

# ANNUAL REPORT 2022

## Plant Industry Bureau



Wisconsin Department of Agriculture,  
Trade and Consumer Protection  
2811 Agriculture Drive Madison, WI  
(608) 224-5012 | <https://datcp.wi.gov>



# About the Plant Industry Bureau

---

The Plant Industry Bureau protects Wisconsin's agricultural and horticultural industries and native plants by overseeing and ensuring compliance with laws and regulations involving plant pests, honeybees, nursery plants, Christmas trees, firewood, and seed. The bureau implements programs designed to prevent the introduction and spread of harmful plant pests and diseases, especially regulated introduced, invasive species.

## Our Programs

Plant Industry Bureau programs include inspection, export certification, quarantine, and survey activities. The bureau also facilitates interstate and international commerce of Wisconsin agricultural products and commodities by certifying plant health and the pest-free status of plants and plant products.

## Our Partners

To carry out its mission, the bureau maintains partnerships with the United States Department of Agriculture Animal and Plant Health Inspection Service (USDA APHIS), the USDA Forest Service (USDA FS), the Wisconsin Department of Natural Resources (DNR), the University of Wisconsin (UW), tribal nations, and other state and federal agencies.







---

# CONTENTS

02	About the Plant Industry Bureau
05	Plant Protection Section
06	Apiary
08	Nursery
14	Christmas Trees
16	Export Certification
19	Forest Pest Regulatory
21	Seed Labeling
22	Potato
23	Pest Survey & Control Section
24	Plant Industry Lab
27	Forest Pests
29	Spongy Moth
31	Commodity Crops
36	Fruit and Vegetables
37	Plant Pest and Biocontrol Permits





Department of Agriculture, Trade  
and Consumer Protection

**APIARY PROGRAM**

## APIARY PROGRAM NEWS

WISCONSIN DATCP

## Our E-Newsletters

---

The Plant Industry Bureau began offering its first email newsletter, *What's Growing On?* in 2021, followed by *Field Notes* and *Apiary Program News* in 2022. These three publications are written and compiled entirely by bureau staff, with distribution through the GovDelivery platform. Our e-newsletters are direct and effective outreach tools for reporting survey and inspection results, providing updates on plant pest interceptions and new detections, and informing readers about Wisconsin's plant protection regulations.

### Apiary Program News

This quarterly newsletter provides program updates, inspection results, apiary import requirements, and honey bee and wild pollinator information. *Apiary Program News* also promotes best management practices in Wisconsin's Pollinator Protection Plan and is distributed to over 2,600 subscribers.

### What's Growing On?

Issued monthly, this publication highlights important finds from our nursery and Christmas tree inspections. *What's Growing On?* also provides licensing information and timely program updates. This publication is issued to 4,100 subscribers, including nursery dealers, nursery growers, licensed Christmas tree growers, and the public.

### Field Notes

This weekly Pest Survey Program update features articles on economically important plant pests affecting the state's field crops, fruits, vegetables, and forests, along with pest monitoring data and maps. *Field Notes* is emailed regularly during the growing season (April through August), and less frequently during the fall and winter months, to 3,000 subscribers.



Department of Agriculture, Trade  
and Consumer Protection

**NURSERY PROGRAM**

## WHAT'S GROWING ON?

WISCONSIN DATCP



Department of Agriculture, Trade  
and Consumer Protection

**PEST SURVEY PROGRAM**

## FIELD NOTES

WISCONSIN DATCP



# Plant Protection Section



As the regulatory section of the Plant Industry Bureau, the Plant Protection Section works to detect, intercept, and prevent the spread of harmful plant pests that threaten Wisconsin's native and commercially grown plants and agricultural resources. Licensing, inspection, and certification are the major emphases of the section.

The section enforces Wisconsin statutes and departmental rules pertaining to the movement of plants, plant products, and honey bees.

---

## Plant Protection Programs

Apiary

Nursery and Christmas Tree

Export Certification

Seed Labeling and Compliance

Firewood Certification

Forest Pest Regulatory

Potato Program



# Apiary Program

The Apiary Program works to reduce the risk and spread of honey bee diseases and pests in Wisconsin, and to promote pollinator protection. Program activities include honey bee hive inspections (provided to beekeepers for free, upon request); enforcement of Wisconsin Honey Bee Import Report requirements and other honey bee pest regulations; pollinator outreach and education; and inspection/certification of honey bee colonies leaving the state, typically for pollination services.

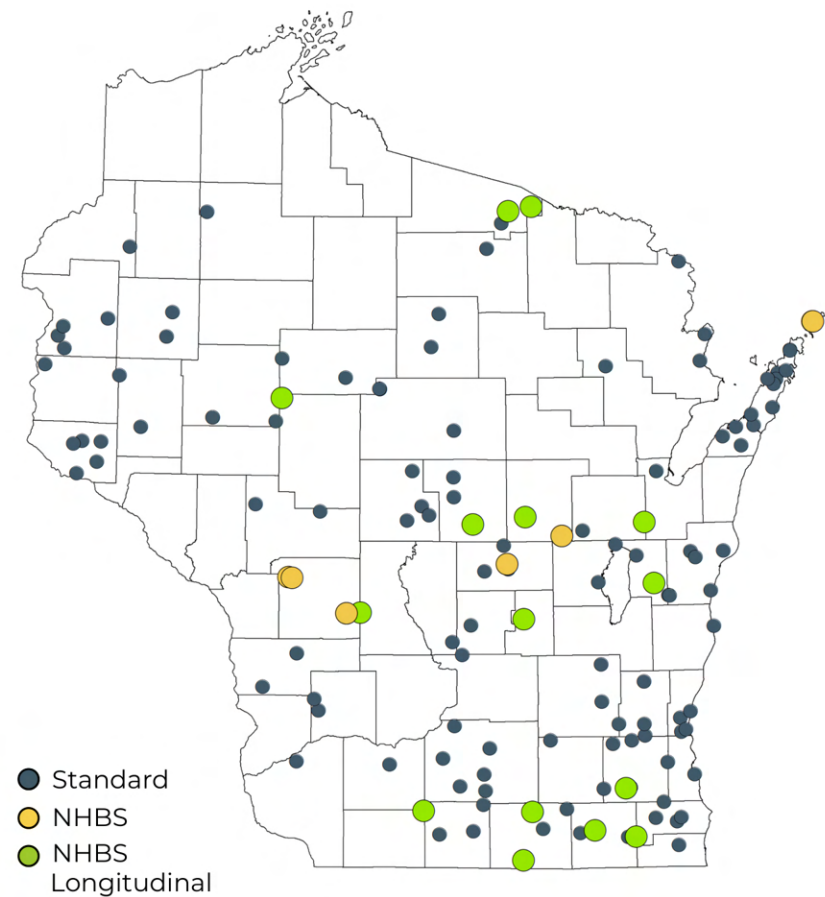
Apiary program staff conducted 234 voluntary inspections and opened approximately 1,462 hives across Wisconsin in 2022.

For the 12th year, the program participated in the USDA National Honey Bee Survey (NHBS) to track markers of colony health and monitor for invasive honey bee threats. Colonies were inspected and sampled for Varroa mites, *Tropilaelaps* mites, *Nosema* levels, and viral pathogens, with testing performed at the USDA ARS Bee Research Lab. Samples were also analyzed for pesticide residues at the USDA AMS National Science Lab. To date, no Wisconsin samples have tested positive for exotic threats, including *Tropilaelaps* spp., *Apis mellifera capensis*, or Slow Bee Paralysis Virus. Final pesticide load test results are pending. All NHBS data is summarized by state and available to the public on the Bee Informed Partnership research portal at <https://research.beeinformed.org/>.

## Apiary Inspection results 2020-2022

	2020	2021	2022
Total hives opened	2,396	2,266	1,462
Varroa mite	65%	41%	58%
Small hive beetle	2.1%	1.1%	2.1%
American foulbrood	0.6%	0.1%	0.0%
European foulbrood	1.2%	1.4%	0.4%
Chalkbrood	8.3%	5.2%	1.4%
Sacbrood	9.7%	8.4%	2.2%
Deformed wing virus	9.3%	4.2%	1.4%
Est. winter mortality	20%	42%	68%

Standard apiary inspections found decreases in five of the seven honey bee pests and diseases tracked. Deformed wing virus incidence decreased from 4.20% in 2021 to 1.42% in 2022 and no American foulbrood was detected for the first time in five years.



Map 1. Apiary Inspections Conducted in 2022



# Apiary Program

In contrast, Varroa mite incidence increased from 41% in 2021 to 58% in 2022. Colony winter losses, as reported through our inspection survey questionnaire, increased from 42% in 2021 to 68% in 2022 and exceeded the 24% national average.

In 2022, the program issued 62 Certificates of Apiary Inspection for about 33,000 migratory hives, primarily destined for California and Texas for pollination services. The certificates are valid for one year from the date of issuance and serve as honey bee health documentation to support the interstate movement of honey bees.

## Apiary Technical Rule Change

DATCP initiated a technical rule change process in 2022 to remove obsolete language from State of Wisconsin Administrative Code, including parts of ATCP 21.13, as well as ATCP 29 and ATCP 35 pertaining to pesticide programs. Proposed apiary-related changes include removing the requirement for honey bee hives to be apparently free of Varroa mites (which are now ubiquitous) and eliminating references to the outdated Fast Africanized Bee Identification System (FABIS) diagnostic manual for defensive or Africanized honey bees. A public hearing was conducted December 16, 2022 and changes are expected to be finalized in 2023.

## Apiary Outreach

Apiary outreach continued to increase in 2022 with the addition of a full-time program coordinator and a part-time seasonal inspector who conducted winter outreach work. In addition to creating an e-newsletter and posting monthly social media updates, program staff delivered 14 talks throughout the state, including at PBS Wisconsin's annual Garden & Landscape Expo, which was also livestreamed on YouTube.



Apiary inspection | DATCP



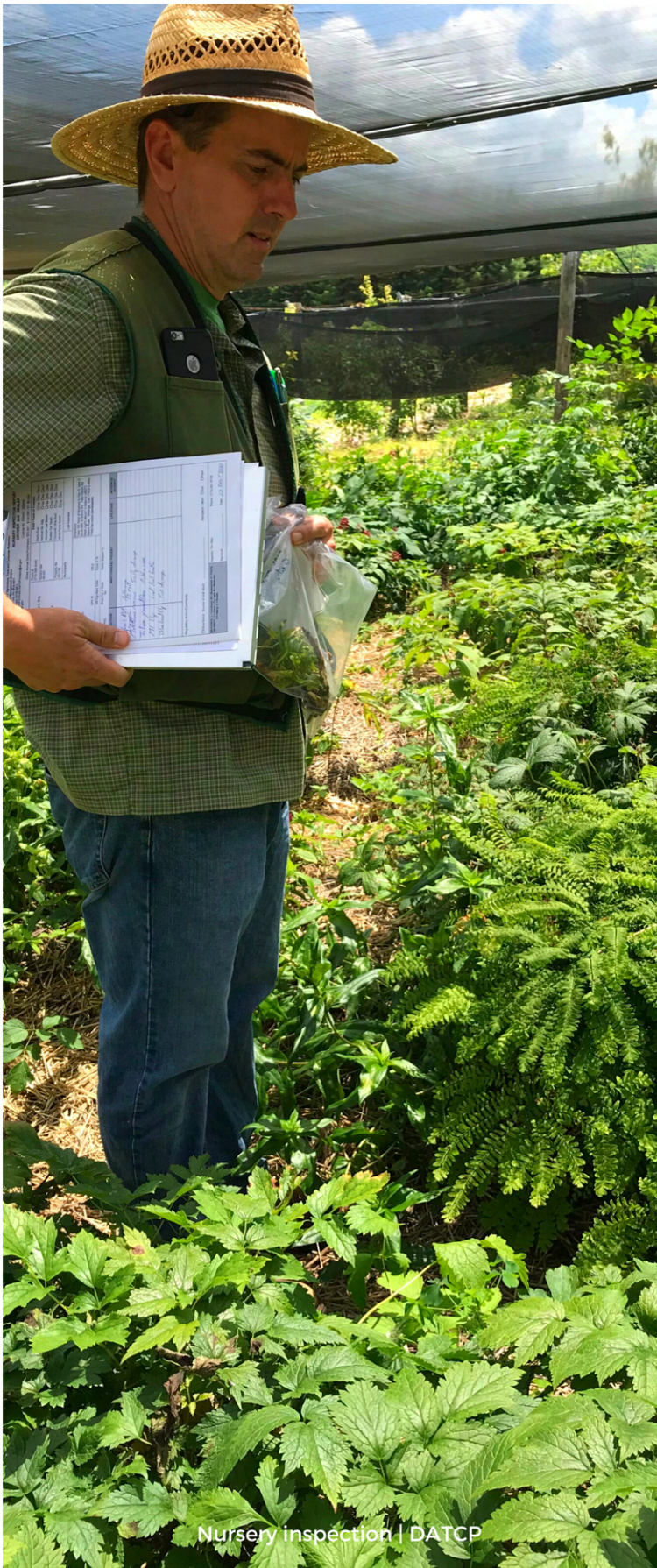
# Nursery Program

The Nursery Program licenses and certifies nursery stock growers and dealers, and provides inspections emphasizing regulatory pests. Nursery inspections promote the production and sale of healthy plants and facilitate interstate commerce through the issuance of over 100 nursery Plant Health Certificates annually. The program also inspects nursery stock imported into Wisconsin to prevent the introduction and spread of pests and diseases. DATCP inspectors partner with DNR staff to ensure invasive plants regulated under the DNR Invasive Species Rule (NR 40) are not sold at nurseries.

