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North Shore Country Club*

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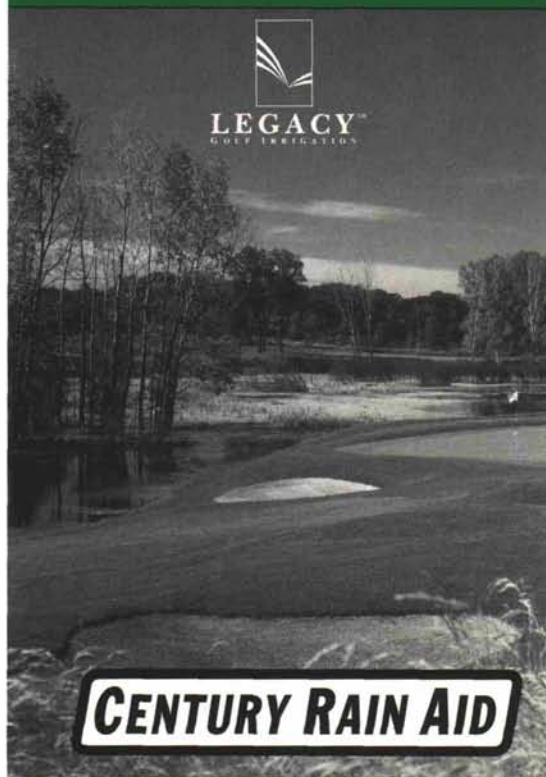
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Midwest Association Joins Audubon's New Supporting Membership Program for Golf Associations

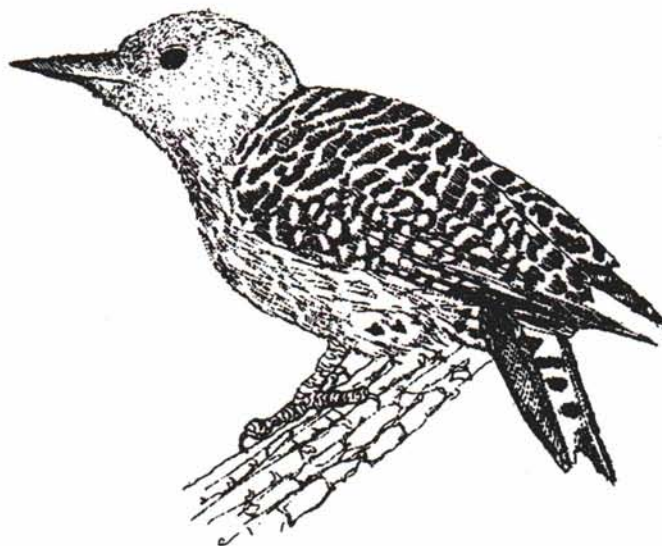
The Midwest Association of Golf Course Superintendents has recently joined the Audubon Cooperative Sanctuary System's Supporting Membership Program for Golf Associations. This new program gives us the opportunity to financially support the education and research programs of Audubon International and promote our own commitment to environmental stewardship.

Benefits of Association Membership

Many of you are already familiar with the Audubon program for golf courses. This program provides information and support to help superintendents manage their courses with a high degree of environmental quality and to receive recognition for their efforts. Our collective participation as a Supporting Association Member is a show of support for the Golf Program and for Audubon International. Our contribution will directly assist the ACSS in providing member services and educational materials that further strengthen and improve their programs. They include:

- Research and technical information
- New educational materials
- Publications
- Telephone and Internet communication

(continued on page 14)



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But our collaboration also benefits superintendents and the golf industry as a whole. For instance, information gained from Audubon's wildlife research taking place at Schuyler Meadows Golf Club in Loudonville, New York, or through Audubon's new database on golf and wildlife can be used to further enhance a superintendent's management plan. Educational publications, such as *Audubon's Guide to Environmental Stewardship on the Golf Course* and *Audubon Case Studies*, which highlight proactive environmental practices taking place on golf courses, are valuable resources. These also serve as important tools in combating public misperceptions about golf and the environment.

Achieving Recognition for Good Stewardship

Another important aspect of the Supporting Membership Program for Golf Associations is achieving recognition for our environmental stewardship efforts. As a Supporting Association Member, we received a press release announcing our participation and commitment to environmental conservation. The release was sent to the major golf industry publications and several local media sources.

Our association can also attain three Levels of Accomplishment and positive publicity by participating in the Audubon Cooperative Sanctuary System. Here's how it works:

LEVEL ONE:

Stewardship Partner, Golf Program Involvement:

The Golf Program provides technical and educational materials and conservation assistance to golf courses throughout North America. Through the Program, golf course superintendents are improving the environment and educating the public about the many benefits that properly maintained golf courses provide for wildlife and people.

To date, only about 14 percent of golf courses nationwide have joined. Audubon would like to see this number grow much higher as a way to really show golf's commitment to environmental stewardship. Our association can receive positive publicity as one of the most active associations in the country when at least half of our members are signed up and 10 percent of those participating are fully certified.

