



RUTGERS UNIVERSITY
Plant Diagnostic Laboratory
New Jersey Agricultural Experiment Station

Plant Diagnostic Laboratory

2025 Fiscal Year Report (July 1, 2024 to June 30, 2025)

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2025 Fiscal Year Rutgers Plant Diagnostic Laboratory Annual Report

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Introduction

Rutgers Soil Testing and Plant Diagnostic Services are provided by Rutgers Cooperative Extension (RCE), the outreach component of the New Jersey Agricultural Experiment Station (NJAES) and the School of Environmental and Biological Sciences (SEBS). Located on the Cook Campus, these laboratories provide New Jersey citizens with chemical and mechanical analyses of soil and diagnoses of plant problems. Their mission is to provide such services in an accurate and timely manner to meet the increasing agricultural and environmental needs of the State. These goals are achieved in cooperation with extension and research faculty and staff at NJAES. This report summarizes the activities of the Plant Diagnostic Laboratory during the 2025 fiscal year.

History

The Rutgers Plant Diagnostic Laboratory and Nematode Detection Service (PDL) was established in 1991 by the dedicated efforts of RCE faculty members Dr. Ann B. Gould and Dr. Bruce B. Clarke, Specialists in Plant Pathology, Dr. Zane Helsel, former Director of Rutgers Cooperative Extension, and Dr. Karen Giroux, past Assistant Director of NJAES. The laboratory was housed in the former USDA post-harvest research laboratory and then Martin Hall on the Cook College campus until 2000 when it was relocated to the Ralph Geiger Turfgrass Education Center at Horticultural Research Farm II in North Brunswick, NJ. The Geiger Center was made possible through the vision and financial backing of Mr. Ralph Geiger and a large group of University and turf industry cooperators.

The PDL accepted its first samples on June 26, 1991, and has since examined 67,555 samples submitted for plant problem diagnosis, nematode analysis, or identification. The laboratory has become an integral part of RCE and SEBS/NJAES programs by providing diagnostic and educational services in support of the teaching, research, and outreach efforts of SEBS/NJAES.

Staff and Cooperators

PDL

Mr. Richard Buckley is the director of the Plant Diagnostic Laboratory. He was hired as a program associate in 1991 and has been in his current position since 1994. Mr. Buckley received his M.S. in Turfgrass Pathology from Rutgers University in 1991. He has a B.S. in Entomology and Plant Pathology from the University of Delaware. He also received special training in nematode detection and identification from Clemson University. Mr. Buckley

has work experience in diagnostics, soil testing, and field research, and is currently responsible for sample diagnosis, soil analysis for nematodes, and the day-to-day operation of the PDL. He also participates in research, teaching, and outreach activities.

Ms. Sabrina Tirpak, Laboratory Researcher II, has worked for the PDL since 1998. She received her B.S. in Plant Science, with an emphasis in horticulture and turf industries as well as a minor in entomology, from Rutgers University in May 2000. She also attended Clemson University for special training in nematode detection and identification. Ms. Tirpak has primary responsibility for insect and weed identification, rapid screening of disease samples using enzyme-based test kits, and assisting in all other aspects of laboratory operations. She also participates in research, teaching, and outreach activities.

Other Support

The PDL regularly employs Rutgers undergraduate students to assist in sample preparation, data entry, and clean-up. As the students help with many of the basic day-to-day tasks, they also gain invaluable laboratory experience that will contribute to career success after graduation.

The laboratories also benefit from the assistance of faculty in several departments, Centers, and Institutes at Rutgers University/SEBS. We owe a great deal of our success to the expertise of faculty in the departments of Plant Biology, Entomology, Ecology, Evolution and Natural Resources, and Agricultural and Resource Management Agents. We would also like to thank the staff of the Rutgers Office of Continuing Professional Education for their support and assistance with our educational programming.

Laboratory Policies

The PDL receives samples from a varied clientele. Sample submission forms, sampling instructions, and fee schedules are available on the NJAES website (www.njaes.rutgers.edu/services). Samples are submitted via United States Postal Service or by private delivery services directly to the laboratory. Many clients walk samples directly into the laboratory.

Samples are processed on a "first come, first served" basis. Detailed records are kept on all samples. A written response including the sample diagnosis, management and control recommendations, and other pertinent information is sent by email to the client.

Fiscal Year 2025 Report

Operations

During the 2025 fiscal year (July 1, 2024 to June 30, 2025), the PDL examined 2,762 specimens submitted for diagnosis, identification (insects, weeds, or fungi), or nematode assay (Table 1), representing a 67% increase (+ 1,109 samples) from FY24. Samples (Figure 2) submitted for diagnosis (-2) decreased only slightly, while identification samples (+993) increased considerably in FY25. This increase was mostly attributed to the greater number of insect trap catch samples

(+968) received from the state's Cooperative Agricultural Pest Survey (CAPS) and other New Jersey Department of Agriculture programs. There was also an increase in nematode assays (+118) largely because the Rutgers Fruit IPM program, which did not conduct its annual nematode survey for blueberry growers during FY24, revived the survey in FY25. In general, sample submissions remained steady for most of the year, peaking in the summer and declining during the winter. It is our view that 1,500 to 2,000 samples represent peak laboratory capacity, so at 2,762 sample submissions, the PDL was operating at the capacity of the laboratory to function efficiently.

Figure 1.

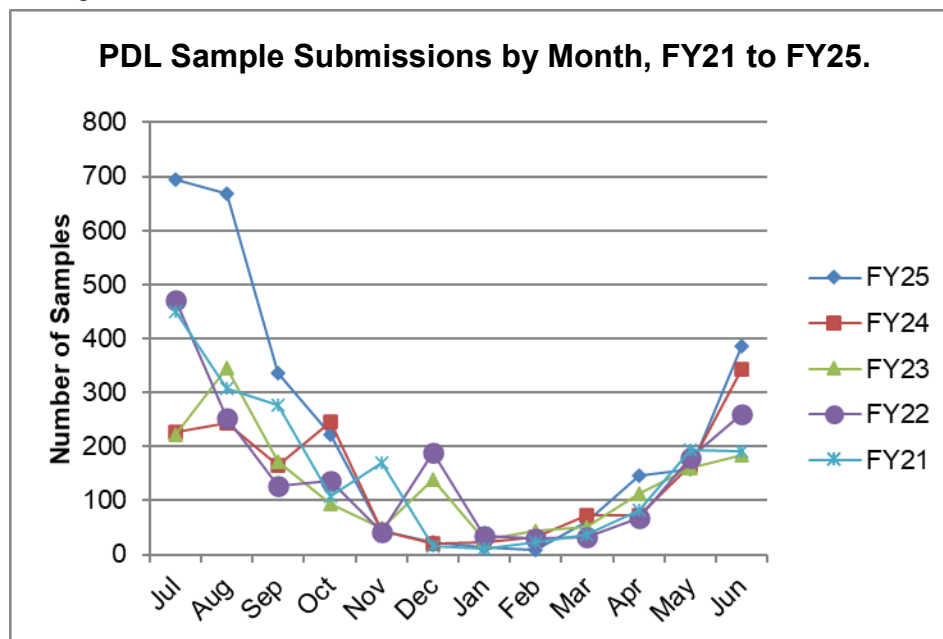
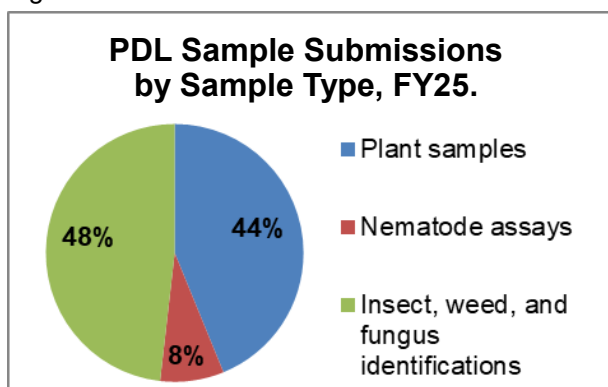


Table 1. PDL sample submissions by month, FY21 to FY25.

| Month | FY21 | FY22 | FY23 | FY24 | FY25 |
|--------------|-------------|-------------|-------------|-------------|-------------|
| July | 451 | 471 | 223 | 226 | 694 |
| August | 308 | 254 | 345 | 244 | 668 |
| September | 276 | 126 | 172 | 164 | 337 |
| October | 107 | 136 | 93 | 245 | 223 |
| November | 171 | 41 | 50 | 54 | 45 |
| December | 16 | 190 | 140 | 21 | 22 |
| January | 11 | 34 | 27 | 22 | 14 |
| February | 22 | 29 | 44 | 32 | 9 |
| March | 36 | 33 | 52 | 72 | 61 |
| April | 82 | 68 | 112 | 73 | 145 |
| May | 193 | 180 | 160 | 166 | 158 |
| June | 192 | 260 | 184 | 343 | 386 |
| Total | 1865 | 1822 | 1602 | 1653 | 2762 |

Figure 2.



The specimens submitted to the PDL by sample type are presented in Figure 2. Most of the samples, 48% (1331), were insect, mold, or plant identifications, 44% (1,210), were plant samples submitted for diagnosis, and 8% (221) of the samples were for nematode analysis.

In Figure 3, samples submitted to the laboratory are presented by origin. In FY25, 87% of the plant submissions were from commercial clientele, 10% were from residential clientele, and 3% were submitted from research faculty at Rutgers University. Commercial plant managers benefit more financially from our services thus they submit the majority of samples to the laboratory. This distribution is consistent with other years.

In FY25, 95% of samples submitted for plant or insect identification were from commercial clients, 3% were residential in origin, and 2% were from research (Figure 3). Household or nuisance pests are the primary issues of concern for residential clients.

Most the nematode assays submitted were from commercial clients, with only one sample received from residential clientele. We expect that the number of nematode samples submitted from residential clients will remain low or nonexistent, since much of this clientele is not familiar with nematode pests.

Samples from research programs represent a relatively small percentage of the total number of plant and soil samples received. However, research samples are an extremely important component of our submissions. Research samples allow the diagnosticians to cooperate with University faculty on problems of great importance to the State of New Jersey.

Turfgrass and ornamentals represent the largest agricultural commodities in New Jersey. In support of New Jersey as an urban agriculture state, it follows that the vast majority of samples (82%) were either turfgrass or ornamental plants (Figure 4). The wide variety of turf and ornamental species grown under diverse environmental conditions in our state results in a large number of problems not readily identifiable by growers or county faculty with these crops. Furthermore, extension faculty and staff who deal primarily with turfgrass and ornamental plants as commodities, as well as plant managers in the turf and ornamentals industries, readily adopted the user fee-based delivery of service. Alternatively, commercial growers of traditional agricultural crops have been slow to adopt a fee-for-service system. Certain RCE faculty and staff members in New Jersey's southern counties continue to provide free diagnostic services and do not advertise laboratory services to these growers. Inroads are being made with these commodity groups through the Vegetable and Fruit IPM groups, and it is our hope that sample submissions from traditional agricultural crops will increase in future years.

Traditionally, most of the soil samples submitted to the laboratory for nematode analysis were from golf turf managers. Problems in golf turf, particularly with nematodes, are more severe during seasons with considerable heat and drought stress, and it is those years that carry the highest submission totals. Another large portion of the nematode samples in FY25 were submitted to the laboratory through the Rutgers Fruit IPM program from blueberry growers.

Figure 3.