The program licensed 610 nursery growers and 1,237 nursery dealers in 2022, with staff inspecting 488 (57%) growing field locations and 617 (25%) dealer locations statewide. Annual inspections prioritized the 116 licensed nurseries who purchased Plant Health Certificates (PHCs), indicating intent to ship plant stock interstate.

## Nursery inspection summary 2021-2022

	2021	2022
Nursery growers licensed	611	610
Nursery grower fields inspected	317	488
Nursery dealers licensed	1232	1237
Nursery dealers inspected	422	617
Plant Health Certificates	115	116
Compliance Agreements	84	87
Licensing violations	16	15
Labeling violations	5	6
Quarantine violation	0	2
NR-40 violations	37	84
Rejection notices sent	14	15



Nursery inspection | DATCP



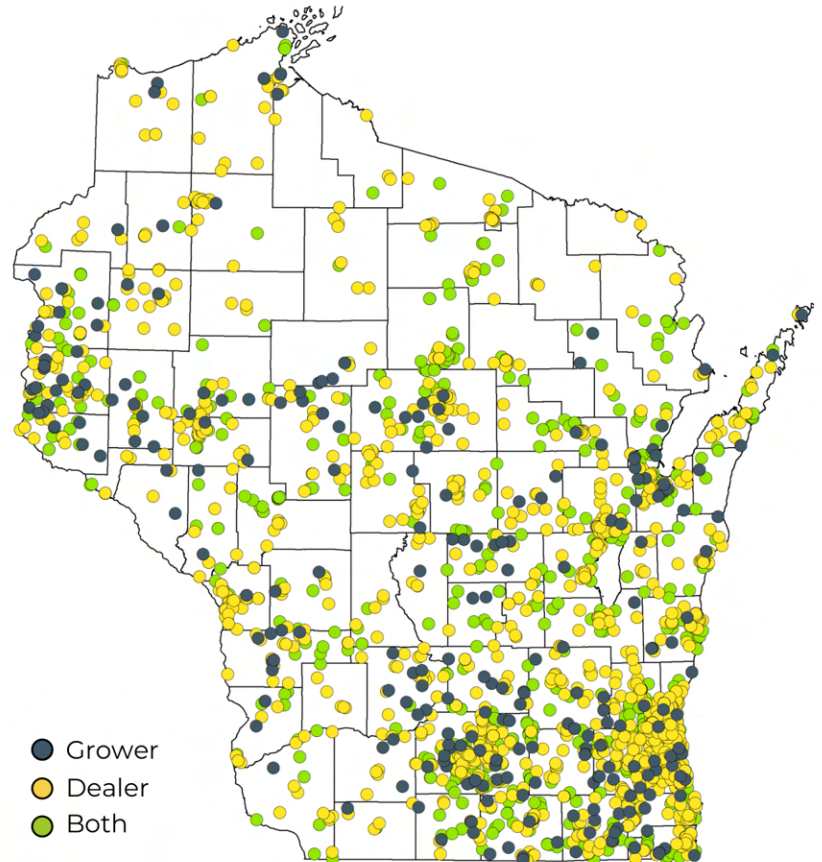
# Nursery Program

As a measure to increase awareness of Wisconsin's plant pest regulations, 15 rejection notices were sent to seven states for unwanted invasive plants, viruses, and scale insects. Inspectors also continued to educate and enforce the NR-40 Invasive Species Rule in nurseries. Routine inspections found 84 incidents of restricted or prohibited invasive plants for sale at 56 nursery locations, up from 37 incidents at 29 locations in 2021. The marked rise was partly the result of shipments of Japanese honeysuckle from a Minnesota nursery to 18 Wisconsin locations.

Inspectors issued 66 compliance documents in 2022 (i.e., activity reports, orders prohibiting sale, pest abatement orders, and warning notices), including 35 for invasive plant sales, 15 for licensing violations, eight for incidents related to pests, six for labeling violations, and two for quarantine violations. One of the quarantine violations involved the sale of 'Purple Plume' barberry at 17 big box stores. This cultivar is prohibited by the black stem rust quarantine. The other violation involved the import of hemlock trees from a hemlock woolly adelgid (HWA)-infested area without a compliance agreement. An order was issued for 10 imported hemlocks to be destroyed, including three trees that had already been installed.

## Nursery Compliance Agreements issued in 2022 were as follows:

- 35 spongy moth
- 33 hemlock woolly adelgid
- 16 Japanese beetle
- 5 black stem rust of wheat
- 3 boxwood blight cleanliness
- 2 blueberries to Michigan



**Map 2. Nursery Inspections Conducted in 2022**

### Transition to Mobile Data Collection

A significant Nursery Program advancement made this year was transitioning from paper inspection forms to Survey123, a digital GIS-based application. Survey123 simplified data collection, decreased mailing costs and delays, and increased reporting efficiency, enabling inspectors to email reports to license holders within 24 hours of the inspection. Program staff also distributed licensing information and other program updates through its e-newsletter, *What's Growing On?* This new publication is issued monthly to 4,100 subscribers through GovDelivery.



# Nursery Program

## Most Common Nursery Pests and Diseases in 2022

The top pests most frequently observed by nursery inspectors in 2022 were spider mites, Japanese beetle, aphids, leaf galls, thrips, and European elm flea weevil.

In addition, inspectors found viburnum leaf beetle (VLB) at 23 locations, primarily in southeastern Wisconsin. This recently established pest feeds exclusively on the leaves of viburnums, and both the adults and larvae cause severe defoliation and eventual shrub mortality. Native viburnums are an important understory component of many Wisconsin woodlands and are at risk as this insect becomes more widely distributed. Viburnum leaf beetle has been found in 14 Wisconsin counties since 2009. All VLB detections in 2022 were in previously confirmed counties.

Spongy moth life stages were found 23 times during nursery inspections, with larvae observed on stock earlier in the season and egg masses detected in August. The relatively high number of spongy moth finds in nurseries is reflective of an outbreak phase in the population cycle observed in parts of Wisconsin in 2022.

Another common pest this year was the redheaded flea beetle (*Systema frontalis*). This generalist species was observed 29 times across 13 counties in 2022, mostly on dogwood, hydrangea, and weigela.

Common diseases found in 2022 were powdery mildew, viruses, and rusts, as detailed on page 12. The top abiotic stressors were cold injury, chlorosis, sun scald, and drought stress, resulting from the cold 2021-2022 winter, nutrient deficiencies, and extended periods of hot, dry weather in June and July.



Viburnum leaf beetle defoliation | DATCP



# Nursery Program

## Ramorum Blight

DATCP continued efforts this year to prevent the introduction of *Phytophthora ramorum* into the state. *Phytophthora ramorum* is the causal organism of the diseases known as Ramorum blight and sudden oak death, which have led to significant tree mortality in the coastal forests of California and Oregon since 1995. The host list for this state and federally regulated pathogen has expanded to nearly 140 plant species, including many popular nursery trees, shrubs, and ornamentals. DATCP has intercepted *P. ramorum* on imported nursery stock in the past.

In 2022, all 26 symptomatic plants collected during nursery surveys, inspections, and as part of a trace forward event involving a consumer who received potentially infected plants, were negative for *P. ramorum*. Plants tested were andromeda (1), pieris (5), rhododendron (18), and viburnum (2). To date, *P. ramorum* has not been detected in the Wisconsin landscape.

## Viruses on Ornamentals Diagnosed at the Plant Industry Bureau Lab in 2022

Virus Name	No. of Positives	Percent Positive	No. of Plants Tested
Alfalfa mosaic virus	2	9%	23
Arabis mosaic virus	0	0%	29
Clematis chlorotic mottle	1	50%	2
Cucumber mosaic	5	9%	57
Hosta virus X	8	42%	19
Ilarvirus group	5	9%	55
Impatiens necrotic spot	3	12%	25
Lilac leaf chlorosis	4	100%	4
Potyvirus group	16	36%	44
Tobacco mosaic	10	17%	59
Tomato ringspot	0	0%	5
Tobacco rattle	27	34%	79
Tobacco ringspot	0	0%	9
Tomato spotted wilt	0	0%	43

## Viruses of Nursery Ornamentals

Inspectors collected 154 symptomatic ornamental plant samples for virus testing in 2022. Tobacco rattle virus was detected most often, with 27 positives (mainly in astilbe, bleeding heart, and peony). Potyviruses were detected in hosta, iris, monkshood, phlox, sedum, and spiderwort, for a total of 16 positive samples. Tobacco mosaic virus was found in 10 samples, while five samples were positive for Ilarviruses. Impatiens necrotic spot virus was confirmed in one sample each of begonia, dianthus, and snapdragon.

Other virus finds included alfalfa mosaic virus on arrowwood and peony; clematis chlorotic mottle virus on clematis; cucumber mosaic virus on astilbe, delphinium, and monkshood; hosta virus X on hosta; and lilac leaf chlorosis virus on lilac.



# Nursery Program

## Rusts on Ornamentals

Six different rust species were detected on ornamental plant samples in 2022. The rusts found were fir-fern needle rust on balsam fir, *Puccinastrum* sp. on balsam fir, and various *Gymnosporangium* rusts: cedar hawthorn rust on pear and hawthorn, pear rust on pear, quince rust on serviceberry, and *G. yamadae* (red star rust, also known as lipstick rust and Japanese apple rust) on apple and crabapple. Red star rust has been documented in nine counties since 2021, when DATCP's Plant Industry Lab confirmed the first official record of the disease in the state.

## Nematodes

Root knot nematodes (*Meloidogyne* spp.) were detected on two astilbe samples from nurseries in Jefferson and Racine counties. Foliar nematodes (*Aphelenchoides* spp.) were detected on seven hostas from two nurseries in Polk and Rock counties.

## Powdery Mildews on Ornamentals

Powdery mildews were found on a variety of ornamental hosts in 2022, including calibrachoa, chokecherry, delphinium, lilac, nannyberry, peony, and sedum. The mildew genera and species identified were *Erysiphe* sp., *Erysiphe viburniphila*, *Microsphaera syringae*, *Oidium* sp., and *Podosphaera* sp.

## Blueberry Scorch, Shock & Sheep Pen Hill Virus

To meet Michigan Department of Agriculture (MDA) quarantine regulations for blueberry scorch, shock, and sheep pen hill virus, Wisconsin nurseries shipping blueberry stock into Michigan must obtain a Blueberry Compliance Agreement with DATCP ensuring their blueberry plants are sampled and tested for these viruses. All 28 samples collected in 2022 passed testing.



Fir rust on balsam fir | DATCP



Powdery mildew on oak | DATCP



# Nursery Program

## Boxwood Blight

This disease of ornamental boxwood plants was first confirmed in 2018 in Wisconsin. In 2022, all 23 suspect samples collected by DATCP from 16 nurseries and retailers, and as part of a nursery-retail pathway survey, tested negative. One positive case was reported by the UW-Madison Plant Disease Diagnostics Clinic from Door County, the only detection in the state in 2022. Boxwood blight has now been confirmed at nurseries in Kenosha County, at retailers in Dane and Portage counties, and on landscape boxwoods in Dane, Door, and Milwaukee counties. Three nurseries renewed boxwood blight compliance agreements with DATCP this year.

## Hemlock Woolly Adelgid

Program staff continued to work with nurseries that import hemlock stock to ensure it comes only from

suppliers who inspect or treat the stock to prevent HWA transmission. This year, 33 nurseries and landscaping companies entered into compliance agreements with DATCP. During inspections, HWA was found on 10 imported hemlock trees at one nursery. Since the nursery did not have a compliance agreement with DATCP, the infested hemlock had to be destroyed.

## Lily Leaf Beetle

First detected in Marathon County in 2014, the invasive scarlet-colored lily leaf beetle (LLB) has now been confirmed in 21 Wisconsin counties: Brown, Calumet, Clark, Dane, Door, Langlade, Lincoln, Marathon, Milwaukee, Oneida, Outagamie, Pierce, Portage, Price, Shawano, Taylor, Vernon, Vilas, Waukesha, Waupaca, and Wood. No new counties were added to the LLB distribution map in 2022.

