

Nitrogen Application in Brown Patch Control

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Recent work conducted under controlled greenhouse conditions at the Pennsylvania State University has revealed that while large brown patch (*Rhizoctonia solani*) on Seaside bentgrass responds very readily to different levels of nitrogen fertility, these reactions can be offset by varying additions of phosphorous and potassium. Plants grown under low nitrogen fertility, with normal phosphorous and potassium levels, were definitely less susceptible to large brown patch than those grown at normal balanced fertility.

However, when phosphorous and potassium levels were reduced in conjunction with nitrogen, susceptibility to large brown patch increased. High nitrogen, with normal levels of phosphorous and potassium, brought about a definite increase in susceptibility to disease. When phosphorous and potassium were increased concurrently with nitrogen, however, the increased susceptibility to large brown patch was offset.

There was no alteration in disease reaction when plants were grown under balanced nutrition from pH 4.0 to 7.0. However, at pH 8.5, and above, bentgrass plants became less susceptible to disease. Under conditions of high nitrogen, with normal phosphorous levels, the plants were less susceptible to large brown patch at pH 7.0 than at pH 4.0 or 5.6.

Soil moisture in the readily available range (field capacity to permanent wilting percentage) had no influence on disease development.

In Washington State, more red thread disease (*Corticium fuciforme*) was observed in poorly nourished lawns during the winter of 1956-1957 than in well nourished ones. Field tests, under naturally occurring disease conditions, revealed that an increase in overall fertility gave a decrease in disease severity. Heavy nitrogen applications were particularly beneficial in disease reduction.

South Converting Greens to Fine Leaf Bermuda

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Probably the advent of improved strains of fine leaf Bermudagrass has been responsible for more greens renovation than any other single factor during the past few years. Throughout the South greens are being converted from common to fine leaved Bermudagrass. Conversion, in some cases, is accomplished in connection with a rebuilding program; in others it is strictly a renovation process. Conversion to improved strains of Bermuda in the southern areas, and to improved strains of bentgrass in the northern areas is a clear indication of progress.

A. W. Crain, agronomist for Goldthwaite's Texas Toro, reports that during 1957 several Texas clubs converted all or some of their greens to an improved strain of Bermudagrass. Strains used were Tifgreen, Gene Tift and Sun-turf. The basic reason for renovation was, in all cases, to replace the existing Bermuda with an improved strain. No soil or design changes were made.

Techniques employed in the renovation program were as follows: The greens were severely verticut, thoroughly aerated and sterilized. A temporary soil sterilent, Vapam, was used. After the proper waiting period, the greens were stolonized, (sprigs spread over the surface), topdressed and fertilized (heavy application of a 10-5-5 organic base fertilizer).

Results: within six weeks (including the two week waiting period) most of the greens were back in play.

Necessity for Fertilizer

Previous work on these and other courses in the area indicated that the procedure outlined was the most desirable method of converting to an improved variety of Bermudagrass. Sprigging into aerator holes, and the use of 4-in. plugs on 12-in. centers had proved to be unsatisfactory under their conditions. Experience had also shown the necessity of adequate fertilization at the time of renovation.

Crain also reported that during the past four years, courses at Weimar, Eagle Lake, Navasota and Yoakum, all located in South Texas, converted from sand to grass greens. Sub-grades were established, stone and pea gravel spread, seedbed prepared, and Gene Tift Bermuda established. The conversion of these courses to grass greens is a milestone of progress worthy of note — there are no courses left with sand greens in the south Texas area.

The work of Carl Anderson, supt. of Woodhill CC in Minneapolis, during late 1956 and 1957 serves to illustrate two other types of renovation.

Anderson's Renovation

The No. 4 green was shaped similar to an inverted saucer — high in the middle and sloping to all sides. The membership wanted the back raised and the green sloped to the front so that shots pitched to the front would hold.

Techniques employed were as follows: The sod was cut from the center of the green back, rolled and stacked. A sandy type topsoil was applied to the depth necessary to acquire the desired grade. The seedbed was then graded and firmed. A 1- to 2-in. layer of compost consisting of 1/2 soil, 1/4 sand and 1/4 peat was spread over the surface and the sod laid. The job was completed in November of 1956. When the season opened in 1957, the green was topdressed and put in play. Carl reports if he were doing the job over he would remove sod from the entire green and rework the soil.

An interesting aside to this project was the removal and utilization of a series of "chocolate drops" as a source of topsoil. These were erected near the green during an earlier period of construction and the surrounding topsoil had been

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