



# Plant Diagnostic Laboratory and Nematode Detection Service



## 2002 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 18,957 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 2002, the laboratory's eleventh 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 Helsen, 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 2002.

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 infor-

mation 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 2002, the RPDL-NDS examined 2,470 specimens submitted for diagnosis, identification, or nematode assay (Table 1). Compared to 2001 levels, this represents a 36% decrease in sample submissions. The decrease in sample submissions was due to the absence of samples from the statewide Bacterial Leaf Scorch (BLS) Survey with the Division of Community Forestry. In the 2001 BLS survey 1,375 oak samples were submitted to the laboratory for testing. If the BLS samples were removed from the 2001 total, then the laboratory received 2,471 submissions in 2001. A total that compares favorably to the 2,470 submissions for 2002. 2,470 samples represents a 13% increase in sample submissions over the 2000 total. It is our view that 2,500 samples represents peak laboratory capacity. The ability to do special projects, like the BLS survey, depends on the pathogen and the prescribed testing protocol. Sample submissions remain steady for most of the year, peaking in the summer and falling off during the winter.

The breakdown of specimens submitted to the RPDL-NDS for diagnosis, identification, or nematode assay in 2002 is as follows; 71% were plants for disease and insect pest diagnosis, 17% were for nematode assays, and 12% were for insect, plant, and fungus identification (Table 2).

In 2002, 72% of the plant submissions were from commercial growers, 11% were from residential clientele, and 17% were submitted from research faculty at Rutgers University (Table 3). Insect, plant, and fungus identifications were 32% commercial, 6% research, and 62% residential in origin. 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 – 1998 to 2002.**

<b>Month</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>
January	33	16	41	17	47
February	26	33	37	46	55
March	56	73	118	85	70
April	132	100	122	137	230
May	174	210	193	226	183
June	260	242	282	317	261
July	274	373	298	459	415
August	251	245	362	421	369
September	178	177	207	921	300
October	123	99	246	876	245
November	55	73	169	172	196
December	36	39	109	169	99
<b>Total:</b>	<b>1598</b>	<b>1680</b>	<b>2184</b>	<b>3846</b>	<b>2470</b>

**Table 2. RPDL-NDS Sample Submission by Sample Type – 2002.**

<b>Sample Type</b>	<b>Samples</b>	<b>Percent of Total</b>
Plant samples	1757	71%
Nematode assay	415	17%
Identification	298	12%
<b>Total</b>	<b>2470</b>	<b>100%</b>

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 (96%) 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. Furthermore, pest diagnosis for commercial growers of other crops are still handled by Extension Specialists and County Agents in other parts of the State at no charge. This practice limits the number of production agriculture samples sent to the laboratory.

**Table 3. RPD-L-NDS Sample Submissions by Origin – 2002.**

<b>Sample Origin</b>	<b>Plant Samples</b>	<b>Percent of Total</b>	<b>Nematode Samples</b>	<b>Percent of Total</b>	<b>ID Samples</b>	<b>Percent of Total</b>
Commercial Growers	1267	72%	414	100%	95	32%
Residential	195	11%	1	0.0%	184	62%
RU Research Programs	295	17%	0	0.0%	19	6%
<b>Total:</b>	<b>1757</b>	<b>100%</b>	<b>415</b>	<b>100%</b>	<b>298</b>	<b>100%</b>

**Table 4. RPD-L-NDS Sample Submissions by Crop Category – 2002.**

<b>Crop</b>	<b>Plant Samples</b>	<b>Percent of Total</b>	<b>Nematode Samples</b>	<b>Percent of Total</b>
Turf	755	43%	197	47%
Ornamentals	925	53%	7	2%
Field Crops	13	1%	3	1%
Vegetable	40	2%	0	0%
Fruit	24	1%	208	50%
<b>Total:</b>	<b>1757</b>	<b>100%</b>	<b>415</b>	<b>100%</b>

Furthermore, commercial growers of traditional agricultural crops have been slow to adopt a user-fee based system. Soil samples submitted to the laboratory for nematode analysis were primarily from commercial fruit growers. A great majority of these samples were submitted to the laboratory through the Fruit IPM program. Nematode samples from growers establishing vineyards were also common. Special thanks to the IPM agents in vegetable and fruit for their support. Nematode problems on golf course greens account for another large group of submissions. The laboratory saw an increase in nematode

samples from golf turf, in part, because of our price structure. A discount was offered when nematode detection was included with routine disease diagnosis.

