WGCSA Convenes at Lake Arrowhead GC for April Meeting

By Mike Lyons, *Golf Course Superintendent, Old Hickory Golf Club*

On April 26th, seventy-two Wisconsin golf course superintendents and affiliates gathered at Lake Arrowhead for lunch, an educational session, and a game of golf.

The educational session was offered by the UW - Madison's new turfgrass and ornamental entomologist, Dr. Chris Williamson. Dr. Williamson covered topics ranging from the old insecticides to the new generation of materials that are available. He also spoke about the problems he has seen this spring. Timing is everything in controlling grubs, the number one pest for golf courses in this state. Japanese beetles feed as adults and larve and flourish in wet conditions. Treating in August closer to the soil surface can result in great success. Dr. Williamson is going to be a great asset to us - he was a golf course superintendent himself not all that long ago.

Golf followed, and the event was a two-man bestball of four. First place, with a score of 124, went to Jim Van Meter, Bruce Schweiger, Conrad Stynchula, and James Krutilla. Second place, close behind with a score of 125, went to Skip Wilms, Chad Ball, Bruce Worzella, and Jim Yost. Third place, with a score of 126, went to Jeff Millies, Fred Millies, Marc Davison, and Dr. Williamson. Flag event winners - all closest to the pin - were Louie Alexandroni, Scott Wendels, Pat Staehler, and Mike Yontz.

Joe Fryman, superintendent for Lake Arrowhead, and his staff had the new 18 holes playing great. It is a wonderful addition to the original 18. Thanks to Joe, Joel Barth (director of golf) and everyone at Lake Arrowhead for working to make our visit there so enjoyable.

WGCSA Meets at Green Bay Country Club

By Mike Lyons, *Golf Course Superintendent, Old Hickory Golf Club*

Marc Davison, host superintendent for the May WGCSA meeting, and his staff had Green Bay Country Club looking and playing great. There were 106 golfers and 110 members and affiliates for dinner and an educational session. Steve Davis of Agrevo was the guest speaker.

Mr. Davis' talk was on Poa annua control. He also briefly discussed earthworm suppression, removal of bentgrass in bluegrass, and microbes in the soil. The presentation was interesting and well done.

The event of the day was a two-man blind partner bestball. First place, with a score of 59, was David Brandenburg and Andy Gruse. Second place, with a score of 62, was Allen Fude and Stan Lushine. The third place score of 63 went to Dan Webb and Dean Musbach. Flag event winners were Tim Peterson and Bruce Worzella - closest to the pin, Jack Fowler - long put, and Scott Wendels - long drive.

Thanks again to Marc and the GBCC staff for an excellent meeting.

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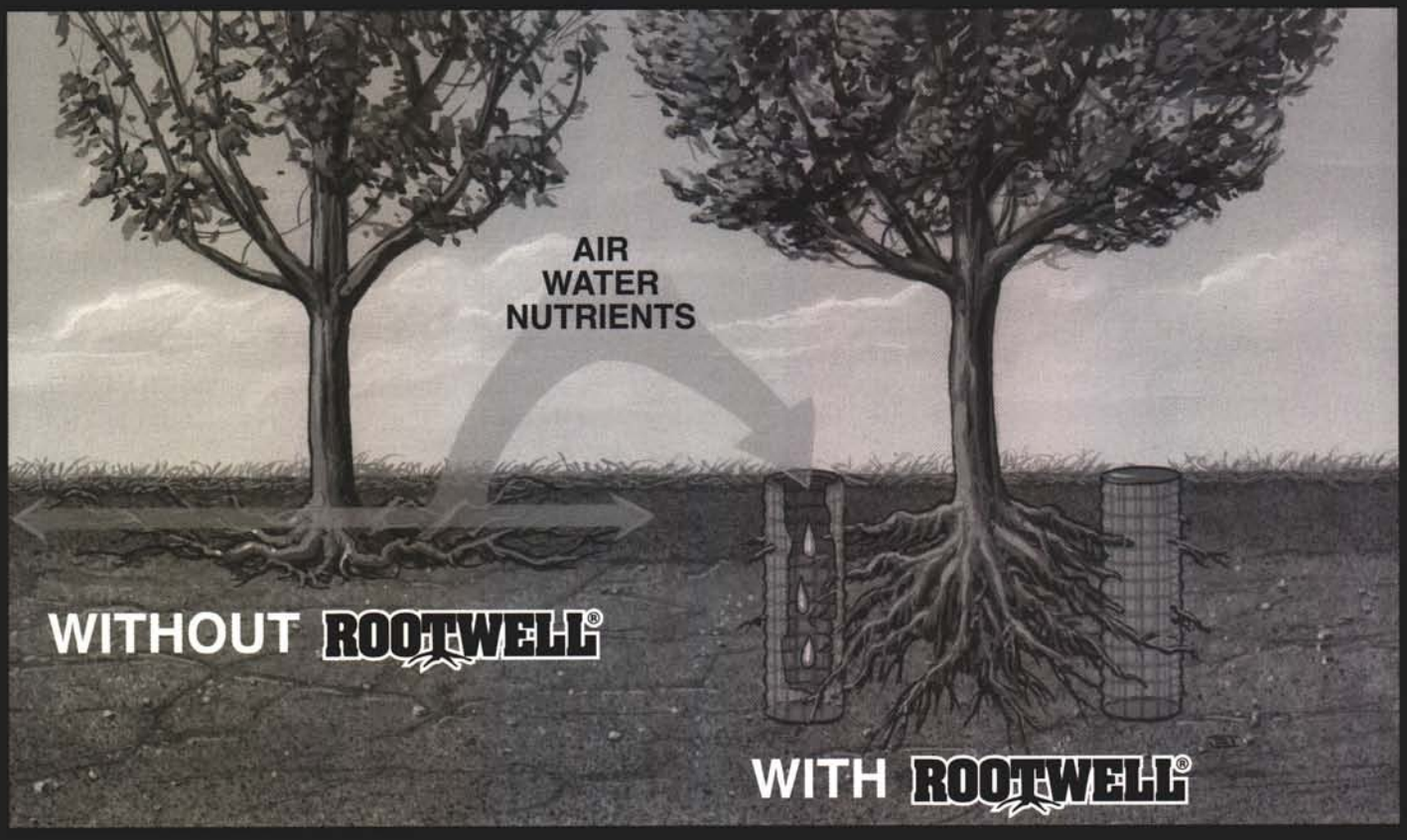

