Mesh Elements Added To Granular Soil Gives Root Zone Stability To Bermudagrass, Perennial Ryegrasses and Tall Fescues

The addition of randomly oriented interlocking mesh elements to granular soil has shown, initially, (1) substantial benefits to turfgrass root zone stability and, (2) enhanced turf growth. The mesh element matrices have a positive effect on soil aeration porosity which is important for root growth needed to intertwine with the mesh to achieve maximum turf stabilization.

Testing the potential benefits from the inclusion of randomly oriented mesh elements in turfgrass root zones was begun in August 1985 at the Texas A&M University Turfgrass Research Field Laboratory located at College Station, Texas. The turfgrass specialists listed on the Progress Report furnished ASPA were Dr. James Beard, Dr. Samuel Sifers and Dr. J.R. Walker.

The mesh elements were provided by Netlon Limited, Blackburn, England. Initial research and testings were done by a group of British turfgrass specialists, who have presented a number of Progress Reports at international conferences.[1]. The results of the American research will be published in the near future.

The initial tests were made with Tifway bermudagrass which has a very vigorous lateral shoot system of rhizomes and stolons. Further testing will be made on the other turfgrasses. Dr. James Beard reports, "I would anticipate that use of the mesh element-root zone system on bunch-type cool-season species, such as perennial ryegrass and tall fescue, would result in even greater beneficial responses."

Various items other than mesh elements have been used during initial experiments, including textile fiber, metal rods and plastic rods. The first tests indicate that the strengthening action of the mesh elements differs significantly from that of the other items.

The researchers mix the masonry sand and the mesh elements in a horizontal, conventional cement mixer. The test plot area was sprigged with Tifway bermudagrass. A topdresssing of sand was added.

Optimum cultural treatments are used. Following turfgrass establishment, the turfs were subjected to numerous tests of lateral shear displacement, compression displacement, divot resistance, sod strength, and rate of recover.

The preliminary results — which will be reported in detail later by the research team — are very positive. Investigation is continuing on an expanded scale.

Potential applications include sport fields, horse race tracks, car parks, golf cart paths, and other turfed roadways traversed by vehicular and foot traffic.

One concern for sod producers will be the possibility of a shorter growth period until time of harvest because of the root zone stability factor. As with netting for many sod producers, the bottom line may focus on ease of application and cost.

ASPA was sent the Progress Report but the research team asked that it not be printed in its entirety because more precise, scientific data will be published as soon as possible. However, Dr. Beard sent the following comments:

1. For horse race tracks, the rate of mesh inclusion which is performing best is 6 kilograms per cubic meters. This is based on experiences at the Sha Tin Race Track in Hong Kong. The extent of divoting damage at Sha Tin resulting from the use of the mesh element-sand root zone matrices has been reduced to less than 10% of what previously had been experienced.

2. The system will perform best if used in combination with a high sand root zone soil mix meeting USGA specifications.

3. Observations to date indicate that one of the big advantages of the mesh matrices-sand root zone system for sport fields is a very consistent playing surface regardless of growing conditions and the degree of rainfall and resultant soil moisture level.

4. This sports field root zone construction system involving randomly oriented interlocking mesh elements is one of the most promising approaches to providing a stable, consistently uniform playing surface under various types of weather conditions. Furthermore it retains the cushioning effect of a turf and thus provides a very desirable alternative in terms of offering some of the stabilizing characteristics of an artificial turf yet retaining the many beneficial dimensions of natural turfgrass.

[1] The British research specialists and their topics include:

A. **Andrawes, K.Z., A. McGown, N. Hytiris, F.B. Mercer, and D.B. Sweetland.** 1986. *The use of mesh elements to alter the stress-strain behavior of granular soils.* Proceedings 3rd International Conference on Geotextiles, Vienna, Austria. 3:839-844.

B. **McGown, A., K.Z. Andrawes, N. Hytiris, and F.B. Mercer.** 1985. *Soil strengthening using randomly distributed mesh elements.* Proc. Int. Conf. S.M.F.E., Balkema, San Francisco, USA. 11:1735-1738.

C. **Mercer, F.B., K.Z. Andrawes, A. McGown, and N. Hytiris.** 1984. *A new method of soil stabilization. Proc. Conf. of Polymer Grid Reinforcement, Thomas Telford, London, England. pp 244-249.*