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, from counties with dense populations that have disease problems associated with turf and ornamentals in residential landscapes or on golf courses, and from counties that have many Fruit IPM

**Table 5. RPDL-NDS Sample Submissions by County – 1998 to 2002.**

<b>In-State</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>
Atlantic	88	96	228	148	113
Bergen	76	82	103	212	136
Burlington	72	88	98	239	79
Camden	63	77	79	264	242
Cape May	57	34	47	50	26
Cumberland	23	38	54	150	31
Essex	24	30	31	58	29
Gloucester	23	27	124	152	52
Hudson	9	5	13	5	14
Hunterdon	28	43	58	128	40
Mercer	49	52	104	231	238
Middlesex	145	132	194	257	240
Monmouth	104	105	147	239	204
Morris	96	128	166	234	161
Ocean	40	59	61	176	106
Passaic	55	43	7	80	38
Salem	22	21	30	82	18
Somerset	150	89	118	195	89
Sussex	10	12	30	99	24
Union	83	57	73	130	43
Warren	26	34	41	52	47
RU Research	66	72	16	200	67
<b>In-State Total:</b>	<b>1309</b>	<b>1324</b>	<b>1822</b>	<b>3382</b>	<b>2037</b>
<b>Out-of-State:</b>	<b>289</b>	<b>356</b>	<b>362</b>	<b>464</b>	<b>433</b>
<b>Total:</b>	<b>1598</b>	<b>1680</b>	<b>2184</b>	<b>3846</b>	<b>2470</b>



program participants. In addition, many citizens in central New Jersey contact Rutgers University directly for assistance with plant-related problems and are referred to the laboratory. The profile also identifies county faculty and programs that promote and utilize RPDL-NDS services.

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. Forty five 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 diagnostic 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, 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 in-state samples.

Of the samples submitted to the RPDL-NDS for diagnosis or identification, 35% 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 29% of the laboratory diagnosis. Insect pest damage was diagnosed on 7% of the submissions. Samples submitted for identification include 7% arthropods, 3% fungi, and 2% plants and weeds. Nematode detection was the other 17% of submissions. The overall breakdown in sample submissions is typical of that reported by other diagnostic laboratories in the United States.

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. Athropod identification increased by 38% from the year 2001 total (130). Fungal identification is also a popular service for the laboratory.

**Table 6. Plant Sample Submissions by Diagnosis – 2002.**

<b>Diagnosis</b>	<b>Number of Samples</b>	<b>Percent of Total</b>
Disease (biotic)	869	35%
Disease (abiotic)	716	29%
Insect Pest	172	7%
Nematode	415	17%
Arthropod ID	180	7%
Fungus ID	74	3%
Plant ID	44	2%
<b>Total:</b>	<b>2470</b>	<b>100%</b>

**Table 7. RPDL-NDS Sample Response Times – 2002.**

<b>Response Time</b>	<b>Number of Samples</b>	<b>Percent of Total</b>
0 to 3 days	2212	90%
4 to 6 days	181	7%
7 to 10 days	40	1.5%
11 to 21 days	23	1%
>21 days	6	0.5%
<b>Total:</b>	<b>2470</b>	<b>100%</b>

Mold infested houses were featured on several television shows and newspaper articles in 2002. These features sent worried clients to the laboratory for assistance.

