

RUTGERS COOPERATIVE EXTENSION

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NEW JERSEY AGRICULTURAL EXPERIMENT STATION

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**Rutgers Plant Diagnostic Laboratory  
and  
Nematode Detection Service**



**2000 Annual Report**

THE STATE UNIVERSITY OF NEW JERSEY  
**RUTGERS**

# Rutgers Plant Diagnostic Laboratory and Nematode Detection Service 2000 Annual Report

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 12,614 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 2000, the laboratory's ninth 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 Helsel, 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 1993. 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 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 attended Clemson for special training in nematode detection this winter.

Several students were employed on a part time basis in 2000. Ms. Clare Liptak, Resource Center Home Horticulturalist, assists the laboratory with marketing.

The laboratory benefits from the assistance of faculty in the Departments of Entomology, Plant Pathology, and Plant Science. In the Department of Plant Pathology, Dr. Ann B. Gould (Laboratory Faculty Coordinator) and Dr. Bruce B. Clarke have devoted hundreds of hours to laboratory business from the inception of the diagnostic laboratory concept through its eventual set-up and operation. Additional faculty and staff in this department who have provided substantial assistance during 2000 include: Dr. James White, mycology; Dr. Donald Kobayashi, phytobacteriology; Dr. Steve Johnston, vegetable pathology; Dr. Brad Hillman, virology; and Dr. Marshall Bergen for general assistance. Dr. John Meade, Dr. Richard Ilnicki, and Dr. Steve Hart of Plant Science were invaluable assistants in weed identification and diagnosis of herbicide injury. Dr. George Wulster of Plant Science also goes above and beyond with his assistance on problems of horticultural crops. Our sincere gratitude goes to Ms. Ethel M. Dutky of the University of Maryland Plant Diagnostic Laboratory. Her advice and assistance has been instrumental in the set-up and operation of the RPDL-NDS.

We would also like to thank the other members of the RCE Resource Center for their support and assistance. Mr. Mike Green, Mr. Brian Parish, and Ms. Holly Kennington provide essential services that we cannot do without.

## 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

### Diagnostics

During 2000, the RPDL-NDS examined 2184 specimens submitted for diagnosis, identification, or nematode assay (Table 1). Compared to 1999 levels, this represents a 33% increase in sample submissions. The increase in sample submissions is largely due to the addition of nematode assays from Rutgers Fruit Integrated Pest Management Program. As expected, the majority of samples were submitted during the summer months and diminished in the fall and winter. The Fruit IPM program samples came between October and December.

The breakdown of specimens submitted to the RPDL-NDS for diagnosis, identification, or nematode assay in 2000 is as follows; 61% were plants for disease and insect pest diagnosis, 24% were nematode assays, and 15% were insect, plant, and fungus identifications (Table 2).

Table 1. RPDL-NDS Total Sample Submissions by Month – 1996 to 2000.

Month	1996	1997	1998	1999	2000
January	27	27	33	16	41
February	21	25	26	33	37
March	85	57	56	73	118
April	76	143	132	100	122
May	101	139	174	210	193
June	243	235	260	242	282
July	351	252	274	373	298
August	213	203	251	245	362
September	159	182	178	177	207
October	91	102	123	99	246
November	47	22	55	73	169
December	34	30	36	39	109
<b>Total:</b>	<b>1448</b>	<b>1417</b>	<b>1598</b>	<b>1680</b>	<b>2184</b>

Table 2. RPDL-NDS Sample Submission by Sample Type – 2000.

Sample Type	Samples	Percent of Total
Plant	1326	61%
Nematode	526	24%
Identification	206	15%
<b>Total</b>	<b>2184</b>	<b>100%</b>

In 2000, 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.

Whereas samples from research programs represent a relatively small percentage of the total number of plant and soil samples received, they are an extremely important component. Research samples allow the diagnosticians to cooperate with University faculty on problems often of great importance to the State of New Jersey. The problems associated with these samples are challenging and occasionally lead to the diagnosis of a new disease.

