2006 WISCONSIN CROP DISEASE SURVEY

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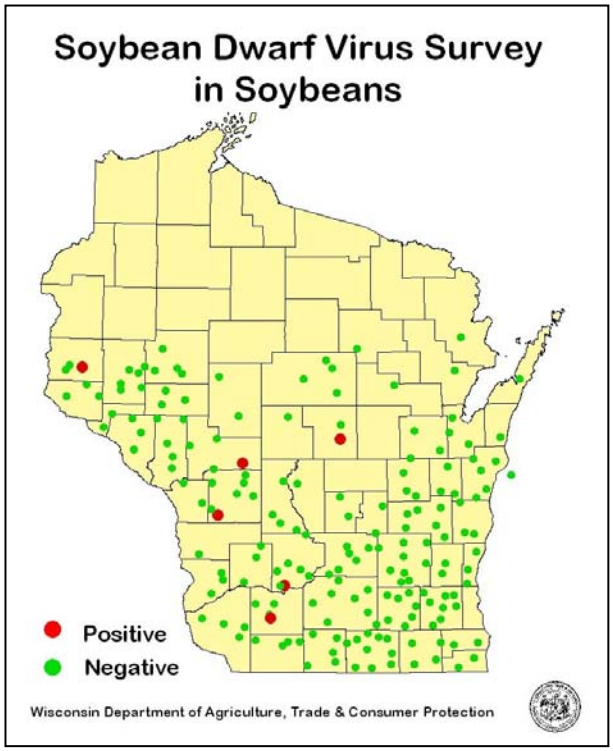
The Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) conducts pest and disease surveys to facilitate trade by documenting the absence of certain regulated diseases and pests in the state, by certifying crops for export, documenting known regulated diseases and detecting new and exotic diseases before they become a problem. For weekly pest and disease survey updates during the growing season please see the Wisconsin Pest Bulletin at http://pestbulletin.wi.gov/. Below are the highlights of the 2006 crop disease survey conducted by the Pest Survey Section:

Soybean Viruses & Asian Soybean Rust – Soybean dwarf virus but no rust.
Snap Bean Virus – No viruses detected.
Seed Corn – Stewart's wilt in one county.
Soybean Cyst Nematode – Spreading north!
Potato Cyst Nematode and Exotic Root Knot Nematode Survey – Clean fields in 2006!

Soybean Virus and Asian Soybean Rust Survey

The introduction of soybean aphids raised concern about aphid-vectored viruses such as the potyviruses: bean common mosaic virus, bean yellow mosaic virus and soybean mosaic virus (SMV). For the last four years, from late July to early August (R2 to R4 growth stage), soybean fields throughout the state were sampled randomly and tested for several viruses including bean leaf beetle-vectored bean pod mottle virus (BPMV) and thrips-vectored tobacco streak virus (TSV). Soybean fields were also scouted for Asian soybean rust (*Phakopsora pachyrhizi*). No Asian soybean rust was observed in any of the 188 fields visited in 2006 in Wisconsin. Foliar samples from each field were tested at Plant Industry Lab using DAS ELISA (double antibody sandwich enzyme-linked immunosorbent assay). All samples tested negative for BPMV, TSV and viruses in the potyvirus group. Six fields tested positive for soybean dwarf virus (SbDV), which was found for the first time in soybeans in Wisconsin in 2003. The low incidence of SbDV is consistent with previous years' survey results. ELISA positive SBDV samples were confirmed by molecular method (RT-PCR). Overwintering bean leaf beetles were tested for BPMV in April and May with beetles from three out of 81 alfalfa fields (the beetle habitat before soybean emergence) positive for BPMV.



