RUTGERS
New Jersey Agricultural Experiment Station
PLANT DIAGNOSTIC LABORATORY

Plant Diagnostic Laboratory

2021 Fiscal Year Report

(July 1, 2020 to June 30, 2021)

Mr. Richard J. Buckley
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2021 Fiscal Year
Rutgers Plant Diagnostic Laboratory
Annual Report

Prepared by:
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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 2020 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 59,714 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, Principal Laboratory Technician, 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. In an effort to control costs for FY21, as well as, due to the impact of COVID-19 on University functions, no undergraduate students were employed.

The laboratories also benefit from the assistance of faculty in several departments, Centers, and Institutes at Rutgers University/School of Environmental and Biological Sciences (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, and we also acknowledge members of the SEBS/NJAES Office of Communications for their support and assistance.

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). Sample submission forms are also available in local County Agricultural offices and by FAX directly from the PDL. Samples are submitted either by mail to a post office box in Milltown or by private delivery service 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 2021 Report

Operations

During the 2021 fiscal year (July 1, 2020 to June 30, 2021), the PDL examined 1,865 specimens submitted for diagnosis, identification (insects, weeds, or fungi), or nematode assay (Table 1), representing a 6% decrease (or 119 samples) from FY20. Samples (Figure 2) submitted for diagnosis (-52) decreased but nematode analysis (+46) increased in FY21. There was a decrease in insect identifications (-113) mostly from Cooperative Agricultural Pest Survey (CAPS) and NJ State Forestry Services trap catches. 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 1,865 sample submissions, the PDL was operating at the capacity of the laboratory to function efficiently.

Figure 1.

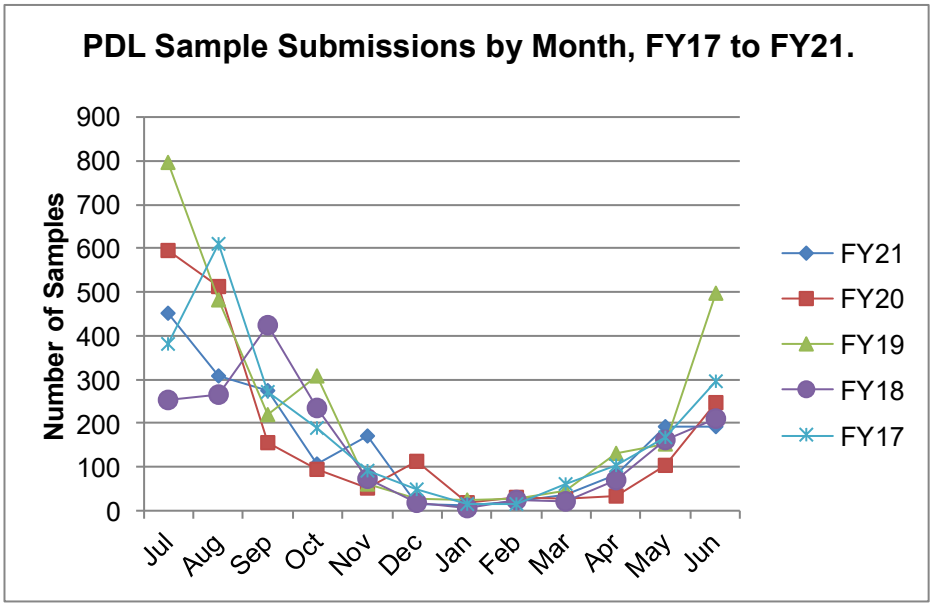
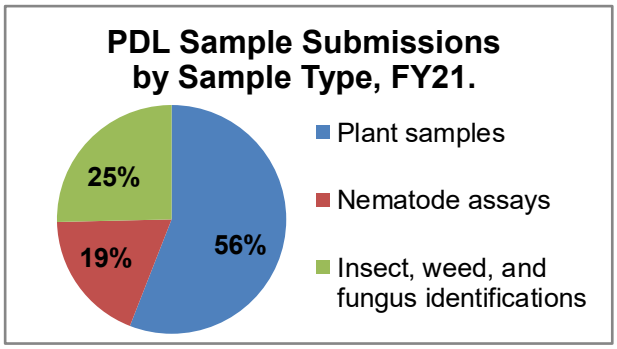


Table 1. PDL sample submissions by month, FY17 to FY21.

Month	FY17	FY18	FY19	FY20	FY21
July	380	252	795	596	451
August	609	266	481	513	308
September	272	424	219	156	276
October	188	236	309	96	107
November	93	74	62	52	171
December	50	20	27	112	16
January	14	6	25	18	11
February	16	25	29	32	22
March	62	21	46	27	36
April	105	71	131	33	82
May	168	161	152	103	193
June	295	212	497	246	192
Total	2252	1768	2773	1984	1865

Figure 2.



The specimens submitted to the PDL by sample type are presented in Figure 2. Most samples, 56% (1,043), were plant samples submitted for diagnosis, 25% (473) of the samples were insect, mold, or plant identifications and 19% (349) of the samples were for nematode analysis.

In Figure 3, samples submitted to the laboratory are presented by origin. In FY21, 83% of the plant submissions were from commercial clientele, 9% were from residential clientele, and 8% 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 FY21, 93% of samples submitted for plant or insect identification were from commercial clients, 7% were residential in origin, and 0% (0 samples) were from research (Figure 3). Household or nuisance pests are the primary issues of concern for residential clients. Of the nematode assays submitted, 97% of the samples were from commercial clients, with 3% (9 samples) from research, and 0% (1 sample) 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.

In general, 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 (83%) 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 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; however, nematode samples from growers establishing vineyards were also very common. A large portion of the nematode samples in FY21 were submitted to the laboratory through the Rutgers Fruit IPM program from blueberry growers. Golf turf represents most of the nematode samples from turfgrass clientele. Problems in golf turf, particularly with nematodes, are more severe during seasons with considerable

Figure 3.

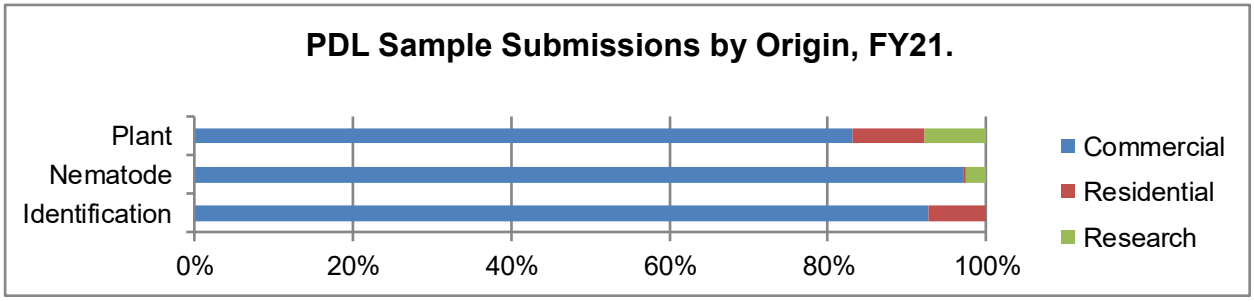


Figure 4.