Turfgrass and ornamentals may represent the largest agricultural commodities in New Jersey. In support of

**Table 3. RPD-L-NDS Sample Submissions by Origin – 2000.**

Sample Origin	Plant Samples	Percent of Total	Nematode Samples	Percent of Total	ID Samples	Percent of Total
Commercial	1037	78%	521	99%	123	37%
Residential	240	18%	1	0.5%	206	62%
RU Research	49	4%	4	0.5%	3	1%
<b>Total:</b>	<b>1326</b>	<b>100%</b>	<b>526</b>	<b>100%</b>	<b>332</b>	<b>100%</b>

**Table 4. RPD-L-NDS Sample Submissions by Crop Category – 2000.**

Crop	Plant Samples	Percent of Total	Nematode Samples	Percent of Total
Turf	589	44%	141	27%
Ornamentals	660	50%	9	1.5%
Field Crops	8	1%	1	0.5%
Vegetable	44	3%	21	4%
Fruit	25	2%	354	67%
<b>Total:</b>	<b>1326</b>	<b>100%</b>	<b>526</b>	<b>100%</b>

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. 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 are also increasing. Special thanks to the IPM agents in vegetable, fruit, and field crops 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

**Table 5. RPDL-NDS Sample Submissions by County – 1996 to 2000.**

In-State	1996	1997	1998	1999	2000
Atlantic	58	64	88	96	228
Bergen	73	85	76	82	103
Burlington	107	132	72	88	98
Camden	79	51	63	77	79
Cape May	18	26	57	34	47
Cumberland	10	17	23	38	54
Essex	21	24	24	30	31
Gloucester	41	31	23	27	124
Hudson	1	16	9	5	13
Hunterdon	23	29	28	43	58
Mercer	65	28	49	52	104
Middlesex	134	158	145	132	194
Monmouth	58	87	104	105	147
Morris	95	60	96	128	166
Ocean	63	37	40	59	61
Passaic	72	70	55	43	7
Salem	21	6	22	21	30
Somerset	54	91	150	89	118
Sussex	17	13	10	12	30
Union	27	63	83	57	73
Warren	30	30	26	34	41
RJ Research	99	33	66	72	16
<b>In-State Total:</b>	<b>1165</b>	<b>1151</b>	<b>1309</b>	<b>1324</b>	<b>1822</b>
<b>Out-of-State:</b>	<b>283</b>	<b>265</b>	<b>289</b>	<b>356</b>	<b>362</b>
<b>Total:</b>	<b>1448</b>	<b>1416</b>	<b>1598</b>	<b>1680</b>	<b>2184</b>

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 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 RPD-L-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. Fifty three 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 RPD-L-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 RPD-L-NDS for diagnosis or identification, 32.5% 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 22.5% of the laboratory diagnosis. Insect pest damage was diagnosed on 6% of the submissions. Samples submitted for identification include 7% arthropods, 5.5% fungus, and 2.5% plant and weed. 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

**Table 6. Plant Sample Submissions by Diagnosis – 2000.**

Diagnosis	Number of Samples	Percent of Total
Disease (biotic)	711	32.5%
Disease (abiotic)	485	22.5%
Insect Pest	130	6%
Nematode	526	24%
Arthropod ID	161	7%
Fungus ID	118	5.5%
Plant ID	53	2.5%
<b>Total:</b>	<b>2184</b>	<b>100%</b>

Table 7. RPDL-NDS Sample Response Times – 2000.

Response Time	Number of Samples	Percent of Total
0 to 3 days	1904	87%
4 to 6 days	179	8%
7 to 10 days	78	3%
11 to 21 days	18	1%
>21 days	5	1%
<b>Total:</b>	<b>2184</b>	<b>100%</b>

needs. Their cooperation has been invaluable in increasing the awareness of the laboratory to potential clients with insects that need identification. Fungal identification is also a growth area for the laboratory. Indoor molds received much publicity in 2000. Mold infested houses were featured on the television shows "Nightline" and "20/20." These features sent worried clients to the laboratory for assistance. Local health departments responding to flood damage from hurricane Floyd also brought mold samples to the laboratory in 2000. The growth rate for this sample type was remarkable.

