

2017 WISCONSIN CROP DISEASE SURVEY

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https://datcp.wi.gov/Pages/Programs_Services/PestSurvey.aspx

DATCP's Pest Survey team and Plant Industry Bureau Laboratory (PIB lab) provide field inspections, surveys for new diseases and pests as well as testing services to growers who export plants or plant materials. This is an overview of the 2017 season highlighting surveys for new diseases on corn, soybean and wheat.

Goss's wilt of corn (*Clavibacter michiganensis nebraskensis*) was detected in 6 of 52 (11.5%) seed field inspection samples from three Wisconsin counties (Dane, Eau Claire, Fond du Lac). Goss's wilt is continuing to decrease in production fields, down from 14.1% in 2016 and 38.5% in 2015. All seed certification samples tested negative for **Stewart's wilt** (*Pantoea stewartii*). Stewart's wilt has not been seen in Wisconsin since 2010.

A special survey for **new corn diseases** (Xanthomonas blight and tar spot) surveyed random corn fields from July 21 to September 29, 2017. This summary represents data from 125 fields in 30 counties visited state-wide including August seed field inspections. **Xanthomonas blight** (*X. vasicola vasculorum*), a new disease on corn, was not detected in Wisconsin. In 2016, Xanthomonas blight was reported from nine states: Colorado, Illinois, Iowa, Kansas, Minnesota, Nebraska, Oklahoma, South Dakota and Texas. The pest survey team collected corn leaves with bacterial blight-like symptoms for testing at the PIB lab. All samples tested negative for Xanthomonas blight but other common corn diseases were identified.

Most frequently-observed corn foliar blights were: Common rust (*Puccinia sorghi*), Gray leaf spot (*Cercospora zeaemaydis*), Northern corn leaf blight (*Setosphaeria turcica*), Northern corn leaf spot (*Cochliobolus carbonum*), Anthracnose (*Colletotrichum graminicola*). A few incidences of Septoria leaf blotch, Phyllosticta leaf spot, Phaeosphaeria leaf spot, and Smut (*Ustilago maydis*) were also detected.



Northern corn leaf spot lesions on corn leaf (A. Phibbs).

Tar spot (*Phyllachora maydis*) was first reported in the Midwest in 2015. The first find in Wisconsin was in 2016 in Green and Iowa Counties. UW reported two finds in Wisconsin in 2017. The disease affects corn in Mexico, Central and South America, where tar spot lesions are also colonized by *Monographella maydis*, another fungus. This second fungus has not been observed in Wisconsin. Tar spot is spread on plant debris that is carried by wind and rain.

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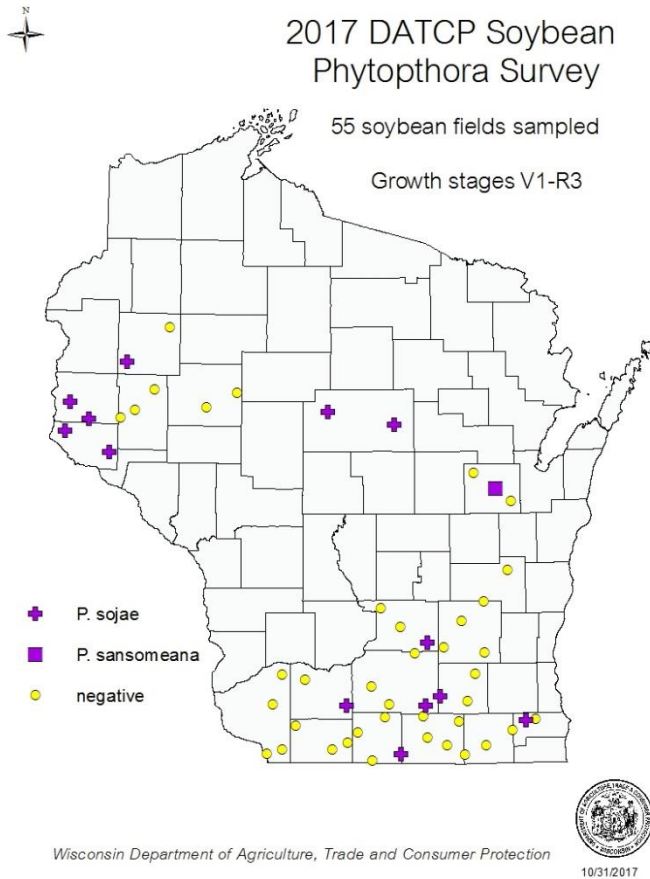
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Virus screening of corn continues to show no evidence of high plains virus (HPV), wheat streak mosaic virus (WSMV) or Maize chlorotic mottle virus (MCMV) in Wisconsin. A few fields in Dane county have a history of sugarcane mosaic virus (SCMV), formerly called maize dwarf virus (MDMV).