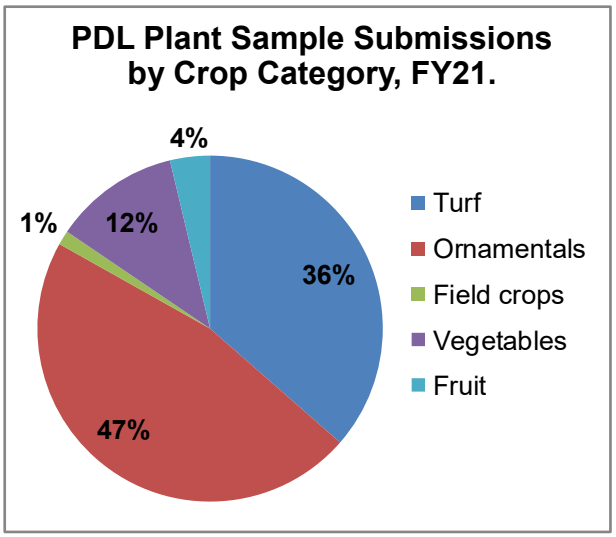
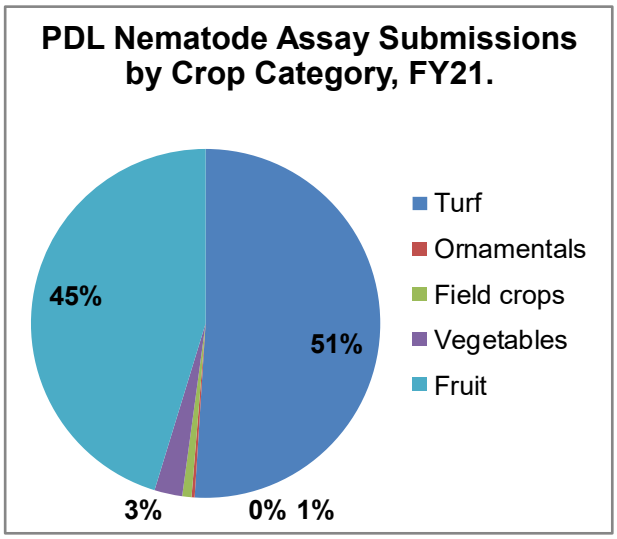


Figure 5.

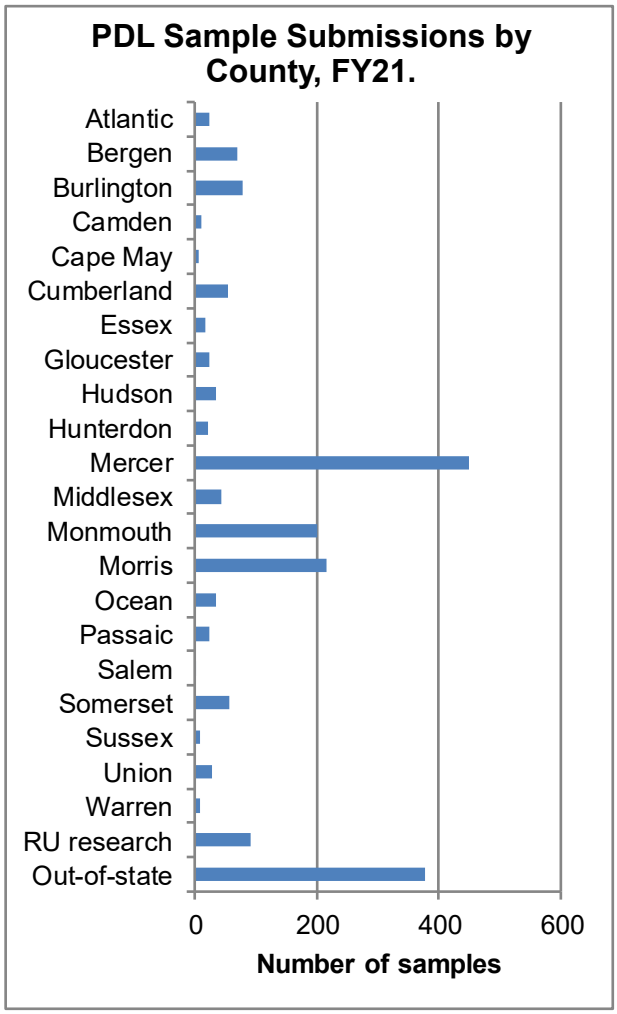


heat and drought stress, and it is those years that carry the highest submission totals.

Samples were submitted to the PDL from all counties in New Jersey (Figure 6). The majority of samples, however, were submitted from counties in close 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 and programs that promote and utilize PDL services.

Approximately 20% of the samples submitted for diagnosis to the laboratory were from out-of-state. The percent of out-of-state samples decreased (-3%) from the previous FY20. Of particular note, 39% of all turf samples were from out-of-state. Golf turf samples were submitted to the laboratory from 18 states in FY21. Turf samples were received from states as far away as Arizona, California, Connecticut, Delaware, Idaho, Massachusetts, Maryland, Nevada, New York, Ohio, Oregon, Pennsylvania, Utah, Vermont, Virginia, and Washington. New York and California provided the largest number of out-of-state samples. Because of his national reputation and his strong support for the laboratory, Dr. Bruce Clarke has helped the Rut-

Figure 6.



gers laboratory develop into one of the premier golf turf diagnostic facilities in the country. Many golf course superintendents contact Dr. Clarke for help, who always forwards them to the laboratory for diagnostic services. Because there are very few laboratories in the country that diagnose turfgrass diseases, these superintendents have continued to submit samples to the PDL. Many golf turf professionals at other universities often refer their clients to Rutgers for second opinions or when they are on leave. Dr. John Inguagiato at the University of Connecticut and Dr. Paul Vincelli at the University of Kentucky, both Rutgers graduates, 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 association with the Professional Golf Turf Management School 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, 34% 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 18% of the laboratory diagnoses. Insect pest damage was diagnosed on 4% of the submissions. Identifications comprised 25% of the total number of samples submitted; of these, 23% (438) were arthropods, 0% (4) fungi, and 2% (31) were plants. Nematode detection accounted for the other 19% 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.

Table 2. PDL sample submissions by county, FY17 to FY21.

In-state	FY17	FY18	FY19	FY20	FY21
Atlantic	43	39	73	61	24
Bergen	84	65	88	67	70
Burlington	66	51	68	75	77
Camden	36	10	32	11	10
Cape May	11	9	13	7	5
Cumberland	85	71	86	33	54
Essex	101	17	17	24	16
Gloucester	10	23	62	12	22
Hudson	21	19	9	32	33
Hunterdon	23	32	60	22	20
Mercer	607	358	875	585	449
Middlesex	106	82	62	51	42
Monmouth	202	249	263	164	200
Morris	169	159	197	234	216
Ocean	47	53	50	39	33
Passaic	35	23	27	20	24
Salem	20	51	85	32	2
Somerset	108	15	115	91	56
Sussex	6	98	16	14	8
Union	18	2	53	25	27
Warren	5	25	14	17	8
RU research	61	11	83	60	91
In-state total	1864	1462	2348	1676	1487
Out-of-state	388	306	425	308	378
Total	2252	1768	2773	1984	1865

Figure 7.

