Methods for Successful Nematode Trialing

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Syngenta Crop Protection
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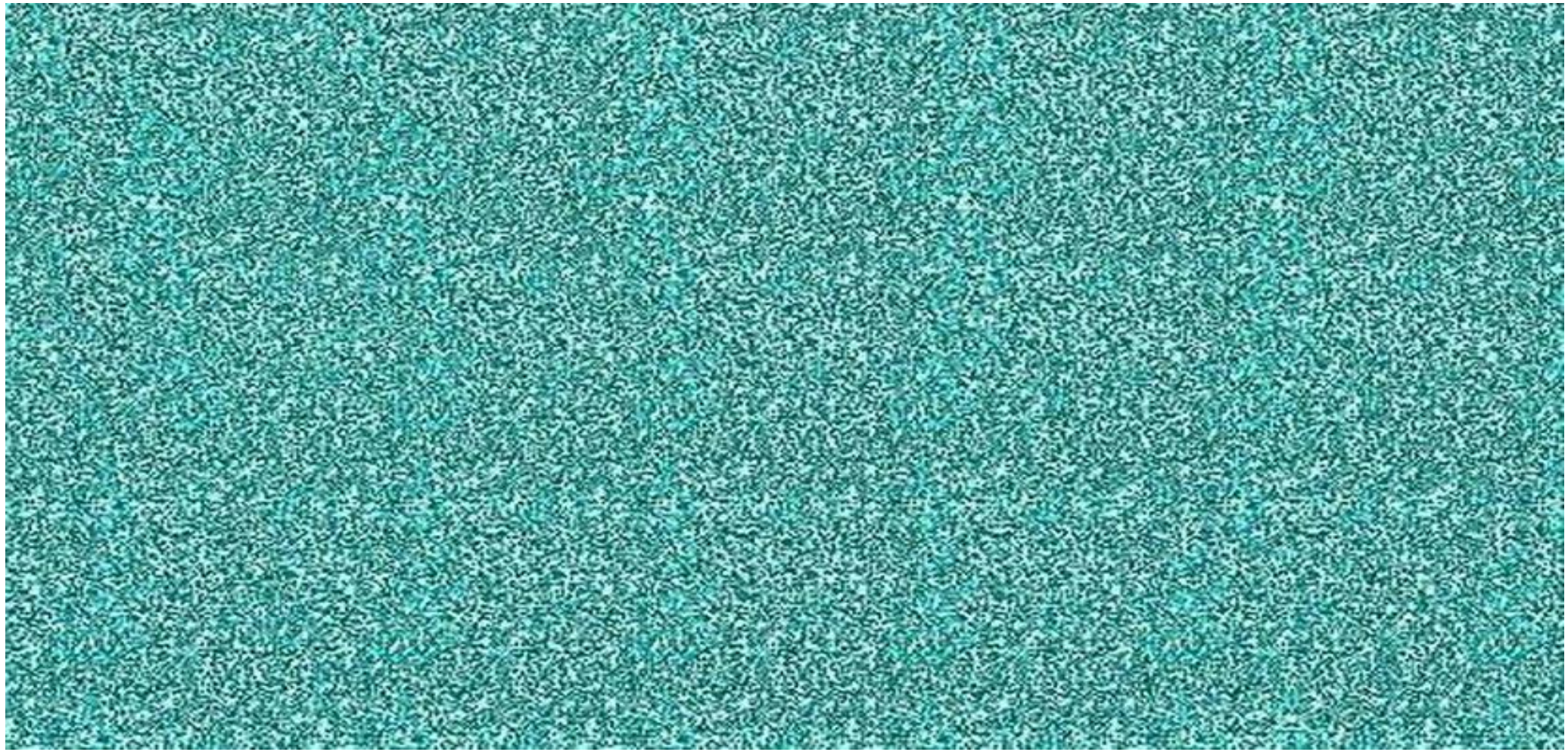
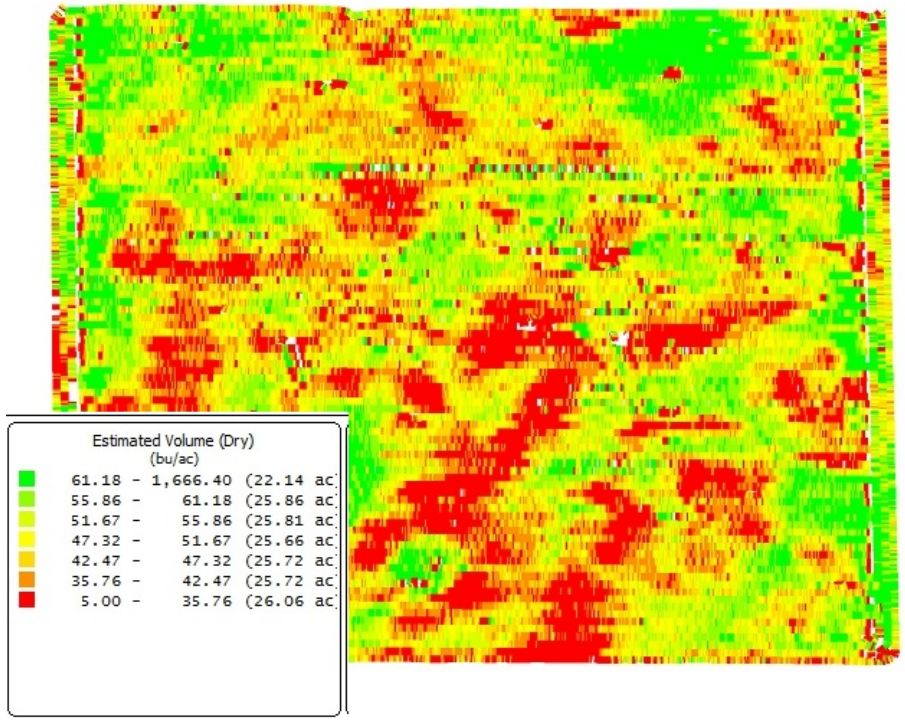