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Lowering Soil pH with Elemental Sulfur

By Dr. James Camberato, *Clemson University*

Editor's Note: A good portion of Wisconsin soils are alkaline in nature, and research in several diseases has shown part of their control can be accomplished with the cultural measure of lowering the soil pH. Therefore, this article by Dr. Jim Camberato, which appeared in the Volume 35, Number 35, May-June 1999 issue of Carolinas Green, clearly could be helpful to Wisconsin golf course superintendents like it undoubtedly was to those in North and South Carolina. It also nicely complements what Dr. Wayne Kussow has written on the issue in this journal.

Chuck Borman, editor of Carolinas Green, and Jim Camberato have both granted permission to reprint it in this issue of The Grass Roots. Thanks to both of them.

In the Carolinas excessively high soil pH occurs in Coastal areas when high bicarbonate water is used for irrigation. With alkaline water, soil pH will increase over time and stabilize around pH 8.2, if calcium is the predominant cation in the soil. Calcium carbonate (lime) is formed in the soil at this pH. Soil pH can exceed pH 8.2 when sodium, rather than calcium, is the dominant cation. In these soils lowering pH is necessary to increase the availability of calcium and micronutrients, particularly iron and manganese. Elemental sulfur (S) is often chosen to lower soil pH, but it must be used carefully. Elemental S has a high potential to burn plant tissue and can lower soil pH too much (pH less than 4.0 is possible) if used improperly or at too high an application rate.

Mode of Action

Sulfur is oxidized by soil bacteria, thereby forming sulfuric acid which is the substance that lowers soil pH. Each 10 pounds of elemental S generates enough acidity to neutralize 30 pounds of line. Warm temperatures and good moisture and aeration are required for S oxidizing bacteria to function. Sulfur oxidation is minimal at soil temperatures less than 50 degrees F. Consequently S oxidation in the winter can be limited even in our mild climate. Sulfur lies 'dormant' in the winter, however, will be oxidized when hot temperatures occur. Even at 75 degrees F the oxidation rate of S is about 15% of that at 85 degrees F, so peak rates of S oxidation don't occur until late spring. Applications are best made when

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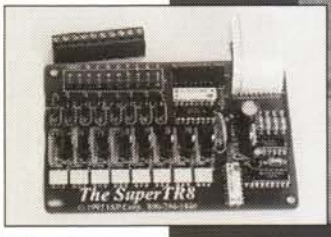

