

# GRAU'S ANSWERS TO TURF QUESTIONS

BY FRED V. GRAU



## Lime's Role in Turf Sanitation Is Poorly Understood

The supt. is deeply involved with sanitation. His concern is to maintain sturdy, healthy turf as free as possible from fungus diseases and troublesome insects. Several now common practices contribute significantly to sanitation in turf.

Aeration (aerifying, coring, slitting) stands at the top of the list. Several excellent machines pierce crusted soil to free poisoned air and admit fresh air charged with oxygen. Abundant oxygen in the soil pores is of primary importance to turf sanitation. Beneficial bacteria must have oxygen so that they may reduce organic wastes, render nutrients available to the plants, and consume disease-producing fungi, slimes and algae. Reduction of organic wastes (excess clippings, lignin and protein residues from organic amendments, dead roots) is essential to the production of healthy turf.

Thatch Removal (verticutting, aerothatching, renovating) at intervals reduces the accumulation of excess grass growth which, in the absence of bacterial decay, creates a severe problem.

Thatch in turf acts just like thatch on a roof — it keeps out water.

Furthermore, diseases and insects are snugly harbored in thatch awaiting only the proper environment (moisture, temperature, pH) to wipe out or severely damage the turf.

### Bacteria Need Food

Fertilization (N-P-K in proper balance) is an integral part of sanitation. Bacteria needed for organic breakdown require carbon for energy and nitrogen for food. Many fertilizers furnish little or no carbon, forcing bacteria to draw from sources in the soil. When carbon is inadequate nitrogen can not be utilized effectively.

Some of the newer, synthetic fertilizers are excellent sources of C and N for bacteria. Other things being equal, stimulation of bacteria favors turfgrass sanitation.

Lime (ground agricultural limestone, burned lime, oyster shell lime, hydrated lime) plays a remarkable, but poorly understood, role in turf sanitation. Active calcium and magnesium as nutrients are essential for the maximum activity of bacteria. Lime adjusts pH toward the neutral or alkaline range where other essential nutrients become more available to plants. Most fungi grow best under acid conditions which develop in the soil and in the microclimate (the space between tips of grass blades and the soil). Many cases of fungus control with lime have been recorded. This includes dollarspot on fairways, brownpatch on greens and leafspot complexes (notably *Helminthosporium* and *Curvularia* acting alone or in combination).

### Value of Lime

Dramatic evidence of the value of light treatments with hydrated lime in checking leafspot diseases was recorded in July and August of 1963 in Omaha, Lincoln, Kansas City, Springfield, Mo., and other Midwestern cities. A telephone call described destruction of putting green turf under prolonged 95 plus temperatures with very high humidity. Damage was described as "water soaked," "turf seems to wear out," "grass seems to be melting." Fungicides were powerless to control these things.

Over the phone we recommended: Spray hydrated lime at  $\frac{1}{2}$  to 1 lb. per 1,000 sq. ft. with and without 2 lbs. per 1,000 sq. ft. of insoluble powdered nitrogen material and leave a control (check) plot.

Two days later a personal inspection revealed:



# Growing Turf the Hard Way

Second in a series by TOM MASCARO



*When a golfer misses a putt any thing can happen!!!*

1. Hydrated lime alone stopped disease and grass had recovered about 50 per cent.
2. Hydrated lime plus 2 lbs. per 1,000 sq. ft. of powdered nitrogen material stopped disease and grass had recovered about 75 per cent.
3. Control (check) plots steadily deteriorated under continued 95+ temperatures.

## Start to Collect Clippings

One complaint was that grass wouldn't grow — no clippings. Two days after the lime-plus treatments, mower baskets once more started filling.

Too simple? Perhaps. But let's look at what seemed to take place. The hot-humid microclimate was highly favorable to the fungi that were operating to make the grass "melt" or "wear out." The light spray of hydrated lime, lightly rinsed in, caused a "flash" change in the microclimate to a high of pH 9.5 or thereabouts. (No actual measurements were taken here — this is factual information from previous research.)

Fungi wither at this high pH range and can not survive. Necessary bacteria are encouraged once more and effective turfgrass sanitation is achieved. The small

addition of nitrogen added further stimulus to the bacteria (carbon and nitrogen). Grass started to grow and recover from the disease(s), even with continued unfavorable growing conditions.

Where inorganic mercury materials had been used for diseases, grass growth was checked severely and recovery was slow.

Sanitation in turfgrass may be furthered by several procedures, not the least of which is the timely and judicious use of lime. Let not the reader be confused by soil tests which read "pH 7.0" or "pH 7.4" It is possible for the pH in the microclimate to be in the acid range and thus highly favorable to fungus diseases, even though the soil reaction below is neutral to alkaline (favorable).

This department welcomes letters pro and con on experiences in sanitation with lime and other methods and materials. The concept of turfgrass sanitation deserves thorough study.

