2018 CROP DISEASE Surveys

DATCP Plant Industry Bureau Laboratory
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2018 CROP DISEASE SURVEYS

Pest Survey Team and Plant Industry Laboratory survey for new diseases & pests

and conduct field inspections to support export certification.

Thank you Pest Survey Team:
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2018 CROP DISEASE SURVEYS

OVERVIEW

- Emerging corn diseases
- Common corn diseases
- Pathway Survey of Fruits and Vegetables
- Soybean cyst nematode
- Phytophthora and Pythium on soybeans

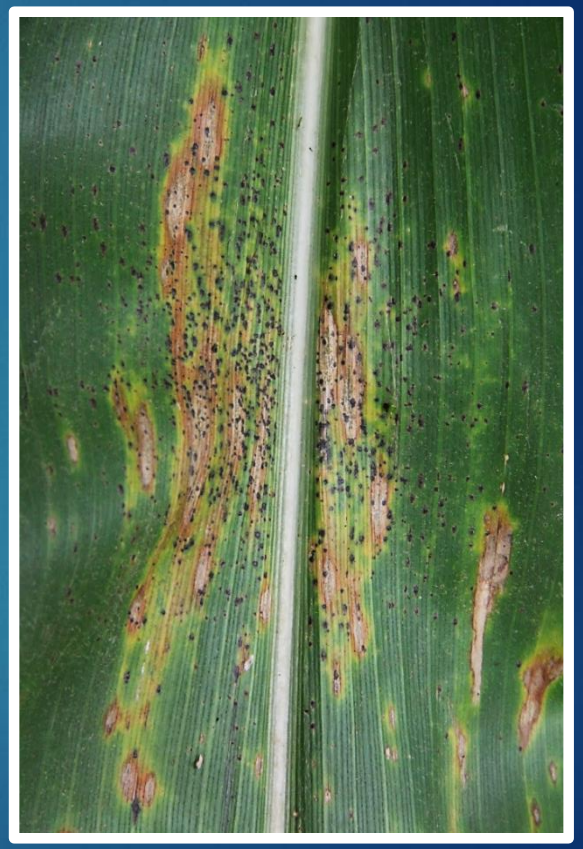
https://datcp.wi.gov/Pages/Programs_Services/PlantIndustryLab.aspx

EMERGING DISEASES OF CORN

Tar spot of corn

Phyllachora maydis

- First reported in US in 2015 (IL and IN)
- First report in Wisconsin in 2016
  (Green and Iowa Counties.)
  again in 2017 according to UW reports.
  (Grant and Lafayette Counties)
- In 2016 and 2017 disease was of minor importance in Wisconsin but in 2018….



Tar spot symptoms on corn leaf

TAR SPOT OF CORN

Major outbreak in the Midwest in 2018

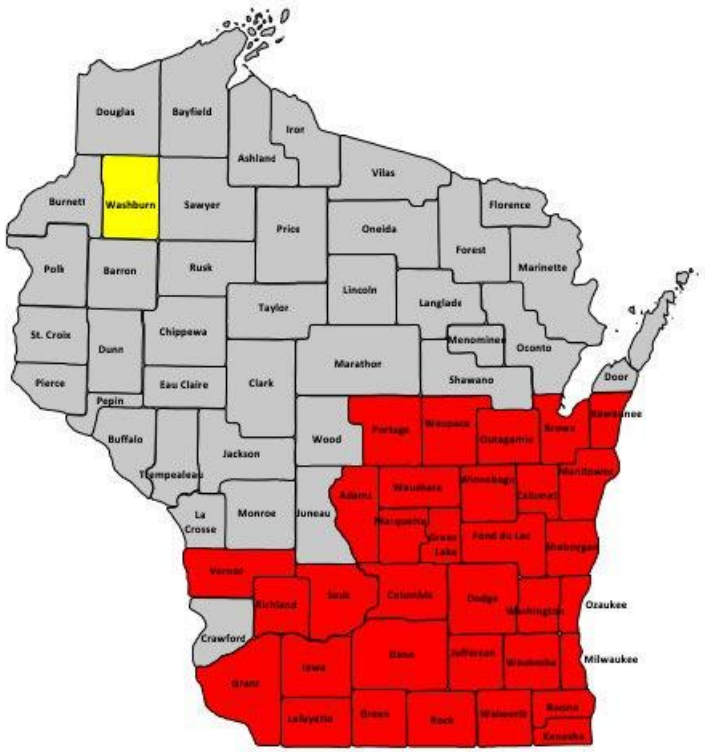
2018 Tar Spot Lab Confirmations – Wisconsin