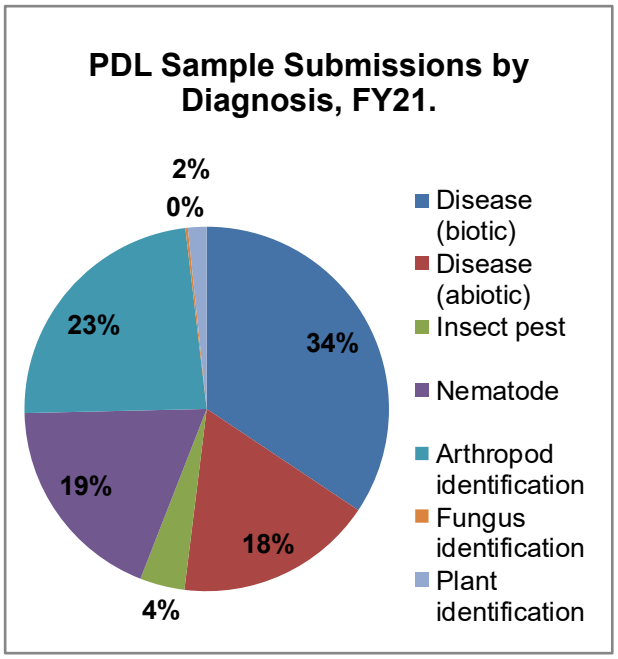
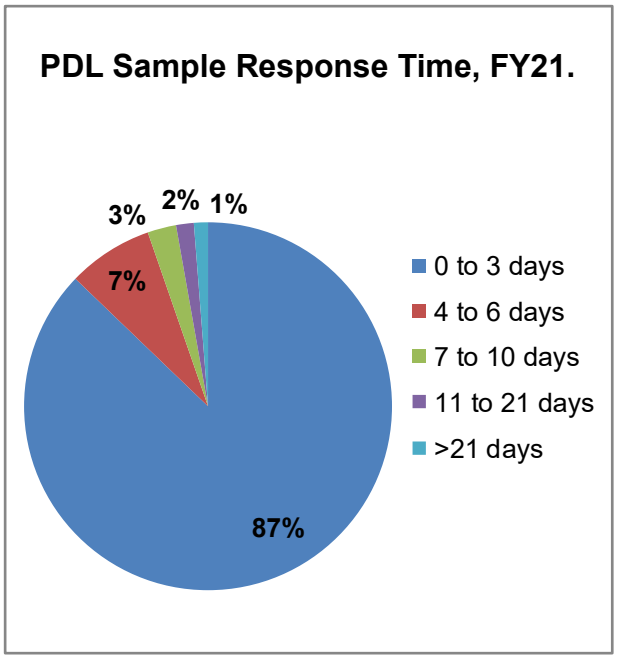


Figure 8.



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. Arthropod identifications decreased in FY21 because the number of trap catch samples from the state's CAPS and NJ State Forestry Services programs decreased (-109).

Fungal identification is also a popular service for the laboratory. Samples from mold-infested houses remained steady in FY21. The submissions of samples for mold identification rise with media attention to the perceived health issues associated with mold-infested homes and the incidence of local flooding.

In FY21, a laboratory response was prepared in less than three days for most (87%) of the samples submitted (Figure 8), and 95% of our clients received a response in less than a week. A number of the samples (52) 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 and STL provides significant educational and outreach services to SEBS,NJAES/RCE, and other agencies (Appendix 3). Many of these activities generated additional income for the laboratories.

Richard Buckley

Mr. Buckley is an instructor in the Rutgers Professional Golf Turf Management School. 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 FY21. These courses included: The Golf Turf Management School: Three Week Preparatory Course; and the Emergency Pesticide Credit Recertification Short Course.

Mr. Buckley coordinated and taught the Advanced Topics in Professional Grounds Maintenance: Turf Disease Short Course. This was the 23nd time he planned and coordinated that short course. Mr. Buckley's Pest Management in Landscape Turf Short Course was cancelled in 2021, which would have been the 29th year for this one-day program. It is scheduled to resume online in the winter of 2022.

Due to COVID-19 restrictions regarding programming, Mr. Buckley did not participate in his usual compliment of RCE and Master Gardener Programs. He is normally an invited speaker in several RCE and Master Gardener programs in Atlantic, Bergen, Camden, Hunterdon, Essex, Mercer, Monmouth, Morris, Ocean, and Passaic Counties.

Mr. Buckley participated as a guest speaker in one undergraduate and one graduate course at Rutgers: Weeds, Diseases, and Insects of Plants (11:776:391) and Plant Disease Clinic (16:765:536).

Mr. Buckley was also an invited speaker for: TurfNet RADIO—Turfgrass Hotline NE; New Jersey Agricultural Leadership Development; New Jersey Nursery Growers Twilight Meeting; Sierra Club of Mercer County; West Virginia Golf Course Superintendents Association; SiteOne University: New York, Connecticut, Mid-Atlantic, Boston, Tri-State, Eastern Great Lakes; EPA Integrated Pest Management Webinar Series; International Society of Arboriculture of PA/DE/NJ Pest Bull Session; New Jersey Turfgrass Association Webinar Series; Landscape Contractors Association MD-DC-VA; Ohio Turfgrass Foundation; New York State Turf and Landscape Association: Professional Conference and Trade Show; Delaware Horticulture Industry Expo; North Jersey Ornamental Horticulture Conference; Long Beach Island Foundation Webinar Series; New Jersey Landscape Contractors Association; New York State Turf Association Southeast Regional Conference; Morris Arboretum Webinar Series; Somerset County Library Webinar Series; West Windsor Shade Tree Commission; and New Jersey Christmas Tree Growers Association Summer Twilight Meeting.

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.

Due to COVID-19 restrictions regarding programming, Ms. Tirpak also did not present her usual programs in support of the Essex, Hunterdon, Monmouth, and Ocean, County Master Gardener Programs. Many of these programs will resume in FY22 either virtually or as in-person programs.

Ms. Tirpak was also an invited speaker for: Penn State Extension: Professional Pest Management School; and Jersey-Friendly Yards Webinar Series. As with other internal programming, many external events were also rescheduled to FY22.

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. To date, the PDL has more than 350 unique subscribers to the site. Mr. Buckley and Ms. Tirpak wrote brief posts on the disease and insect pests problems submitted to the laboratory. Most of the articles submitted to the PPA blog were also submitted for publication in the Cornell University ShortCUTT turfgrass newsletter. The Plant Diagnostic Laboratory's PPA blog posts can be found at plant-pest-advisory.rutgers.edu/category/plant-diagnostic-lab.

Service

The PDL staff provided tours of the Ralph Geiger Turfgrass Education Center and the Plant Diagnostic Laboratory to numerous groups in FY21. In addition, the STL staff also provided tours of their lab for several programs.

Mr. Buckley is a member of the newly formed 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

To help advertise laboratory services at grower meetings or other activities, two sets of table-top and banner display units are available on loan to anyone who wishes to advertise Soil Testing La-

boratory and Plant Diagnostic Laboratory services. The laboratory staff regularly attends and staffs an exhibit to explain laboratory services and sell soil test kits.

In past years, this marketing initiative has brought the display to the following programs: The Great Tomato Tasting; New Jersey Green Expo Turf and Landscape Conference; Frelinghuysen Arboretum's Community Garden Conference; Rutgers Home Gardeners School; Rutgers Gardens Summerfest; New Jersey Nursery and Landscape Association NJ Plants Show - Professional Landscape and Nursery Tradeshow; and the Rutgers Turf Field Days. Due to COVID-19 programming restrictions, these events were cancelled for FY21 with many anticipated to resume in FY22.

Income

The PDL and STL are expected to recover all costs and be self-supporting. Laboratory clientele are charged a nominal fee for diagnostic and testing services as well as for educational activities. Grant activity and cost-sharing arrangements also provide some degree of funding. 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 review fees from similar labs from other states and agreed that prices were too low. The fee schedule was adjusted accordingly and the new fees were implemented immediately to zero complaints. This was the first fee increase since 2006. We agreed to reconvene the group every three years to review the changes and adjust according to market needs.

A sample submission form and the appropriate payment accompanied the majority of samples received by the PDL from residential clientele. A submission form accompanied most commercial samples; however, the majority of these submissions did not include payment. In most cases, commercial growers preferred to be sent a bill. Internal transfer of funds was used to pay for the plant samples diagnosed for research programs at Rutgers University.

In FY21, $315,038.35 was generated from all PDL activities and covered 114% of all costs. A complete breakout of all revenues and expenses is included in Appendix 2 of this report.

PDL policy permits Rutgers employees, government agencies, County faculty, extension specialists, and selected government agencies to submit a small number of samples "free of charge." These samples are to be used for educational development and government service. The laboratory also receives a number of direct requests for free service from the public. In many cases, letters are sent to the "Department of Agriculture" or to some other vague address. These requests for information eventually find their way to the appropriate laboratory. The PDL processed 17 "no charge" samples in FY21. As per PDL policy, volume discounts are provided to companies submitting large numbers of samples as well as to grant-funded projects and those samples submitted from Federal and State agencies.

