Wisconsin Disease Survey and Near Misses

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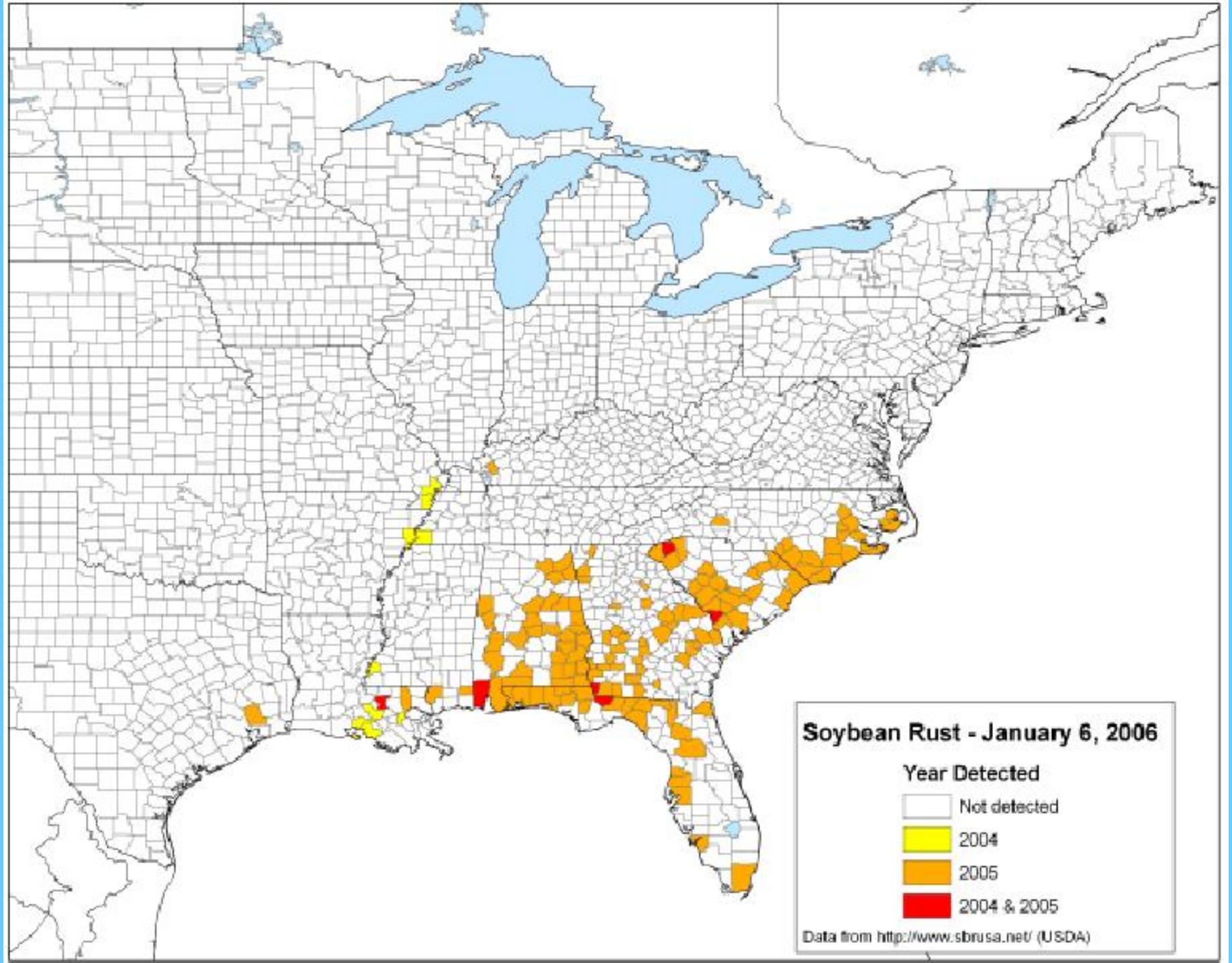
Highlights of 2005 Survey

- No soybean rust detected.
- Soybean viruses scarce again.
- Soybean dwarf virus found again.
- Frogeye leaf spot reappears.

2005 Highlights, *cont.*

- Four more counties added to soybean cyst nematode map.
- 21 seed corn fields with Stewarts wilt.
- No wheat streak mosaic virus or High Plains virus detected in corn or wheat.


Soybean Rust - January 6, 2006
Year Detected
Not detected
2004
2005
2004 & 2005
Data from http://www.sbrusa.net/ (USDA)

Soybean Survey Method

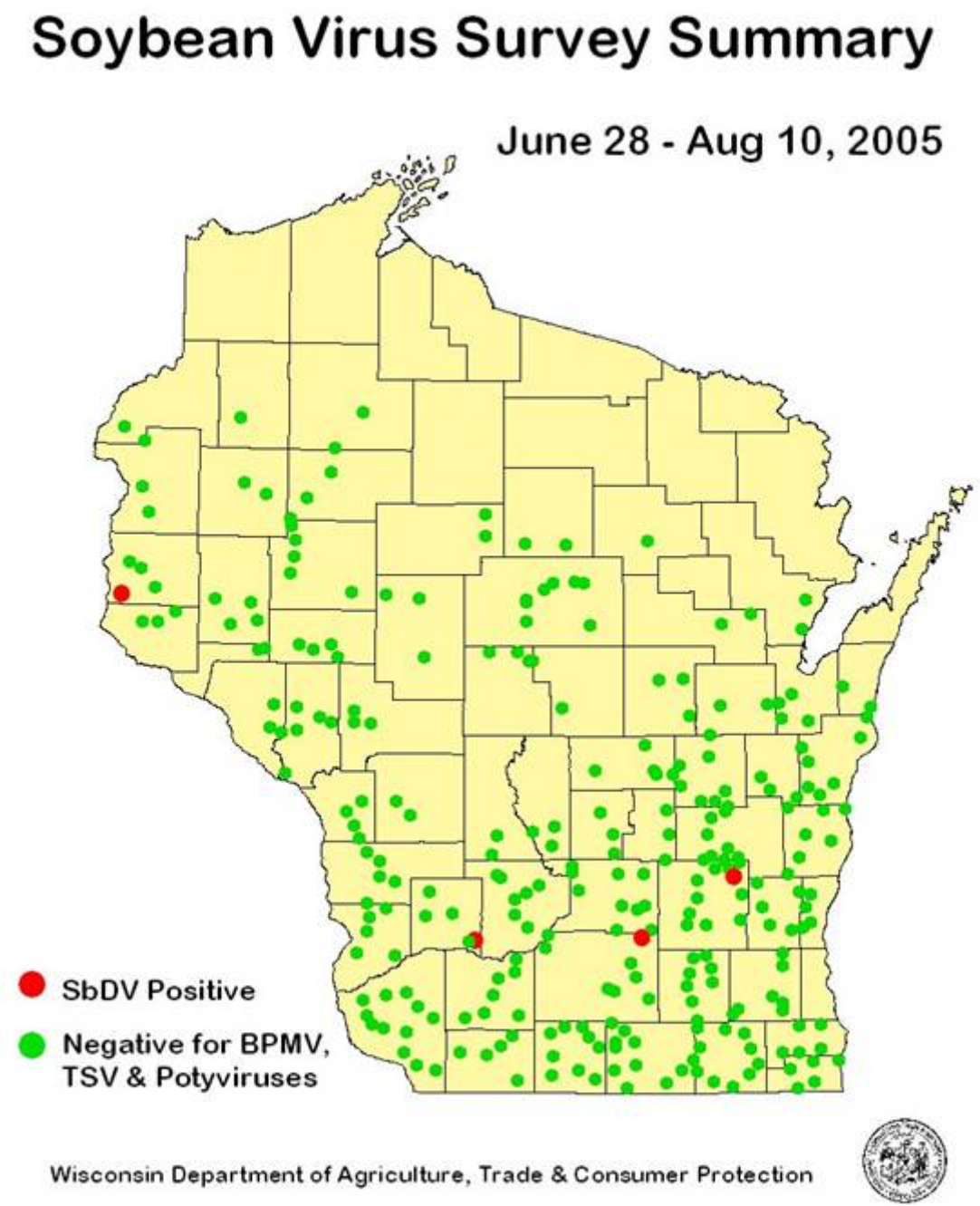
At 276 fields around the state:

- Examine for rust symptoms.
- Count aphid numbers.
- Estimate defoliation.
- Sample plants for virus testing:
  - Collect 10 leaves at four points in field.
  - Uppermost fully-unfurled trifoliate.
  - Store samples on ice until delivered to lab.

Laboratory Analysis

- ELISA testing for:
  - Bean Pod Mottle Virus (BPMV)
  - Soybean Dwarf Virus (SbDV)
  - Tobacco Streak Virus
  - Potyvirus group (includes Bean common mosaic virus, bean yellow mosaic virus, soybean mosaic virus)

DAS ELISA kits from Agdia Inc., Elkhart, IN



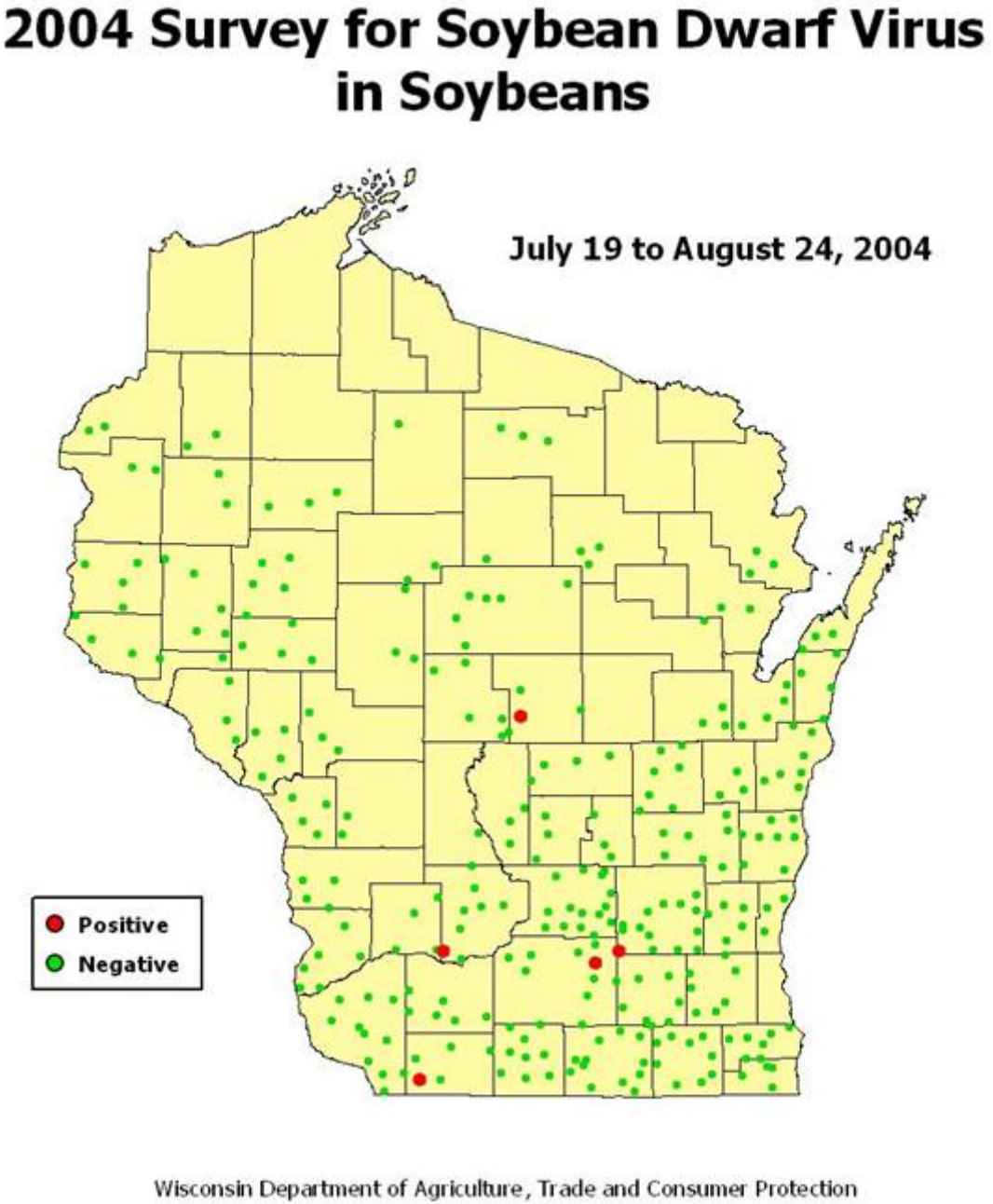
Results

- 276 fields sampled
  - 4 fields with SbDV
  - No BPMV
  - No TSV
  - No Potyviruses

Soybean Dwarf Virus (SbDV)

- Soybean Dwarf Virus was first detected on Wisconsin soybeans in 2003.