= Confirmed

= Suspected but negative

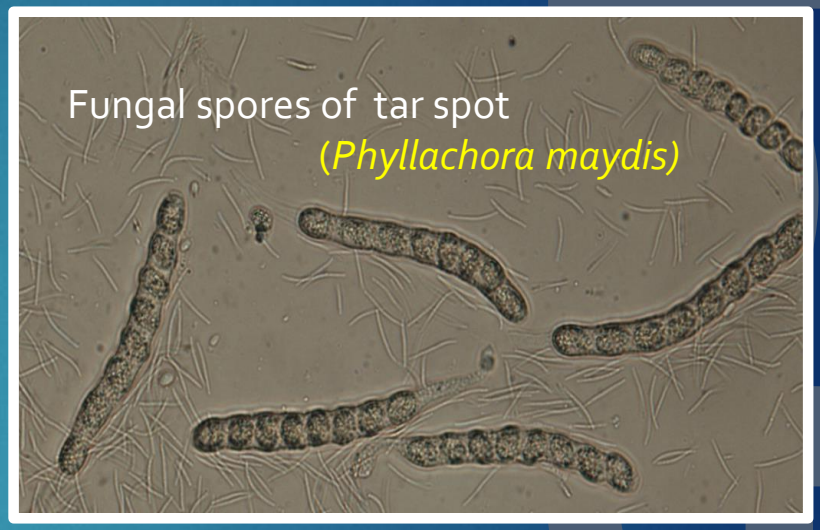
= Not tested

Updated: 10/19/18



TAR SPOT OF CORN

Phyllachora maydis



- Tar spot infects only corn.
- Not seed borne.
- Spreads with fresh or dried corn leaves and husks.
- Seems to overwinter in Wis.

- Tar spot occurs at high elevations in Mexico, Central and South America.
- Crop losses occur there when tar spot infections are colonized by second fungi *Monographella maydis* and a third fungi *Coniothyrium phyllachorae*.

- TAR SPOT COMPLEX

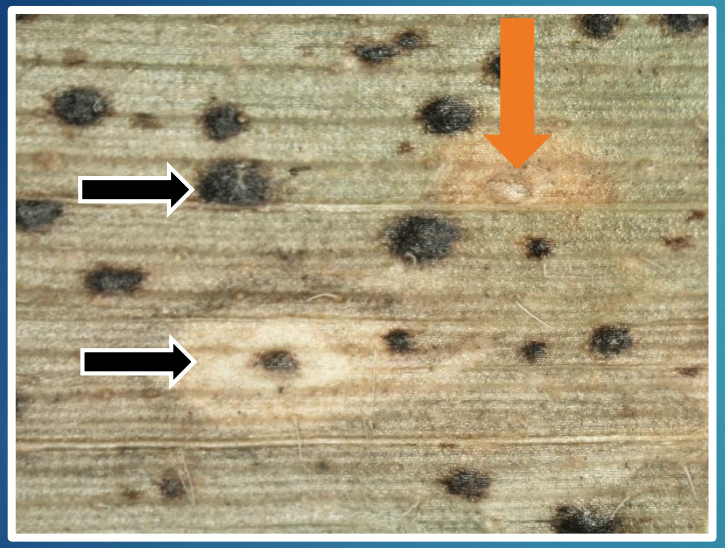
TAR SPOT OF CORN

Two types of tar spot symptoms on a corn leaf.

Simple black spots on the left and fisheye-like shaped lesions on the right.

TAR SPOT AND RUST SYMPTOMS

Southern rust single pustule and Tar spot symptoms on corn leaf

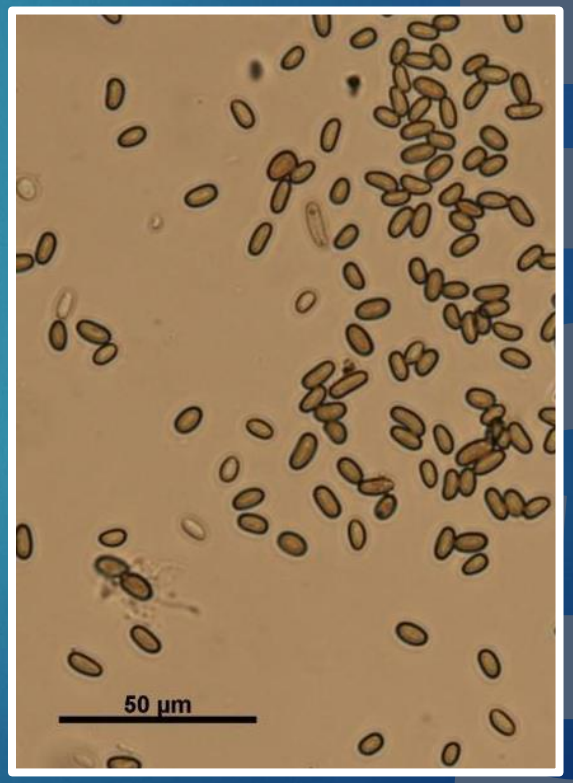


Common rust pustule (telium) late season symptoms on corn leaf

- Traces of Southern corn rust (*Puccinia polysora*) in 3 fields in
- Walworth, Richland and Sauk Counties.

