

2025 Schutter Diagnostic Laboratory Annual Report Summary

The Schutter Diagnostic Laboratory (SDL) at Montana State University (MSU) is provided as a service to the citizens of Montana for plant pest identification and integrated pest management education. In 2025, the SDL conducted 2,307 plant, plant disease, insect, mushroom, and abiotic diagnoses in 51 Montana counties and supported clients in four additional states – Missouri, North Dakota, Oregon, and Wyoming, demonstrating its broad regional reach. County Extension offices remained the primary users of SDL services, submitting 53% of all samples. By providing timely, research-based plant disease and pest identifications, SDL strengthened county-level diagnostic capacity and enabled Extension faculty to serve their communities more effectively. As one faculty member summarized, “*Literally, I wouldn’t be able to do my job effectively without SDL...When 4-H duties and other tasks are piling up, SDL is a saving grace...clients appreciate the formal lab report... and they have a lot of trust in the SDL.*”[†] This statewide support network enhances the efficiency, credibility, and responsiveness of Extension programming, benefiting agricultural producers and the communities they serve.

- 100% of SDL clients thought the timeliness of a response/diagnosis was good or excellent*.
- 98% of SDL clients found the clarity of the information provided with the diagnosis/identification was good to excellent*.
- 94% of SDL clients found SDL services very to extremely useful in solving their plant- or arthropod-related problems*.
- 67% of SDL clients adapted their pest management decisions based on recommendations provided in the SDL report*.

Selected Impacts and Outcomes in 2025

Informed pest management decisions and reduced unnecessary pesticide use

SDL diagnostic reports directly influenced client learning and management actions. In 2025, 48%* of clients rated non-pesticide treatment options as good or excellent, 49%* rated treatment recommendations as good or excellent, 64%* rated prevention information as good or excellent, and 67%* adapted their pest management decisions based on SDL recommendations. Accurate identification of abiotic plant disorders also prevented unneeded chemical inputs; more than 100 woody ornamental samples suspected of disease were diagnosed as winter injury or other abiotic issues, saving clients’ money and reducing environmental impacts.

Identification of ticks

In 2024, the SDL identified the first **black-legged tick** (*Ixodes scapularis*, also called the deer tick) collected from Montana. Since this tick species is the primary vector of Lyme disease, there has been an increased interest in tick identification. In 2025, the SDL received a higher number of tick samples (13 total) than in previous years. Tick species identified include: *Amblyomma americanum*, *Dermacentor albipictus*, *Dermacentor andersoni*, *Dermacentor variabilis*, and *Ixodes kingi*.

[†] Selected quotes copied verbatim from the 2025 Extension agent feedback survey, n=40, compiled by MSU Social Data Lab.

* Results of the 2025 SDL client survey, n=78, compiled by MSU Social Data Lab.

Early detection of plant diseases

Early detection of regulatory plant pathogens, such as *Phytophthora ramorum*, is key to safeguarding Montana's green industry and agriculture. A paper birch sample submitted with suspected *Phytophthora* infection was confirmed — through collaboration with the Montana Department of Agriculture APHIS plant health director and the USDA Plant Pathogen Confirmatory Diagnostics Laboratory — as *Phytophthora cactorum*, the causal agent of Phytophthora bleeding canker. This marked the first detection of Phytophthora bleeding canker on paper birch in Montana. The SDL also continued its long-standing support of the state's mint industry by testing in-vitro plant lines for *Verticillium dahliae* for the sixth consecutive year. In 2025, 12 mint lines were screened, ensuring that only disease-free plant material enters commercial production. This proactive testing helps protect growers from introducing a destructive soilborne pathogen and supports the ongoing health and marketability of Montana's mint crops.

Early detection and containment of high-risk invasive weeds

Early detection of agriculturally significant pests is a critical SDL function. Two species of concern - **Palmer amaranth (*Amaranthus palmeri*)** and **waterhemp (*A. tuberculatus*)** - pose increasing threats in Montana. In 2025, SDL received 19 *Amaranthus* samples for identification and numerous related inquiries. Working in collaboration with local Extension field faculty:

- We confirmed Palmer amaranth in three new counties and facilitated PCR testing when appropriate. All detected populations were removed before producing seed, and to our knowledge, no Palmer amaranth population has set seed in Montana.
- We assisted with the identification of a large new waterhemp population in one county, connecting the producer with partners to support containment.
- In all remaining cases, we identified other common species, saving producers and land managers significant time and expense by preventing unnecessary, costly treatments.

