



THE STATE UNIVERSITY OF NEW JERSEY

**RUTGERS
COOPERATIVE
EXTENSION**

Plant Diagnostic Laboratory and Nematode Detection Service



2003 Annual Report



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Mr. Richard Buckley
Laboratory Coordinator

Ms. Sabrina Tirpak
Principal Laboratory Technician

Introduction

The mission of the Rutgers Plant Diagnostic Laboratory and Nematode Detection Service (RPDL-NDS), a service of the New Jersey Agricultural Experiment Station (NJAES), is to provide the citizens of New Jersey with accurate and timely diagnoses of plant problems. These goals are achieved in cooperation with Rutgers Cooperative Extension (RCE) and research faculty at Cook College/NJAES. Since its establishment in April of 1991, the Plant Diagnostic Laboratory has examined 21,267 samples submitted for plant problem diagnosis, nematode analysis, or identification. The laboratory has become an integral part of Rutgers Cooperative Extension and Cook College/NJAES programs by providing diagnostic and educational services and by assisting with research. This report summarizes the activities of the RPDL-NDS during the calendar year 2003, the laboratory's twelfth full year of operation.

History

The Rutgers Plant Diagnostic Laboratory was established in 1991 with an internal loan and is projected to become self-supporting. The laboratory was established by the dedicated efforts of RCE faculty members Dr. Ann B. Gould and Dr. Bruce B. Clarke, Specialists in Plant Pathology, Dr. Zane Hessel, Director of Extension, and Dr. Karen Giroux, past Assistant Director of NJAES. Without their vision and persistence, this program would not exist.

On April 1, 1991, a Laboratory Coordinator was hired on a consultant basis to renovate laboratory space and order equipment. The laboratory was housed in Building

6020, Old Dudley Road, on the Cook College Campus until April 1, 1999 when it was moved to Martin Hall. The laboratory is currently located in the Ralph Geiger Turfgrass Education Building, which is located on the turfgrass research farm in North Brunswick, NJ. The new Geiger Center was dedicated on November 17, 2000 and the laboratory moved in on December 22, 2000. 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. It was an honor to have been invited into this space and we hope that this is the final move for quite some time.

The Rutgers Plant Diagnostic Laboratory began accepting samples on June 26, 1991. At that time, the majority of equipment and supplies were in place. A full-time diagnostician (program associate) was hired September 1, 1991, and the Laboratory Coordinator was hired on a permanent basis on November 1, 1991.

Staff and Cooperators

Richard J. Buckley is the coordinator of the RPDL-NDS. He was promoted to this position from program associate in October of 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. Mr. Buckley is responsible for sample diagnosis, soil analysis for nematodes, and the day-to-day operation of the laboratory.

In July of 2000, Ms. Sabrina Tirpak was added to our staff as the Senior Laboratory Technician. Ms. Tirpak received her B.S. in Plant Science from Rutgers University in May 2000. She had been a part-time assistant in the laboratory since 1998. Ms. Tirpak's degree carries an emphasis in horticulture and turf industries. She has a minor in entomology. She also attended Clemson for special training in nematode detection and identification. Ms. Tirpak is responsible for insect and weed identifications, and assists in all other aspects of laboratory operations.

Several students were employed on a part time basis in 2003. Mr. Daniel Stanley, Ms. Maria Afuang, and Ms. Sara Baxer each spent some time in 2003 employed by the laboratory.

The laboratory benefits from the assistance of faculty in several Cook College Departments. These include the Departments of Plant Biology and Pathology; Entomology; and Ecology, Evolution, and Natural Resources. We owe a great deal of our success to the expertise of many of the Faculty in these departments. We would also like to thank the staff of the Office of Professional Continuing Education for their support and assistance with our educational programming, and cannot forget the other members of the Rutgers Resource Center for their support and assistance.

Laboratory Policy

The RPDL-NDS receives samples from a varied clientele. According to laboratory policy, samples for diagnosis from residential clients may be submitted only after screening by appropriate county faculty or staff. If the sample requires more than a cursory diagnosis it may be submitted, along with the appropriate payment, to the laboratory for evaluation. The county office provides the appropriate form, including instructions for proper sample selection and submission. Samples from professional clientele may be handled as above or may be submitted directly to the laboratory.