TAR SPOT COMPLEX

Tar spot fisheye lesions with sporulating Coniothyrium sp.



Coniothyrium spores magnified 400X

TAR SPOT COMPLEX

Gene-based testing identified
Coniothyrium sp./ Paraphaeosphaeria sp.

Monographella maydis was not observed in Wisconsin.

OTHER FUNGAL DISEASES

Frequently detected on tar spot infected corn.

% detection out of 36 tar spot subsamples.

- Gray leaf spot (*Cercospora zeae-maydis*) 100%
- Anthracnose *(Colletotrichum graminicola*) 97%
- Northern corn leaf blight (*Setosphaeria turcica*) 44%
- Northern corn leaf spot (*Cochliobolus carbonum*) 31%

Incidental finds

- Alternaria, Epicoccum, Fusarium, Phyllosticta, and Septoria.

More research is needed!

Gray leaf spot
(*Cercospora zeae-maydis)*

EMERGING DISEASES OF CORN

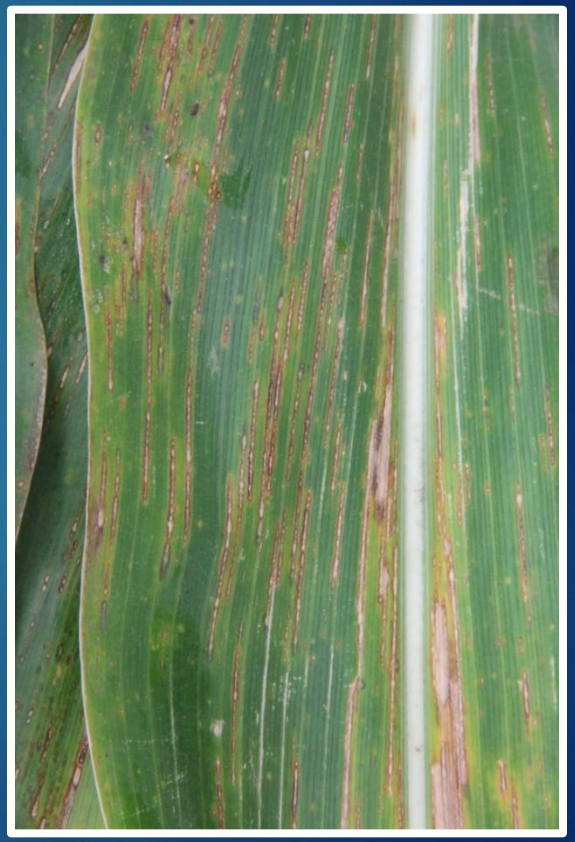
Xanthomonas bacterial blight of corn

Xanthomonas vasicola pv. vasculorum.

- First find in Wisconsin September 2018 by UW Field Crops Pathology & UW Diagnostic Clinic.
- Distribution in US in 2018: CO, IL, IA, KS, MN, NE, OK, WI, SD, TX .

- It was first reported in the Republic of South Africa in 1949.
- Not a regulated disease. No significance for trade.

- Symptoms of Northern corn leaf spot race 3 (*Cochliobolus carbonum*) can be confused with bacterial blight.



Symptoms of Northern corn leaf spot race 3

BACTERIAL BLIGHTS OF CORN

- No Stewart's wilt since 2010.

- No Goss's wilt in 2018.
- 11.5% Goss's wilt in 2017.

VIRUSES OF CORN

- No Maize Chlorotic Mottle Virus (MCMV)
- No High Plains Virus (HPV)
- No Wheat Streak Mosaic virus (WSMV)
- No Sugarcane Mosaic Virus (SCMV)

  syn. Maize Dwarf Mosaic Virus (MDMV)


Sugarcane Mosaic Virus **(SCMV)**

PATHWAY SURVEY FOR EXOTIC DISEASES

- Bundled fruit and vegetable crop survey of:
- Community gardens,
- Community supported agriculture (CSA) farms,
- Small immigrant farms,
- Great diversity of crops.
- Potentially multiple pest and disease organisms at each survey site.
- Elevated risk of pest introduction.
- Close proximity to urban areas.
- Metropolitan areas of Madison, Milwaukee and La Crosse.