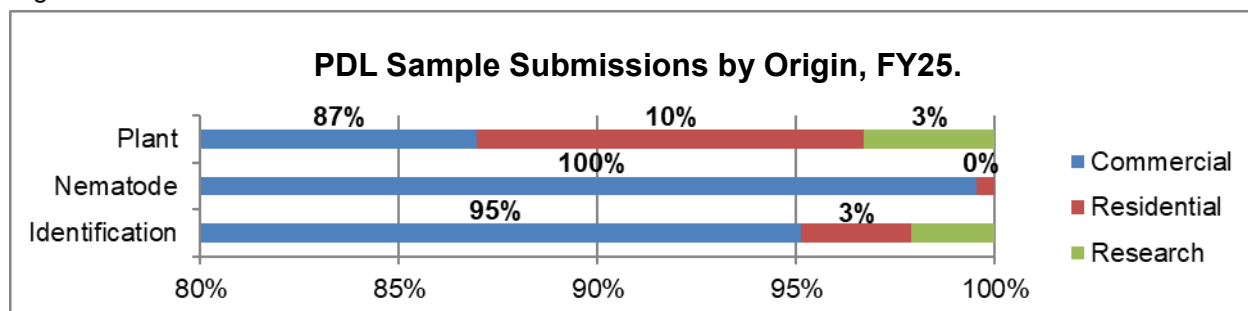


Figure 4.

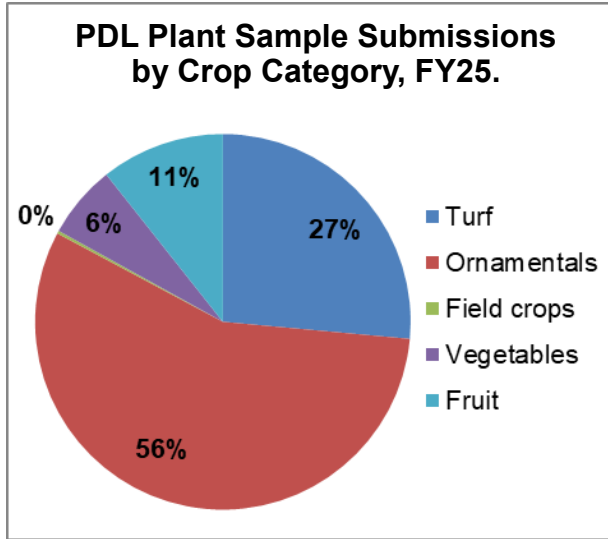
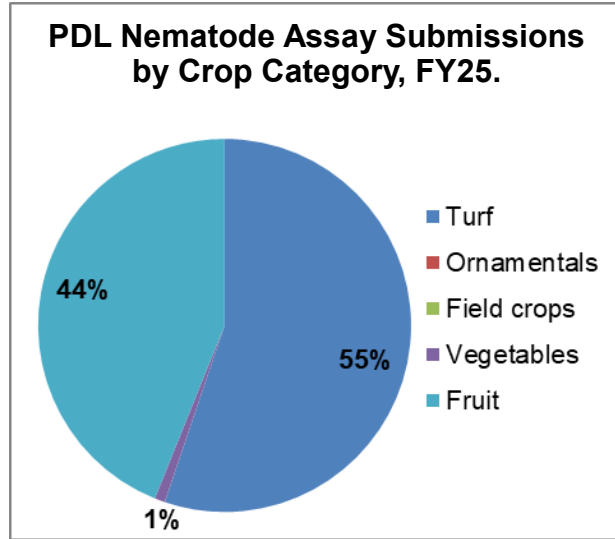
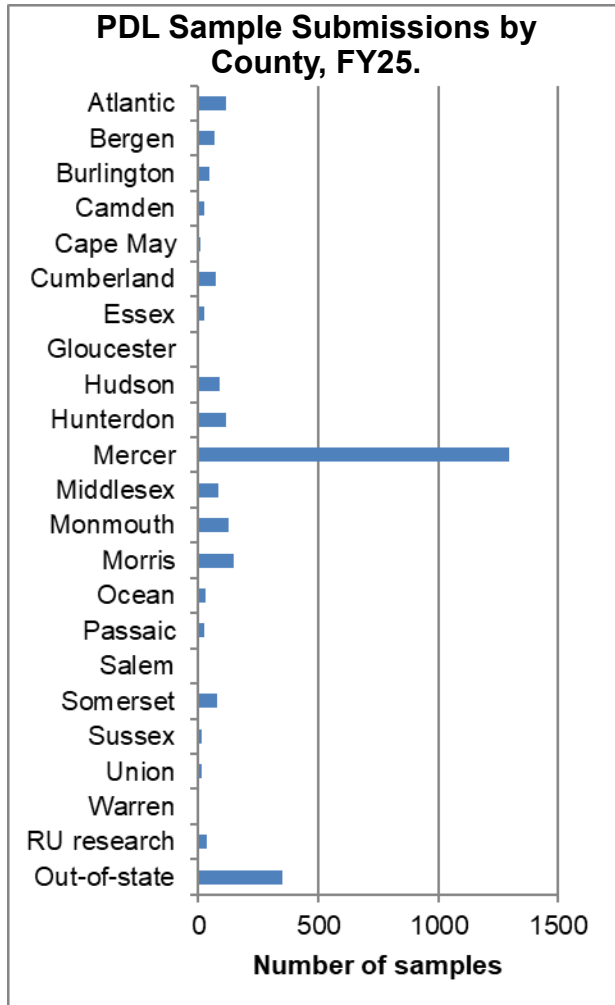


Figure 5.



Samples were submitted to the PDL from all counties in New Jersey (Figure 6). The majority of samples, however, were submitted from counties in closer proximity to the laboratory. The probable explanation for this is that many citizens in central New Jersey contact Rutgers University directly for assistance with plant-related problems and are referred to the laboratory by the campus information service and through various academic departments. Samples were also abundant from counties with dense populations that have disease problems associated with turf and ornamentals in residential landscapes or on golf courses. In addition, county profiles are also influenced by the presence or absence of staff in those offices. To some degree, the profile also identifies county faculty, staff and Master Gardener programs that promote and utilize PDL services.

Figure 6.



Approximately 13% of the samples submitted for diagnosis to the laboratory were from out-of-state. While percent of out-of-state samples decreased by 4%, the actual number of out-of-state samples received increased by 62 from the previous FY24. Of particular note, 48% of all turf samples were from out-of-state. Turf samples were submitted to the laboratory from 20 states in FY25. They were received from states as far away as Arizona, California, Connecticut, Delaware, Georgia, Massachusetts, Maryland, Maine, Nevada, New Hampshire, New York, Ohio, Oregon, Pennsylvania, Texas, Vermont, Virginia, Washington, West Virginia, and Wisconsin. New York and Pennsylvania provided the largest number of out-of-state samples.

Many golf turf professionals at other universities refer their clients to Rutgers for second opinions or when they are on leave. Dr. John Inguagiato at the University of Connecticut, Dr. Paul Koch at the University of Wisconsin, and Dr. Lee Miller at Purdue University refer clients to the PDL. Dr. Frank Rossi of Cornell University is also a great supporter of our program. He advocates and advertises laboratory services in his ShortCutt newsletter, which reaches more than 2,700 turf managers in New York State. Lastly, Mr. Buckley's and Ms. Tirpak's association with the Rutgers Professional Golf Turf Management Program allows for contact with as many as 90 potential new clients each year. Many of the students turn into regular patrons of the laboratory services. The charge for out-of-state samples is substantially higher to help defray the cost of in-state samples.

Of the samples submitted to the PDL for diagnosis or identification, 25% were associated with biotic disease-causing agents (Figure 7). Abiotic

disease-causing factors (e.g., environmental extremes, nutrient deficiencies, poor cultural practices, poor soil conditions, etc.) accounted for another 15% of the laboratory diagnoses. Insect pest damage was diagnosed on 4% of the submissions. Identifications comprised 48% of the total number of samples submitted; of these, 47% (1303) were arthropods, <1% (11) fungi, and 1% (17) were plants. Nematode detection accounted for the other 8% of submissions. The overall breakdown in sample submissions is typical of that reported by other diagnostic laboratories and reflects the normal seasonal totals for submissions to the Rutgers laboratory.

Insect samples account for most of the organisms identified by the laboratory. Many residential clients submit samples of stored product or nuisance pests that are found within the household. The number of these samples has declined as the Department of Entomology has added an urban entomologist who offers the service free-of-charge.

Table 2. PDL sample submissions by county, FY21 to FY25.

| In-state | FY21 | FY22 | FY23 | FY24 | FY25 |
|----------------|------|------|------|------|------|
| Atlantic | 24 | 23 | 143 | 26 | 113 |
| Bergen | 70 | 90 | 80 | 69 | 68 |
| Burlington | 77 | 61 | 58 | 58 | 45 |
| Camden | 10 | 4 | 14 | 12 | 22 |
| Cape May | 5 | 12 | 4 | 8 | 7 |
| Cumberland | 54 | 54 | 102 | 83 | 75 |
| Essex | 16 | 34 | 32 | 20 | 23 |
| Gloucester | 22 | 10 | 5 | 22 | 2 |
| Hudson | 33 | 83 | 31 | 107 | 89 |
| Hunterdon | 20 | 45 | 35 | 64 | 113 |
| Mercer | 449 | 330 | 301 | 410 | 1298 |
| Middlesex | 42 | 73 | 37 | 38 | 81 |
| Monmouth | 200 | 218 | 120 | 121 | 124 |
| Morris | 216 | 210 | 155 | 152 | 150 |
| Ocean | 33 | 28 | 30 | 39 | 29 |
| Passaic | 24 | 13 | 10 | 15 | 27 |
| Salem | 2 | 11 | 1 | 6 | 4 |
| Somerset | 56 | 64 | 72 | 51 | 77 |
| Sussex | 8 | 6 | 16 | 9 | 13 |
| Union | 27 | 32 | 22 | 20 | 15 |
| Warren | 8 | 9 | 8 | 13 | 4 |
| RU research | 91 | 52 | 52 | 23 | 34 |
| In-state total | 1487 | 1462 | 1328 | 1366 | 2413 |
| Out-of-state | 378 | 360 | 274 | 287 | 349 |
| Total | 1865 | 1822 | 1602 | 1653 | 2762 |

Figure 7.

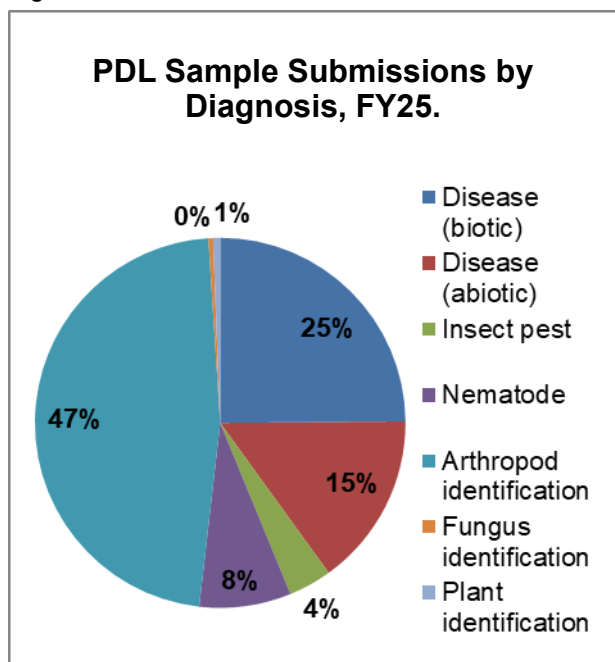
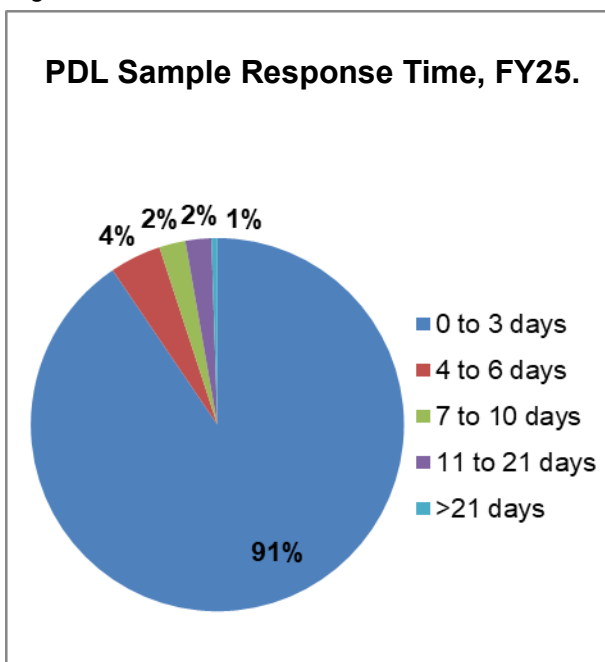


Figure 8.