Detailed records are kept on all samples. A written response including the sample diagnosis, management

and control recommendations, and other pertinent information is mailed or sent by FAX to the client. Additionally, the client is billed if payment does not accompany the sample. Copies are forwarded to appropriate county faculty for their records. Commercial growers are contacted by telephone or FAX to help them avoid delay in pest treatments.

Operations

During 2003, the RPDL-NDS examined 2,310 specimens submitted for diagnosis, identification, or nematode assay (Table 1). Compared to 2002 levels, this represents a decrease in sample submissions of 160 or 6% of the 2002 total. The decrease in submissions was primarily associated with decreases in fruit tree and golf turf nematode samples. In light of sample declines from certain commodity/pathogen groups, sample submissions remained steady for most of the year, peaking in the summer and falling off during the winter. It is our view that 2,250 to 2,500 samples represents peak laboratory capacity, so sample submission totals were well within expectations.

The breakdown of specimens submitted to the RPDL-NDS for diagnosis, identification, or nematode assay in 2003 was as follows; 75% were plants for disease and insect pest diagnosis, 13% were for nematode assays, and 12% were for insect, plant, and fungus identification (Table 2).

In 2003, 64% of the plant submissions were from commercial growers, 10% were from residential clientele, and 26% were submitted from research faculty at Rutgers University (Table 3). Commercial plant managers benefit most from our services and are willing to pay the fees, therefore, they submit the greatest volume of samples to the laboratory. Insect, plant, and fungus identifications were 36% commercial, 3% research, and 61% residential in origin. Most of these samples represent identifications of household or nuisance pests, which are largely issues of concern for residential clients. Nematode assays were 99% commercial and 1% from residential clients. We expect that the number of nematode samples submitted from residential clients will remain low since much of this clientele is not familiar with nematode pests.

Table 1. RPDL-NDS Total Sample Submissions by Month – 1999 to 2003.

Month	1999	2000	2001	2002	2003
January	16	41	17	47	26
February	33	37	46	55	33
March	73	118	85	70	56
April	100	122	137	230	75
May	210	193	226	183	179
June	242	282	317	261	276
July	373	298	459	415	442
August	245	362	421	369	347
September	177	207	921	300	417
October	99	246	876	245	211
November	73	169	172	196	233
December	39	109	169	99	15
Total:	1680	2184	3846	2470	2310

Table 2. RPDL-NDS Sample Submission by Sample Type – 2003.

Sample Type	Samples	Percent of Total
Plant samples	1742	75%
Nematode assay	289	13%
Identification	279	12%
Total	2310	100%

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

Turfgrass and ornamentals may 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 (94%) were either turfgrass or ornamental plants (Table 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. This drives sample submission in favor of those commodities. Commercial growers of traditional agricultural crops have been slow to adopt a user-fee based system. Furthermore, some extension specialists and certain faculty continue to provide free service and fail to advertise diagnostic laboratory services to these grow-

Table 3. RPD-L-NDS Sample Submissions by Origin – 2003.

Sample Origin	Plant Samples	Percent of Total	Nematode Samples	Percent of Total	ID Samples	Percent of Total
Commercial Growers	1108	64%	286	99%	102	36%
Residential	176	10%	3	1%	170	61%
RU Research Programs	458	26%	0	0.0%	7	3%
Total:	1742	100%	289	100%	279	100%

Table 4. RPD-L-NDS Sample Submissions by Crop Category – 2003.

Crop	Plant Samples	Percent of Total	Nematode Samples	Percent of Total
Turf	697	40%	125	43%
Ornamentals	936	54%	75	26%
Field Crops	7	1%	0	0%
Vegetable	62	3%	15	5%
Fruit	40	2%	74	26%
Total:	1742	100%	289	100%

ers. Inroads are being made with these commodity groups through the Vegetable IPM group and it is our hope that sample submissions from traditional agricultural crops will continue to increase in future years. A large number of soil samples submitted to the laboratory for nematode analysis were from commercial fruit growers. A great majority of these samples were submitted to the laboratory through the Fruit IPM program; however, 2003 brought a 136 sample decrease in those particular samples from 2002. It is our understanding that the Fruit IPM program changed their fee structure and made nematode testing optional,

subsequently, many of the participants opted out of nematode testing. These samples were primarily submitted in the late-fall. Nematode samples from growers establishing vineyards were also common. Nematode problems on golf course greens account for another large group of submissions. The laboratory also saw a decrease in nematode samples from golf turf. The decrease in these samples occurred, in large part, because of the rainy season. Nematode problems in golf turf are more severe during seasons with considerable heat and drought stress. Finally, nematode samples from ornamental plants reflects

Table 5. RPD-L-NDS Sample Submissions by County – 1999 to 2003.