PATHWAY SURVEY FOR EXOTIC PESTS & DISEASES

- 13 Exotic insect species & 12 plant pathogens.
- Regulated, export certification or economically significant.
- Networking with UW Extension, IPM Institute.
- Raise awareness of new invasive pests and diseases.
- Early detection.

PATHWAY SURVEY FOR EXOTIC DISEASES

- CSA's: 16
- Community gardens: 19
- Orchards / vineyards: 21
- Scouts: 5
- Bi-weekly visits
- May 31 to Oct 16, 2018

TARGET DISEASES in CSA's & COMMUNITY GARDENS

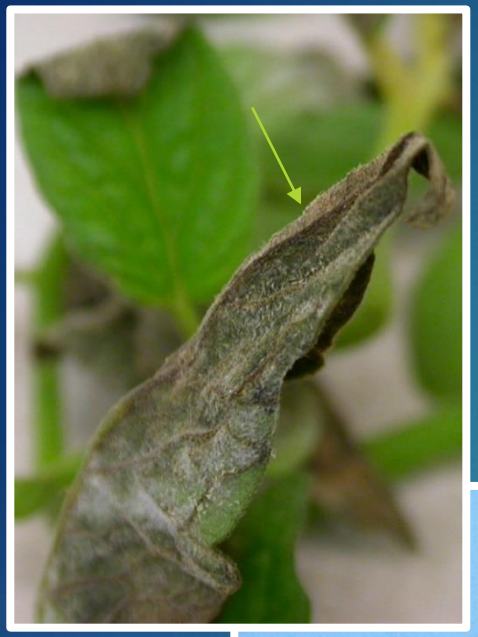
Host Crop	Disease	Pathogen
Tomato, pepper	Bacterial wilt & canker	Clavibacter michiganensis michiganensis
Tomato, potato, pepper	Late blight	Phytophthora infestans
Onion, garlic, bulb	Stem and bulb nematode	Ditylenchus dipsaci
Corn	Java downy mildew	Peronosclerospora maydis
Corn	Philippine downy mildew	Peronosclerospora philippinensis
Cucurbit	Downy mildew of cucurbits	Peronosclerospora cubensis
Cucurbit	CGMMV	Cucumber green mottle mosaic virus

BACTERIAL WILT & CANKER

Clavibacter michiganensis michiganensis

- Tomato, pepper
- Transmitted by seed and plants.
- Survives only on plant matter.
- Present in U.S.

- Economically significant disease.
- Can affect certification for export.
- Not detected during survey.



LATE BLIGHT

Phytophthora infestans

- Tomato, potato
- Introduced by infected plants, seed tubers.
- Does not overwinter in WI.
- Regulated, state law.

Late blight infected leaves and fruit with fuzzy layer of sporangia.

COMMON TOMATO PROBLEMS

Environmental

Septoria leaf spot

Early blight, *Alternaria solani*

STEM AND BULB NEMATODE

Ditylenchus dipsaci

Note the lack of roots from base of bulb.

- Hosts: Onion, garlic, bulb flowers.
- Economically significant disease in garlic production.
- Present in US.
- Introduced with infected bulbs.
- No stem and bulb nematode detected during survey.

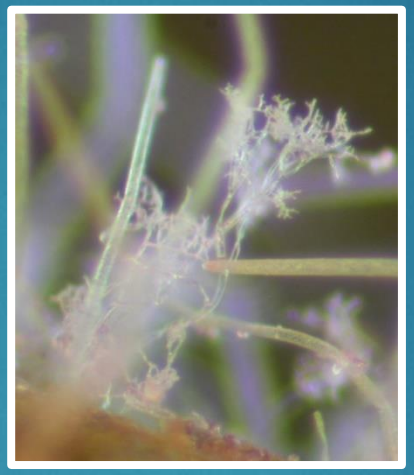
BACTERIAL SOFT ROT

- No stem and bulb nematode.
- Bacterial soft rot was found.

CUCURBIT DOWNY MILDEW

Peronosclerospora cubensis

Checkerboard like downy mildew symptoms on upper side of leaf.



Fuzzy downy mildew fungal structure on lower side of leaf.

Angular leaf blight symptoms caused by Pseudomonas lachrymans bacteria.

- Host: Cucurbits
- Economically significant disease.
- Not regulated. Present in US.
- Blown in from south, does not overwinter in WI.

