

# RUTGERS COOPERATIVE EXTENSION

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NEW JERSEY AGRICULTURAL EXPERIMENT STATION

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## Rutgers Plant Diagnostic Laboratory and Nematode Detection Service



## 2001 Annual Report



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Mr. Richard Buckley  
Laboratory Coordinator

Ms. Sabrina Tirpak  
Senior 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 16,487 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 2001, the laboratory's tenth 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 also has a minor in entomology. She has also attended Clemson for special training in nematode detection and identification.

Several students were employed on a part time basis in 2001.

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**

### **Diagnostics**

During 2001, the RPDL-NDS examined 3846 specimens submitted for diagnosis, identification, or nematode assay (Table 1). Compared to 2000 levels, this represents a 76% increase in sample submissions. The increase in sample submissions is largely due to laboratory participation in the statewide Bacterial Leaf Scorch (BLS) Survey with the Division of Community Forestry. 1375 oak samples were submitted for BLS in September and October. Without the BLS survey samples the laboratory still enjoyed a 13% increase (2471 samples) in sample submissions. In light of our other samples, as expected, the majority of samples were submitted during the summer months and diminished in late-fall and winter .

The breakdown of specimens submitted to the RPDL-NDS for diagnosis, identification, or nematode assay in 2001 is as follows; 81% were plants for disease and insect pest diagnosis, 12% were nematode assays, and 7% were insect, plant, and fungus identifications (Table 2).

In 2001, 78% of the plant submissions were from commercial growers, 18% were from residential clientele, and 4% were submitted from research faculty at Rutgers University (Table 3). Insect, plant, and fungus identifications were 37% commercial, 1% research, and 62% residential in origin. Nematode assays were 99% commercial and .5% each from Rutgers research projects and 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 – 1997 to 2001.**

<b>Month</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>
January	27	33	16	41	17
February	25	26	33	37	46
March	57	56	73	118	85
April	143	132	100	122	137
May	139	174	210	193	226
June	235	260	242	282	317
July	252	274	373	298	459
August	203	251	245	362	421
September	182	178	177	207	921
October	102	123	99	246	876
November	22	55	73	169	172
December	30	36	39	109	169
<b>Total:</b>	<b>1417</b>	<b>1598</b>	<b>1680</b>	<b>2184</b>	<b>3846</b>

**Table 2. RPDL-NDS Sample Submission by Sample Type – 2001.**

<b>Sample Type</b>	<b>Samples</b>	<b>Percent of Total</b>
Plant samples	3130	81%
Nematode assay	447	12%
Identification	269	7%
<b>Total</b>	<b>3846</b>	<b>100%</b>

Generally samples from research programs represent a relatively small percentage of the total number of plant and soil samples received. The data from 2001 includes the laboratory participation in the statewide BLS survey. Research samples are an extremely important component of our sample load. Research samples allow the diagnosticians to cooperate with University faculty on problems often of great importance to the State of New Jersey. In the case of BLS, we are a member of a multidisciplinary research team that consists of Rutgers Faculty, State and community foresters, shade tree commissions, and municipal arborists.

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 (97%) were either turfgrass or ornamental plants (Table 4). Normally the distribution between turf and ornamentals is relative similar, but this year's data was skewed by the BLS survey. Overall, 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

**Table 3. RPDL-NDS Sample Submissions by Origin – 2001.**

<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	1354	43%	446	100%	83	31%
Residential	292	9%	1	0.0%	181	67%
RU Research Programs	1484	48%	0	0.0%	5	2%
<b>Total:</b>	<b>3130</b>	<b>100%</b>	<b>447</b>	<b>100%</b>	<b>269</b>	<b>100%</b>

**Table 4. RPDL-NDS Sample Submissions by Crop Category – 2001.**

<b>Crop</b>	<b>Plant Samples</b>	<b>Percent of Total</b>	<b>Nematode Samples</b>	<b>Percent of Total</b>
Turf	766	25%	138	31%
Ornamentals	2285	72%	2	0.5%
Field Crops	5	0.5%	2	0.5%
Vegetable	41	1.5%	28	6%
Fruit	33	1%	277	62%
<b>Total:</b>	<b>3130</b>	<b>100%</b>	<b>447</b>	<b>100%</b>

sample submission in favor of those commodities. Furthermore, pest diagnosis and plant identification 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. Soil samples submitted to the laboratory for nematode analysis were primarily from commercial fruit growers. The majority of these samples were submitted to the laboratory through the Fruit IPM program. Nematode samples from growers that are establishing vineyards were also increasing. 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.