In-State	1999	2000	2001	2002	2003
Atlantic	96	228	148	113	118
Bergen	82	103	212	136	64
Burlington	88	98	239	79	118
Camden	77	79	264	242	56
Cape May	34	47	50	26	32
Cumberland	38	54	150	31	77
Essex	30	31	58	29	57
Gloucester	27	124	152	52	49
Hudson	5	13	5	14	11
Hunterdon	43	58	128	40	35
Mercer	52	104	231	238	135
Middlesex	132	194	257	240	317
Monmouth	105	147	239	204	225
Morris	128	166	234	161	109
Ocean	59	61	176	106	93
Passaic	43	7	80	38	32
Salem	21	30	82	18	12
Somerset	89	118	195	89	138
Sussex	12	30	99	24	14
Union	57	73	130	43	66
Warren	34	41	52	47	43
RU Research	72	16	200	67	112
In-State Total:	1324	1822	3382	2037	1913
Out-of-State:	356	362	464	433	397
Total:	1680	2184	3846	2470	2310

a large portion of the total submissions. These samples were submitted by the state nursery stock inspection service to assist in the certification of plant material being shipped to Canada from several local production facilities.

Samples were submitted to the RPDL-NDS from all of the counties in New Jersey (Table 5). The majority of samples, however, were submitted from counties in close proximity to the laboratory. In addition, many citizens in central New Jersey contact Rutgers University directly for assistance with plant-related problems and are referred to the laboratory. 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. The profile also identifies county faculty and programs that promote and utilize RPDL-NDS services. The significant drops from certain counties reflect the reduction in nematode samples from Fruit IPM program participants.

Approximately 17% of the samples submitted for diagnosis to the laboratory were from out-of-state (Table 5). Nearly all of these samples were turf. Fifty one percent of all the turf samples were from out-of-state. New York, Pennsylvania, and Virginia provide the largest totals. Because of his national reputation and his strong support for the laboratory, Dr. Bruce Clarke has helped the Rutgers laboratory develop into one of the premier golf turf diag-

nostic facilities in the country. Many golf course superintendents send samples to Dr. Clarke, who always forwards them to the laboratory for diagnosis. Golf turf samples were submitted to the laboratory from 20 states, several from states as far away as Florida, Arizona, Washington, Montana, and California. Because there are very few laboratories in the country that diagnose turfgrass diseases, these superintendents have continued to submit samples to the RPDL-NDS. Many golf turf professionals at other universities often refer their clients to Rutgers for second opinions or when they are on leave. Furthermore, Mr. Buckley's association with the Professional Golf Turf Management School allows for contact with as many as 90 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 instate samples.

Of the samples submitted to the RPDL-NDS for diagnosis or identification, 36% were associated with biotic disease-causing agents (Table 6). Abiotic injury (e.g., environmental extremes, nutrient deficiencies, poor cultural practices, poor soil conditions, etc.) accounted for another 34% of the laboratory diagnosis. Insect pest damage was diagnosed on 5% of the submissions. Samples submitted for identification include 5% arthropods, 5% fungi, and 2% plants and weeds. Nematode detection was the other 13% of submissions. The

Table 6. Plant Sample Submissions by Diagnosis – 2003.

Diagnosis	Number of Samples	Percent of Total
Disease (biotic)	838	36%
Disease (abiotic)	793	34%
Insect Pest	111	5%
Nematode	289	13%
Arthropod ID	116	5%
Fungus ID	117	5%
Plant ID	46	2%
Total:	2310	100%

Table 7. RPDL-NDS Sample Response Times – 2003.

Response Time	Number of Samples	Percent of Total
0 to 3 days	2008	87%
4 to 6 days	202	9%
7 to 10 days	63	2.75%
11 to 21 days	31	1%
>21 days	6	0.25%
Total:	2310	100%

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.

