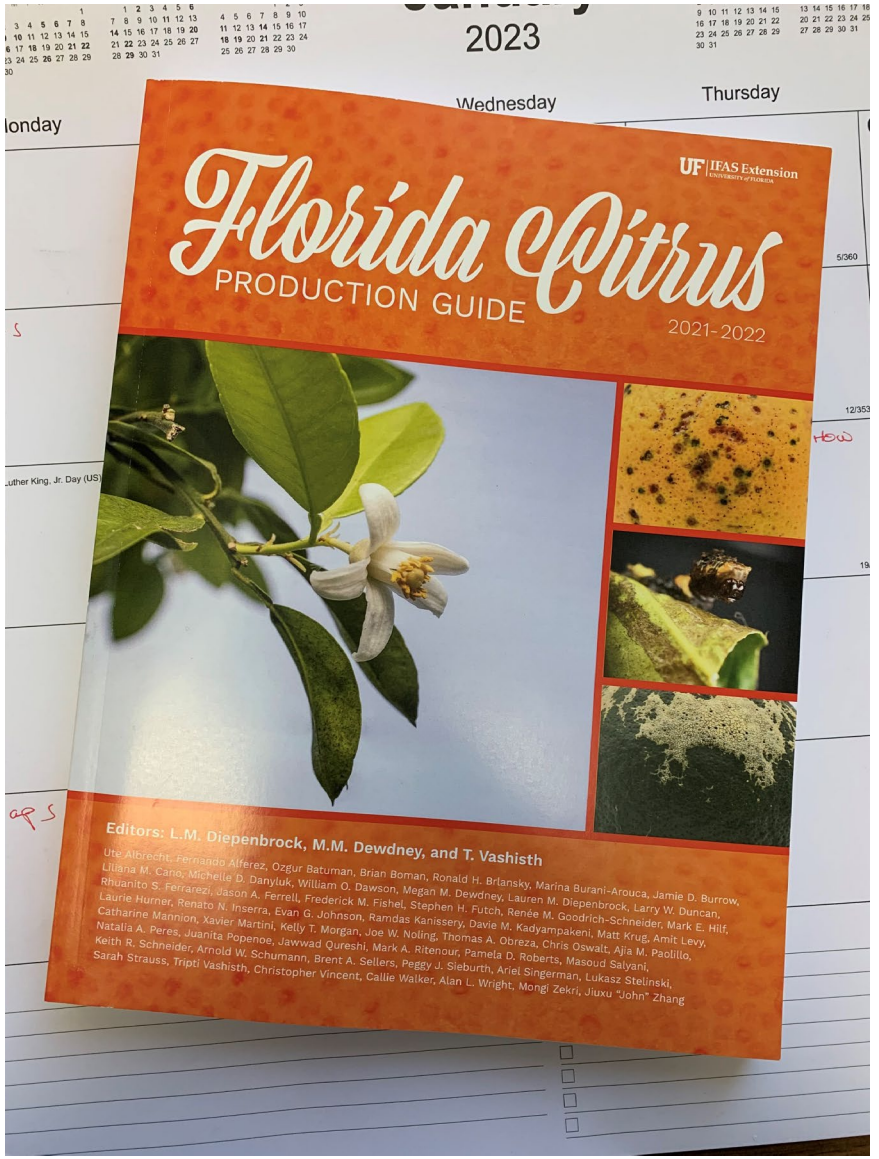


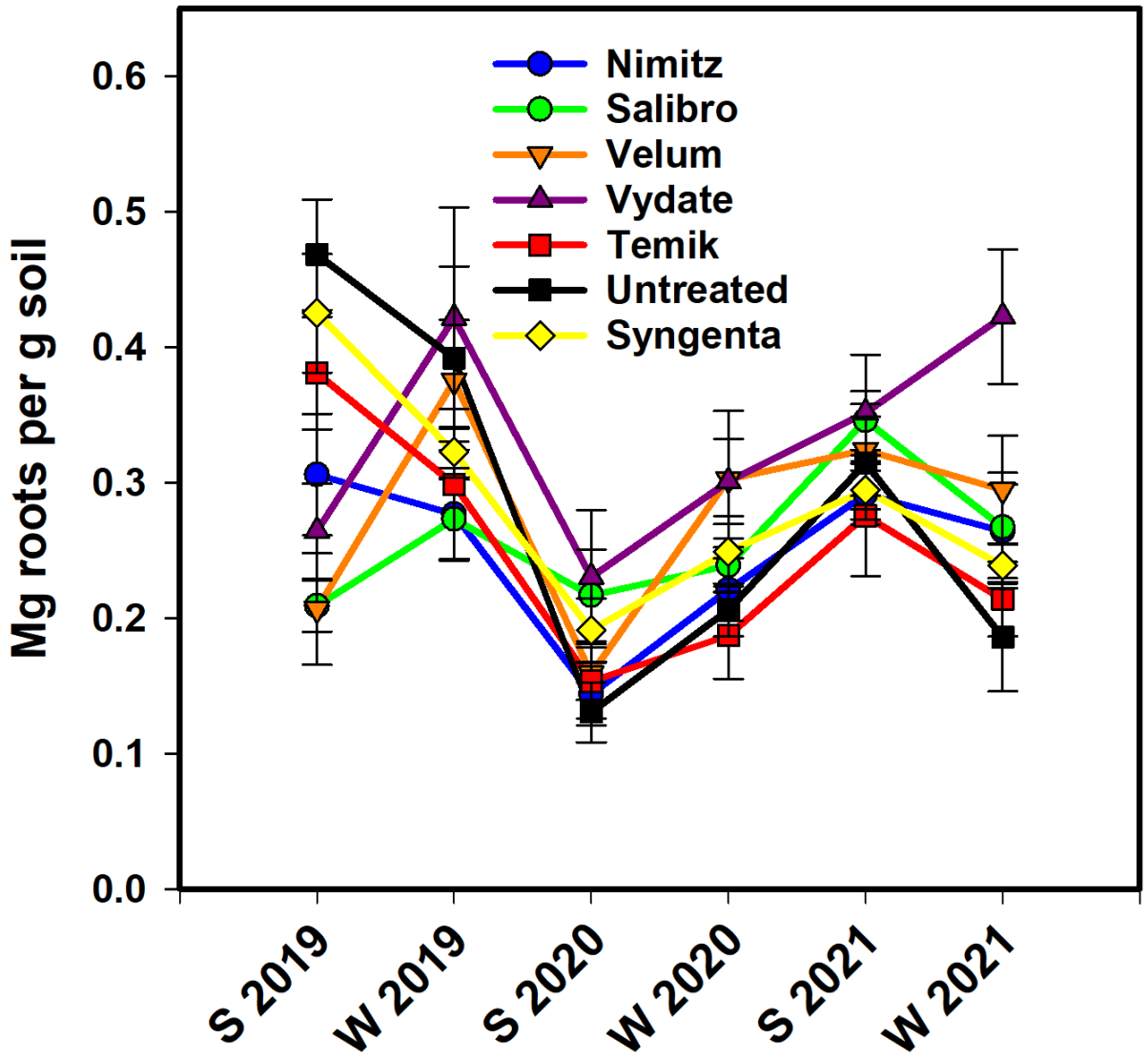
New nematicide chemistries objectives

1. CRDF trial to estimate profitability of nematode management in young HLB-affected trees
2. Compare nematicides for efficacy
    - Six nematicides
    - Eight, 4-tree plots per treatment
    - All but one nematicide treatment occurs spring and fall