## Top 10 Pests, Diseases, and Abiotic Issues Found During Nursery Inspections in 2022

Pest	Count	Disease	Count	Abiotic	Count
Spider mites (spruce, maple)	260	Powdery mildews	144	Cold or winter injury	58
Japanese beetle	136	Virus-like symptoms	115	Sun scald/leaf scorch	51
Aphids	114	Rust or pustules	114	Chlorosis	49
Leaf galls	37	Leaf spots	99	Drought or heat stress	33
Thrips	37	Tar spot of maple	64	Nonviable stock	19
Deer damage	36	Apple scab	59	Dieback	17
Hackberry nipple gall	35	Leaf spot or blight	41	Environmental damage	13
European elm flea weevil	33	Bacterial leaf spot/blight	37	Herbicide injury	13
Two spotted spider mite	33	Rhizosphaera needlecast	35	Frost damage	11
Fletcher scale	31	Septoria leaf spot	35	Mechanical damage	10



[illegible]A woman with short brown hair and glasses, wearing an orange safety vest over a dark long-sleeved shirt, is looking down at a small orange object she is holding in her hands. She is standing in a field of green trees, likely a Christmas tree nursery. The background is filled with rows of young evergreen trees. The text "Nursery and Christmas tree inspector | DATCP" is overlaid at the bottom of the image.

In 2022, staff inspected 519 Christmas tree fields. Spongy moth egg masses were found in 23 of the fields. Of the non-regulated pests observed, balsam gall midge was the most common. Also notable was the pine leaf beetle, a native chrysomelid that feeds on the needles of fir and pine. Needle browning caused by this beetle has been found in Wisconsin Christmas tree fields since at least 2019. *Rhizosphaera* needle blight of fir and white pine blister rust were the diseases observed most often.



# Christmas Tree Program

The program issued 374 Christmas tree grower licenses, 90 Plant Health Certificates, 41 Phytosanitary Certificates (mostly for international exports), and one State Phytosanitary Certificate (for interstate export) in 2022. The continued use of Survey 123 for mobile data collection has greatly increased efficiency and reduced turnaround time for licensees and the USDA to receive Christmas tree inspection reports.

## Christmas Tree Lot Inspections

Christmas tree lot inspections are conducted from mid-November until Christmas. The inspections help in identifying unlicensed growers, documenting tree origin and certification paperwork, and ensuring trees are free from regulated pests and diseases.

This season, 67 lots were inspected. Four lots were unlicensed and three of the four obtained licenses.

Elongate hemlock scale (EHS, *Fiorinia externa*) was suspected at eight lots on fir trees imported from the eastern U.S. Pest Abatement Orders were issued at four of those lots after lab samples were confirmed to have live EHS life stages. Release orders were issued for the other four lots once the lab determined that all scales present were dead.

## Christmas Tree Inspections Conducted and Certificates Issued 2020-2022

Year	Growers Licensed	PHCs Issued	Phytos Issued	Fields Inspected	Lots Inspected
2020	517	112	34	517	57
2021	606	120	42	606	74
2022	374	90	42	519	67

## Top 10 Pests, Diseases, and Abiotic Issues Found in Christmas Tree Fields in 2022

Pest	Count	Disease	Count	Abiotic	Count
Balsam gall midge	94	Rhizosphaera needle blight fir	45	Frost damage	48
Balsam twig aphid	88	White pine blister rust	39	Mortality	37
Deer damage	57	Broom rust of fir	35	Chlorosis	30
White pine weevil	32	Lirula needlecast	31	Mechanical injury	13
Pine needle scale	22	Phytophthora/Pythium root rot	21	Winter injury	11
Allegheny mound ant	22	Rhizosphaera needlecast spruce	16	Environmental injury	6
Pine leaf beetle	19	Needlecast	13	Herbicide injury	5
Zimmerman pine moth	17	Root issues	12	Cold injury	3
Fir coneworm	15	Weir's cushion rust	7	Drought or heat stress	3
Pine bark adelgid	14	Armillaria root rot	6	Fertilizer issue	3



# Export Certification Program

The Export Certification Program inspects and certifies plant products for international export and interstate shipment. Program specialists check country and commodity-specific plant pest regulations and assist customers in understanding phytosanitary requirements for over 200 countries. The program facilitates the export of pest-free Wisconsin plant products.

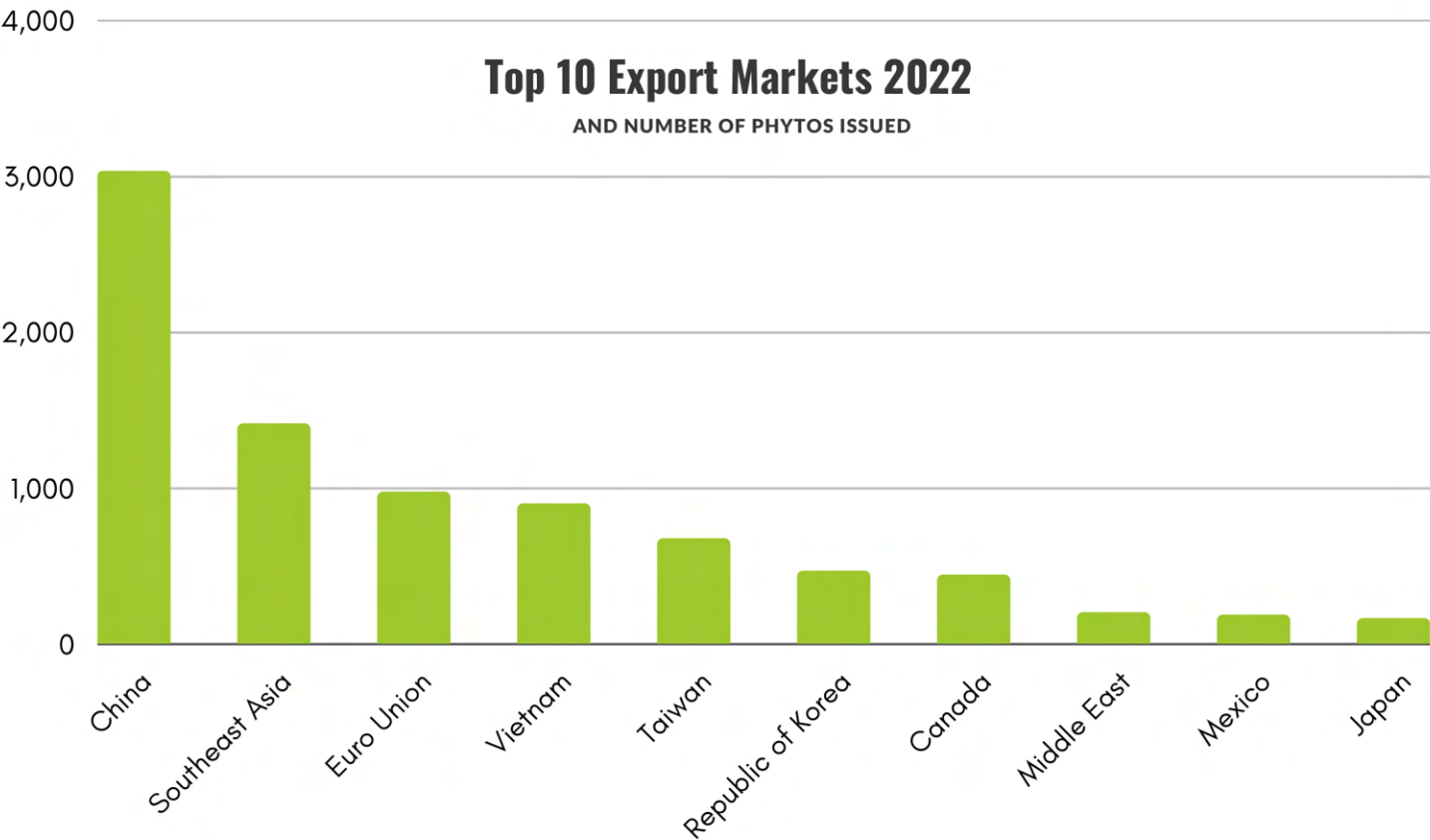
Exports certified by the Program in 2022 exceeded \$1.2 billion and were shipped to 84 countries. The total number of phytosanitary certificates printed was 8,323, down from 8,900 in 2021. China and Southeast Asia (Indonesia, Malaysia, Philippines, Thailand) were the top two destinations for exports, while the European Union rose to third place. Grain exports, including soybean, kidney bean and corn, accounted for 50% of the total commodities certified this year, followed by wood products at 38%. No Wisconsin commodities were rejected or destroyed at destination ports in 2022.

## 2022 STATS

**\$1.2 BILLION**  
IN EXPORTS  
CERTIFIED IN 2022

**84**  
DESTINATION  
COUNTRIES

**8,323**  
PHYTOS  
PRINTED

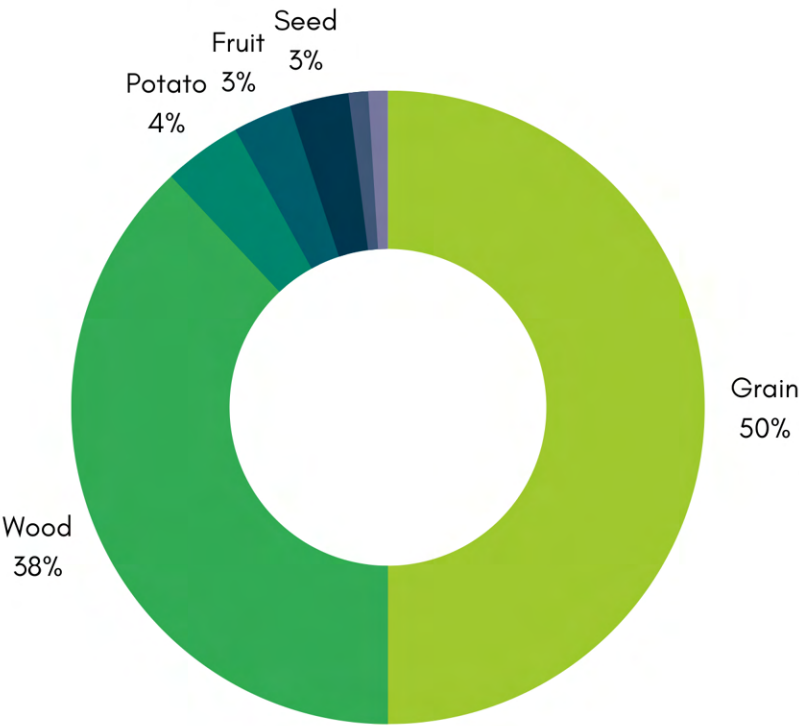




# Federal and State Phytos Issued 2021 & 2022

Program staff printed and issued 8,323 phytosanitary certificates in 2022, a slight decrease from 8,900 certificates in 2021. The total number of applications processed was 12,136, also lower than 13,141 applications the year before.

Application or Certificate Status	2021 Number of Applications	2022 Number of Applications
Printed	8,900	8,323
Replaced	3,196	2,571
Voided	990	1,190
In Progress	172	125
Returned	19	21
Canceled	55	52
Applications Processed	13,141	12,136



## Top Exports

Grain exports, including soybeans and corn, accounted for 50% of the total certificates issued in 2022, followed by wood products (logs, lumber, and veneer) at 38%. Other major exports this year were agricultural seed, potatoes, cranberries, and wheat.



# Export Certification Program

## Log and Lumber Inspections

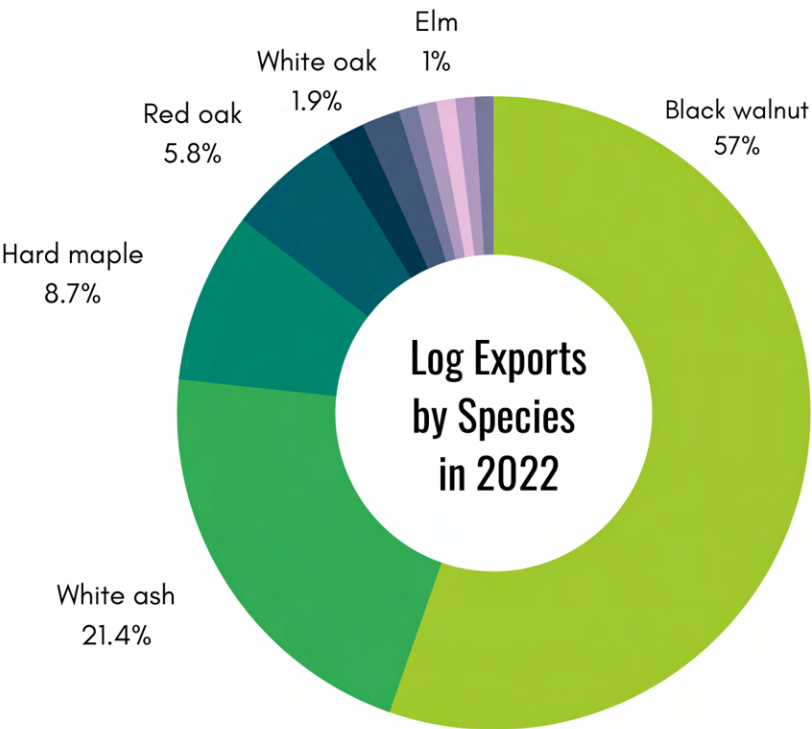
Inspections conducted in 2022 to support export certification included logs and kiln dried lumber. Two hundred and sixty-two log inspections (161,424 logs) were conducted and 38 kiln dried lumber compliance agreements were signed. Compliance agreements specify actions or best management practices exporters must follow to meet the requirements of receiving counties. Companies that sign agreements benefit from expedited certification of overseas lumber shipments.

