DATCP's 2003 Disease Survey Results

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WI Department of Agriculture, Trade and Consumer Protection

Cooperative Pest Survey Mission

“ ... to facilitate the detection of new or exotic plant pests, and to assess the distribution, abundance and seasonal dynamics of established agricultural pests.”

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Wisconsin Pest Bulletin

- Published weekly from April to September, with occasional issues in early Spring and late Fall.
- Available free online at http://www.datcp.state.wi.us/arm/environment/insects/pest-bulletin/
- Paper subscriptions available for $20/year.
- Contributions from knowledgeable field workers are welcome--email or call for info.

Topics

- Preliminary soybean and snap bean virus results, including Soybean Dwarf Virus
- Powdery scab of potato
- Soybean cyst nematode distribution

Snap and soybean viruses

- Several soybean viruses are aphid-vectored
- Snap beans are host to the soybean aphid (*Aphis glycines*)
- Snap bean growers have reported substantial losses due to viruses in the last few years

Survey Method

- Collect 10 leaves at five points in field
- Uppermost fully-unfurled trifoliate
- Count aphid numbers
- Estimate defoliation
- Store samples on ice until delivered to lab
- Samples stored at -80 C

Laboratory Analysis

- ELISA testing for:
  - Bean Pod Mottle Virus (BPMV)
  - Cucumber Mosaic Virus (CMV)
  - Soybean Mosaic Virus (SMV)
  - Tomato Spotted Wilt Virus (TSWV)
  - Soybean Dwarf Mosaic Virus (SbDV)

DAS ELISA kits from Agdia Inc., Elkhart, IN

Results

- 311 fields sampled (25 snap bean, 286 soybean fields)
- Lab analysis still in progress- samples complete for 4 viruses

- 17 snap bean fields positive for CMV
- 12 soybean fields positive for BPMV
- 2 soybean fields positive for SbDV
- No TSWV detected

- **Soybean Dwarf Virus on soybeans has not been previously reported in Wisconsin**.
- Present in Japan, Australia and New Zealand, Syria, California
- One positive field in Lafayette County, one positive field in Columbia County

SbDV

- Aphid-vectored (persistent)
- Several strains are known-- “Dwarfing” and “Yellowing”, indistinguishable by our laboratory techniques
- Host range: more than 50 plants, including peas, beans, lupines, various clovers, beets, spinach….

SbDV strain D (dwarfing strain)

Image from CABI Crop Protection Compendium

SbDV strain Y (yellowing strain)

Image from CABI Crop Protection Compendium

Implications of find:

- SbDV has been shown to not be vectored efficiently by *Aphis glycines*
- The aphid associated with SbDV in Japan, *Aulacorthum solani*, exists in several biotypes of varying vector efficiency

Aulacorthum solani (glasshouse or foxglove aphid) is not reported to occur in Wisconsin

Image from Institut National de la Recherche Agronomique

Implications, con’t.

- Soybean dwarf virus causes significant yield loss in Japan
- Differences exist in host plant response, but response of WI varieties is unknown
- No known regulatory impact

Powdery Scab

Molley

Powdery scab of potato:

- not previously reported in Wisconsin
- common in western states
- caused by *Spongospora subterranea* f. sp. *subterranea*

Powdery scab, con’t.

- Causes surface blemish (similar to common scab) and dehydration in storage
- Vector of potato mop top virus (PMTV), the subject of a national survey effort in 2002

History of the 2003 powdery scab detection:

- Detected on seed potatoes brought in from Colorado, Spring of 2003. (Potatoes were ordered destroyed prior to planting.)
- Symptoms were found on plants in August, 2003
- Laboratory analysis confirmed powdery scab