Peppers: Thirteen varieties of field and greenhouse-grown seed production peppers were tested for pospiviroids and shown free from this group of viroids that includes potato spindle tuber viroid (PSTVd). PSTVd is a pest of concern for exporters of solanaceous crops such as potatoes, eggplants and tomatoes. It has not been seen in Wisconsin in over 45 years and is considered to have been eradicated.

Early Season Soybean Phytophthora Root Rot Survey

Fifty-five soybean fields were surveyed for root rot from June 9 to 30, 2017. From each field 20 seedling roots were carefully dug up and submitted to PIB lab. Molecular testing showed that 24% (13 of 55) of samples were infected by *Phytophthora sojae*, a fungus-like pathogen that is known to cause damping-off in seedlings. This was markedly less than the 38% infected fields found in 2016. The number of fields



where of *P. sojae* is found during this annual survey varies from year to year; the lowest detection since 2008 was in 2011 with 13%, while the highest level was 49% in 2014. The map below shows *P. sojae* and *P. sansomeana* detections in 2017.

Phytophthora sansomeana was first detected in Wisconsin soybeans in 2012. In 2017, it was found again in an Outagamie Co. field. *P. sansomeana* has been documented in soybean roots in 10 Wisconsin counties (Calumet, Dane, Dodge, Dunn, Eau Claire, Green, Jefferson, Outagamie, Marathon and Sheboygan). Certain isolates of *P. sansomeana* have been reported to be pathogenic on soybean and corn. It has also been found on Christmas tree roots in Wisconsin.

Our survey has documented four other *Phytophthora* species in soybean roots: *P. pini*, *P. sp. "personii"*, *P. inundata* and *P. iranica*. So far no significant impact on soybean production has been observed by these four species.

A closely related root rot pathogen, **Pythium**, was encountered in almost all fields. 96% (53 of 55) of fields tested positive in 2017. Data going back to 2011 shows between 96 and 100% of fields infected each year. A remarkable diversity of *Pythium* species is known to occur in soybean fields. *Pythium* also often occurs in mixed infections with other pathogens, complicating effective control strategies.

Generally Phytophthora and Pythium disease pressure is higher under wet spring conditions, with Pythium favored by cooler and Phytophthora by warmer temperatures.

Cereal and corn cyst nematodes

This survey was conducted to look for exotic cereal cyst nematodes in cereal and corn producing fields of Wisconsin. Nematodes are microscopically small worm-like creatures that parasitize crops and affect their health and productivity. Females of this group of nematodes form pinhead-sized cysts that are filled with eggs containing worm-shaped juveniles ready to hatch and infest more roots. The cysts turn into tough resting bodies that can remain in the soil with eggs remaining viable for decades. Cyst nematode examples of economic significance are: soybean cyst nematode, which is widespread in Wisconsin, and the potato cyst nematode, which is not known to be present in this state.

Cereal cyst nematodes feed on small grains and are among the most important nematode pests of small grains. Symptoms on wheat are stunted plants, reduced tillering, chlorotic leaves, and shallow, bushy roots. This survey specifically targeted the following cereal cyst nematodes: *Heterodera filipjevi*, present in Europe, Asia and recently discovered in three wheat producing Northwestern states; *Heterodera latipons*, the Mediterranean cereal cyst nematode; and *Punctodera chalcoensis*, the Mexican corn cyst nematode. These exotic cyst nematodes could potentially impact trade and yield if they were accidentally introduced to Wisconsin.

The survey also included *Heterodera avenae*, a cereal cyst nematode that's widespread in North America, Asia, Europe and North Africa, to assess its prevalence in Wisconsin.

The survey was conducted in counties containing the majority of the wheat acreage in the state (Brown, Calumet, Columbia, Dane, Dodge, Door, Fond du Lac, Green, Jefferson, Kewaunee, Manitowoc, Outagamie, Racine, Sauk, Rock, Sheboygan, Walworth and Winnebago). Wheat is the main host for *H. filipjevi* and *H. latipons*. Corn, host for *P. chalcoensis*, is also grown in these counties.

Table 1. shows cyst nematode species detected during 2015 and 2016 field surveys. 198 soil samples were collected from 4-17 to 11-2-2015. 114 soil samples were collected from 7-20 to 12-7-2016.