A client summarized the lab's value in the 2025 annual customer satisfaction survey:

"The state noxious weed EDRR program couldn't function without the SDL, especially for species like phragmites and Palmer amaranth."‡

Early detection of invasive insects

In 2025, SDL contributed to statewide invasive species protection by identifying the first record of **brown marmorated stink bug (*Halyomorpha halys*)** in Lewis and Clark County. Early confirmation of this pest, known to damage a wide range of vegetables, fruits, field crops, and ornamentals and responsible for tens of millions of dollars in losses in other states, allowed us to rapidly alert gardeners, growers, and Extension personnel through Urban and Ag Alerts. These early communications helped raise awareness and support proactive monitoring.

Another invasive insect, the **emerald ash borer (*Agrilus planipennis*)**, kills ash trees and has not been detected in Montana yet. Early detection is important because 40% of publicly owned trees in many Montana communities are ash. The SDL worked with the Montana Department of Agriculture on four occasions to determine if suspected damage to ash trees was caused by the emerald ash borer. All samples were determined to be caused by other agents, such as other wood-boring beetle species, preventing unnecessary removals while maintaining readiness for true detections. This diagnostic support strengthens Montana's ability to respond quickly should emerald ash borer enter the state.

‡ Selected quotes copied verbatim from the 2025 SDL client survey, n=78, compiled by MSU Social Data Lab and the 2025 sample feedback survey, n=40, submitted with each sample report.

How MSU Extension field faculty benefited from SDL services in 2025[†]:

- “Quality and reliable diagnostics followed by information that is scientifically backed and locally available is an invaluable asset to my ability to provide excellence in landscape maintenance and service.”
- “[...] I would say that it’s the level of expertise and thorough recommendations coming from SDL, making it easier to do my job in the sense of meeting the community needs around identification and management.”
- “Helping me learn to better identify pests and diseases for my clients in my county. Confirming or denying suspicions, and being able to culture out samples is a key component that I would not be able to do.”

What other SDL clients appreciated about SDL services in 2025[‡]:

- “This is an excellent group of scientists, I am grateful to have access to their knowledge in such a timely manner. I do use ‘online apps’ but I am not confident in their diagnosis, nor am I confident in their recommendations, especially if they are not local. [...]”
- “The greatest benefit using the lab was its ability to provide clear and thorough diagnostic results, which identified the specific diseases affecting plants in certain fields. These diagnoses offered answers to the issues observed. Which in turn helps guide decisions for future field management.”
- “Because of the SDL report about my unknown plant, I determined it was not a species to be concerned about and therefore did not take action to control. It saved me time and money.”
- “Incredibly helpful; an enormously valuable resource for Montana!”
- “You provide a service that would otherwise be unavailable to the home gardener. It’s some of the best use of my tax dollars I’ve seen!



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Introduction

The mission of the Schutter Diagnostic Laboratory (SDL) is to safeguard Montana agriculture, landscapes, and public spaces from plant pests by offering identification services, management advice, and education. Our recommendations are based on integrated pest management (IPM) principles, where IPM is a sustainable approach to managing pests by combining biological, cultural, physical, and chemical tools in a way that minimizes economic and environmental risks. Our mission also includes early detection of new and invasive pests that may pose a risk to Montana and the U.S. to prevent significant limitations to agricultural production and international trade.

Local MSU Extension offices represent the largest SDL customer group. Other SDL clients submitting samples in 2025 were homeowners/gardeners (47%), researchers/specialists (13.6%), growers/farmers (7.6%), agribusiness (4.6%), agent/educator (4.6%), crop consultants (4.6%), landscapers (3%), pest control operators (3%), and regulatory agents (1.5%), based on 78 survey responses to the 2025 SDL client survey.

In 2025, the SDL received 1,743 samples and diagnostic inquiries. In total, the SDL team delivered 2,307 plant disease, insect/other arthropod, plant, mushroom, herbicide injury, and other abiotic disorders diagnoses through physical, email, and Plant Sample Submission app samples (Table 1).

Table 1. Number of diagnoses by the Schutter Diagnostic Lab in 2025.