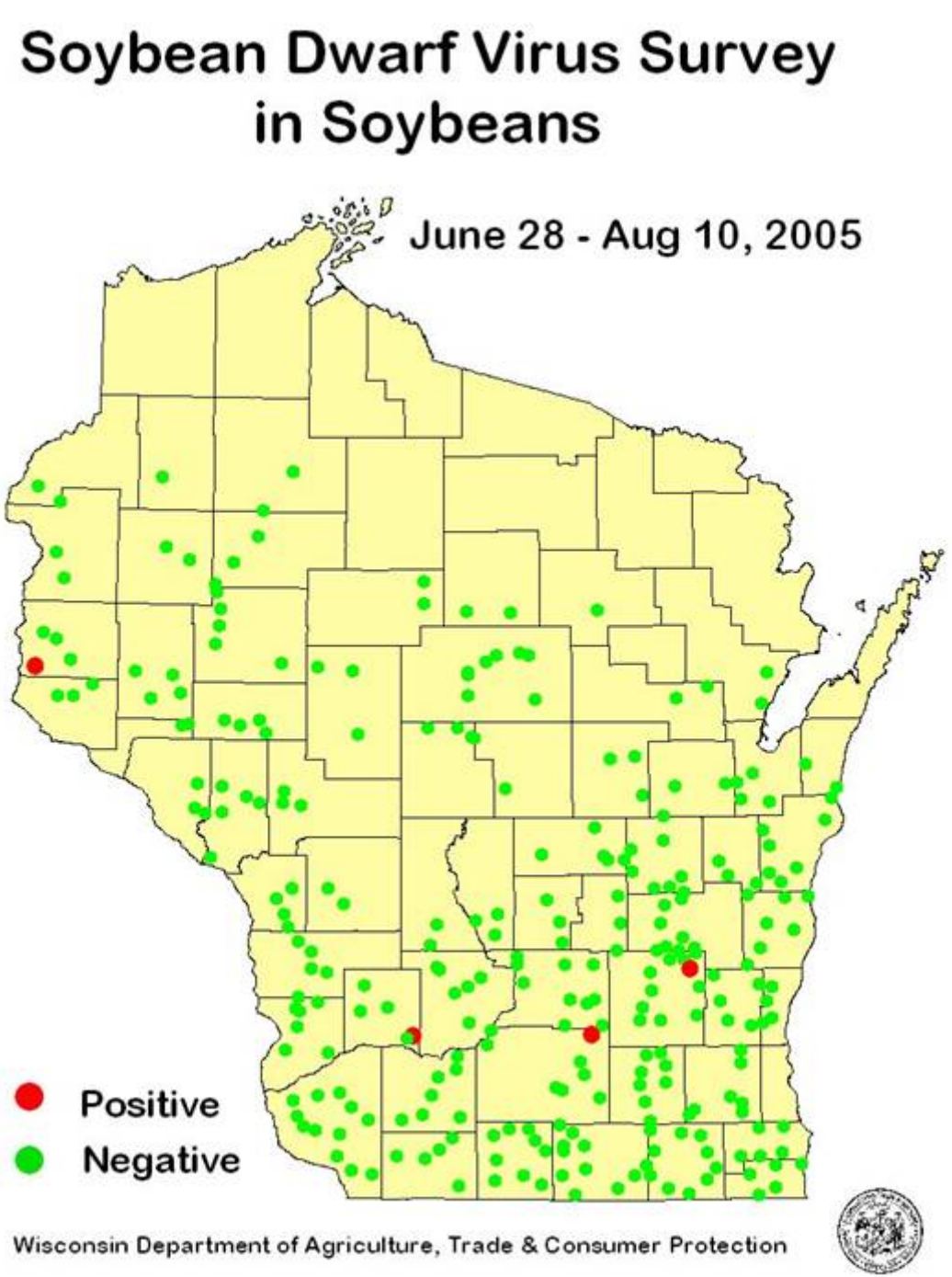
- Present in Japan, Australia and New Zealand, Syria, California and SE U.S. (on clover)



SbDV on soybeans, 2004

Counties:

Portage, Dodge, Dane, Sauk, Lafayette



SbDV on soybeans, 2005

Counties:

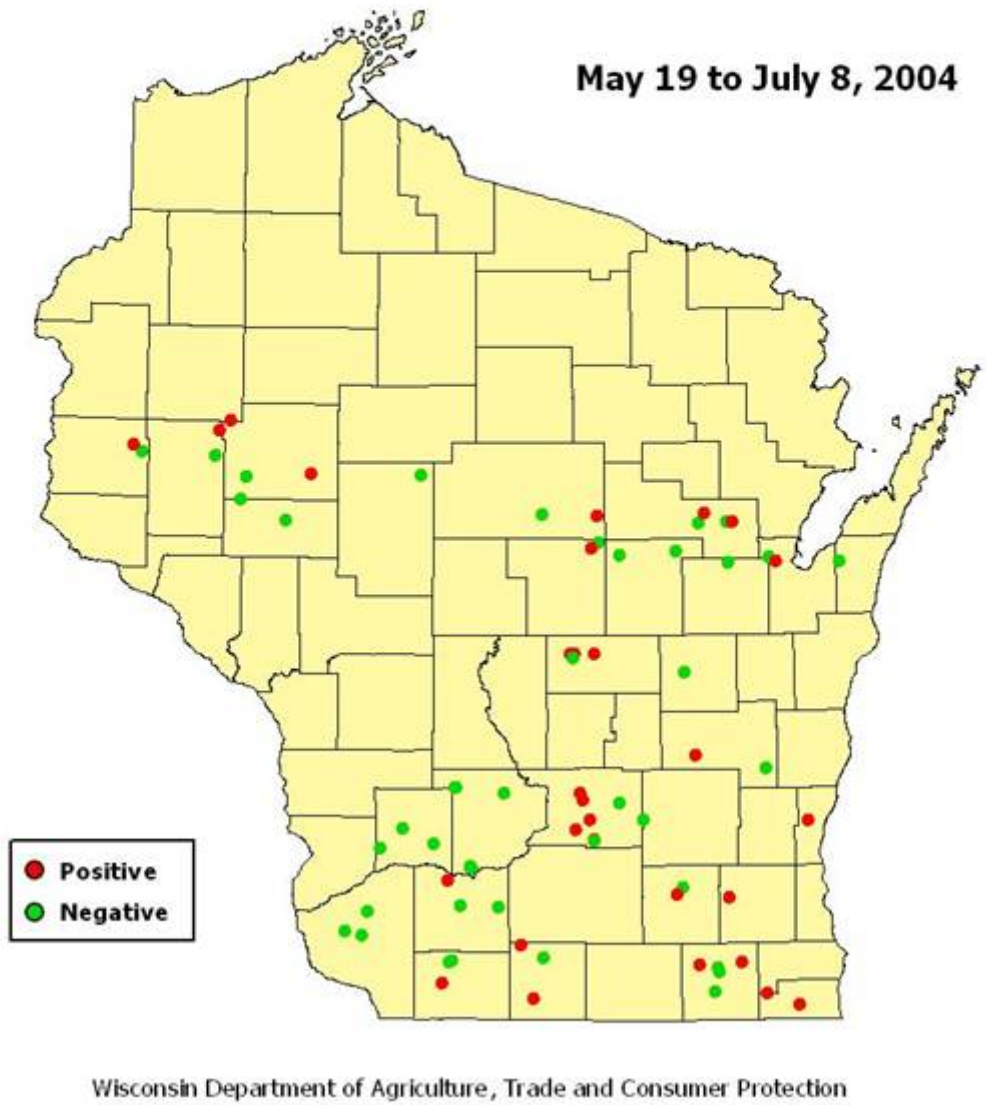
Dane,
Dodge,
Richland,
St. Croix

SbDV on clover

- To determine overwintering ability of virus, DATCP conducted a survey of clovers from 5/24/04-7/8/04, and from 5/13/05-6/15/05.
- Red clover (*Trifolium pratense*) is reported to be a host of SbDV-d.

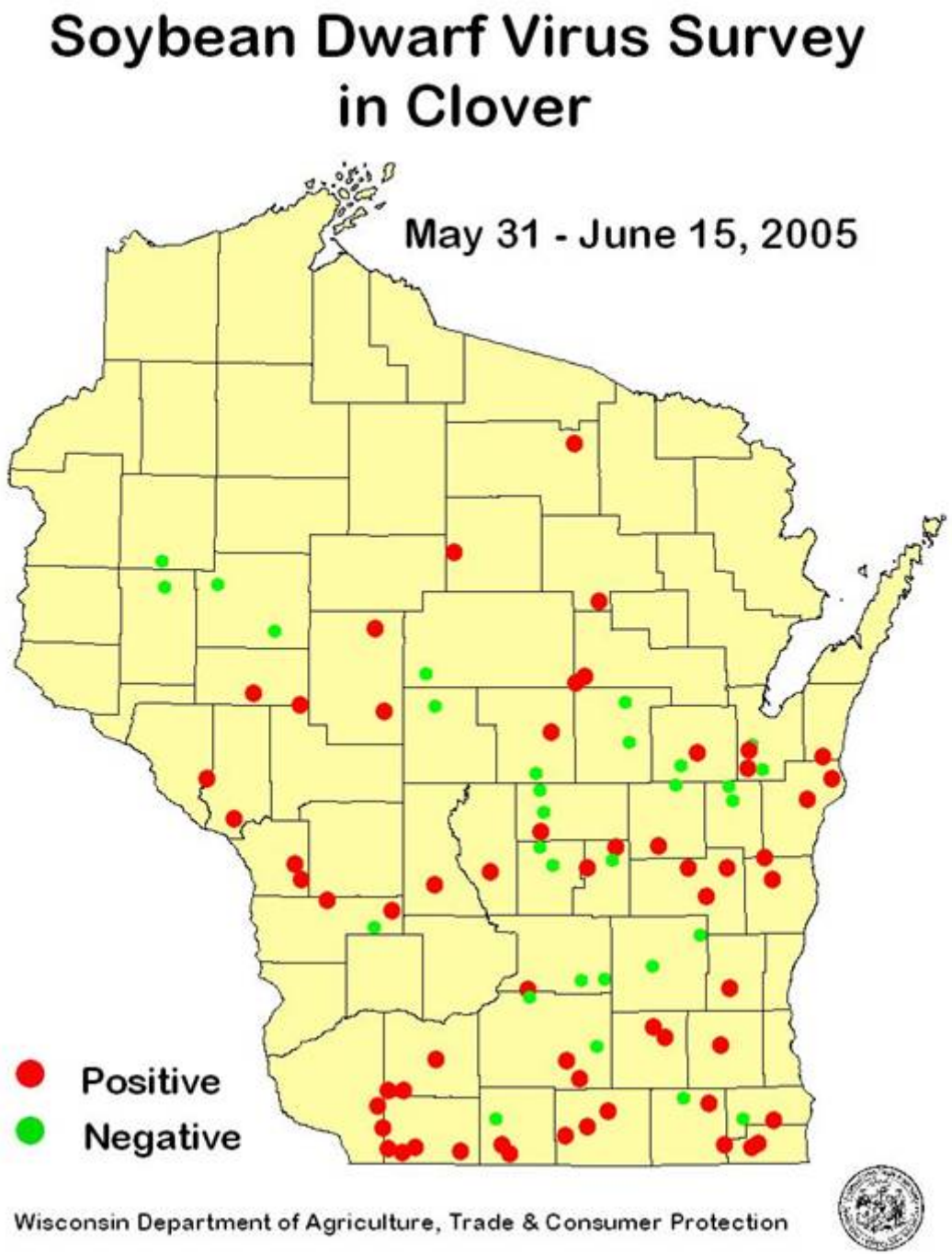
SbDV on clover-2004

- 31 of 53 red clover samples were positive for SbDV.
- 2 of 24 white clovers were positive.



SbDV on clover-2005

- 58 of 86 red clover samples were positive for SbDV.
- A total of 61 of 92 samples were positive.