Future Directions

As in the past, the top priority for FY21 will be to increase revenue and reduce expenses. To accomplish this, we will continue to advertise laboratory services at trade shows, field days, fairs, and educational programs. Laboratory staff will be participating in several cost-sharing grant activities in FY21. These efforts and our continued cooperation with the Office of Continuing Professional Education are expected to generate additional funds.

Increasing advertising and awareness of laboratory services should bring increasing numbers of samples. Even with increased sample numbers, it may be necessary to increase some testing fees in FY22 to cover increasing costs.

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 Cornell. Grant monies provided by the USDA through the NEPDN were used in FY21 to pay salaries, 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 FY22 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; and train Master Gardeners as first detectors.

Ramapo Tomato Sale

In the spring of 2008, the New Jersey Agriculture Experiment Station revived the hybrid tomato variety 'Ramapo'. The staff of the PDL conducted the retail sale of the seed with Cindy Rovins. The variety 'Moreto`dn' was added for the 2009 season, a "Rediscover the Jersey Tomato" t-shirt for 2010, and the variety 'KC-146' was introduced for 2013. The 'Rutgers 250' tomato seed variety was released for the 2016 growing season, coinciding with the 250th anniversary of Rutgers University, and a "Rediscover Jersey Strawberries" t-shirt was added for 2017. The 'Pumpkin' habanero pepper seeds were offered for sale to the public in 2018. A bicolor grape tomato variety, 'Scarlet Sunrise', was added to the seed sales in 2020. Through FY21, the PDL has processed 18,045 orders for 50,803 packets of seeds. The t-shirts are extremely popular also with over 1,825 sold. Orders continue to come into the laboratory almost daily.

COVID-19

Laboratory activities continued uninterrupted during FY21. Laboratory staff have been in the laboratory processing samples since May of 2020 despite COVID-19 restrictions for other Rutgers employees. Once Hort. Farm 2 was opened for research, laboratory clients were able to leave samples in the hallway outside the laboratory. Clients were instructed via our website about any ongoing changes to our sample submission procedures and contact information. The changes were advertised by several grower groups including the New Jersey Turfgrass Association and the New Jersey Nursery and Landscape Association.

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 began in May 2021 (11 responses in FY21) and are included in Appendix 4 of this report. We anticipate reporting additional results in this publication for FY22 as the data set increases in size.

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-FY21.

Salaries and benefits (full and part time staff)	$267,690.92
Supplies and services	
Diagnostic and testing supplies	
Printing and marketing	
References	
Equipment maintenance	
Office supplies	
Credit card fees	$7,409.03
Communications	
Telephone/fax	
Postage	$2,055.59
Travel	
Paid talks and professional meetings	$0
Total operating costs	$277,155.54

Table A2.2. Income, PDL-FY21.

Sample fees	$112,293.00
Lecture fees	
OCPE and other honorarium	$18,995.00
Grants and contracts	
NPDN	$25,000.00
IPM	$25,981.98
Other	
Salaries (NJAES/SEBS)	$128,415.37
Total actual income	$315,038.35

Table A2.3. Estimated expenses, PDL-FY22.

Salary and benefit costs	$285,000.00
Supplies and services	$10,000.00
Communications, marketing and travel	$3,000.00
Total potential cost FY22	$298,000.00

Table A2.4. Estimated income, PDL-FY22.

Plant Health Samples	
2000 @ $55 average fee per sample	$110,000.00
Lecture fees	
OCPE and other honoraria	$22,000.00
Cost recovery	
Grant and contracts	$42,000.00
Salaries (NJAES/SEBS)	$127,000.00
Total potential income FY22	$301,000.00

Appendix 3.
Table A3.1. Complete listing of lectures presented by Richard J. Buckley, PDL Director, FY21.

Date	Title	Audience	Location	Par-ticipants[1]
07/07/20	RUPDL Golf Turf Update ONLINE (0.5hr)	Turfnet Radio - Turfgrass Hotline Northeast	online	I,L,T
08/12/20	RUPDL Golf Turf Update ONLINE (0.5hr)	Turfnet Radio - Turfgrass Hotline Northeast	online	I,L,T
09/09/20	The Rutgers Plant Diagnostic Lab (1hr)	New Jersey Agriculture Leadership Development Program	online	C,F
09/24/20	Southern Blight in the Greenhouse and Nursery (0.3hr)	New Jersey Nursery Growers Twilight Meeting	online	N
10/12/20	#1. Principles of Pest Management: Introduction to Integrated Pest Management (1.5hr)	Professional Golf Turf Management School	online	T
10/12/20	#1. Diseases and Insect Pests of Ornamentals: Abiotic Stress in Trees (2hr)	Professional Golf Turf Management School	online	T
10/13/20	#1. Turf Diseases. Turf Diseases: Principles of Plant Pathology (2hr)	Professional Golf Turf Management School	online	T
10/13/20	#1: Insects in Fine Turf: Introduction to Entomology; Insect Structure and Function (1.5hr)	Professional Golf Turf Management School	online	T
10/14/20	Spotted Lanternfly (1hr)	Sierra Club of Mercer County	online	H
10/16/20	Diseases and Insect Pests of Turf (3hr)	Emergency Pesticide Recertification Short Course	online	I,L,T
10/19/20	#2. Principles of Pest Management: IPM Basics: Considerations for Setting up a Program (1.5hr)	Professional Golf Turf Management School	online	T
10/19/20	#2. Diseases and Insect Pests of Ornamentals: Scouting Tips for Landscapes; Pesticide Review (2hr)	Professional Golf Turf Management School	online	T
10/20/20	#2. Turf Diseases: Introduction to Mycology and Fungal Structures (2hr)	Professional Golf Turf Management School	online	T
10/20/20	#2. Insects in Fine Turf: Insect Classification; Orders (1.5hr)	Professional Golf Turf Management School	online	T
10/22/20	Advanced Turf Disease Workshop (3hr)	Advanced Turf Disease Short Course	online	I,L,T
10/23/20	Advanced Turf Disease Workshop (3hr)	Advanced Turf Disease Short Course	online	I,L,T
10/26/20	#3. Principles of Pest Management: Principles of Insect Pest and Disease Control (1.5hr)	Professional Golf Turf Management School	online	T
10/26/20	#3. Diseases and Insect Pests of Ornamentals: New Plant Pathogens: Bacteria, Phytoplasma, Virus, Parasitic Plants (2hr)	Professional Golf Turf Management School	online	T
10/27/20	#3. Turf Diseases: The Red Thread Syndrome; Snow Molds (2hr)	Professional Golf Turf Management School	online	T
10/27/20	#3. Insects in Fine Turf: Insect Growth and Development; Insect Behavior (1.5hr)	Professional Golf Turf Management School	online	T
11/02/20	#4. Principles of Pest Management: Cultural Control (1.5hr)	Professional Golf Turf Management School	online	T