In 2002, a laboratory response was prepared in less than three days for most (90%) of the samples submitted (Table 7), and 97% 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 2002, 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 70 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 35 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 2002. These courses included the Professional Grounds Maintenance short course; the Golf Turf Management School: Three Week Preparatory Course; the Home Gardeners School; Landscape Integrated Pest Management: An Intelligent Approach; Athletic Field Construction; Managing Diseases in Ornamental Plants; the Professional Parks Maintenance Short Course, 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 ninth 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 fourth time he coordinated that short course. Mr. Buckley was the 2002 coordinator for the Advanced Turf Management Symposium for the fifth time.

Mr. Buckley was an invited speaker in several Rutgers Cooperative Extension programs. The following programs were included: the Fruit, Vegetable, and Flower Growers Twilight Meeting in Bergen County; North Jersey Ornamental Horticulture Conference – Turf Day and Landscape Day; Home Depot Garden Center Training for Somerset County, and the Master Gardener Hotline Training. Lectures in support of the Mercer, Monmouth, Middlesex, Camden/Gloucester, Ocean, Somerset/Hunterdon, Union, and Passaic County Master Gardener Programs were also given.

Mr. Buckley also earned income for the RPD-L-NDS as an invited speaker for the Pennsylvania Turf Council: Eastern Pennsylvania Turf Show; New Jersey Turf Expo; The Reed and Perrine Turf Care Seminar; Central Pennsylvania Golf Course Superintendents Association June Meeting; South Jersey Landscapers Association Education Seminar; New Jersey Christmas Tree Growers Association Winter Meeting; and the American Golf Corporation Regional Educational Seminar.

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 The Plant Clinic, Introduction to Plant Pathology, and Greenhouse Environmental Control. 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. Ms. Tirpak participated in 2002 Science-sational Day, a hands on science day sponsored by RCE 4H of Burlington County and the Mount Laurel Schools Community Education Program.

#### **Extension Publications**

During 2002, 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 2002 the turfgrass portions of the article submitted to the PPA were also submitted for publication in the Cornell University Short CUTT turfgrass newsletter.

In July, a Plant Diagnostic Laboratory Policy and Procedures Manual was distributed to each county office. The manual was a revision of the original manual distributed in the spring of 1992.

#### **Fact Sheets**

Mr. Buckley, Ms. Tirpak, and Dr. Albrecht Koppenhoffer, Extension Specialist in Turfgrass Entomology coauthored the following RCE factsheets in 2002:

FS1007 An Integrated Approach to Insect Management in Turfgrass: Sod Webworms

FS1008 An Integrated Approach to Insect Management in Turfgrass: Hairy Chinch Bug

FS1013 An Integrated Approach to Insect Management in Turfgrass: Black Cutworm

FS1014 An Integrated Approach to Pest Management in Turfgrass: Nematodes

FS1015 An Integrated Approach to Insect Management in Turfgrass: Billbugs

FS1016 An Integrated Approach to Insect Management in Turfgrass: Annual Bluegrass Weevil

#### **Service**

Mr. Buckley served as a member of the Resource Center Advisory Committee. The laboratory served the Department of Plant Biology and Pathology as a source of independent study credit for undergraduate students interested in Plant Pathology. In 2002, Ms. Maria Afuang earned credits while working in the laboratory.

## 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 RPDL-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 Department of Continuing Professional Education, who placed a copy of the advertising brochure in each short course educational packet that was distributed.

In the spring of 2002, Ms. Sabrina Tirpak developed submission forms to reflect sample submissions for mold identifications and for nematode assays. These services had been performed by the laboratory, but had not had unique submission forms. There are currently seven submission forms that reflect each of the laboratory services.

As of July 1, 2002, the fees for laboratory services were increased. At that time the laboratory also began accepting payment via credit card. Ms. Tirpak updated each of our forms to reflect the new fees and to provide space for credit card information. Each form was also modified to reflect current RCE and Resource Center graphic art.