SbDV biology

- Aphid-vectored (persistent)
- Several strains are known– the WI strain is “dwarfing” (by RT-PCR, Les Domier, Univ. of IL)
- Host range: more than 50 plants, including peas, beans, lupines, various clovers, beets, spinach….

Implications of find:

- Some strains of SbDV have been shown to be vectored by *Aphis glycines* under greenhouse conditions, but the low incidence in WI soybeans suggests poor vector efficiency.
- *A. glycines* on clover (not reported)?
- Another aphid on both clover and soybean?

Frogeye Leaf Spot of soybean

- Caused by *Cercospora sojina.*
- Common in Mississippi delta regions; reportedly increasing in Iowa.
- Overwinters in residue.

Frogeye in the DATCP records

- First detection in 2000, Iowa County
- One detection in 2001, Dane County
- One detection in 2005, Richland County

Soybean Cyst Nematode

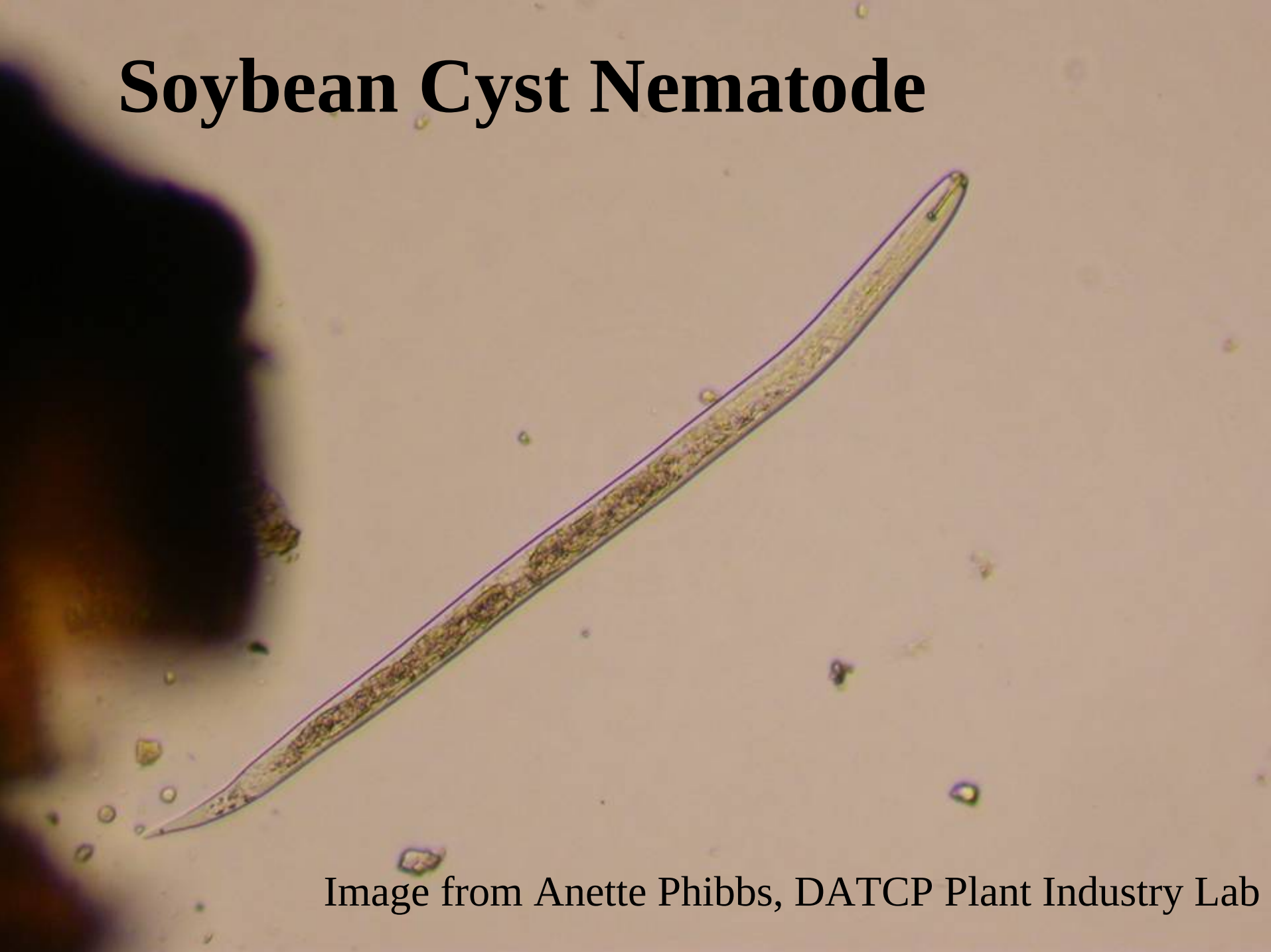
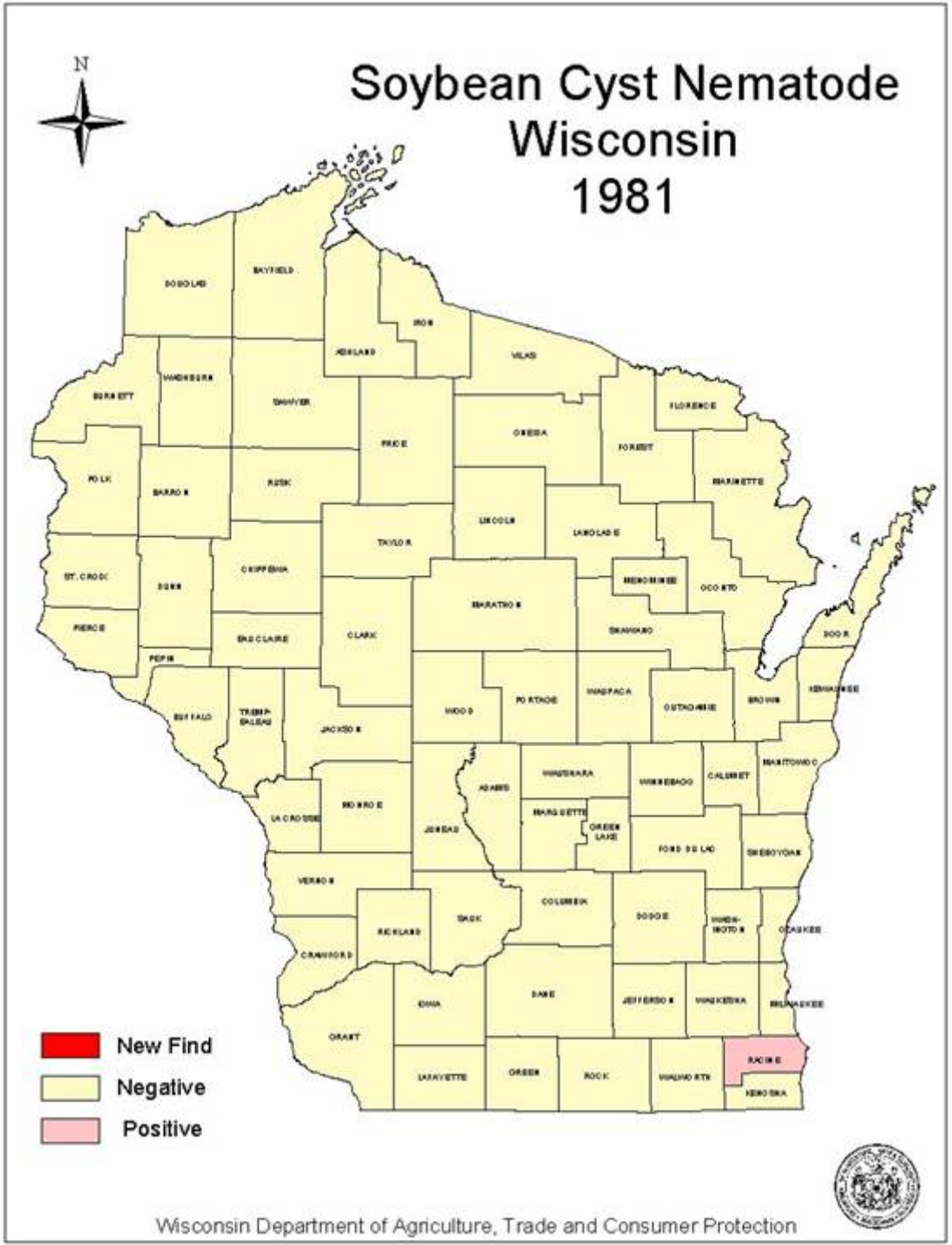
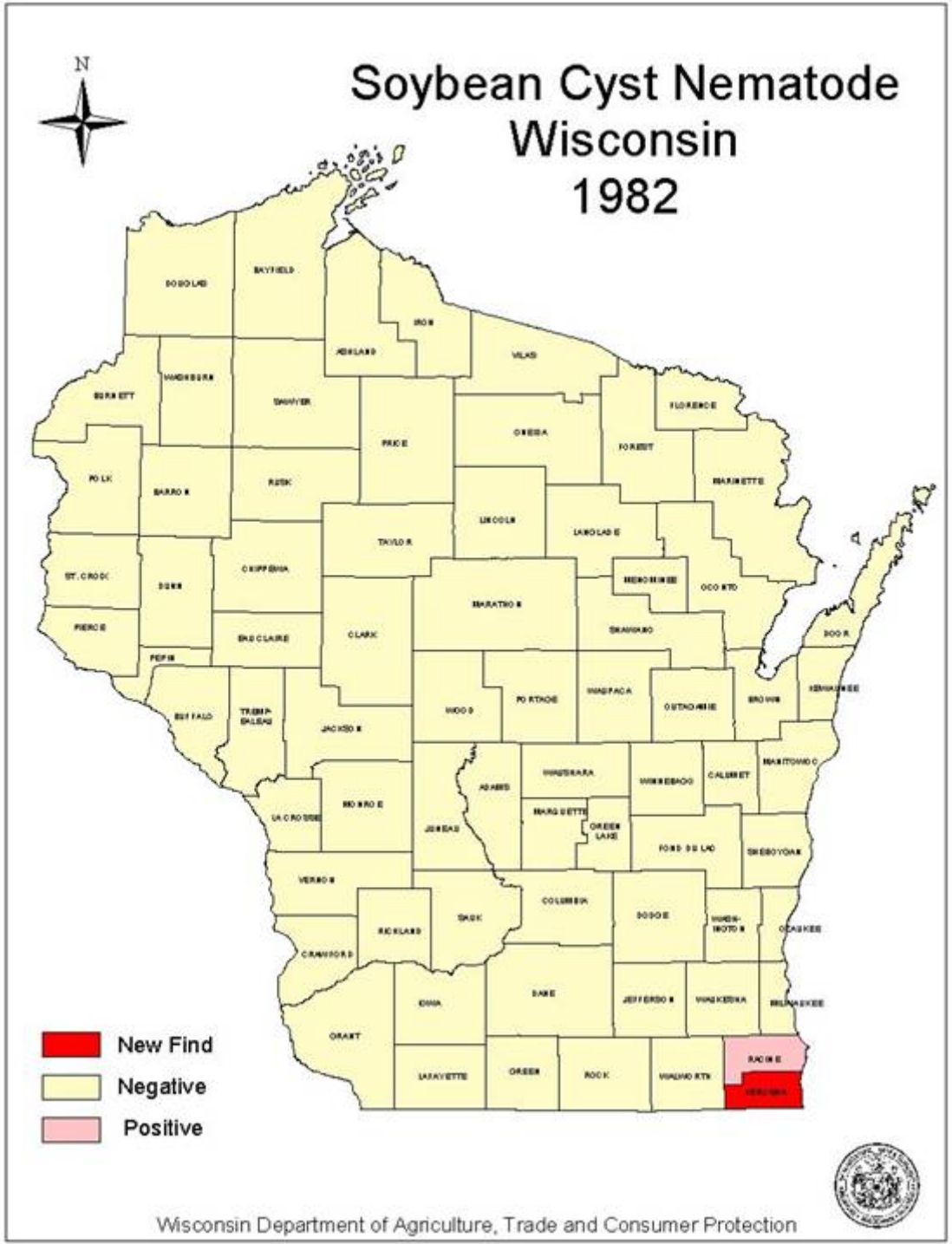


Image from Anette Phibbs, DATCP Plant Industry Lab

SCN

- Four new counties added to list of infested counties.
- Soybean growers in counties where SCN has been identified should test for the organism.
- Management strategies are well-established—see http://www.plantpath.wisc.edu/soyhealth/scn.htm