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

Date	Title	Audience	Location	Par-ticipants[1]
11/02/20	#4. Diseases and Insect Pests of Ornamentals: Leaf Spots, Anthracnose, and Stem Diseases (2hr)	Professional Golf Turf Management School	online	T
11/03/20	#4. Turf Diseases: Diseases Caused by Algae and Other Related Organisms; Slime Molds (2hr)	Professional Golf Turf Management School	online	T
11/03/20	#4. Insects in Fine Turf: IPM Basics: A Review of Scouting Techniques and Insecticides (1.5hr)	Professional Golf Turf Management School	online	T
11/04/20	Anthracnose: the Scourge of the Modern Putting Green (1hr)	West Virginia Golf Course Superintendents Assoc.	online	I,L,T
11/04/20	Dollar Spot: the Most Important Turf Disease (1hr)	West Virginia Golf Course Superintendents Assoc.	online	I,L,T
11/04/20	The Magical Mushrooms of Turf (1hr)	SiteOne University: New York	online	I,T
11/04/20	Fear No Weevil! (1hr)	SiteOne University: New York	online	I,T
11/09/20	#5. Principles of Pest Management: Fungicide Selection and Use (1.5hr)	Professional Golf Turf Management School	online	T
11/09/20	#5. Diseases and Insect Pests of Ornamentals: Root Rots and Vascular Wilt Diseases (2hr)	Professional Golf Turf Management School	online	T
11/10/20	#5. Turf Diseases: Diseases Caused by Species of the Fungus Rhizoctonia; Fairy Ring (2hr)	Professional Golf Turf Management School	online	T
11/10/20	#5. Insects in Fine Turf: Nematodes (1.5hr)	Professional Golf Turf Management School	online	T
11/12/20	Insects that Suck: Scale (1hr)	EPA Integrated Pest Management Webinar Series	online	A,I,L,T
11/16/20	#6. Principles of Pest Management: Fungicide Selection and Use (1.5hr)	Professional Golf Turf Management School	online	T
11/16/20	#6. Diseases and Insect Pests of Ornamentals: Rusts, Mildews, and Molds; Mites(2hr)	Professional Golf Turf Management School	online	T
11/17/20	#6. Turf Diseases: Root-infecting Patch Diseases (2hr)	Professional Golf Turf Management School	online	T
11/17/20	#6. Insects in Fine Turf: Coleoptera--Scarabs: The White Grub Complex (1.5hr)	Professional Golf Turf Management School	online	T
11/23/20	#7. Principles of Pest Management: Insecticide Selection and Use (1.5hr)	Professional Golf Turf Management School	online	T
11/23/20	#7. Diseases and Insect Pests of Ornamentals: Suckers: Scale, Bugs, Hoppers, and Plant Lice (2hr)	Professional Golf Turf Management School	online	T
11/24/20	#7. Turf Diseases: Anthracnose; “Helminthosporium” Leaf Spots (2hr)	Professional Golf Turf Management School	online	T
11/24/20	#7. Insects in Fine Turf: Coleoptera--Weevils: Annual Bluegrass Weevil; Billbugs (1.5hr)	Professional Golf Turf Management School	online	T
11/30/20	#8. Principles of Pest Management: The Least Toxic Alternative (1.5hr)	Professional Golf Turf Management School	online	T

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

Date	Title	Audience	Location	Par-ticipants[1]
11/30/20	#8. Diseases and Insect Pests of Ornamentals: Borers: Round-headed and Flat-headed Borers; Gall Makers and Miners (2hr)	Professional Golf Turf Management School	online	T
12/01/20	#8. Turf Diseases: Dollar Spot; Gray Leaf Spot (2hr)	Professional Golf Turf Management School	online	T
12/01/20	#8. Insects in Fine Turf: Lepidoptera: Armyworms, Cutworms, and Sod Webworms (1.5hr)	Professional Golf Turf Management School	online	T
12/03/20	Pest Bull Session: Diseases of Shade Trees (2hr)	ISA of PA-DE-NJ	online	A
12/07/20	#9. Principles of Pest Management: Commercial Biocontrol and Biocontrol Concepts (1.5hr)	Professional Golf Turf Management School	online	T
12/07/20	#9. Diseases and Insect Pests of Ornamentals: Borers: Weevils, Bark Beetles, and Clear-winged Moths (2hr)	Professional Golf Turf Management School	online	T
12/08/20	#9. Turf Diseases: Rust, Smut, Mildews and Other Minor Leaf Blighting Diseases (2hr)	Professional Golf Turf Management School	online	T
12/08/20	#9. Insects in Fine Turf: Hemiptera: Chinch Bugs; Ground Pearls (1.5hr)	Professional Golf Turf Management School	online	T
12/09/20	RUPDL Golf Turf Update (1hr)	New Jersey Turfgrass Association Webinar Series	online	A,I,L,T
12/10/20	#10. Turf Diseases: Abiotic Stress in Turfgrass (2hr)	Professional Golf Turf Management School	online	T
12/10/20	#10. Insects in Fine Turf: Regional Concerns: Mole Crickets and Crane Flies (1.5hr)	Professional Golf Turf Management School	online	T
12/11/20	#10. Principles of Pest Management: Scouting Your Golf Course (1.5hr)	Professional Golf Turf Management School	online	T
12/11/20	#10. Diseases and Insect Pests of Ornamentals: Leaf Feeders: Lepids, Sawfly, and Weevils (2hr)	Professional Golf Turf Management School	online	T
01/06/21	Diseases of Tall Fescue: 2020 and Beyond (1hr)	Landscape Contractors Association of MD-DC-VA	online	C,G,H, I,L,N,T
01/07/21	RUPDL Golf Turf Update (1hr)	Ohio Turfgrass Foundation	online	I,T
01/11/21	#1. Principles of Pest Management: Introduction to Integrated Pest Management (1.5hr)	Professional Golf Turf Management School	online	T
01/11/21	#1. Diseases and Insect Pests of Ornamentals: Abiotic Stress in Trees (2hr)	Professional Golf Turf Management School	online	T
01/12/21	#1. Turf Diseases. Turf Diseases: Principles of Plant Pathology (2hr)	Professional Golf Turf Management School	online	T
01/12/21	#1: Insects in Fine Turf: Introduction to Entomology; Insect Structure and Function (1.5hr)	Professional Golf Turf Management School	online	T
01/13/21	Buckwheat and the Landshrimp (1hr)	New York State Turf and Landscape Association: Professional Conference and Trade Show	online	C,G,H, I,L,N,T

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

Date	Title	Audience	Location	Par-ticipants[1]
01/13/21	Key Diseases of Bedding Plants and Other Herbaceous Ornamentals (1hr)	Delaware Horticulture Industry Expo	online	C,G,H, I,L,N,T
01/14/21	Our Majestic Oaks (1hr)	Delaware Horticulture Industry Expo	online	C,G,H, I,L,N,T
01/14/21	RUPDL Landscape Turf and Ornamentals Update (1hr)	New Jersey Turfgrass Association Webinar Series	online	A,I,L,T
01/18/21	#2. Principles of Pest Management: IPM Basics: Considerations for Setting up a Program (1.5hr)	Professional Golf Turf Management School	online	T
01/18/21	#2. Diseases and Insect Pests of Ornamentals: Scouting Tips for Landscapes; Pesticide Review (2hr)	Professional Golf Turf Management School	online	T
01/19/21	#2. Turf Diseases: Introduction to Mycology and Fungal Structures (2hr)	Professional Golf Turf Management School	online	T
01/19/21	#2. Insects in Fine Turf: Insect Classification; Orders (1.5hr)	Professional Golf Turf Management School	online	T
01/19/21	Diagnostic Tips for the Problem Lawn (1hr)	SiteOne University: Connecticut	online	C,G,H, I,L,N,T
01/21/21	Diagnostic Tips for the Problem Lawn (1hr)	SiteOne University: Mid-Atlantic	online	C,G,H, I,L,N,T
01/21/21	Cultural Control of Turf Diseases (1hr)	SiteOne University: Mid-Atlantic	online	C,G,H, I,L,N,T
01/21/21	The Complete Turf Disease for Golf Courses (1.5hr)	Professional Golf Turf Management School: Three Week Course	online	T
01/22/21	The Complete Turf Disease for Golf Courses (2hr)	Professional Golf Turf Management School: Three Week Course	online	T
01/25/21	#3. Principles of Pest Management: Principles of Insect Pest and Disease Control (1.5hr)	Professional Golf Turf Management School	online	T
01/25/21	#3. Diseases and Insect Pests of Ornamentals: New Plant Pathogens: Bacteria, Phytoplasma, Virus, Parasitic Plants (2hr)	Professional Golf Turf Management School	online	T
01/26/21	#3. Turf Diseases: The Red Thread Syndrome; Snow Molds (2hr)	Professional Golf Turf Management School	online	T
01/26/21	#3. Insects in Fine Turf: Insect Growth and Development; Insect Behavior (1.5hr)	Professional Golf Turf Management School	online	T
01/27/21	The Complete Turf Disease for Golf Courses (1.5hr)	Professional Golf Turf Management School: Three Week Course	online	T
02/01/21	#4. Principles of Pest Management: Cultural Control (1.5hr)	Professional Golf Turf Management School	online	T