LEVEL TWO:

Education Partner, School Program Involvement:

Just as golf courses are actively participating in conservation activities, so too are schools. Through the Audubon Cooperative Sanctuary Program for Schools, teachers, students, and school administrators are transforming their school sites to benefit wildlife, conserve resources, and create exciting learning opportunities. Schools have developed habitat trails, built nest boxes, created recycling programs, and achieved greater wildlife and conservation awareness.

Through the Adopt-a-School effort, administered by Audubon and endorsed by GCSAA, superintendents can serve as valuable resource people



to help schools achieve their goals. By adopting schools within our association's territory, we can provide technical and financial support to a school that might not otherwise be involved with the school sanctuary program. To achieve status as an Education Partner, 10 percent of our members need to adopt a school. How many of us have children in school or have schools right in our golf course neighborhood who could benefit from involvement in the School Program?

LEVEL THREE:

Environmental Partner, Backyard Program Involvement:

The Audubon Cooperative Sanctuary Program for Backyards helps homeowners incorporate both indoor and outdoor conservation projects. Parcel by parcel, the land managed by homeowners adds up to an important refuge for wildlife.

(continued on page 16)

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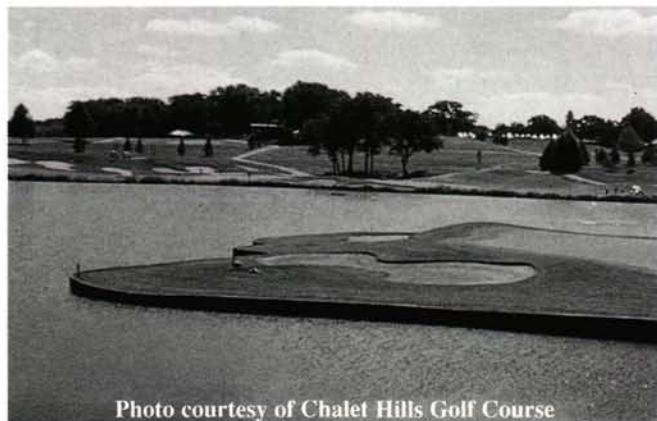


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Midwest Association Joins Audubon's...
(continued from page 14)

Lots of homeowners could use tips on backyard management from superintendents, but how many of us are doing all we can right in our own homes to promote wildlife and environmental conservation? To achieve recognition as an Environmental Partner, at least 25 percent of our Association members need to be enrolled in the Backyard Program.

A Win-Win-Win Situation

Becoming a Supporting Association Member is a WIN-WIN-WIN situation: Audubon continues to receive much needed financial support, the golf industry receives positive publicity and

valuable educational resources, and the environment continues to thrive because of stewards like us. Let's strive to be the best in our profession and achieve each Level of Accomplishment.

If you are not already a member of Audubon's programs for Golf, Schools, or Backyards, or if you know of a school that you would like to adopt, you can contact Audubon directly for a brochure and more information. If you have questions you'd like to ask of someone who's already certified in the Golf Program, you can contact one of Audubon's State Stewards at the address below:

Audubon Cooperative
Sanctuary System
Jeffery Nickel
Membership Coordinator
46 Rarick Road
Selkirk, NY 12158
(518) 767-9051
e-mail: auduboncsp@aol.com

Illinois State Steward:
Peter Leuzinger
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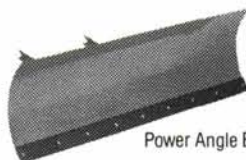
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Shade Problems? M.S.U. to the Rescue

Dr. James Baird
Michigan State University

7rees are an integral part of most golf courses and turf landscapes. However, shade from trees often results in turf thinning or loss, especially on putting greens. While removing the tree(s) may be the most immediate and effective way to rectify problems associated with low light intensity, it is in the best interest of the game of golf that we develop turfgrasses and turfgrass management strategies that are better adapted to shade environments. Before we formulate strategies aimed at growing better turf in shade, let's briefly review some of the effects of shade on the turfgrass plant and the turf environment.

Shade Effects on the Turfgrass Plant

Shade from trees and other structures reduces not only the quantity of photosynthetically active radiation (PAR) but also the quality of PAR reaching the turf canopy. Turfgrasses grown in shade receive less PAR from the blue and red regions of the spectra and, especially under trees, a lower ratio of red/far-red radiation. Alteration in light quality and quantity regulates seed germination of some species. In addition, turfgrasses undergo significant morphological changes in response to altered light, including decreased leaf thickness, leaf width, tillering, and root mass and increased stem and leaf elongation and vertical growth habit. Low light causes several anatomical changes, including reduced chloroplasts, cuticle, and cell wall thickness and stomatal density and higher lignin content. Physiological responses to shade

include reduced photosynthesis, respiration, carbohydrate synthesis and storage, and transpiration.

