

# CHEMICAL LOG

## Summer Patch Control: Departure From Folklore

By J.M. Vargas Jr.

Annual bluegrass was believed to die from high temperatures for many years. Research has since shown that annual bluegrass actually dies from three major pests in warm weather: anthracnose, the black turfgrass atenioid grub and summer patch.

The most devastating and most difficult to control of these is summer patch, caused by *Magnaporthe poae*. It is also a serious disease of Kentucky bluegrass when grown in areas of the world that have very warm summers; i.e., where the nighttime temperatures remain above 70 degrees Fahrenheit for a month or more.

### Symptoms and Occurrence

The disease first appears in the warm weather of summer as yellow- to bronze-colored, irregular-shaped patches, ranging from 6 inches to 3 feet in diameter. Examination of the roots with a dissecting scope reveals dark-colored ectotrophic hyphae called "runner" hyphae.

Usually after a rainy period or heavy downpour, heavy or excess irrigation during the warm summer period will also bring on symptoms of the disease. Modeling studies have shown a direct correlation between moisture pushing the oxygen out of the soil and the development of symptoms. The other key factor for symptom development is having the soil temperature remain above 70 degrees F at a 2-inch depth for at least 48 hours.

Even though symptoms occur during the warm weather, the initial infection occurs in the spring of the year when the soil temperatures first reach 65 degrees F at a 2-inch depth. Only the outer cortical tissue of the root is infected at this time. *M. poae* remains in the cortical tissue causing little noticeable damage until the soil temperatures reach above 70 degrees F, and the rain or heavy irrigation regimes push the oxygen out of the soil. The lack of oxygen weakens the roots of the grass plant and allows the pathogen to invade the vas-

cular tissue of the plant, where it interferes with water and nutrient uptake and the movement of photosynthesis products from the foliage to the roots.

### Cultural Management

Managing summer patch with cultural practices requires a two-pronged approach. Maintaining adequate soil fertility, coupled with an adjustment of your irrigation schedule, will often result in adequate control.

**Fertility.** Good fertility starts with having adequate levels of all the nutrients present in the soil. Most of these can be applied based on soil tests. Nitrogen, of course, is the exception. Having adequate levels of nitrogen is not only important in managing summer patch, it is essential. Without adequate levels of nitrogen, even fungicide treatments will not be effective.

Research has clearly shown that to effectively manage summer patch, a half-pound of nitrogen per 1000 square feet every three weeks is required. The slow-release carriers like Turf Restore and IBDU have been more effective in managing summer patch than quick-release forms of nitrogen, like urea. In spite of "folklore" which suggests nitrogen should not be applied in the summer because it will only make the plant more susceptible to stress, research shows moderate levels of nitrogen to be essential in order to manage summer patch.

**Irrigation.** Light daily irrigation ranging in amounts from .1 to .4 inches (depending on the amount of supplemental rainfall, temperature and evapotranspiration) will help reduce the severity of summer patch. The most effective time to apply this irrigation water is mid to late afternoon. This allows time for the foliage to dry before entering the nighttime period. It also helps to cool the plant off during the warmest part of the day, to better allow it to survive the summer stress period.

This type of irrigation regime does not push the oxygen out of the soil, which will

bring on summer patch symptoms.

What about the old theory that light daily irrigation will result in the turfgrass plant having a short root system? Like many of the turf management practices commonly recommended, it is based on "folklore" rather than good scientific data. Rhizotron and other studies have shown that soil temperatures during the warm summer months determine the length of root growth. Also, remember that we are recommending *light* daily irrigation, not to be confused with *heavy* daily irrigation. Heavy irrigation will deplete the soil of oxygen, resulting in plants that will definitely have short root systems.

### Chemical Controls

For many years, trying to manage summer patch with fungicides proved to be erratic at best and futile the rest of the time. The key turned out to be timing.

The best fungicides for the management of summer patch are the sterol inhibitors; Bayleton and Rubigan, for example. But to be effective, they have to be applied before symptom development occurs.

Bayleton and Rubigan need to be applied as soon as the soil temperatures reach 65 degrees F, with a second application made 30 days later. In areas where summer lasts for more than three months, an additional application may have to be made 30 days later.

Once the disease symptoms are present, the benzimidazole fungicides, like Fungo 50 and Clearys 3336, managed the disease the best. However, some loss of turf is encountered when trying to manage summer patch curatively. A second application three weeks after is usually required with these fungicides. Remember, to be effective, these fungicides need to be drenched into the root zone.

Unless adequate levels of nitrogen are also applied, these fungicide treatments will not be effective. □

J.M. Vargas Jr. is a professor in the department of botany and plant pathology at Michigan State University.