Diagnosis Type	Number of Diagnoses
Plant Disease	863
Arthropods	767
Plant ID	277
Mushroom ID	27
Herbicide Injury	115
Other Abiotic Disorders	258
Total	2,307

We received samples from all 51 counties in Montana and 4 additional states – Missouri, North Dakota, Oregon, and Wyoming. Most samples, 53%, were submitted through MSU Extension services, and 47% were submitted from non-Extension clientele. Most samples from Extension were received from Gallatin, Yellowstone, Ravalli, and Lewis & Clark Counties. Eighty-five percent of Extension samples were from non-commercial clientele while 15% were from commercial sources. For the non-Extension samples, 54% were from non-commercial clientele and 46% from commercial sources. Eighty-four percent of the sample diagnoses were associated with a weed, disease, or pest while 16% of the diagnoses were from abiotic causes (i.e., winter injury, nutrient imbalance, suspected herbicide injury, drought, or cultural problems).

In addition to diagnostic services, SDL diagnosticians provide outreach materials about pests of concern to clients in Montana. For example, the SDL maintains a Facebook page that has over 1,000 followers. In 2025, we published a total of 5 Facebook posts reaching over 5,893 people, with an average of 28 engaged users per post. Our posts usually focus on timely information about plant diseases, insects, and plant identification for our wide range of clientele.

We also send out [Urban Alerts and AgAlerts](#) that inform our clientele about pertinent issues statewide via text or email. The MSU Urban Alert system (848 subscribers) is intended for Extension field faculty, landscape professionals, arborists, and anyone concerned with ornamental plants and vegetables. In 2025

we posted 6 [Urban Alerts](#). The MSU AgAlert system (2,037 subscribers) provides current and research-based information for Montana agricultural clients. There were 14 [AgAlerts](#) posted in 2025.

2025 Plant Disease Summary

Diagnostic Staff

Dr. Uta McKelvy, Assistant Professor Extension Plant Pathology

Dr. Eva Grimme, Plant Disease Diagnostician & Associate Extension Specialist III

Other Assistants/Specialists

Erin Gunnink-Troth, Research Associate

Abiya Saeed, Extension Horticulture Specialist

Sarah Eilers, Montana Master Gardener Coordinator

Sample Summary

In 2025, the SDL completed 863 plant disease diagnoses (agricultural and horticultural samples). Samples submitted through the Plant Diagnostics Information System (PDIS) by MSU Extension personnel (53%) consisted of 43% non-commercial and 9% commercial entities. Samples submitted by entities outside of MSU Extension accounted for 47% with 27% coming from commercial sources and 20% from non-commercial sources.

A total of 164 agricultural samples were submitted for disease diagnosis in 2025 in addition to 7 diagnoses that were completed via email. Small grain crops accounted for 50% of all crop samples (82 samples processed; 35 winter wheat, 17 spring wheat, 11 barley, 7 durum wheat, further unspecified wheat, oats, corn, triticale, and kernza). Pulse crops (20%) constituted the second-largest group of crop samples (33 samples processed; 13 chickpea, 12 dry field pea, and 8 lentil samples), followed by garlic (12 samples). Other crops submitted for disease diagnosis in 2024 included alfalfa (4%), potato (4%), and forage grasses (3%).

A total of 489 horticultural samples and 12 mint variety samples were submitted to the SDL for disease testing. Deciduous woody ornamentals accounted for 31% and evergreen woody ornamentals accounted for 15% of the horticulture diagnoses made by the SDL in 2025. Sample hosts of these categories included Colorado blue spruce, blue spruce, pine trees, fir, lilac, juniper, poplar, crabapple, oak, linden, mountain ash, boxelder, and maple trees.

Fruit and vegetable samples (apple, pear, cherry, raspberry, tomato) accounted for 13%, perennial & annual plants for 8%, and turf samples accounted for 7% of the horticulture diagnoses.

Trends from 2025: Agriculture

Agricultural crops accounted for 254 disease diagnoses in 2025. Of these, 204 diagnoses identified disease problems (80%) and 50 diagnoses identified abiotic disorders (20%). Samples were received from 33 of 56 Montana counties, with Gallatin, Chouteau, Pondera, and Liberty counties contributing over 50% of agricultural crop samples.