## Seed Field Inspection and Laboratory Testing

Seed grown for export is inspected during the growing season for regulated plant pests. Field inspection and lab testing of the standing crop before harvest is a service provided to seed producers to meet the phytosanitary requirements of domestic and foreign customers.

In 2022, seed fields totaling 535 acres were inspected for 17 seed companies and growers. DATCP's Plant Industry Lab tested 95 samples from field crops, fruits, small grains, ornamentals, and vegetables. A total of 484 tests for 117 different plant pathogenic bacteria, fungi, viruses, and nematodes were performed on the 95 samples.

Seed was exported from Wisconsin to the following destinations: Argentina, Australia, Brazil, Canada, Chile, European Union, Israel, Japan, Jordan, Kazakhstan, Malaysia, Mexico, Mongolia, New Zealand, Peru, Republic of Korea, South Africa, Spain, Thailand, Turkey, United Kingdom, Ukraine, and Uruguay.



## Phytosanitary Testing for Seed Fields 2022

Crop	No. Samples	No. Tests Per Sample	No. Diseases
Blueberry	28	3	None
Corn	43	66	***
Garlic	6	1	None
Melon	2	4	None
Oats	1	3	None
Onion	1	15	None
Pepper	7	3	None
Soybean	4	7	None
Sunflower	2	13	None
Tomato	2	2	None

\*\*\*Anthracnose of corn (1 field), Goss's wilt (3 fields), Northern corn leaf blight (2 fields).



# Forest Pest Regulatory Program

## Firewood Certification

The movement of firewood in Wisconsin is regulated by quarantines and DNR firewood rules. The spongy moth quarantine prohibits the movement of firewood east to west from the state's 52 infested counties to non-quarantined counties. State emerald ash borer (EAB) quarantines prohibit movement of firewood from Wisconsin to states with regulations for this pest. Only firewood bearing a DATCP label certifying that proper heat treatment or aging methods have been used to kill invasive insects or diseases is allowed into state parks and other state-owned lands.

Under the voluntary Firewood Dealer Certification Program, anyone may apply for certification by completing an application form, obtaining a facilities and processes inspection, and by using an approved treatment method

such as heat treatment (heating to 140°F for at least 60 minutes) or seasoning (storing the firewood on-premises for a minimum of 24 months before sale or distribution). Firewood which has been inspected and certified receives the DATCP-certified label. In 2022, the program certified 41 firewood dealers.

Through a DATCP-DNR interagency collaboration, Wisconsin joined the list of 13 states participating in [www.FirewoodScout.org](http://www.FirewoodScout.org). DATCP supplies data on local and certified firewood vendors to Firewood Scout web managers who generate interactive maps that outdoor recreationists can use to source local firewood close to their travel destinations. Additional outreach efforts in 2022 included helping to organize and host the National Firewood Conference in Arlington, Wisconsin June 15-16.



Firewood inspection | DATCP



# Forest Pest Regulatory Program

## Forest Pest Compliance and Outreach

The Forest Pest Regulatory Program works with members of the nursery and forest products industries to gain compliance with state and federal quarantines regulating movement of certain trees, shrubs, and forest products that may harbor spongy moth or HWA. In 2022, inspectors facilitated 68 compliance agreements, 42 for intrastate movement of spongy moth and 26 for HWA. Using a new online training video, 34 industry personnel were trained to identify spongy moth life stages. Regulatory outreach also included weekly social media posts, articles for industry publications, press releases, and trade shows.

In 2022, the program participated in Administrative Code Chapter ATPC 21 updates. The proposed changes would rescind quarantines for EAB, pine shoot beetle, and thousand cankers disease, revise language for the HWA and *P. ramorum* exterior quarantines, and enact a new exterior quarantine for elongate hemlock scale. The ATPC 21 rule revisions were approved by the DATCP Board in August 2022 and are anticipated to go into effect in May 2023, pending final approval by the state legislature.

## Sod Inspection

Thirty-two fields on seven sod farms were inspected for pests to facilitate the out-of-state movement of turf sod. Since Wisconsin is generally infested with Japanese beetle (JB) and is classified as a Category 3 state under the JB Harmonization Plan, sod growers who ship beetle host material from areas infested with JB are responsible for complying with the certification requirements of receiving states. No regulated pests were found.



Spongy moth caterpillars | Evgeniy Andree



# Seed Labeling Program

The Seed Program monitors agricultural, lawn, and vegetable seed to ensure labeler and dealer compliance with standards prescribed by the Wisconsin Seed Law. Seed that does not meet label guarantees or conform to purity, germination rate and noxious weed seed restriction standards may be removed from the marketplace and labelers may be subject to penalties. Seed program inspectors perform a range of duties, such as evaluating labels for compliance, issuing stop sale orders and collecting samples for analysis.

In 2022, DATCP licensed 739 seed labelers. Program staff conducted 268 inspections and collected 409 seed samples, an increase from 175 inspections and 368 samples in 2021. Fifty-two new licenses were processed this year, while 129 seed labelers from 2021 claimed “out of business” or canceled their licenses.

Seed industry violations were the second lowest level in program history (behind 2021). Sixteen violations were found in the 409 samples, for a 3.9% violation rate. One of the violations was categorized as minor, seven were technical, and eight were considered serious. Six of this year’s samples containing *Amaranth* spp. seeds were sent for further determination. None were identified as the prohibited invasive weeds Palmer amaranth or waterhemp. The following compliance actions were taken: 1) 13 seed lots were relabeled and 2) two lots were removed from sale by the labeler. The table below summarizes the number of inspections completed, samples collected, and violation rates in the last 10 years, including 2020 when inspections were limited by the pandemic.

Seed industry violations were the 2nd lowest level in program history. Only 16 violations were found in the 409 samples, for a 3.9% violation rate. One of the violations was categorized as minor and eight were serious. The 2022 violation rate is also well below the 10-year average of 5.3% and indicates improvement in labeling compliance.

## Ten-Year Seed Inspection Results 2013-2022

Year	Licensed Labelers	Labelers Inspected	Samples Collected	% Labelers Sampled	No. of Violations	% Violation
2013	725	109	375	14%	30	8.0%
2014	730	207	341	12%	18	5.3%
2015	725	236	343	14%	16	4.7%
2016	728	219	374	16%	18	4.8%
2017	742	181	410	16%	22	5.4%
2018	743	192	371	15%	17	5.1%
2019	789	295	392	16%	26	6.6%
2020	821	39	*84	*	*	*
2021	797	175	368	12%	15	4.1%
2022	739	268	409	14%	16	3.9%
10-Yr Ave	754	192	347	14%	20	5.3%



# Potato Program

The Potato Program includes potato rot nematode inspections, late blight response, and coordination of the Wisconsin Seed Potato Certification Program (WSPCP) with the University of Wisconsin-Madison.

In June 2022, the State National Harmonization Program (SNHP) audited two seed potato growers. Due to excessive rain in Homestead, Florida, where winter grow-out testing is conducted, 600 lots from these growers were flooded and no winter virus readings could be collected. Instead, DATCP allowed farms to use the summer field readings from the prior year to certify 300 of the lots, stipulating that the growers must submit records of field and harvest readings from the prior two years, along with the 2020 post-harvest test, for verification of the foundation seed standards. The lots met standards and were issued North American Certified Seed Potato Health certificates.

Program staff also conducted fall inspections for potato rot nematode (PRN), *Ditylenchus destructor* in 2022. Potato rot nematode is a quarantine pest which occurs in localized areas of Asia, Europe, and North America. Wisconsin is one of 10 states where PRN is found.

Potato fields prioritized for PRN inspection include fields entering the WSPCP and previously-infested fields with a current crop of potatoes. Eighteen fields totaling 899.5 acres were inspected for PRN in 2022. All 18 of the fields were new to seed potato production and showed no evidence of PRN. In addition, no cases of late blight were detected in potato fields this season.

Potato rot nematode has never been reported or intercepted in-state or out-of-state in seed potatoes or commercial potatoes from Wisconsin. Today, there are a total of 3,049 acres with a history of PRN infestation.

## History of Potato Rot Nematode Infestations in Wisconsin 1953-2022

County	Current Status	Sum of Acres	Count of Fields
Forest	Released not used for potato	15	01
Kenosha	Release not used for potato	01	01
Langlade	Infested	442.3	19
Langlade	Release not used for potato	122.5	08
Langlade	Released/certified seed	1697.4	50
Langlade	Released/table stock	613.3	24
Lincoln	Released/certified seed	37	01
Manitowoc	Released/certified seed	9.3	01
Marathon	Infested	8.4	01
Marathon	Released/certified seed	64.5	02
Portage	Released/table stock	38.2	01



# Pest Survey and Control Section



The Pest Survey and Control Section conducts surveys for the early detection of exotic plant pests and diseases of economic and regulatory significance and responds to new pest introductions by initiating strategic control or eradication measures. Surveys supply information to the Plant Industry Bureau's regulatory programs and may be used to determine pest presence or absence, substantiate pest-free status, or to establish or revise a quarantine regulation. The section includes the Plant Industry Laboratory in Madison, which provides plant pest and disease diagnostic services to the bureau's regulatory and survey programs.

---

## Pest Survey Programs

Plant Industry Bureau Lab

Forest Pest Survey

Spongy Moth Program

Commodity Crop Survey

Specialty Crop Survey

Plant Pest & Biocontrol Permits



# Plant Industry Bureau Laboratory

The Plant Industry Bureau Laboratory processed 942 plant samples for diseases and 89 samples for insect and mite concerns in support of DATCP's Christmas tree, Nursery, Pest Survey, and Phytosanitary programs in 2022. In addition, 617 insect trap samples were screened for regulated and non-native pests. The lab conducted 1,866 tests on the 942 samples processed for diseases, using techniques including microscopy, culturing, enzyme-linked immunosorbent assay (ELISA), polymerase chain reaction (PCR), and sequencing to identify the pathogens causing disease.

Lab testing first confirmed new state records for the pathogens *Gymnosporangium yamadae* (the causal agent of red star rust) and *Erysiphe viburniphila* (a powdery mildew species) in 2021. This year, *G. yamadae* was documented in eight more counties by DATCP and the UW-Madison Plant Disease Diagnostics Clinic. Red star rust has now been confirmed in Dane, Kenosha, Milwaukee, Outagamie, Ozaukee, Portage, Racine, Sheboygan, and Waukesha counties, on both nursery stock and landscaped trees. The prevalence of cases in the last two years indicates that this invasive disease of apple, crabapple, and juniper may be widely distributed in the state. In addition, a second detection of the powdery mildew *Erysiphe viburniphila* on viburnum was confirmed in Washington County in 2022. This species has also been recorded in Adams County.

Diagnosticians at the Plant Industry Lab became accredited by the USDA National Plant Protection Laboratory Accreditation Program (NPPLAP) in 2022 to perform *Phytophthora ramorum* testing using NPPLAP's validated real-time PCR diagnostic test. Accreditation is achieved through successful analysis of a blind test panel and authorizes the lab to test for *P. ramorum*. This expanded diagnostic capacity is expected to increase efficiency in making determinations and releasing test results.



