A REVIEW OF NEMATODE PROBLEMS IN FLORIDA STRAWBERRY FIELDS

J.A. Desaeger¹ and J. W. Noling²
University of Florida, ¹ GCREC, Wimauma, and ² CREC, Lake Alfred, FL, USA

jad@ufl.edu
Strawberry production in Florida

95% of Florida production

High production cost—$67,000/ha

Soil fumigation

Transplants from outside FL

Overhead and drip irrigation

Harvesting November-April
# Many Pests and Diseases in FL strawberries

(N. Peres, J. Renkema)

<table>
<thead>
<tr>
<th>Fungal</th>
<th>Bacterial</th>
<th>Insects/Mites</th>
<th>Weeds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phytophthora crown rot</td>
<td>Colletotrichum crown rot</td>
<td>Angular Leaf Spot</td>
<td></td>
</tr>
<tr>
<td>Colletotrichum glomerospooides</td>
<td>Charcoal rot</td>
<td>Xanthomonas fragariae</td>
<td></td>
</tr>
<tr>
<td>Phytomyza cactorum</td>
<td>Macrophoma phaseolina</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Fungal**
  - Phytophthora crown rot
  - Colletotrichum crown rot
  - Charcoal rot

- **Bacterial**
  - Angular Leaf Spot
  - Xanthomonas fragariae

- **Insects/Mites**
  - Aphids
  - Cyclamen Mite
  - Spider Mite
  - Western Flower Thrips

- **Weeds**

## Resources

- SAS – Strawberry Advisory System App

---

5/31/2018
Nematodes primary driving pest in Florida strawberries
Nematodes as plant parasites of food crops

- Annual nematode crop loss ? $100 billion globally and $5 billion in US (from 1987)
- Nematode crop loss difficult to estimate > non-specific symptoms > spotty, stunted, chlorotic
- Significance of nematode crop loss will increase
What Nematodes in FL strawberry fields?

1. **Sting nematode** – *Belonolaimus longicaudatus*
   Common in Florida, native

2. **Northern root-knot** – *Meloidogyne hapla*
   Less common, pr. introduced

3. **Northern lesion** – *Pratylenchus penetrans*
   Less common, pr. introduced

4. **Foliar nematodes** – *Aphelenchoides spp.*
   Uncommon, pr. introduced
Sting nematodes - *Belonolaimus longicaudatus*

- # 1 nematode in FL strawberries
- Many hosts ...
Sting nematode damage
NORTHERN ROOT KNOT NEMATODE (Meloidogyne hapla) On Florida Strawberry

Field symptoms: wilting, stunting, discoloration galling, plant mortality
Source of infestation = transplants!

Canadian bare root source of Radiance

North Carolina bare root source of Radiance

Root Knot Nematode (Meloidogyne hapla)

70% end of season plant collapse

RYFarm, March 22, 2016- Radiance and watermelon collapsing from Meloidogyne hapla
Root-knot nematode often only recognized when double-cropping (cantaloupe, watermelon, ...)

[Images of crops and root-knot nematode damage]
Pratylenchus penetrans – northern lesion nematode

- Tunnel and feed inside roots - endoparasitic
- Very common in NE US and Canada
- Wide host range
- Predisposes plants to invasion by pathogens (black root rot disease complex of strawberry)
Foliar nematodes (*Aphelenchooides*), Plant City, Nov. 2016

Smaller plants, tight, stunted, compact crowns; curled, puckered, distorted leaves, hard and rough to the touch; > 150 foliar nematodes per g leaf

*Aphelenchooides besseyi*

Crimp or dwarf disease of strawberry

A. Brooks, Plant City, 1929
Dramatic change in plant response to foliar nematode during season

**December 2016**

**Late November 2016**

**March 2017**

**DID THE FOLIAR NEMATODE SPREAD WITHIN THE FIELD?**
Possibly ... rain, dew, irrigation, ... picking!
Nematode Management Options

Sanitation
Crop rotation
Biocontrol
Solarization

Plant Resistance / Tolerance
Steaming
Biofumigation
Cover crops

Good agronomy
Tillage
Chemical - Fumigants

Strawberries w/o Fumigants in Florida?
Are nematodes putting squeeze on Florida strawberries?

- **How widespread?**
  - Sting nematode very widespread, others?

- **Can northern nematodes survive in Florida?**
  - Possibly and probably ...

- **Threat?**
  - Definitely sting, foliar, root-knot and lesion

- **Management?**
  - ... not many options
• Andrea Ruthes
• Jake Helmer
• Mike Burrell
• Johan Desaeger
• Paul Dahlin
• Homan Regmi
• Chenzhao “Bonnie” Xie
• David Moreira