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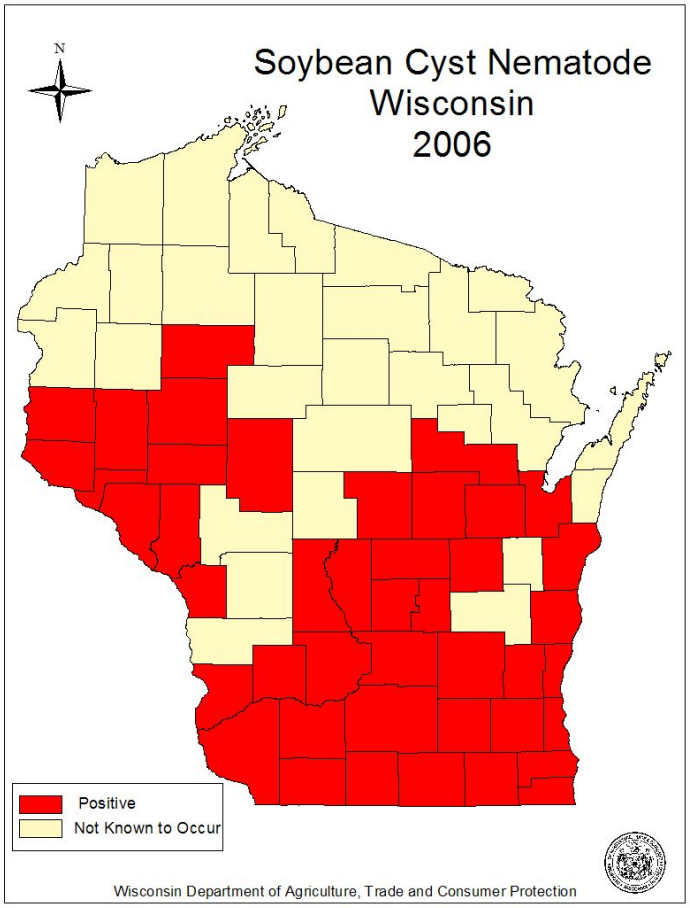
Snap Bean Virus Survey

According to the Wisconsin Agricultural Statistical Service, Wisconsin is the nation's top producer of snap beans. In 2006 snap bean fields in the northwest, north-central and north-eastern part of Wisconsin (Adams, Barron, Chippewa, Langlade, Marathon, Oconto, Portage and Waushara counties) were sampled and tested for four viral diseases. None of the 62 snap bean fields tested positive for BPMV, Cucumber mosaic virus (CMV), potyviruses or TSV.

Seed Corn Survey

In 2006, 53 seed corn fields were inspected for export certification. Foliar samples were tested for Stewart's wilt (*Pantoea stewartii*) and three viruses. Stewart's wilt infected seed is prohibited from export by 23 countries worldwide. *P. stewartii* is vectored by the corn flea beetle (*Chaetocnema pulicaria*), which is also the wintering reservoir. Flea beetles caught in 40 corn fields in spring did not carry the disease. This bacterial disease affects susceptible sweet corn varieties and inbred lines, most hybrid corn is resistant. In 2006 the disease was found in three fields in Grant County. Stewart's wilt has been documented in various locations throughout the state over the last 7 years. To meet the import requirements of foreign trading partners, all samples were also tested for three viruses: High plains virus (HPV), maize dwarf mosaic virus (MDMV) and wheat streak mosaic virus (WSMV). HPV, WSMV and their vector the wheat leaf curl mite (*Aceria tosichella*) are not known to occur in Wisconsin. No HPV or WSMV were detected. Four fields in Dane Co. tested positive for MDMV, which can be transmitted by more than 20 species of aphids.

Soybean Cyst Nematode Survey



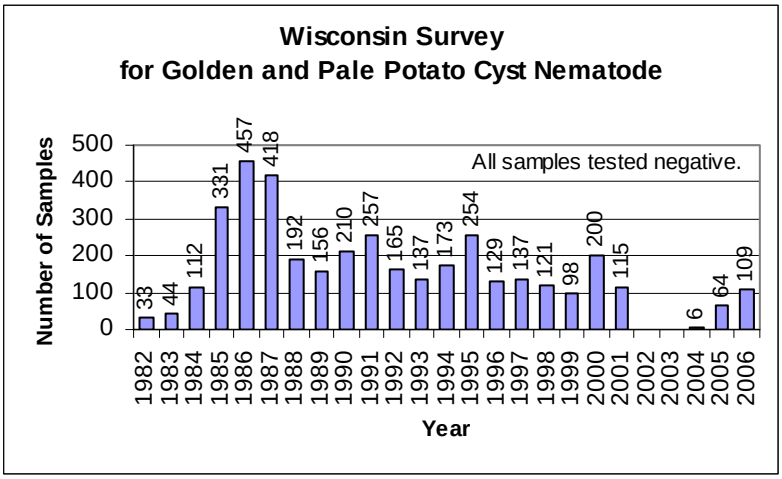
Soybean cyst nematode (*Heterodera glycines*), SCN, is the number one economic pest problem in soybean production in the U.S. causing an estimated $800 million to $1 billion in losses according to the American Phytopathological Society. Yield losses in Wisconsin were estimated at 1.9 million bushels in 2004. SCN was first detected in Racine County in Wisconsin in 1981. Soybean fields have been surveyed and field soils screened annually ever since. By 2006, 43 Wisconsin counties were known to be infested with SCN. The current map is based on cumulative data collected by WDATCP and the University of Wisconsin. For information about soil testing and SCN management please check the following websites http://planthealth.info/scnguide/ and http://www.plantpath.wisc.edu/soyhealth/index.htm.