Arthropod identifications increased (+989) in FY25 largely because the number of trap catch samples from the state’s Cooperative Agricultural Pest Survey (CAPS) and NJ Department of Agriculture programs increased (+968, 1250 total trap catch samples).

In FY25, a laboratory response was prepared in less than three days for most (91%) of the samples submitted (Figure 8), and 95% of our clients received a response in less than a week. A number of the samples (176) took longer than 10 days to diagnose. In these cases, special consultation (i.e. culturing or other lab tests) was required for an accurate diagnosis, and the clients were advised of progress throughout the period. Since nematode samples deteriorate rapidly in storage, virtually all of the nematode processing was finished in less than three days. The rapid response time is attributed largely to the expertise of our competent staff. Adequately trained staff is essential to the continued growth and efficient operation of the laboratory.

Teaching and Outreach

In addition to providing diagnostic services and soil analysis, the staff of the PDL provides significant educational and outreach services to RCE, SEBS/NJAES, and other agencies (Appendix 3). Many of these activities generated additional in-

come for the laboratories. Collectively, Mr. Buckley and Ms. Tirpak presented 167 lectures in FY25 (Table 3).

Table 3. PDL Lectures by Audience, FY25.

| Audience | Buckley | Tirpak | Total |
|--------------------|------------|-----------|------------|
| RCE & OCPE | 82 | 33 | 115 |
| Industry | 30 | 8 | 38 |
| Master Gardener | 5 | 6 | 11 |
| College/University | 2 | 1 | 3 |
| Total | 119 | 48 | 167 |

Richard Buckley

Mr. Buckley is an instructor in the Rutgers Professional Golf Turf Management Program. He taught four courses (Diseases of Turf; Diseases and Insect Pests of Ornamental Plants; Insect Pests in Fine Turf; and Principles of Pest Management on the Golf Course) in both the spring and fall sessions. This twice a year, 10-week teaching commitment consists of a total of 140 hours of contact time per year. The teaching efforts by the PDL staff in the Professional Golf Turf Management School generate significant income for the laboratory. This income and client development source also helps support the PDL.

Mr. Buckley participated in several other OCPE short courses in FY25 including the Landscape Integrated Pest Management Short Course, Rutgers Professional Golf Turf Management Program: Three Week Preparatory Course and the Rutgers Home Gardeners School. Mr. Buckley served as the course coordinator and lecturer for the Pest Management in Landscape Turf Short Course. This was the 31st year for this one-day program.

Mr. was an invited speaker in several RCE programs including the North Jersey Commercial Fruits Growers Meeting. Lectures were also given in support of the Hunterdon, Monmouth, and Morris County Master Gardener Programs. He also participated in the Certified Gardener Training Program in Gloucester County.

Mr. Buckley participated as a guest speaker in two undergraduate course at Rutgers: General Plant Pathology (11:776:302), and Weeds, Diseases, and Insects of Plants (11:776:391).

Mr. Buckley was also an invited speaker for: 2024 Friends of the Frelinghuysen Arboretum Tree Symposium; 2024 Eastern Shore Association of Golf Course Superintendents Fall Turfgrass Conference; West Virginia Golf Course Superintendents: 35th Annual Turf Conference & Show; Red Bank Mayor's Wellness Campaign; Western Washington Golf Course Superintendents Association; International Society of Arboriculture of PA-DE-NJ Pest Bull Session; New Jersey Green Expo—Turf and Landscape Conference; New York State Turf Association 2025 Education Day; SiteOne University; Delaware Horticulture Industry Expo and Pesticide Conference; New Jersey Christmas Tree Growers Association Winter Meeting; Grass Roots 2025 Winter Seminar; New Jersey Agricultural Leadership Development Program; 2025 Cultivated Sod Association of New Jersey Seminar; New Jersey Agricultural Convention and Trade Show; The Andersons Reed & Perrine Turf and Ornamental Seminar; Mid-Atlantic Golf Course Superintendents Association 2025 Educational Seminar; Brooklyn Landscape Gardeners Association Education Day; New Jersey Landscape Contractors Association Trade Show and Conference; 2025 Garden State Tree Conference; Renaissance at Manchester Homeowners Association Monthly Meeting; Licensed Tree Expert Prep Course; and the White Plains Urban Forestry Tree Stewards Program.

Sabrina Tirpak

Ms. Sabrina Tirpak is responsible for teaching Turf Diseases and Turf Insects laboratory practicums in the Rutgers Professional Golf Turf Management School. She has approximately 60 hours of contact time per year in the turf school.

Ms. Tirpak participated in additional OCPE short courses in FY25 including the Landscape Integrated Pest Management Short Course.

Ms. Tirpak was an invited speaker in several RCE programs including the North Jersey Ornamental Horticulture Symposium—Landscape Day and Tree Day, and the South Jersey Commercial Fruit Growers Meeting. Ms. Tirpak also presented programs in support of the RCE of Hunterdon, Mercer, Monmouth, and Morris County Master Gardener Programs.

Ms. Tirpak participated as a guest speaker in one undergraduate course at the Rutgers: Weeds, Diseases and Insects of Plants (11:776:391).

Ms. Tirpak was also an invited speaker for: New Jersey Green Expo—Turf and Landscape Conference; Penn State Winter Turf & Ornamentals School; Licensed Tree Expert Prep Course; and Duke Farms Community Gardens Class.

Awards and Recognitions

Mr. Buckley received the “Friend of the Green Industry Award” from the New York State Turfgrass Association. The award presentation took place at the NYSTA Education Day—Central Region on January 8, 2025 in Verona, NY.

Extension Publications

Mr. Buckley is a contributor to the Plant & Pest Advisory. The print version of the newsletter was transformed for the 2013 growing season into a blog format. A special section on the blog site was designated for Plant Diagnostic Laboratory activities. Mr. Buckley and Ms. Tirpak write brief posts on the disease and insect pests problems submitted to the laboratory. The Plant Diagnostic Laboratory's PPA blog posts can be found at plant-pest-advisory.rutgers.edu/category/plant-diagnostic-lab.

Research Publications

Bauberger, C., Tirpak, S., Buckley, R., Fardella, P., Luo, J., Zhang, N., & Chou, M. Y. (2024). An Emerging Patch Disease Resembling Take-All Patch and Summer Patch of Cool-Season Turfgrasses Caused By the Ectotrophic Root Infecting Fungus *Slopeiomyces Cylindrosporus*. [Abstract]. ASA, CSSA, SSSA International Annual Meeting, San Antonio, TX. <https://scisoc.confex.com/scisoc/2024am/meetingapp.cgi/Paper/159521>

Industry Publications

Buckley R. (2024, October 1). Are Your Lilacs Looking Shabby? *The New Jersey Landscape Contractor Magazine*, (Fall 2024 Issue), 34.

Buckley R, Chou MY. (2025, June 12). If it's Summer, Must be Summer Patch? *New Jersey Turfgrass Association Clippings*, Vol. 117 (Issue 2 2025), pages 18-20, https://issuu.com/cecepeabody/docs/clippings_2025_no2--fsm2archivsm

Service

The PDL staff provided tours of the Ralph Geiger Turfgrass Education Center and the Plant Diagnostic Laboratory to numerous groups in FY25.

Mr. Buckley is a member of the Nursery Working Group initiated by Dr. Timothy Waller, County Agent from RCE of Cumberland County.

Mr. Buckley and Ms. Tirpak are members of the Cooperative Agricultural Pest Survey (CAPS) team. The CAPS program is a pest surveillance program managed by USDA-APHIS and state departments of agriculture. They are also members of the Forest, Landscape, and Agriculture Pest Roundtable (FLAPR) organized by the Rutgers Urban Forestry Program of NJAES. Universities, natural resource protection organizations, and industry groups are also partners of both groups.

Marketing

Laboratory services are advertised at grower meetings or other green industry events. Table-top and banner display units are used to advertise Soil Testing Laboratory and Plant Diagnostic Laboratory services. Staff from both the Soil Testing Laboratory and Plant Diagnostic Laboratory regularly attends and staffs a booth to explain laboratory services and sell soil test kits.

Print ads reflecting Plant Diagnostic and Soil Testing Laboratory services have been developed and deployed into several green industry publications. Lastly, PDL staff are frequent lecturers in regional green industry educational programs. These events have been an excellent option for capturing new clients and educating potential clients in laboratory services and submission protocols.

Income

The PDL is expected to recover all costs and be self-supporting. Laboratory clientele are

charged a nominal fee for diagnostic and testing services, site visits, and for educational activities. Grant activity and cost-sharing arrangements also provide some degree of funding.

A sample submission form and the appropriate payment accompanied the majority of samples received by the PDL from residential clientele. The ability to accept payment via credit card has been a very successful tool in limiting the time necessary to collect our fees and has reduced losses due to non-payment. In many cases, commercial growers preferred to be invoiced, which costs laboratory personnel time and effort to collect. Internal transfer of funds was used to pay for the plant samples diagnosed for research programs at Rutgers University.

In FY25, \$487,137.02 was generated from all PDL activities and revenue streams, which covered 137% of all costs. A complete breakout of all revenues and expenses is included in Appendix 2.

National Plant Diagnostic Network

In 2003, the PDL was invited to participate in the National Plant Diagnostic Network (NPDN). The NPDN is a coordinated network of plant diagnostic laboratories from land grant universities in the US. The network provides a cohesive distribution system to quickly detect pests and pathogens that have been deliberately or unintentionally introduced into agricultural and natural ecosystems. It is designed to be a key part of our homeland security effort to protect agriculture in the nation. Advantages of joining the system include rapid evaluation and reporting of potential bioterrorist threats and other high consequence diseases or pest problems; rapid response time for diagnosis; formal coordination of diagnostic labs within the NPDN; improved links with Federal and State regulatory agencies; and improved quality and uniformity of information associated with sample submission and reporting. The USDA provides grant monies as incentive to participate. Mr. Buckley is the principal investigator in the Rutgers subcontract.

