

Soils Research Report: Late Season Nitrogen Fertilization,  
Nitrogen Carrier Evaluations, and Plot Establishment

Paul E. Rieke, Richard A. Bay and John F. Whims  
Crop and Soil Sciences, M.S.U.

Major efforts in 1981 were placed on completing the soil modification for greens establishment at the Hancock Turfgrass Research Center. The plots to be used for greens irrigation research were constructed essentially according to the specifications designed by the U.S.G.A. including tile, pea gravel layer and topsoil mix. There was no sand layer included between the topsoil mix and the pea gravel. The plot areas drain well, but the border areas tend to pond water for a period of time where subsoil was brought to the surface during installation of the irrigation system. This subsoil material caused the soil surface to be sealed and limits infiltration rate. In normal construction this should not present a problem, since irrigation installation would occur on the perimeter of the green. An exception might be a football field or other large turf area in which irrigation lines and heads will be found in the middle of the field and where sandy soil mixes are used.

Three other greens were established on different soils. One was directly on the sandy loam topsoil existing on the site. Another was on 2NS (coarse mix) sand with peat worked into the upper 4-6 inches, and the third was built as a Purr-wick green with dune sand (predominantly medium and fine sands) with the plastic liner and tile drainage. Establishment rate of seeded Penncross creeping bentgrass was fastest on the topsoil followed by the U.S.G.A. mix. The establishment rate was much slower on the two sand greens, especially on the Purr-wick sand. This was likely due to lower nitrogen availability caused by leaching from the sands and no topsoil in the mix to provide some nitrogen and cation exchange capacity. We do not think that irrigation was a factor as the plots were irrigated independently. Clearly more frequent nitrogen fertilization will be needed on these sandy soils.

Appreciation is gratefully acknowledged to the Standard Sand Corporation which donated all the sand used in modifying the soils for the greens; the Michigan Turfgrass Foundation which paid for transportation of the sand, and much of the labor cost; irrigation companies who provided irrigation equipment and some of the labor for installation; and many individual members of the Michigan Turfgrass Foundation who donated use of equipment and/or personal labor. Special thanks to Ron Foote, superintendent at Forest Akers Golf Course, M.S.U., for loaning use of the soil shredder used for mixing all the soil, and for helpful advice given willingly. Without this kind of widespread support, we could not have the quality plots on which we will be conducting turf research for many years.

Late season nitrogen fertilization and nitrogen carrier evaluation

A large late season (or dormant nitrogen fertilization) study was initiated in October, 1980 on a Penncross creeping bentgrass putting green at the Soils Research Farm in East Lansing. Treatments are shown in Table 1. Plot size was 3 feet by 6 feet. All treatments were applied by hand. Turf responses were typical of those observed in earlier studies and in other studies given later in this report. One observation which was very apparent was that those plots fertilized with the completely soluble N sources (ammonium nitrate and urea) at the 2 pound rate gave very quick response to the October 15 fertilization as might be expected. The grass became very green and succulent. There was a period of several weeks before there was a hard freeze. When the hard freeze came in late November, significant injury to the leaf tissue occurred on these plots. The