PHILIPPINE DOWNY MILDEW

Philippine Downy Mildew.
Bob Kemerait, University of Georgia, Bugwood.org

Peronosclerospora philippinensis

- Select Agent
- Not present in the US.
- Distribution Asia, Africa

- also similar
  JAVA DOWNY MILDEW
- Peronosclerospora maydis

- Neither detected during survey.

BASIL DOWNY MILDEW

Peronospora belbahrii

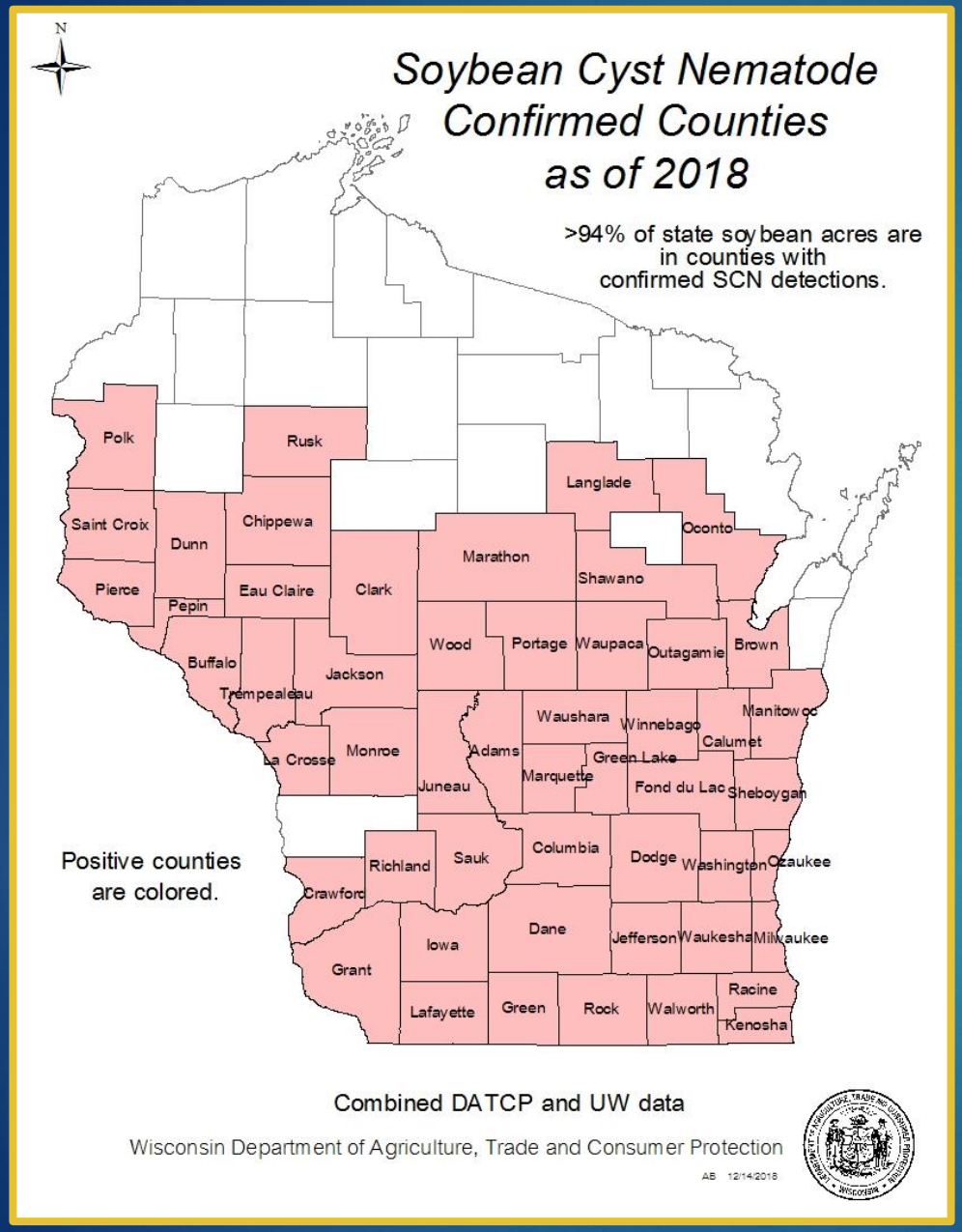
Basil downy mildew symptoms on basil.

- The pathogen is spread on seed, on infected plants, and by wind.
- Very destructive on culinary basils.
- Prevention is only management option.
- First Detection in US 2007.
- First detection in WI in 2010.
- 2018 detection in La Crosse Co. community garden, other Wisconsin reports.
- Common in Africa, Europe, New Zealand.