In 2000, a laboratory response was prepared in less than three days for most (87%) of the samples submitted (Table 7), and 94% 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 2000, Mr. Buckley 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 five courses, Diseases of Turf, Diseases and Insect Pests of Ornamental Plants, Insect Pests in Fine Turf, Principles of Pest Management on the Golf Course, and Weed Identification 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 50 hours of contact time. Ms. Clare Liptak also spent countless hours assisting Mr. Buckley at evaluating weed collections for this course. In the fall, Ms. Sabrina Tirpak assumed responsibility for teaching a laboratory practicum in the Turf School. The teaching efforts by the PDL-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 2000. These courses included the Professional Grounds Maintenance short course; the Golf Turf Management School; Three Week Preparatory Course; the Home Gardener's School; Landscape Integrated Pest Management: An Intelligent Approach; and the Introduction to Golf Turf Management Short Course.

Mr. Buckley served as the course coordinator for the Pest Management in Landscape Turf Short Course. This was the seventh 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 second time he coordinated that short course. Mr. Buckley participated in the planning and coordination of the Advanced Golf Turf Management Seminar for the fifth time in 2000.

Mr. Buckley was an invited speaker in several Rutgers Cooperative Extension programs. The following programs were included: the South Jersey Christmas Tree Growers Twilight Meeting in Gloucester County; Master Gardener Hotline Training; and Westfield's IPM Training in Union County. Lectures in support of the Passaic, Monmouth, Gloucester, Ocean, Somerset/Hunterdon, and Essex County Master Gardener Programs were also given.

Mr. Buckley also earned income for the RPDL-NDS as an invited speaker for New Jersey Turf Expo; Reed and Perrine - Turf Care Seminar; Certified Tree Experts Training; and the Lawn Doctor National Convention.

Mr. Buckley participated in several out-of-state and regional programs in 2000. These programs include: the Landscape Contractors Association of MD-DC-VA Winter Workshop; the Nassau/Suffolk Landscape Gardeners Association 32<sup>nd</sup> Annual Professional Turf & Plant Conference; University of Delaware Turf Diagnostic Clinic; the Delaware Ornamentals and Turf Workshop; Vermont Greenscape Conference; and the Penn State 2000 Winter Grounds Seminar.

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

**Extension Publications.** During 2000, the RPDL-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.

One extension factsheet was co-authored in 2000. Several other extension factsheets were also written during the year and are currently under review.

Buckley, R.J., and Gould, A.B. 2000. An Integrated Approach to the Control of Canker Diseases in Woody Ornamentals. 4. Botryosphaeria Canker. Rutgers Cooperative Extension Publication FS401.

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

## Marketing

The RPDL-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 2000 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. The brochure is currently being reviewed and revised. Once again, special thanks goes to the Department of Professional Continuing Professional Education, who placed a copy of the advertising brochure in each short course educational packet that was distributed. Ms. Tirpak developed a 3"x5" card that advertised the laboratory move. Three thousand six hundred of these cards were distributed by mail and by hand at trade shows and educational programs during the winter of 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 RPD, NDS and how to access them, and is available on loan to anyone who wishes to advertise the laboratory services. Ms. 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 2001.

## 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 2000 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 \$70,500 was generated from diagnostic services and nematode assays during 2000, representing a 9% increase in income over 1999.

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,

Table 8. RPD, NDS No Charge Requests – 2000.

Client Category	Number of Samples
RCE County Faculty/Program Associates	86
RCE Specialists	28
Rutgers Research Programs (not RCE)	18
Rutgers Non-Research Faculty/Staff	31
Direct Mail/Walk-ins	12
Other Government Agencies/University	7
<b>Total:</b>	<b>182</b>

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 182 "no charge" samples in 2000 (Table 8). These samples accounted for 8% 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 2000. Operating expenses decreased in 2000 due to the full-

time staffing additions. However, capitol expenses required for the move to the new laboratory facility required substantial laboratory resources. 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 Expenditures in 2000 (excluding full-time salaries).

Salaries & Benefits: (student help)	\$7,625.18
Supplies and Services: Diagnostic supplies Printing/advertising References/publications Equipment maintenance Office supplies Photographic services	\$7,488.73
Capital Equipment: (new laboratory)	<\$50,050.86>
Communications: Telephone/FAX Postage	\$1,978.40
Travel: Travel to give paid talks Travel to professional meetings Marketing expenses	\$1,974.75
Actual Expenses:	<\$69,117.92>
<b>Actual Operating Costs:</b>	<b>\$19,067.06</b>

Table 11. RPDL-NDS Estimated Expenditures for 2001.

