receive the same treatments, but the nitrogen responses on the annual bluegrass are not as clearly defined and do not appear to last as long as on the Penncross. Some of this difference may be due to the higher clay content soil (loam) where the annual bluegrass is grown while greater leaching would occur on the loamy sand. But even with slow release materials which would not be as susceptible to leaching (such as IBDU or Milorganite) the responses are not as marked on the annual bluegrass site.

## EFFECT OF NITROGEN, COPPER AND SULFUR ON ALGAE ON A PENNCROSS CREEPING BENTGRASS GREEN

A rather serious algae condition developed in 1985 on a Penncross creeping bentgrass green growing on a sand/peat soil at the Hancock Turfgrass Research Center. The turf had received less than 2 pounds of nitrogen per 1000 square feet in 1984 while none had been applied in 1985 until the study was initiated in July. Treatments applied are outlined in Table 5. The annual nitrogen treatments were divided into 2 applications, while the copper and sulfur treatments were applied at the beginning of the study in July. Plot size was 3 feet by 6 feet with 3 replications. Because the turf was so weak there was no untreated check included in the study. It is obvious that the algae intrusion into the turf is occurring on turf which was fertilized at very low nitrogen rates in the past. In an attempt to increase ball roll and to reduce other turf management problems we may be using such low nitrogen rates that algae competition is encouraged because of the limited density of the turf. And sand topdressing and the use of high sand content soils in the construction of greens which have little organic matter and water holding capacity may enhance susceptibility to the algae problem. Susceptibility will vary with the kind of grass you have, nitrogen rate, nitrogen carrier, other auxiliary practices such as verticutting, topdressing, cultivation, specific site conditions, traffic and other management practices. Of course an algicide can be used to reduce the magnitude of the problem.

## EFFECT OF TOPDRESSING PROGRAM AND NITROGEN FERTILITY PROGRAM ON A PENNEAGLE CREEPING BENTGRASS GREEN

The study outlined in Table 6 was initiated in 1982 on Penneagle creeping bentgrass growing on a modified loamy sand. The soil mix used in the study was prepared to match the texture of the soil utilized in the original construction. Turf quality ratings were taken twice in 1985 as shown in Table 6. Plots receiving the higher nitrogen rates ranked higher but in some cases were too succulent. Those plots receiving the 6 pounds annual rate of nitrogen per 1000 square feet were more susceptible to wilt, consistent with observations on other plots. There was also a tendency for plots receiving sand topdressing treatment at the high nitrogen rate to wilt before those receiving soil mix topdressing although no data were taken.

Stimpmeter readings taken in August (Table 7) indicate that shorter roll occurred on all plots receiving higher nitrogen consistent with observations reported by others. There was no difference observed due to topdressing treatment on that date.

Table 6. Effect of Nitrogen fertility and topdressing on quality of Penneagle creeping bentgrass green at Hancock Turfgrass Research Center. Averages from three replications.

| Treatment No. | Topdressing | lbs N 1000 ft.$^2$ | Quality Rating (9=best) Aug 2 | Aug 29 |
|---|---|---|---|---|
| 1 | 12 cu. ft. Soil Mix Spring/Fall | 3 | 7.7 bd* | 6.2 cd |
| 2 | 12 cu. ft. Dune Sand Spring/Fall | 3 | 8.0 ad | 6.0 cd |
| 3 | 3 cu. ft. Dune Sand 3 weeks, 8 app./yr | 3 | 7.0 d | 6.5 bd |
| 4 | 6 cu. ft. Dune Sand 6 weeks, 4 app./yr | 3 | 7.2 cd | 6.5 bd |
| 5 | Check | 3 | 7.2 cd | 5.5 d |
| 6 | 12 cu. ft. Soil Mix Spring/Fall | 6 | 9.0 a | 8.2 a |
| 7 | 12 cu. ft. Dune Sand Spring/Fall | 6 | 8.2 ac | 7.8 ab |
| 8 | 3 cu. ft. Dune Sand 3 weeks, 8 app./yr | 6 | 8.3 ab | 8.0 ab |
| 9 | 6 cu. ft. Dune Sand 6 weeks, 4 app./yr | 6 | 8.8 b | 7.3 ac |
| 10 | Check | 6 | 8.2 ac | 7.0 ad |

*Means within columns with like letters do not differ significantly according to Duncan's Multiple Range Test (5%).

Table 7. Ball speed as affected by nitrogen fertility and topdressing program on Penneagle bentgrass at the Hancock Turfgrass Research Center. Stimpmeter readings, average of four rolls, three replications.

| Treatment No. | Topdressing | lbs N/1000 $ft^2$ | Average distance of ball travel (in inches) |
|---|---|---|---|
| 1 | 12 cu. ft. Soil Mix Spring/Fall | 3 | 84.9 a* |
| 2 | 12 cu. ft. Dune Sand Spring/Fall | 3 | 84.4 a |
| 3 | 3 cu. ft. Dune Sand 3 weeks, 8 app./yr | 3 | 85.9 a |
| 4 | 6 cu. ft. Dune Sand 6 weeks, 4 app./yr | 3 | 88.0 a |
| 5 | Check | 3 | 82.6 a |
| 6 | 12 cu. ft. Soil Mix Spring/Fall | 6 | 72.3 b |
| 7 | 12 cu. ft. Dune Sand Spring/Fall | 6 | 74.0 b |
| 8 | 3 cu. ft. Dune Sand 3 weeks, 8 app./yr | 6 | 73.4 b |
| 9 | 6 cu. ft. Dune Sand 6 weeks, 4 app./yr | 6 | 74.4 b |
| 10 | Check | 6 | 73.9 b |

*Means in columns with like letters do not differ significantly according to Duncan's Multiple Range Text (5%).