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

Date	Title	Audience	Location	Par-ticipants[1]
02/01/21	#4. Diseases and Insect Pests of Ornamentals: Leaf Spots, Anthracnose, and Stem Diseases (2hr)	Professional Golf Turf Management School	online	T
02/02/21	#4. Turf Diseases: Diseases Caused by Algae and Other Related Organisms; Slime Molds (2hr)	Professional Golf Turf Management School	online	T
02/02/21	#4. Insects in Fine Turf: IPM Basics: A Review of Scouting Techniques and Insecticides (1.5hr)	Professional Golf Turf Management School	online	T
02/08/21	Boxwood: Now You see Them, Soon You Won't (1.5hr)	Weeds, Diseases, and Insects of Plants (11:776:391)	online	C
02/08/21	#5. Principles of Pest Management: Fungicide Selection and Use (1.5hr)	Professional Golf Turf Management School	online	T
02/08/21	#5. Diseases and Insect Pests of Ornamentals: Root Rots and Vascular Wilt Diseases (2hr)	Professional Golf Turf Management School	online	T
02/09/21	#5. Turf Diseases: Diseases Caused by Species of the Fungus Rhizoctonia; Fairy Ring (2hr)	Professional Golf Turf Management School	online	T
02/09/21	#5. Insects in Fine Turf: Nematodes (1.5hr)	Professional Golf Turf Management School	online	T
02/11/21	Rhododendron: Royalty or Roadkill (1.5hr)	Weeds, Diseases, and Insects of Plants (11:776:391)	online	C
02/11/21	Diagnostic Tips for the Problem Lawn (1hr)	SiteOne University: Boston	online	C,G,H, I,L,N,T
02/15/21	#6. Principles of Pest Management: Fungicide Selection and Use (1.5hr)	Professional Golf Turf Management School	online	T
02/15/21	#6. Diseases and Insect Pests of Ornamentals: Rusts, Mildews, and Molds; Mites(2hr)	Professional Golf Turf Management School	online	T
02/16/21	#6. Turf Diseases: Root-infecting Patch Diseases (2hr)	Professional Golf Turf Management School	online	T
02/16/21	#6. Insects in Fine Turf: Coleoptera--Scarabs: The White Grub Complex (1.5hr)	Professional Golf Turf Management School	online	T
02/18/21	Insects that Suck: Scale (1hr)	North Jersey Ornamental Horticulture Conference	online	A,I,L,T
02/20/21	Spotted Lanternfly and Friends (1 hr)	Long Beach Island Foundation Webinar Series	online	H
02/22/21	#7. Principles of Pest Management: Insecticide Selection and Use (1.5hr)	Professional Golf Turf Management School	online	T
02/23/21	#7. Turf Diseases: Anthracnose; “Helminthosporium” Leaf Spots (2hr)	Professional Golf Turf Management School	online	T
02/23/21	#7. Insects in Fine Turf: Coleoptera--Weevils: Annual Bluegrass Weevil; Billbugs (1.5hr)	Professional Golf Turf Management School	online	T
02/23/21	Abiotic Stress in Golf Turf (1hr)	SiteOne University: Tri-State	online	C,G,H, I,L,N,T

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

Date	Title	Audience	Location	Par-ticipants[1]
02/23/21	Root-Infecting Patch Diseases (1hr)	SiteOne University: Tri-State	online	C,G,H, I,L,N,T
02/24/21	Basic Turf Disease: Pick Your Best Defense (1.5hr)	New Jersey Landscape Contractors Association	online	A,I,L,T
03/01/21	#8. Principles of Pest Management: The Least Toxic Alternative (1.5hr)	Professional Golf Turf Management School	online	T
03/01/21	#7. Diseases and Insect Pests of Ornamentals: Suckers: Scale, Bugs, Hoppers, and Plant Lice (2hr)	Professional Golf Turf Management School	online	T
03/02/21	#8. Turf Diseases: Dollar Spot; Gray Leaf Spot (2hr)	Professional Golf Turf Management School	online	T
03/02/21	#8. Insects in Fine Turf: Lepidoptera: Armyworms, Cutworms, and Sod Webworms (1.5hr)	Professional Golf Turf Management School	online	T
03/08/21	#9. Principles of Pest Management: Commercial Biocontrol and Biocontrol Concepts (1.5hr)	Professional Golf Turf Management School	online	T
03/08/21	#8. Diseases and Insect Pests of Ornamentals: Borers: Round-headed and Flat-headed Borers; Gall Makers and Miners (2hr)	Professional Golf Turf Management School	online	T
03/09/21	#9. Turf Diseases: Rust, Smut, Mildews and Other Minor Leaf Blighting Diseases (2hr)	Professional Golf Turf Management School	online	T
03/09/21	#9. Insects in Fine Turf: Hemiptera: Chinch Bugs; Ground Pearls (1.5hr)	Professional Golf Turf Management School	online	T
03/10/21	#9. Diseases and Insect Pests of Ornamentals: Borers: Weevils, Bark Beetles, and Clear-winged Moths (2hr)	Professional Golf Turf Management School	online	T
03/11/21	Abiotic Stress in Golf Turf (1hr)	SiteOne University: Eastern Great Lakes	online	C,G,H, I,L,N,T
03/11/21	Root-Infecting Patch Diseases (1hr)	SiteOne University: Eastern Great Lakes	online	C,G,H, I,L,N,T
03/11/21	Leaf Spot Diseases in Turf: The Case for Proper Seed Selection (1hr)	New York State Turf Association: Southeast Regional Conference	online	I,L,T
03/15/21	#10. Turf Diseases: Abiotic Stress in Turfgrass (2hr)	Professional Golf Turf Management School	online	T
03/15/21	#10. Insects in Fine Turf: Regional Concerns: Mole Crickets and Crane Flies (1.5hr)	Professional Golf Turf Management School	online	T
03/16/21	#10. Principles of Pest Management: Scouting Your Golf Course (1.5hr)	Professional Golf Turf Management School	online	T
03/16/21	#10. Diseases and Insect Pests of Ornamentals: Leaf Feeders: Lepids, Sawfly, and Weevils (2hr)	Professional Golf Turf Management School	online	T
03/24/21	Shade Tree Diseases in the Urban Forest: Foliage (1.5hr)	Morris Arboretum Webinar Series	online	A,I,L,N

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

Date	Title	Audience	Location	Par-ticipants[1]
03/31/21	Shade Tree Diseases in the Urban Forest: Wood and Roots (1.5hr)	Morris Arboretum Webinar Series	online	A,I,L,N
06/06/21	Spotted Lanternfly and Friends (1hr)	Somerset County Library Webinar Series	online	H
06/04/21	Shade Tree Diseases in the Urban Forest (1.5hr)	West Windsor Shade Tree Commission	online	H
06/17/21	Christmas Tree IPM Update (0.5hr)	New Jersey Christmas Tree Growers Association Summer Twilight Meeting	Warren County	X
06/29/21	Basic Diagnostic Techniques (1.5hr)	Plant Disease Clinic (16:765:536)	New Brunswick, NJ	C

[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

Table A3.2. Complete listing of lectures presented by Sabrina Tirpak, PDL Principal Laboratory Technician, FY21.