Fifty-five percent of diagnoses that identified a disease problem in 2025 were associated with fungal and fungal-like pathogens. Root, crown, and seedling rots accounted for 29% of all crop disease diagnoses in 2025. Root rots associated with *Fusarium* sp. were very common (16%) affecting winter and spring wheat,

chickpea, lentil, field pea, winter pea, barley, durum wheat, and bean; *Rhizoctonia* sp. (8%) caused root diseases in winter and spring wheat, barley, durum wheat, chickpea, field pea, and lentil. Common root rot of cereals caused by *Cochliobolus sativus* (2%), oomycete root rots (*Pythium* spp. and *Aphanomyces* spp.; 1%) were less common in 2025.

Fungal foliar diseases accounted for 9% of all crop disease diagnoses in 2024 (19 diagnoses). This represents a continuing trend of decreasing fungal foliar disease diagnoses since 2023. Environmental conditions in spring and early summer 2025 were characterized by below-average precipitation across many parts of the state and were likely not conducive to foliar disease development. Leaf spot diseases accounted for 7.4% of all crop disease diagnoses in 2025 and included net blotch (*Drechslera teres*) in barley; tan spot (*Pyrenophora tritici-repentis*) in winter and spring wheat; Ascochyta blight (*Didymella rabiei*) in chickpea and field pea, Septoria leaf spot (*Septoria pisi*) in field and garden peas; and spring black stem (*Phoma medicaginis*) in alfalfa. Powdery mildew was observed in three cases on winter, durum and spring wheat; white mold (*Sclerotinia* sp.) was observed on one garlic sample.

In 2025, we observed an increase in *Verticillium* spp. detected on crop samples (3% of fungal diagnoses), affecting garlic, alfalfa, chickpea, winter pea, lentil, bean, and potato; 1 diagnosis each).

Post-harvest and storage disorders associated with fungal pathogens accounted for 10% of all crop disease diagnoses in 2025. This included skin blotch (*Embellisia allii*), Fusarium basal rot and dry rot (*Fusarium* spp.), bulb and crown rot (*Fusarium proliferatum*), and blue mold (*Penicillium hirsutum*) in garlic; mold issues in hay and silage associated with *Alternaria* sp., *Aspergillus* sp., and *Botrytis* sp.; Fusarium dry rot (*Fusarium* spp.) in potato; and *Penicillium* seed rot (*Penicillium* spp.) in hemp. Fungal head/grain diseases accounted for 2% of disease diagnoses in 2025. They included black point (*Alternaria* sp.) and sooty molds in winter and durum wheat, triticale, and loose smut (*Ustilago nuda* f. sp. *hordei*) in barley.

Eight percent of diagnoses in 2025 were attributed to viral pathogens, representing an increase from 1% of diagnoses in 2024. Except for one, all virus disease diagnoses identified symptoms of Wheat streak mosaic disease and confirmed the presence of the wheat curl mite vector (*Aceria tosichella*) in winter wheat, spring wheat, and durum wheat. More than half the samples were submitted from Chouteau and Pondera counties, while other source counties included Glacier, Toole, Liberty, Phillips, Cascade, Gallatin and Yellowstone.

Three percent of disease diagnoses were associated with bacterial pathogens in 2025. *Pseudomonas* sp. caused bacterial brown spot on beans, bacterial leaf blight on dry peas and oats. Other bacterial diseases observed in 2025 included post-harvest and storage such as common scab in potato (*Streptomyces scabies*) and bacterial bulb rot in garlic (unidentified bacteria)

Two diagnoses (1% of total) identified stem and bulb nematode (*Ditylenchus dipsaci*) in garlic bulb samples in 2025.

Montana crop production in 2025 was challenged by a lack of precipitation in spring and early summer reducing water availability, impairing nutrient uptake, and causing drought and heat stress. These environmental conditions are somewhat reflected in the composition of the 50 abiotic disorder diagnoses on agricultural crops in 2025. Among those, nutrient imbalances and low soil pH accounted for 34% of diagnoses, followed by cultural/environmental problems (28%), heat/drought stress (14%), and cold/frost/freeze damage (8%).

Physiological leaf spot (PLS) is a reoccurring abiotic disorder observed on several winter and spring wheat varieties and accounted for 10% of abiotic diagnoses in 2025 (corresponding to 5 samples). Physiological leaf spot diagnoses have steadily declined since 2023, which may be the result of increased awareness and ability of on-site diagnosis due to outreach/education efforts by Extension specialists, PLS-unfavorable environmental conditions, improved nutrient (chloride) management, and/or a decrease in acreage of PLS-susceptible wheat varieties.