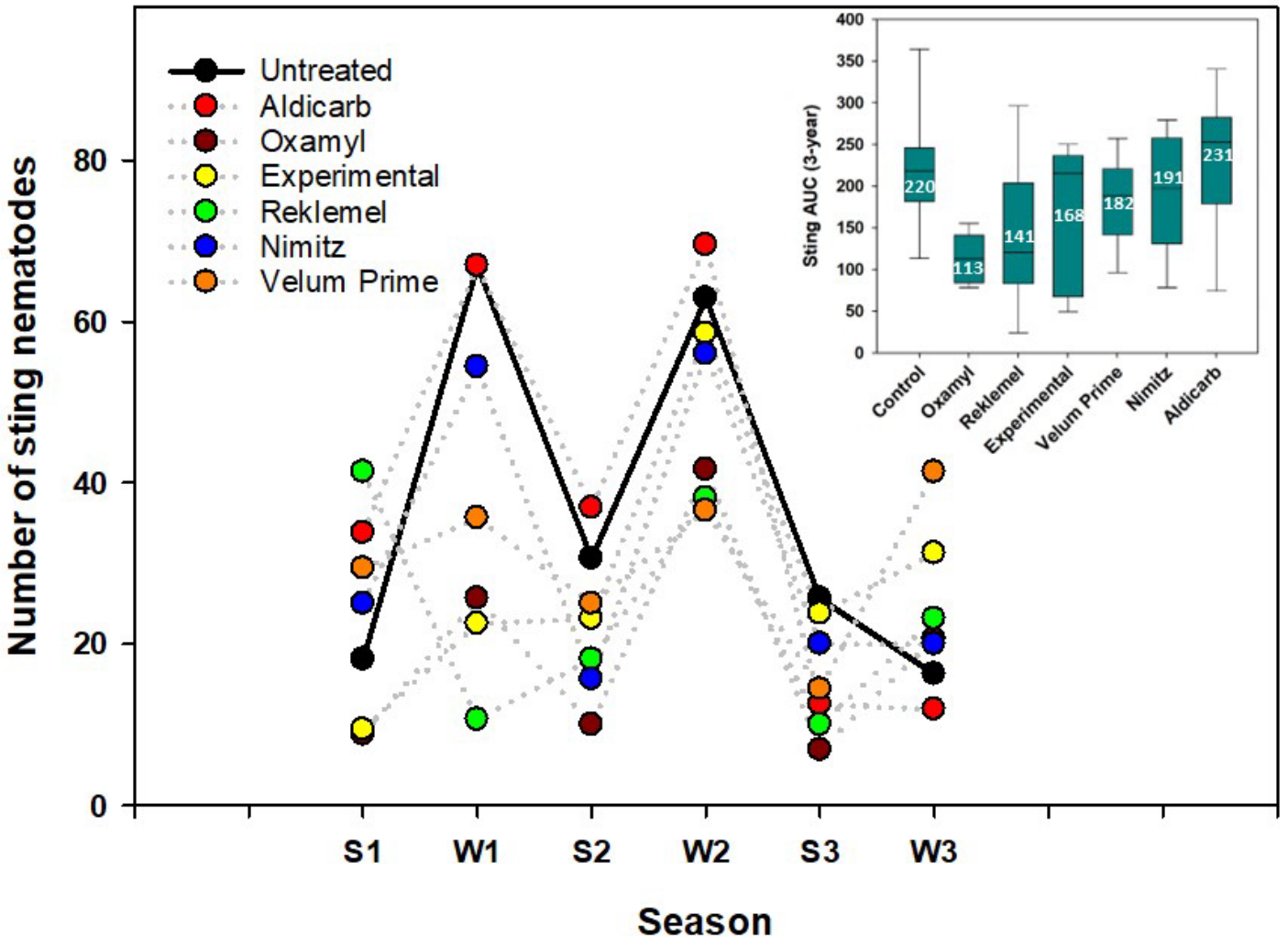

Chemical management

- Untreated trees larger initially (by chance).
- Root mass for untreated trees was initially highest, eventually lowest.
- Oxamyl effect on roots was superior among the nematicides tested.