The laboratory staff and Mr. Phil Wisnewski of Resource Center Services subsequently updated the Plant Diagnostic Laboratory website to reflect new services, new forms, and new fees. A photograph of the laboratory was added to the website, as well as, maps and directions to our turf farm location.

All laboratory submission forms are now available for download from the website, or in hard copy from the RCE publications office.

To advertise laboratory services and the new fee structure, Ms. Tirpak developed a mass mailing card. As a marketing tool, the cards also served as coupons redeemable for samples at pre-July 1 prices. A mailing list

was developed from the laboratory database. Another mailing list was developed by Mr. Jim Morris of the Office of Continuing Professional Education. Thirty six hundred of these cards were distributed by mail to all of the participants of OCPE programs in landscape, turfgrass, and grounds since year 2000. Another 1,000 cards were sent in a mass mailing to former RPDL-NDS commercial clientele.

To help advertise laboratory services at grower meetings or other activities, a mobile display unit was developed. 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. She has updated the presentation of the display and added a literature rack to provide selected extension publications to the attendees of these 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. The display has been retired for 2003 and is now part of the Resource Center Services mobile marketing unit. We expect the display to be a part of numerous state, county, and local events in 2003.

## Funding

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

Before July 1, 2002 the fee schedule for diagnostic services and nematode assays was:

<b>Residential Clients:</b>	\$20.00/sample
<b>Commercial Growers:</b>	
Fine turf	\$50.00/sample
All others	\$20.00/sample
<b>Out-of-State Growers:</b>	\$75.00/sample

On July 1, 2002 the fees for diagnostic services and nematode assays were raised. This was the first fee increase since the inception of the laboratory. The new fee structure was refined to reflect each sample type.

### **2003 RPDL-NDS Fee Schedule**

#### **Most samples (except fine turf):**

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

#### **Fine and sports turf:**

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

#### **Nematode assay:**

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

#### **Fungus and mold identification:**

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

#### **Insect identification:**

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

#### **Plant and weed identification:**

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

#### **Special tests:**

#### **Fungicide resistance screening:**

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

#### **Virus screening:**

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

#### **Endophyte screening:**

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

#### **Other services negotiable.**

#### **Contracts and volume discounts available.**

Over \$91,080 was generated from diagnostic services and nematode assays during 2002. This total was slightly less than the \$92,740 generated in 2001. If the BLS survey income (\$13,750) was removed from the 2001 total, then the income generated in 2002 represents a 15% increase in

sample income over 2001 (\$78,990). The state BLS survey was considered to be a one-time revenue source and should not be counted on in future years.

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 236 "no charge" samples in 2002 (Table 8). These samples accounted for 9% 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 2002. Operating expenses were higher in 2002 due to the purchase of new computers for the laboratory and the expense of marketing the fee increase. For more detailed budget information see Appendix I.

**Table 8. RPD-L-NDS No Charge Requests – 2002.**

<b>Client Category</b>	<b>Number of Samples</b>
RCE County Faculty/Staff	107
RCE Specialists	82
Rutgers Research Programs (not RCE)	11
Rutgers Non-Research Faculty/Staff	26
Direct Mail/Walk-ins	9
Other Government Agencies/University	1
<b>Total:</b>	<b>236</b>

### **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 2002 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.

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

**Table 9. RPDL-NDS Approximate expenditures in 2002 (excluding full-time salaries).**

Salaries & Benefits: (students, consultants)	\$9,111.95
Supplies and Services: Diagnosticsupplies Printing/advertising References/publications Equipmentmaintenance Office supplies Photographic services	\$9,055.02
Capital Equipment: (computers)	\$8,228.00
Communications: Telephone/FAX Postage Mass mailings	\$3,178.29
Travel: Travel to give paid talks Travel to professional meetings Llptak marketing expenses	\$553.97
<b>Actual Operating Costs:</b>	<b>\$30,127.23</b>

