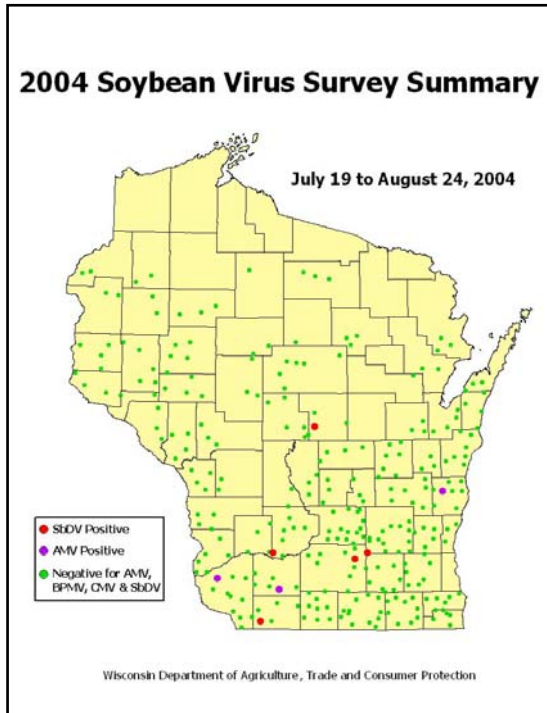


WI DATCP's 2004 DISEASE SURVEY HIGHLIGHTS

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Soybean virus survey

The 2004 soybean virus survey found a surprising lack of viruses. The survey was conducted



from July 19 to August 24, targeting fields in the R2-R4 stage of growth. At each field, the topmost fully expanded trifoliolate was collected from 10 plants at four sites in the field. Aphid counts were conducted, an estimate of bean leaf beetle defoliation was made, and apparent virus symptoms were noted. Samples were kept on ice until frozen at -80° deg. C. Leaves were ground and assayed for virus presence using DAS-ELISA (reagents from Agdia, Elkhart, Indiana). Of the 293 fields sampled, three had detectable alfalfa mosaic virus, while five had soybean dwarf virus. No cucumber mosaic virus (CMV) was detected in any field sampled. No bean pod mottle virus (BPMV) was detected either, despite a May-June survey of the bean leaf beetle that indicated the presence of BPMV in beetles in six counties in southern Wisconsin.

Soybean Dwarf Virus

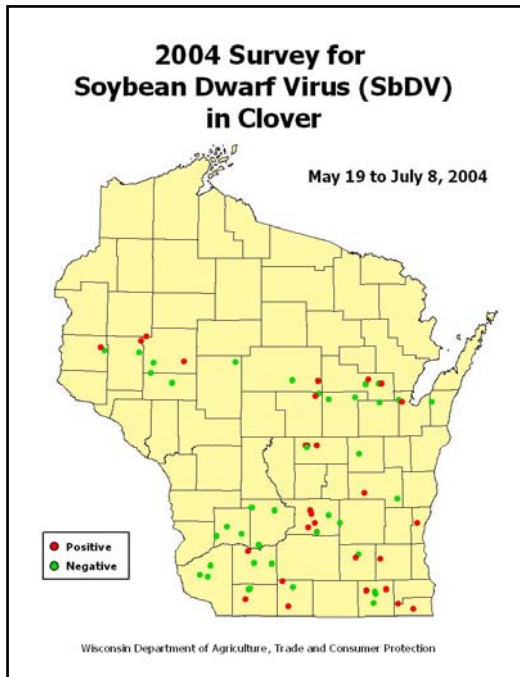
Soybean dwarf virus (SbDV) was first detected on Wisconsin soybeans in 2003, when two of

286 soybean fields tested were positive by ELISA and RT-PCR. In the 2004 survey, five of 293 fields were positive. Several strains of SbDV are known to occur throughout the world; the strain found in Wisconsin has been determined by RT-PCR to be the Yellowing (SbDV-Y) strain. The virus is vectored by aphids in a non-persistent fashion. Under laboratory conditions, the soybean aphid (*Aphis glycines*) has not been shown to be a vector, and none of the reported aphid vectors of SbDV-Y are known to occur in Wisconsin. However, it may be that the sheer large numbers of *A. glycines* and associated host probing may be causing the observed small percentage of soybeans infected with SbDV.

SbDV Clover survey

To determine if an overwintering reservoir of SbDV exists, DATCP conducted a spring survey of clovers. Red clover (*Trifolium pretense*) is reported to be a host of SbDV-Y; white clover (*Trifolium repens*) is not. Leaves were collected from clover plants and kept on ice until frozen at -80° C. Leaves were ground and sap extracts were tested using DAS-ELISA. Thirty-one of 53 red clover samples were positive for SbDV. Two samples of white clovers tested positive out of 24 sites sampled; however, it is possible that the host plant in these samples was misidentified. The results show that SbDV is widespread in clover in Wisconsin. The relative low incidence of SbDV on soybeans may be due to the lack of an efficient aphid vector, though relations between the virus, the two hosts and aphids are still unclear. Plans are to repeat the clover survey in 2005, with attention to aphid species present.