Steps for Successful Nematode Trialing

- Nematodes
- Design the Trial for Nematodes
- Give Your Nematodes Their Favorite Food
- Sample Where the Nematodes Are
- Analyze and Report Samples Correctly

Finding Nematodes



- Sample to Confirm!

Infesting Nematodes

- Infested soil/roots
  - Maximum protection from the elements
- Direct inoculation into transplant hole (under the plant)
- In-furrow sprays and through drip lines is not recommended

Nematode Gardens: Dedicated areas for nematode trialing

Feed your nematodes all year!!

www.nemaplex.ucdavis.edu

Trial Design for Nematodes:

SCN egg count variation – real life example

Inside an area, approximately the size of two pick-up trucks, SCN egg counts can go from 0 to 6,400 eggs/100 cc of soil.

1/3 acre

11,000	5,100	2,900	3,200	350	250	750	2,200
11,000	5,100	2,900	3,200	350	250	750	2,200
4,100	1,900	1,900	5,900	1,000	2,600	0	100
32,600	19,500	23,700	11,600	8,200	6,400	10,900	3,400
37,000	7,600	9,400		6,400	6,200	10,700	1,700
16,500	17,600	6,000		0	3,700	3,700	6,100
19,700	7,600	2,300	50	450	700	250	1,600
12,600	10,600	100	50	0	0	0	50
9,000	4,800	850	0	250	0	0	500

Trial Set-Up: "Aggregation of SCN egg population densities in a small area of naturally infested field research plots near Ames, Iowa. Each small rectangle represents a plot measuring 10 feet by 20 feet. The number in each rectangle is the number of SCN eggs per 100 cc soil as determined from a 10-core soil sample from each plot." [1]

[1] Greg Tylka, Iowa State University

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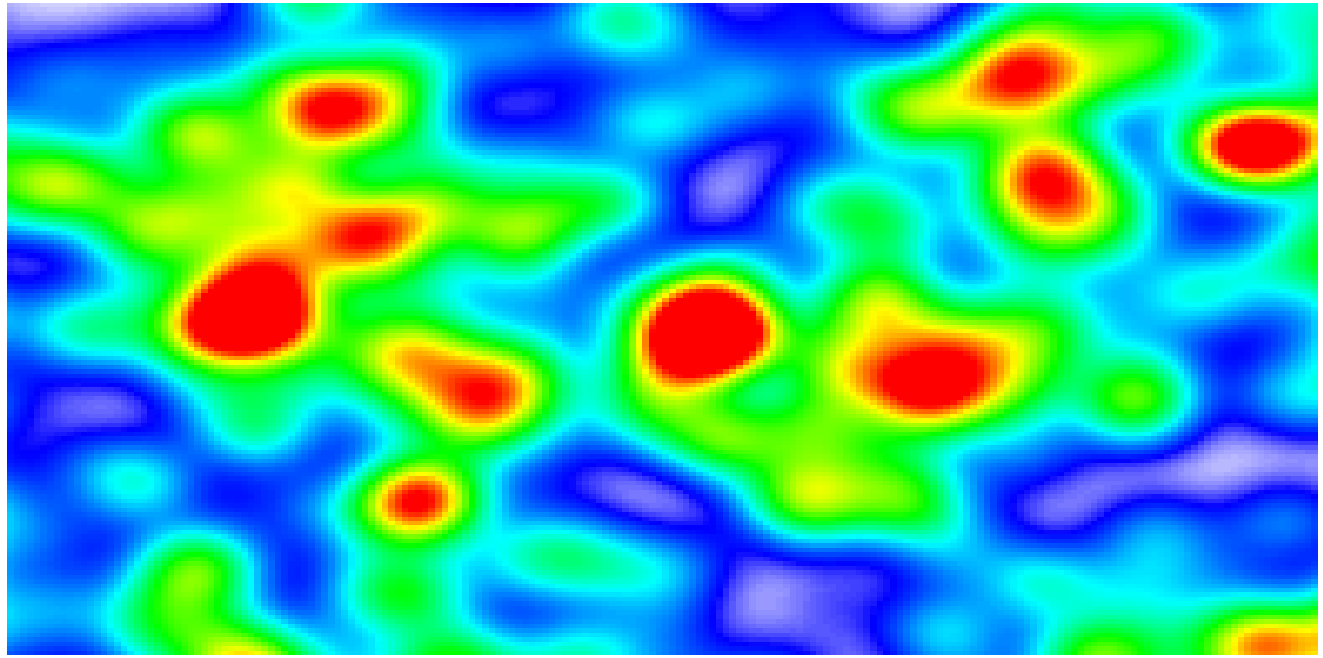
Trial Area Nematode Distribution



