Report on nutritional studies

Agronomic turfgrass research report. *R.L. Goss. 1970. Proceedings of the 24th Annual Northwest Turfgrass Conference. pp. 90-92. (from the Western Washington Research and Extension Center, Washington State University, Puyallup, Wash.).*

This report contains an updating on the status of some long-term nutritional studies that are being conducted on a 10-year-old colonial bentgrass turf at the Western Washington Field Research Station near Puyallup, Wash. The investigations of sulfur nutrition involve a multifactor study with various nitrogen and phosphorus levels included.

Colonial bentgrass plots receiving sulfur applications were superior in turfgrass quality, including shoot density, leaf texture and color. Wettable sulfur applied at 1.15 pounds per 1,000 square feet produced a reasonable response whereas 3.5 pounds per 1,000 square feet gave an even better response.

Certain qualitative changes within the turfgrass community also occurred in addition to the direct turfgrass quality response to sulfur. All plots that did not receive sulfur contained annual bluegrass, with some having percentages as high as 50 per cent. The annual bluegrass population was particularly high where a high soil phosphorus level existed. Plots receiving a combination of phosphorus and sulfur contained some annual bluegrass, but much less than the phosphorus treated plots without sulfur. Plots treated with sulfur contained little annual bluegrass. The author suggests that the sulfur is lowering the soil pH, causing the phosphorus to be tied-up in an unavailable state for plant growth. Thus, annual bluegrass growth is impaired.

Comments: Sulfur is an essential macronutrient that is a vital constituent of certain amino acids as well as a requirement for protein synthesis. A sulfur deficiency disrupts protein synthesis and eventually impairs growth. Sulfur deficiency symptoms are characterized by an initial pale coloration of the lower leaves, which gradually progresses into a pale-yellow-green appearance of the above ground shoots.

Sulfur is fairly evenly distributed throught the plant and is removed in turfgrass clippings in quantities similar to phosphorus. Sulfur is absorbed by turfgrass roots primarily in the sulfate form. The amount of readily available sulfur occurring in the sulfate form in soils is quite small because of its high water solubility. The sulfur content of soils is usually lower under conditions that accentuate the decomposition of organic matter and where leaching is severe.

The sulfur response reported in this paper is quite distinctive and unquestionably indicates that the turf is being impaired by a soil sulfur deficiency. In the past there has been no concern regarding possible sulfur deficiencies in turfgrasses because most of the fertilizers being used contained a substantial sulfur component. However, some of the newer turfgrass fertilizer formulations have a substantially reduced sulfur content.

Rooting from sod by Poa pratensis L. and Agrostis tenuis Sibth. *J.H. Madison. 1970. Crop Science. 10(6):718-719. (from the Department of Environmental Horticulture, University of California at Davis, Davis, Calif. 95616).*

The objective of this study was to investigate the source of the new roots initiated from transplanted sod and the effect of soil thickness on the source of new roots. Fifteen square inch pieces of Kentucky bluegrass *(Poa pratensis* L.) and colonial bentgrass *(Agrostis tenuis* Sibth.) were harvested December 1, 1969. The sods were cut to soil thicknesses of approximately 0, 5, 1 and 2 inches. Three replications of each soil thickness treatment within each species were placed in medium-fine quartz sand flats. The transplanted sods were grown in a 68-degree F. greenhouse with supplemental lighting that provided a 16-hour day length. Treatment evaluations included the number of roots and shoots produced after (a) 8, 15 and 22 days in the case of the bluegrass sods and (b) 8, 18 and 29 days in the case of the bentgrass sods.

Analysis of the data revealed that the number and rate of root development increased to 0.5 inch. An evaluation of the source of root initiation revealed that the first roots were initiated from the basal nodes of existing shoots.

The rate of root initiation from colonial bentgrass was much slower and more erratic than from Kentucky bluegrass at all soil transplant thicknesses. Only a portion of the bentgrass shoots initiated new roots from the basal nodes whereas all Kentucky bluegrass shoots initiated new roots. The roots produced from transplanted colonial bentgrass sod were associated with active growing shoots.

Comments: The thickness at which a sod should be cut for transplanting varies with (a) the turfgrass species, (b) uniformity of the soil surface, (c) soil type and (d) sod strength.

As illustrated in this paper, sod that is harvested relatively thin will root faster and more extensively after transplanting than thicker cut sod. The thin cut sod is also lighter in weight and easier to handle. One potential problem is that sod cut 0.5 inch thick or less is quite prone to injury from atmospheric desiccation if not kept moist at all times. □