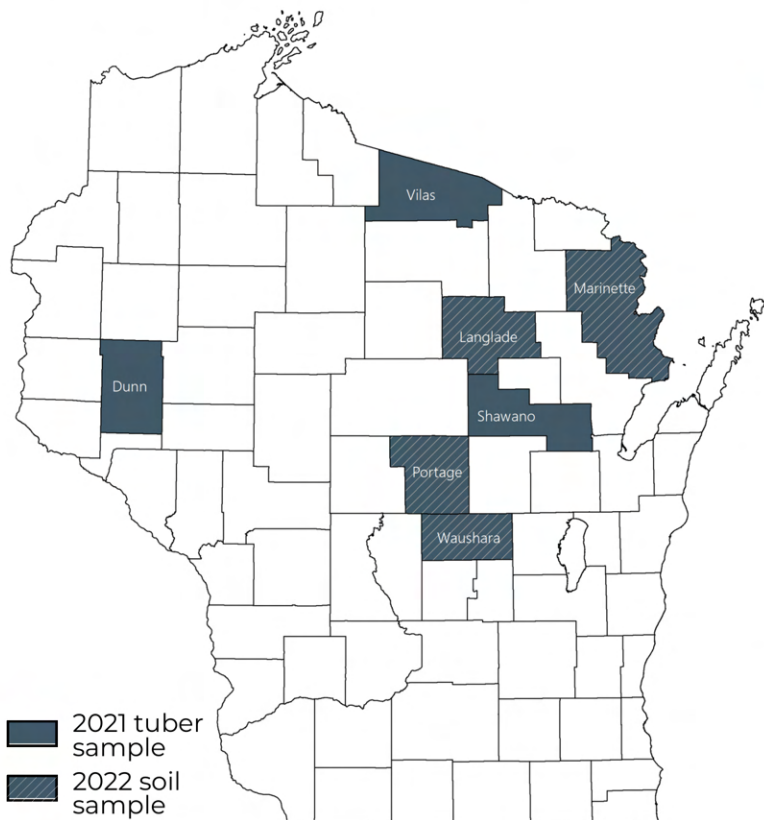
Plant Industry Lab Plant Pathologist | DATCP



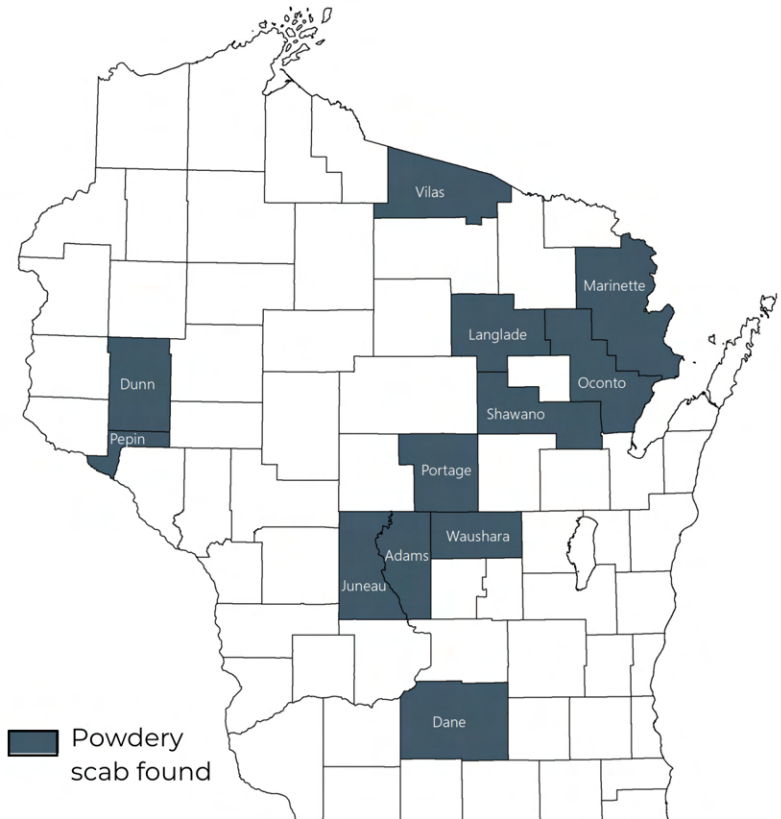
# Plant Industry Bureau Laboratory

## Potato Mop Top Virus Survey

Potato mop top virus (PMTV) was detected for the first time in a Wisconsin-grown potato tuber in 2020, prompting DATCP to conduct a two-year survey for PMTV and its vector, *Spongospora subterranea* f. sp. *subterranea* (the fungus-like organism that causes powdery scab). Both PMTV and powdery scab are of economic importance to potato production. Potato mop top virus compromises tuber quality and contributes to total virus load. Seed potatoes are ineligible for certification if allowable virus limits are exceeded. The powdery scab pathogen was included in the survey because it vectors PMTV, its survival and persistence in the soil, and lack of effective control options. The multiyear survey included tuber sampling in 2021 and soil sampling in 2022.



Map 3. Counties surveyed for PMTV 2021-2022



Map 4. Powdery Scab Detections 2002-2022

Lab testing found no PMTV in the combined 309 tuber and soil samples collected from potato growing areas of Wisconsin. Powdery scab was identified in nine tubers from 103 lots sampled in 2021 and in 70 soil samples from 206 potato production fields sampled in 2022.

Results of the survey suggest that PMTV is not widely present in Wisconsin-grown tubers or in fields where powdery scab occurs in the state's potato growing areas. Powdery scab has been documented in Wisconsin for the last 20 years and is known to occur in the following 12 counties: Adams, Dane, Dunn, Juneau, Langlade, Marinette, Oconto, Pepin, Portage, Shawano, Vilas, and Waushara (Map 4).





Boxwood blight | DATCP

# Plant Industry Bureau

## Laboratory

### Nursery and Retail Plants Pest Survey

Pest survey specialists conducted a visual and trapping survey of 17 Wisconsin nursery and garden center locations for 19 injurious pests and diseases of state and national concern. Site selection was based on volume of plants sourced from out-of-state suppliers and prioritized locations in an 11-county metropolitan area across southeastern and south-central Wisconsin. The survey focused on seven diseases and 12 insect pests at elevated risk of introduction to the state through the nursery trade. Funding was provided through the 2022 Plant Protection Act 7721.



Spotted lanternfly | agriculture.ny.gov

Visual survey work began in April and was carried out biweekly through August. Trapping surveys started in June with the deployment of 78 pheromone-baited insect traps across the 17 sites. All symptomatic plant samples and trap catch were submitted to the Plant Industry Lab for testing and screening for target organisms.

Laboratory analysis of 410 insect trap samples found no target insects. In addition, testing of 18 symptomatic plant samples collected as a result of visual surveys (including 17 target disease suspects and one target insect suspect) found a single target organism: *Gymnosporangium yamadae* (red star rust). This rust species was confirmed on crabapple and apple at two sites in Dane County and one site in Sheboygan County.



Red star rust on crabapple | DATCP

The 12 insects targeted by this survey were: an ambrosia beetle, Asian longhorned beetle, box tree moth, elongate hemlock scale, European cherry fruit fly, hemlock woolly adelgid, Japanese wax scale, light brown apple moth, nun moth, oak splendor beetle, spotted lanternfly, and summer fruit tortrix moth. Diseases targeted during visual surveys were: apple proliferation, beech bleeding canker, beech leaf disease, boxwood blight, red star rust, Ramorum blight, and southern bacterial wilt.



# Forest Pest **Surveys**

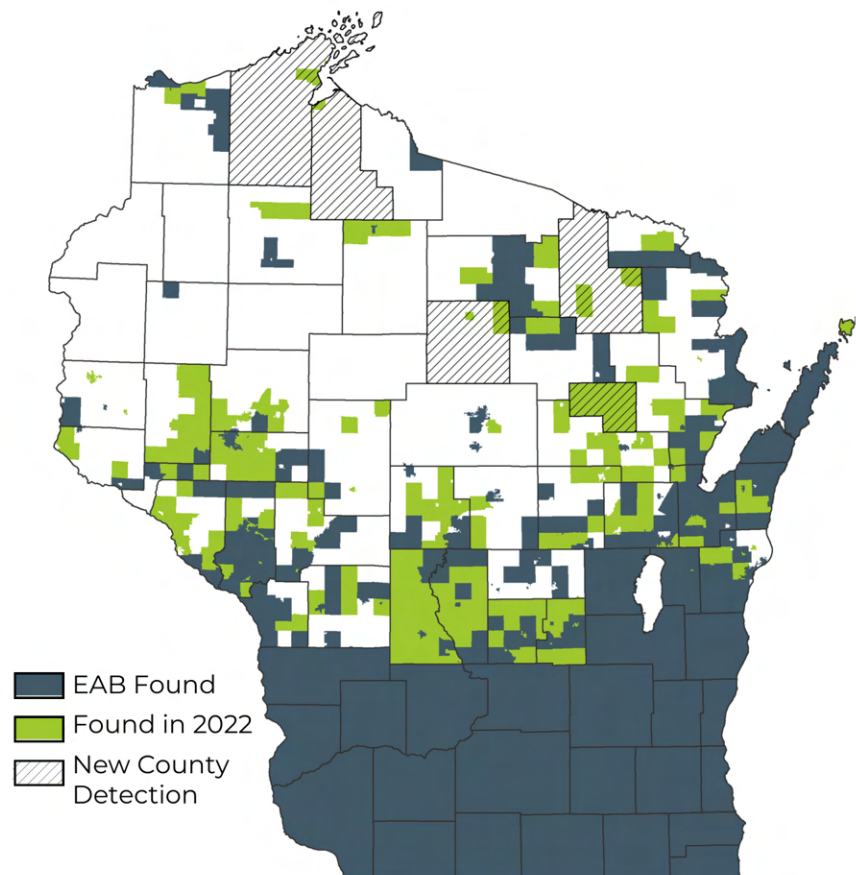
Forest entomologists set 162 insect traps across 82 sites in 2022 as part of forest pest detection and monitoring work. Five separate surveys generated over 600 trap samples, from which thousands of insect specimens were screened for 18 regulated or non-native tree pests.

## **Emerald Ash Borer**

DATCP confirmed reports of emerald ash borer (EAB) infestations in five new counties in 2022, adding Ashland, Bayfield, Forest, Lincoln, and Menominee counties to a list of 66 out of 72 Wisconsin counties with confirmed populations. Reports from DATCP staff, citizens, and partner agencies led to an additional 208 new municipal detections in counties where EAB has already established. Statewide municipal detections in 2022 were more than double those reported in 2021, marking the second highest annual total on record. Many factors may account for this increase, including concerted efforts by DATCP and partner agency staff, availability of new mobile reporting tools, and continued expansion of EAB populations into uninfested areas.

## **Spotted Lanternfly**

In 2022, DATCP continued preemptive survey work for spotted lanternfly (SLF) in southeastern Wisconsin. This region offers the most optimal climate and host availability for SLF in the state. Forty-two circle-style traps baited with methyl salicylate were placed on tree of heaven or other preferred host species in close proximity to potential introduction pathways, such as



**Map 5. Emerald Ash Borer Detections 2008-2022**

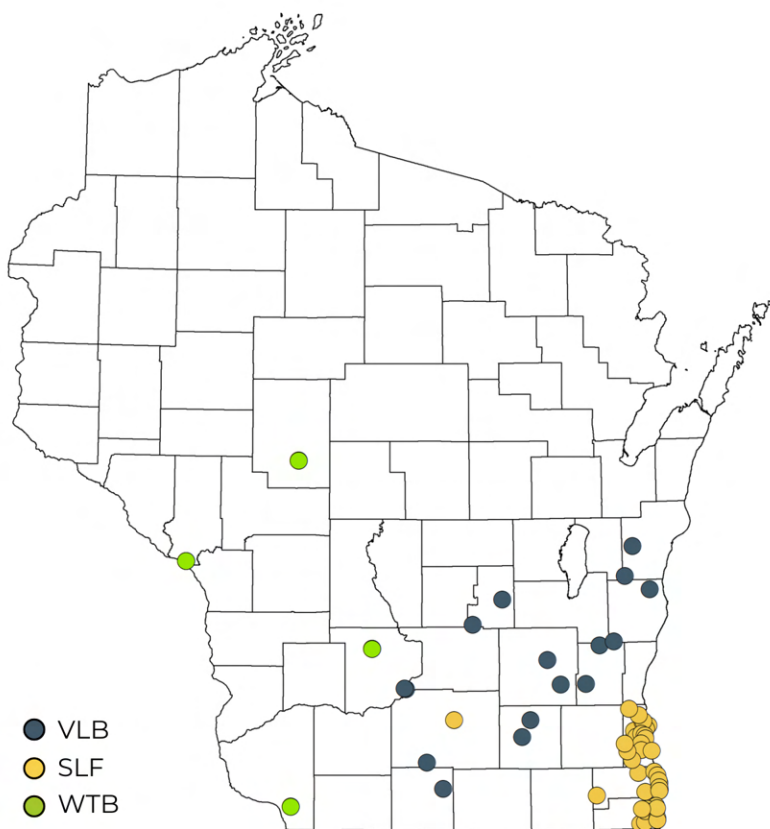
railyards and multi-modal transportation facilities. Surveyors also conducted 26 visual surveys in the same region, walking perimeters of high-risk areas and scanning preferred host trees for SLF life stages. Additionally, 27 Wisconsin apple orchards were given SLF identification materials and included SLF in their scouting programs this season. At the time of this publication, no live SLF have been detected in Wisconsin, although in November 2022 several dead specimens were found on nursery stock grown in Pennsylvania (where SLF is abundant) and newly planted at a Walworth County residence. The property has been designated as a high-priority site for continued surveillance and detection trapping in 2023.