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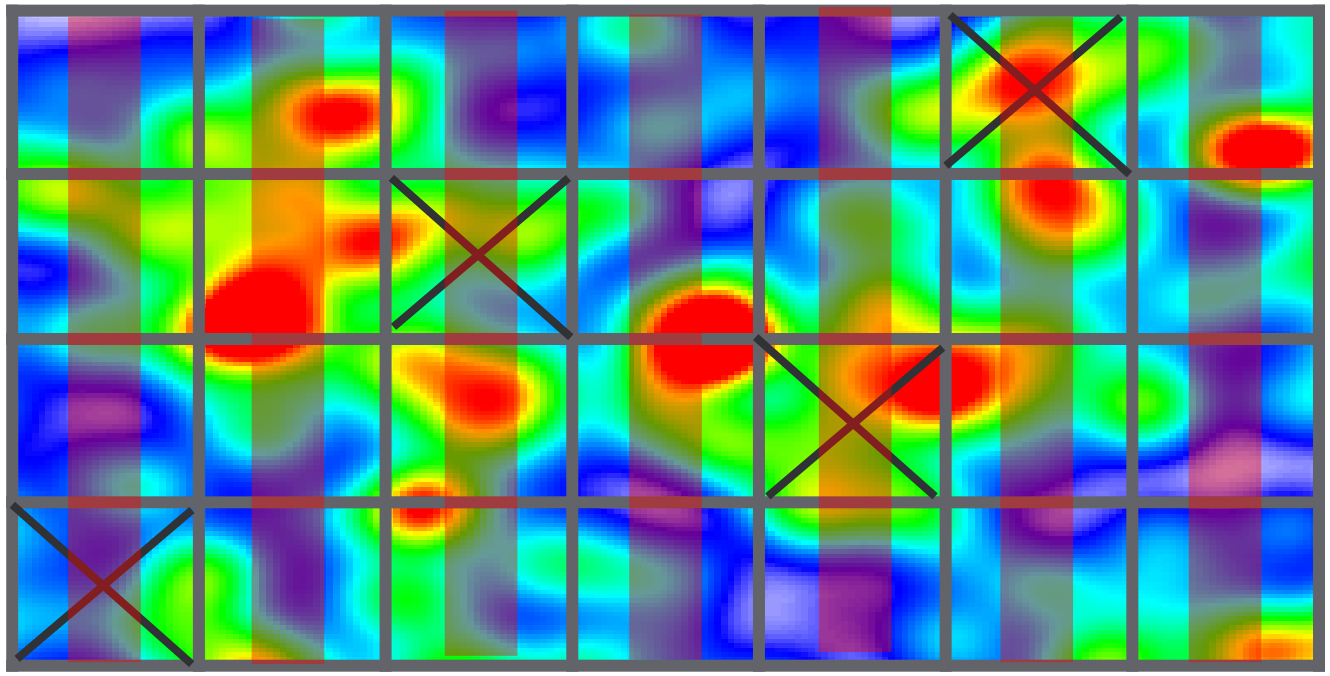
Trial Area Nematode Distribution

RCBD: 7 treatments, 4 row plots, sample center 2



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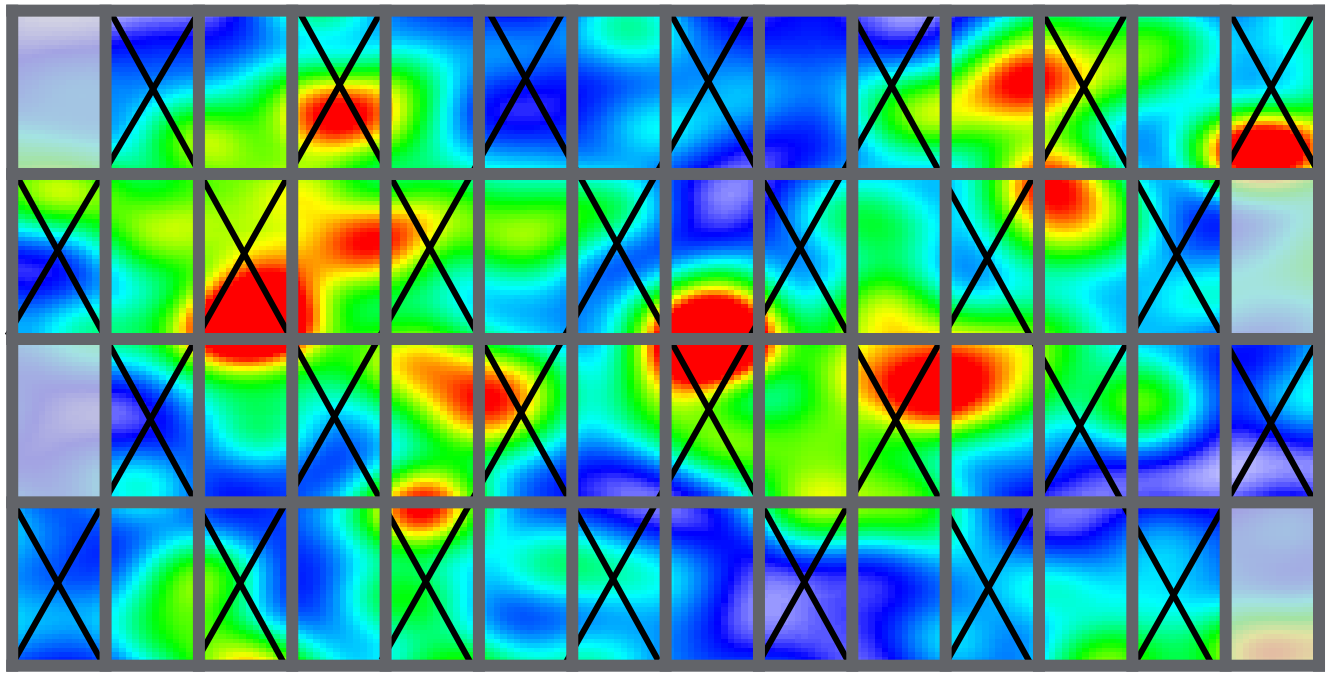
Trial Area Nematode Distribution