Table 1. Soil survey results	2015		2016	
	Number of fields infested	Percent of samples	Number of fields infested	Percent of samples
Soybean cyst (<i>Heterodera glycines</i>)	29	15%	22	19%
Soybean cyst-like (<i>Heterodera spp.</i>) including Clover cyst (<i>H. trifolii</i>)	14	7%	7	6%
Cactus cyst-like (<i>Cactodera spp.</i>)	12	6%	4	4%
Cereal cyst (<i>Heterodera avenae</i>)	0	0%	0	0%
Exotic cereal cyst (<i>Heterodera filipjevi</i>)	0	0%	0	0%
Mediterranean cyst (<i>Heterodera latipons</i>)	0	0%	0	0%
Mexican corn cyst (<i>Punctodera chalcoensis</i>)	0	0%	0	0%
Total positive samples	55	28%	29	25%

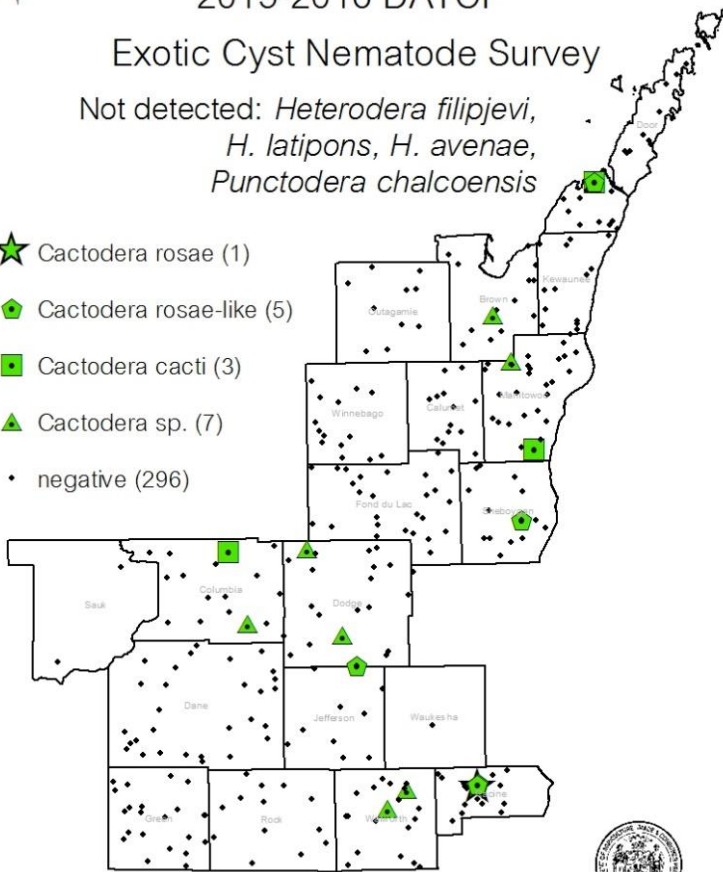


2015-2016 DATCP

Exotic Cyst Nematode Survey

Not detected: *Heterodera filipjevi*,
H. latipons, *H. avenae*,
Punctodera chalcoensis

- ★ *Cactodera rosae* (1)
- ◊ *Cactodera rosae*-like (5)
- *Cactodera cacti* (3)
- ▲ *Cactodera* sp. (7)
- negative (296)



Wisconsin Department of Agriculture, Trade and Consumer Protection

Year	Wheat	Oat	Corn
2015	91	9	98
2016	89	3	22

Soil sampling was conducted during the growing season by collecting 15-20 soil cores from randomly chosen fields. Soil samples were taken to Plant Industry laboratory for cyst extraction and identification. Cysts were screened under 20 to 400X magnification and prepped for gene-based testing such as species specific PCR and sequence analysis.

Cyst nematode species identified during surveys in 2015 and 2016. The three targeted exotic cereal cyst nematodes were not detected in Wisconsin. *H. filipjevi*, *H. latipons* and *Punctodera chalcoensis* have never been reported in this state.

Roughly a quarter of fields tested contained other cyst nematode species. Soybean cyst nematode (*Heterodera glycines*), an economically significant pest of soybeans, was found in 15% (2015) and 19% (2016) of fields. These fields were most likely planted with soybeans as a rotational crop at some point in time. Other cyst nematodes in the genus *Heterodera* including clover cyst (*H. trifolii*) were detected in 7% (2015) and 6% (2016) of fields. Clover cysts infest clovers and legumes but not corn or cereals. They are not an economically significant pest, however they can be confused with soybean cyst nematode. There were no finds of *Heterodera avenae* which would be the most likely cereal cyst nematode to occur in Wisconsin cereal fields.

Cactodera cysts were found in 6% (2015) and 4% (2016) of fields surveyed. *Cactodera* species such as *C. cacti*, *C. weissii* and *C. milleri* have been documented in this state. They are usually found on non-crop hosts and are probably feeding on weeds in cereal and corn fields.

Cactodera rosae was found in a Racine Co. corn field for the first time in Wisconsin during the 2015 soil survey. DNA-testing detected more *Cactodera rosae*-like cysts in wheat fields in Dodge and Racine Counties and in corn fields in Door and Sheboygan Counties. In each case very few cysts were recovered. These finds suggest that *C. rosae* may be widespread. There is no information at this point if this nematode has any effect on wheat, oats or corn in this state.