Insects 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. Over the last four years the Department of Entomology has cooperated with the laboratory to forward clients with insect identification needs. Their cooperation has been invaluable in increasing the awareness of the laboratory to potential clients. Arthropod identification, however, declined in 2003 from the 2002 total (180). Fungal identification is also a popular service for the laboratory. Samples from mold infested houses increased in 2003 from 2002 (74). Mold identifications appear to be related to seasonal weather patterns with more samples submitted in wet years. Furthermore, regular attention to mold issues in homes by local and national media outlets increases awareness and subsequent sample submissions.

In 2003, a laboratory response was prepared in less than three days for most (87%) of the samples submitted (Table 7), and 96% of our clients received a response in less than a week. A number of the samples took longer than 10 days to diagnose. In these cases, special consultation 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 presence of our competent staff. The addition of Ms. Tirpak in 2000 as a full-time assistant greatly enhances laboratory productivity. Adequately trained staff is essential to the continued growth and efficient operation of the laboratory.

Other Laboratory Activities

Teaching

In addition to providing diagnostic services, the staff of the RPDL-NDS provides educational services to Cook College/NJAES, Rutgers Cooperative Extension, and other agencies (Appendix II). Many of these educational activities generated additional income for the laboratory.

In 2003, the laboratory staff participated in a number of short courses offered by the Office of Continuing Professional Education. 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 - ten week - teaching commitment consists of one two-hour lecture in each class per week for a total of 80 hours of contact time. Ms. Sabrina Tirpak is responsible for teaching a laboratory practicum in the Turf School. She has improved and expanded her role in the turf school to approximately 30 hours of contact time per session. The teaching efforts by the RPDL-NDS staff in the Professional Golf Turf Management School generate significant income for the laboratory. This income source is essential for the success of the laboratory as it provides

virtually 100% of our revenue in the winter months.

Mr. Buckley participated in several other Office of Continuing Professional Education short courses in 2003. These courses included the Professional Grounds Maintenance short course; the Golf Turf Management School: Three Week Preparatory Course; Landscape Integrated Pest Management: An Intelligent Approach; Athletic Field Management School; the Professional Parks Maintenance Short Course; the Professional Landscape and Grounds Management School, and two Emergency Pesticide Credit Recertification Short Courses. Ms. Tirpak participated in Managing Diseases in Ornamental Plants.

Mr. Buckley served as the course coordinator for the Pest Management in Landscape Turf Short Course. This was the eleventh year for this one-day program. Mr. Buckley also coordinated and taught the Advanced Topics in Professional Grounds Maintenance: Turf Disease Short Course. This was the fifth time he coordinated that short course. Mr. Buckley was the 2003 coordinator for the Advanced Turf Management Symposium for the sixth time. In 2003 a new short course, Basic Entomology for the Plant Professional, was coordinated by Mr. Buckley and Ms. Tirpak and offered for the first time.

Mr. Buckley was an invited speaker in several Rutgers Cooperative Extension programs. The following programs were included: the Nursery Growers Twilight Meeting in Burlington County; North Jersey Ornamental Horticulture Conference – Tree Day and Landscape Day; the Central Jersey Turf and Ornamentals Institute, and the Master Gardener Helpline Training. Lectures in support of the Burlington, Cape May, Mercer, Monmouth, Middlesex, Camden/Gloucester, Ocean, Somerset/Hunterdon, Union, and Passaic County Master Gardener Programs were also given. Ms. Tirpak presented programs in support of the Ocean County Master Gardeners.

Mr. Buckley earned income as an invited speaker for the Pennsylvania Turf Council: NE Pennsylvania Turfgrass and Grounds Maintenance School and the Western Pennsylvania Turfgrass Show; the Penn State

Winter Grounds Maintenance Seminar; New Jersey Turf Expo; The Reed and Perrine Turf Care Seminar; New Jersey Christmas Tree Growers Association Summer Meeting; Certified Tree Expert Training; New Jersey Flower and Outdoor Living Show; the Brooklyn Landscape Gardeners Association Winter Meeting; the Bergen County Bonsai Society Quarterly Meeting; and Cornell's Organic Approach to Turf Management Program.

