Wisconsin Department of Agriculture, Trade and Consumer Protection

Wisconsin Pest Survey Report

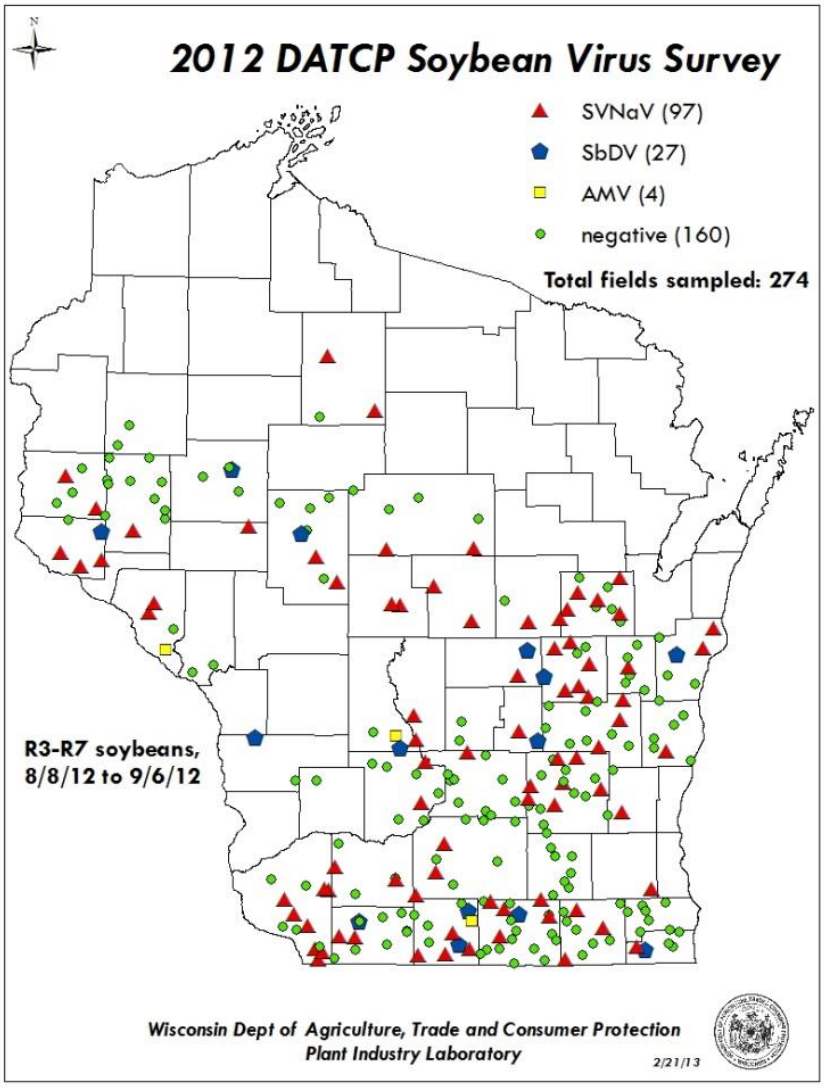
Updated-2012 SOYBEAN VIRUS SURVEY

http://pestsurvey.wi.gov/

Fig. 1 Soybean leaflets infected with Soybean vein necrosis-associated virus (SVNaV) showing symptoms of chlorosis and vein necrosis. Photo: A. Phibbs.