Trends from 2025: Horticulture

Horticultural samples accounted for 561 diagnoses (samples submitted through the Plant Diagnostic Information System [PDIS]) and 65 plant disease diagnoses for electronically submitted samples (i.e., photos in emails).

Over one hundred submitted woody ornamental samples were suspected of disease but were diagnosed as winter injury or other abiotic disorders, making a pesticide application unnecessary.

Foliar fungal diseases were again predominant during 2025. Evergreen samples, especially Colorado blue spruce and blue spruce, were submitted with signs of *Rhizosphaera* needle cast disease (6) and/or sudden needle drop (25). Pine trees were mainly affected by *Dothistroma* needle blight (7). In deciduous samples, apple scab was confirmed on apple (1) and crabapple (3) samples. Anthracnose disease was confirmed this season on aspen (1), lilac (1), maple (5), and peony (2). Oak leaf blister disease was confirmed on six oak tree samples. *Cytospora* canker was again the most prevalent canker disease diagnosed on spruce trees (2), fruit trees (4), poplar trees (3), ash (1) and one American elm. Powdery mildew infection was confirmed on cherry (1), lilac (3), pea shrub (1), spirea (1), and box elder (1). Eight elm tree samples were submitted for Dutch elm disease testing and the disease was confirmed on three elm tree samples. *Marssonina* leaf spot was suspected on four poplar samples.

Fifteen plant samples, including apple, crabapple, pear, raspberry, cotoneaster, hawthorn, Mountain ash, and serviceberry were submitted to the SDL with suspected fire blight infection. Samples were tested with rapid disease diagnostic kits, confirming positive results on 18% of the submitted samples. Clients were able to implement IPM strategies promptly.

Root rots caused by *Pythium* spp. affected several turfgrass samples (24) this season. *Rhizoctonia* root rot was confirmed on only two turfgrass samples.

2025 Insect Diagnostics Summary

Diagnostic Staff:

Chloe Rice, Extension Associate Specialist, Urban Arthropod Diagnostician
Marni Rolston, Research Associate, Agricultural Arthropod Diagnostician

Other Assistants/Specialists:

Dr. Frank Etzler, State Survey Coordinator, Montana Department of Agriculture
Dr. Michael Ivie, Systematic Entomologist, Montana State University
Dr. Casey Delphia, Research Associate/Entomologist, Montana State University
Abi Saeed, Horticulture Extension Specialist, Montana State University
Dr. Justin Runyon, Entomologist, USDA Forest Service

Arthropod Identification Activities and Trends

In 2025, a total of 767 arthropod diagnoses were completed, of which 593 diagnoses were made for physical samples submitted through the Plant Diagnostics Information System (PDIS) and 174 diagnoses were made via photos in emails. 44% percent of diagnoses were for samples submitted by Extension agents and the rest were from samples submitted directly to the Schutter Lab. 20% percent of the diagnoses were for commercial clientele, while the rest were for non-commercial clients. 88% diagnoses were from samples collected from urban settings and 12% were from agriculture-related settings. The SDL also worked with the USDA's Natural Resources Conservation Service and the Montana Veterinary Diagnostic Lab to help identify insects they received from clients.

Agriculture-Related Arthropod Samples

Ninety-one arthropod samples collected from agricultural settings were submitted to the SDL in 2025. The most common host crops were winter, spring and durum wheat (53%). Arthropod samples from alfalfa and commercial garlic comprised 4% and 3%, respectively. The SDL received samples from pasture/rangeland (8%), livestock settings (8%) and commercial greenhouses (3%). The remaining samples were from a diverse range of agricultural crops, including lentil, sugar beet, camelina, potato, mustard, corn, barley, sainfoin, and oats.

The most common small grain pest in 2025 was the wheat curl mite (Table A2). Other important arthropods diagnosed from wheat include the wheat stem sawfly, brown wheat mite, black grass bugs, and the Hessian fly. Specimens of a bristly olive grass aphid were also submitted. This is a non-native insect that is well-established in the northern US but rarely causes economic damage to wheat. Insects submitted from alfalfa fields include alfalfa weevils, plant bugs and the alfalfa blotch leafminer. Other crop pests submitted to the SDL include the European corn borer in field corn, bulb mites and tarsonemid mites in garlic, army cutworm in lentil, and tuber-damaging Arionid slugs in a potato field.