PATHWAY SURVEY FOR EXOTIC DISEASES

- No target diseases were detected.
- 18 Suspect target disease samples were submitted to PIB Lab.
- Other diseases were identified.
- Building network.
- Outreach to urban farmers.
- Produced factsheets for cooperators.
- Updates to lab technology.

Zucchini with Fusarium rot



- Few new county detections: Langlade Co. in 2017, Marathon Co. in 2013.
- First detection in Wisconsin was in Racine Co. in 1981.

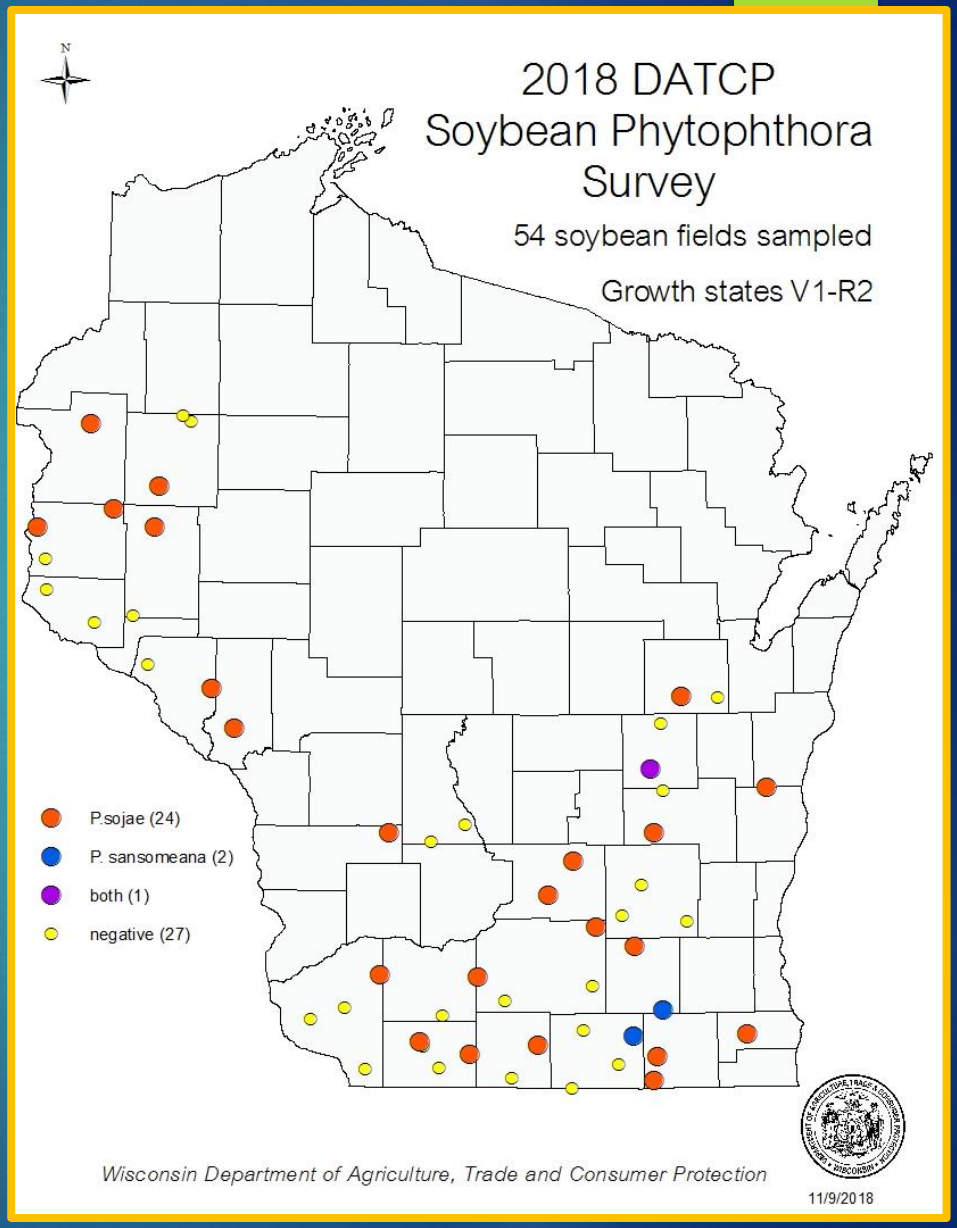
Soybean cyst

PHYTOPHTHORA ON SOYBEAN

- In 2018, 54 fields surveyed.

