

MODELING SUMMER PATCH

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Summer patch is a turfgrass disease caused by the root-infecting fungus, Phialophora graminicola. Initially, summer patch appears as a sunken area of dead turf, several inches in diameter. During subsequent years, the patch expands to form a 6-18 inch ring of dead turf encircling a tuft of healthy turf. The disease is most damaging to annual bluegrass (Poa annua L.), Kentucky bluegrass (Poa pratensis L.), and fine-textured fescues (Festuca spp.). Symptoms are usually evident only during periods of high temperatures from June to September, although patches seem to persist through cooler periods on lawns and roughs.

In 1983 and 1984, summer patch caused severe late-summer turf loss on annual bluegrass fairways on golf courses throughout the Midwest. These losses even occurred on golf courses where superintendents were using good fungicide programs for the control of diseases such as dollar spot, anthracnose, and brown patch. Generally, the disease is most severe under prolonged periods of heat stress and possibly drought. However, all areas are not equally affected by summer patch and there may be great variability in disease severity even between fairways on the same golf course.

We are developing a computer model that will predict when summer patch outbreaks will occur and how severe they will be. This model will be made available in a microprocessor for access and use on the golf course. The model should allow superintendents with large fungicide budgets to treat fairways just prior to a disease outbreak. It will allow superintendents with smaller budgets to inform their membership about an impending outbreak so the membership knows that the superintendent is aware of the outbreak even if no treatment is applied. It is not often the loss of turf that results in problems for superintendents. More often, superintendents encounter problems because the membership did not understand why the turf died, believing that it was the superintendent's fault, or because the membership felt that the superintendent was not aware of the problem and failed to do something about it. A model to forecast the occurrence of summer patch outbreaks should shift most of the responsibility from the superintendent to the greens committee, board, or membership.

In the summer of 1985, we began monitoring environmental factors on a golf course fairway to determine what combination of factors leads to summer patch outbreaks. Some of the variables that we are monitoring include soil moisture, temperature, and oxygen diffusion rate, and air temperature and relative humidity. This information will be used in the development of the prediction model and may lead to cultural practices that will reduce the occurrence or severity of summer patch. We are also inoculating plots with Phialophora graminicola at the Hancock Turfgrass Research Center to control and study some of the environmental factors which may be important in the development of summer patch. Curative and preventative fungicide and fertilizer trials were conducted on golf course fairways and homeowners' lawns this summer. Results of the trials will be available in the fall of 1985.