Other educational services provided by the staff of the RPD-L-NDS, for which the laboratory received no compensation, included lectures by Mr. Buckley in undergraduate and graduate courses including Introduction to Plant Pathology, and Nursery Crop Production. Mr. Buckley and Ms. Tirpak visited Herbert Hoover Middle School as guest speakers for several eighth grade classes. Herbert Hoover is part of Edison Township Board of Education.

Extension Publications

During 2003, the RPD-L-NDS staff contributed regularly to the Plant & Pest Advisory. The laboratory staff wrote a brief article on laboratory activities for each issue of the newsletter, which was bi-weekly from March to September and monthly from September to December, published by Rutgers Cooperative Extension and the New Jersey Agricultural Experiment Station. In 2003 the turfgrass portions of the articles submitted to the PPA were also submitted for publication in the Cornell University Short CUTT turfgrass newsletter.

Service

Mr. Buckley served as a member of the Resource Center Advisory Committee. The laboratory staff provided tours of the Ralph Geiger Turfgrass Education Center and the Plant Diagnostic Laboratory to numerous groups in 2003.

Marketing

An advertising brochure was developed in 1992 for general distribution at county offices, grower meetings, and other activities. This brochure briefly describes the services of the RPD-L-NDS and how to access them. To date, well over 20,000 copies of this brochure have been

distributed. Once again, our special thanks to the Office of Continuing Professional Education, who placed a copy of the advertising brochure in each short course educational packet that was distributed.

To help advertise laboratory services at grower meetings or other activities, a mobile display unit was developed. The display is part of the Resource Center Services mobile marketing unit. This display unit briefly describes the services of the RPDL-NDS and how to access them, and is available on loan to anyone who wishes to advertise the laboratory services. Ms. Clare Liptak has taken over the responsibility of representing the laboratory with the display unit at fairs, trade shows, and other events. Her initiative brought the display to many programs including Ag Field Day, the Rutgers Gardens Open House, Turf Field Day, and the NJ Turf Expo. We expect the display to be a part of numerous state, county, and local events in 2004.

Funding

The Plant Diagnostic Laboratory is expected to be self-supporting. Charging clientele for diagnostic services and educational activities generates funding for the laboratory.

2003 RPDL-NDS Fee Schedule

Most samples (except fine turf):

\$30 instate
\$75 out-of-state

Fine and sports turf:

Instate:
\$65 per sample
\$100 disease and nematode assay
Out-of-state:
\$95 per sample
\$150 disease and nematode assay

Nematode assay:

\$20 instate (except fine turf)
\$50 instate (fine turf)
\$75 out-of-state fine turf

Fungus and mold identification:

Instate:
\$30 microscope identification
\$60 culture identification
Out-of-state:
\$75 microscope identification
\$100 culture identification

Insect identification:

\$30 instate residential
\$40 instate commercial
\$75 out-of-state

Plant and weed identification:

\$30 instate
\$75 out-of-state

Special tests:

Fungicide resistance screening:

\$100 instate
\$150 out-of-state

Virus screening:

\$75 instate
\$100 out-of-state

Endophyte screening:

\$75 instate
\$100 out-of-state

Other services negotiable.

Contracts and volume discounts available.

Over \$97,307 was generated from diagnostic services and nematode assays during 2003. This total was slightly higher than the \$91,080 generated in 2002, which represents a 6% increase in sample fees.

A sample submission form and the appropriate payment accompanied the majority of samples received 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. Almost 100% of the clients billed have remitted payment. Furthermore, the laboratory continues to recover outstanding accounts from past years. Transfer of funds paid for almost all of the samples diagnosed for research programs at Rutgers University.

Laboratory policy allows 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 non-address. These requests for information eventually find their way to the laboratory. The Plant

Diagnostic Laboratory processed 140 “no charge” samples in 2003 (Table 8). These samples accounted for 6% of the samples processed. We are working to minimize the number of no charge requests, particularly for those clients outside of Rutgers Cooperative Extension faculty and staff.

Income generated from all laboratory activities covered 100% of the non-salary expenses incurred in 2003. Operating expenses were lower in 2003 than in 2002. For more detailed budget information see Appendix I.

