

not for grass, but for fungi! Diseases such as *Pythium* and *Rhizoctonia* occur in these areas first, and tend to be more severe.

What does all of this mean and how can you use it for better grass on your golf course? My tip involves techniques for actually showing and measuring air circulation or the lack of it.

Several different techniques combine to produce the desired results. One is the Turbo Meter, from Spectrum Technologies of Plainfield, Illinois. Another, air circulation fans, are available from a number of different sources. The final element is the use of

a smoke bomb (or similar device) to show actual air movement direction, rather than simply feeling the air movement on your face or measuring it with the Turbo Meter.

The Turbo Meter is often used by Bob Brame, Green Section agronomist, to illustrate air circulation problems during Turf Advisory Service visits in the Mid-Atlantic Region.

The Turbo Meter, air circulation fans, and smoke bombs are all used by the professional staff of the Resorts of Pinehurst, Pinehurst, North Carolina, to grow better grass. In fact, Brad Kocker, Director of Golf Course Main-

tenance, and Bob Farren, Assistant Director of Golf Course Maintenance, have been so impressed with the effects of fans around their pocketed greens that they will have 62 fans in operation for the 1992 season.

They use the Turbo Meter to help locate the fans so that sufficient air movement is achieved (at least 3 mph). It works. The goals of having better grass, which the golfers *can* see and appreciate, and less disease with less chemicals are achieved.

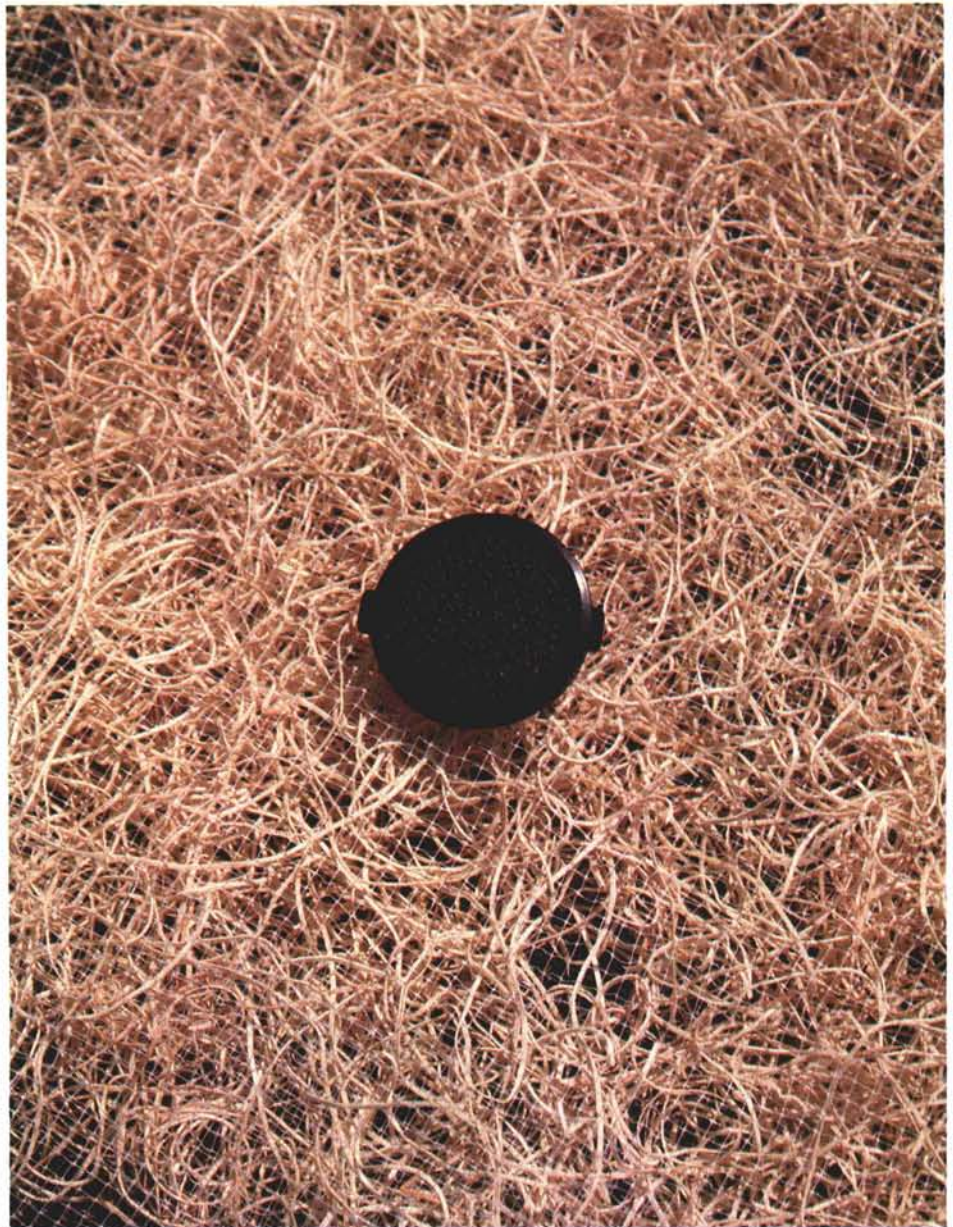
The Turbo Meter, fans, and smoke. It's better than licking your finger and sticking it up in the air!

EXCELSIOR GREEN COVERS

by **ROBERT C. VAVREK, JR.**
Agronomist, Great Lakes Region,
USGA Green Section

EXCELSIOR is thin, curled wood shavings commonly used as a packing material before the days of bubble-wrap and styrofoam "pop-corn." Curlex Greensavers are turf covers made from a layer of aspen wood excelsior loosely held together by fine netting. Similar products are used by landscape contractors as a mulch and to control erosion on new seedings. Excelsior mats are a common sight along steep banks adjacent to highways, sites especially prone to washouts and sheet erosion.