Arthropods collected from agriculture-related settings were also submitted to the SDL in 2025. Clients provided samples of face flies and cluster flies in ranch buildings, false chinch bugs aggregating on the sides of a barn, and chironomid blood worms in a stock tank. One of the more unusual samples we received was a sheep foot louse taken from a mountain goat, submitted by the Montana Veterinary Diagnostic Lab.

Every year the SDL receives a few samples of non-damaging/beneficial arthropods collected from agricultural lands. In 2025, some of these samples included parasitic braconid wasp cocoons on the heads

of wheat, small dung flies and scarab beetles helping decompose horse manure, and predatory carabid and rove beetles in cropland. Clients are often concerned about these non-damaging insects and are relieved to learn they are beneficial and don't need to be managed. Reports associated with the diagnoses of arthropod pests in agricultural landscapes usually include information about how to preserve these important beneficial arthropods.

Urban Arthropod Samples

In 2025, a total of 676 arthropod diagnoses were completed from non-agricultural settings, which included gardens, yards, backyard greenhouses, garden centers, nurseries, parks, and houses or other buildings. Each year the Schutter Diagnostic Lab receives a wide variety of arthropods from urban spaces and 268 unique arthropod identifications were made in 2025. For 5% of urban arthropod cases, no evidence of arthropods or their damage was found, preventing unnecessary management such as the use of insecticides. Further, 9% of urban arthropod diagnoses were of beneficial arthropods, allowing management recommendations to be adjusted to preserve populations of these insects.

Woody ornamentals: Arthropods from woody ornamentals made up 35% of the urban arthropod diagnoses. The greatest number of samples came from spruce, pine, aspen, ash, and elm. See Table A1 for common arthropods associated with these woody ornamentals. Beneficial arthropods included parasitic wasps, green lacewings, and lady beetles, all three of which help to control the populations of pestiferous insects. In reports associated with these diagnoses, clients received information about how to adjust their pest management strategies to accommodate the beneficial insects.

Indoor/structural: 35% of urban arthropod diagnoses were from inside or on buildings. Pantry pests identified included the larder beetle and red flour beetle. Fabric pests identified include the webbing clothes moth, casemaking clothes moth, and carpet beetles. Other common indoor pests included root weevils, brown marmorated stink bug, boxelder bug, western conifer seed bug, Arhyssus bug, fungus gnats, booklice, humpbacked flies, firebrats, and silverfish. Common pests from houseplants included scale insects, citrus mealybugs, whiteflies, and aphids. Indoor arachnids identified include harvestmen, wolf spiders, sun spiders, and agelenid spiders including the hobo spider.

Examples of non-damaging insects which entered buildings include the knapweed root weevil, clover weevil, click beetles, noctuid moths, parasitic wasps, false blister beetles, rove beetles, elm seed bugs, and masked hunters. Clients were reassured that these insects were not typically considered structural or stored product pests.

Kitchen garden: Vegetables arthropod pests were 3% of the urban arthropod diagnoses. Some of the vegetables submitted to the lab were tomato, garlic, potato, cabbage, and pumpkin. The most common vegetable pests were spider mites, aphids, and thrips. Fruit trees, berries, and currants made up 9% of urban arthropod diagnoses. Fruits submitted to the lab included apple, pear, cherry, plum, raspberry, and strawberry. Common pests included aphids, leafhoppers, raspberry sawfly, spotted snake millipede, pear sawfly, plum and cherry curculio, codling moth, stink bugs, and blister mites.

2025 Weeds Lab Summary (Plant ID, Mushroom ID, and Herbicide Injury)

Diagnostic Staff

Noelle Orloff- Associate Extension Specialist III

Extension Specialists

Dr. Jane Mangold, Extension Rangeland Invasive Plant Specialist, Montana State University

Dr. Tim Seipel, Extension Cropland Weed Specialist, Montana State University

Other Cooperators

Dr. Cathy Cripps, Professor Emerita, Mycology

Dr. Chance Noffsinger, Assistant Professor, Mycology

Plant Identification Activities and Trends

In 2025, the SDL processed 167 physical specimens for plant identification, and 110 electronic samples (i.e. photos in emails). Most samples came from noncommercial sources such as government personnel, homeowners, and small acreage landowners. These samples accounted for 78% of sample submissions. Noncommercial samples may be from agency or regulatory personnel, or from residential or small acreage landowners who need information on how to control a plant in their management area or in gardens or small pastures. Samples from commercial clients such as farmers, ranchers, consultants, nurseries, and representatives from agribusinesses accounted for 22% of all submissions. About 56% of plant identification samples were from local Extension offices submitting samples on behalf of their clients. We identified plants from 45 Montana counties and reservations, and two additional states (South Dakota and Wyoming).