Future Directions

As in the past, the top priority for 2003 will be to generate more income. To accomplish this, we will continue to advertise laboratory services. Ms. Liptak has generated a list of trade shows, field days, fairs, and educational programs to attend with the display unit. Continued cooperation with the Office of Continuing Professional Education and other educational activities are expected to generate additional funds.

Other priorities in 2004 include: developing additional educational materials in the form of fact sheets in cooperation with extension faculty; improving current educational programming with technology upgrades from traditional slide shows; focusing on ways to add and train labor for the laboratory during its busiest periods; increasing laboratory productivity with technology; and professional improvement (which includes participation in professional societies).

We are constantly evaluating the immediate and future needs of the State for additional services. Your suggestions are welcome.

National Plant Diagnostic Network

In 2003 the Plant Diagnostic Laboratory 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. The

network will provide 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 association 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 provided grant monies as incentive to participate.

Northeast Plant Diagnostic Network

The Northeast Plant Diagnostic Network 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 Northeast Network is Cornell University. Rutgers University Plant Diagnostic Laboratory has been identified as a cooperating institution and intends to participate as a subcontractor to the regional center at Cornell. Grant monies provided by the USDA will be used to purchase equipment and supplies to upgrade the laboratory’s capability for accurate and timely diagnosis of plant problems. The equipment upgrades will allow for improved communication with our local stakeholders and those cooperators and experts in the Northeast Regional and National Networks. The capacity for improved communication will facilitate the rapid dissemination of information concerning current plant disease and insect pest activity. The new equipment and upgrades in technology will also provide the means to create modern educational resources for use in local and regional training programs.

Table 8. RPDL-NDS No Charge Requests – 2003.

Client Category	Number of Samples
RCE County Faculty/Staff	86
RCE Specialists	11
Rutgers Research Programs (not RCE)	4
Rutgers Non-Research Faculty/Staff	23
Direct Mail/Walk-ins	16
Total:	140

APPENDIX I. Rutgers Plant Diagnostic Laboratory and Nematode Detection Service – Budget

Table 9. RPDL-NDS Approximate expenditures in 2003 (excluding full-time salaries).

Salaries & Benefits: (students, consultants)	\$9,120.25
Supplies and Services:	\$10,080.73
Diagnostic supplies	
Printing/advertising	
References/publications	
Equipment maintenance	
Office supplies	
Photographic services	
Capital Equipment: (digital imaging)	\$1,859.97
Communications:	\$2368.74
Telephone/FAX	
Postage	
Mass mailings	
Travel:	\$265.34
Travel to give paid talks	
Travel to professional meetings	
Liptak marketing expenses	
Actual Operating Costs:	\$23,695.03

Table 11. RPDL-NDS Estimated Expenditures for 2004.

Seasonal labor:	\$ 10,000
General operating:	\$ 15,000
One-time equipment cost:	\$ 15,000
Marketing:	\$ 2,500
Educational development and travel:	\$ 2,500
Total Estimated Expenditures 2003:	\$ 45,000

Table 10. RPDL-NDS Income in 2003.

Sample fees:	\$82,412.85
Unpaid sample fees:	\$2,235.00
Lecture fees:	
O.C.P.E.	\$16,072.50
Other honoraria	\$2,400.00
Grants and contracts:	
State Nursery Nematode Inspection	\$1,500.00
NEPDN	\$30,000.00
Value of no-charge samples:	<\$4,200.00>
Fruit IPM discount:	<\$280.00>
BLS grant discount:	<\$6,680.00>
Total potential revenue:	<\$145,780.35>
Actual Total Income:	\$134,620.35

Table 12. RPDL-NDS Potential Income for 2004¹.

Estimated TURF Sample Income:	
40% @ \$65	\$65,000
Estimated OUT-OF-STATE Sample Income:	
20% @ \$95	\$47,500
Estimated ALL OTHER Sample Income:	
40% @ \$30	\$30,000
Estimated LECTURE FEE Income:	\$15,000
Total Potential Income for 2004:	\$157,500

¹ based on 2,500 samples submitted in 2004.

Appendix II. Complete Listing of Lectures Presented During 2003.