Paired Plot - Checkerboard: 7 treatments, 2 row plots



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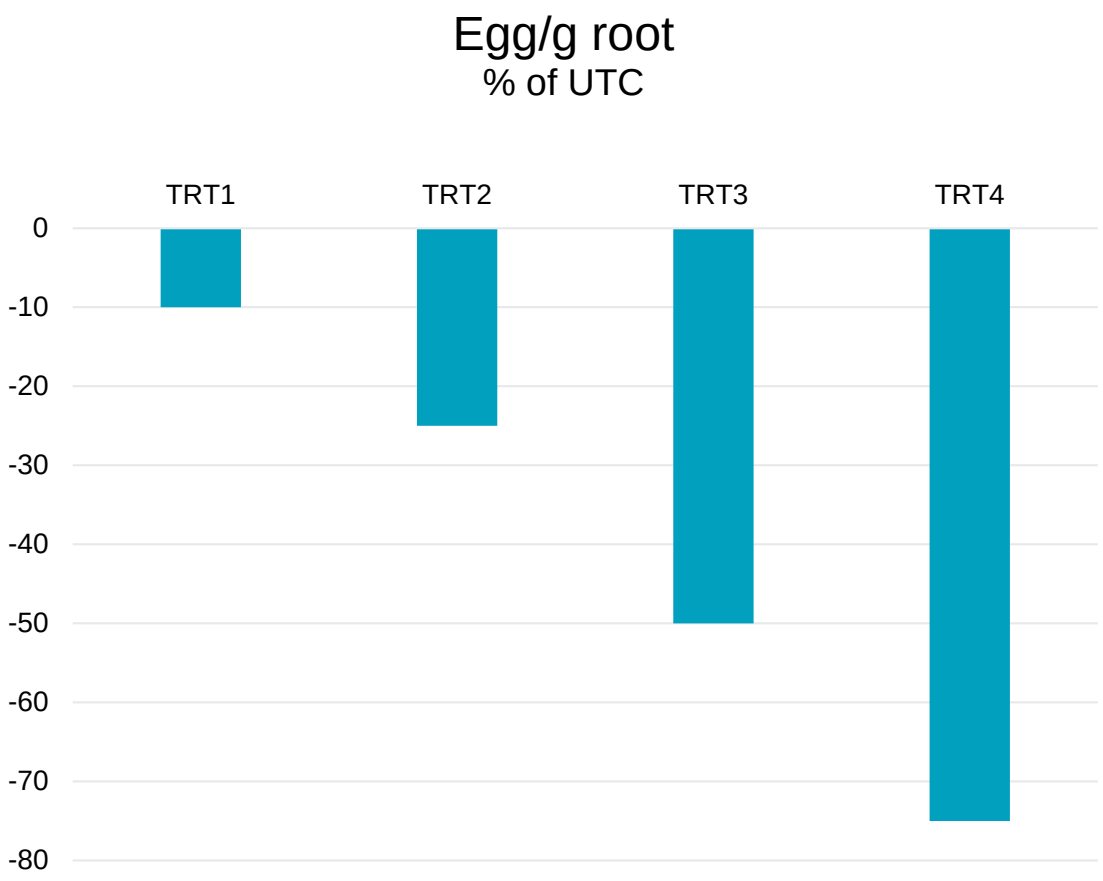