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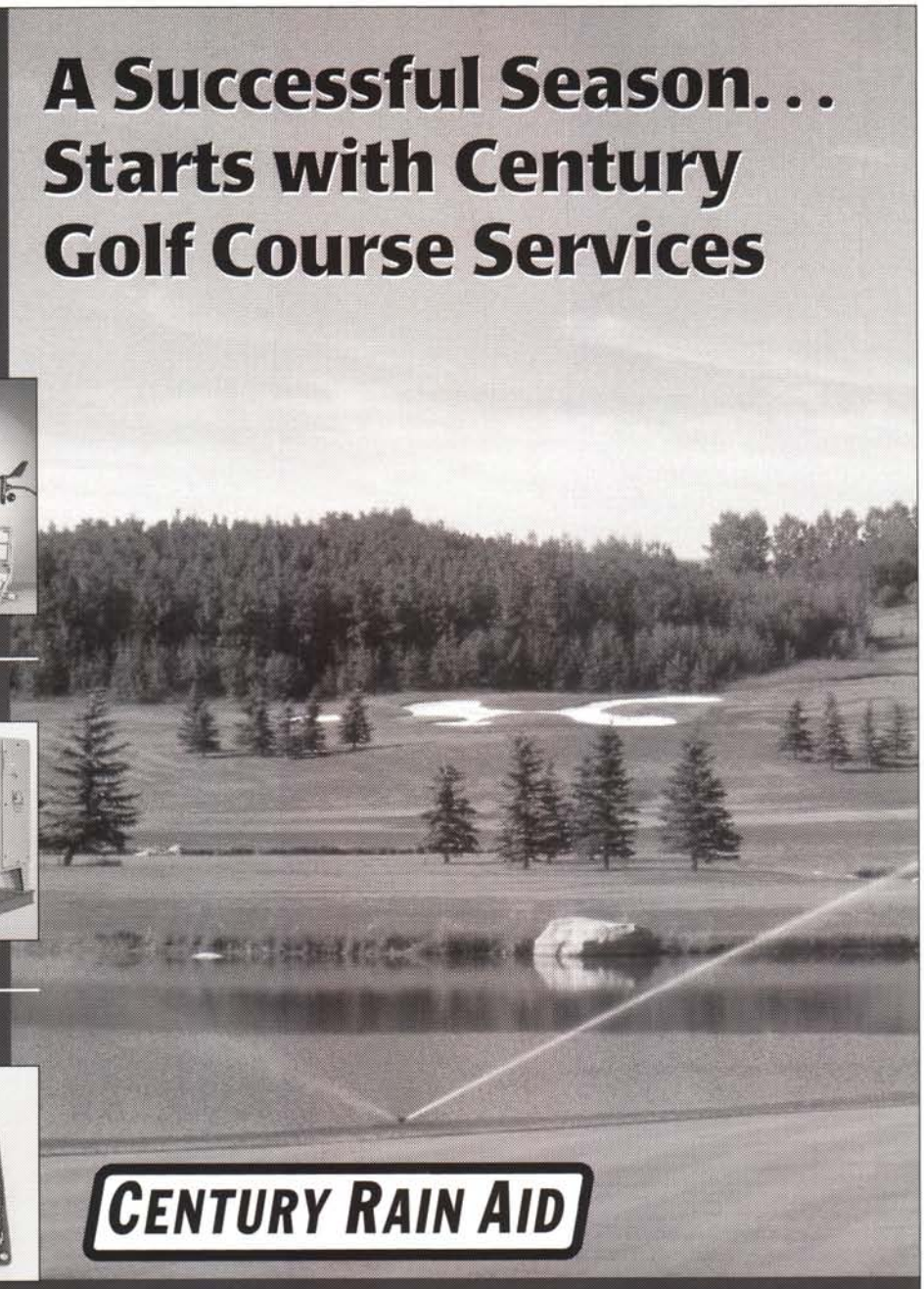

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temperatures are warm enough for the bacteria to oxidize the S (70 - 80 degrees F), but not hot enough to accentuate tissue burn.

Advantages of Incorporation Over Surface Application

Sulfuric acid produced on leaf and crown tissue can burn these tissues. Incorporation of S into the soil by application just after core aerification is a good method for reducing burn. In addition, incorporated S is preferred over surface application because acidification is accelerated and a greater volume of soil is treated.

1) Less chance for leaf and crown damage with incorporated applications. *Sulfuric acid generated on leaves and in thatch can damage foliage and destroy crown. Contact with the soil buffers the decrease in soil pH around the S particle so this damage is limited.*

2) Faster reaction of incorporated S in comparison to surface applied S occurs because of higher soil moisture levels. *Sulfur oxidation requires good moisture which is more prevalent in the soil than in the thatch or on the leaf surface. Plenty of irrigation water should be applied to wash the S from the turfgrass leaves after any method of application.*

3) Incorporated applications acidify a larger portion of the root zone than surface applications. *Elemental S is immobile in the soil so surface applications remain on the soil surface. Even after the S is oxidized the acidity produced is slow to move into the root zone. Consequently severe decreases in pH may occur in the thatch layer and immediate soil surface with little impact on the remainder of the root zone.*

Sulfur Application Rates

Sulfur application may be warranted on soils with pH in the high 7's or greater. Using S on soils of lower pH is usually not necessary and can be dangerous due to over-acidification. Calcium should be added to soils dominated by sodium at the same time soil pH is lowered with S.

Sulfur rates should be low to avoid damage to the crowns of the turfgrass plant. Each application to bermudagrass at fairway or rough height should be less than 5 pounds per 1000 square feet, with lower rates being safer. Applications to greens should not exceed 0.5 pounds per 1000 square feet per application. *It is wise to check the soil pH before reapplication of S to avoid over-acidification, especially on sand-based greens that have little capacity to buffer changes in soil pH.* Before taking a soil sample and considering reapplication of S, ensure that temperatures and time were sufficient for the S to have been oxidized, greater than 75 degrees F and 4 to 6 weeks. Commercial S sources range in purity from 50 to 99%, so remember to adjust the application rate based on the S content of the material.