N
Soybean Cyst Nematode
Wisconsin
1981
New Find
Negative
Positive
Wisconsin Department of Agriculture, Trade and Consumer Protection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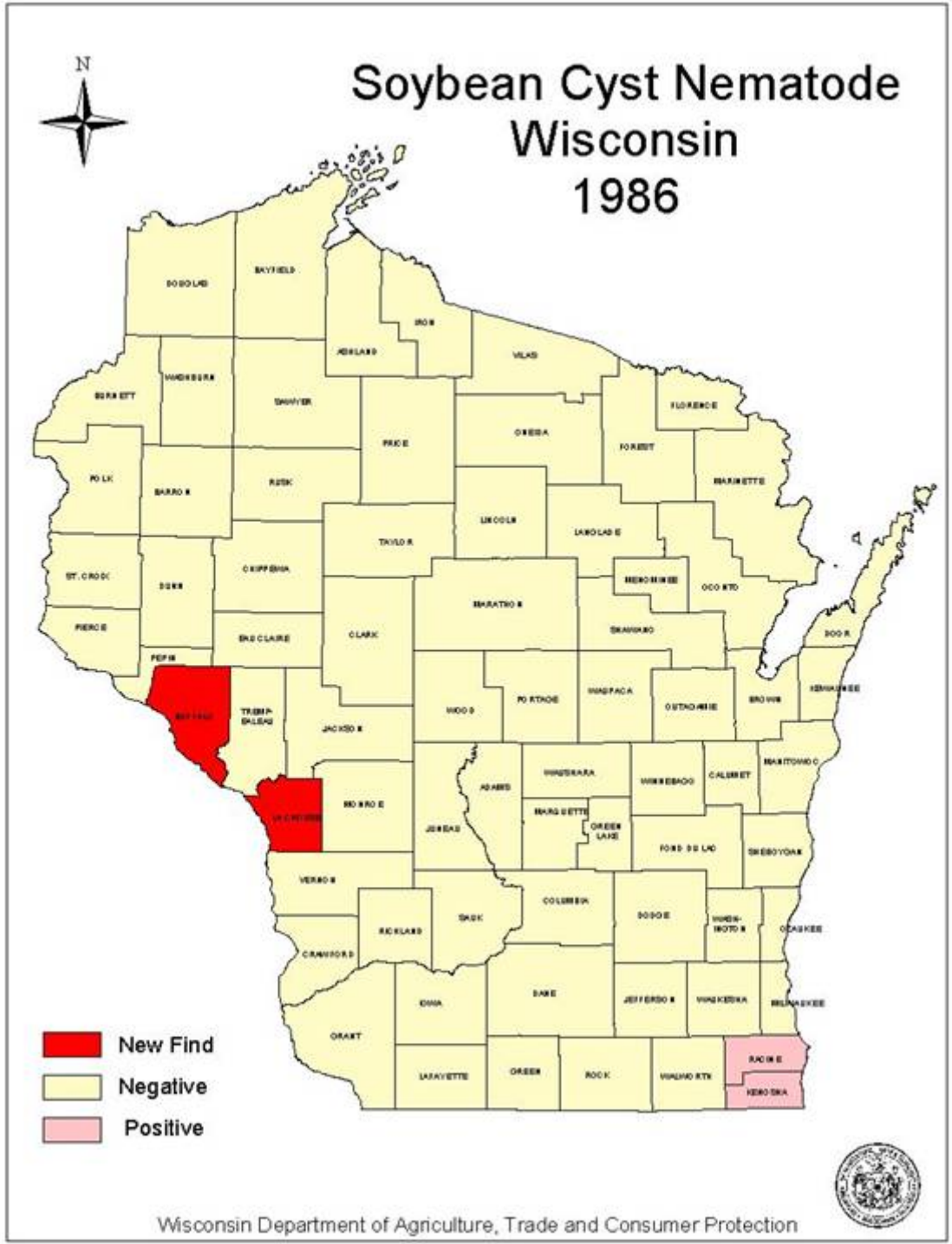
Wisconsin
1982
New Find
Negative
Positive
Wisconsin Department of Agriculture, Trade and Consumer Protection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Wisconsin
1986
New Find
Negative
Positive
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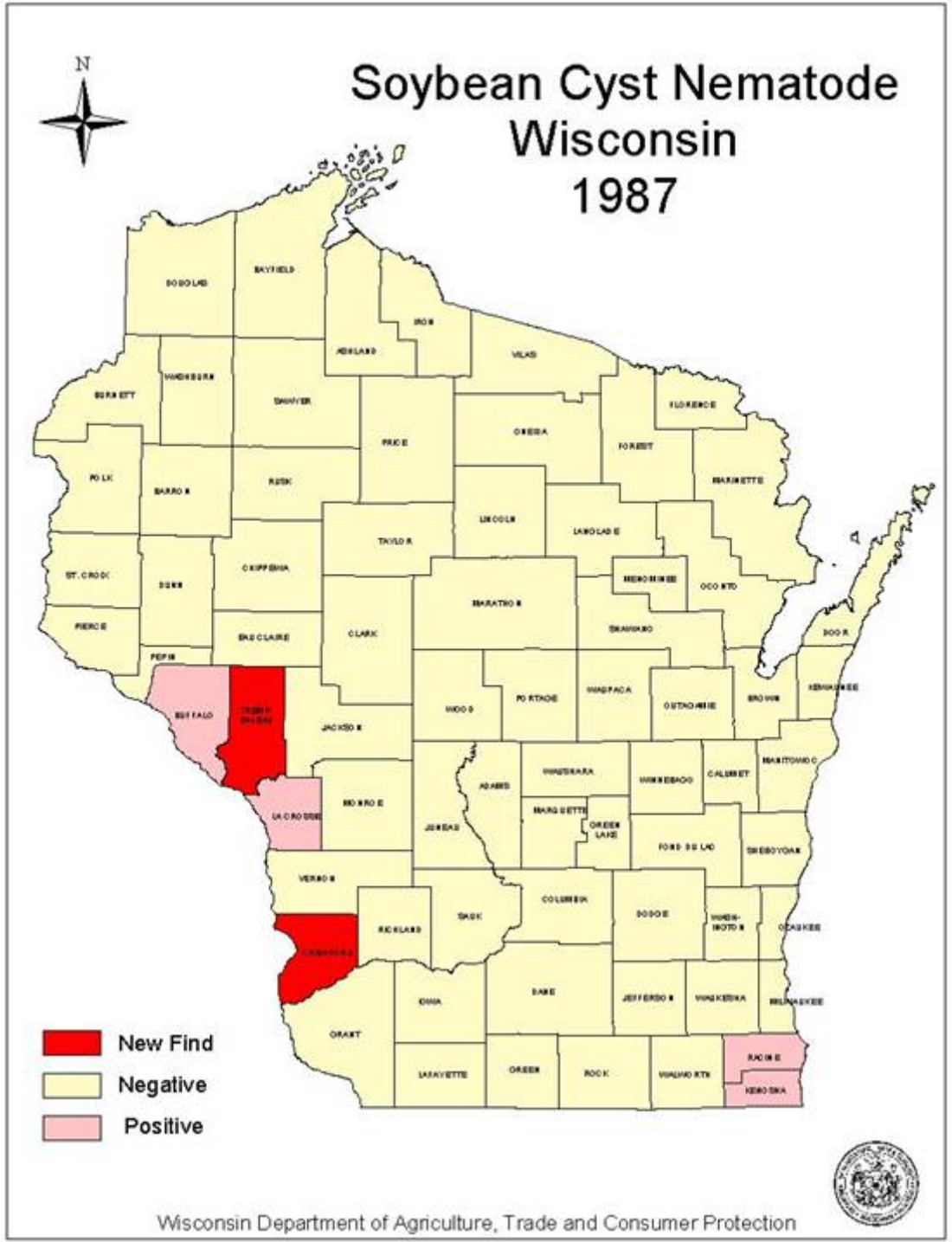
