Turfgrass research review

by Dr. James B. Beard

Observations on Bentgrass puffiness

A Note on the Development of Puffiness in 1/4-inch Bentgrass Turf with Varied Nitrogen Fertilization. R. E. Engel. 1967 Report on Turfgrass Research at Rutgers University, New Jersey Agricultural Experiment Station Bulletin 818. pp. 46-47. 1967. (from the Department of Soils and Crops, Rutgers, the State University, New Brunswick, N.J.).

This paper involves a series of observations concerning the affect of nitrogen fertilization treatments such as carriers, rates and time of application on variations in the puffiness of a bentgrass turf. The turf was composed of a mixture of Seaside and Penncross creeping bentgrass, which was mowed three times a week at a quarter of an inch. Watering was done three times a week during periods of moisture stress with about a quarter of an inch of water per application. The soil was a loam containing approximately 14 per cent clay. The experimental area received a groove cultivation treatment plus a sandy loam topdressing once a year. The turf was 12 years old when the experiments started.

The treatment comparisons in this study included an activated sewage sludge, urea and ureaformaldehyde with each applied at two nitrogen levels, four and eight pounds of actual nitrogen per 1,000 square feet per year. The fertilization schedule involved (a) a uniform seasonal application applied in eight equal applications from March through October, (b) four equal applications applied during the cooler periods of March, April, September and October, and (c) four equal applications applied during the warm periods of May, June, July and August.

After four consecutive years of selected nitrogen fertilization treatments, differential responses in the form of puffiness became evident. Visual ratings of this effect were made with the degree of response being more evident in the following year.

Results during the fourth and fifth year of fertilization treatment indicated that puffiness was greater at the eight-pound nitrogen treatment than at the four-pound level, regardless of the type of nitrogen carrier involved. A comparison of the three carriers showed urea resulted in greater puffiness than the two organic carriers.

Some very interesting results were observed in relation to the season of the year in which the nitrogen was applied. The warm season fertilization treatment (four equal applications in May, June, July and August) resulted in a minimum degree of puffiness

compared to the fertilization applied during the cool temperature periods or in eight equal applications throughout the growing season. Also, the eight-pound application rate of ureaformaldehyde applied in March resulted in significantly greater puffiness than when applied in September.

Comments: The author of this article defines puffiness "as dense, loosely attached patches of top growth that tend to buckle into a higher position than the immediately surrounding turf." It commonly occurs on turfs maintained under putting green conditions and results in more scalping and relatively poor putting quality or poor ball roll. Puffiness will vary with the particular bentgrass variety involved and correlates with the rate of vegetative growth.

The basic response which underlies all observations in this paper is that excessively high levels of nitrogen nutrition result in excessive growth and the resulting puffiness. In the case of the nitrogen carriers, the greater per cent nutrient availability of urea at a much more rapid rate has stimulated excessive growth. In the case of the timing of nitrogen fertilization, the mid-summer fertilization during periods of relatively slow growth due to high temperature stress has limited the degree of nitrogen response and resulting puffiness compared to the cool portions of the growing season where growth is relatively rapid and where responses to higher nitrogen fertility are more evident in the degree of puffiness. This data indicates that when fertilizations are made in the cooler portions of the growing season it is important that the rate be sufficiently low to avoid excessive stimulation of top growth. The level of nitrogen to be applied should only be that amount which is sufficient to maintain color and to provide an adequate level of recouperative ability from injury caused by environmental stress, turfgrass pests or traffic.

Other References of Interest:

1. Index to the Proceedings of the Florida Turfgrass Management Conference pp. 1-32. 1953-1967. H. G. Meyers and G. C. Horn* (from the Department of Ornamental Horticulture, University of Florida, Gainesville. Fla.)

2. The economics of turfgrass sprinkler irrigation. W. W. Wood. California Turfgrass Culture. 17 (2):15-16. 1967. (from the Extension Service, University of California at Riverside, Riverside, Calif., 92502).

3. Chemical control of *Fusarium* blight of turfgrasses. G. A. Bean*, R. N. Cook, and A. E. Rabbitt. Plant Disease Reporter. 51(10): 839-841. 1967. (from the Department of Botany, University of Maryland, College Park, Md.).

4. Residue of Bensulide in turfgrass soil following annual treatments for crabgrass control. S. W. Bingham and R. E. Schmidt*. Agronomy Journal. 59(4):327-329. 1967. (from the Department of Agronomy, Virginia Polytechnic Institute, Blacksburg, Va.) □