

Spotlight on Diagnosis

An Effective and Efficient System for Collecting Fees for Insect and Plant Disease Diagnosis

GEORGE W. HUDLER and JULIET E. CARROLL, Department of Plant Pathology, and CAROLYN KLASS, Department of Entomology, Cornell University, Ithaca, NY

Cornell University's Insect and Plant Disease Diagnostic Laboratory, established in 1971, serves noncommercial as well as commercial interests in New York State. The laboratory is a joint effort of the Department of Plant Pathology and the Department of Entomology and is supported by the Cooperative Extension Service and the College of Agriculture and Life Sciences. One plant pathologist, one entomologist, and one half-time secretary staff the laboratory throughout the year. In addition, two student assistants are employed full-time during the summer and part-time during the school year. The annual cost to the college (including salaries, fringe benefits, and operating expenses) to provide diagnostic services via the laboratory is approximately \$70,000.

Services performed by laboratory staff include insect and plant disease identification. Analysis of soil for chemical or physical properties, extraction and identification of nematodes from soil, plant identification, and analysis of foliage for nutrient content are services performed in other laboratories on the campus (each for a fee) and are not duplicated in the diagnostic laboratory. If diagnosticians suspect that such analyses will aid diagnosis, they forward that recommendation to the client.

In 1983, Cooperative Extension Service administrators at the college requested that a means for charging clients for services provided by the laboratory be developed and implemented. The forthcoming system, now in its fifth year of operation, has been integrated with relative ease and effectiveness into ongoing Cooperative Extension activities at all levels of the organization. We share it here with the knowledge that many other state Cooperative Extension services are also grappling with ways to recoup some of their expenses and are pondering implementation of fees for diagnostic services.

The system. Every specimen that comes to the Laboratory must be accompanied by a prepaid Diagnostic Checklist (Fig. 1). The checklists are sold by the laboratory, and most are purchased by county Cooperative Extension associations for redistribution (via sale or giveaway) to their clients. "Walk-in" clients purchase checklists directly from the laboratory. New agricultural agents receive 10 clearly marked "free" checklists to be used however they see fit but hopefully for their own education.

We have a two-tiered fee system. The checklist used primarily for noncommercial clients (i.e., homeowners, teachers, town/city government) costs \$2.00 and has a white top sheet. The checklist for commercial clients (e.g., farmers, Christmas tree growers, turf/landscape managers, and residential and structural pest control officers) sells for \$6.00 and has a pink top sheet. Justification for the difference in the fees is based on the premise that specimens from commercial concerns often represent significantly greater threats in terms of potential monetary loss and/or legal recourse and therefore require more diagnostician time and more elaborate tests for precise diagnosis.

The checklist is a four-part, carbon-paper form. The bottom

sheet, marked SENDER: RETAIN THIS COPY UNTIL DIAGNOSIS IS RECEIVED, is to be kept as a record that a sample was sent to the laboratory. When diagnosis is complete, the response is typed on the checklist and the copy marked DIAGNOSTICIAN is retained by the laboratory. The original, marked GROWER/HOMEOWNER, and the copy marked AGENT/SPECIALIST are returned to the county agent, who retains the latter copy in the county office and gives the original to the client.

If a sample is sent directly to the laboratory without a checklist, either we send a postcard informing the client that the sample has been received, with diagnosis in progress, and that there is a fee for diagnostic services or we send notification of the fee with the diagnosis. When the fee is received (over 95% send the money), the diagnosis and other appropriate information about the sample are entered on a checklist. The copies of the checklist are then distributed as described above.

If, for any reason, a checklist is filled out improperly or is otherwise rendered unusable, it is replaced free of charge. We simply ask that the old checklist be sent to us.

Fig. 1. The Cornell University Insect and Plant Disease Diagnostic Checklist. The top sheet (original) is pink or white, and the copies are yellow, blue, and green.