Seasonal labor:	\$12,500
General operating:	\$12,500
One-time equipment cost:	\$ 5,000
Marketing:	\$ 2,500
Educational development and travel:	\$ 2,500
<b>Total Estimated Expenditures 2001:</b>	<b>\$ 35,000</b>

Table 10. RPDL-NDS Income in 2000.

Sample fees:	\$62,065.00
Unpaid sample fees:	\$3,165.00
Lecture fees:	
Professional Golf Turf School	\$17,850.00
O.C.P.E. Short Course Coordinator	\$2,600.00
O.C.P.E. Short Course Instructor	\$2,050.00
Other	\$2,100.00
Value of no-charge samples:	<\$3,640.00>
Fruit IPM discount:	<\$1,650.00>
<b>Total potential revenue:</b>	<b>\$95,120.00</b>
<b>Actual Total Income:</b>	<b>\$89,830.00</b>

Table 12. RPDL-NDS Estimated Income for 2001<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 2001:</b>	<b>\$132,500</b>

<sup>1</sup> based on 2500 samples submitted in 2001.

# Appendix II. Complete Listing of Lectures Presented During 2000.

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

Date	Title of Presentation	Audience	Location	Number of handouts	Type of participants <sup>1</sup>
1-3/00	Diseases of Turfgrass (10 Lectures)	Professional Golf Turf Management School	Cook College	20	T
1-3/00	Diseases of Ornamentals(10 Lectures)	Professional Golf Turf Management School	Cook College	20	T
1-3/00	Principles of Pest Management on the Golf Course (10 Lectures)	Professional Golf Turf Management School	Cook College	20	T
1-3/00	Weed Identification(10 Lectures)	Professional Golf Turf Management School	Cook College	20	T
1-3/00	Insects of Turfgrass(10 Lectures)	Professional Golf Turf Management School	Cook College	20	T
1/6/00	Diseases of Turfgrass	Professional Grounds Maintenance	Cook College	5	L,T
1/10/00	Diagnosing Lawn Problems	Lawn Doctor National Conference	Atlantic Co.	1	L,T
1/10/00	Abiotic Disorders of Trees and Shrubs	Lawn Doctor National Conference	Atlantic Co.	1	L,T
1/13/00	Diseases of Ornamental Plants	Professional Grounds Maintenance	Cook College	1	L,T
1/20/00	Troubleshooting Turf Disorders	Advanced Topics in Professional Grounds Maintenance: Turf Disease Short Course	Cook College	1	T,L
1/20/00	Selection and Use of Fungicides on Turfgrass	Advanced Topics in Professional Grounds Maintenance: Turf Disease Short Course	Cook College	4	T,L
1/21/00	Intro to Turf Diseases: Part 1	3 Week Turf School	Cook College	2	T
1/25/00	Turfgrass Insect Pests: ID, Monitoring, and Control	Landscape IPM Short Course	Cook College	3	T,L
1/27/00	Intro to Turf Diseases: Part 2	3 Week Turf School	Cook College	2	T
1/28/00	Intro to IPM and Insect Control	3 Week Turf School	Cook College	2	T
2/1/00	Turfgrass Insect Pests: ID, Monitoring, and Control	Landscape IPM Short Course	Cook College	3	T,L
2/3/00	Understanding White Grubs in Turfgrass	Reed and Perrine Turf Seminar	Monmouth Co.	2	I,T,L
2/16/00	Major Cankers of Shade Trees	Landscape Contractors Association of MD-DC-VA Winter Workshop	Bethesda, MD	6	I,T,L
2/17/00	Turf Insect Pests: White Grubs	Fine and Sports Turf(11:776:451)	Cook College	2	C
2/21/00	Turf Insect Pests: Weevils and Bugs	Fine and Sports Turf(11:776:451)	Cook College	2	C
2/22/00	Basic Turf Diseases; Pick Your Best Defense	Pest Management in Landscape Turf	Cook College	5	I,T,L
2/22/00	Insect Pests in Landscape Turf	Pest Management in Landscape Turf	Cook College	4	I,T,L
2/24/00	Turf Insect Pests: Moths	Fine and Sports Turf(11:776:451)	Cook College	2	C
2/29/00	Gray Leaf Spot Diagnostic Demonstration	Advanced Turf Management Symposium	Cook College	1	I,T
3/1/00	What's Up Doc? My Grass is Sick!	Nassau/Suffolk Landscape Gardeners Association 32 <sup>nd</sup> Annual Pro Turf and Plant Conference	Brightwaters, NY	2	T,L

<sup>1</sup>Audience Add: d: A=Arborist; C=College (Academic); G=Greenhouse; H=Residential Client; I= Industry; L=Landscape Professionals; N=Nursery Growers; T=Turfgrass Managers; X= Christmas Tree Growers.