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Powdery scab of potato

Powdery scab (caused by *Spongospora subterranea* f. sp. *subterranea*) was detected in the state for the second year in a row. In 2003, this disease was found in three fields in two counties, out of 65 fields in eight counties surveyed. All the positive fields were in the Central Sands region, and all fields were within about 20 miles of one another.

In 2004, the known range of *S. subterranea* in Wisconsin was expanded considerably, with positive fields detected in Oconto and Langlade counties by observant growers and crop consultants. Powdery scab has been common in western states for a number of years, where in some areas it has reportedly caused a shift to less-susceptible cultivars. Infection can increase desiccation and increase decay in storage. It is also the vector for potato mop top virus (PMTV), a virus not known to occur in Wisconsin, or in the

United States outside of the state of Maine.

Ralstonia

For the second year in a row, geraniums infected with *Ralstonia solanacearum* race 3 biovar 2 were imported into the United States from Guatemala. *R. solanacearum*, a bacteria, is the causal agent of southern wilt of geraniums—and of brown rot of potatoes. The disease is present in tropical areas of the world and in Europe. *R. solanacearum* is divided into races based upon host range and into biovars based upon carbohydrate utilization. Race 1 of the organism is present in the southern U.S., where it infects tomatoes. Race 3 biovar 2 is not known to occur in the United States. As an aside, R3B2 is listed as a Select Agent in the Agricultural Bioterrorism Prevention Act of 2002, making it a felony punishable by a fine of up to \$250,000 and imprisonment of not more than 5 years for “whoever transfers a biological agent or toxin to a person who the transferor knows or has reasonable cause to believe is not registered” or “whoever knowingly possesses a biological agent or toxin without registering under the regulations....”

For the past several years, the disease has occurred in asymptomatic geranium cuttings propagated in Guatemala and imported into the U.S. for rooting and potted plant production. Geraniums at a number of greenhouses in Wisconsin were quarantined and ordered destroyed in a joint DATCP-USDA effort, and the facilities disinfected. In 2003, seven WI greenhouses were issued Emergency Action Notifications. In 2004, 24 greenhouses in the state participated in destroying geraniums, with many of those facilities taking action voluntarily.

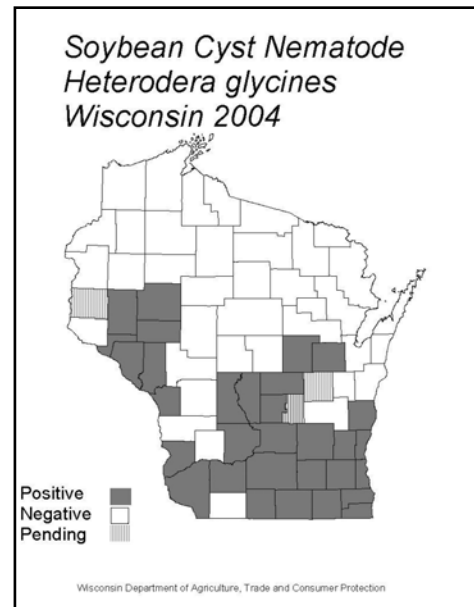
Inspections of propagating facilities in Central America and in Africa by industry plant pathologists and USDA personnel, and the adoption of Best Management Practices for preventing infection by the geranium industry (as well as the costs to the industry associated with continuing quarantine and destruction) should reduce the likelihood of importing infected plant material in the future.

Brown root rot of alfalfa

Another recent disease concern for the state is brown root rot of alfalfa, caused by *Phoma sclerotoides*. Reports from Minnesota (Samac, et. al., 2004) suggest that this disease has been spreading south from Canada. Dr. Samac's work, in cooperation with Dr. Craig Grau of UW-Madison, determined that the disease has been found as far south as Columbia County in Wisconsin. Brown root rot infection may contribute to stand decline, yield loss and increased susceptibility to winter kill. A survey was undertaken to determine the incidence of the disease in the southern part of the state. Survey protocol required the collection of whole symptomatic alfalfa plants for testing. Samples were tested with PCR to detect the fungus. Twenty-three fields were sampled in the southern third of the state, in an attempt to determine the southern range of the disease. No *P. sclerotoides* was detected in any of the samples collected.

Soybean cyst nematode

Soybean cyst nematode (*Heterodera glycines*) has been present in Wisconsin since at least 1981. Nematode infestation often goes undetected, and is believed to cost soybean growers a considerable amount of lost yield every year. Soybean cyst nematode may also infest soil contained in pots or in the root ball of trees, and so is a concern for nursery growers in the state. In accordance with plant protection conventions, DATCP maintains a record of Wisconsin counties in which SCN has been detected. Despite sampling several hundred fields in uninfested counties, and sharing results with UW researchers testing soil samples from growers, no new counties have been added to the official SCN map since 2002.



Samac, D. A. and C. R. Hollingsworth. 2004. Identification of *Phoma sclerotoides*, the Causal Agent of Brown Root Rot, in Wisconsin and Minnesota. [abstract] North American Alfalfa Improvement Conference, July 19-21, 2004, Ste. Foy, Quebec, Canada. Abstract No. 50.