EFFECTS OF IRON ON ROOTING

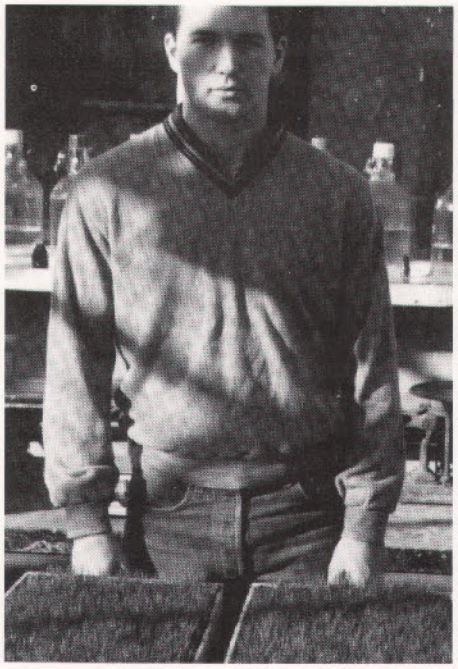
By Jeffery Bahr

James Beard defines sod as, "plugs, blocks, squares or strips of turfgrass plus the adhering soil that is used for vegetative planting." Rooting into the underlying soil is the primary requisite for sod establishment.

Iron is active in plants through chlorophyll synthesis and is a constituent of certain enzymes in the respiration system (James B. Beard c. 1973; *Turfgrass: Science and Culture*). Thus, turfgrass color is influenced by the level of iron available to the plant. It has been noticed, however, that iron applications do not substantially increase shoot development, hence, there is more available energy for root development.

It was on the premise that foliar iron applications hasten rooting of organically grown sod in mineral soil that this experiment was based.

Dr. Wayne Kussow and I conducted the study with Kentucky bluegrass established in peat soil during the spring semester of 1988. Sod was grown and cared for in the greenhouse for nine weeks. A week before the sod was cut, two different treatments of nitrogen were applied. The treatments consisted of 1) one pound of nitrogen per thousand square feet, and 2) one half pound of nitrogen per thousand square feet. One sod strip was not treated with extra nitrogen and served as a control.



Jeff Bahr in the Soil Science Department greenhouses where he conducted his research project.

The sod was cut at a depth of one half inch below the soil surface. Each sod strip was cut into 10 three and one half by four and one half inch pieces. The sod pieces were placed on individual three and one half by four and one half inch wire mesh screens. Four hooks were attached to the screen and extended through the soil and root systems of the sod pieces. The sod, with the wire mesh screens, was transplanted into mineral soil. The proper iron treatments were then applied. The iron treatment consisted of 0.25 ounces of iron per thousand square feet. Nitrogen, iron, and starter fertilizer applications are shown in Table 1 for each treatment.

Observations on root strength were taken the first and second weeks after transplanting. A second application of iron was applied to treatment 10 two weeks after transplanting. Three weeks after transplanting the sod root strength was tested by attaching the four hooks, coming up through the sod, to a rope which was suspended by a boom and pulley system and attached to a pail on the other end. Sand was poured at a constant rate into the pail until the sod piece was torn from the soil. The pail with the sand was weighed and recorded for each replicate.

Sod grown on organic soil was used because the degree of root acclimation is greater than that of mineral soil. One week after transplant of the sod pieces, the pieces with the one half pound per thousand square feet application of nitrogen rooted most consistently. The iron had little or no effect after one week.

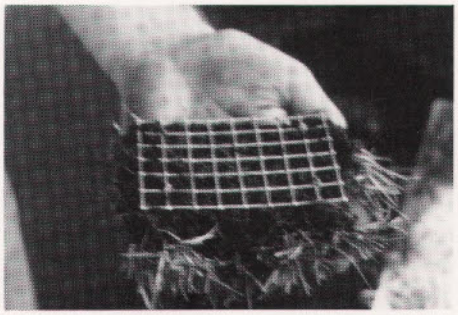
By the second week all the sod pieces had established roots into the mineral soil. After the third week the iron application did have a major impact in root strength for the treatments with no extra nitrogen (treatments 1 and 4). Starter fertilizer increased the rooting rate for the treatments with no extra nitrogen (treatments 1,4, and 7). The treatments with half pound nitrogen rooted the best of all treatments,

TABLE 1

Treatment	Nitrogen (lb./M)	Iron (0.25 oz./M)	Starter fertilizer	Root tensile strength (lb.)
1	0	–	–	9.62
2	0.5	–	–	13.06
3	1.0	–	–	9.30
4	0	+	–	11.48
5	0.5	+	–	12.05
6	1.0	+	–	10.31
7	0	+	+	12.71
8	0.5	+	+	12.40
9	1.0	+	+	11.67
10	0.5	++	+	11.41

(+ one treatment applied – no treatment applied)

Blsd 2.75 lb.