Samples were submitted to the RPDL-NDS from all of the counties in New Jersey (Tables 5). The majority of samples, however, were submitted from counties in close proximity to the laboratory or from counties with dense populations that have disease problems associated with turf and ornamentals in residential landscapes or on golf courses. Disease problems on these commodities are difficult to diagnose and are subsequently submitted to

**Table 5. RPDL-NDS Sample Submissions by County – 1997 to 2001.**

<b>In-State</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>
Atlantic	64	88	96	228	148
Bergen	85	76	82	103	212
Burlington	132	72	88	98	239
Camden	51	63	77	79	264
Cape May	26	57	34	47	50
Cumberland	17	23	38	54	150
Essex	24	24	30	31	58
Gloucester	31	23	27	124	152
Hudson	16	9	5	13	5
Hunterdon	29	28	43	58	128
Mercer	28	49	52	104	231
Middlesex	158	145	132	194	257
Monmouth	87	104	105	147	239
Morris	60	96	128	166	234
Ocean	37	40	59	61	176
Passaic	70	55	43	7	80
Salem	6	22	21	30	82
Somerset	91	150	89	118	195
Sussex	13	10	12	30	99
Union	63	83	57	73	130
Warren	30	26	34	41	52
RU Research	33	66	72	16	200
<b>In-State Total:</b>	<b>1151</b>	<b>1309</b>	<b>1324</b>	<b>1822</b>	<b>3382</b>
<b>Out-of-State:</b>	<b>265</b>	<b>289</b>	<b>356</b>	<b>362</b>	<b>464</b>
<b>Total:</b>	<b>1416</b>	<b>1598</b>	<b>1680</b>	<b>2184</b>	<b>3846</b>

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. The profile also identifies county faculty that promote and utilize RPDL-NDS services.

Approximately 12% 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 with New York, Pennsylvania, and Virginia providing 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, 34% 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 44% of the laboratory diagnosis. Insect pest damage was diagnosed on 3% of the submissions. Samples submitted for identification include 4% arthropods, 3% fungus, and 1% plant and weed. Nematode detection is the other 11%. 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 three 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. Fungal identification is also a growth area for the laboratory. Mold infested houses were

**Table 6. Plant Sample Submissions by Diagnosis – 2001.**

<b>Diagnosis</b>	<b>Number of Samples</b>	<b>Percent of Total</b>
Disease (biotic)	1309	34%
Disease (abiotic)	1701	44%
Insect Pest	120	3%
Nematode	447	11%
Arthropod ID	129	4%
Fungus ID	104	3%
Plant ID	36	1%
<b>Total:</b>	<b>3846</b>	<b>100%</b>

**Table 7. RPDL-NDS Sample Response Times – 2001.**

<b>Response Time</b>	<b>Number of Samples</b>	<b>Percent of Total</b>
0 to 3 days	3190	82%
4 to 6 days	308	8%
7 to 10 days	133	4%
11 to 21 days	205	5%
>21 days	7	1%
<b>Total:</b>	<b>3846</b>	<b>100%</b>

featured on several television shows in 2001. These features sent worried clients to the laboratory for assistance and still drive many of these submissions.

In 2001, a laboratory response was prepared in less than three days for most (82%) of the samples submitted (Table 7), and 90% 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 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 2001, the laboratory staff participated in a number of short courses offered by the Office of Continuing Profes-

sional 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 40 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 12 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 2001. 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; and the Professional Parks Maintenance Short Course.

Mr. Buckley served as the course coordinator for the Pest Management in Landscape Turf Short Course. This was the eighth 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 third time he coordinated that short course. Ms. Tirpak assisted as course coordinator for the spring Home Gardeners School.

Mr. Buckley was an invited speaker in several Rutgers Cooperative Extension programs. The following programs were included: the Christmas Tree Growers Twilight Meeting in Hunterdon County; North Jersey Ornamental Horticulture Conference – Tree Day; and Union County Golf Course Training. Lectures in support of the Mercer, Monmouth, Middlesex, Camden/Gloucester, Ocean, Somerset/Hunterdon, Union, and Essex County Master Gardener Programs were also given.

Mr. Buckley also earned income for the RPD-L-NDS as an invited speaker for New Jersey Turf Expo; The Lesco Turf Care Trade Show; Certified Tree Experts Training; New Jersey Golf Course Superintendents Association Class C Winter Meeting; the Tappan Zee Rhododendron Society; and the Lawn Dr. National Convention.