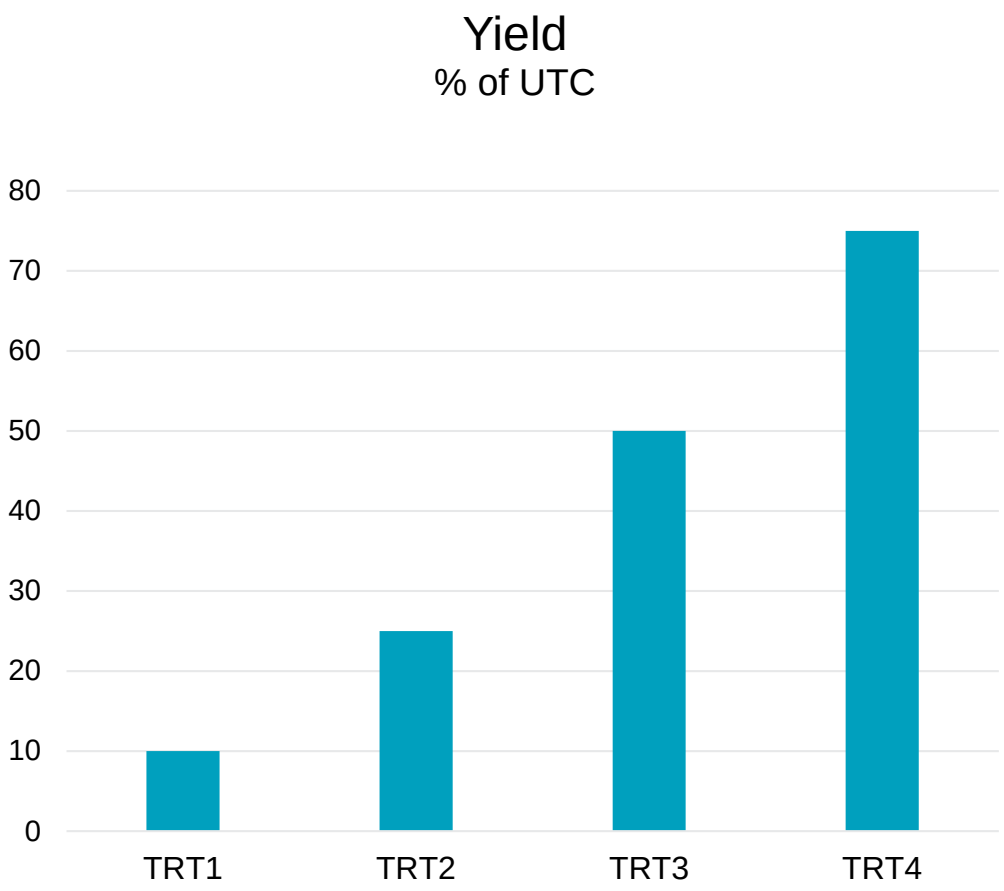
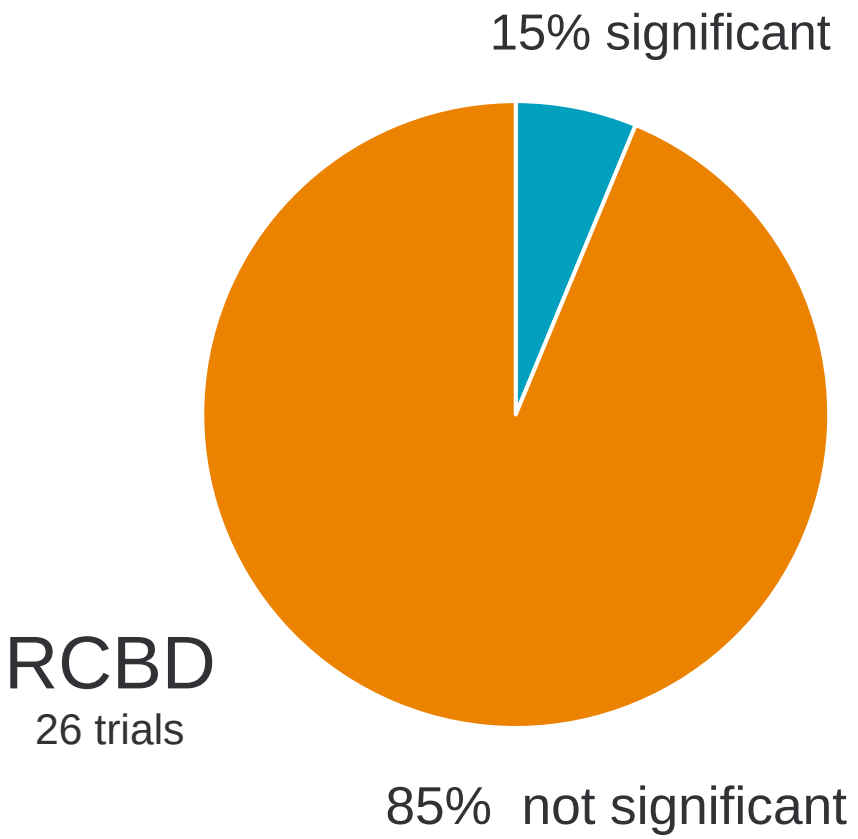
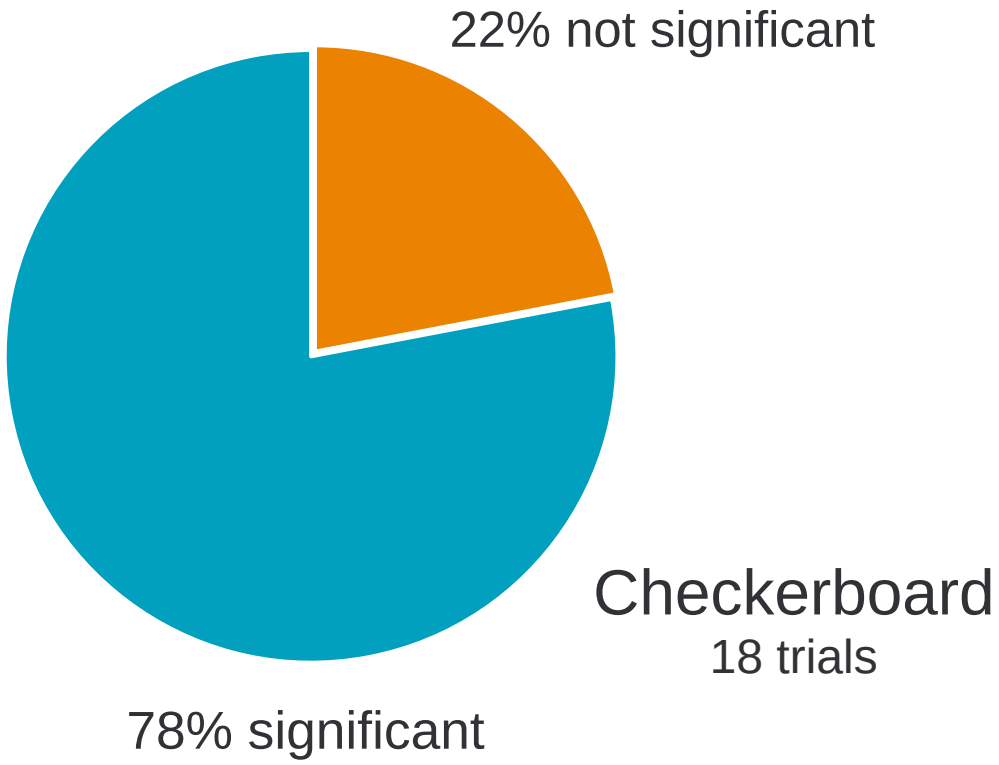
Example Results Slides