**Table 11. RPDL-NDS Estimated Expenditures for 2003.**

Seasonal labor:	\$ 10,000
General operating:	\$ 15,000
One-time equipment cost:	\$ 10,000
Marketing:	\$ 2,500
Educational development and travel:	\$ 2,500
<b>Total Estimated Expenditures 2003:</b>	<b>\$ 40,000</b>

**Table 10. RPDL-NDS Income in 2002.**

Sample fees:	\$89,265.00
Unpaid sample fees:	\$1,815.00
Lecture fees: Professional Golf Turf School	\$21,497.00
O.C.P.E. Short Course Coordinator	\$2,875.00
O.C.P.E. Short Course Instructor	\$3,100.00
Other	\$1,650.00
Value of no-charge samples:	<\$4,720.00>
Fruit IPM discount:	<\$940.00>
BLS grant discount	<\$2,480.00>
Total potential revenue:	\$128,342.00
<b>Actual Total Income:</b>	<b>\$120,202.00</b>

**Table 12. RPDL-NDS Potential Income for 2003<sup>1</sup>.**

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
<b>Total Potential Income for 2003:</b>	<b>\$157,500</b>

<sup>1</sup> based on 2,500 samples submitted in 2003.

# Appendix II. Complete Listing of Lectures Presented During 2002. Richard J. Buckley, Laboratory Coordinator, Plant Diagnostic Laboratory