PLEASE PRINT CLEARLY—INSTRUCTIONS ARE PRINTED ON BACK OF LAST PAGE

DIAGNOSTIC CHECKLIST SUPPLEMENT

Checklist Number _____

GREENHOUSE, GLASSHOUSE, POTTED CROPS		
SYMPTOMS <input type="checkbox"/> whole plant <input type="checkbox"/> a few leaves <input type="checkbox"/> a few roots <input type="checkbox"/> all symptoms on an isolated section of plant	LOCATION OF PLANTS IN GREENHOUSE <input type="checkbox"/> side walls ft. away <input type="checkbox"/> doors ft. away <input type="checkbox"/> heat pipes ft. away <input type="checkbox"/> fans/pads ft. away	
SOIL/POTTING MEDIUM <input type="checkbox"/> 1/3 top 1/3 sand (peat) 1/3 peat moss <input type="checkbox"/> Cornell Peat Lite Mix <input type="checkbox"/> 100% peat moss <input type="checkbox"/> _____ <input type="checkbox"/> _____	PLANTS GROWING IN <input type="checkbox"/> raised bench <input type="checkbox"/> ground bed <input type="checkbox"/> _____ in deep <input type="checkbox"/> pots <input type="checkbox"/> plastic <input type="checkbox"/> clay <input type="checkbox"/> _____ size	STERILIZATION <input type="checkbox"/> steam <input type="checkbox"/> chemical (describe) _____ Has a recent soil analysis been done? Results? _____
GROWING CONDITIONS		
Day temp _____ Fertilizers _____		Watering (Methods, drainage, frequency) _____
Night temp _____		
Has CO ₂ been used? _____		
TURFGRASS		
1. Type of grass <input type="checkbox"/> Kentucky Bluegrass <input type="checkbox"/> Annual Ryegrass <input type="checkbox"/> Perennial Ryegrass <input type="checkbox"/> Fescue <input type="checkbox"/> Variety _____	2. Use <input type="checkbox"/> Home Lawn <input type="checkbox"/> Commercial Lawn <input type="checkbox"/> Putting Green <input type="checkbox"/> Golf Course Fairway <input type="checkbox"/> Athletic Field	4. Mowing Height _____ 5. Mowing Frequency _____ 6. Amount of Irrigation _____ 7. pH of Soil _____
3. Age of Stand _____		
Recent Applications/Treatments rate and/or date of fertilizer, pesticides, lime, verticillium, overseeding, topdressing, etc. _____		
Problem Distribution and Appearance <input type="checkbox"/> Affects entire stand <input type="checkbox"/> Turf is generally thinned and weak <input type="checkbox"/> Appears as circular patches, _____ across <input type="checkbox"/> Appears as rings with healthy grass inside <input type="checkbox"/> Occurs in irregular patches, not circular <input type="checkbox"/> Occurs in large streaks <input type="checkbox"/> Exhibits a zone of stimulation and/or mushrooms <input type="checkbox"/> Appears just in _____ areas (sloping, sunny, shady, wet, dry, etc.)		
<input type="checkbox"/> Plants will <input type="checkbox"/> Turf is yellowed <input type="checkbox"/> Turf can be pulled up easily <input type="checkbox"/> Leaves exhibit spots <input type="checkbox"/> Leaves have tip die-back <input type="checkbox"/> Leaves bear powdery or fungal substance, color is _____ <input type="checkbox"/> Leaves are shredded <input type="checkbox"/> Roots are rotted, brown or black		

GROWER /HOMEOWNER COPY

Fig. 2. The Diagnostic Checklist Supplement is designed to accompany a Diagnostic Checklist and samples of diseased greenhouse crops or turfgrass.

Initially, there was some concern that the one-page checklist did not provide opportunity for extended descriptions of symptoms that might aid diagnosis. In such cases, senders were encouraged to include additional details in a separate letter. Greenhouse and turf problems were judged to be sufficiently unique that a Diagnostic Checklist Supplement (Fig. 2) was developed. Supplements are distributed at no charge, and their use greatly facilitates diagnosis of diseases and cultural problems.

Some observations. The average number of samples received annually declined from a 6-year average of 3,885 under the no-fee system to 2,522, 2,598, 2,702, 2,752, and 3,005 during 1983–1987, respectively. Numbers of both insect and plant

disease samples were reduced by similar percentages.

Although the onset of the fee system apparently has caused fewer samples to be submitted, the quality of samples has improved markedly. Specimens obviously have been chosen with more care and packaged to reach the laboratory in the best condition possible.

Counties vary in the way they pass the fee for diagnosis on to clients. Some counties ignore the two-tiered structure completely and charge all clients a flat fee of between \$3.00 and \$4.00. In such cases, “profits” realized by charging more than checklists cost are used to help defray postage fees for shipment of specimens. Other counties appreciate the flexibility inherent in the system and utilize it as such. And, some submit so few samples in a year’s time that they simply absorb the cost of checklists in their own budgets and charge clients nothing.

Income from sale and subsequent processing of diagnostic checklists is deposited in a special college account earmarked for the laboratory. The money is used at the discretion of the laboratory staff to pay student assistants and to purchase routine laboratory supplies and books. About 80% of the funds collected each year is used in this way; the remainder is accumulated over several years to enable purchase of more expensive items, such as computer hardware and microscopes.

Mechanically, we believe the system works very well. Each person involved in the transaction of getting a specimen from the field to the laboratory ends up with a copy of the checklist with the identifying number that allows the progress of the specimen to be traced. The actual exchange of cash is limited, for the most part, to that occurring at the county office and has not been an undue burden. There was some objection from county agents and to a lesser extent from clients when the fee system for diagnostic services was first announced. That virtually disappeared within a month or two, however. Some regular users of the laboratory’s services confided that they were surprised the services had been provided at no charge for as long as they had. Agents are particularly pleased to be kept abreast of activities in their counties via receipt of the county copy of the checklist no matter who submits the specimen. On many occasions, this communication has allowed agents to improve awareness of the Cooperative Extension Service in the counties by following up (via personal visits, phone calls, mailings, etc.) on samples sent by residents directly to the college and, thus, the laboratory.

In the development of any system of the sort described here, planning sessions invariably include discussion of a number of “what if” scenarios. Most of those have been worked out in the 5 years that our system has been operating, and we would be pleased to respond to more specific questions from those trying to cope with the issue of fees for diagnostic services.