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Wisconsin
1987
New Find
Negative
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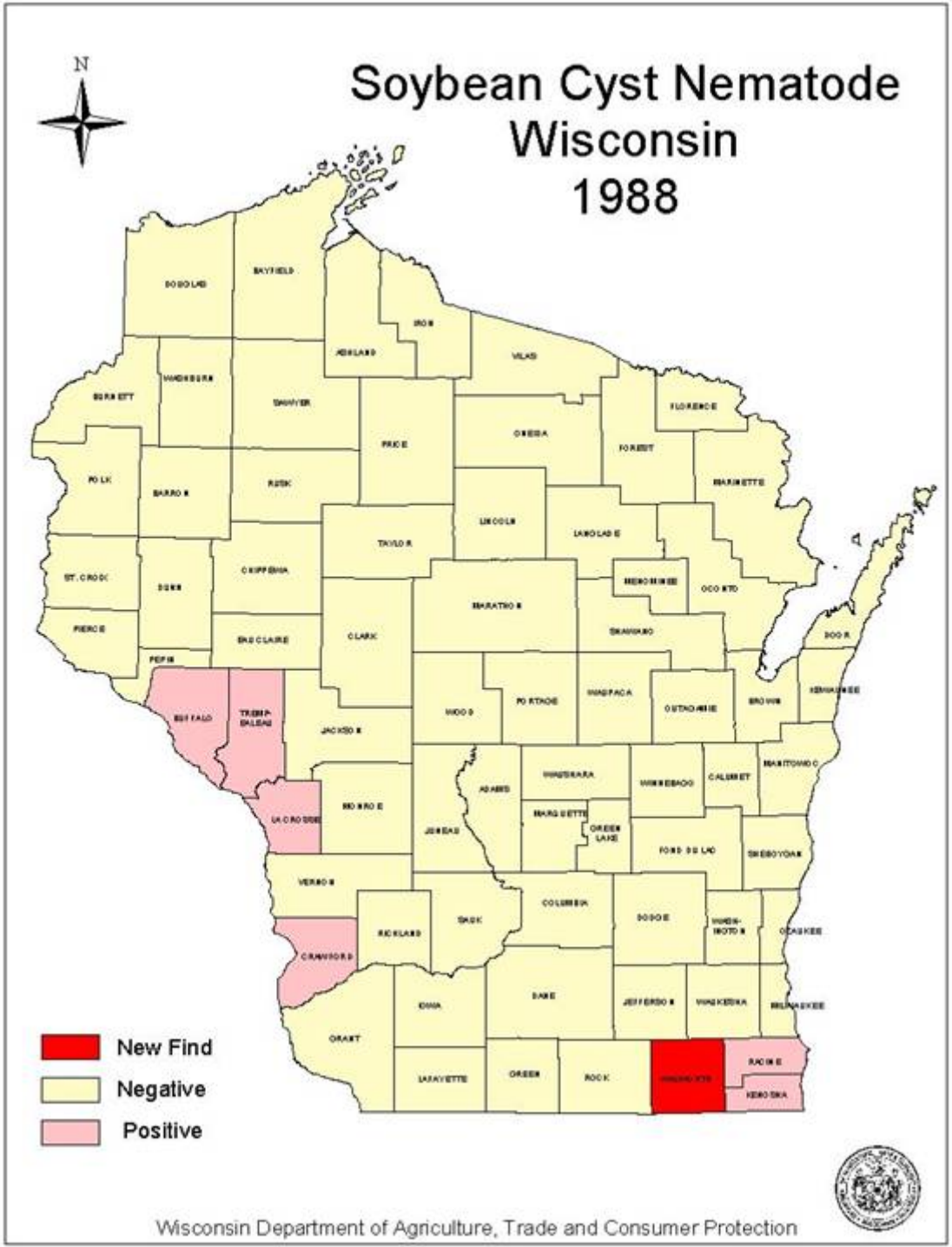
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1988
New Find
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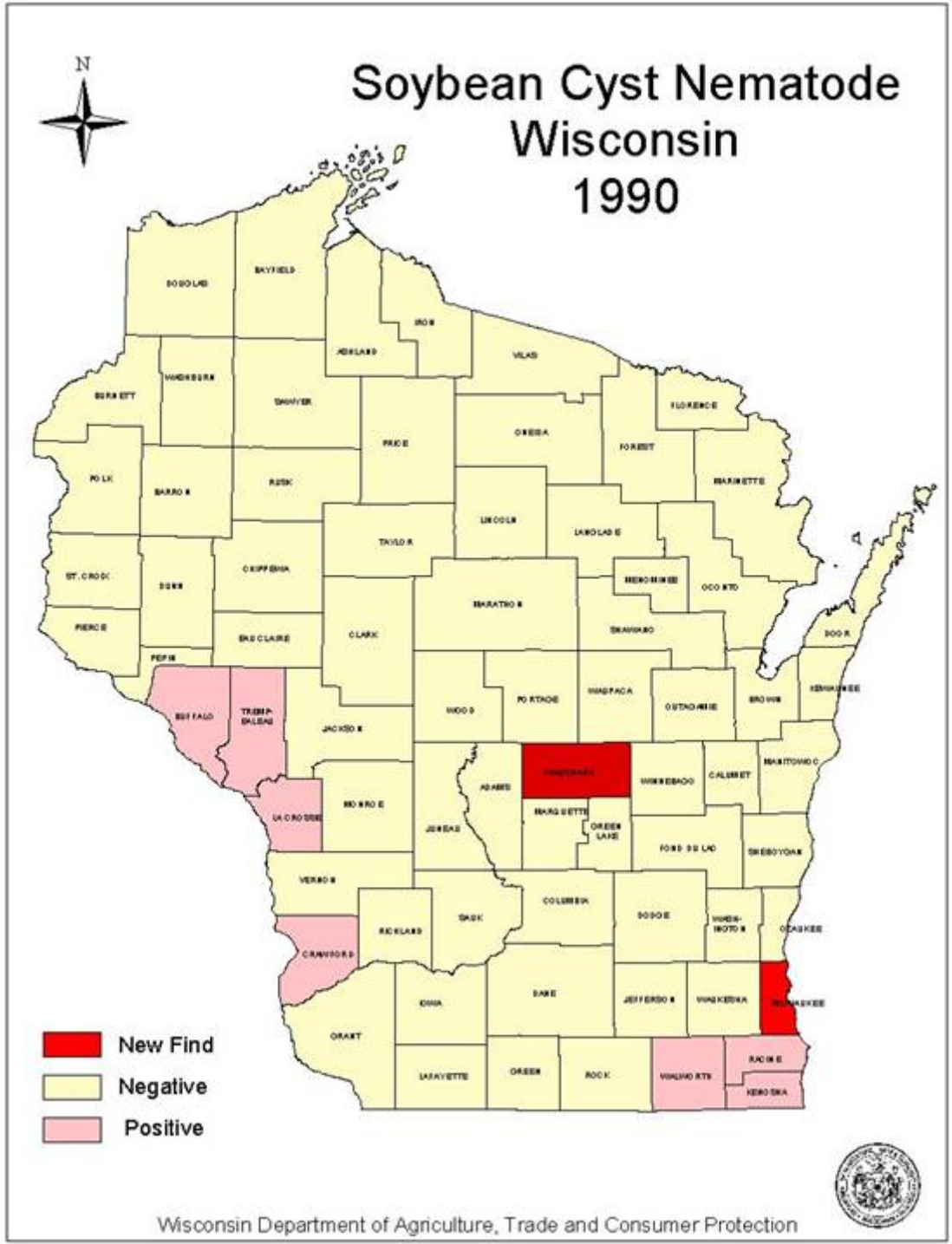
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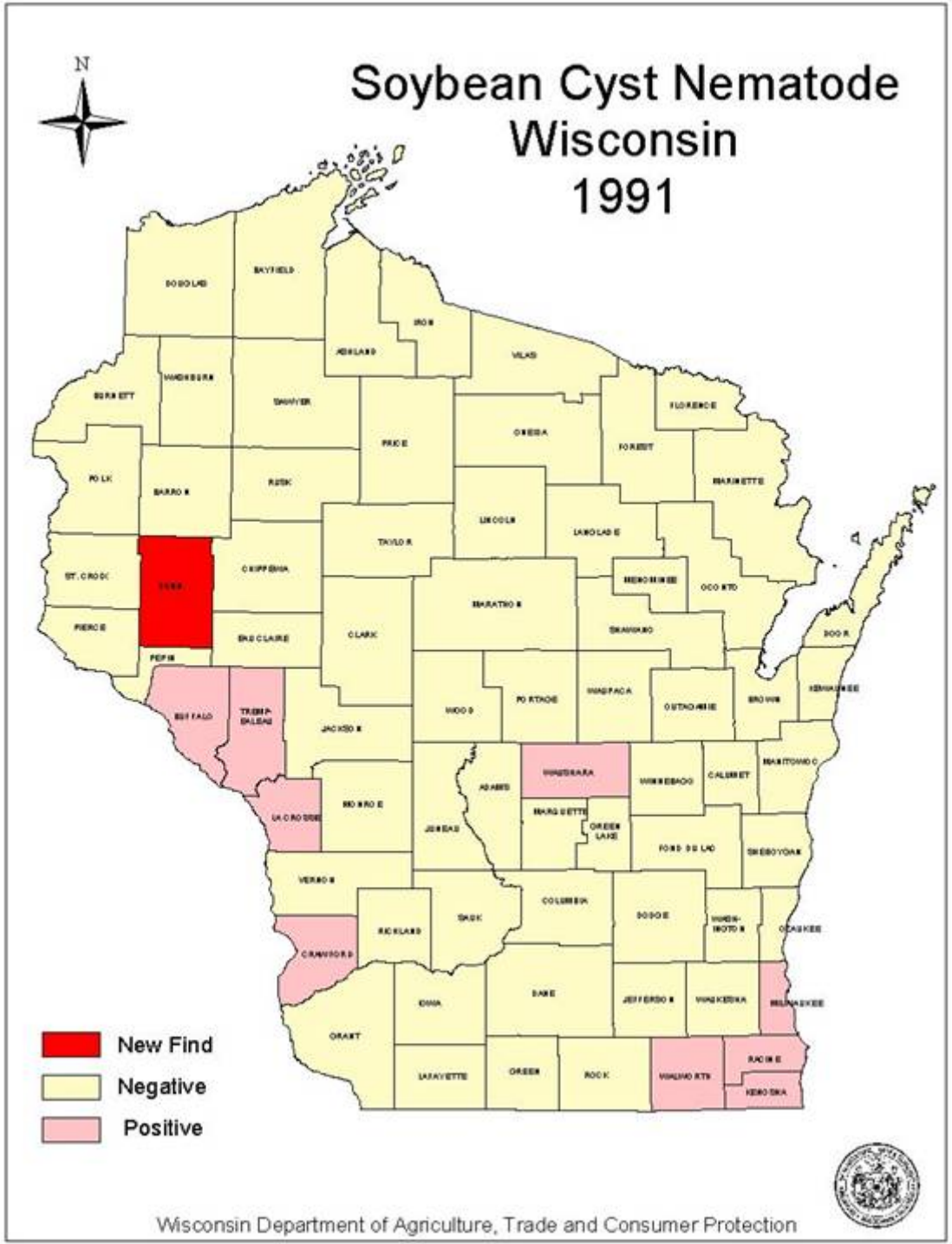
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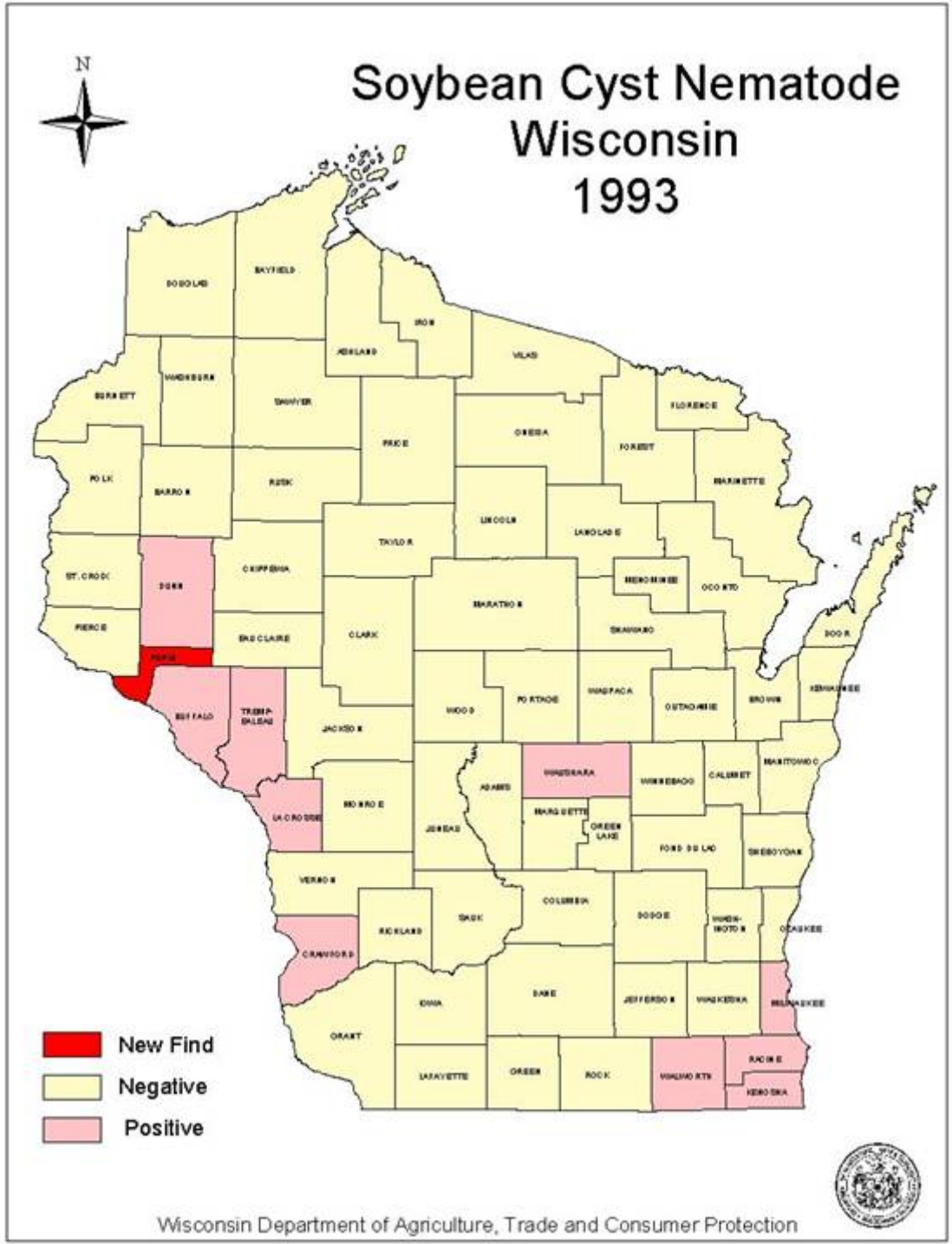
