

GTI HILITES

# Necrotic Ring Spot of Turfgrass

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The patch diseases of turfgrass are among the newer diseases causing concern to the turfgrass industry throughout North America. In the early 1980's, one of these diseases, necrotic ring spot was separated from the Fusarium Blight Complex, which was a troublesome and highly controversial disease and particularly damaging to Kentucky bluegrass. Although there were reports concerning necrotic ring spot disease from bordering American States, very little was known about their incidence and distribution in Ontario. The overall goal of this research was the study of the incidence, impact and management of necrotic ring spot in turfgrasses of Southern Ontario.

## Two major objectives

During the first year of a three year study (1991 -1992), there were two major objectives, the first of which was to confirm the causal agent of necrotic ring spot as *Leptosphaeria korrae* in Ontario. This objective was satisfied when we were able to isolate the fungus in pure culture, and then induce sexual spore production, which defined the pathogen conclusively as *Leptosphaeria korrae*, the causal agent of necrotic ring spot. Aside from reports

from British Columbia, this was the first large-scale confirmed report of the disease in Canada.

As part of resolving this objective Prof. Hsiang and Mr. O'Gorman developed laboratory techniques for the isolation and culture of the fungus. These procedures now serve as guides for diagnosis and confirmation of the disease in turfgrass.

The second major objective was to determine the incidence of necrotic ring spot in Ontario through a written survey and field isolations. This objective was conducted during the summers of 1992 and 1993. A total of 56 responses to necrotic ring spot had been received by the fall of 1993: 4% from home owners, 77% from lawn care companies, 14% from golf clubs, and 5% from sod farms. The reports came from 17 different counties throughout southern Ontario from Windsor to Ottawa (Fig. 1) When the respondents were asked (1) did they consider the Fusarium Patch disease a serious problem, and (2) is necrotic ring spot a serious problem, 97% considered Fusarium to be a serious problem and 74% indicated necrotic ring spot to be a serious problem.

## A method for quick identification

In the second year a project was undertaken to develop a method for quick identification of the necrotic ring spot fungus. Previous procedures could take eight

weeks or longer. Hsiang and O'Gorman devised a biotechnological technique which quickly and accurately fingerprints the necrotic ring spot fungus from turfgrass roots in less than two working days.

## Managing the disease

Research currently under way is aimed at investigating biological and chemical methods to manage necrotic ring spot disease. Although there are no fungicides registered for use on necrotic ring spot in Canada, fungicide applications are often made because the disease is unsightly and can be devastating. The problem is that none of our fungicides currently registered and available for use in the control of turfgrass diseases is known to satisfactorily control necrotic ring spot - not to mention the problem of non-registered use of fungicide.

There is thought to be differences in susceptibility of Kentucky bluegrass cultivars to necrotic ring spot disease. In August of 1992, 16 cultivars of Kentucky bluegrass were obtained from seed companies with the request that these cultivars be dominant or projected to be important in the near future. These cultivars were seeded in Sept. 1992, and in June, 1993, they were inoculated with the necrotic ring spot fungus. Data from this inoculation will be collected during 1994 and 1995.



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## A Pest Profile on Necrotic Ring Spot

Prof. Tom Hsiang

**PATHOGEN:** *Leptosphaeria korrae*

**HOST PLANTS:** Kentucky bluegrass and possibly fine fescue are particularly susceptible.

**SEASON of OCCURRENCE:** Pathogen is active in late spring and early autumn, but summer heat may intensify the symptoms.

**CONDITION FAVOURING DISEASE:** Cool temperatures (10 to 20 C) and moist conditions. It is most common on sodded turf, two or more years after establishment, particularly on sites where there is very little top soil and with a hard pan of clay underneath.

**SYMPTOMS:** Patches develop 10 cm to one meter in diameter with ring or frog-eye symptoms, especially on recently sodded lawns. The turf in the patches have very little root hold. The centres of the dead patches are depressed or invaded by other grasses and weeds, and the patches may coalesce. On the plants, the outer leaves turn yellow and bleach out. Younger leaves turn red-purple before turning brown. Dark strands and masses of hyphae can be seen on root surfaces which blacken. Symptoms are most apparent when the fungus is active, but stress conditions such as summer drought will enhance symptom expression.

**LIFE CYCLE:** The fungus survives the winter on roots and lower crowns as mycelium. In the spring, spores or mycelium infect roots and may causes symptoms 12 to 18 months later. Summer heat and dryness decrease the activity of the pathogen, but symptoms from prior root damage may be enhanced by drought. In the fall, cool moist conditions allow the fungus to grow and infect more turf.

**CULTURAL CONTROL:** Fertilize to promote growth during early spring and fall, but reduce succulent growth during the summer. Spread nitrogen applications over several times during the growing season. Use deep, infrequent watering to promote deep rooting, along with light syringing in the summer to reduce heat stress. Thatch should be controlled to promote plant vigour. Encourage deep rooting by increasing the mowing height. Overseed or resod patches with resistant turfgrasses.

**CHEMICAL CONTROL:** No chemicals are registered for necrotic ring spot control in Canada. Consult provincial publications for recommendations.

**RESISTANT TURFGRASSES:** From the results of several American cultivar resistance tests, these Kentucky bluegrass cultivars did not show susceptibility: Adelphi, Classic and Nugget; whereas Glade, Ram 1, and Sydsport were found to be susceptible to necrotic ring spot.

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