Richard J. Buckley, Laboratory Coordinator, Plant Diagnostic Laboratory

Date	Title of Presentation	Audience	Location	Handouts	Participants ¹
1-3/03	Diseases of Turfgrass (10 Lectures)	Professional Golf Turf Management School	Cook College	20	T
1-3/03	Diseases of Ornamentals (10 Lectures)	Professional Golf Turf Management School	Cook College	20	T
1-3/03	Principles of Pest Control on the Golf Course (10 lectures)	Professional Golf Turf Management School	Cook College	20	T
1-3/03	Insects of Turfgrass (10 Lectures)	Professional Golf Turf Management School	Cook College	20	T
1/7/03	The Myth of Vascular Wilts (1 hour)	North Jersey Ornamental Horticulture Conference	Bergen County	1	A,L
1/8/03	It Might Be Mites (1 hour)	North Jersey Ornamental Horticulture Conference	Bergen County	1	A,L
1/9/03	Diseases of Turfgrass (1 hour)	Athletic Field Management School	Cook College	2	T
1/16/03	Diseases of Ornamental Plants (3 hours)	Professional Landscape and Grounds Management School	Cook College	2	A,L,T
1/23/03	Basic Turf Diseases (2 hours)	Pest Management in Landscape Turf Short Course	Cook College	3	L,T
1/24/03	Turfgrass IPM Practice (3 hours)	Professional Golf Turf Management School:Three Week Course	Cook College	1	T
1/28/03	Basic Turf Diseases (1.5 hours)	Landscape IPM Short Course	Cook College	3	L,T
1/28/03	Diagnosing Plant Problems (1.5 hours)	Landscape IPM Short Course	Cook College	3	L,T
1/30/03	To Spray or not to Spray: Fungicide Use on Shade Trees (1 hour)	NE Pennsylvania Turfgrass and Grounds Maintenance School	Wilkes Barre,PA	2	A,L,T
1/30/03	Diagnosing Diseases of Ornamental Plants (1 hour)	NE Pennsylvania Turfgrass and Grounds Maintenance School	Wilkes Barre, PA	2	A,L,T
1/31/03	The Complete Turf Disease for Golf Courses (6 hours)	Professional Golf Turf Management School: Three Week Course	Cook College	3	T
2/4/03	Insect Pests of the Thatch and Foliage (1.5 hours)	Reed and Perrine Turf Seminar	Monmouth County	2	I,T,L
2/5/03	Common Insects and Pesticide Use for Turf and Ornamentals (1.5)	Professional Parks Maintenance Short Course	Cook College	2	T,L
2/12/03	Basic Turf Diseases: Pick Your Best Defense (1 hour)	Penn State Winter Grounds Maintenance Seminar	Kutztown, PA	3	A,L,T
2/13/03	Diagnosing Diseases of Ornamental Plants (1 hour)	Penn State Winter Grounds Maintenance Seminar	Kutztown, PA	3	A,L,T
2/16/03	Diseases of Trees and Shrubs in Residential Landscapes (2 hours)	Bergen County Bonsai Society Quarterly Meeting	Bergen County	3	H
2/20/03	Basic Turf Disease: An Organic Approach (5 hours)	Cornell's Organic Approach to Turf Management	Bethpage, NY	3	I,L,T
2/21/03	Basic Entomology Concepts (6 hours)	Basic Entomology for the Plant Professional Short Course	Cook College	10	L,T
2/21/03	Diseases of Trees and Shrubs (1 hour)	NJ Flower, Garden, and Outdoor Living Show	Middlesex County	2	H
2/26/03	To Spray or not to Spray: Fungicide Use on Shade Trees (5 hour)	Western Pennsylvania Turfgrass Conference	Pittsburgh,PA	2	I,L,T
2/26/03	Basic Turf Disease:Pick Your Best Defense (5 hour)	Western Pennsylvania Turfgrass Conference	Pittsburgh, PA	2	I,L,T
2/27/03	IPM Strategies for Turf Disease Management (1 hour)	Central JerseyTurf and Ornamentals Institute	Somerset County	3	A,L,T
2/26/03	Basic Turf Disease:Pick Your Best Defense (1 hour)	Brooklyn Landscape Gardeners Association Meeting	New York, NY	3	A,L,T
3/6/03	The Truth About Nematodes (1 hour)	Advanced Turfgrass Management Symposium	Cook College	3	I,T
3/11/03	Diagnosing Plant Problems (3 hours)	Master Gardener Training	Ocean County	3	H
3/13/02	Diagnosing Plant Problems (3 hours)	Master Gardener Training	Burlington County	3	H
3/14/03	The Complete Turf Disease (6 hours)	Advanced Turf Disease Management Short Course	Cook College	3	I,L,T
3/18/03	Diagnosing Plant Problems (3 hours)	Master Gardener Training	Monmouth County	3	H
3/25/03	Diseases of Trees and Shrubs (3 hours)	Master Gardener Training	Ocean County	3	H
3/26/03	Diagnosing Plant Problems (3 hours)	Master Gardener Training	Camden/Gloucester Co.	3	H
4/2/03	Diagnosing Plant Problems (3 hours)	Master Gardener Training	Essex County	3	H
4/5/03	Diseases of Shade Trees (2 hours)	Certified Tree Expert Training Program	Cook College	2	A,L
4/7/03	Diagnosing Abiotic Plant Problems (1.5 hours)	Nursery Crop Production (11:776:439)	Cook College	1	C
4/10/03	Insect Pests of Trees and Shrubs (3 hours)	Master Gardener Training	Ocean County	3	H
4/23/03	Diagnosing Plant Problems (1.5 hours)	General Plant Pathology (11:770:301)	Cook College	1	C
4/24/03	Diseases and Insect Pests of Turfgrass (3 hours)	Master Gardener Training	Cape May County	3	H
5/1/03	Diagnosing Plant Problems (3 hours)	Master Gardener Training	Passaic County	3	H
5/19/03	Hands On Disease and Insect Pest ID (2 hours)	Master Gardener Helpline Training	Cook College	2	H
6/18/03	Insect Pests of Trees and Shrubs (3 hours)	Master Gardener Training	Monmouth County	3	H
7/19/03	Disease Management in Christmas Tree Plantations (1 hour)	NJ Christmas Tree Growers Association Summer Meeting	Sussex County	2	N
8/19/03	Nursery Disease Diagnostic Clinic (.5 hour)	Nursery Growers Twilight Meeting	Burlington County	3	N
9/29/03	Diagnosing Plant Problems (3 hours)	Master Gardener Training	Morris County	3	H
10/15/03	Identification and Control of Ornamental Diseases (1 hour)	Emergency Pesticide Recertification Short Course	Cook College	2	A,T,L
10/15/03	Reducing Turf Disease Through Culture (1 hour)	Emergency Pesticide Recertification Short Course	Cook College	4	A,T,L

