

# Acid Rain

## Is there danger to turf?

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Recently an article appeared in a Toronto, Canada, newspaper claiming that acid rain has killed the fish in many of the lakes in NE Ontario. This article claimed that the acidity of the rain was caused by pollution from the burning of high sulphur coal. (Ohio coal is high sulphur.)

Governor James A. Rhodes wisely appointed Dr. Widenfaul, of the Ohio Research and Development Center, Agronomy Department to study and monitor rainfall to determine the acidity and other elements.

Acid Rain is not something new. Dr. Widenfaul tells the writer that the Swedish Ag. Dept. has kept records for 35 years. At OARDC he tests the rain water weekly (averaging).

In the agricultural areas where 30" or more of rain falls, 25 lbs. of lime (calcium and Magnesium) are lost per



1,000 sq. ft. annually (1,000 lbs per acre). The Ag. Dept. of our government had a program of supplying, at cost to the farmer, 2 tons per acre, of lime every 4 years for his crops. This neutralized the acid rain, and also took care of the elements lost to drainage and run-off.

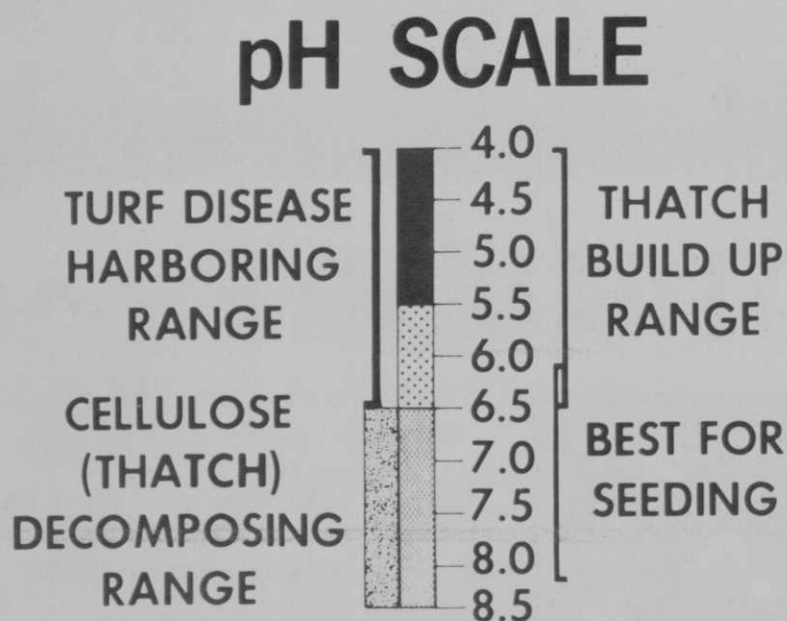
Testing every rain storm, for its acidity and the nitrogen content is new to the turf grass industry. At Lyons Den we are now making records of each rain cycle, (daily if necessary). We are looking at it from the effects that acid rain has on diseases of turf on the golf greens.

Note from the chart below, that as the turf becomes acid in thatch or soil the fungi population increases in proportion to the acidity. Also, thatch builds up faster at the lower pH ranges. (Thatch is the enemy of all fine turf.)

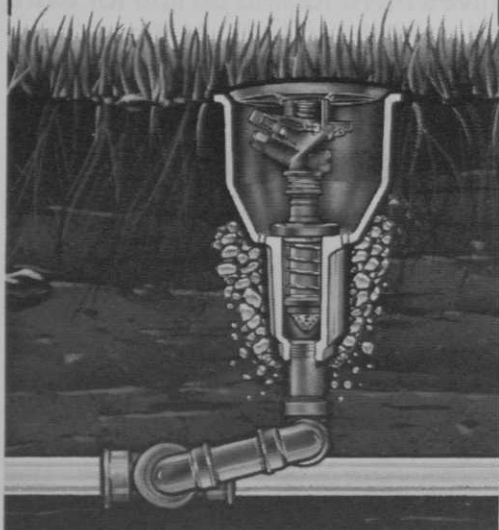
Correcting acidity in turf is only one step toward better disease control. Yet, it is basic. If the pH in both thatch and soil is pH 7.0 or above, then fungicides will have to be used to control diseases. As you can see from the chart, it might be well to apply lime to raise the pH level first and if this does not give control, then select the fungicide that one thinks will control the specific disease.