## A Black Algae Problem

**Q.** Each fall when the rains come some of our greens are severely affected by black algae. Is there a cure-all that would stop this when the greens get too much water?

**A.** We have a thatch problem but the turf is  
(Continued on page 76)

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## Grau's Questions and Answers

(Continued from page 46)

healthy and thick. There are no thin spots, yet the algae comes year in, year out. I suspect that the drainage problem and the thatch make conditions ideal for algae. It always forms just where the water collects before running off the green.

We use a fertilizer recommended by an agronomist. Some say this is why we have algae so bad but I've seen algae in the fairways where there is too much water and no fertilizer. It is even in dry places where the water has laid for a day or two and then dried up.

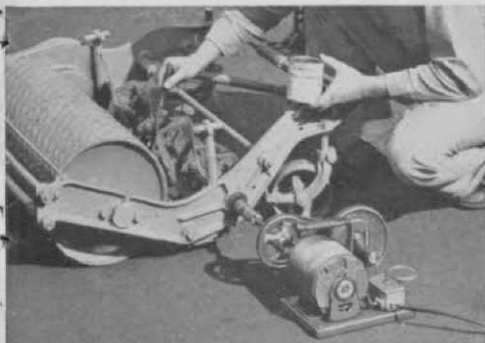
(Washington)

A. Poor drainage and thatch certainly will help aggravate the algae problem. Correcting the drainage is a major problem which should be undertaken after consultation with a specialist who can study the situation.

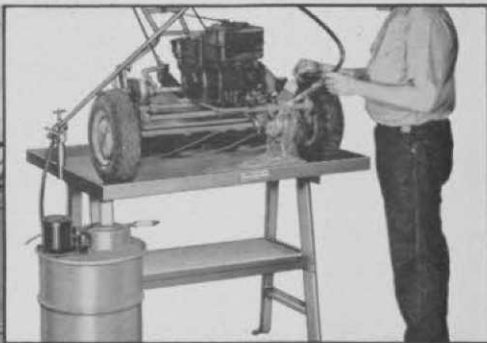
Thatch can be reduced mechanically with any of the several excellent machines on the market. But reduce it gradually and adequately fertilize to maintain vigorous turf and good playing conditions. Soil cultivation is essential to provide better aeration so that bacteria can be encouraged to reduce the thatch.

You do not mention the pH value of the soil but it is well known that periodic applications of ground limestone greatly encourages decomposition of thatch. Two applications a year at 25 lbs. to 1,000 sq. ft. each time can be a

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great help. The soil itself quite possibly could be neutral but the thatch creates acid conditions which must be corrected.

When algae appears, it is a good plan to dust hydrated lime on the greens. Two pounds to 1,000 sq. ft. will do a good job of checking algae, especially if it can be applied and allowed to lie overnight as a dust without being wetted by rain or irrigation.

## Fall Renovation to Improve Fairways

**Q.** Enclosed please find soil report of our fairways. The course is two years old and is laid out on dairy and crop farmland. The fairways are in poor condition and we want to start improving them. I have talked to several supts. and fertilizer people, but no one can explain "facultative anaerobes" mentioned in the report. Neither does the report mention lime even though the pH ranges from 5.1 to 6.1. If you recommend lime, tell me how much, what kind and the best time to apply. (New York)

**A.** The soil test report is difficult to interpret. My analysis is that you need lime and nitrogen, no P or K until later soil tests show the need. In early fall cultivate the fairways thoroughly, then apply one ton per acre of dolomitic ground limestone. At the same time apply 150 pounds of actual nitrogen to the acre (4 lbs./M<sup>2</sup>). By cultivating well, the nitrogen material will go into the soil where, if it is a soluble, it will minimize burning. If it is an insoluble, it comes in contact with soil bacteria which will start releasing the N.

None of my soils books mention "facultative



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anaerobes". Essentially they are bacteria that can work with or without oxygen. Don't worry about them — they will adjust.

Since there is ample P and K in your soil, I disagree with the recommendation that you should use a 5-10-10 fertilizer to correct acidity.

Under no circumstances should you follow the recommendation to spray twice daily with a 10 to 20 per cent copper sulfate solution. It can render bacteria harmless and poison the soil so that grass can not grow.

## Golf Car Manufacturers Granted Charter

Following the July 14 executive board meeting of the American Golf Car Manufacturers' Assn., James H. Carrier, president, has announced the approval and adoption of association by-laws and receipt of a charter by the State of Illinois to operate as a non-profit organization. Carrier reports that valuable progress has been made in discussions of the manpower, materials and operating procedure for attaining the association's objectives. All golf car manufacturers are invited to join the AGCMA. The association is seeking an executive secretary. Those interested in the position are invited to send a complete resume and recent photograph to American Golf Car Manufacturers' Assn., P.O. Box 8373, Chicago, Ill.