Other educational services provided by the staff of the RPD-L-NDS, for which the laboratory received no compensation, included lectures in undergraduate and graduate courses including The Plant Clinic, Introduction to Plant Pathology, and Fine and Sports Turf.

**Extension Publications.** During 2001, 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 by Rutgers Cooperative Extension and the New Jersey Agricultural Experiment Station.

**Service.** Mr. Buckley served as a member of the Rutgers Cooperative Extension Home Horticulture Working Group and the Resource Center Advisory Committee.

## **Bacterial Leaf Scorch Survey**

Bacterial Leaf Scorch of amenity shade trees (BLS) is a relatively new disease in New Jersey. The disease is caused by the xylem limited bacterium *Xylella fastidiosa*, and was identified in the state in 1986. Dr. Ann Gould has been studying the problem in New Jersey since the 1990's. We are currently a member of a multidisciplinary research team that consists of Rutgers Faculty, State and community foresters, shade tree commissions, and municipal arborists. Each year more and more samples of oaks are sent to the laboratory for BLS diagnosis. It is apparent that this disease is a serious threat to New Jersey's shade trees.

In the spring of 2001, the laboratory coordinator was approached by Michael D'Errico of the Division of Community Forestry at a Certified Tree Expert training program in Monmouth County about a BLS survey. He subsequently recruited a bid for BLS testing services from our laboratory. The laboratory won the bid to participate in the survey and in September and October of 2001 tested 1,375 samples for BLS infection. Ms. Sabrina Tirpak, our Senior Technician deserves much of the credit for this job. Ms. Tirpak worked closely with Ms. Pam Tappen of the Forestry Service to coordinate the sample submissions and reporting. She worked with the manufacturer (Agdia, Inc.) of a BLS testing kit to develop an efficient protocol for our laboratory, and spent tireless hours doing the testing. Without Ms. Tirpak's dedicated effort, we could not have completed the job. It is a credit to her work ethic that the testing was done in an efficient and timely manner.

**The following is the executive summary from the state BLS report:**

### **Executive Summary**




New Jersey's street tree resource is an old and majestic one. A well-established street tree can create a sense of calm and peace, and can bring a sense of community to the towns that we live in. Street trees serve an important






purpose in New Jersey. Trees help to clean our air by filtering dust and particulates, and they decrease carbon dioxide and increase oxygen levels in our atmosphere. Trees also clean our water, stabilize our soils, provide shade from the hot summer sun, and food and shelter for birds and other wildlife.

Oaks are historically an important part of the landscape of New Jersey. The Northern red oak is our state tree, and the pin oak is one of the top five most commonly planted street trees in New Jersey. This historic resource is now being threatened by a pathogen that is affecting our oaks. Bacterial Leaf Scorch (BLS) is a disease caused by bacteria that clog the water transport vessels in the tree, blocking the flow of water from roots to leaves. This causes the leaves to scorch and die, and leads to the decline and eventual mortality of the tree.

Through the efforts of tree organizations across the state and with the cooperation of the state legislature, Public Law 2001, chapter 8 was signed into law, providing funding for a statewide survey and analysis of the spread and potential implications of this disease in New Jersey's oaks. The New Jersey Forest Service- Community Forestry Program conducted the survey during the summer and fall of 2001. This document reports on the results of that survey effort.

The findings of the statewide Bacterial Leaf Scorch survey project include:

-  • 533 out of 1,372 oaks sampled tested positive for Bacterial Leaf Scorch infection; this is 39% of the samples taken statewide.
-  • 61% or greater positive sample results were found in samples taken in Mercer, Burlington, Camden, Gloucester, Salem, and Cumberland Counties.
-  • 233 of the 533 oaks that tested positive for Bacterial Leaf Scorch (44%) are over 20 inches in diameter.

-  • The economic impact of this disease could be devastating to municipal budgets in New Jersey municipalities, as trees will need to be pruned and in many cases removed to address potential hazards caused by the disease.
-  • The aesthetic impact of this disease will also be felt throughout New Jersey's affected municipalities, as large tree removals will change the character of neighborhoods, and replacement trees will take decades to grow to the size of the trees that were removed.
-  • Bacterial Leaf Scorch is not just a street tree problem, in the future traditional forests should also be surveyed, sampled and monitored for this disease.
-  • There is widespread interest and support for the project from the residents of New Jersey, who throughout the survey showed concern for their trees and willingness to help.
-  • There is a great need for research, monitoring, treatment, and education and awareness to continue in order to find a way to stop the spread of this disease in New Jersey's oaks. The New Jersey Forest Service will continue to seek funding and support from the state legislature and other organizations in order to make this possible.