Several superintendents in the Minneapolis/St. Paul area have had good success using excelsior mats as green covers to minimize turf injury caused by wind desiccation and crown hydration during the long Minnesota winters. Unlike the thin geotextile fabrics, the aspen shavings swell when wet to provide a substantial layer of insulation. Once the greens freeze, they tend to remain frozen despite short freeze/thaw cycles that occur during the winter.



Aspen wood excelsior mats swell when wet, which provides more protection during freeze/thaw cycles than geotextile fabrics.



(Above) Excelsior covers protect turf from desiccating winds and encourage early spring green-up.

(Right) Excelsior mats are more difficult to handle than geotextile fabrics and require a considerable amount of storage space.



A potential problem with fabric covers is the greenhouse effect that occurs during the occasional sunny, 40-degree day in January or February. Even though the loose weave of a geotextile “breathes” sufficiently to allow movement of water and air through the cover, several superintendents have noticed that a slight amount of thawing occurs in the upper soil profile on sunny midwinter days.

The effect of warming the turf during the day, then quickly cooling it at night

is not known, but there is a good chance for turf injury from crown hydration where free water collects on low areas of a green. The crowns (growing points) of the turf absorb water and are severely injured or killed during a rapid drop in temperature. Ice crystals form inside plant cells and rupture cell membranes. *Poa annua* is much more susceptible to this type of winter injury than creeping bentgrass. Unfortunately, *Poa annua* usually dominates the stand of turf in poorly drained areas of the green.

Excelsior covers provide better thermal insulation for the putting surface. The surface of the cover may thaw, but the frost usually remains in the soil. This minimizes the occurrence of freeze/thaw cycles and protects the turf, especially *Poa annua*. This may be a two-edge sword, though. As the percentage of *Poa annua* increases on the greens, so does the potential for losing turf to anthracnose, summer patch, heat stress, etc., during the summer.

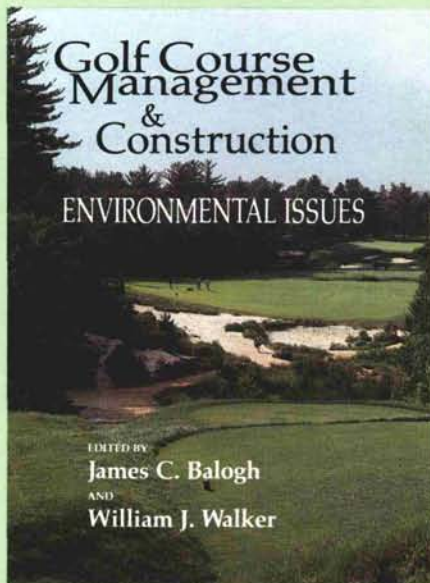
Fabric covers can be custom-cut to fit each green. Excelsior mats are supplied in 4 × 100 ft. rolls, so the task of installing and removing the covers is more time consuming and labor intensive. The wood fibers and the netting deteriorate over time and the average life expectancy of a mat is three to five years. Covers that are properly dried before being stored and are handled very carefully last up to seven years. On the other hand, they may only

last a year or two if they are stored wet or handled roughly. Proper storage is a must and is a significant cost item to consider before making an investment. Rolled mats take up a considerable amount of space; one superintendent rents seven to nine semi-tractor trailers to store the mats used to cover tees and greens.

In summary, excelsior covers are items to consider in areas where freeze/thaw problems exist. The initial cost of

the mats is relatively the same as custom-made fabric covers. They provide a bit more winter protection against crown-hydration winterkill of *Poa annua*. Both types of covers provide protection from desiccating winter wind and stimulate earlier green-up in spring. Whether or not excelsior mats are worth the trouble associated with installation, removal, and storage can only be determined by the superintendent at each golf course.

NEWS NOTES FOR SPRING



New Book on Golf Courses and the Environment Announced

Golf Course Management and Construction: Environmental Issues — available in May, 1992 — is a comprehensive reference book summarizing the scientific literature on the positive and potentially negative environmental effects of golf courses on surface and ground water quality, wildlife, and wetlands.

The book provides a scientific rather than emotional analysis of the environmental effects of golf courses and should prove invaluable to those debating golf courses and the environment. The book is based on Spectrum Research's (Duluth, Minnesota) review of pertinent scientific literature con-

cerning several of the environmental issues facing golf courses and reported to the USGA's Turfgrass Research Committee two years ago.

The easy-to-read book is divided into chapters, such as wildlife, water use, and pesticide applications, and includes an extensive reference section at the end of each chapter. The book should prove invaluable to anyone interested in the environment and golf courses, including superintendents, architects, green

committees, researchers, developers, and regulators.

Golf Course Management and Construction: Environmental Issues will be available in May, 1992, for \$72.25 (includes shipping and handling) from Lewis Publishers, 2000 Corporate Blvd. NW, Boca Raton, FL 33431, 1-800-272-7737, or the USGA, 908-234-2300.

The book will also be available for review at the U.S. Open Championship at Pebble Beach, June 18-21.

DONATION FOR TURFGRASS RESEARCH PROGRAM



Rick Fredericksen (right), President of the Minnesota Golf Course Superintendents Association, presents a check for the benefit of turfgrass research to Jim Snow, National Director and Chairman of the USGA Turfgrass Research Committee. The donation marks the sixth year the MGCSA has contributed to the USGA/GCSAA Turfgrass Research Program. The presentation was made at the GCSAA Conference and Show in New Orleans, Louisiana, in February.