Golden Nematode and Pale Potato Cyst Nematode Survey

On April 19, 2006, officials of the US Department of Agriculture's Animal and Plant Health Protection Service-Plant Protection and Quarantine (USDA APHIS PPQ) and the Idaho State Department of Agriculture (ISDA) announced the detection of potato cyst nematode (*Globodera pallida*), also known as pale cyst nematode (PCN) a major pest of potato crops previously not known to occur in the United States. Since the original detection, thousands of soil samples have been collected and screened by state and federal officials in Idaho. So far PCN has been detected in seven Idaho fields within close proximity. No seed production operations have been found to be infested with PCN.

PCN is widespread in Europe and South America. In North America, it had previously been detected only in Newfoundland, Canada. The nematode has the potential to cause crop losses up to 80% if populations reach critical levels. It affects potatoes, eggplant and tomatoes. Potato cyst nematode is closely related to golden nematode (*Globodera rostochiensis*, GN), an economically significant potato pest in Europe and a quarantine pest in many potato growing countries. Both nematode species form cysts on the true roots of potatoes. Laboratory diagnostics are required to differentiate one species from the other. Golden nematode was first discovered in the U.S. in 1941 in New York. It has been confined to New York by an effective state-federal quarantine for over 50 years. In Canada GN was known to occur only in limited areas in British Columbia and Newfoundland until on August 15, 2006, the Canadian Food Inspection Agency (CFIA) announced the detection of golden nematode in a commercial potato field near Montreal, Québec.

Neither the pale cyst nematode nor the golden nematode has ever been detected in Wisconsin. DATCP's Pest Survey and Control Section, participating with the USDA's Cooperative Agricultural Pest Survey (CAPS) program, has been sampling Wisconsin potato fields periodically for cyst nematodes since 1982. DATCP results for 2006 showed no evidence of either cyst nematode in 109 tested fields.



Currently USDA APHIS PPQ is formulating a survey plan that will be the standard for a nationwide survey. The draft survey plan requires sampling 100% of certified seed potato fields and 10% of each state's commercial potato fields. According to the Wis. Agricultural Statistical Service, Wisconsin growers produced 68,000 acres of potatoes in 2005, making the Badger State the fourth largest potato producing state in the nation. The state is also a leading seed producer, with 8,500 acres of seed production in 2006. DATCP is consulting with UW-Madison potato experts, the UW seed potato program and industry representatives to prepare for this survey. If implemented as currently proposed, the national survey may require a tremendous increase in sampling and screening capacity for DATCP.

Exotic Root Knot Nematode Survey

In 2005, Plant Industry Bureau staff has started a USDA CAPS funded survey for Columbia root-knot nematode (*Meloidogyne chitwoodi*) and False Columbia root-knot nematode (*M. fallax*). These microscopic worm-like pests are closely related to northern root-knot nematode (*M. hapla)* which is present in Wisconsin and feeds on a long list of vegetables and weeds including potatoes. Columbia root knot nematode (CRN) is a regulated pest of potatoes and common in the western part of the US but has not been found in Wisconsin. The closely related False Columbia root-knot nematode (FCRN) is not known to occur in the United States. Soil samples from 173 fields in 16 potato growing counties were sampled and screened for vermiform juvenile root-knot nematodes. Testing combined classic nematology methods and molecular techniques. Root-knot nematodes are separated from soil by Baermann funnel. The resulting nematode containing effluent is subjected to real time polymerase chain reaction (PCR). Plant Industry lab adapted PCR techniques that allow for the detection and positive identification of a single nematode in a sample which would be very time consuming to achieve using classic methods alone. All soil samples from Wisconsin potato fields tested negative for Columbia root-knot nematode and False root-knot nematode. The testing did reveal several fields infested with northern root–knot nematode (*M. hapla*). This survey will continue in 2007. Both potato cyst-and exotic root-knot nematode surveys are conducted to demonstrate to our trading partners that these pests are either absent from this state, or in the event of detection, provide growers with an early warning that allows for the greatest variety of response options including eradication.

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