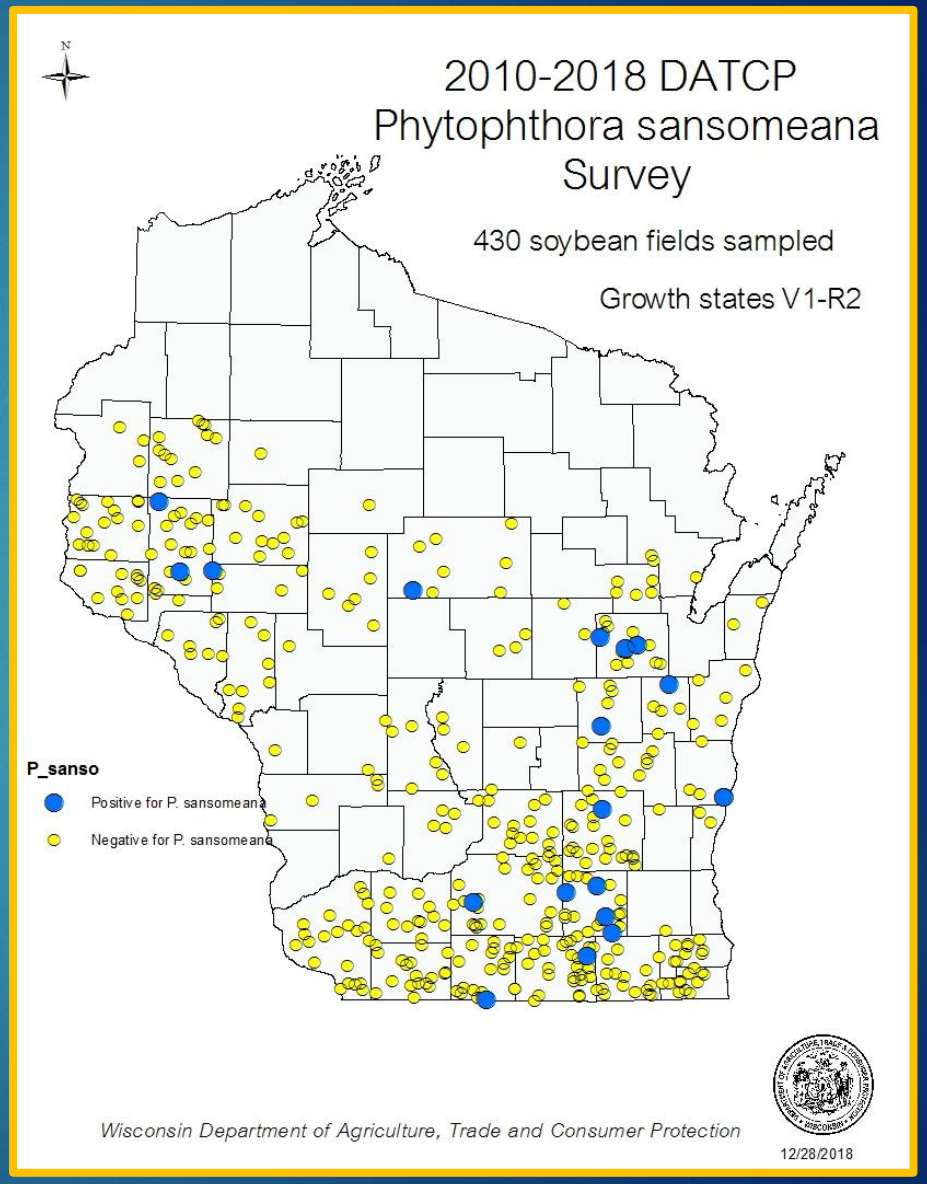
- 46% positive for *P. sojae (25/54)*.
- 24% positive for *P. sojae in 2017 (13/55)*.
- Over 10 years of annual survey 13% to 49% fields infested.

- *P. sansomeana* was found in
- Jefferson, Rock and Winnebago Counties.
- Rock and Winnebago are new County detections in 2018.