## Marketing

The RPD-L-NDS developed a 15-minute slide presentation to help advertise laboratory services to various grower groups. Copies of this presentation are available on loan to anyone who wishes to advertise the laboratory's services. Numerous presentations of this program were made throughout 2001 by the staff of the Plant Diagnostic Laboratory.

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. Ms. Tirpak developed a “3x5” card that advertised the laboratory move in 2000. Thirty six hundred of these cards were distributed by mail and by hand at trade shows and educational programs during the winter of 2000/2001.

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 with 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. Several events are planned for 2002.

## Funding

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

The 2001 fee schedule for diagnostic services and nematode assays was:

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

Over \$92,740 was generated from diagnostic services and nematode assays during 2001, representing an 18% increase in sample income over 2000. A 13% increase in income was generated from the samples without including the BLS survey. The BLS survey is currently 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

**Table 8. RPDL-NDS No Charge Requests – 2001.**

Client Category	Number of Samples
RCE County Faculty/Staff	93
RCE Specialists	7
Rutgers Research Programs (not RCE)	13
Rutgers Non-Research Faculty/Staff	41
Direct Mail/Walk-ins	3
Other Government Agencies/University	0
<b>Total:</b>	<b>157</b>

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 157 “no charge” samples in 2001 (Table 8). These samples accounted for 4% 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 2001.

Operating expenses decreased in 2001 due to the full-time staffing additions. For more detailed budget information see Appendix I.

## **Future Directions**

As in the past, the top priority for 2001 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 2001 include: the development of additional educational materials in the form of bulletins, fact sheets, and slide sets in cooperation with extension faculty; focusing on ways to add and train labor for the laboratory during its busiest periods; 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 2001 (excluding full-time salaries).**

Salaries & Benefits: (student help)	\$5,397.80
Supplies and Services:	\$14,907.51
Diagnostic supplies	
Printing/advertising	
References/publications	
Equipment maintenance	
Office supplies	
Photographic services	
Capital Equipment: (new laboratory)	<\$2,374.65>
Communications:	\$2,120.15
Telephone/FAX	
Postage	
Travel:	\$0
Travel to give paid talks	
Travel to professional meetings	
Marketing expenses	
<b>Actual Operating Costs:</b>	<b>\$24,800.11</b>

**Table 11. RPDL-NDS Estimated Expenditures for 2001.**

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 2001:</b>	<b>\$ 40,000</b>

**Table 10. RPDL-NDS Income in 2001.**

Sample fees:	\$86,100.00
Unpaid sample fees:	\$6,640.00
Lecture fees:	
Professional Golf Turf School	\$19,300.00
O.C.P.E. Short Course Coordinator	\$2,055.00
O.C.P.E. Short Course Instructor	\$1,830.00
Other	\$1,900.00
Value of no-charge samples:	<\$1,570.00>
Fruit IPM discount:	<\$1,295.00>
Total potential revenue:	\$120,690.00
<b>Actual Total Income:</b>	<b>\$117,825.00</b>

**Table 12. RPDL-NDS Estimated Income for 2002<sup>1</sup>.**

Estimated TURF Sample Income:	
40% @ \$50	\$50,000
Estimated OUT-OF-STATE Sample Income:	
20% @ \$75	\$37,500
Estimated ALL OTHER Sample Income:	
40% @ \$20	\$20,000
Estimated LECTURE FEE Income:	\$25,000
<b>Total Estimated Income for 2002:</b>	<b>\$132,500</b>

<sup>1</sup> based on 2500 samples submitted in 2002.

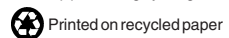
# Appendix II. Complete Listing of Lectures Presented During 2001.

