

Sand plan for healthy turf

A new management programme for greens

Since World War II, we have seen play on some nearby golf courses go from 20,000 rounds a year to over 100,000 rounds a year. The pattern has been the same throughout the country. This has required changed maintenance practices, principally an increased use of nitrogen fertilizer and water to grow more grass in order to keep up with wear. Because the resulting grass is more succulent and more attractive to insects and fungi, increased amounts of control chemicals have been used. Increased irrigation and increased play have aggravated compaction, which is relieved by use of coring machines.

We now use maximum amounts of fertilizer on greens, but play continues to increase. What direction can we take now? In considering this question, we felt that a different approach to putting green maintenance was worth considering.

Although great progress has been made in putting green management over the past 25 years, the major problems continue to include thatch and compaction. Thatch provides a reservoir for diseases and both thatch and compaction limit air, water and root movement in soil. Coring, to relieve the problem, creates a serious weed problem with *Poa annua*, goose-grass and crabgrass.

Our solution to these problems is to provide light and frequent top-dressing with sand in the 0.05 to 1.0 mm range. This sand will drop out of sight and the golfer will never know the green has been dressed. Just enough sand is applied to mingle with the stolons and prevent a thatch layer from forming. Coring is eliminated because compaction is reduced. Bentgrass seed is added to the top-dressing

About the Author:

Dr. John H. Madison was born in the Midwest, raised in New England and received his Ph.D. in plant physiology at Cornell University, New York. He came to the University of California, Davis campus in 1953 where he has worked continuously with turf-grasses. He is the author of two major texts; "Principles of Turfgrass Culture" and "Practical Turfgrass Management" as well as many other publications.

so there is continual crowding of weeds and rapid replacement of turf whenever bare areas occur. For the sake of economy, seed, herbicides, insecticides, and fertilizer are added to the top-dressing so all operations are combined.

When the program is begun on an existing green, there may be some immediate response if the green is badly thatchbound. If the green is the ordinary layer cake of thatch and sand layers occasionally pierced by aerifier holes, no immediate results should be expected. However, by the end of the second growing season there should be noticeable weed suppression and good general vigour. Improved rooting should begin to result in a turf more tolerant of stress.

The program

We top-dress every three weeks with the following materials.

Sand-0.05-1.0 mm
(- 18 + 200
screen)

[Continued on facing Page]

[Sand Plan/continued]

Nitrogen source
to provide Nat

K_2SO_4

Dolomitic lime
(acid soils or
dolomitic
gypsum (soils
above pH 6.5)

(If dolomites are
not available
add Epsom
salts

Zinc chelate or
mixed minor
element chelates

Iron chelate

Phosphorus source
to provide P at
Bentgrass seed

When pesticides are used, we add them as wettable powders to give the recommended rate. We alternated between the insecticides Diazinon, a somewhat systemic phosphate, and Sevin, a carbamate. Depending on season and disease, we have used thiram, Dexon, captan, Koban, and Daconil 2728. ®

How the program has worked so far.

1. Amount and Frequency of Top-dressing: This is critical. The goal is to apply just enough sand just often enough so thatch is mixed with sand but a good cushion or mat is left above the sand.

We apply 3 cubic feet of sand per 1,000 square feet at three-week intervals, 15 times a year. This is a little over $\frac{1}{2}$ inch of sand per year.

2. Top-dressing Sand: Sand, as specified (- 18 200), will drop from sight as soon as it dries, or it may be washed in by turning on the irrigation system for a minute or two. If the application is not even, one may need to drag or broom it in. The golfer should never know the green was top-dressed. Keep looking for a good sand.

3. Top-dressing Practice: We find that top-dressing machines apply material evenly at low rates. We figure

on adding $\frac{1}{28}$ " of sand at each treatment.

If mixing top-dressing requires buying special equipment, the sand and fertility programs can be separated during the initial 2-4 year test period. For good mixing, the sand should be slightly damp.

4. Coring: A coring machine can be well used to break the interface at the first top-dressing. After that the coring machine should be prohibited. It is no longer needed and its use spoils the benefit of weed control.

5. Weed control: Most weed seeds require light to germinate. Top-dressing buries them and replaces them with grass seed.

6. Disease Control: Top-dressing should reduce inoculum by burying it. We have had Pythium on our aprons that failed to enter the experimental area. Top-dressing areas, in shade, continue to get Fusarium patch during long periods of cold, wet over-cast.

7. Insect Control: Without thatch, it is more difficult for caterpillars to burrow and easier for birds to find them, but control is still necessary. Insecticides in the top-dressing are effective.

8. Mineral Nutrition: Different sands are more or less mineral rich. The minerals added are for assurance—actual need may be less. When more nitrogen is used, other minerals should be increased in proportion.

9. Organic Matter: No organic matter is used in the top-dressing. This program is to control excess organic matter—thatch. Grass creates its own organic matter which adds to the cation exchange capacity of the soil.

With grateful acknowledgement to USGA Green Section RECORD a publication on Turf Management by the U.S. Golf Association.