Date	Title of Presentation	Audience	Location	Number of Handouts	Type of Participants <sup>1</sup>
1-3/02	Diseases of Turfgrass (10 Lectures)	Professional Golf Turf Management School	Cook College	20	T
1-3/02	Diseases of Ornamentals (10 Lectures)	Professional Golf Turf Management School	Cook College	20	T
1-3/02	Principles of Pest Control on the Golf Course (10 lectures)	Professional Golf Turf Management School	Cook College	20	T
1-3/02	Insects of Turfgrass (10 Lectures)	Professional Golf Turf Management School	Cook College	20	T
1/9/02	To Spray or Not to Spray? Fungicide Use in the Landscape	Eastern Pennsylvania Turf Conference and Trade Show	Valley Forge, PA	2	T,L
1/9/02	Common Vascular Wilts of Shade Trees	Eastern Pennsylvania Turf Conference and Trade Show	Valley Forge, PA	2	T,L
1/10/02	Diseases of Turfgrass (6 hours)	Advanced Professional Grounds Maintenance Short Course	Cook College	5	L,T
1/11/02	Diseases of Turfgrass (3 hours)	Professional Grounds Maintenance Short Course	Cook College	2	T,L
1/14/02	Turf Diseases You Might Have Missed	North Jersey Ornamental Horticulture Conference	Morris County	1	L,T
1/16/02	Diseases of the Stem:Cankers and Branch Blights	North Jersey Ornamental Horticulture Conference	Morris County	1	L,T
1/17/02	Diseases of Trees and Shrubs (3 hours)	Professional Grounds Maintenance Short Course	Cook College	2	T
1/22/02	Diagnosing Plant Problems	Landscape IPM Short Course	Cook College	3	T,L
1/25/02	Basic Turfgrass IPM	3 Week Turf School	Cook College	2	T
1/26/02	Diseases of Christmas Trees	NJ Christmas Tree Growers Association Winter Meeting	Monmouth County	2	X
1/30/02	Diseases of Turfgrass	Landscape IPM Short Course	Cook College	3	T,L
1/31/02	Basic Plant Pathology and Disease Diagnosis	Managing Diseases in Ornamental Plants Short Course	Cook College	2	A,L
1/31/02	Introduction to Turf Diseases: Part 1	3 Week Turf School	Cook College	2	T
2/1/02	Introduction to Turf Diseases: Part 2	3 Week Turf School	Cook College	2	T
2/6/02	Common Insects and Pesticide Use for Turf and Ornamentals	Professional Parks Maintenance Short Course	Cook College	2	T,L
2/19/02	Basic Turf Diseases: Pick Your Best Defense	South Jersey Landscapers Association Seminar	Atlantic County	5	I,T,L
2/20/02	Insect Pests of the Thatch and Foliage	Reed and Perrine Turf Seminar	Monmouth County	2	I,T,L
2/22/02	Basic Turf Diseases	Pest Management in Landscape Turf Short Course	Cook College	5	I,T,L
2/27/02	Basic Turf Disease	Athletic Field Construction Short Course	Cook College	5	I,T
3/5/02	Tree Diseases	Master Gardener Training	Burlington County	1	H
3/14/02	Diagnosing Plant Problems	Master Gardener Training	Monmouth County	3	L
3/15/02	Diagnosing Plant Problems	Home Depot Training	Somerset County	2	L
3/16/02	Diseases and Insect Pests of Rhododendron	Home Depot Training	Cook College	2	H
3/28/02	Problem Diagnosis for Greenhouse Crops	Greenhouse Environmental Control (11:776:321)	Cook College	1	C
4/10/02	Diagnosing Plant Problems	Master Gardener Training	Camden/Gloucester Co.	3	H
4/11/02	Diagnosing Plant Problems	Master Gardener Training	Passaic County	3	H
4/18/02	Diagnosing Plant Problems	Master Gardener Training	Ocean County	3	H
4/24/02	Diagnosing Plant Problems	General Plant Pathology (11:770:301)	Cook College	1	C
5/20/02	Pest Walk	Master Gardener Hotline Training	Cook College	5	A,L
6/12/02	Disease Management in the Nursery	Fruit, Vegetable, and Flowers Growers Meeting	Bergen County	2	N
7/03/02	Diagnostic Clinic	Plant Disease Clinic (16:765:536)	Cook College	5	C
7/15/02	Anthraxnose	Central Pennsylvania Golf Course Super. Assoc.	York, PA	2	I,T
10/16/02	Identification and Control of Ornamental Diseases	Emergency Pesticide Recertification Short Course	Cook College	2	A,T,L
10/16/02	Reducing Turf Disease Through Culture	Emergency Pesticide Recertification Short Course	Cook College	4	A,T,L
10/17/02	Plant Pathology and Disease Diagnostic Concepts	Emergency Pesticide Recertification Short Course	Cook College	3	HT
10/22/02	Plant Pathology and Disease Diagnostic Concepts	Master Gardener Training	Hunterdon/Somerset Co.	3	H
10/24/02	Turf and Tree Disease Management	Master Gardener Training	Union County	3	A,T,L
10/30/02	Anthraxnose	Emergency Pesticide Recertification Short Course	Cook College	4	A,T,L
11/14/02	Diagnosing Plant Problems	American Golf Educational Seminar	Hunterdon County	5	I,T
11/15/02	Diagnosing Plant Problems	Master Gardener Training	Hunterdon County	3	H
11/15/02	Diagnosing Plant Problems	Master Gardener Training	Mercer County	3	H
12/10/02	Practical Solutions to Common Turf Diseases	Middlesex County	Middlesex County	3	H
12/10/02	Practical Solutions to Common Landscape Pests	Atlantic County	Atlantic County	2	I,L,T
12/11/02	Practical Solutions to Common Landscape Pests	Atlantic County	Atlantic County	2	I,L,T
12/11/02	It Might Be Mites	Atlantic County	Atlantic County	2	I,L,T
10-12/02	Principles of Pest Control on the Golf Course (10 Lectures)	Professional Golf Turf Management School	Cook College	20	T
10-12/02	Diseases of Turfgrass (10 Lectures)	Professional Golf Turf Management School	Cook College	20	T
10-12/02	Diseases of Ornamentals (10 Lectures)	Professional Golf Turf Management School	Cook College	20	T
10-12/02	Insects of Turfgrass (10 Lectures)	Professional Golf Turf Management School	Cook College	20	T

<sup>1</sup> 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.



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