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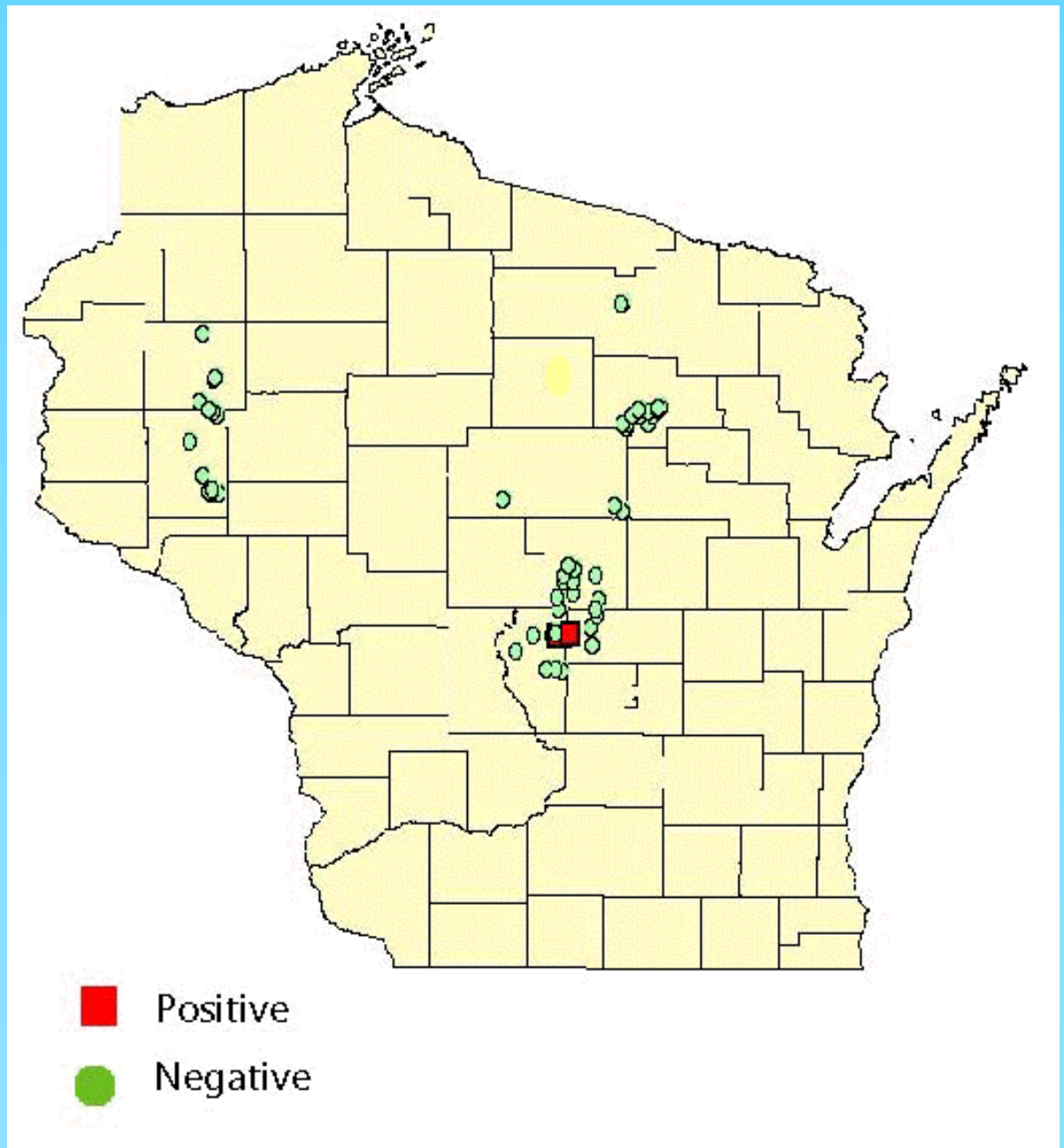
Soil survey for *Spongospora subterranea* f. sp. *subterranea*

- Soil samples collected from 65 fields in eight counties
- Sampling included Hancock Ag Research Station and UW Lelah Starks Elite Foundation Seed Potato Farm
- Polymerase Chain Reaction (PCR) technology was used to detect the pathogen

Soil Survey results

- Three fields in two counties (Adams and Waushara) tested positive for *S. spongospora*. All positive fields were within about 20 miles of one another.