# Forest Pest Surveys

## Velvet Longhorned Beetle

Surveys targeting the velvet longhorned beetle (VLB) have been conducted in Wisconsin since 2017, following the first detection in Milwaukee County. For the 2022 season, trapping was carried out at 16 sites across eight counties along waterways and in urban locations. The traps were placed in counties with no prior detections. The survey resulted in the capture of one VLB specimen in a Washington County trap and 10 VLB specimens in two Sauk County traps, both of which are new county records.



Map 6. Forest Pest Detection Surveys 2022

In the last five years, early detection surveys have collected VLB in 12 southeastern Wisconsin counties: Columbia, Dane, Fond du Lac, Kenosha, Milwaukee, Ozaukee, Racine, Rock, Sauk, Walworth, Washington and Waukesha. All collections were made using cross-vane panel traps with pheromone lure.

The pest potential of this introduced Asian wood borer remains unknown. Velvet longhorned beetle has been found in at least 14 states and is established in Illinois, Wisconsin, and Utah. In Wisconsin, it has been intercepted in rustic hickory-style log furniture manufactured in China (2016) and collected in survey traps. Research indicates that it may be a secondary agent with a preference for stressed or unhealthy trees. To date, no infested trees have been observed or reported in the Wisconsin landscape, and there have been no environmental or economic impacts attributed to VLB.

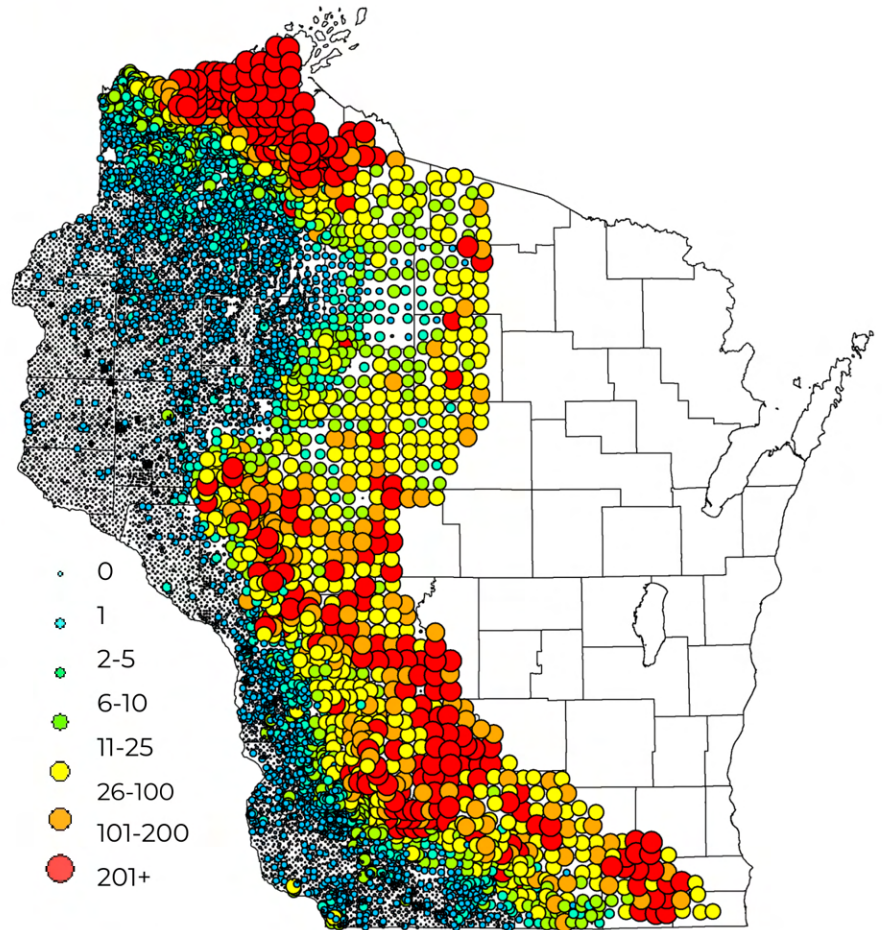
## Walnut Twig Beetle Survey

Annual presence/absence surveys for the walnut twig beetle (WTB) have been conducted in Wisconsin for more than a decade. The beetle is native to the southwestern U.S., but in recent years has been found east of the Mississippi, though not in Wisconsin. As a vector of the *Geosmithia morbida* fungus which causes thousand cankers disease of walnut, WTB is a regulated pest for walnut exports. This season, monitoring was conducted at four sawmills where 11 multi-funnel traps were set in log yards holding walnut. Walnut twig beetle was not found in the 83 trap samples processed.

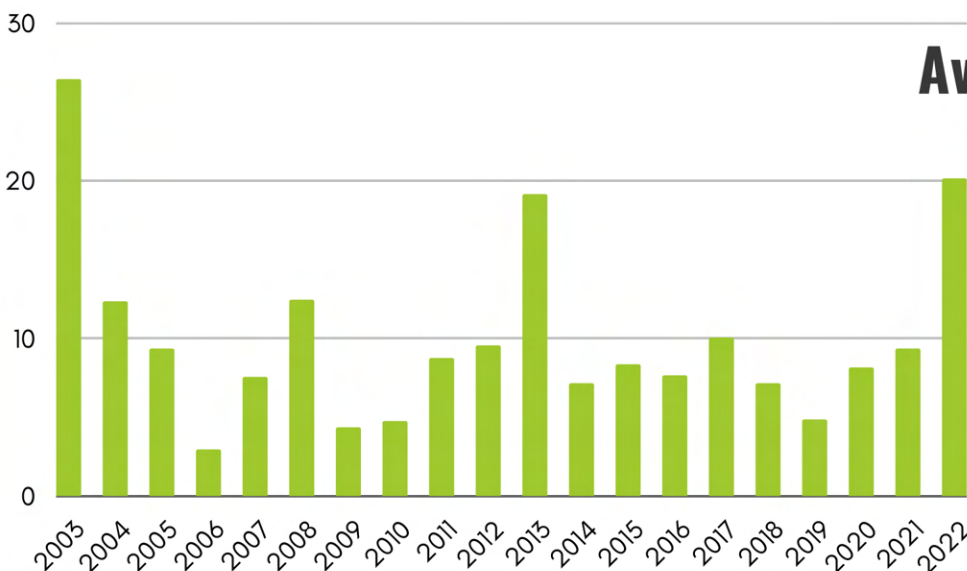
# Spongy Moth Program

The Slow the Spread of the Spongy Moth Program is a collaborative interagency effort between DATCP, USDA-Forest Service, and government agencies in 12 participating states. The program's goal is to slow the spread of spongy moth by detecting and treating isolated pockets in which spongy moth is advancing westward.

Spongy moth trap catches roughly doubled throughout Wisconsin this season, marking a third consecutive year of population growth. The Spongy Moth Program set 10,044 traps in 47 counties spanning from central to western Wisconsin. Analyses of trapping sites indicate statewide male moth totals increased by 102% from 99,847 total moths (9.3 moths/trap) in 2021 to 201,549 total moths (20.1 moths/trap) in 2022. The sharply higher counts reflect an outbreak phase that has been building since a low population was recorded in 2019.



Map 7. Spongy Moth Trapping Survey Results 2022



## Ave No. Moths per Trap 20-Year Trend

Annual average moth counts have ranged from as high as 26 moths per trap in 2003 to less than one per trap, with a 20-year average of 10 per trap



# Spongy Moth Program

Population increases were most pronounced in the eastern two-thirds of Wisconsin, where spongy moth has been established for years. Reports from landowners and DNR aerial surveys indicated the heaviest caterpillar feeding occurred in Bayfield County and around the Kettle Moraine region of southeastern Wisconsin. In the sparsely infested western one-third of Wisconsin, rates of spread remained moderate in the southwestern and west-central regions. Spread rates were notably high, however, in northwestern Wisconsin along the Lake Superior shore.

Favorable weather conditions are generally accepted as the driving force behind Wisconsin's population increase. Three consecutive years of warm, dry summers and relatively mild winters have limited the impacts of larval diseases and winter egg mass mortality, respectively. As a result, more caterpillars have hatched and survived to

the adult stage each year. If favorable weather persists, spongy moth populations will likely remain high or continue to increase in 2023.

The Spongy Moth Slow the Spread Program treated outlier populations in 54 sites identified during the previous trapping season, totaling 121,774 treatment acres. BTK aerial spray applications began May 19 and ended June 2. Foray BTK was applied to 16,052 acres at 25 sites in western Wisconsin. Forest Service mating disruption (MD) aerial applications occurred from June 25-July 13. A total of 105,722 acres at 29 sites were treated with MD in western Wisconsin.

## Spongy Moth Trapping and Treatment Summary 2013-2022

Year	Number of Traps	Number of Moths	Ave. Moths per Trap	Acres Treated
2013	18,513	353,134	19.1	145,860
2014	13,105	92,786	7.1	168,113
2015	11,712	97,505	8.3	232,668
2016	11,386	86,462	7.6	201,207
2017	10,940	109,333	10.0	154,947
2018	10,748	76,447	7.1	7,288
2019	10,962	52,396	4.8	113,911
2020	10,308	83,720	8.1	152,978
2021	10,787	99,847	9.3	88,977
2022	10,044	201,549	20.1	121,774

### 52-YEAR PROGRAM STATS

1,050,391

TRAPS SET

5,798,229

MOTHS CAPTURED

4,422,492

ACRES TREATED

# Commodity Crop Surveys

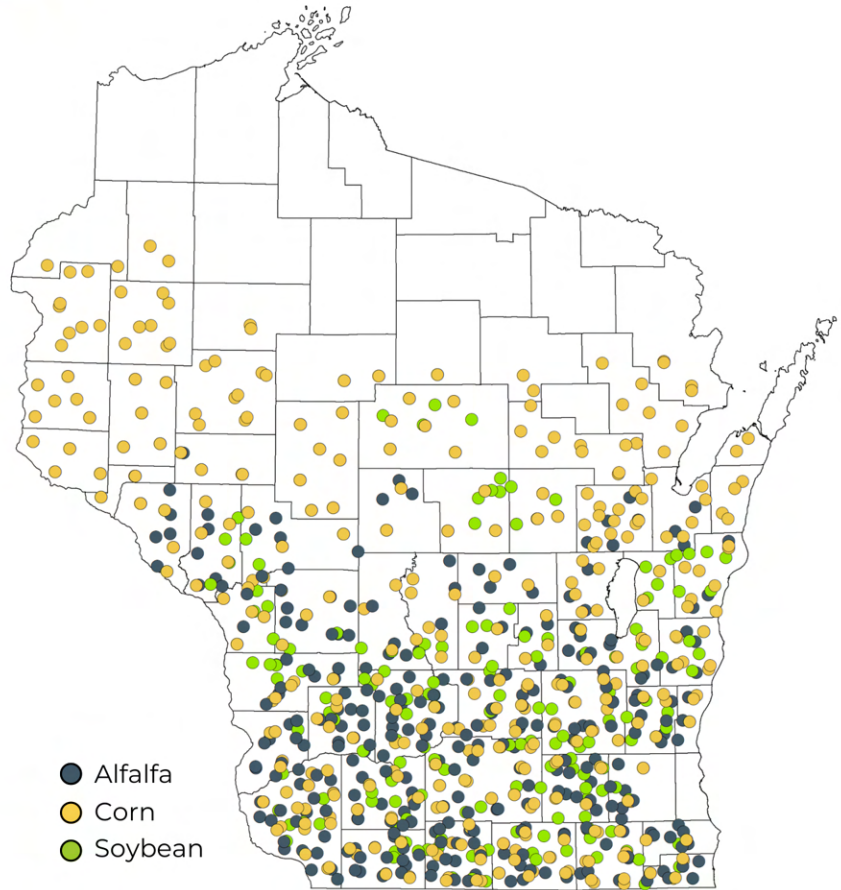
Pest survey specialists monitored alfalfa, corn and soybean fields in 2022 for several invasive national priority pests that are currently not known to occur in Wisconsin or have limited distributions in the state. Survey work was funded by the USDA Cooperative Agricultural Pest Survey (CAPS) Program and DATCP and conducted from May through August. Field crop surveys also collected data on the leading economic pests of concern to Wisconsin crop producers, such as the corn rootworm, Japanese beetle, and soybean aphid.