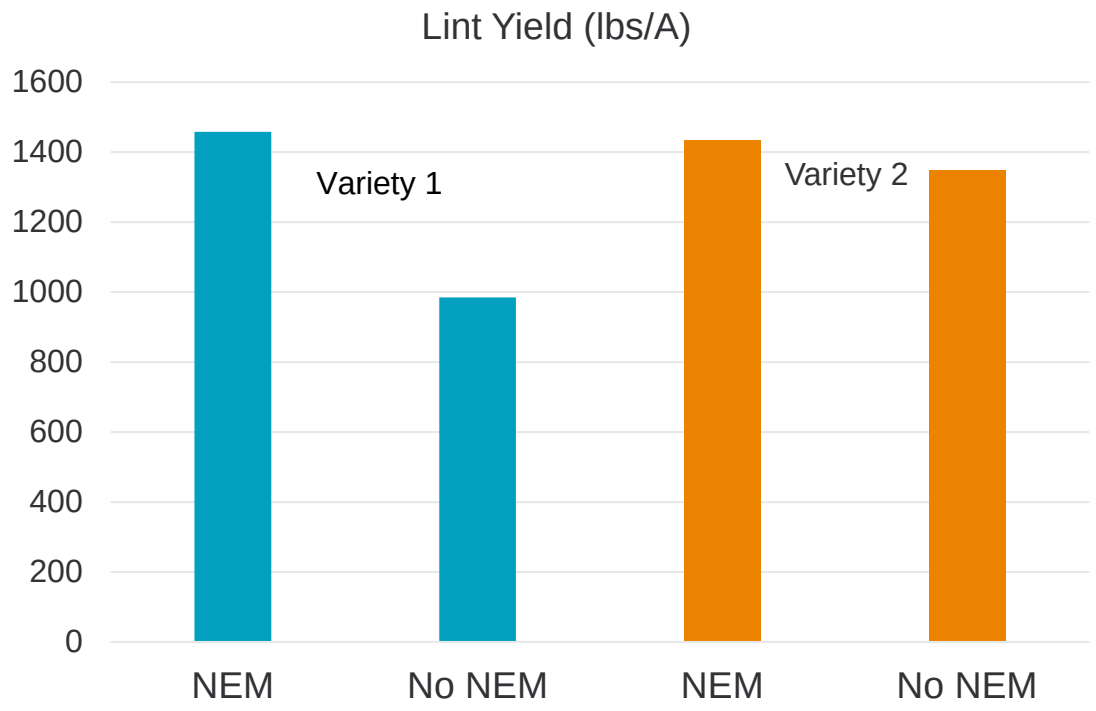
% of Trials with Signficant p-value for Nematode Ratings
2017





