

NEW IDEAS AND PRACTICES FOR TURF MANAGEMENT ON GOLF COURSES IN A CHANGED ECONOMIC ENVIRONMENT

by Vaclav Zolman

The Turf Symposium in Milwaukee, The Turf Clinic at Medinah Country Club, the Turf Conferences at the University of Illinois and Purdue, the Turf Conference and Show in New Orleans, and the Chicago District Golf Association seminar presented new fruitful programs for golf superintendents. The theme of the lectures and discussion was management of golf courses under present economic conditions. An intensive search for new and efficient methods has been aimed at an old problem: turfgrasses cannot grow naturally when attacked by diseases and fungi, or later when invaded by weeds and nematodes. Even more importantly, the results with expensive pesticides are not satisfactory on infected golf courses. Therefore, the superintendents and experts are intensively looking for new natural, practical, and more efficient measures in turf management. In this article, we summarize and evaluate methods used on golf courses in the Northeast, the West, and the Midwest.

I. Old Chicago Turf Management Style

As in most regions of the United States, turf management in Chicago has been developed from the maintenance of pastures. It relies upon the use of certain rules for fertilizing and chemicals. The rules were established for all maintenance work on golf courses. (For example: the soil mixture on greens should be natural or 1/3 soil, 1/3 peat, 1/3 sand or 1:1:1) Fertilizing programs features 12-4-8 formulations. Preventive applications of pesticides (fungicides) started in early Spring and continued at weekly intervals until fall. Soil and irrigation water testing was not considered essential.

Golf courses following the old practices have turf problems, more disease and fungi develop, and weeds, *Poa*, are prevalent. Superintendents rarely produce quality turf uniformly on all greens and tees. Usually, greens and tees must be rebuilt, and fairways reseeded after a period of years. This approach to turf management is very expensive, since the price of fertilizer and pesticides is booming, and the labor for rebuilding greens and tees has increased.

II. Purdue Method of Turf Improvement

(Dr. William Daniel)

The principle of this method is the chemical interaction and affinity between arsenic (As) and phosphorus (P) and arsenic toxicity. Arsenic is more toxic to some weeds, such as *Poa*, than to other turfgrasses. In the beginning, the arsenic program works in favorable soil, good drainage, and climatic conditions. Repeated applications of arsenic accumulate in the soil to a point toxic to turfgrasses. Conditions favorable for spreading disease and thatch is built up.¹ Therefore, the arsenic program cannot be recommended as a permanent turf management practice.

III. California Method of Turf Improvement

(Dr. J. Madison)

In California, turfgrasses on golf courses die because of very high concentrations of salts (sodium) in the topsoil and irrigation water. A fertilizing program including heavy applications of nitrogen and intensive spraying for diseases does not help. Only a light topdressing (80% sand and 20% peat) applied at three week intervals brings good results. Thus, the California method improves the physical properties of the soil, the soil structure, and dilutes the salts in the topsoil. This

method of turf management works, especially on greens and tees with high proportions of clay and organic matter. The limiting factor is getting too sandy a topsoil. This method is fully acceptable as a permanent practice.

IV. Northeast Method of Turf Improvement

According to Elliot Roberts,² turfgrasses on golf courses in the Northeast were hit hard by Fungus in 1973. Successful results using applications of wetting agents was reported at the Milwaukee Symposium and the Urbana Conference. Theoretically, because of chemical interactions the toxic salts in the topsoil were diluted and leached down into the subsoil, decreasing their toxicity to the turfgrasses.

Wetting agents can help in certain soil conditions, temporarily. However, this method and the fertilizing program contradict each other. On the one hand, reserves of nutrients are being built up in the soil from expensive fertilizers, and on the other hand, the same nutrients are leached out using wetting agents. Wetting agent application can be hazardous if the chemical composition of the soil is unknown.