Date	Title	Audience	Location	Par-ticipants[1]
10/21/20	#1. Turf Disease Laboratory - Basic Mycology (3hr)	Professional Golf Turf Management School	online	T
10/22/20	#1. Turf Insect Laboratory - Structure and Function/ Insect Orders (3hr)	Professional Golf Turf Management School	online	T
11/04/20	#2. Turf Disease Laboratory - Introduction to Microscopy (3hr)	Professional Golf Turf Management School	online	T
11/05/20	#2. Turf Insect Laboratory - Metamorphosis and Behavior (3hr)	Professional Golf Turf Management School	online	T
11/18/20	#3. Turf Disease Laboratory - Recognizing Signs Produced by Turf Pathogens, Part 1 (3hr)	Professional Golf Turf Management School	online	T
11/19/20	#3. Turf Insect Laboratory - Nematodes (3hr)	Professional Golf Turf Management School	online	T
12/02/20	#4. Turf Disease Laboratory - Recognizing Signs Produced by Turf Pathogens, Part 2 (3hr)	Professional Golf Turf Management School	online	T
12/03/20	#4. Turf Insect Laboratory - White Grubs (3hr)	Professional Golf Turf Management School	online	T
12/07/20	Sprucing Up Your Knowledge of Picea Problems (1hr)	Penn State Extension: Professional Pest Managers School	online	A,L,T
12/09/20	#5. Turf Disease Laboratory - Recognizing Signs Produced by Turf Pathogens, Part 3 (3hr)	Professional Golf Turf Management School	online	T

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

Date	Title	Audience	Location	Par-ticipants[1]
12/10/20	#5. Turf Insect Laboratory - Using an Insect ID Key (3hr)	Professional Golf Turf Management School	online	T
12/15/20	#6. Turf Insect Laboratory - Lab Final: Identifying Common Insects in Turf (1.5hr)	Professional Golf Turf Management School	online	T
12/15/20	#6. Turf Disease Laboratory - Lab Final: Diagnose the Problem (1.5hr)	Professional Golf Turf Management School	online	T
01/12/21	Getting to Know the Good Guys: Beneficial Insects in the Landscape (1hr)	Jersey-Friendly Yards Webinar Series	online	H
01/20/21	#1. Turf Disease Laboratory - Basic Mycology (3hr)	Professional Golf Turf Management School	online	T
01/21/21	#1. Turf Insect Laboratory - Structure and Function/ Insect Orders (3hr)	Professional Golf Turf Management School	online	T
02/09/21	#2. Turf Disease Laboratory - Introduction to Microscopy (3hr)	Professional Golf Turf Management School	online	T
02/10/21	#2. Turf Insect Laboratory - Metamorphosis and Behavior (3hr)	Professional Golf Turf Management School	online	T
02/17/21	#3. Turf Disease Laboratory - Recognizing Signs Produced by Turf Pathogens, Part 1 (3hr)	Professional Golf Turf Management School	online	T
02/18/21	#3. Turf Insect Laboratory - Nematodes (3hr)	Professional Golf Turf Management School	online	T
03/03/21	#4. Turf Disease Laboratory - Recognizing Signs Produced by Turf Pathogens, Part 2 (3hr)	Professional Golf Turf Management School	online	T
03/04/21	#4. Turf Insect Laboratory - White Grubs (3hr)	Professional Golf Turf Management School	online	T
03/10/21	#5. Turf Disease Laboratory - Recognizing Signs Produced by Turf Pathogens, Part 3 (3hr)	Professional Golf Turf Management School	online	T
03/11/21	#5. Turf Insect Laboratory - Using an Insect ID Key (3hr)	Professional Golf Turf Management School	online	T
03/16/21	#6. Turf Insect Laboratory - Lab Final: Identifying Common Insects in Turf (1.5hr)	Professional Golf Turf Management School	online	T
03/18/21	#6. Turf Disease Laboratory - Lab Final: Diagnose the Problem (1.5hr)	Professional Golf Turf Management School	online	T

[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 4. Plant Diagnostic Laboratory Client Survey, FY21.

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

11 Responses

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

0 Responses

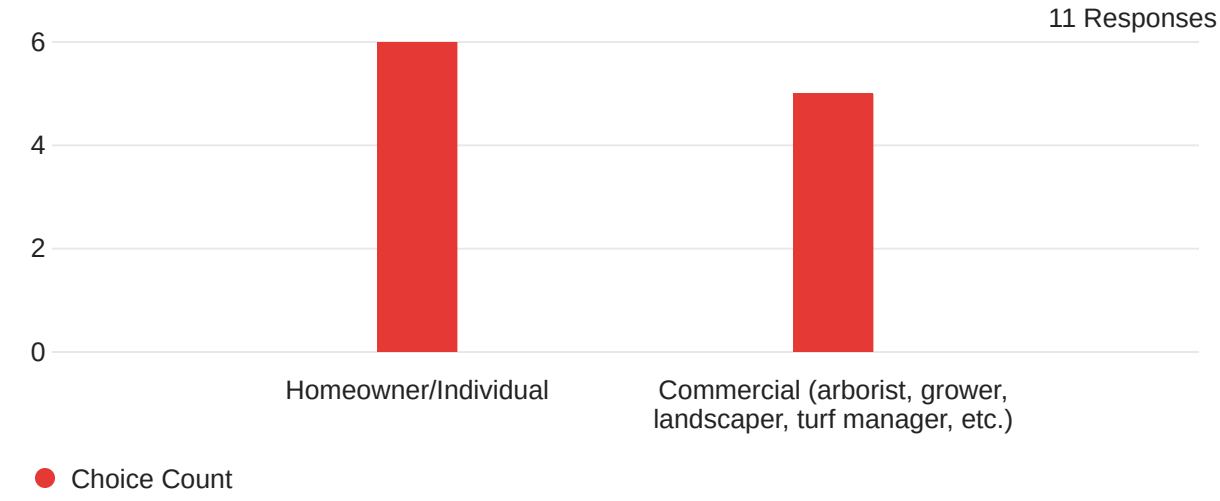
Please describe the issue with the timeliness of your diagnostic report(s).