Powdery scab soil survey results



Implications of find:

- Seed production areas of the state were free of the disease
- Distribution of the disease is apparently very limited
- No known regulatory significance
- Clean seed stock should prevent the introduction to additional farms

Soybean Cyst Nematode

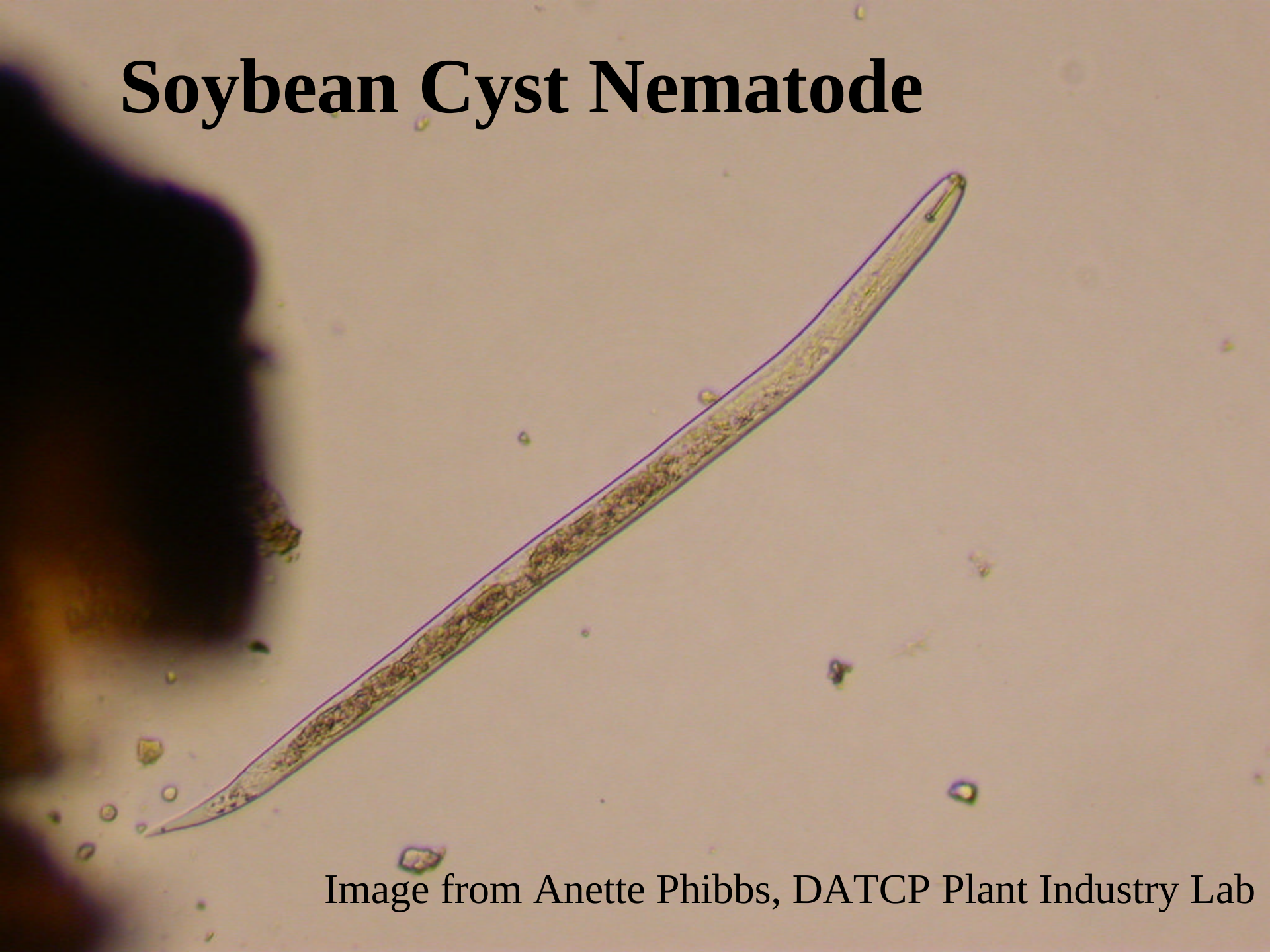


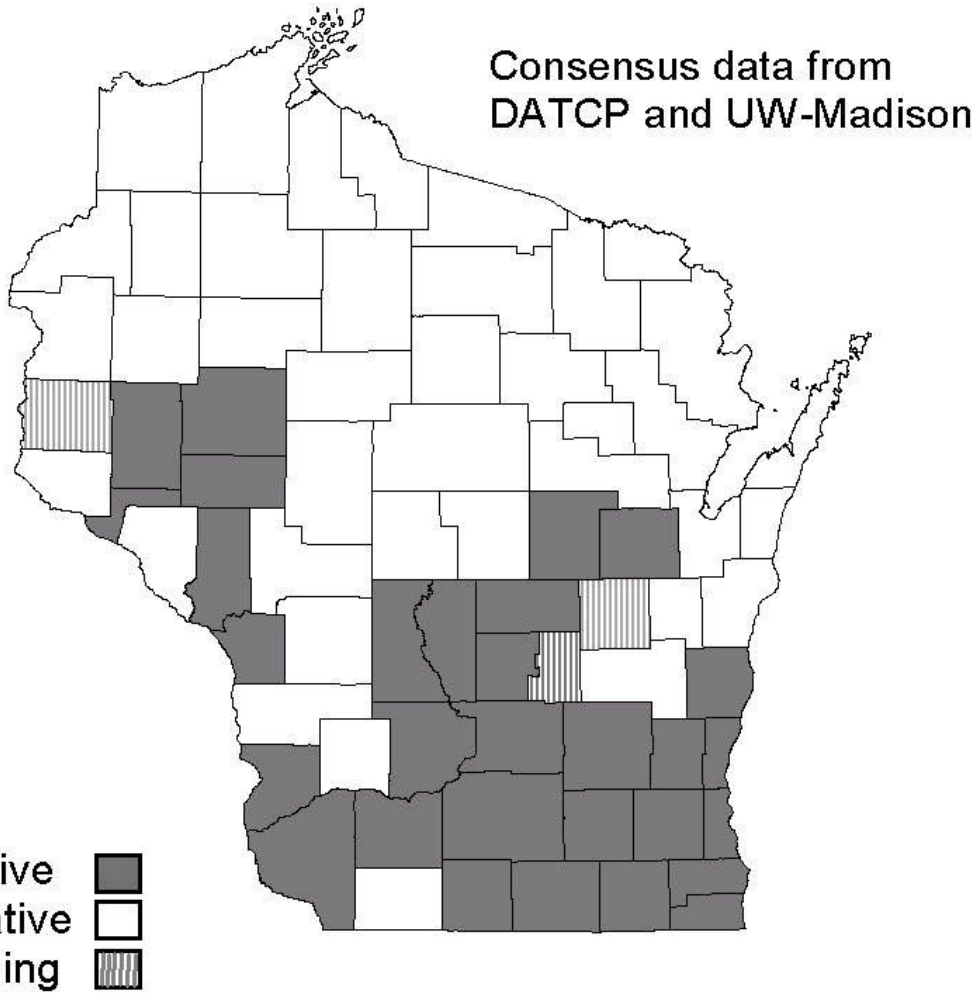
Image from Anette Phibbs, DATCP Plant Industry Lab

- Soybean cyst nematode continues to spread throughout Wisconsin
- Growers in counties where SCN has been identified should test for the organism
- Management strategies are well-established

Soybean Cyst Nematode

(Heterodera glycines)

Wisconsin 2003



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