Sugarbeet Cyst Nematode Survey in the Red River Basin, 2001

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Nematologist, Dept of Plant Pathology, Southern ROC, Waseca
Population response of soybean cyst nematode to long-term corn-soybean cropping sequences in Minnesota. 
*Agronomy Journal*. 93:619-626. (Porter, Chen et al., 2001)

Soybean cyst nematode population development and associated soybean yields of resistant and susceptible cultivars in Minnesota. 
*Plant Disease*. 87:760-766. (Chen, Porter et al., 2001)

Crop sequence effects on soybean cyst nematode and soybean and corn yields.
*Crop Science*. 41:1843-1849. (Chen, Porter et al., 2001)

Evaluation of trap crops for managing *Heterodera glycines*. 
*Journal of Nematology*. (In press). (Chen, Porter et al., 2001)
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Funded by the
Northern Canola Growers Association
Bismarck, ND
Objective:

To survey sugarbeet and canola land in the Red River Basin for the presence of the sugarbeet cyst nematode.
Sugarbeet cyst nematode:  
*Heterodera schachtii*

Hosts include sugarbeet, canola, etc.

Soybean cyst nematode:  
*Heterodera glycines*

Hosts include soybean.
Cyst nematode hosts cause the nematode population to increase.

Sugarbeet cyst nematodes can reduce sugarbeet and canola yields.

Soybean cyst nematodes don’t influence sugarbeet and canola yields.
Our roles:

Paul - Site selection
Obtain soil samples

Senyu - Analyze soil samples
Conduct bioassays

Jointly - Interpret & report results
Site selection:

Dave Gehrtz    Interstate Seed Co.
Al Cattanach    Am. Crystal Sugars Co.
Tom Knudsen     Minn-Dak Farmers Coop.
Karen Andol     U of M @ Roseau
Site selection form & “Data Sheet”:

The Survey is targeting supposed 'hot spots:' field entry points, sugarbeet soil tare dump sites, etc. Our goal is to see if the cyst nematode can be found on land planted primarily to canola or sugarbeet ....

Submission of the "Data Sheet" will be our signal that we have the knowledge & consent of the farmer / cooperator.
“Data Sheet”:

- Person submitting form
- Farmer name and address
- Field location
- Field history
  + Crops grown the past 6 years
  + Whether sugarbeet, canola or soybean had ever been grown on the field.
Persons submitting “Data Sheets”:

Paul Beech
Jeffery Loeks
John Dummer
Terry Lunde
Jim Coffman
Bruce Tiegs
Jon Warner
Donna Aafedt
Greg Richards
John Prigge
Dan Bernhardson
Cory Kritzberger
Neil Boeddeker
John Halland
Chad Wardner
Roger Sellnow

Kirk Johnson
Arron Nelson
Kelly Sharpe
Curt Meyer
Tom Zidon
Tyler Grove
Marc Connelly
Jeff Sveen
Maureen O’Leary
Cody Kritzberger
Tim Leshuk
Nick Arends
Tom Hermann
Jack Call
Tim Kenyon
Karen Andol
### Soil sample locations:

<table>
<thead>
<tr>
<th>Minnesota #</th>
<th>N. Dakota #</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Am. Crystal Sugar growers &amp;/or canola growers:</strong></td>
<td></td>
</tr>
<tr>
<td>Kittson 17</td>
<td>Pembina 10</td>
</tr>
<tr>
<td>Marshall 11</td>
<td>Grand Forks 10</td>
</tr>
<tr>
<td>Polk 10</td>
<td>Walsh 9</td>
</tr>
<tr>
<td>Norman 5</td>
<td>Traill 3</td>
</tr>
<tr>
<td>Clay 2</td>
<td>Cass 3</td>
</tr>
<tr>
<td>Pennington 1</td>
<td></td>
</tr>
<tr>
<td>Red Lake 3</td>
<td></td>
</tr>
<tr>
<td><strong>Minn-Dak Coop. growers:</strong></td>
<td></td>
</tr>
<tr>
<td>Wilkin 9</td>
<td>Richland 6</td>
</tr>
<tr>
<td>Traverse 2</td>
<td></td>
</tr>
<tr>
<td><strong>Total 60</strong></td>
<td><strong>Total 41</strong></td>
</tr>
</tbody>
</table>
Soil sample locations:

Typically, at each location 3 separate soil sample composites were analyzed.

Each soil sample composite was from approximately 20 cores taken to a depth of 8 inches from a radius of ~ 25ft.

Soil samples collected in May, June & July.
Soil sample locations & land-use history:

<table>
<thead>
<tr>
<th>Description</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total locations</td>
<td>101</td>
</tr>
<tr>
<td>Piling stations</td>
<td>22</td>
</tr>
<tr>
<td>Crop land</td>
<td>79</td>
</tr>
<tr>
<td>Sugarbeet</td>
<td>63</td>
</tr>
<tr>
<td>Canola</td>
<td>31</td>
</tr>
<tr>
<td>Sugarbeet &amp; Canola</td>
<td>17</td>
</tr>
<tr>
<td>Former tare sites</td>
<td>37</td>
</tr>
<tr>
<td>Soybean</td>
<td>49</td>
</tr>
</tbody>
</table>
# Piling station locations:

<table>
<thead>
<tr>
<th>Ada</th>
<th>Ada West</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ardoch</td>
<td>McArthur</td>
</tr>
<tr>
<td>Argyle</td>
<td>Midway</td>
</tr>
<tr>
<td>Bathgate</td>
<td>O'Meara</td>
</tr>
<tr>
<td>Crookston</td>
<td>Oslo</td>
</tr>
<tr>
<td>Eldred</td>
<td>Reynolds</td>
</tr>
<tr>
<td>Foxhome</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>Hawes</td>
<td>Stephen</td>
</tr>
<tr>
<td>Hitterdal</td>
<td>Tyler</td>
</tr>
<tr>
<td>Kennedy</td>
<td>Voss</td>
</tr>
<tr>
<td>Lyngass</td>
<td>Warren</td>
</tr>
</tbody>
</table>
Results:

Over 300 soil samples were analyzed from 101 locations:

No sugarbeet cyst nematodes were found.

No soybean cyst nematodes were found.

A nematode from the cyst-forming genus *Cactodera* was found at one location. Sugarbeet was determined to be a host.
Results:

We were surprised.

We had expected to find more cyst nematodes.

I doubt we missed them – they weren’t there.
Implications for Crop Rotation:

– Sugarbeet – SmGrain – Canola – SmGrain –

You really don’t want nematodes.
Questions???