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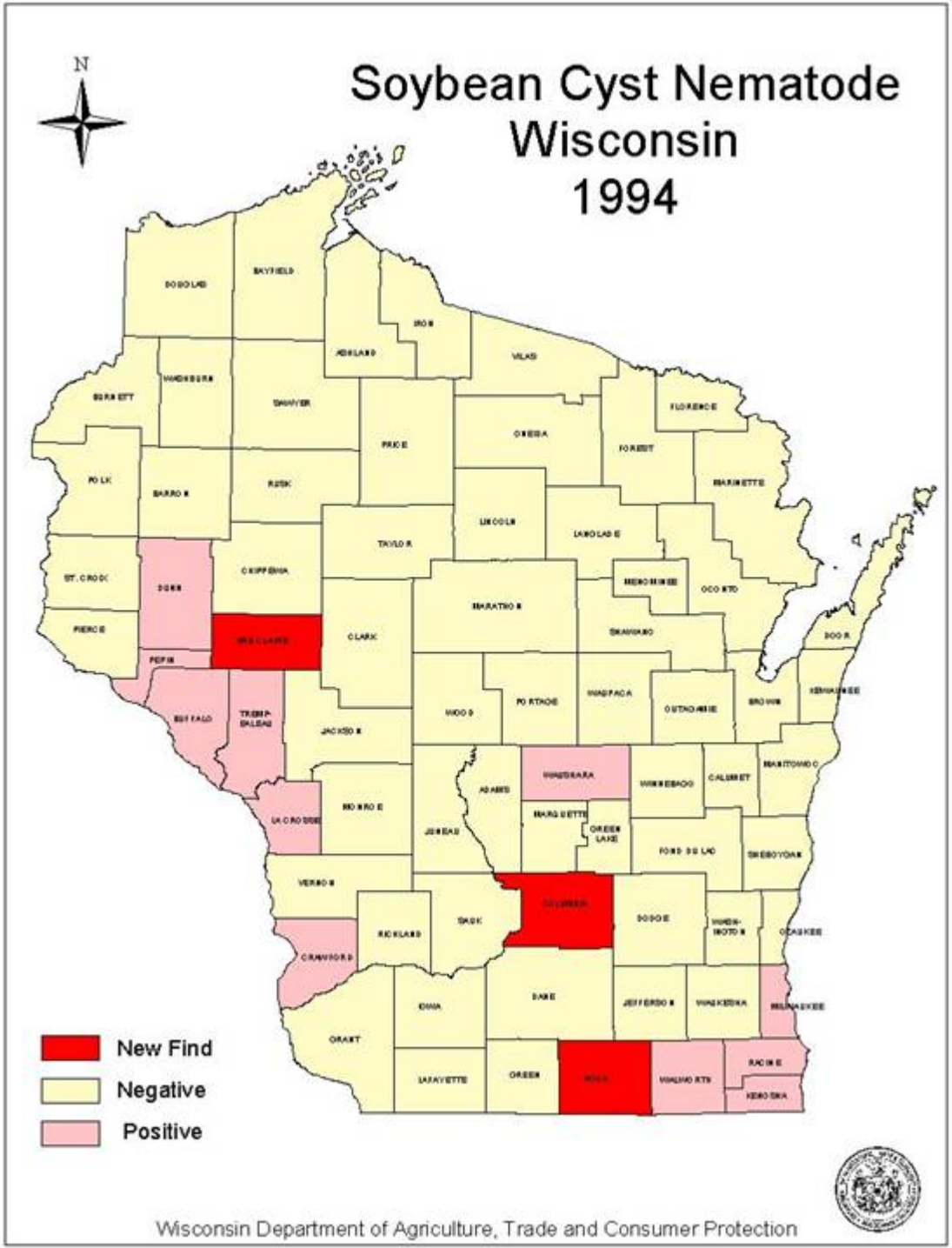
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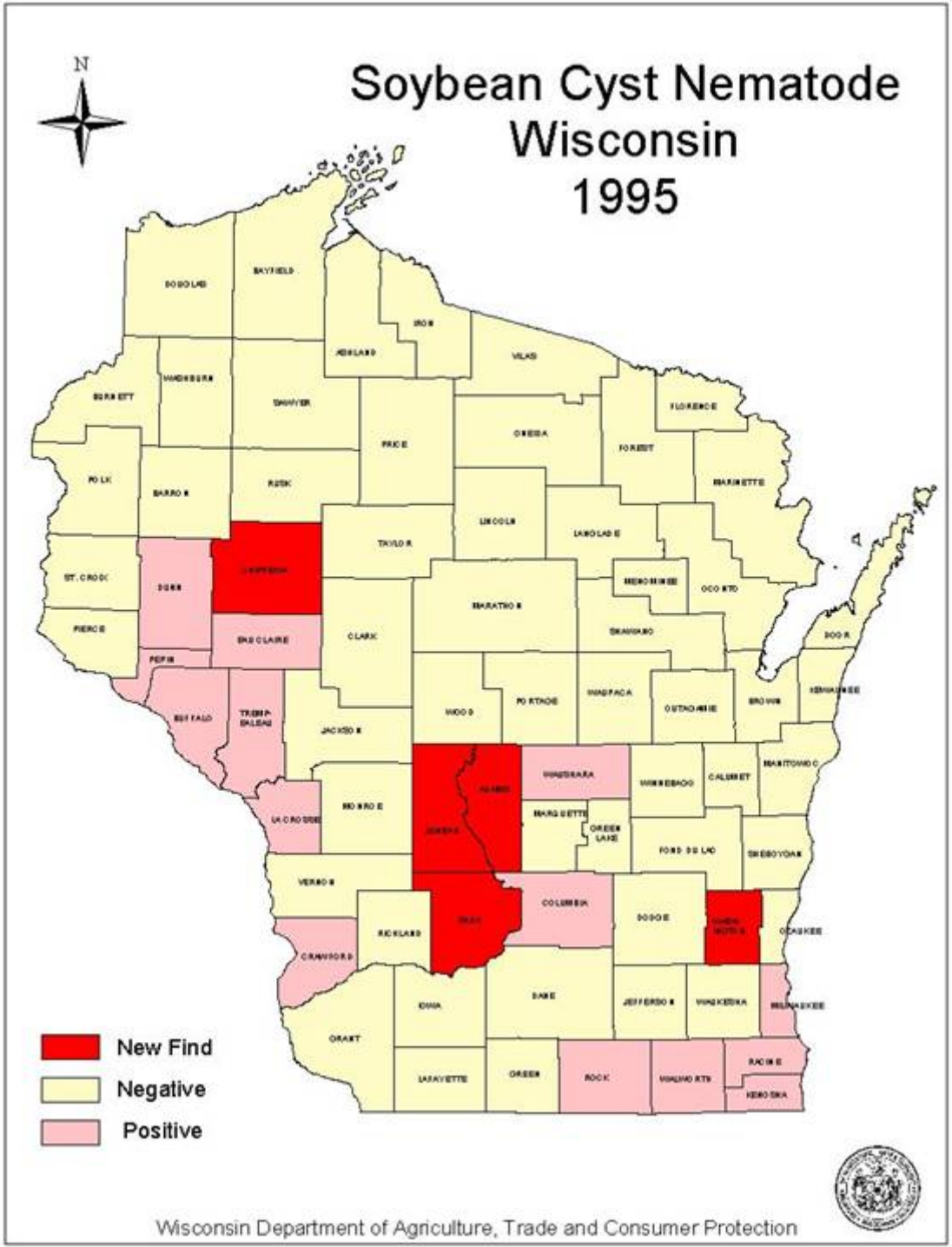
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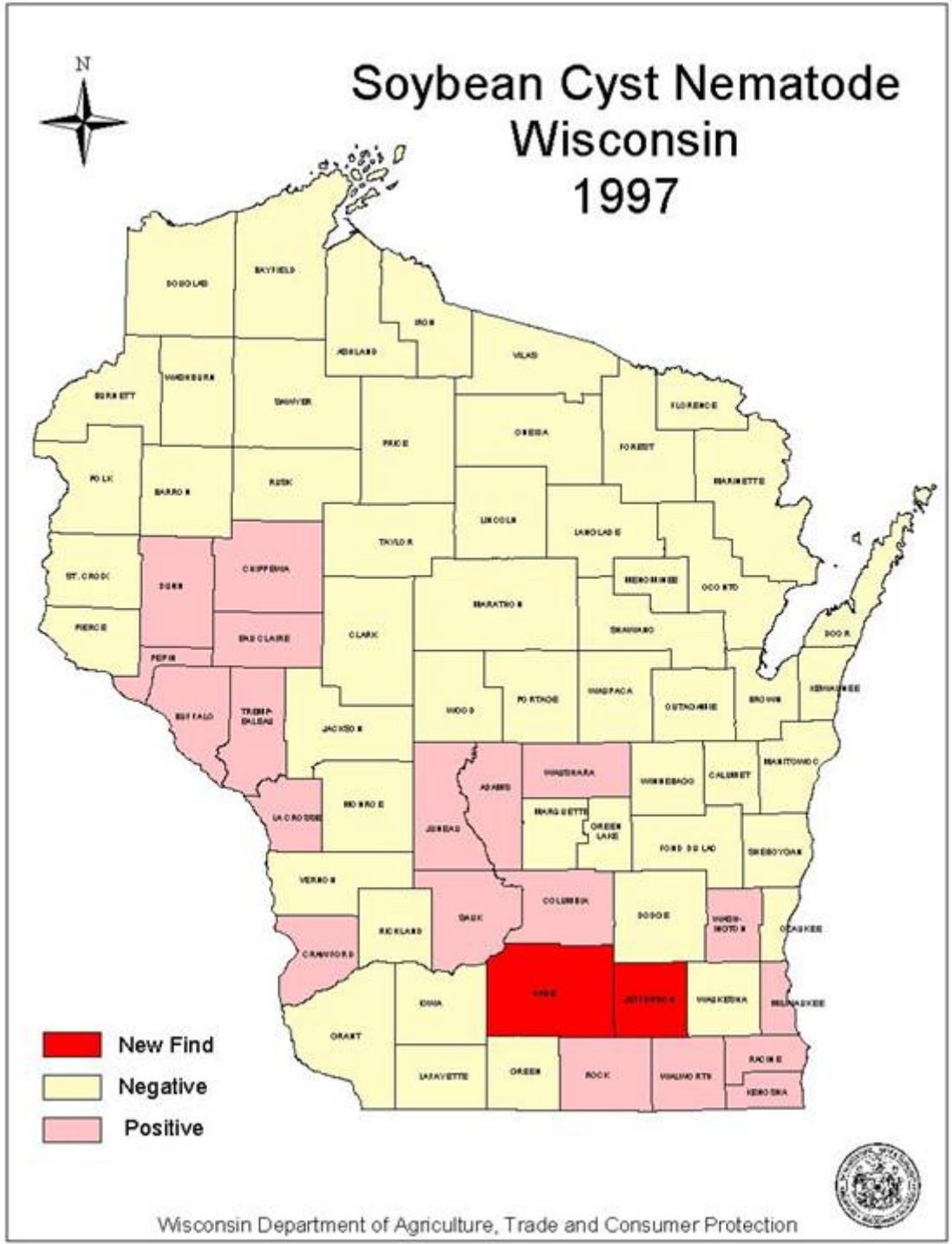
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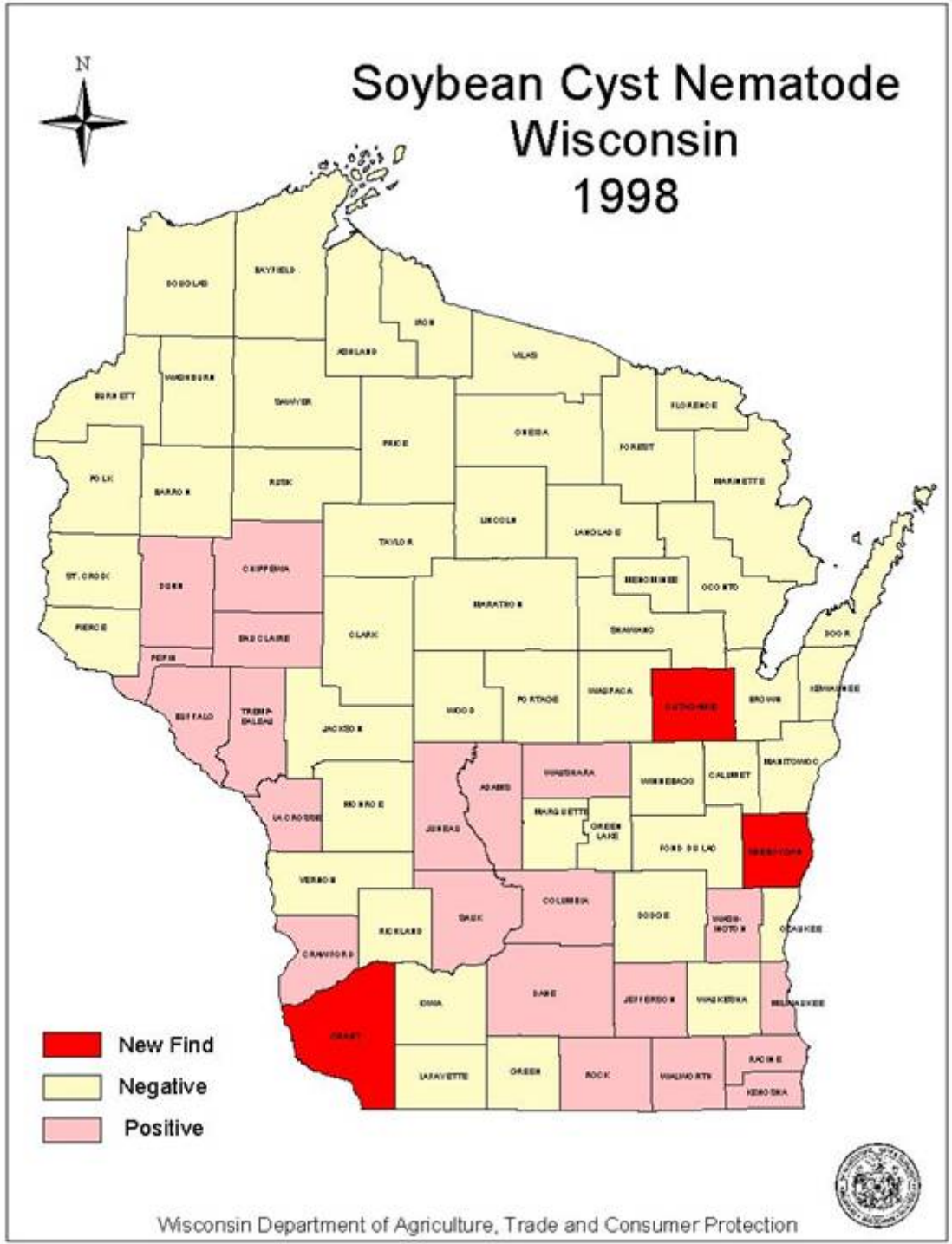
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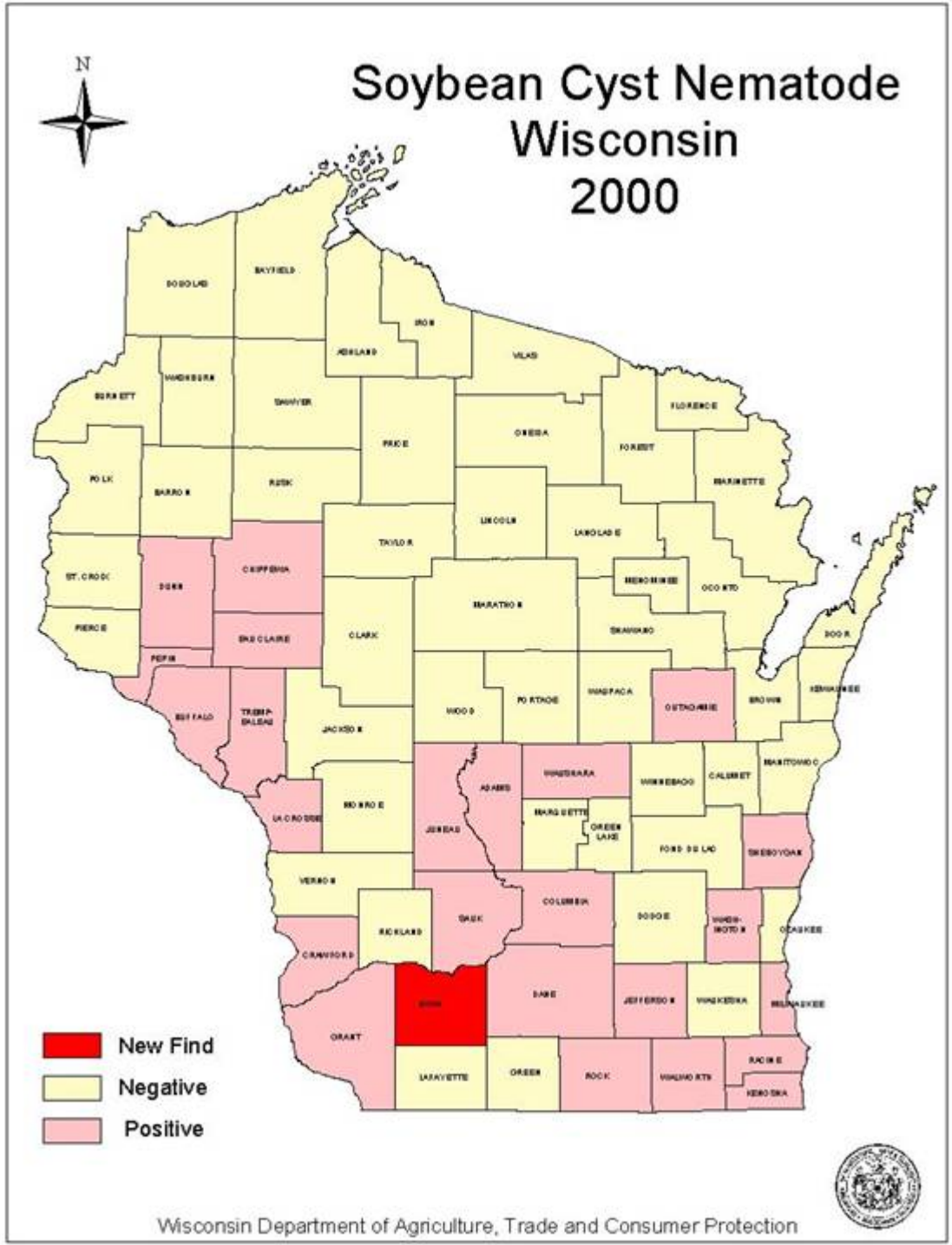