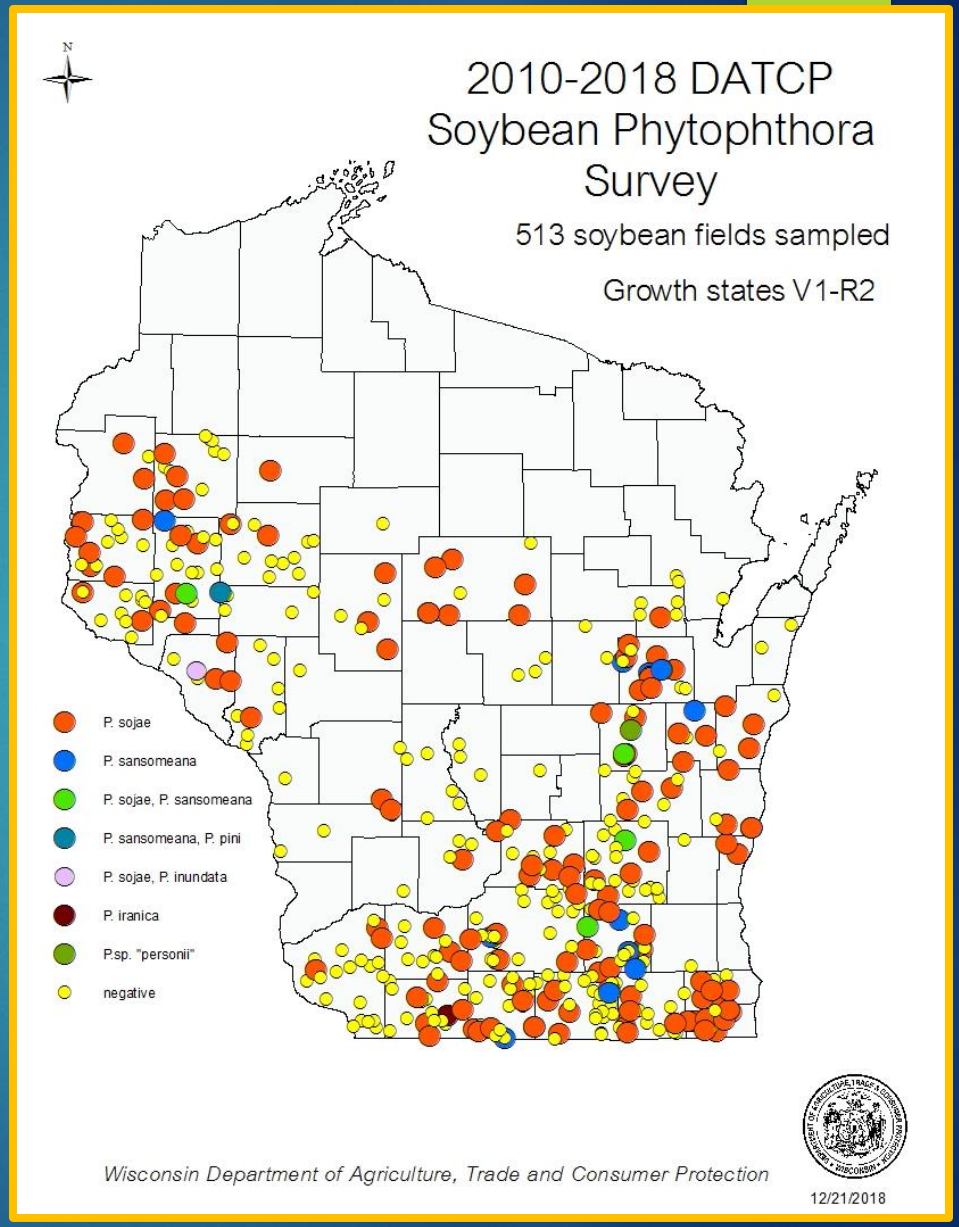
PHYTOPHTHORA ON SOYBEAN

- *P. sansomeana* present on soybean in 12 WI counties:
  Calumet, Dane, Dodge, Dunn, Eau Claire, Green, Jefferson, Marathon, Outagamie, Rock, Sheboygan and Winnebago.
- *P. sansomeana* also found on Balsam and Fraser fir in Christmas tree fields in:
  Clark, Jackson, Lincoln, Manitowoc, Marathon, and Price County.
- *P. sansomeana* in 17 WI counties.



PHYTOPHTHORA ON SOYBEAN

- Annual surveys identified 6 different Phytophthora species on soybeans in WI.
- *P. sojae* only affects soybean.
- *P. sansomeana* (2012) affects both soy and corn.
- *P. pini*, *P. sp. personii* *(2014)*
- *P. inundata*, *P. iranica* (2015) effect on soybeans unknown.



PYTHIUM AND OTHER OOMYCETES ON SOYBEAN

- 2011 - 2018 Surveyed total of 320 fields.
- Pythium was present in 96-100% of fields.
- 16 Pythium species
- 1 Pythiogeton
- 1 Phytopythium

Root rot affected soybean roots

PLANT INDUSTRY LABORATORY

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

Phyllosticta leaf spot on rhubarb

THANK YOU!

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