V. Illinois Method for Turf Improvement

(Dr. Al Turgeon)

Illinois favors planting of new varieties which are genetically resistant to diseases and fungi, and well adapted to the local climate. They emphasize a good preventative fungicide program. However, some pesticides, including mercury, arsenic and lead compounds have been, or will be, banned in many states soon. Some pesticides applied for years in the past remain in residue polluting the soil. These are toxic to the microbial complex in the soil providing a stimulus for spreading disease and fungi. Other pesticides stop natural growth of turfplants if not applied properly (Arsenic compounds, Dyrene, Chlordane, Tersan 1991)

The selection of new resistant varieties of turfgrasses, adopted to our climate is fully recommended, but the permanent preventative pesticide program is not fully acceptable. The safest and most effective program is healthy turf. Balancing the soil environment can be aided by complete soil testing.

VI. Up-to-Date Management in the Chicago Area

Inflation, recession, rising prices of fertilizers and pesticides has hit the golf course business hard. One effective tool for economical management is soil testing. Charles Baskin, past president GCSAA, William Knoop, Director of Education GCSAA, and William Daniel, Purdue University, highly recommend soil testing. At the National Conference in New Orleans, John Jackman, Superintendent, Medinah Country Club suggested a complete testing of soil plus irrigation water. He has profited by test results on his three golf courses over the past ten years. Many other progressive superintendents have benefitted from the information soil tests can provide.

The concept of the new turf management program is similar to that used in human medicine. Thorough diagnosis and then treatment. A complete test of soil and irrigation water administered by Brookside Laboratories consists of 26 separate measurements. The nutritional level of the soil is rated in accordance with established standards for turf soil. A program for upgrading or correcting your conditions, balancing your soil environment, is then scheduled over a three year period.

Advantages of this new program, soil diagnosis and follow up therapy, are numerous. Financial return of the money invested in soil and water analysis is inevitable.

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The structure of the topsoil is corrected to standard for the best growth of turfgrasses. The nutrients present in the soil or water; whether tied up in reserve, present in excess, or at toxic levels can be utilized. The toxic effect of chemicals can be controlled or eliminated. pH is corrected automatically. The nutrients supplied in fertilizers (10-10-10 or 12-4-8) will not accumulate in the soil in harmful excess polluting the soil, because investment will be made only for those macro elements or trace elements found lacking and necessary for proper balance. Systematic balancing of essential nutrients in the soil will decrease the amount of expensive fertilizer used (nitrogen).

Essential micronutrients properly selected and calibrated, contribute to the utilization of the macro-nutrients supplied from fertilizers. Minor elements contribute 20-30% to turfgrass growth say some scientists. Expensive pesticides can be replaced in their function by low cost minor elements if prescribed by a soil test. One case of pesticide, 10 lbs. cost over \$100.00 compared with 10 lbs. of minor elements for \$2.00, which may produce better results.

Rebuilding a golf course can be very expensive. A single putting green today costs between \$8,000 and \$15,000. We can avoid rebuilding greens and tees, and renovating fairways by balancing existing topsoil to turf needs. Money invested in good thorough testing yields the highest financial return.

A good superintendent is responsible for the golf course turf-wise but also for the economical prosperity of the club. The superintendents most reliable tool is his soil and water test results. He must recognize the merits of others, and use current research technology when it is applicable. Healthy turf attracts more golfers. This means not only fame and prestige for the club, but more money in the budget to face future burdens.

¹Davis, RR, Nutrition and Fertilizers. Turfgrass Science, A.A. Hanson and F. Juska, American Society of Agronomy 1969, p 138

Record, Lee "The Turf Management Picture in 1973 As We Saw It" USGA Green Section Record, March 1974, p 16

Turgeon, Al "Effects of Repeated Applications of Preemergence Herbicides on Kentucky Bluegrass." Agronomy Abstr. 1974 Annual Meeting in Chicago, Nov. 1974, p 102

²Roberts, Elliot "The Fungus Among Us". The Golf Superintendent March 1974, p 22

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