Northeast Plant Diagnostic Network

The Northeast Plant Diagnostic Network (NEPDN) is the regional part of the National Plant Diagnostic Network that focuses on regional concerns regarding plant diseases and insect pests. The regional center for the NEPDN is Cornell University. The Rutgers PDL has been identified as a cooperating institution and participates as a subcontractor to the regional center at the University of Maine. Grant monies provided by the USDA through the NEPDN were used in FY25 to pay sal-

aries, participate in professional training programs and meetings, and to purchase equipment and supplies to upgrade the laboratory's capability for accurate and timely diagnosis of plant problems. Upgrades to laboratory technologies improve communication with our local stakeholders, cooperators, and experts in the northeast regional and national networks. The capacity for improved communication facilitates the rapid dissemination of information concerning current plant disease and insect pest activity. The new equipment and upgrades in technology also provide the means to create modern educational resources for use in local and regional training programs. Grant monies received for FY26 will be used to continue to upgrade laboratory capability to handle pathogens of consequence and other biohazards; attend training programs for insect and disease identification; hire labor to enter data into the National Plant Disease Information System.

Northeast IPM Program

The Rutgers Plant Diagnostic Laboratory's partnership with the NPDN has well equipped the laboratory to execute its mission. Trained staff, however, is necessary to ensure that we continue to play our part as a partner in the efforts of local and regional IPM programs, USDA-APHIS-PPQ, and CAPS to protect the agricultural interests in the region. Proper staffing is also critical in providing diagnostic services for the agricultural interests within the state and to maintain the strong historical relationships with Rutgers IPM and New Jersey Department of Agriculture programs. Grant monies received to that end will be used to cover a portion of the costs of one technical employee who is trained to perform basic diagnostic tasks including fungal culturing, insect identifications, ELISA, PCR, and other common tasks associated with insect pest and disease diagnostics. The technician will also train in SOPs for pests and diseases of concern in our region and will participate in ongoing training programs for Rutgers graduate and undergraduate students who are interested in IPM, diagnostics, and plant biosecurity.

Client Survey

Beginning in January of 2021 a client satisfaction survey was included with each emailed sample report. Survey data and comments are currently being collected to assist laboratory staff in evaluating the impact of our work. Survey responses collected during FY25 (47 responses) are included in Appendix 4 of this report.

Future Directions and Challenges

The top priority for FY26 will be to increase revenue and reduce expenses. To accomplish this, we will continue to promote laboratory services wherever possible. Increasing the awareness of laboratory services should bring increasing numbers of samples, however, our expectations are tempered in this regard due to the nature of the operation. Many factors outside of our control (ex. weather) strongly contribute to the need for laboratory services from season to season.

Despite continuing efforts to promote laboratory services, samples numbers from the turfgrass industry have plateaued or fallen in recent years. For many seasons, the Rutgers PDL was one of the only outlets for turf industry professionals to get quality turfgrass disease diagnosis. In the last decade, however, University laboratories in several states have adopted turfgrass diagnostics, chemical manufacturers and distributors have hired Ph. D. turfgrass pathologists to their sales staffs, and many private turf consultants have entered the market. These developments, as well as several other factors, have significantly diluted the number of turf samples coming into our laboratory from around the country. Any reduction in turf samples has an outsized impact on revenues. In order to combat this trend, we continue to engage with turf industry professional associations in education and awareness programs in the hopes of capturing new clients or re-engaging with old ones.

In the spring of 2019, PDL staff convened a focus group of laboratory stakeholders to discuss the laboratory fee schedule. The group consisted of golf course superintendents, lawn and landscape professionals, academic advisors, and chemical industry representatives. The group agreed that prices were too low. Our fee schedule was adjusted accordingly and the new fees were implemented immediately to zero complaints. This was the first fee increase since 2006. We expect to reconvene the group to discuss future price increases.

In 2022, the NPDN established a Core standard to require all NPDN member laboratories to commit to excellence in plant diagnostics by achieving core accreditation. The purpose of the NPDN Core standard is to provide an overarching framework that helps laboratories to maintain a high level of professionalism and quality of diagnostic results. The Rutgers PDL intends to achieve the Core standard and has been attending regular monthly meetings with other NEPDN diagnosticians to that end. We expect that this process will take several years.

In recent years, there has been an exponential increase in the number of plant pathogen diagnostic protocols using nucleic acid tools. These advances in science have led a rapid transition to molecular diagnostics at many Land Grant University diagnostic facilities. The Rutgers PDL recognizes the need to incorporate these tools into our routine laboratory practices.

To that end, the NJAES administration has provided funding to purchase new equipment that will help us begin the transition to more modern diagnostic tools. An isothermal fluorometer that performs amplification and detection of nucleic acid was purchased in FY24 and is in use for detection of certain pathogens. We continue to add pathogens this system as per our clients' needs.

The PDL is currently working with Dr. Ming-Yi Chou on using high throughput gene sequencing for turfgrass diagnosis. Currently, one abstract has been published and more are in-press. This activity has resulted in an income generating service for the PDL to separate and define several root-infecting pathogens in golf course putting greens.

Funding has always been the fundamental challenge to the success of the Plant Diagnostic Laboratory. Salaries are the main cost driver for the operation. The need to increase revenues each year to meet increasing salaries is unsustainable. If the New Jersey Agricultural Experiment Station and Rutgers Cooperative Extension deem that a plant diagnostic facility is indispensable to our mission, then the salaries of all full-time employees must be paid and guaranteed by the administration. We are one of the only diagnostic facilities in the country that must cover our own salary expenses to operate. Our cost structure and funding model is foreign to most of our colleagues. As a result, many of our colleagues diagnose samples for free or at modest fees compared to our laboratory for the services they offer. This makes competing for samples in their states impossible and is a financial incentive for New Jersey green industry professionals to send samples to out-of-state facilities, which limits our ability to increase revenues.

Because our ability to control salary costs is so limited, we have had to forgo student employees in the laboratory post-pandemic to counter the salary creep of our full-time employees. Furthermore, over the years, more and more administrative tasks have been passed down to the laboratory from the business office. As a result, a considerable amount of time is spent by Mr. Buckley and Ms. Tirpak doing routine laboratory chores rather than pursuing diagnostics, educational outreach activities, and professional development. NJAES funding of the

PDL Director's salary in FY25 allowed the PDL to re-staff the laboratory with student help. Also in FY25, the SEBS Business Office dedicated the time of Mr. Kevin Reynolds to assist with the routine business tasks of the PDL, which also helps us focus on our core mission of plant problem diagnosis.

Diversity, Equity, and Inclusion

The Rutgers PDL has a long history of hiring underrepresented minority students as laboratory technicians. The experience gained in our laboratory has enabled many of them to gain University credits toward their degrees and has led to graduate school positions. Several of our black, Asian, and female technicians now have excellent, successful jobs in the green industry. Administrative support via salary support will enable us to continue this tradition of training and promoting underrepresented populations into the historically white, male dominated green industry professions.

Appendix 1.

PLANT DIAGNOSTIC LABORATORY - FEE SCHEDULE

All fees are per sample. Please visit www.njaes.rutgers.edu/services for sampling instructions.

STANDARD SAMPLE (most samples except fine turf)

| | |
|---------------------|-------|
| In-state | \$50 |
| Out-of-state | \$100 |

FINE AND SPORTS TURF

| | |
|--|-------|
| In-state | |
| Disease/insect diagnosis | \$100 |
| Disease/insect diagnosis & nematode assay* | \$150 |
| Out-of-state | |
| Disease/insect diagnosis | \$120 |
| Disease/insect diagnosis & nematode assay* | \$200 |

* Combination price applies only to samples from same location (i.e. the same green, field, etc.)

NEMATODE ASSAY

| | |
|------------------------------------|-------|
| In-state (except fine turf) | \$50 |
| In-state fine turf | \$75 |
| Out-of-state | \$100 |

FUNGUS AND MOLD IDENTIFICATION

| | |
|--|-------|
| In-state microscopic identification | \$50 |
| Out-of-state microscopic identification | \$100 |

INSECT IDENTIFICATION

| | |
|---------------------|-------|
| In-state | \$50 |
| Out-of-state | \$100 |

PLANT AND WEED IDENTIFICATION

| | |
|---------------------|-------|
| In-state | \$50 |
| Out-of-state | \$100 |

SPECIAL TESTS AND SERVICES*

- Endophyte screening
- Fungicide resistance testing
- Pesticide residue and contaminant testing
- Site consultation
- Speaker request
- Virus testing

*Please call ahead to discuss available tests, fees, and specifics.

**OTHER SERVICES NEGOTIABLE. CONTRACTS AND VOLUME DISCOUNTS ARE AVAILABLE.
ALL FEES ARE SUBJECT TO CHANGE WITHOUT NOTICE.**

Appendix 2. Plant Diagnostic Laboratory Budget

Table A2.1. Expenses, PDL-FY25.

| | |
|---|---------------------|
| Salaries and benefits (full and part time staff) | \$349,706.98 |
| Supplies and services | |
| Diagnostic and testing supplies and services | |
| Shipping costs | |
| References | |
| Equipment maintenance | |
| Office supplies | |
| Credit card fees | |
| FY24 supplies expense correction ... (\$907.79) | |
| Communications | |
| Telephone/fax | \$1,567.30 |
| Travel | |
| Paid talks and professional meetings | \$5,403.99 |
| Total operating costs | \$355,770.48 |

Table A2.2. Income, PDL-FY25.

| | |
|----------------------------------|---------------------|
| Sample fees | \$104,071.00 |
| Lecture fees | |
| OCPE and other honoraria | \$28,112.50 |
| Grants and contracts | |
| NPDN | \$25,000.00 |
| IPM..... | \$56,776.22 |
| Other | |
| Salaries (NJAES/RCE) | \$273,177.30 |
| Total actual income | \$487,137.02 |

Table A2.3. Estimated expenses, PDL-FY26.

| | |
|---|---------------------|
| Salary and benefit costs | \$390,000.00 |
| Supplies and services..... | \$20,000.00 |
| Communications, marketing and travel | \$5,000.00 |
| Total potential cost FY26 | \$415,000.00 |

Table A2.4. Estimated income, PDL-FY26.

| | |
|---|---------------------|
| Plant Health Samples 2000 @ \$55 average fee per sample | \$110,000.00 |
| Lecture fees | |
| OCPE and other honoraria | \$25,000.00 |
| Cost recovery | |
| Grant and contracts..... | \$80,000.00 |
| Salaries (NJAES/RCE)..... | \$275,000.00 |
| Total potential income FY26 | \$490,000.00 |

**Appendix 3.
Table A3.1. Complete listing of lectures presented by Richard J. Buckley, PDL Director, FY25.**

| Date | Title | Audience | Location | Participants¹ |
|-------------|---|--|------------------|---------------------------------|
| 10/07/24 | #1. Principles of Pest Management: Introduction to Integrated Pest Management (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 10/07/24 | #1. Turf Diseases: Principles of Plant Pathology (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 10/08/24 | #1. Diseases and Insect Pests of Ornamentals: Abiotic Stress in Trees (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 10/08/24 | #1: Insects in Fine Turf: Introduction to Entomology; Insect Structure and Function (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 10/14/24 | #2. Principles of Pest Management: IPM Basics: Considerations for Setting up a Program (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 10/14/24 | #2. Turf Diseases: Introduction to Mycology and Fungal Structures (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 10/15/24 | #2. Diseases and Insect Pests of Ornamentals: Scouting Tips for Landscapes; Pesticide Review (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 10/15/24 | #2. Insects in Fine Turf: Insect Classification; Orders (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 10/21/24 | #3. Principles of Pest Management: Principles of Insect Pest and Disease Control (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 10/21/24 | #3. Turf Diseases: The Red Thread Syndrome; Snow Molds (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 10/22/24 | #3. Diseases and Insect Pests of Ornamentals: New Plant Pathogens: Bacteria, Phytoplasma, Virus, Parasitic Plants (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 10/22/24 | #3. Insects in Fine Turf: Insect Growth and Development; Insect Behavior (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 10/28/24 | #4. Principles of Pest Management: Cultural Control (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 10/28/24 | #4. Turf Diseases: Diseases Caused by Algae and Other Related Organisms; Slime Molds (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 10/29/24 | #4. Diseases and Insect Pests of Ornamentals: Leaf Spots, Anthracnose, and Stem Diseases (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 10/29/24 | #4. Insects in Fine Turf: IPM Basics: A Review of Scouting Techniques and Insecticides (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 11/02/24 | The Trouble with Beech: Beech Leaf Disease (1hr) | 2024 Friends of the Frelinghuysen Arboretum Tree Symposium | Morris County | H |
| 11/04/24 | #5. Principles of Pest Management: Fungicide Selection and Use (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |

**Appendix 3. (Continued)
Table A3.1. (Continued)**

| Date | Title | Audience | Location | Participants¹ |
|-------------|---|---|------------------------------------|---------------------------------|
| 11/04/24 | #5. Turf Diseases: Diseases Caused by Species of the Fungus Rhizoctonia; Fairy Ring (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 11/05/24 | #5. Diseases and Insect Pests of Ornamentals: Root Rots and Vascular Wilt Diseases (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 11/05/24 | #5. Insects in Fine Turf: Nematodes (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 11/07/24 | 2024 Dead Golf Turf Year in Review: The Diagnostician's Point of View (1hr) | 2024 Eastern Shore Association of Golf Course Superintendents Fall Turfgrass Conference RU Professional Golf Turf Management Program | Ocean City, MD Middlesex County | I,T T |
| 11/11/24 | #6. Principles of Pest Management: Fungicide Selection and Use (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 11/11/24 | #6. Turf Diseases: Root-infecting Patch Diseases (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 11/12/24 | #6. Diseases and Insect Pests of Ornamentals: Rusts, Mildews, and Molds; Mites (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 11/12/24 | #6. Insects in Fine Turf: Coleoptera--Scarabs: The White Grub Complex (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 11/13/24 | Common Fungal Disease that Cause Everybody Trouble Part 1: Pythium Diseases of Landscape and Golf Turf (1hr) | 35th Annual West Virginia GCSA Turf Conference & Show | Charleston, WV | I,T |
| 11/13/24 | Common Fungal Disease that Cause Everybody Trouble Part 2: Rhizoctonia Diseases of Landscape and Golf Turf (1hr) | 35th Annual West Virginia GCSA Turf Conference & Show | Charleston, WV | I,T |
| 11/18/24 | #7. Principles of Pest Management: Insecticide Selection and Use (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 11/18/24 | #7. Turf Diseases: Anthracnose; "Helminthosporium" Leaf Spots (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 11/19/24 | The Art and Science of Diagnosis (1.5hr) | General Plant Pathology (11:776:302) | Middlesex County | C |
| 11/19/24 | #7. Diseases and Insect Pests of Ornamentals: Suckers: Scale, Bugs, Hoppers, and Plant Lice (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 11/19/24 | #7. Insects in Fine Turf: Coleoptera--Weevils: Annual Bluegrass Weevil; Billbugs (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 11/25/24 | #8. Principles of Pest Management: The Least Toxic Alternative (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 11/25/24 | #8. Turf Diseases: Dollar Spot; Gray Leaf Spot (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 11/26/24 | The Wonder Weed: Basic Biology and Ecology of Cannabis (1hr) | Red Bank Mayor's Wellness Campaign | Monmouth County | H |
| 11/26/24 | #8. Diseases and Insect Pests of Ornamentals: Borers: Round-headed and Flat-headed Borers; Gall Makers and Miners (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |

**Appendix 3. (Continued)
Table A3.1. (Continued)**

| Date | Title | Audience | Location | Participants¹ |
|-------------|---|--|-------------------|---------------------------------|
| 11/26/24 | #8. Insects in Fine Turf: Lepidoptera: Armyworms, Cutworms, and Sod Webworms (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 12/02/24 | #9. Principles of Pest Management: Commercial Biocontrol and Biocontrol Concepts (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 12/02/24 | #9. Turf Diseases: Rust, Smut, Mildews and Other Minor Leaf Blighting Diseases (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 12/03/24 | #9. Diseases and Insect Pests of Ornamentals: Borers: Weevils, Bark Beetles, and Clear-winged Moths (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 12/03/24 | #9. Insects in Fine Turf: Hemiptera: Chinch Bugs; Ground Pearls (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 12/04/24 | Winter Kill in Turf (1hr) | Western Washington Golf Course Superintendents Association | online | I,L,T |
| 12/04/24 | Pest Bull Session: Tree Diseases Update (2hr) | International Society of Arboriculture of PA-DE-NJ | Wayne, PA | A |
| 12/06/24 | #10. Insects in Fine Turf: Regional Concerns: Mole Crickets and Crane Flies (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 12/06/24 | #10. Diseases and Insect Pests of Ornamentals: Leaf Feeders: Lepids, Sawfly, and Weevils (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 12/09/24 | #10. Principles of Pest Management: Scouting Your Golf Course (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 12/09/24 | #10. Turf Diseases: Abiotic Stress in Turfgrass (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 12/10/24 | Dead Turf Review: A Year of Carnage (0.75hr) | New Jersey Green Expo—Turf and Landscape Conference | Atlantic City, NJ | I,L,T |
| 12/10/24 | Reducing Turfgrass Disease Pressure at Schools Using Cultural Practices (0.5hr) | New Jersey Green Expo—Turf and Landscape Conference | Atlantic City, NJ | I,L,T |
| 12/11/24 | The Trouble with Beech: Beech Leaf Disease (1hr) | New Jersey Green Expo—Turf and Landscape Conference | Atlantic City, NJ | I,L,T |
| 12/12/24 | Remember Why I Hate Boxwoods! (1.5hr) | New Jersey Green Expo—Turf and Landscape Conference | Atlantic City, NJ | I,L,T |
| 12/12/24 | Will it Ever Snow Again? Snow Mold Diseases in Turf (1hr) | New Jersey Green Expo—Turf and Landscape Conference | Atlantic City, NJ | I,L,T |
| 12/16/24 | Basic Plant Pathology and the Art of the Diagnosis (3hr) | Master Gardener Training Program | Morris County | H |
| 12/17/24 | Basic Plant Pathology and the Art of the Diagnosis (3hr) | Master Gardener Training Program | Hunterdon County | H |
| 01/06/25 | #1. Diseases and Insect Pests of Ornamentals: Abiotic Stress in Trees (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |

**Appendix 3. (Continued)
Table A3.1. (Continued)**

| Date | Title | Audience | Location | Participants¹ |
|-------------|---|---|------------------|---------------------------------|
| 01/06/25 | #1: Insects in Fine Turf: Introduction to Entomology; Insect Structure and Function (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 01/07/25 | #1. Principles of Pest Management: Introduction to Integrated Pest Management (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 01/07/25 | #1. Turf Diseases. Turf Diseases: Principles of Plant Pathology (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 01/08/25 | Basic Turfgrass Disease: Pick Your Best Defense (2hr) | New York State Turf Association 2025 Education Day | Verona, NY | I,L,T |
| 01/14/25 | #2. Diseases and Insect Pests of Ornamentals: Scouting Tips for Landscapes; Pesticide Review (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 01/14/25 | #2. Insects in Fine Turf: Insect Classification; Orders (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 01/15/25 | Basic Turfgrass Disease: Pick Your Best Defense (1hr) | SiteOne University | Atlantic County | A,L,I,T |
| 01/16/25 | The Trouble with Beech: Beech Leaf Disease (1hr) | Delaware Horticulture Industry Expo and Pesticide Conference | Dover, DE | I, L,T |
| 01/16/25 | Insects that Suck: Scale (1hr) | Delaware Horticulture Industry Expo and Pesticide Conference | Dover, DE | I, L,T |
| 01/17/25 | #2. Principles of Pest Management: IPM Basics: Considerations for Setting up a Program (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 01/17/25 | #2. Turf Diseases: Introduction to Mycology and Fungal Structures (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 01/20/25 | #3. Principles of Pest Management: Principles of Insect Pest and Disease Control (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 01/20/25 | #3. Turf Diseases: The Red Thread Syndrome; Snow Molds (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 01/21/25 | #3. Diseases and Insect Pests of Ornamentals: New Plant Pathogens: Bacteria, Phytoplasma, Virus, Parasitic Plants (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 01/21/25 | #3. Insects in Fine Turf: Insect Growth and Development; Insect Behavior (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 01/23/25 | Basic Plant Pathology and the Art of the Diagnosis (3hr) | Landscape IPM Short Course | Middlesex County | A,L,T |
| 01/23/25 | The Complete Turf Disease for Golf Courses (2hr) | RU Professional Golf Turf Management Program: Three Week Course | Middlesex County | T |
| 01/24/25 | The Complete Turf Disease for Golf Courses (2hr) | RU Professional Golf Turf Management Program: Three Week Course | Middlesex County | T |

**Appendix 3. (Continued)
Table A3.1. (Continued)**

| Date | Title | Audience | Location | Participants¹ |
|-------------|--|---|-------------------|---------------------------------|
| 01/24/25 | The Complete Turf Disease for Golf Courses (1.5hr) | RU Professional Golf Turf Management Program: Three Week Course | Middlesex County | T |
| 01/25/25 | What the Rutgers Plant Diagnostic Laboratory Can Do for You! (0.5hr) | New Jersey Christmas Tree Growers Association Winter Meeting | Burlington County | X |
| 01/27/25 | #4. Principles of Pest Management: Cultural Control (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 01/27/25 | #4. Turf Diseases: Diseases Caused by Algae and Other Related Organisms; Slime Molds (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 01/28/25 | No Disease or Insect: Winter Damage on Golf Turf (1hr) | Grass Roots Winter Seminar | Bergen County | I,T |
| 01/28/25 | Disease Consequences of Low Maintenance Turf (1hr) | Grass Roots Winter Seminar | Bergen County | I,L,T |
| 01/28/25 | #4. Diseases and Insect Pests of Ornamentals: Leaf Spots, Anthracnose, and Stem Diseases (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 01/28/25 | #4. Insects in Fine Turf: IPM Basics: A Review of Scouting Techniques and Insecticides (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 01/29/25 | What the Rutgers Plant Diagnostic Laboratory Can Do for You! (0.5hr) | NJ Agricultural Leadership Development Program | Middlesex County | F,S |
| 01/29/25 | What the Rutgers Plant Diagnostic Laboratory Can Do for You! (0.5hr) | 2025 Cultivated Sod Association of New Jersey Seminar | Burlington County | F,I |
| 02/03/25 | #5. Diseases and Insect Pests of Ornamentals: Root Rots and Vascular Wilt Diseases (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 02/03/25 | #5. Insects in Fine Turf: Nematodes (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 02/04/25 | Fungus Farming Beetles and You (0.5hr) | New Jersey Agriculture Convention and Trade Show | Atlantic County | I |
| 02/05/25 | #5. Principles of Pest Management: Fungicide Selection and Use (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 02/05/25 | #5. Turf Diseases: Diseases Caused by Species of the Fungus Rhizoctonia; Fairy Ring (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 02/10/25 | #6. Diseases and Insect Pests of Ornamentals: Rusts, Mildews, and Molds; Mites (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 02/10/25 | #6. Insects in Fine Turf: Coleoptera--Scarabs: The White Grub Complex (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 02/11/25 | #6. Principles of Pest Management: Fungicide Selection and Use (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 02/11/25 | #6. Turf Diseases: Root-infecting Patch Diseases (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |

**Appendix 3. (Continued)
Table A3.1. (Continued)**

| Date | Title | Audience | Location | Participants¹ |
|-------------|---|--|-------------------|---------------------------------|
| 02/12/25 | Common Diseases on Turf and Ornamentals in New Jersey (1hr) | The Andersons Reed & Perrine Turf and Ornamental Seminar | Middlesex County | L, T |
| 02/17/25 | #7. Diseases and Insect Pests of Ornamentals: Suckers: Scale, Bugs, Hoppers, and Plant Lice (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 02/17/25 | #7. Insects in Fine Turf: Coleoptera--Weevils: Annual Bluegrass Weevil; Billbugs (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 02/18/25 | Fairy Rings: The Rings of Death (1hr) | Mid-Atlantic GCSAA 2025 Education Seminar | Ellicott City, MD | I, T |
| 02/19/25 | #7. Principles of Pest Management: Insecticide Selection and Use (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 02/19/25 | #7. Turf Diseases: Anthracnose; "Helminthosporium" Leaf Spots (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 02/24/25 | #8. Diseases and Insect Pests of Ornamentals: Borers: Round-headed and Flat-headed Borers; Gall Makers and Miners (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 02/24/25 | #8. Insects in Fine Turf: Lepidoptera: Armyworms, Cutworms, and Sod Webworms (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 02/25/25 | #8. Principles of Pest Management: The Least Toxic Alternative (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 02/25/25 | #8. Turf Diseases: Dollar Spot; Gray Leaf Spot (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 02/26/25 | The Trouble with Beech: Beech Leaf Disease (1hr) | Brooklyn Landscape Gardeners Association Education Day | Staten Island, NY | A, I, L, T |
| 02/26/25 | Plant killers: Beech Leaf Disease and Summer Patch (1hr) | New Jersey Landscape Contractors Association Trade Show and Conference | Bergen County | A, I, T, L |
| 02/27/25 | Fungus Farming Beetles and You (1hr) | 2025 Garden State Tree Conference | Atlantic County | A, I, T, L |
| 03/03/25 | #9. Diseases and Insect Pests of Ornamentals: Borers: Weevils, Bark Beetles, and Clear-winged Moths (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 03/03/25 | #9. Insects in Fine Turf: Hemiptera: Chinch Bugs; Ground Pearls (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 03/04/25 | #9. Turf Diseases: Rust, Smut, Mildews and Other Minor Leaf Blighting Diseases (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 03/04/25 | #9. Principles of Pest Management: Commercial Biocontrol and Biocontrol Concepts (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 03/05/25 | What the Rutgers Plant Diagnostic Laboratory Can Do for You! (0.5hr) | North Jersey Commercial Fruit Growers Meeting | Hunterdon County | F |
| 03/06/25 | Basic Plant Pathology and the Art of the Diagnosis (3hr) | Master Gardener Training Program | Monmouth County | H |

**Appendix 3. (Continued)
Table A3.1. (Continued)**

| Date | Title | Audience | Location | Participants¹ |
|-------------|--|--|-------------------|---------------------------------|
| 03/10/25 | #10. Insects in Fine Turf: Regional Concerns: Mole Crickets and Crane Flies (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 03/10/25 | #10. Diseases and Insect Pests of Ornamentals: Leaf Feeders: Lepids, Sawfly, and Weevils (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 03/11/25 | Turfgrass Management Question and Answers (1hr) | Renaissance at Manchester Homeowners Association Monthly Meeting | Ocean County | H |
| 03/11/25 | #10. Principles of Pest Management: Scouting Your Golf Course (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 03/11/25 | #10. Turf Diseases: Abiotic Stress in Turfgrass (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 03/13/25 | Why I Hate Boxwoods! (1.5hr) | Weeds, Diseases and Insects of Plants (11:776:391) | Middlesex County | C |
| 03/15/25 | Diagnostic Tips for the Problem Lawn (1.25hr) | Rutgers Home Gardeners School | Middlesex County | H |
| 03/15/25 | Emerging Problems in New Jersey Landscapes (1.25hr) | Rutgers Home Gardeners School | Middlesex County | H |
| 03/28/25 | Basic Turfgrass Disease: Pick Your Best Defense (2hr) | Pest Management of Landscape Turf Short Course | Middlesex County | L, T |
| 04/02/25 | Basic Plant Pathology and the Art of the Diagnosis (3hr) | Certified Gardener Training Program | Gloucester County | H |
| 04/03/25 | Key Insect Pests in New Jersey Landscapes (3hr) | Master Gardener Training Program | Monmouth County | H |
| 04/12/25 | Basic Tree Disease Identification and Control (3.5hr) | Licensed Tree Expert Prep Course | Middlesex County | A, L |
| 05/21/25 | Diseases and Insects of Woody Ornamentals (6hr) | White Plains Urban Forestry Tree Stewards Program | White Plains, NY | A, L |

¹ Audience Addressed: A=Arborists; C=College (Academic); Co=Construction; E=Engineers; F=Farmers; G=Greenhouse; H=Residential Clientele; Hf=Health Officers; I=Industry; L=Landscapers; N=Nursery Growers; S=State Officials; T=Turfgrass Managers; X=Christmas Tree Growers

**Appendix 3.
Table A3.2. Complete listing of lectures presented by Sabrina Tirpak, PDL Principal Laboratory Technician, FY25.**

| Date | Title | Audience | Location | Participants ¹ |
|----------|--|---|---------------------|---------------------------|
| 08/22/24 | Hornets, and Wasps, and Bees, Oh My! (1hr) | Master Gardener Training Program | online (Mercer Co.) | H |
| 10/15/24 | Introduction to Entomology (3hr) | Master Gardener Training Program | Hunterdon County | H |
| 10/16/24 | #1. Turf Disease Laboratory - Basic Mycology (3hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 10/17/24 | #1. Turf Insect Laboratory - Structure and Function / Insect Orders (3hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 10/23/24 | #2. Turf Disease Laboratory - Introduction to Microscopy (3hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 10/29/24 | #3. Turf Disease Laboratory - Recognizing Signs Produced by Turf Pathogens, Part 1 (3hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 10/30/24 | #2. Turf Insect Laboratory - Metamorphosis and Behavior (3hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 11/12/24 | #6. Diseases and Insect Pests of Ornamentals: Rusts, Mildews, and Molds; Mites (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 11/12/24 | #6. Insects in Fine Turf: Coleoptera--Scarabs: The White Grub Complex (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 11/13/24 | #4. Turf Disease Laboratory - Recognizing Signs Produced by Turf Pathogens, Part 2 (3hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 11/14/24 | #3. Turf Insect Laboratory - Nematodes (3hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 11/20/24 | #4. Turf Insect Laboratory - White Grubs (3hr) | Master Gardener Training Program | Middlesex County | T |
| 11/25/24 | Introduction to Entomology (3hr) | RU Professional Golf Turf Management Program | Morris County | H |
| 11/26/24 | #5. Turf Disease Laboratory - Recognizing Signs Produced by Turf Pathogens, Part 3 (3hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 12/04/24 | #5. Turf Insect Laboratory - Using an Insect ID Key (3hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 12/05/24 | #6. Turf Disease Laboratory - Lab Final: Diagnose the Problem (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 12/06/24 | #6. Turf Insect Laboratory - Lab Final: Identifying Common Insects in Turf (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 12/10/24 | Molds and Mildews in the Landscape: Part 1 (0.5hr) | New Jersey Green Expo—Turf and Landscape Conference | Atlantic City, NJ | A,I,L,T |
| 12/10/24 | Molds and Mildews in the Landscape: Part 2 (0.5hr) | New Jersey Green Expo—Turf and Landscape Conference | Atlantic City, NJ | A,I,L,T |
| 12/11/24 | Fungus Farming Beetles and You! (0.5hr) | New Jersey Green Expo—Turf and Landscape Conference | Atlantic City, NJ | A,I,L,T |
| 12/11/24 | The Mini Tree Engravers (0.5hr) | New Jersey Green Expo—Turf and Landscape Conference | Atlantic City, NJ | A,I,L,T |

**Appendix 3. (Continued)
Table A3.2. (Continued)**

| Date | Title | Audience | Location | Participants¹ |
|-------------|--|---|-------------------|---------------------------------|
| 12/12/24 | Leaf Feeding Insects in Turf (1hr) | New Jersey Green Expo—Turf and Landscape Conference | Atlantic City, NJ | A,I,L,T |
| 01/08/25 | 2024 Tree Disease Update: A Hot and Wet Summer! (1hr) | North Jersey Ornamental Horticulture Symposium: Tree Day | Morris County | A,L |
| 01/09/25 | Pests to Expect in 2025 (1hr) | North Jersey Ornamental Horticulture Symposium: Landscape Day | Morris County | L,T |
| 01/14/25 | #2. Diseases and Insect Pests of Ornamentals: Scouting Tips for Landscapes; Pesticide Review (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 01/14/25 | #2. Insects in Fine Turf: Insect Classification; Orders (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 01/17/24 | #1. Turf Insect Laboratory - Structure and Function / Insect Orders (3hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 01/22/25 | Key Insect Pests in New Jersey Landscapes (1hr) | Landscape IPM Short Course | Middlesex County | L,T |
| 01/22/25 | #2. Turf Insect Laboratory - Metamorphosis and Behavior (3hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 01/23/25 | #1. Turf Disease Laboratory - Basic Mycology (3hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 01/27/25 | ABCs in Trees: The Fungus Farming Ambrosia and Bark Coleoptera and You (1hr) | Penn State Winter Turf & Ornamentals School | Grantville, PA | L,T |
| 01/28/25 | #4. Diseases and Insect Pests of Ornamentals: Leaf Spots, Anthracnose, and Stem Diseases (2hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 01/28/25 | #4. Insects in Fine Turf: IPM Basics: A Review of Scouting Techniques and Insecticides (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 01/29/25 | #2. Turf Disease Laboratory - Introduction to Microscopy (3hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 02/13/25 | #3. Turf Insect Laboratory - Nematodes (3hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 02/20/25 | #4. Turf Insect Laboratory - White Grubs (3hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 02/26/25 | #4. Turf Disease Laboratory - Recognizing Signs Produced by Turf Pathogens, Part 2 (3hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 03/03/25 | Rhododendron Pests and Diseases (1.5hr) | Weeds, Diseases and Insects of Plants (11:776:391) | Middlesex County | C |
| 03/04/25 | What the Rutgers Plant Diagnostic Laboratory Can Do for You! (0.5hr) | South Jersey Commercial Fruit Growers Meeting | Gloucester County | F |
| 03/05/25 | #5. Turf Disease Laboratory - Recognizing Signs Produced by Turf Pathogens, Part 3 (3hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 03/06/25 | #5. Turf Insect Laboratory - Using an Insect ID Key (3hr) | RU Professional Golf Turf Management Program | Middlesex County | T |

