TURF LITTER SUPPRESSES DISEASE

by Robert L. Haney

Did you know turfgrass litter that builds up on the soil surface supports thousands of different kinds of microorganisms which decompose the litter and suppress turf diseases?

According to Dr. Phil Colbaugh, plant pathologist with the Texas Agricultural Experiment Station at Dallas, turfgrasses have a unique microbiological defense system which protects against many diseases attacking them.

Most diseases of turfgrasses are caused by fungal pathogens which feed on both living and dead plants. Fungi which cause Fusarium blight, leafspot, brown patch and Pythium blight are common examples. This group of fungal pathogens largely relies on turf litter for survival when it is too cold, hot, wet or dry for rapid growth. The litter is also used in the production of spores or fungus threads by which the diseases spread.

The accumulated litter which surrounds the turfgrass plant consists of grass clippings, dead or dying lower leaves, stolens, rhizomes, roots and tillers which are in various stages of decomposition.

Microorganisms which decompose litter not only compete with fungal pathogens for available food, but also produce compounds which suppress the growth of pathogens. Litter decomposition is mostly done by bacteria; however, many beneficial fungi are also present in litter, especially during advanced stages of decomposition.

Colbaugh cautions against excessive buildup of grass clippings. Research has shown that turfgrass clippings which are added to the litter during mowing greatly favor disease increase.

He explains that at the time of mowing, turfgrass clippings have a high content of available nutrients and low numbers of beneficial microorganisms needed to suppress fungal pathogens. Collection of turf clippings during the growing season prevents excessive buildup of litter which favors disease.

Temperature, moisture and a continuous supply of available nutrients are important factors which regulate disease development on turfgrass and suppress litter microorganisms. There are many examples of turfgrass disease which are started during periods of environmental extreme, or when too much or too little fertilizer is applied.

For example, summer disease problems are common on closely clipped turf, or where temporary drought conditions allow turf litter to dry. Colbaugh's research has shown that the activities of litter microorganisms are greatly reduced without moisture. But, several turf pathogens grow readily on dried litter immediately after remoistening.

Colbaugh considers drying and rewetting of litter to be a major factor favoring disease activity on turf during the summer. Turfgrass also becomes increasingly susceptible to disease when under water stress. Drought aids the development and spread of disease on turf.

Research shows that proper irrigation is necessary to maintain an active microdefense system on litter and a vigorous stand of turf during the summer. Keeping turfgrass litter moist allows continuous activity of beneficial litter microorganisms. This doesn't mean that turfgrass should be kept sopping wet, as this would favor certain fungal pathogens. A well developed turf cover will maintain litter in a moist condition for a long period while a thin cover will lose moisture quickly.

Increasing the mowing height of turf during the summer months helps conserve moisture in litter, Colbaugh's research shows. The frequency and amount of water applied to a lawn should be based on the existing structure of the turf canopy. For a lawn with a dense canopy, once-a-week deep watering may be sufficient to keep both the soil and litter moist. For a lawn that is thinned out, several short morning waterings may be necessary in addition to the weekly deep watering to keep both the litter and the soil moist.

The timing of watering of turf can help reduce disease activity, according to Colbaugh. The practice of early morning watering allows the turf foliage to dry quickly. Watering of turf during the evening or at night usually keeps the foliage moist for long periods and creates a very favorable environment for disease activity by turfgrass pathogens.

Cultural practices designed to keep litter-decomposing microorganisms vigorous, have proven helpful in the suppression of many fungal pathogens on turf. Future research will look for additional triggers of fungal pathogens on turfgrasses. These studies will enable plant scientists to propose other cultural practices for turfgrass based upon an understanding of how common turf diseases can be naturally suppressed. □

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