restrictions, concern over mercury use led to national restriction in Canada in 1993, with sales allowed until December 1997, and use until December 2000.

An extensive survey was conducted on the greens of seven golf courses from various areas of Alberta with a varied history of mercury use. Clipping samples were obtained following mowing and soil samples taken from the greens, collars and surrounds. Interestingly, there was great concern that these levels would be highly leachable, thereby requiring the green to be considered hazardous waste should it ever be renovated and removed. This did not turn out to be the case, as mercury levels found in leachate were low.

However, soil samples revealed that chronic (7 to 40+ years) mercury use resulted in levels 1 to 50 times higher than the acceptable regulatory limit in Canada (6.6mg/kg). *In fact, on one course, two greens which had not received mercury in the last 15 years still had 5 times the regulatory limit for mercury (23 to 33 mg/kg) in the top 2" and over 6 times more at the 4" to 6" depth.* In general, the older the green, the longer the mercury use, the higher the levels of mercury found in the soil. This was not the case for clippings, where a green that received only 1 mercury application had the same (below regulatory limit) amount of mercury as the greens that received many years of applications.

The authors of the study suggest that while the soils and clippings are not hazardous waste, they still must handled and disposed of in a way that reduces the risk for contaminating other soils and water bodies. This study is likely to have a substantial impact on the golf turf industry over the next few years. This could include how reduced soil mercury levels may explain higher incidence of pests such as moss, and how we might deal with clippings and soils from contaminate greens.

From: Byrtus, G. 1998. An Assessment of Mercurial Fungicide Residues in Golf Course Soils and Clippings. 1997 Annual Report from the Prairie Turfgrass Research Center, Olds, Alberta.

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Plant Disease Diagnostic Clinic

The Plant Disease Diagnostic Clinic at Cornell provides golf courses with diagnostic services. The number of turfgrass samples processed through the clinic has increased steadily over the past few years. We believe the clinic can provide golf courses with the fast, accurate, professional services they need.

The fee structure varies depending on the type of diagnoses required. Identification of pathogens of fungal and bacterial diseases is performed for a $25.00 fee. This service will provide the client with the causal agent of the disease and any control recommendations that are available. Nematode identification services are available for a $40.00 fee.

When submitting samples for analysis to the clinic, provide as much information as possible to help ensure an accurate diagnosis of the problem. Forms for submitting samples are available from the clinic.

The turfgrass sample should contain all parts of the grass. Using a cup cutter works well. Wrap the sample in a paper bag and mail it in a sturdy box as quickly as possible. If the sample can not be mailed immediately, keep it refrigerated or out of direct sunlight. Try to collect the sample prior to the application of any pesticides. Once pesticides have been applied it may be difficult to obtain an accurate diagnosis. It is helpful if the sample comes from an area that has early symptoms of the problem. Dead areas often contain a number of secondary organisms that may hinder the detection of the primary pathogen.

The collection of samples for nematode analyses varies slightly. It helps to send in an sample of healthy turf as well as problem turf to be used in the determination of the primary pathogen. The best time of year for nematode analyses is in the spring, about a month after the grass greens up, and in mid-autumn. A minimum of 6 subsamples, approximately 1" in diameter, should be collected from an area that is a 1/2 acre in size. The subsamples should be collected randomly throughout the area. The samples should be collected at a depth of around 4". The subsamples should be mixed together thoroughly. Approximately a pint of soil should be transferred to a plastic bag and shipped as soon as possible. Again, if time doesn't permit immediate shipping, keep the sample refrigerated.

Call the clinic with any questions prior to submitting a sample. The clinic strives to get you fast, accurate results and prior clarification of questions enables us to get your results on a more timely basis. Contact: Plant Disease Diagnostic Clinic, 334 Plant Science Bldg., Cornell University, Ithaca, NY 14853; (607) 255-7850.

KAREN SIROIS
CORNELL UNIVERSITY TURFGRASS TEAM

The Plant Disease Diagnostic Clinic can help golf courses identify pathogens of fungal and bacterial diseases and any control recommendations, plus nematode identification services.