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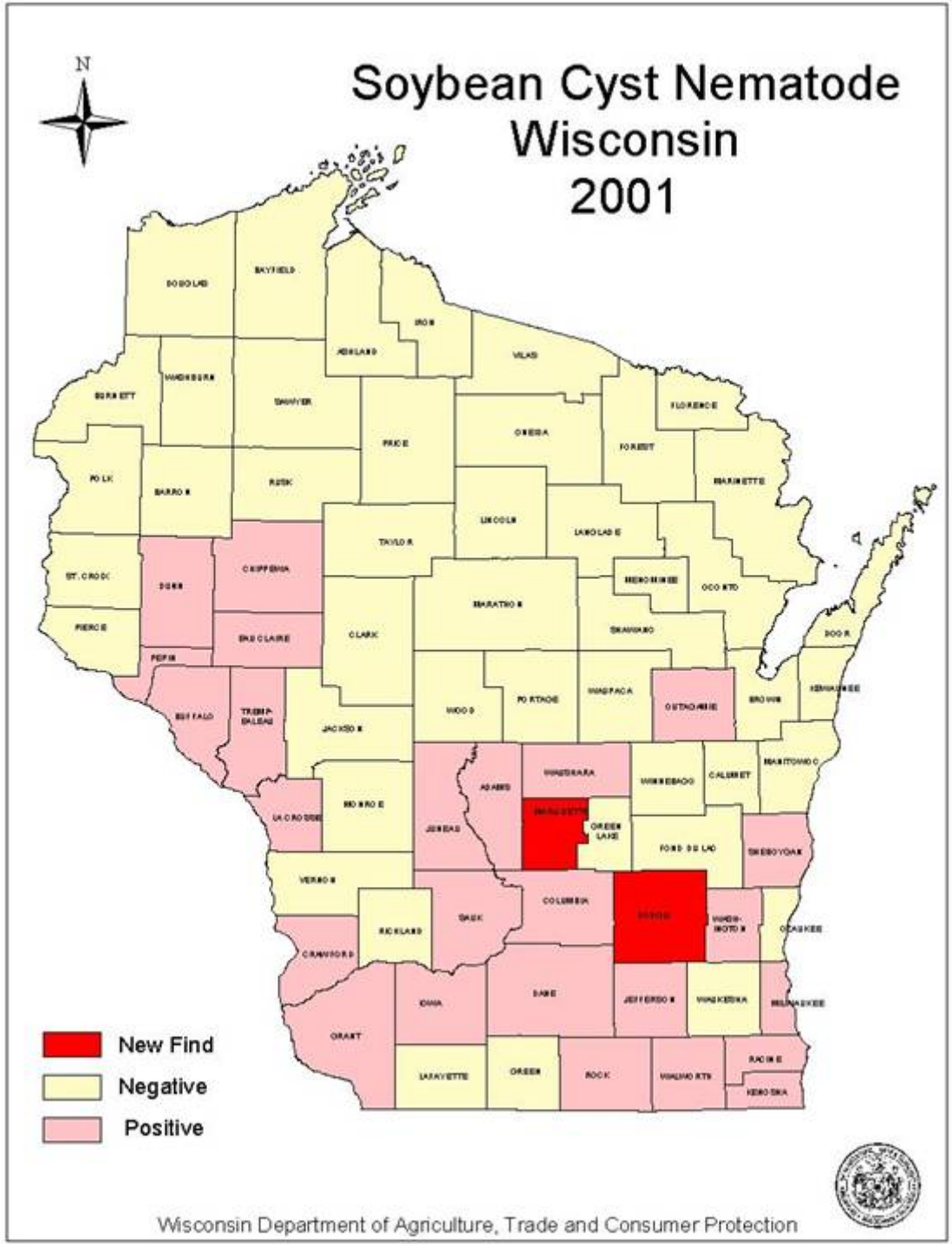
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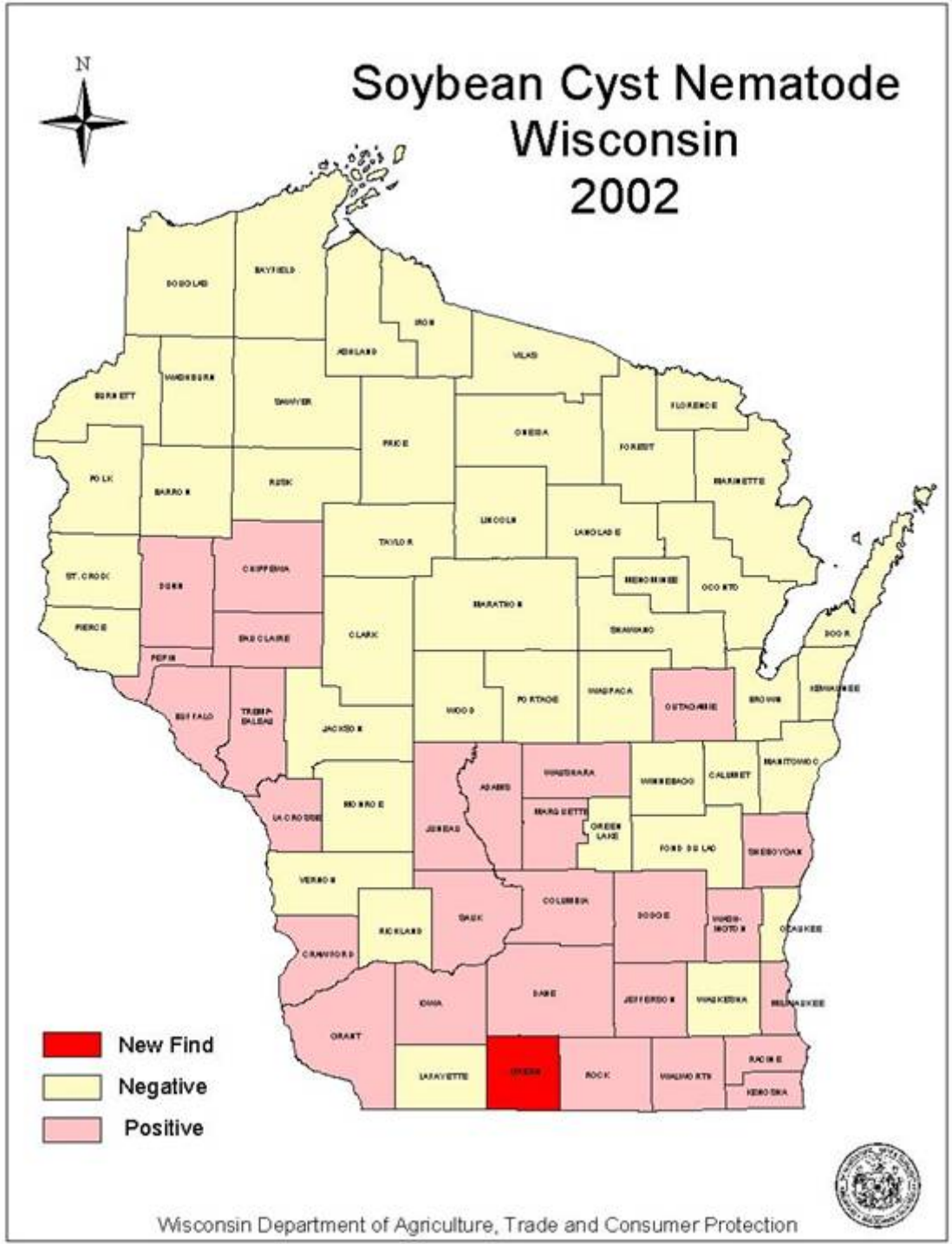
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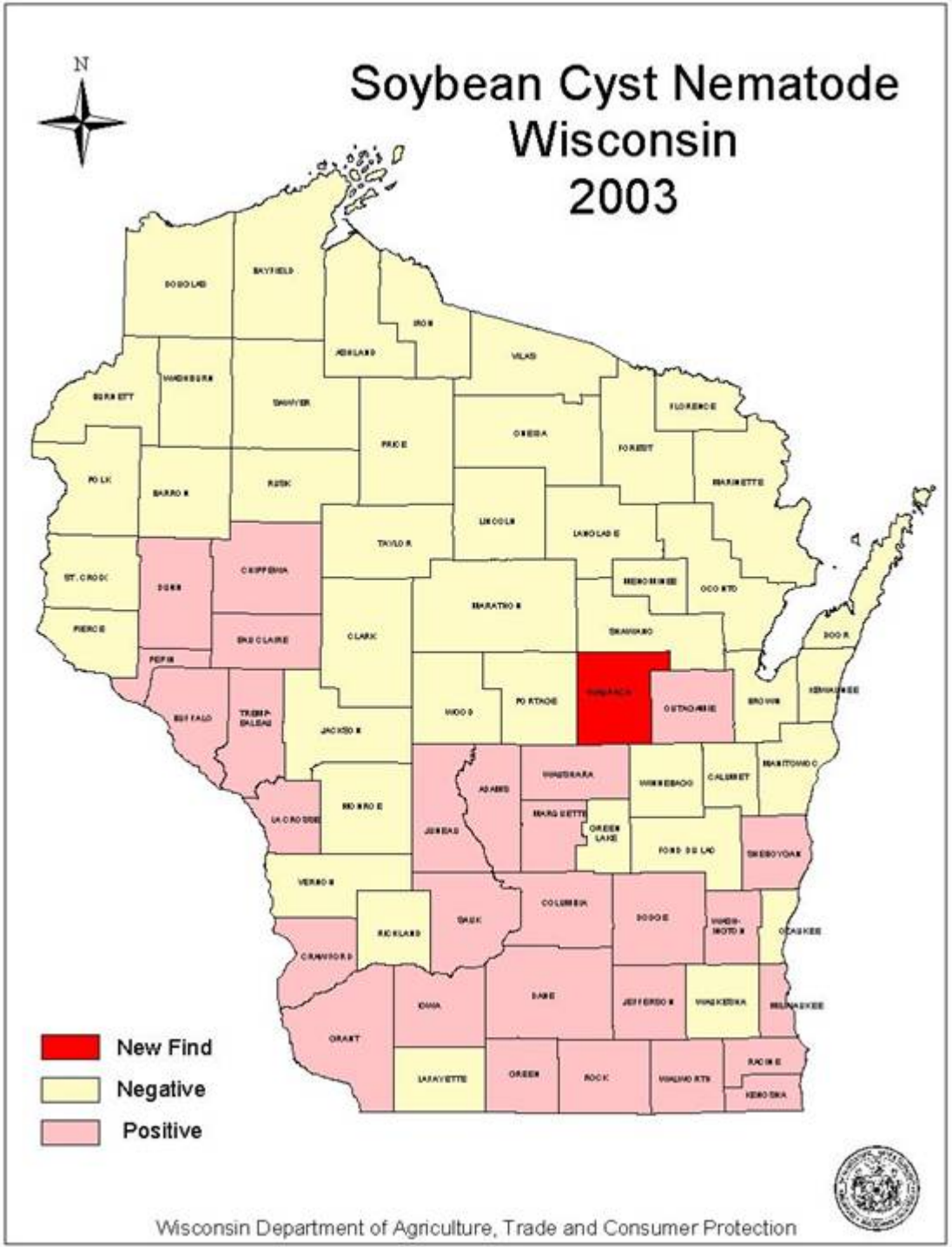
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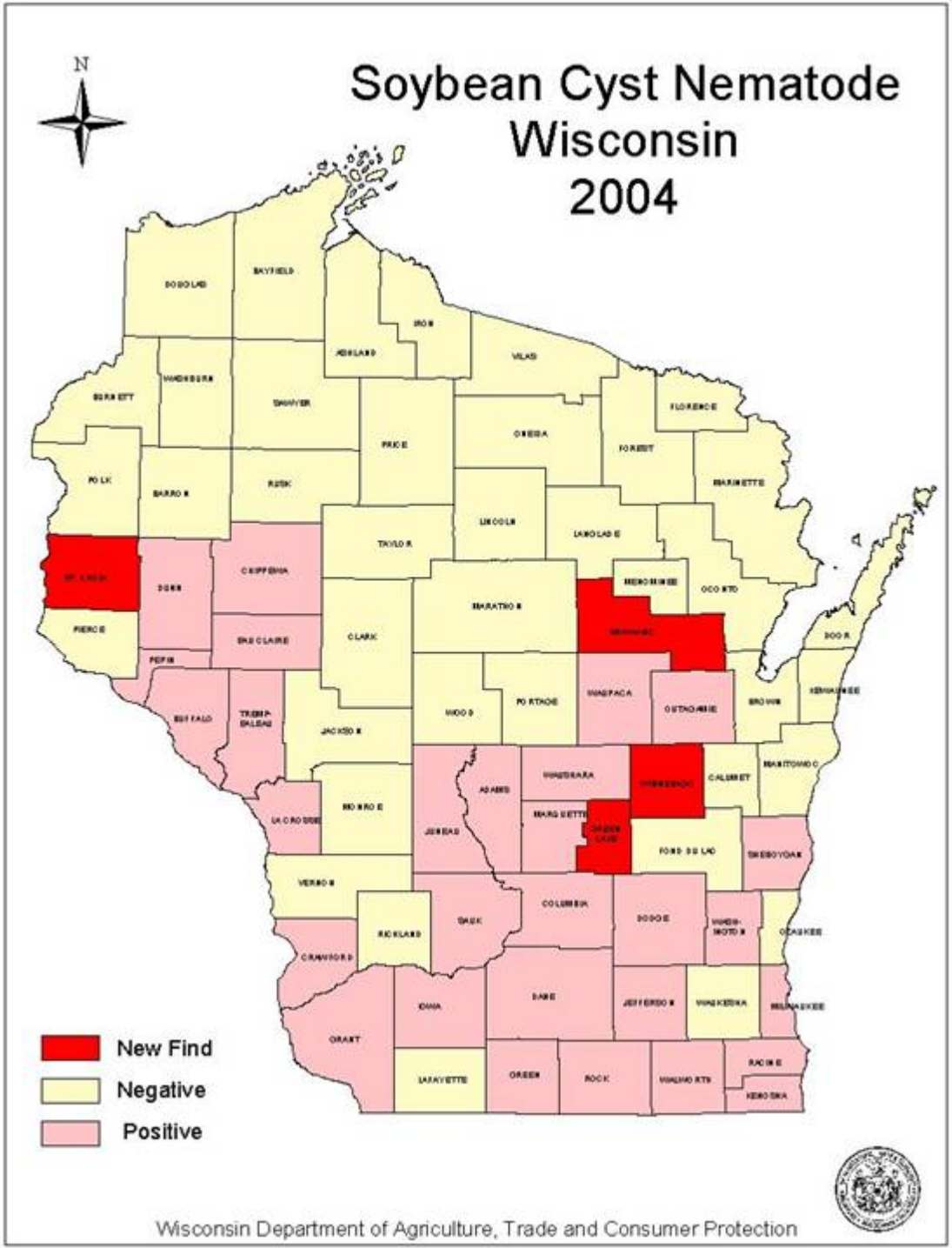
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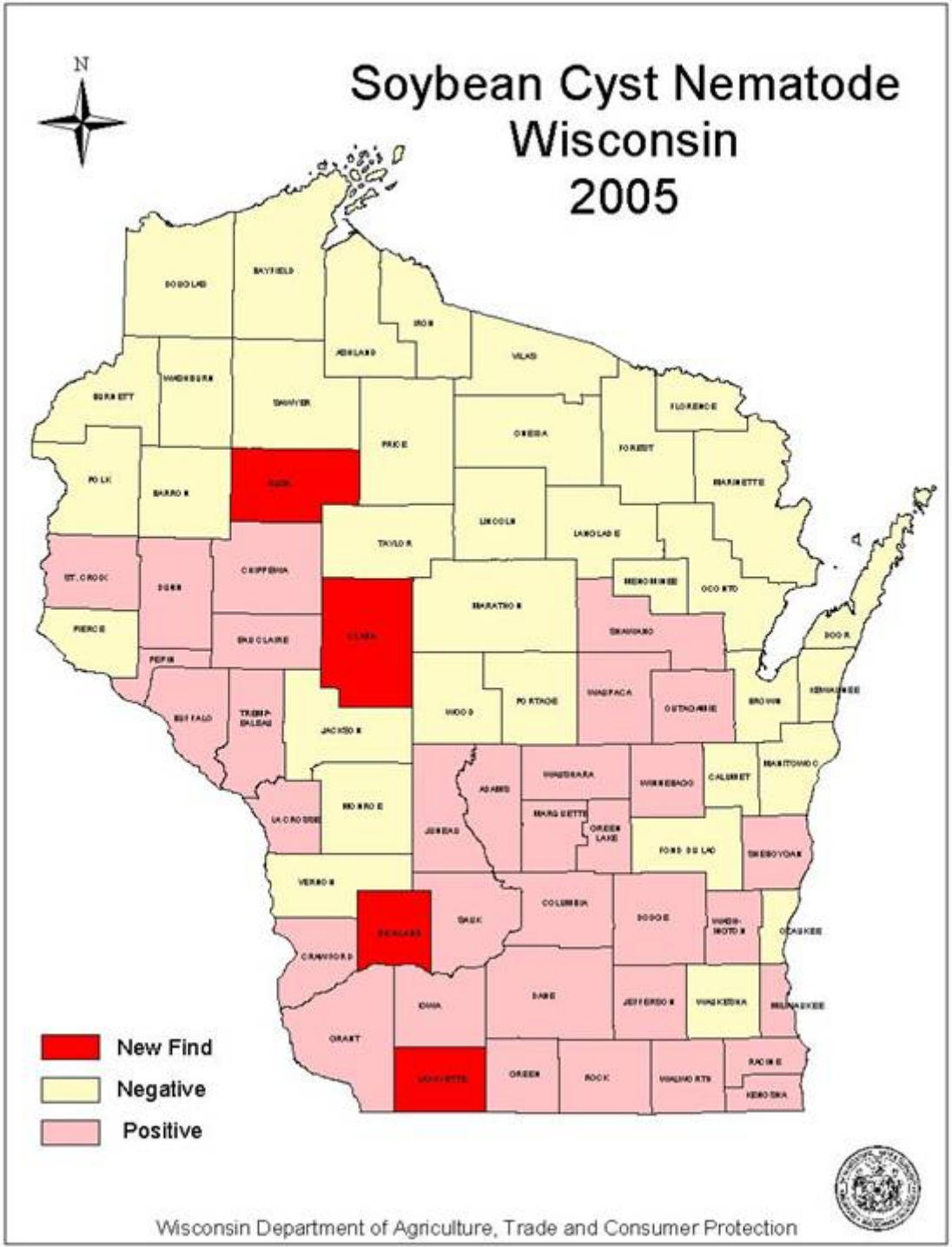
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Stewart's wilt of corn