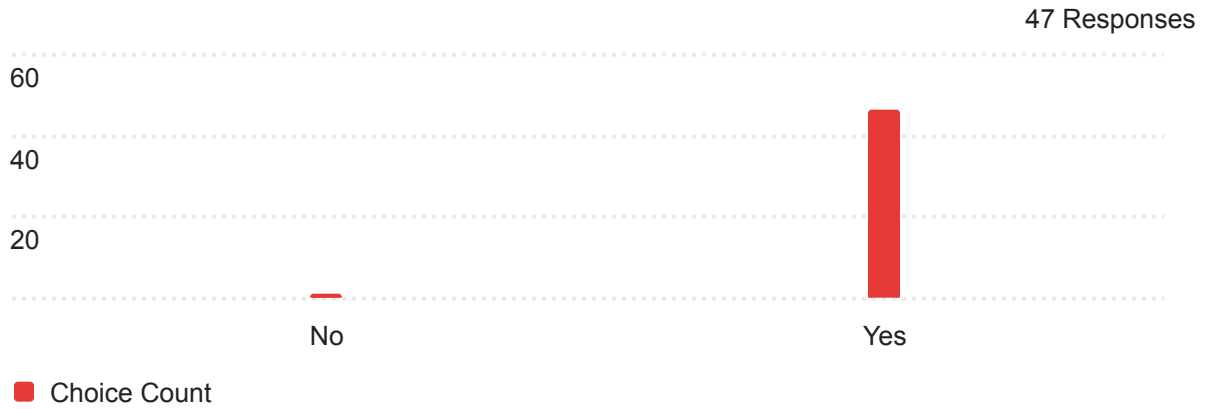
**Appendix 3. (Continued)
Table A3.2. (Continued)**

| Date | Title | Audience | Location | Par- ticipants¹ |
|-------------|---|--|------------------|---------------------------------------|
| 03/12/25 | #6. Turf Disease Laboratory - Lab Final: Diagnose the Problem (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 03/13/25 | #6. Turf Insect Laboratory - Lab Final: Identifying Common Insects in Turf (1.5hr) | RU Professional Golf Turf Management Program | Middlesex County | T |
| 03/17/25 | Household Insect Pests (3hr) | Master Gardener Training Program | Morris County | H |
| 03/20/25 | Introduction to Entomology (3hr) | Master Gardener Training Program | Monmouth County | H |
| 04/12/25 | Key Insect Pests of Shade Trees (3.5hr) | Licensed Tree Expert Prep Course | Middlesex County | A,L |
| 04/22/25 | Household Insect Pests (3hr) | Master Gardener Training Program | Monmouth County | H |
| 04/28/25 | Tomato Troubles: Disorders & Diseases (1.5hr) | Duke Farms Community Gardens Class | Somerset County | H |

¹ Audience Addressed: A=Arborists; C=College (Academic); Co=Construction; E=Engineers; F=Farmers; G=Greenhouse; H=Residential Clientele; Hf=Health Officers; I=Industry; L=Landscape; N=Nursery Growers; S=State Officials; T=Turfgrass Managers; X=Christmas Tree Growers

Appendix 4. Plant Diagnostic Laboratory Client Survey, FY25.

Q1 - Did you receive the diagnostic report(s) in a timely manner?



Q2 - Please describe the issue with the timeliness of your diagnostic report(s).

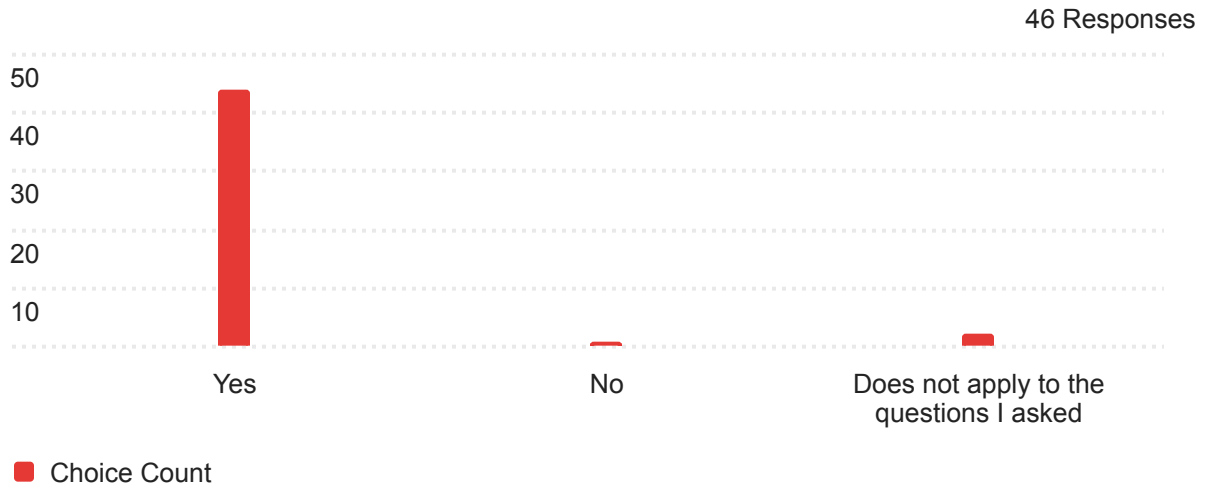
1 Responses

Please describe the issue with the timeliness of your diagnostic report(s).

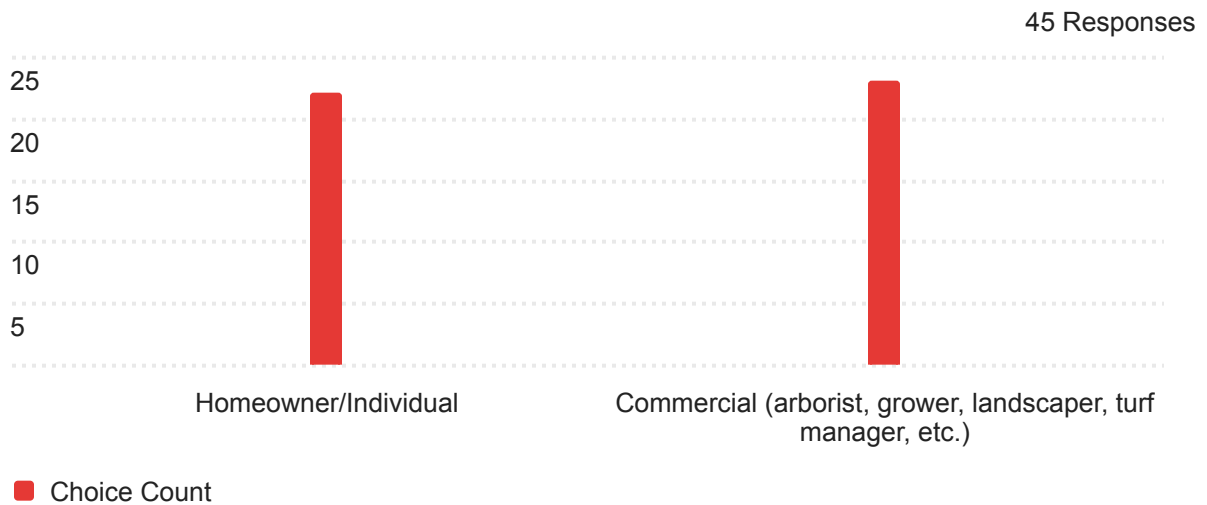
Report was filed before being sent

Appendix 4. (Continued)

Q3 - Did the information provided help you to solve your problem?

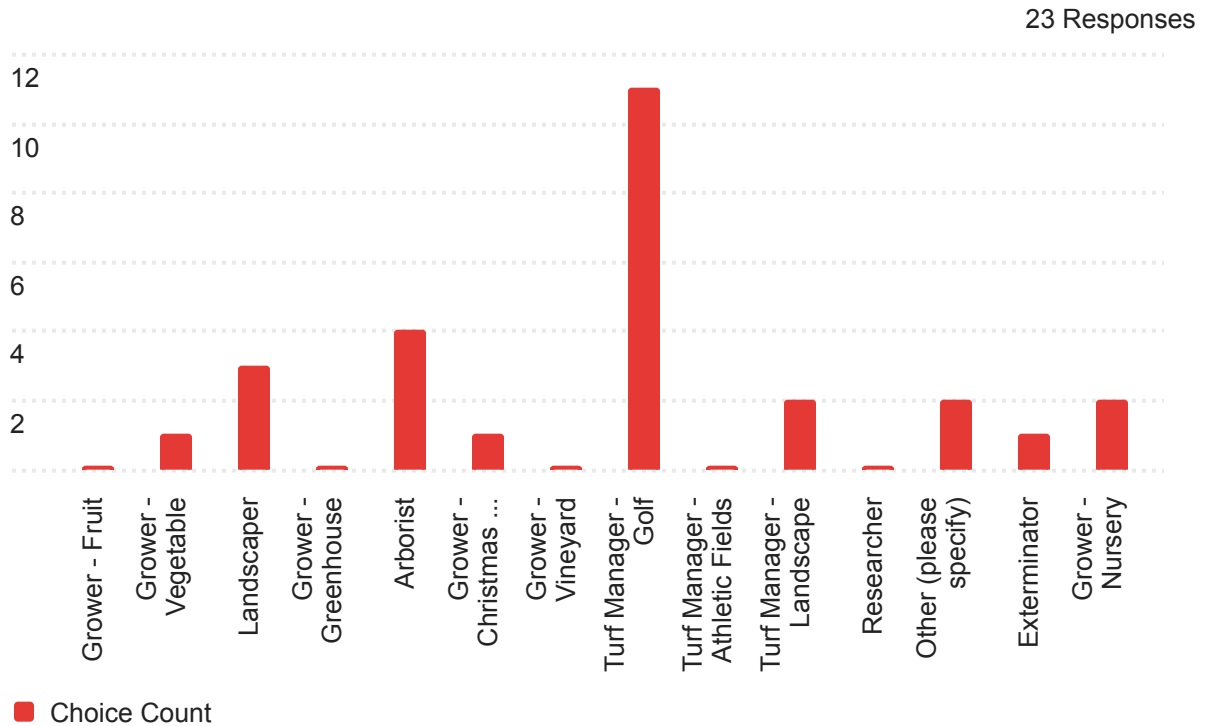


Q4 - As a client of the Rutgers Plant Diagnostic Laboratory, how is your role best described?