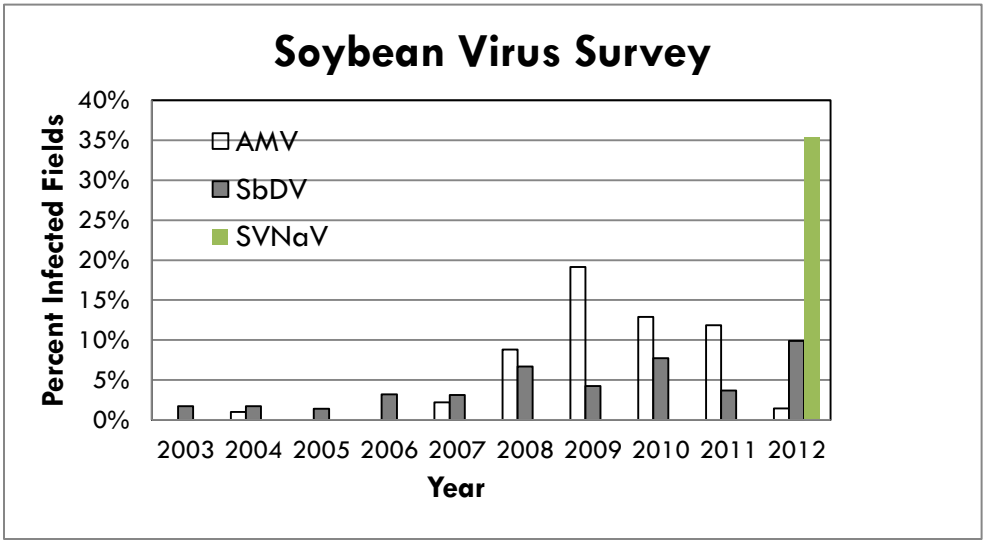
A new virus, the soybean vein necrosis-associated virus (SVNaV), was detected in Wisconsin soybean fields in summer of 2012. Soybean leaves with chlorosis and vein necrosis symptoms alerted UW researchers and DATCP plant pathologists to check for this virus. Soybean vein necrosis disease was first described in Tennessee in 2008 but had not been documented in Wisconsin. The DATCP virus survey collected samples from 274 fields in all soybean growing counties in the state. A subset of six leaf samples that showed pronounced symptoms (Fig. 1) was confirmed to be infected with SVNaV. SVNaV is a tospovirus, a group of viruses that is often transmitted by thrips. How SVNaV spreads in soybeans needs to be studied further. UW and DATCP are collaborating on this survey (1). For more information see the UW Extension article by D. Smith and K. Willis http://fyi.uwex.edu/fieldcroppathology/files/2012/10/SVNaV.pdf.

Complete analysis of all samples, revealed that a large number of fields were infected with this new virus, 97 out of 274 or 35.4%! This was the most common virus found since 2003, the first year of DATCP's soybean virus survey. Figure 1 shows the distribution of virus infected fields throughout the state.



In 2012, 27 (9.9%) soybean fields tested positive for soybean dwarf virus (SbDV). This is an increase from 2010 (7.7%), however the level of virus in each field was very low and no obvious dwarfing symptoms were observed. Dwarfing strain was confirmed to be the predominating strain of SbDV during this survey. Few finds of yellowing strain isolates have been reported in the past. Soybean dwarf virus was first

detected in Wisconsin in 2003 (2). SbDV can only be transmitted by persistently feeding, colonizing aphids, which would have occurred weeks before survey sampling. In US soybean fields, the soybean aphid is the only documented vector capable of transmitting SbDV. It is considered a very inefficient vector (3). Soybean aphid counts showed aphids present in 32% of sampled fields. Among the 27 fields infected with SbDV, we only found aphid populations in 7 fields (26%). It appears that the factors governing SbDV infection of soybeans are more dynamic and warrant further research. Overall the population of soybean aphids was exceptionally low in 2012. 2012 was an unusual year because of the drought and heat providing prime conditions for pests such as spidermites, whiteflies and thrips.



Alfalfa mosaic virus (AMV) was detected in four (1.5%) out of 274 fields, much lower levels than in 2011 when 11.9% of fields tested positive. AMV can be introduced by seed and be easily transmitted by several species of casually probing aphids. It is a common virus on many crops and vegetables.

Figure 2. Compares the percent of infected fields for each virus from 2003 to 2012.

Methods: Samples for the 2012 survey were collected from Aug 8 to Sept 6, when fields were in the R4 to R7 stages. The number of soybean fields for sampling was chosen based on soybean acres in each county (4). In each field, at four sites five plants were randomly sampled, collecting two leaflets from the upper and mid-canopy. Leaf samples were kept on ice and transported to Plant Industry Laboratory for testing. All viruses were detected utilizing a nucleic acid based method, reverse transcription (RT) – polymerase chain reaction (PCR) (5, 6, 7).

References

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4. Visual sample plan statistical software designed by US Department of Energy and Arc Map.
5. Harrison et al. Plant Dis. 89:28-32, 2005.
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