## Invasive Soybean Pests

USDA CAPS surveys in Wisconsin soybean fields targeted six national and state priority pests: cucurbit beetle, frogeye leaf spot, maritime garden snail, soybean gall midge, tobacco streak virus, and yellow witchweed. These exotic species have been identified as threats to U.S. agriculture with the potential for introduction into Wisconsin. Visual surveys and sweep net sampling in 306 soybean fields yielded no new exotic pests. In addition, lab analyses of symptomatic leaf samples from 27 fields found no evidence of tobacco streak virus or frogeye leaf spot.

## Soybean Gall Midge

An emerging pest of Midwestern soybeans, the soybean gall midge (SGM) was not found in Wisconsin in 2022. In the last five years, SGM has been confirmed in 155 counties in Iowa, Nebraska, Minnesota, Missouri, and South Dakota, including 15 new counties this year. The closest known SGM infestations are in south-central Minnesota, only 70 miles from western Wisconsin.



Map 8. Commodity Crop Surveys 2022

## Soybean Aphid

Populations recorded during the annual survey were very low. Ninety-nine percent of the 157 fields sampled from July 11-August 9 had average counts below 50 aphids per plant, 1% had 51-100 per plant, and no surveyed fields showed above-threshold populations of 250 or more aphids per plant. The 2022 state average count was just six aphids per plant, the same average recorded in 2021 and only marginally higher than the all-time low average of five aphids per plant in 2019. Results of this season's effort suggest that aphid pressure was generally low to moderate in 2021-2022, and no soybean field sampled met treatment guidelines during the survey timeframe.

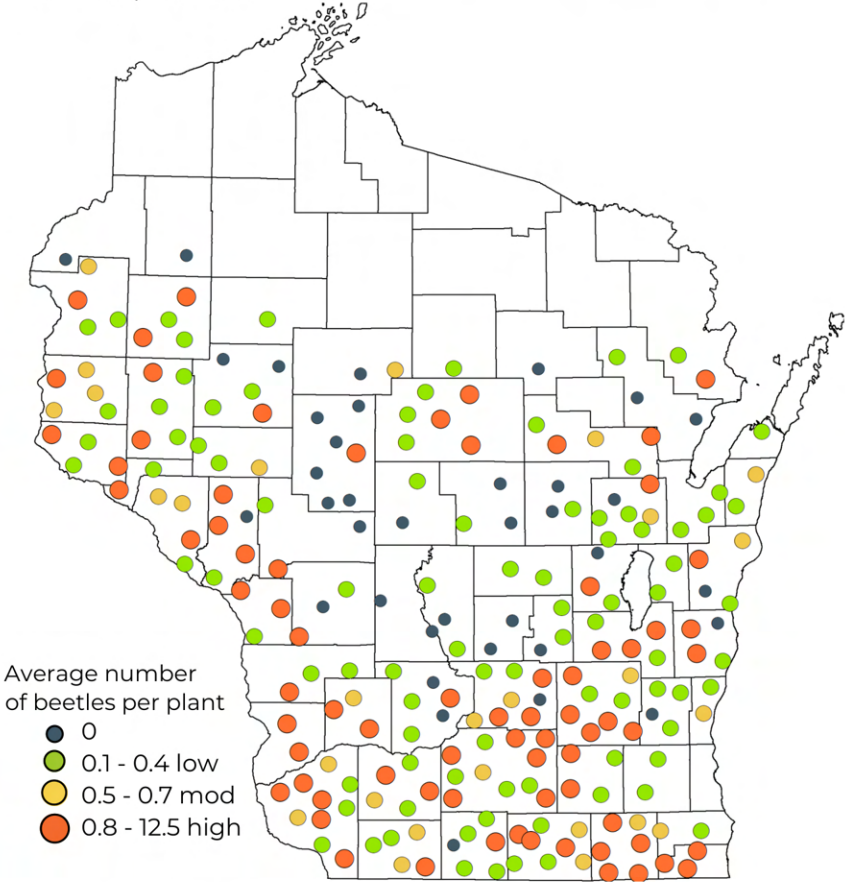


# Commodity Crop Surveys

## Corn Rootworm

Beetle populations remained high across much of the southern half of Wisconsin for the second year in a row. The annual survey in August found a state average of 0.9 beetle per plant, an increase from 0.8 per plant in 2021 and the highest average in more than a decade (since 2008). The heaviest adult rootworm pressure was recorded in the southwest counties, where the district average was well above-threshold at 1.3 beetles per plant. Counts were also relatively high in the south-central and east-central regions. Corn fields with populations above the 0.75 beetle-per-plant economic threshold comprised 33% of this year's 229 sites.

Based on the higher populations observed in August, southern and western Wisconsin corn producers were advised to closely review their rootworm management plans for 2023 and consider crop rotation if practical.



Map 9. Annual Corn Rootworm Beetle Survey 2022



Corn rootworm beetle | DATCP

# Commodity Crop Surveys

## Western Bean Cutworm

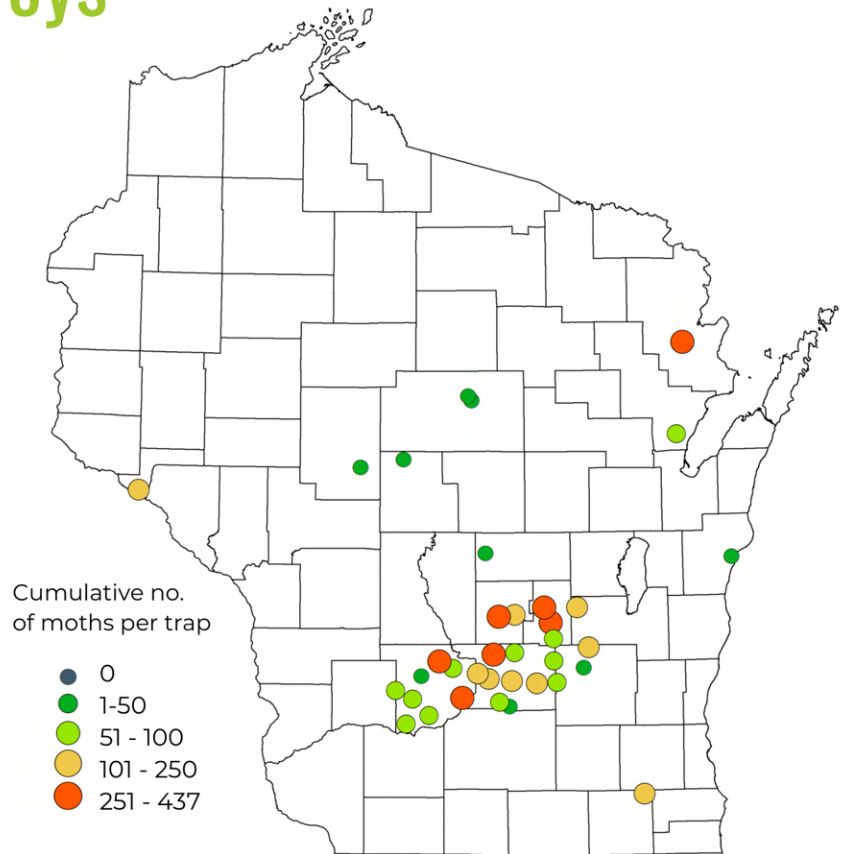
Moth counts in 2022 were the highest recorded in 18 years of surveys. The annual trapping program from June-August registered an average of 133 moths per trap (4,804 moths in 36 traps), surpassing the previous survey record of 117 moths per trap (5,614 moths in 48 traps) set in 2021. The highest individual cumulative count for the 10-week monitoring period was 437 moths in a Columbia County trap. This season's relatively large flight produced heavy larval infestations in scattered corn fields in the west-central and central counties in August and September.

## Invasive Corn Pests

Corn surveys conducted in Wisconsin as part of the USDA CAPS Program targeted five exotic national priority pests: cucurbit beetle, late wilt, maritime garden snail, Philippine downy mildew, and yellow witchweed. Visual surveys in 235 corn fields found no new exotic pests. A map showing the 2022 CAPS commodity survey sites is provided on page 31.

## Corn Earworm

DATCP's corn earworm monitoring network captured a total of 4,173 moths in 13 traps, with the largest flights recorded during the week of September 1 -7. The pheromone trap location with this season's highest cumulative catch was Ripon in Fond du Lac County, where 1,395 moths (1/3 of the 2022 total moth catch) were collected. Compared to 2021 when 11,837 moths



**Map 10. Western Bean Cutworm Moth Counts 2022**

were collected in 16 traps, this year's total count was nearly three times lower and larvae were also less common during fall corn surveys. Corn earworm caterpillars were observed at only 2% of corn sites sampled in September and October.

## Black Cutworm

A late planting season in 2022 contributed to a high risk of spring cutworm damage to emerging corn. The first significant migration flights of nine or more moths in two nights were registered during the week of April 29-May 5 and the primary larval damage period began by May 25. The spring trapping survey captured 777 moths in 30 traps, with a peak recorded May 6-12. Despite an elevated potential for outbreaks due to late tillage and planting, severe black cutworm injury was not observed or reported this season.



# Commodity Crop **Surveys**

## European Corn Borer

Larval populations were extremely low again in 2022. The state average count in 229 corn fields sampled this fall was 0.05 borer per plant (or five borers per 100 corn stalks), which is only slightly higher than the 2021 survey average of 0.04 borer per plant and the all-time low average of 0.01 per plant recorded in 2018 and 2019. Six of the state's agricultural districts showed averages less than or equal to last year's levels, while negligible increases were noted in the south-central, east-central and north-west areas. Larvae were absent from 88% of the fields sampled in September and October.

The near-record low number of corn borers observed again this year reflects the continued prevalence of Bt corn, which accounted for 80% of the state's corn acres in 2022.

## Bacterial Leaf Diseases of Seed Corn

The Plant Industry Lab tested leaf samples from 35 seed corn fields for Stewart's wilt, caused by the bacterium *Pantoea stewartia*, and bacterial leaf streak of corn, caused by the bacterium *Xanthomonas vasicola* pv. *vasculorum*. All samples were negative for both diseases.

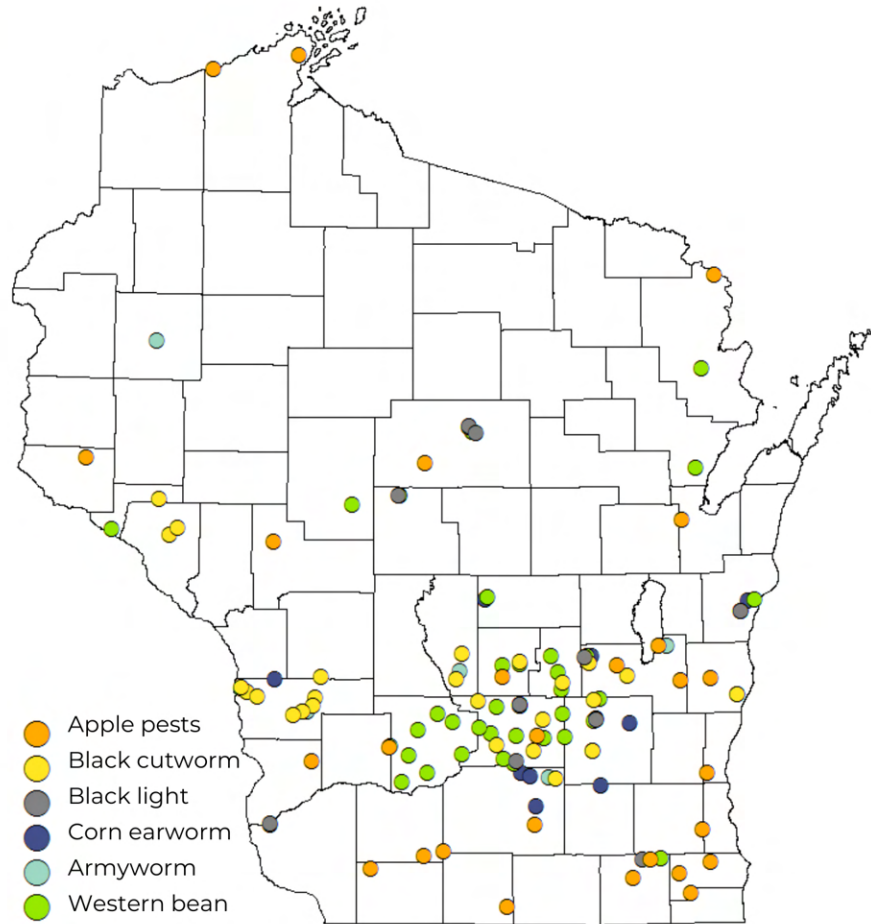
In addition, samples from 28 seed corn fields were tested for Goss's wilt, caused by the bacterium *Clavibacter michiganensis* subsp. *nebraskensis*. Of the fields tested, three samples were positive and 25 were negative. The fields positive for Goss's wilt were in Adams and Dane counties.