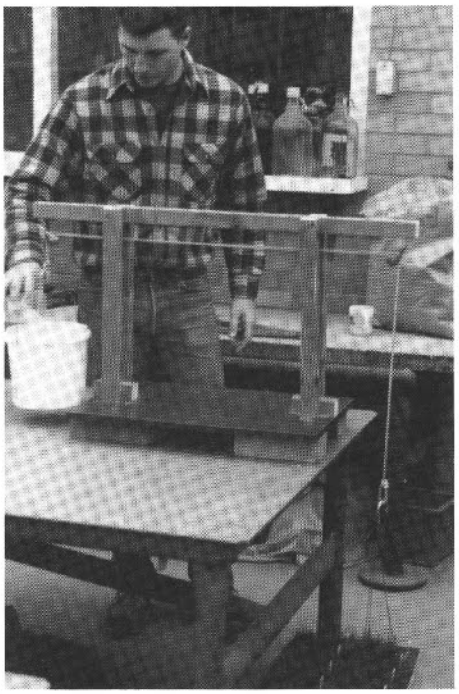


Wire mesh screens were placed beneath sod prior to treatments.

but, the iron applications did not seem to have a major effect on the rooting. The one pound application of nitrogen seemed to induce more shoot growth; hence, there was no substantial difference between iron applications in these treatments. The sod pieces treated with a second application of iron were noticeably darker but had a lower rooting response than comparable treatments.

Iron application is useful in inducing strong roots for sod that is nitrogen deficient. Too much nitrogen, regardless of how much iron is applied, can be detrimental to strong root growth.

Is that a Jacobsen mower?



Jeff devised a unique method for measuring root strength.

USGA Director speaks...

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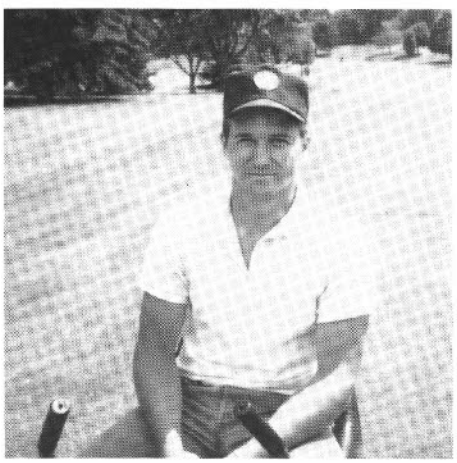
Overall team best ball winners were Jeff Bottenzek and Dick Evenson. Second place went to Bryan Schmidt and Wayne Otto. Third place winners were Jerry Ebel and Bruce Worzella. Losing the tie breaker and finishing fourth were Pat Mertz and Chad Ball. Fifth place went to Jim Wunrow and Dave Murgatroyd.

This meeting was the second of three featuring USGA Green Section staff. Needless to say, it is always an honor to have the Green Section National Director take time from his busy schedule to be a part of someone else's. For the Wisconsin GCSA, it truly was a memorable meeting.



NOR-AM Scholarship winner Jeff Bahr.

BAHR TO RECEIVE NOR-AM SCHOLARSHIP

Jeff Bahr, a senior in Dr. Wayne Kussow's Turf and Grounds Management Program at the University of Wisconsin-Madison, has been chosen as the 1988-1989 recipient of the NOR-AM TURF SCHOLARSHIP. The announcement was made by John Turner, NOR-AM's representative for Wisconsin. The award will be formally presented to Jeff at the 1989 WTA Winter Turfgrass Conference and Annual Meeting next January.

John Turner has been absolutely dedicated to turfgrass education and deserves an applause for working to include Wisconsin in the generous NOR-AM program. Many fine young people have benefited from this financial aid.

Jeff Bahr is the son of WGCSA member and La Crosse Country Club Golf Course Superintendent Joe Bahr. Jeff was selected by a UW-Madison faculty committee.