In the past most emphasis was placed on the pH of soil only, where as

*Continues on page 10*



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### Acid rain from page 8

the disease problem was in the thatch which could have a low pH while the soil pH is neutral or above; such as with some high sand content greens.

Dr. James Boyce, former Research Director of turf grasses for all of Canada, thinks we have opened a new line of thinking in connection with why we have so many summer time turfgrass diseases.

Dr. Patricia Sanders, Pathologist, Penn State University, was excited to learn of what we are doing with acid rain versus disease.

One golf superintendent whom I do not wish to name has a secret. His is one of America's greatest courses. Not having given acid rain a thought until we talked, he normally applies 10 lbs. of superfine dolomite lime, (raw rock powdered) per 1,000 sq. ft. to his fairways, FOUR times a year.

Dr. Fred V. Grau, retired director from USGA Green Section, has preached 1 lb. of hydrated lime plus 2 lbs. of urea formaldehyde fertilizer per 1,000 sq. ft. on golf greens for many years. Was he counteracting acid rain?

The late Paul Truckenbrod, Sunnysbrook Golf, Kent, Ohio, taught us to dust hydrated lime on golf greens late in the evening, before fungicides were available, to counteract or control as best we could the humid-weather diseases of turf.

The late Colin Smith, Shaker Heights Country Club may not have known about acid rain 40 years ago, but he knew that something was happening so he had John Spodnik, now grounds manager for Westfield properties, Westfield, Ohio, put on 25 lbs. of superfine Dolomite Lime per 1,000 sq. ft. to the greens every spring. (Always great greens.)

From this you can see that lime is the only thing we have to counteract acidity in the thatch layer of turf. It might be caused partially by acid rain. We are studying it.

When the rain was 3.8 pH recently, we had an outbreak of a disease we had never seen before. It hit only one strain of grass in the greens. Now we record daily the pH of the water we know as guttated water (dew) on the greens. These are at a low enough range to harbor or incubate diseases.

In the Lyons Agricultural & Soil Test Kit we include the Purdue University method (3 reagents) with color charts to test the rain (can also be used to test thatch and soil).

As a cross check we have added

Squibbs Nitrazine paper that has a wide range, 4.0 up to 8.5 pH. A cross check if you please.

The more Tender-Loving Care we gave our No. 3 fairway in 1977, the less grass we grew and the more fungi we had eating away the turf. Here we developed the Purdue Method of testing thatch. The pH of the thatch was 4.5 pH. That layer was, like many home lawns 2" deep. By applying 100 lbs. of superfine lime per 1,000 sq. ft. plus aerifying, plus 10 lbs. of 15-15-15 fertilizer per 1,000 sq. ft., aerified four times, only 1 lb. of Manhattan rye grass seed, this fairway got well, the thatch oxidized and we have had a decent fairway for the past three seasons. This is the only way to economically eliminate thatch.

We are developing some new programs at Lyons Den that are too early to talk about. Perhaps our studies of 1980 will be available for 1981. Would a spray lime system be practical to counteract acid rain? We shall try.

### Suggested Technique for Testing Rain Water

In the Lyons Agricultural Soil and Plant tissue Test Kit: Use the 3 - spot plate

1. Fill each with rain water. (Keep spots clean.)
2. To each spot add 1 drop of each of the 3 reagents.
3. Use the special in the center spot, use No. 1 on the left and No. 2 on right.
4. Stir with a clean plastic stir and do not use the same one on each spot. Contamination.
5. Compare the colors on the chart.

### Testing Dew (Guttated Water)

1. Dampen the Whatman filter paper but keep fingers off the area to be tested.
2. Apply just 1 drop of each of the 3 reagents
3. Compare colors.

The use of Squibb's Nitrazine paper is another quick test. A roll of this is available at most drug stores, costing approximately \$7.50. Wet about a 1" strip in either rain water or guttated water (dew). A color chart is on the side of roll. We use this as a cross check. Finally, we suggest that all chemicals be renewed annually.