Plant identification samples submitted represented 196 unique species. Forty-two percent of samples were of exotic plants. The most commonly submitted exotic species were Palmer amaranth (*Amaranthus palmeri*, 5), Powell's amaranth (*Amaranthus powellii*, 5) and ventenata (*Ventenata dubia*, 5). Note that Palmer amaranth is native to North America but not to Montana, and is considered an agricultural weed. Thirty-eight percent of samples were Montana native plants. The most commonly submitted native species were redroot pigweed (*Amaranthus retroflexus*, 3), Baltic rush (*Juncus balticus*, 3), and western wheatgrass (*Pascopyrum smithii*, 3). Notably, we received eighteen samples in the *Amaranthus* genus in 2025, due largely to concern about Palmer amaranth and waterhemp (*A. tuberculatus*).

Twenty confirmed specimens of state-listed noxious weeds and other state-regulated plants were submitted representing thirteen unique species (Table 2). The SDL provides a valuable resource where land managers can get accurate information about suspected problematic plants such as noxious weeds.

Table 2. State listed noxious weeds and regulated plants submitted to the SDL in 2025. Records marked with an asterisk are new county records to our knowledge.

Species	County	Montana Regulation
Palmer amaranth	Carter, Chouteau*, Fergus*, Hill*	Restricted seed species
Common reed	Gallatin	Priority 1A noxious weed
Blueweed	Gallatin	
Common buckthorn	Broadwater*	Priority 1B noxious weed
Bohemian knotweed	Sweet Grass	Priority 1B noxious weed
Tall buttercup	Gallatin	Priority 2A noxious weed
Ventenata	Gallatin, Judith Basin*, Sanders	Priority 2A noxious weed
Common tansy	Ravalli	Priority 2B noxious weed
Hoary Alyssum	Flathead, Ravalli	Priority 2B noxious weed
Oxeye daisy	Rosebud*	Priority 2B noxious weed
Spotted knapweed	Pondera	Priority 2B noxious weed
Whitetop	Gallatin	Priority 2B noxious weed
Cheatgrass	Hill	Priority 3 regulated plant

Mushroom Identification Activities

In addition to plants, we also identify mushroom specimens. In 2025 Dr. Cathy Cripps assisted the SDL by identifying 27 mushroom samples. These specimens were of 20 different species. All mushroom samples were from non-commercial sources (e.g. home gardeners, medical personnel, general public), and were found in mainly lawns, gardens, or natural areas. Clients interested in mushroom identification are most often concerned with edibility or toxicity of mushrooms, and proper identification and guidance is vital for these types of questions.

Herbicide Injury Diagnosis

We assessed 91 physical samples for potential herbicide injury along with 24 electronically submitted samples, for a total of 115 herbicide injury cases. This number was a 66% increase compared with 2024 when we assessed 69 samples for herbicide injury symptoms. We suspected herbicide injury to be affecting samples in 73% of cases in 2025. Clients in several cases involving damage to property were referred to the Montana Department of Agriculture field offices for assistance with further investigation.

Most herbicide injury cases were from residential yards, or ornamental or vegetable garden settings, where we assessed 73 samples for herbicide injury symptoms. Of these, 31 woody ornamental samples showed symptoms consistent with synthetic auxin herbicide injury. These symptoms may have arisen due to factors such as herbicide drift or root uptake after lawn herbicide applications. Sixteen vegetable samples from home gardens also showed symptoms consistent with synthetic auxin herbicide injury. Based on site histories it is likely most of these occurred because of herbicide carryover in garden

amendments (manure or compost) or newly purchased topsoil. Other issues we encountered in residential landscapes included woody plants showing glyphosate injury symptoms (two cases), and a suspected case of herbicide drift from a neighboring property. In 18 potential herbicide injury cases in these settings, plant symptoms were suspected to instead be due to other environmental, insect, or disease-related factors.