It's More Than Just a Color Issue

Turf problems in shade are caused by many factors other than just low light intensity. Shade

Shade also increases relative humidity above the turf canopy which, together with reduced temperature, results in lower evapotranspiration, increased soil moisture, and greater potential for disease development.

from trees or other structures reduces turf canopy air temperatures by about 2° to 4°F and bare soil air temperatures by as much as 36°F. While cooler temperatures in shade may be beneficial to turf during hot and dry periods of summer, shade environments can exacerbate lower temperatures in fall, winter and spring, thus causing potential detrimental effects to turf growth. Shade also increases relative humidity above the turf canopy which, together with reduced temperature, results in lower evapotranspiration, increased

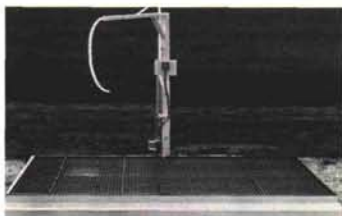
soil moisture, and greater potential for disease development. The relationship of shade-to-soil moisture and temperature together with the physiological and morphological changes to plants grown in low light has led several turf scientists to conclude that resistance to drought, waterlogging, and low temperatures is equally important to low light adaptation when selecting turfgrasses for shade environments. From my experiences, I would add that resistance to traffic would play a significant role in turfgrass shade tolerance.

In Search of Shade-Tolerant Turfgrasses

Plants adapted to full sun have been observed to exhibit greater morphological plasticity to grow in low light than plants adapted to shade. Furthermore, it would be important to select for shade tolerance among plants adapted to sun because of their higher seed yield potential (from a breeding standpoint) and greater potential to survive if the shade source is suddenly removed. From a morphological standpoint, selection for shade tolerance in turfgrasses should focus on plants that are able to maintain the same morphological characteristics as observed in full sun. Physiological adaptations to shade include increased chlorophyll content, decreased chlorophyll a/b ratio, increased photosystem II/I ratio, changed pigment composition, greater granal stacking, and reduced respiration.

Thus far, a gene or combinations of genes associated with shade tolerance have not been

(continued on page 24)



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Pathological Pointers: Fungicides, Grass Plant Growth and Algae

Dr. Ward Stienstra
Extension Pathologist Turfgrass
University of Minnesota

Fungicides are used to prevent or protect a grass plant from disease. Fungicide use was determined in the past by knowing what disease was expected (preventive) or by what disease was present (curative); and at times, we had choices about which product to select. Choices were made based upon cost of control (economics) or length of control (persistence) or product availability (on-site or rapid delivery) and range of other diseases expected that could also be managed. Today you must consider two additional aspects.

The superintendent in '95 that suffered from algae must consider the following reports about fungicides in the DMI (DeMethylation Inhibiting) group. These products can produce the dark green effect (increased chlorophyll and thicker leaves) especially in the summer. This can result in a more open canopy and the development of algae. The cause of this is not understood. Is it due to a direct effect on algae or a result of changed grass plant structure and growth or some other unknown reason? Increased algal problems were reported following use of Banner, Bayleton, Eagle and Sentinel in field trials. All but Banner had more algae than the check when greenhouse tested. Field plots treated with Sentinel exhibited carryover into the next year when scored for quality. Lynx had the least algae and may be an exception to the rule that DMI's in

the field and in the greenhouse tend to increase algae. Rubigan was not tested in these studies, but it was expected to perform as a DMI also.

Reports about the benefits of using Aliette and Fore every 7 to 14 days should also consider the potential for reduced algal competition or direct algal control with Fore.

*A pathological pointer:
DMI fungicides are
more than fungicidal,
and interactions are
a real possibility.
How this can affect
you is dependent
on use rates and
the environment.*

Those who are using plant growth regulators (chemistry type II, limitation of gibberellin biosynthesis [Primo, TGR or Cutlas]) may find some disease control (list above is least to most), but the level of disease control-Dollar Spot is minor. The similarity of these growth regulators and some DMI products is significant, and programs that use both growth regulators and DMI fungicides could experience additive effects especially in the hot period of the season. Fungicide selection today should also con-

sider your expected use of plant growth regulators.

A chemistry type I product (Mefluidide) used for seed head suppression when mixed with Ferromec is reported to produce effective suppression without any undesirable side effects. The side effects of growth regulators, type I or II and I believe some DMI fungicides, are not completely understood. Gibberellin needed for cell elongation is reported to result in suppressed growth of stems making some grasses shorter and stronger, but is this the only result of suppressed gibberellin production? Even if the plant's production of gibberellin is the only product affected by growth regulators, all other products in the production pathway can be affected. Synthesis of gibberellic acid in a plant is not the only plant hormone; Auxins and Kinins and Gibberellins are all involved in stimulating basic aspects of growth, cell division and elongation. Each is reported to work in conjunction not only with other substances but also within the group of three; and in animal systems, it is known that such hormones mediate a great variety of functions in addition to growth.

A pathological pointer: DMI fungicides are more than fungicidal, and interactions are a real possibility. How this can affect you is dependent on use rates and the environment. ■

Credit: Hole Notes, June 1996