# Cooperator Networks

Cooperator networks are an efficient, cost-effective approach DATCP's Pest Survey Program has used for more than 30 years to accomplish its pest surveillance and early detection goals. The program enlists volunteer cooperators throughout the state to collect and report data on the leading economic pests of concern to Wisconsin crop producers. Insect trapping data supplied by the networks indicate current risk level and help growers prepare for pest threats. Cooperators represent a variety of agricultural backgrounds, including apple growers, agronomists, farmers, crop consultants, gardeners, and UW-Extension staff.

**In 2022, the Pest Survey Program maintained six networks consisting of 70 cooperators:**

- 43 cooperators in 24 counties provided precise emergence and flight data on corn earworm, true armyworm, western bean cutworm, and other significant pests of field crops. Data from the 101 pheromone and black light traps included in these networks is especially useful for forecasting outbreaks of priority corn pests.
- 27 apple orchards participated the apple pest monitoring network, covering 21 counties and setting 178 traps for seven orchard pests.
- Our six cooperator networks included a total of 129 sites spanning across 37 counties, yielding an enormous volume of data from areas of the state that DATCP's limited number of Pest Survey staff could not access on a regular basis.



**Map 11. Insect Monitoring Network Sites 2022**

## Insect Monitoring Network Trap Numbers 2022

Pest Type	Cooperators	Traps Set	Trap Type
Apple orchard pests	27	178	Pheromone delta
Black cutworm	10	30	Pheromone milk jug
Black light	9	12	Black light
Corn earworm	8	13	Hartstack
Armyworm	6	11	Pheromone milk jug
Western bean cutworm	10	36	Pheromone milk jug





Leek moth survey trap | DATCP

## Vegetable Pest Surveys

DATCP plant pest specialists visited 10 community gardens and CSA farms on a biweekly basis this season to survey for new and emerging vegetable pests. The two primary targets were the swede midge and leek moth. The former is newly introduced, while the latter has not been found in Wisconsin.

### Leek moth

Early detection surveys for this allium pest native to Europe have been conducted in Wisconsin since 2018. Until recently, leek moth was a National Priority Pest due to the frequency of interceptions at U.S. ports of entry and its capacity to cause severe economic losses to allium crops. Leek moth was first detected in North America in 1993 in Ottawa, Canada, and gradually spread into New York by 2009. Its range expansion is expected to continue. In the last five years, pheromone traps have been set at 56 garden and small farm locations to detect this pest. Leek moth has never been captured in a survey trap or reported in Wisconsin.

### Swede midge

Swede midge (SM) was confirmed for the first time in the state in 2019. The flies were captured on survey traps in Dane and Milwaukee counties. This year, traps were set in Columbia, Dane, La Crosse, and Sauk counties as part of an exotic vegetable pest detection survey. All traps were negative for swede midge. No new SM detections have occurred in the state since 2019.

### Brown Marmorated Stink Bug

Grant and Shawano counties were the newest additions to the Wisconsin BMSB distribution map in 2022. Thirty-nine of the state's 72 counties now have confirmed BMSB finds. Reproducing populations have become well established in southern and eastern Wisconsin, and range expansion is advancing into the western and northern areas of the state.



Brown marmorated stink bug | DATCP



# Plant Pest & Biological Control Permits



The Plant Industry Bureau reviews USDA APHIS Plant Protection and Quarantine (PPQ) 526 permit applications to import or distribute plant pests, biological control organisms, and noxious weeds in Wisconsin. Requests for PPQ 526 permits are approved only if the organism(s) on the application is widely established in the state or an environmental risk assessment indicates little risk of adverse effect from the importation. Conditions on containment and disposal methods may be imposed, facility inspections may be conducted to ensure permit conditions are met, and state and federal PPQ officials must concur to allow importation.

In 2022, APHIS enacted several permitting program policy and technological updates that impacted Wisconsin. The most significant was replacing its ePermits online system with eFile. APHIS eFile is a web-based system that allows

users to apply for and receive all Organism and Soil, and Plant and Plant Product permits. In addition, starting January 1, 2022, PPQ began issuing only single-year permits. Previously permits were valid for three years.

Another policy change made this year was the new requirement for stakeholders who import earthworms into the United States to obtain a PPQ 526 permit. The new policy applies to all earthworm species and is intended to help prevent the introduction and spread of potentially harmful plant and animal pests/pathogens transmitted from imported earthworms. PPQ only issues import permits for earthworms for environmental release in the United States from countries that are free from foot-and-mouth disease.



# Plant Pest & Biological Control Permits

Pest Survey specialists processed a total of 201 PPQ 526 permit applications this year: 79 for isopods, 56 for plant pathogens, 45 for insects and arthropods, four for earthworms (three for the common nightcrawler, *Lumbricus terrestris* and one for the compost worm, *Eisenia veneta*), and two for federal noxious weeds. Fifteen permits had the organism names redacted. The 56 permits for plant pathogens mainly included bacteria, fungi, phytoplasmas, and viruses for use in research and development.

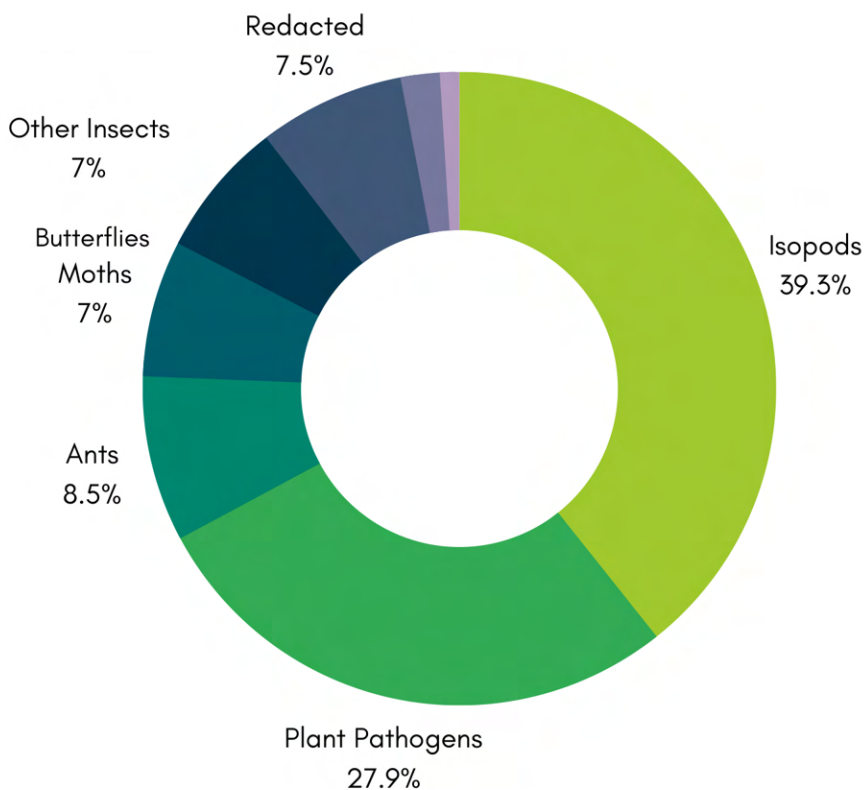
Permit request trends in 2022 included a sharp increase in applications for isopods, namely *Armadillidium* spp., *Cubaris* spp., and *Porcellio* spp. Isopods, also known as pill bugs or woodlice, are used for cleanup in terrariums/vivariums and are valued by

hobbyists for their aesthetics. A similar rise in imports of various ant species for interstate commercial resale to hobbyists was also observed this year. Seventy-nine of the permits issued in 2022 were for isopods, 17 were for ants, and 24 were for butterflies, moths, crickets, and mealworms.

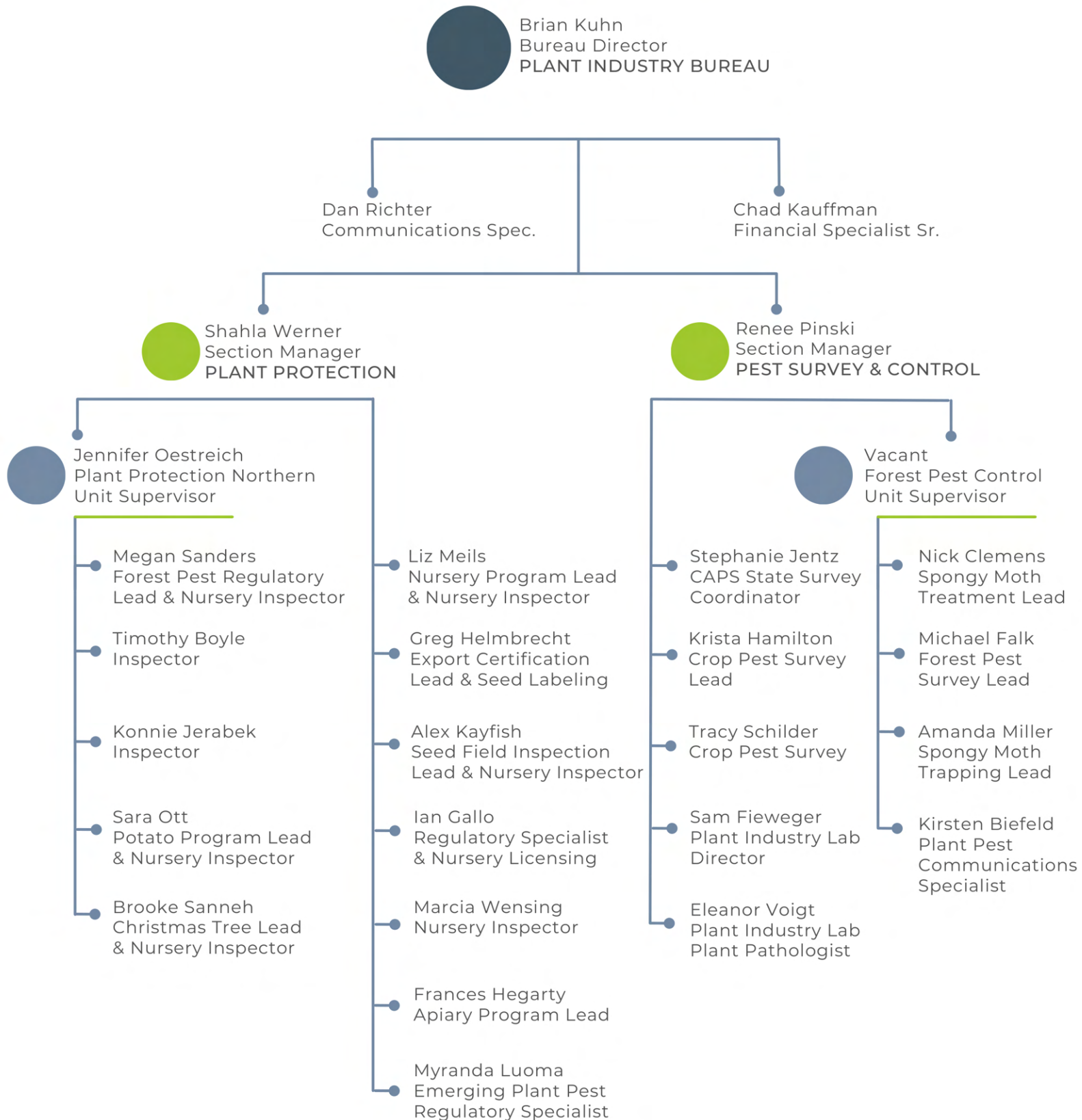
In addition to PPQ 526 permits, Plant Industry Bureau staff also review federal PPQ 525-A permits to receive soil and PPQ 588 controlled import permits to import plants or plant products for experimental or developmental purposes. Staff approved 15 PPQ 588 permits, and one PPQ 525-A permits in 2022, for a total of 217 PPQ permits issued.

## Plant Pest Permits Issued in 2022

Isopods, also commonly known as pill bugs or woodlice, accounted for 39% of the 201 PPQ 526 permits issued in 2022, followed by plant pathogenic bacteria, fungi, and viruses at 28%. Permit requests also included ants, butterflies, crickets, moths, and other insects, which comprised 23% of this year's total. In addition, four permits (2%) were issued for earthworms and two permits (1%) were issued for federal noxious weeds.



# Plant Industry Bureau Organization





# 2022

## ANNUAL REPORT

### **WISCONSIN DATCP**

Department of  
Agriculture, Trade and  
Consumer Protection

### **BUREAU OF PLANT INDUSTRY**

<https://www.datcp.wi.gov>  
1-866-440-7523  
P-DARM412 (04/2022)

### **ARM DIVISION**

Division of  
Agricultural Resource  
Management