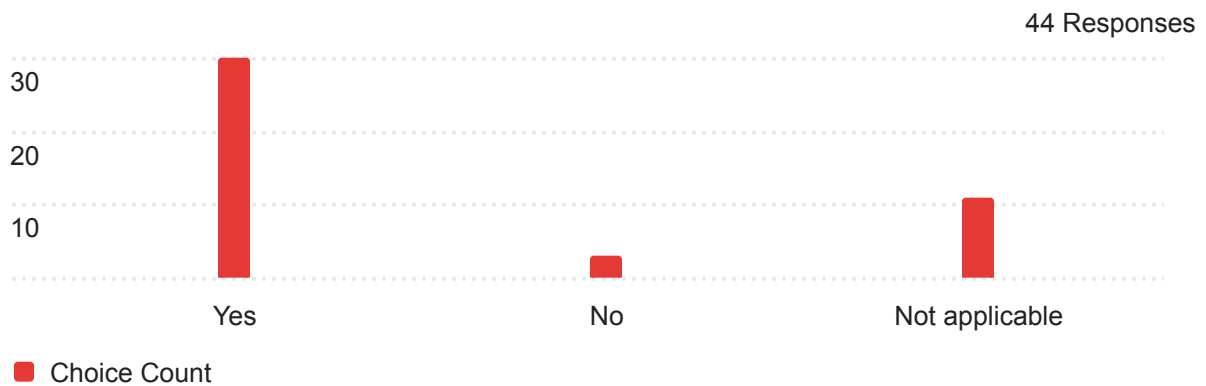


Appendix 4. (Continued)

Q4.1 - Please check all that apply to describe yourself: -
Selected Choice

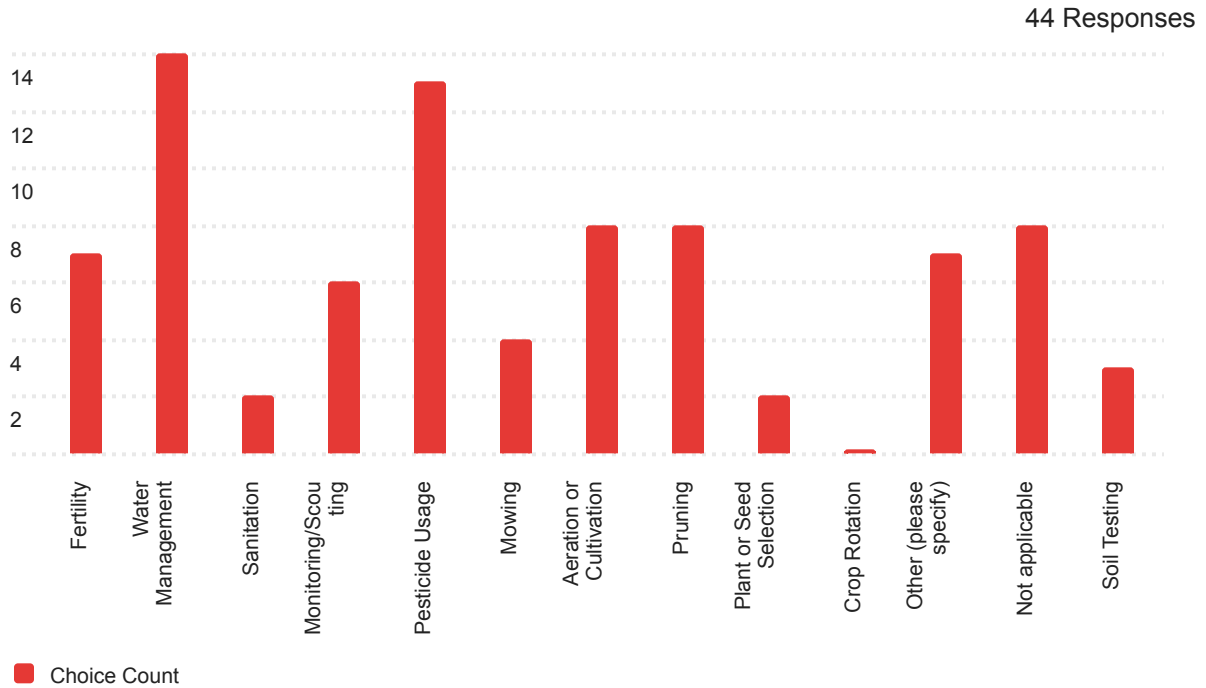


Q5 - Did the information provided help you to use Integrated Pest Management (IPM) strategies (cultural practices and use of least toxic pesticides as a last resort) to manage your pest or disease problem(s)?



Appendix 4. (Continued)

Q6 - Did you implement or alter any management practice(s) based on recommendations in the diagnostic report(s)? Please select all that apply: - Selected Choice



Q6_11_TEXT - Other (please specify) - Text

7 Responses

Other (please specify) - Text

Will replant using a raised bed

Will perform control practice as advised

Program to get rid of zoysia grass

not yet!

I won't get to apply what I learned till next season

I had aerated, scarified , raked in seed and rolled and had been watering 3x a day. I purchased seed from United seed. Seed I purchased was high on NYEP trials. My complete disappointment is that the diagnosis did not personalize it to what I wrote in the form to you. This specifically that I had overseeded etc.

Just received report so will present this to my Arborist to determine appropriate treatment plan.

Appendix 4. (Continued)

Q7C - If you implemented any of the practice(s) recommended, please select all of...

| Field | 10 Responses | | | | |
|---|--------------|--------|--------|--------|---------|
| | 1-10% | 11-25% | 26-50% | 51-75% | 76-100% |
| A reduction in potential plant loss | 1 | 0 | 1 | 2 | 3 |
| Increased yield | 0 | 0 | 0 | 2 | 1 |
| Reduced the amount of unnecessary inputs (pesticides, fertilizer, etc.) | 0 | 1 | 1 | 2 | 1 |
| Limited the spread of disease or insect pest | 0 | 0 | 2 | 1 | 4 |
| Reduced the impact on aesthetics | 1 | 0 | 1 | 3 | 5 |
| Increased profit | 1 | 1 | 1 | 1 | 1 |
| Increased quality of crop/plant | 0 | 0 | 1 | 1 | 5 |

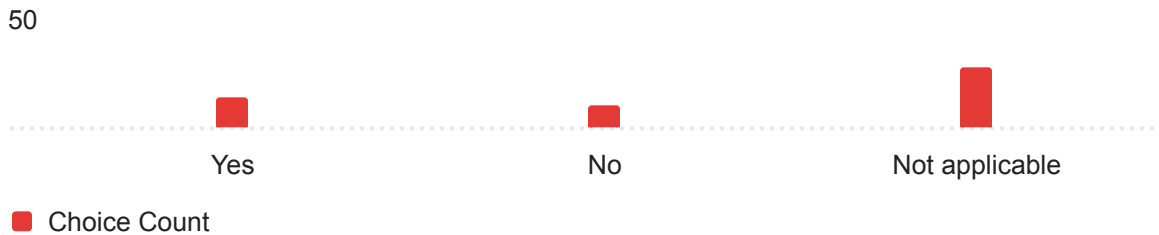
Q7H - If you implemented any of the practice(s) recommended, please select all of...

| Field | 3 Responses | | | | |
|---|-------------|--------|--------|--------|---------|
| | 1-10% | 11-25% | 26-50% | 51-75% | 76-100% |
| A reduction in plant death | 1 | 0 | 0 | 0 | 0 |
| Reduced the amount of unnecessary inputs (pesticides, fertilizer, etc.) | 0 | 0 | 0 | 0 | 0 |
| Limited the spread of disease or insect pest | 0 | 0 | 0 | 1 | 0 |
| Reduced the impact on aesthetics | 0 | 0 | 0 | 1 | 0 |
| Increased quality of crop/plant | 0 | 0 | 0 | 1 | 0 |
| Increased yield | 0 | 0 | 0 | 0 | 0 |

Appendix 4. (Continued)

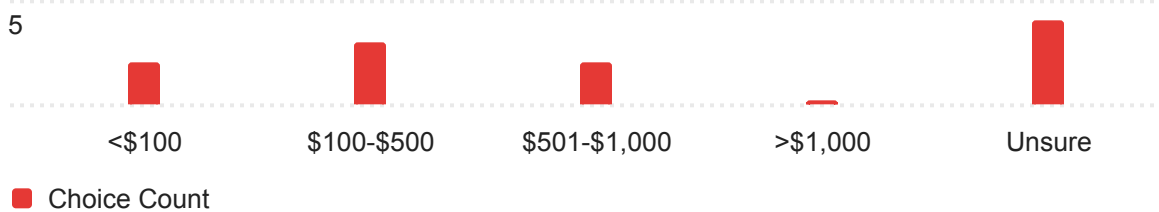
Q8 - Were you able to reduce the use of pesticides as a result of the information provided in the diagnostic report(s)?

42 Responses



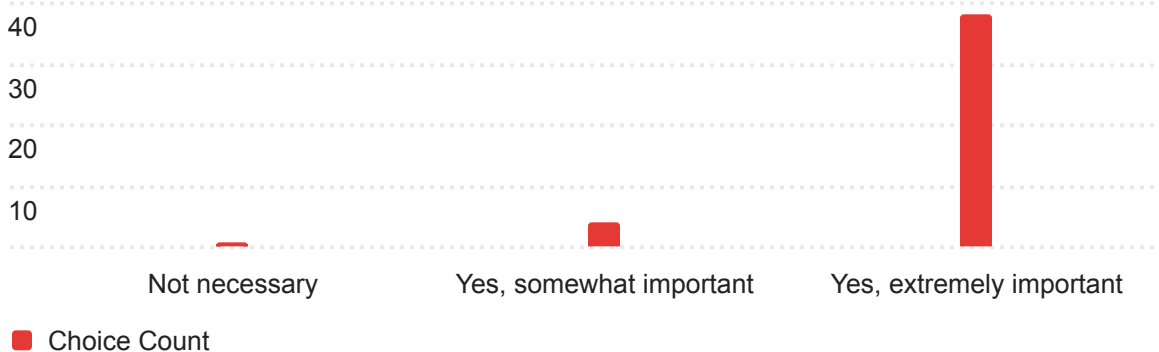
Q8.1 - What would be an estimate of the cost savings from reducing the use of pesticides as a result of the information provided?

11 Responses



Q9 - Does the Rutgers Plant Diagnostic Laboratory provide a beneficial service for you?

42 Responses



Appendix 4. (Continued)

Q10 - If you would like to share any additional comments about the service you received from the Rutgers Plant Diagnostic Laboratory, please enter them below.

22 Responses

If you would like to share any additional comments about the service you received from the Rutgers Plant Diagnostic Laboratory, please enter them below.

Thank you for your help!

Thank you for the service you do

In many cases if client does not trust arborist - Rutgers is used as a second opinion to assure client that our assessment is correct.

I have used your services in the past and continue to be impressed by the professionalism knowledge, concern and efficiency of the entire process. You provide an important resource to the people of New Jersey.

Very courteous personnel.

Thanks so much for solving my issue with Tree#1. I will be following with a sample from Tree#2

Still not sure if I can replant the same species in this location. Please let me know if I can or if I have to find something else, if you read this comment. Thank you for your time and help.

I say turn off your sprinklers and pray for snow, people just want 20-20-20 and Cygon. These reports are part of my system for educating my customers.
Colin

Sabrina was incredibly responsive and helpful.

I responded to this in another question. I have used the Lab for yrs which has provided conclusive info on the disease. This time I got the diagnosis, but at the same time I am so disappointed and let down in the type of response. I asked myself, "what was the purpose of filling out the form if it's not incorporated into the Lab's answer?". Years ago, I had gotten a response from Rich Buckley that provided a specific response that included the facts in the questionnaire I had filled out. I feel like the response I got this time was just an automatic answer where a button was pressed for the answer. I respect Rich Buckley immensely. I even had the honor to have taken his pesticide course years ago. As a homeowner, it was a bit overwhelming. I will continue to use the lab. It's just in this last diagnosis it's appears my questionnaire was not addressed.

Staff was helpful and the analysis was prompt and extensive.

Appendix 4. (Continued)

Great service. Look forward to using it again.

Thank you for the pertinent information, direction to take and all in a timely manner.

i have just received your report and some (most?) of your questions ask for results after I implement your suggestions. Perhaps a follow up questionnaire a month or so later would be helpful to you.

Always timely and insightful with clear descriptions of the issues and steps to take.

Thanks for the help gang!

Answers I gave to survey regarding outcomes of practices implemented 'not applicable' , too early to give any results of practices implemented.

I truly appreciate the value, expertise and "very fast" formal response. My Copper Beech Trees are very important to me and to future generations.

staff provided very useful analysis and recommendations for our problem. Staff was very professional and courteous; and the response to our request was very fast. They do an excellent service to the New Jersey community. Thank you.

Rich and his team are great. Managing putting greens is very difficult and their expertise and rapid responses are appreciated

Thank you very much for the information. I will not be able to replant asparagus until next year, but the information was very helpful. Thank you for your service!

Thank you for your speedy and important info. I look forward to working with you again.



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New Jersey Agricultural Experiment Station
Rutgers, The State University of New Jersey
Ralph Geiger Turfgrass Education Center
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