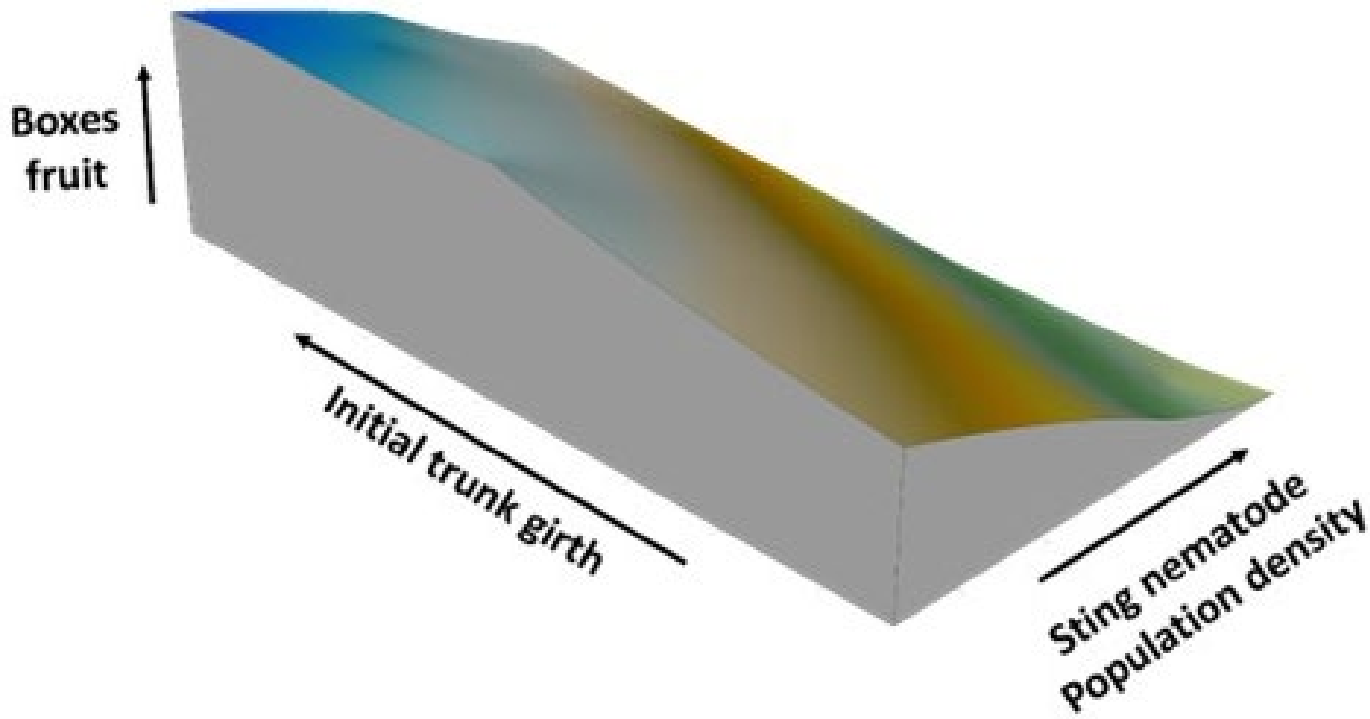
Chemical management

- Nematicide efficacy was variable, but oxamyl consistently reduced nematodes compared to the untreated trees.
- The ‘area under the curve’ or overall average nematode population size was least for oxamyl and greatest for aldicarb.



Chemical management

- Fruit weight of 4-year-old trees was significantly related to the size of trees at the beginning of the trial and to the overall abundance of sting nematodes.
- However, the treatments did not increase yield enough to be profitable.



Sting nematode and HLB

- Will trees respond profitably to sting nematode IPM if HLB infection is delayed for several years?

Sting nematode and HLB

- CRDF trial to measure the interaction between HLB and sting nematode using IPCs and nematicides.

	B 1	B 2	B 3	B 4	B 5	B 6	B 7	B 8	B 9	B 10	B 11	B 12	B 13	B 14	B 15
3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
5	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP
8	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
9	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
10	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP
13	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
14	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
15	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
17	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP
18	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
19	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
20	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
21	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
22															

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Sting nematode IPM

- Ideally, sting nematode will one day be managed in citrus with a combination of cover cropping with non-host plants, rootstock tolerance/resistance, HLB avoidance, and judicious use of nematicides.

Thank you!