- A disease of regulatory significance—prohibited by at least 23 countries worldwide.
- Can cause significant yield loss in sweet corn.
- 2005 seed production field inspection found Stewart's wilt (caused by the bacteria *Pantoea stewartii*) in 21 of 44 fields.

Historical record:

1999: 1 field, first in 56 years in WI

2000: 10 counties, 57% of seed fields inspected

2001: None found

2002: Two fields, Kenosha and Calumet Counties

2003: One field, Dane County

2004: One field, Rock County

2005: Eight counties, 48% of seed fields

P. stewartii biology

- *P. stewartii* is vectored by the corn flea beetle (*Chaetocnema pulicaria*), which is also the overwintering reservoir.

P. stewartii control

- Corn inbreds and sweet corn are more susceptible than field corn hybrids.
- Cold winter temperatures are the critical factor in flea beetle survival.

Wheat streak virus, High Plains virus and Maize dwarf mosaic virus

- Neither wheat streak mosaic virus (WSMV) nor High Plains Virus (HPV) are known to occur in Wisconsin.
- Both viruses are vectored by the wheat leaf curl mite, *Aceria tosichella*. This mite has not been reported in Wisconsin.
- Wheat and corn are hosts to the viruses.

WSMV, HPV and MDMV on wheat

- 82 wheat fields were sampled between June 6 and June 20.
- No viruses of interest were detected.

WSMV, HPV and MDMV on corn

- 44 inbred corn fields were sampled between Aug. 28th and Sept. 9th.
- One field in Dane County tested positive for maize dwarf mosaic virus.
- No WSMV or HPV found.

http://pestbulletin.wi.gov/

DATCP Pest Survey Hotline

1-800-462-2803