Of the 32 commercial agricultural samples we assessed for herbicide injury, there were several different suspected causes of injury. We observed symptoms consistent with group 14 herbicide injury in eight cases involving field peas, sugarbeet, and lentils. In six cases, we observed symptoms consistent with group 2 herbicide injury to pulse crops. Herbicide drift from neighboring fields was suspected in two cases affecting chickpea (group 4) and winter wheat (group 9). Finally, we assessed 11 crop samples where symptoms were explained best by other environmental factors or plant disease rather than herbicides.

Table A1. Common arthropods and diseases associated with urban/ornamental plant hosts submitted to the Schutter Diagnostic Lab in 2025.

Host Tree	Common Insects/Arthropods	Common Diseases
Apple/ Crabapple	Blister mites, Codling moths, Spider mites, Rough stink bugs, Woolly apple aphids, Green lacewings	Fire blight, Cytospora canker, Apple scab
Ash/ Green Ash	Leafcurl aphids, Green lacewings, Spider mites, Lace bugs, Ash bark beetles, Gall mites	Anthracnose, Powdery mildew
Aspen/ Cottonwood/ Poplar	Aphids, Poplar vagabond aphids, Spider mites, Eriophyid mites, Poplar bud gall mites, Green lacewings, Carpenterworms, Leaf blotch miner moths	Cytospora canker, Marssonina leaf spot
Cherry/ Chokecherry	Gall mites, Cherry curculio, Stink bugs, Lace bugs, Pearslug sawfly	Black knot, Powdery mildew
Cotoneaster	Aphids	Cytospora canker
Elm	Aphids, Elm leafminer sawfly, European elm scale, Agromyzid leafminer flies, Lady beetles, Green lacewings, Banded elm bark beetles	Dutch Elm disease, Cytospora canker
Fir	Western spruce budworm	N/A
Juniper	Callidium sp. borer	Cedar-apple rust
Lilac	Aphids, Eye-spotted lady beetle, Eriophyid mites, Thrips	Bacterial blight, Powdery mildew
Maple	Cottony maple scale	Maple anthracnose, Verticillium wilt
Oak	Rough oak bulletgall wasp, Green lacewings, Lecanium scales	Oak leaf blister
Pine	Pine needle scale, Aphids, Spider mites	Dothistroma needle blight, Diplodia tip blight
Plum/Pear/ <i>Prunus</i> (Other than Cherry)	Aphids, Plum curculio, Eriophyid mites, Pear leaf blister mite	Cytospora canker, Peach leaf curl
Rose	Aphids, Cynipid wasp galls, Rose leafhopper	N/A
Spruce	Pine needle scale, Spruce spider mite, Aphids, Cooley spruce gall adelgid, Spruce bud scale, Giant conifer aphids, Western spruce budworm, White pine weevil	Rhizosphaera needle cast, Cytospora canker, Sudden needle drop, Sooty mold
Willow	Aphids, Chalcidoid parasitic wasps	N/A

Table A2. Common arthropods and diseases associated with agricultural crop plant hosts submitted to the Schutter Diagnostic Lab in 2025.

Crop host	Common Insects/Arthropods	Common Disease
Alfalfa	Alfalfa weevil, alfalfa blotch leafminer, plant bugs	Spring black stem
Barley	NA	Net blotch
Chickpea	NA	Fusarium root rot, Rhizoctonia root rot, Ascochyta blight
Dry field peas	NA	Fusarium root rot
Garlic	Bulb mites, Tarsonemid mites	Embellisia skin blotch, Fusarium basal rot, stem and bulb nematode
Lentil	Army cutworm, thrips	Fusarium root rot
Oats	Sawtoothed grain beetle (stored grain)	Bacterial leaf blight
Potato	Arionid slugs, Julid millipedes	Common scab
Wheat	<p><i>Spring wheat:</i> Wheat curl mite, wheat stem sawfly, Hessian fly, bristly olive grass aphid</p> <p><i>Winter wheat:</i> Wheat curl mite, wheat stem sawfly, Hessian fly, brown wheat mite, Western flower thrips</p> <p><i>Durum wheat:</i> Wheat curl mite</p>	<p><i>Spring wheat:</i> Fusarium root rot, Wheat streak mosaic disease</p> <p><i>Winter wheat:</i> Wheat streak mosaic disease, Fusarium root and crown rot, Rhizoctonia crown and root rot, Physiological leaf spot* (not a disease but GxE response)</p> <p><i>Durum wheat:</i> Wheat streak mosaic disease</p>