Variety/Hybrid Selection

- Nematode tolerance levels vary widely within crops



Nematode Sampling

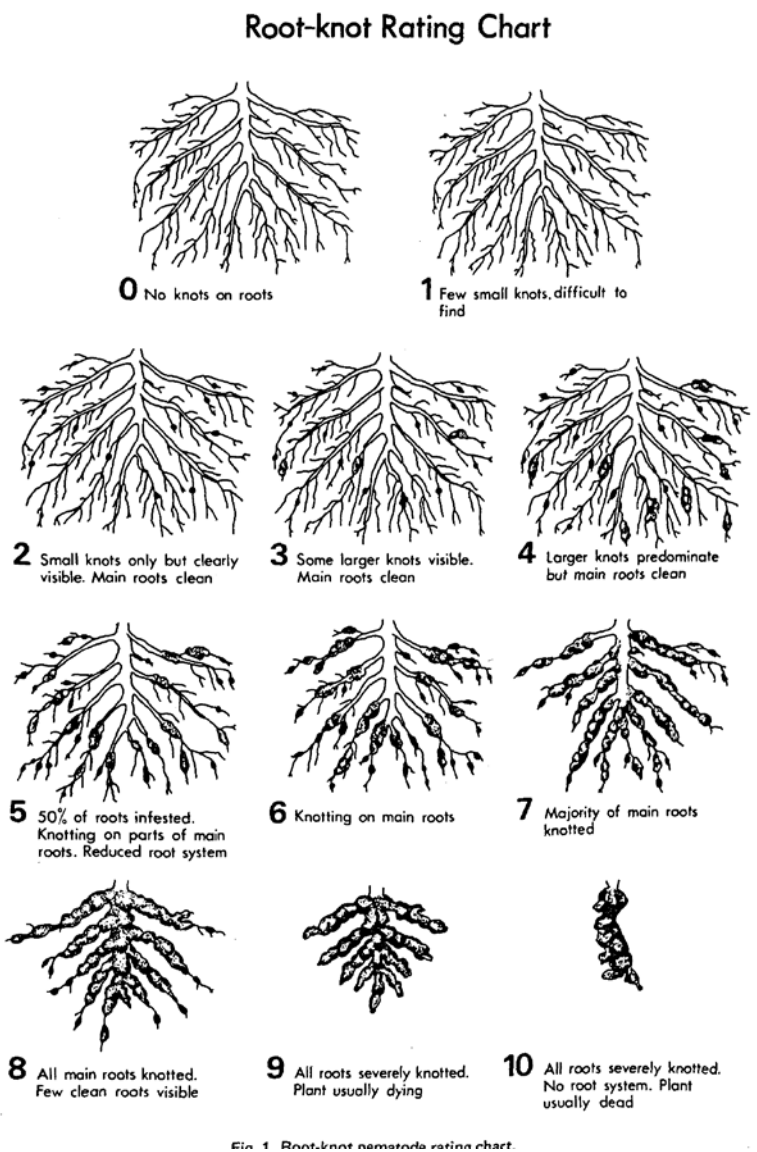
- Tools and Methods
- ALWAYS sample in good moisture
- Soil Samples
  - Transect the root zone
  - Mix several cores per plot
- Root Samples
  - Be gentle
  - Get as much as possible

Nematode Sampling

- Root-knot nematodes

- Fall-Spring Sampling: Non-crop
  - Soil Samples
    - # J2's per 100cc of soil

- In-Season: 30 – 60 DAP
  - Root Samples
    - Gall ratings/counts
    - # of eggs per gram of root



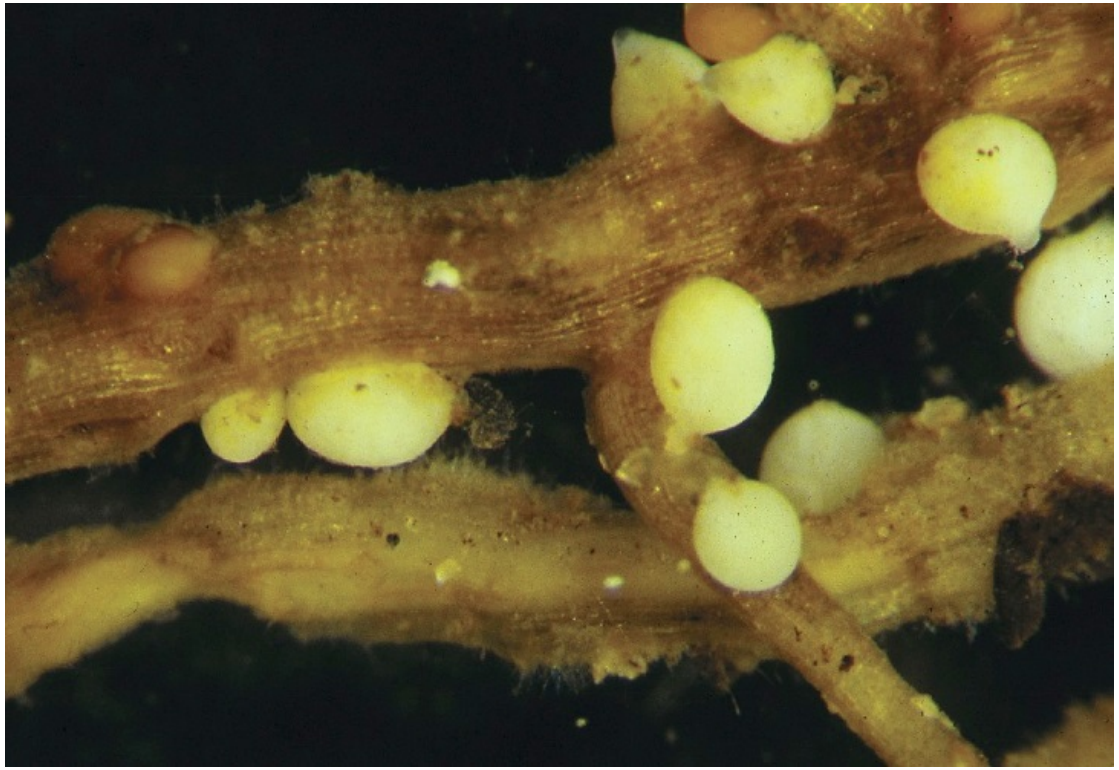
Nematode Sampling

- Soybean Cyst Nematodes

- Fall-Spring Sampling: Non-crop
  - Soil Samples
    - # cysts per 100cc soil

- In-Season: 60 – 90 DAP
  - Soil Samples
    - # cysts per 100cc soil
    - # eggs per cyst