¹ Audience Addressed: A=Arborist; C=College (Academic); G=Greenhouse; H=Residential Clientele; I=Industry; L=Landscape Professionals; N=Nursery Growers; T=Turfgrass Managers; X=Christmas Tree Growers.

Appendix II. Complete Listing of Lectures Presented During 2003. Richard J. Buckley, Laboratory Coordinator, Plant Diagnostic Laboratory

Date	Title of Presentation	Audience	Location	Number of Handouts	Type of Participants ¹
10/16/03	Diagnosing Plant Problems (3 hours)	Master Gardener Training	Hunterdon/Somerset Co.	3	H
10/21/03	Diagnosing Plant Problems (3 hours)	Master Gardener Training	Union County	3	H
11/21/03	Diagnosing Plant Problems (3 hours)	Master Gardener Training	Middlesex County	3	H
11/26/03	Diagnosing Plant Problems (3 hours)	Master Gardener Training	Essex County	3	H
12/10/03	What is IPM? (.5 hour)	New Jersey Turf Expo	Atlantic County	2	I,L,T
12/11/03	Top Five Insect Pests in Landscape Turf (.5 hour)	New Jersey Turf Expo	Atlantic County	2	I,L,T
10-12/03	Principles of Pest Control on the Golf Course (10 Lectures)	Professional Golf Turf Management School	Cook College	20	T
10-12/03	Diseases of Turfgrass (10 Lectures)	Professional Golf Turf Management School	Cook College	20	T
10-12/03	Diseases of Ornamentals (10 Lectures)	Professional Golf Turf Management School	Cook College	20	T
10-12/03	Insects of Turfgrass (10 Lectures)	Professional Golf Turf Management School	Cook College	20	T

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