## Richard J. Buckley, Laboratory Coordinator, Plant Diagnostic Laboratory

Date	Title of Presentation	Audience	Location	Number of handouts	Type of participants <sup>1</sup>
1-3/01	Diseases of Turfgrass (10 Lectures)	Professional Golf Turf Management School	Cook College	20	T
1-3/01	Diseases of Ornamentals(10 Lectures)	Professional Golf Turf Management School	Cook College	20	T
1-3/01	Principles of Pest Management on the Golf Course (10 Lectures)	Professional Golf Turf Management School	Cook College	20	T
1-3/01	Insects of Turfgrass(10 Lectures)	Professional Golf Turf Management School	Cook College	20	T
1/9/01	To Spray or Not to Spray? An IPM Approach to Tree Disease Managing Tree Diseases	North Jersey Ornamental Horticulture Conference	Morris Co.	2	A,L
1/10/01	An Integrated Pest Management Program for Diseases of Turfgrass	New York State Turf and Landscape Association	West Chester, NY	2	A,I,L,T
1/11/01	Identification and Control of Lawn Insect Pests	Professional Grounds Maintenance Short Course	Cook College	5	L,T
1/15/01	Diagnosing Tree and Shrub Problems	Lawn Doctor National Conference	Atlantic Co.	1	L,T
1/15/01	Turf Disease Identification and Control (9 – 30 min lectures)	Lawn Doctor National Conference	Atlantic Co.	1	L,T
1/18-19/01	Turf Disease Identification and Control (9 – 30 min lectures)	Advanced Topics in Professional Grounds Maintenance: Turf Disease Short Course	Cook College	1	T,L
1/23/01	Diagnosing Plant Problems	Landscape IPM Short Course	Cook College	3	T,L
1/26/01	Intro to Turf Diseases: Part 1	3 Week Turf School	Cook College	2	T
1/31/01	Understanding White Grubs in Turfgrass	Lesco Turfgrass Trade Show and Seminar	Mercer Co.	3	I,L,T
2/1/01	Intro to Turf Diseases: Part 2	3 Week Turf School	Cook College	2	T
2/2/01	Intro to IPM and Insect Control	3 Week Turf School	Cook College	2	T
2/7/01	Common Insects and Pesticide Use for Turf and Ornamentals	Professional Parks Maintenance Short Course	Cook College	2	T,L
2/22/01	Basic Turf Diseases: Pick Your Best Defense	Pest Management in Landscape Turf	Cook College	5	T,L
2/28/01	Basic Turf Diseases: Pick Your Best Defense	Athletic Field Construction Short Course	Cook College	4	I,T,L
3/17/01	Spring Turf Diseases	Home Gardeners School	Cook College	2	T
3/20/01	Basic Turf Disease for the Golf Course Crew	Union Co. Golf Course Employee Training Program	Union Co.	3	H
3/28/01	Diagnosing Plant Problems	Master Gardener Training	Camden/ Gloucester Co.	3	H
4/4/01	Diagnosing Plant Problems	Master Gardener Training	Monmouth Co.	3	H
4/19/01	Diagnosing Plant Problems	Master Gardener Training	Ocean Co.	3	H
4/23/01	Diagnosing Plant Problems	Master Gardener Training	Cook College	1	C
5/15/01	Tree Diseases and Plant Health Care	General Plant Pathology (11:770:301)	Cook College	5	A,L
6/19/01	Disease Management in Christmas Trees	Certified Tree Expert Training Program	Monmouth Co.	2	N
7/26/01	Turf Diagnostic Clinic	North Jersey Christmas Tree Growers Meeting	Hunterdon Co.	5	C
9/19/01	Key Pests of Ericaceous Plants	Home Horticulture In-service	Cook College	5	H
10/18/01	Identification and Control of Ornamental Diseases	Tappan Zee Rhododendron Society	Rockland Co.	7	H
10/18/01	Reducing Turf Disease Through Culture	Emergency Pesticide Recertification Short Course	Cook College	2	A,T,L
10/25/01	Plant Pathology and Disease Diagnostic Concepts	Emergency Pesticide Recertification Short Course	Cook College	4	A,T,L
10/29/01	Anthraxnose	Master Gardener Training	Somerset Co.	3	H
		Golf Course Superintendents Association of New Jersey	Somerset Co.	2	T
		Class "C" Training Program	Somerset Co.	2	T
10/30/01	Plant Pathology and Disease Diagnostic Concepts	Master Gardener Training	Union Co.	3	H
11/1/01	Plant Pathology and Disease Diagnostic Concepts	Master Gardener Training	Mercer Co.	3	H
11/2/01	Diagnosing Plant Problems	Master Gardener Training	Middlesex Co.	3	H
12/11/01	Troubleshooting Turf Problems	New Jersey Turf Expo	Atlantic Co.	2	I,L,T
12/19/01	Diagnosing Plant Problems	Master Gardener Training	Essex Co.	3	H
10-12/01	Principles of Pest Control on the Golf Course(10 Lectures)	Professional Golf Turf Management School	Cook College	20	T
10-12/01	Diseases of Turfgrass(10 Lectures)	Professional Golf Turf Management School	Cook College	20	T
10-12/01	Diseases of Ornamentals(10 Lectures)	Professional Golf Turf Management School	Cook College	20	T
10-12/01	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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