  - Root Samples
    - # cysts per gram of root
    - # eggs per cyst



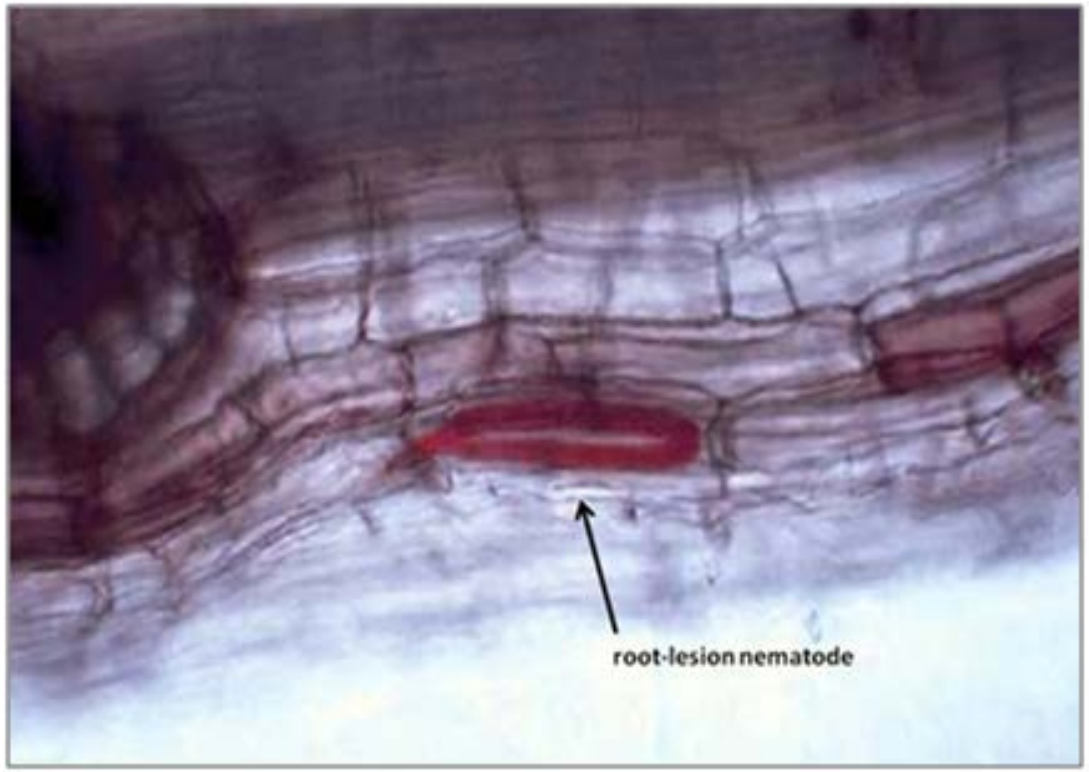
Albert Tenuta, OMAFRA

Nematode Sampling

- Root Lesion & Lance Nematodes

- Fall-Spring Sampling: Non-crop
  - Soil Samples
    - # nematodes per 100cc of soil

- In-Season: 30 DAP – R1
  - Soil and root Samples
    - # nematodes per 100cc of soil
    - # of nematodes per gram of root



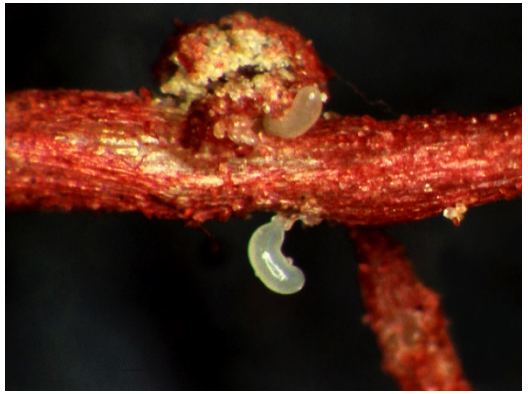
Greg Tylka

Nematode Sampling

- Reniform*, Stubby Root, Stunt, Ring, Sting, Needle

- All sample timings
  - Soil samples
    - # of nematodes per 100cc soil

- Reniform
  - In-season root samples
    - # eggs per gram of root



Sample Handling and Processing

- Keep samples cool and out of the sun
  - Do NOT FREEZE

- Communicate with processing lab
  - Know your nematode
  - Processing is different for many nematodes

- Interpret and communicate results accurately
  - Ground truth results

Perfect Nematode Trial

- Contact
  - scott.moore@syngenta.com
  - 318-282-6552