# Appendix II. Complete Listing of Lectures Presented During 2000.

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

Date	Title of Presentation	Audience	Location	Number of handouts	Type of participants <sup>1</sup>
3/16/00	Diagnosing Plant Problems	Master Gardener Training	Passaic Co.	3	H
3/18/00	Diseases of Flowers and Herbaceous Ornamentals	Home Gardeners School	Cook College	1	H
4/4/00	Diagnosing Plant Problems	Master Gardener Training	Monmouth Co.	3	H
4/5/00	Diagnosing Plant Problems	Master Gardener Training	Gloucester Co.	3	H
4/11/00	Diagnosing Plant Problems	Master Gardener Training	Ocean Co.	3	H
4/27/00	Key Problems in New Jersey Landscapes	Topics in Ornamental Horticulture (00:000:000)	Cook College	1	C
5/1/00	Diagnosing Moisture Stress Problems on Trees	Master Gardener Hotline Training	Cook College	1	H
5/10/00	Tree Diseases and Plant Health Care	Certified Tree Expert Training Program	Monmouth Co.	5	A,L
6/20/00	Disease Management in Christmas Trees	South Jersey Christmas Tree Growers Meeting	Gloucester Co.	2	N
7/10/00	Cultural Control of Plant Diseases	Westfield IPM Seminar	Union, Co.	1	L,T
7/13/00	Turf Diagnostic Clinic	University of Delaware Cooperative Extension Training	Newark, De.	5	L,T
7/18/00	Disease Diagnostic Procedures	Plant Disease Clinic (16:765:536)	Cook College	1	C
10/5/00	Plant Pathology and Disease Diagnostic Concepts	Master Gardener Training	Somerset Co.	1	H
10/26/00	Nematodes as Plant Pathogens	Intro to Plant Pathology (16:765:000)	Cook College	5	C
10/27/00	What's a Plant Pathologist?	South Brunswick High School Career Exploration Program	Middlesex Co.	1	C
11/9/00	Troubleshooting Lawn Problems	Delaware Ornamentals and Turfgrass Workshop	Hockessin, De	2	I,L,T
11/28/00	Troubleshooting Lawn Problems	Vermont Greenscape Assoc. 8 <sup>th</sup> Annual Turfgrass Conference	West Lebanon, NH	2	I,L,T
12/7/00	Basic Turf Diseases: Pick Your Defense	Penn State Grounds Manager's Seminar	Warrington, Pa.	3	L,T
12/12/00	What's Buggin' You? Identification of Key Pests in the Landscape	New Jersey Turf Expo	Atlantic Co.	2	I,L,T
12/14/00	Diagnosing Sports Field Problems	New Jersey Turf Expo	Atlantic Co.	2	I,L,T
12/19/00	Introduction to Turf Disease	Intro to Golf Course Turf Maintenance	Cook College	5	T
12/20/00	Plant Pest Diagnosis	Master Gardener Training	Essex Co.	1	H
10-12/00	Weed Identification (10 Lectures)	Professional Golf Turf Management School	Cook College	20	T
10-12/00	Principles of Pest Control on the Golf Course(10 Lectures)	Professional Golf Turf Management School	Cook College	20	T
10-12/00	Diseases of Turfgrass(10 Lectures)	Professional Golf Turf Management School	Cook College	20	T
10-12/00	Diseases of Ornamentals(10 Lectures)	Professional Golf Turf Management School	Cook College	20	T
10-12/00	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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N.J. AGRICULTURAL EXPERIMENT STATION  
RUTGERS, THE STATE UNIVERSITY OF NEW JERSEY  
NEW BRUNSWICK**

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