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

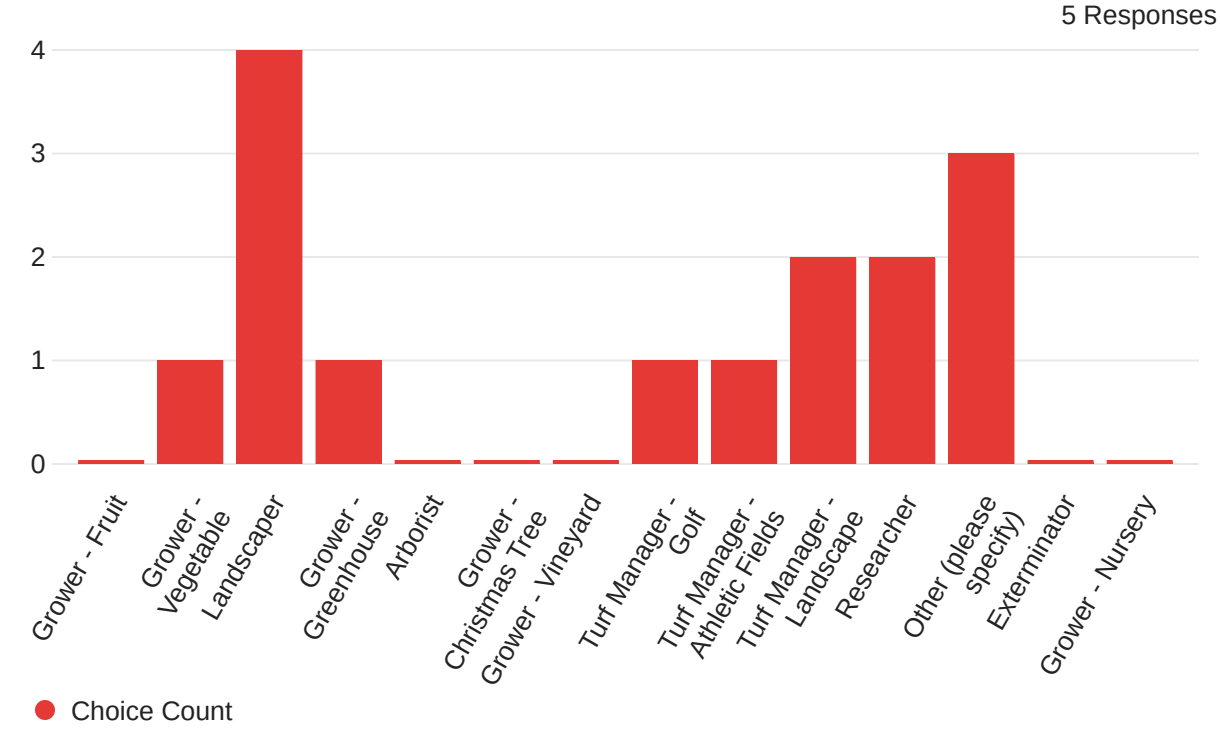
11 Responses

Appendix 4. (Continued)

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



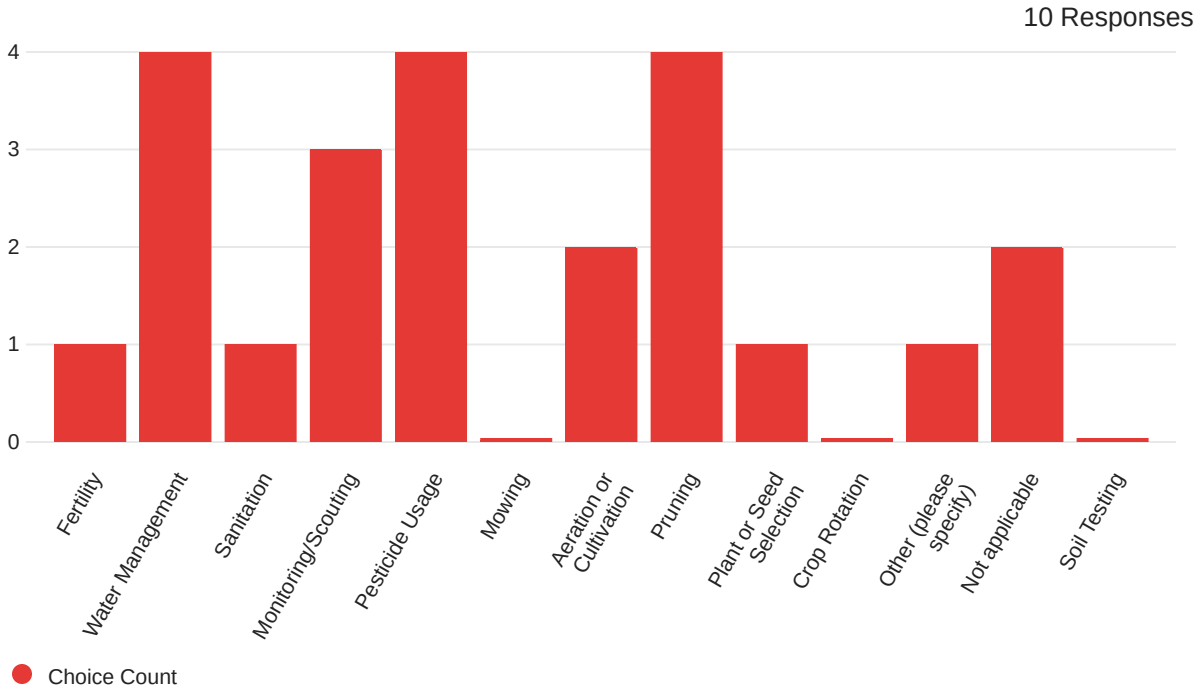
Q4.1 - Please check all that apply to describe yourself: - Selected Choice



Appendix 4. (Continued)

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)?

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



Appendix 4. (Continued)

Q6_11_TEXT - Other (please specify) - Text

1 Responses

Other (please specify) - Text
Will use fungicide as recommended.

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

3 Responses

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

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

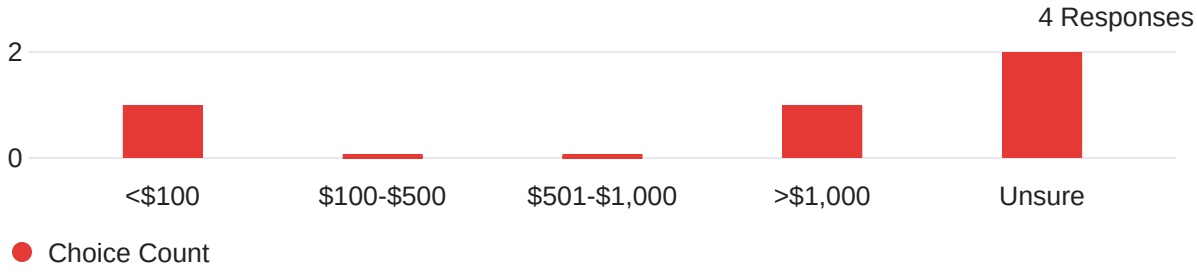
1 Responses

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

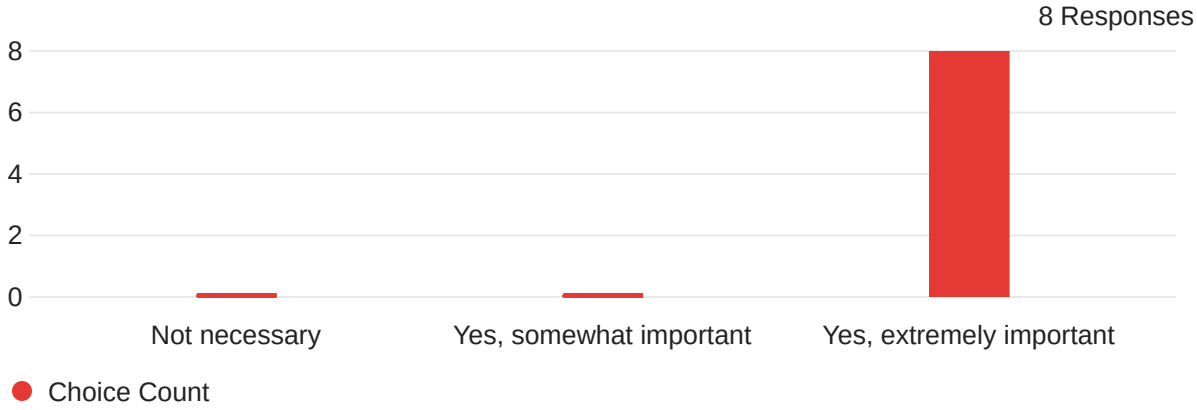
Appendix 4. (Continued)

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

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



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



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.

4 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.
Rutgers Plant Diagnostic Laboratory prevented me from scheduling a costly and unnecessary fungicide treatment to my oak tree. Great service and it was extremely helpful.
The sample was received quickly anas ere the results. Thanks so much for being a great resource.
RPDL is Best in the business for both speed, accuracy, and information provided. Fantastic resource for turf managers and growers
Sabrina and Rich are extremely helpful, insightful and efficient. I was surprised to get the report back so quickly! I will recommend the lab to others.

RUTGERS
New Jersey Agricultural
Experiment Station
PLANT DIAGNOSTIC LABORATORY

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