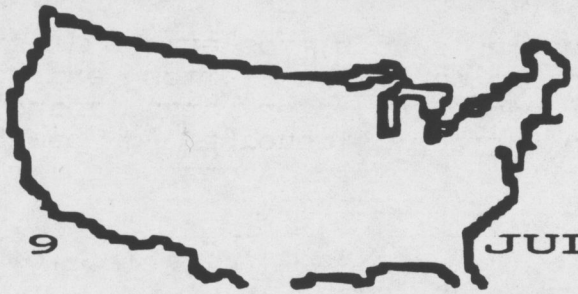
TURFCOMMS



V. 6, I. 9 JULY 29, '92

PURPOSE: To pass on what we learn willingly and happily to others in the profession so as to improve turf conditions around the country.

SULFURIC ACID/UREA INJECTION : My investigation of acid/urea treatment of irrigation water as it is being done in the Greater Dallas area showed it to be very beneficial where the user's water source was the high bicarbonate water common to the Trinity Group Aquifer*. Also users with high sodium water were being helped. By the same token a user with water polluted by runoff from an airport and users with high calcium water did not appear to be measurably helped with this product. It is generally agreed by agronomist dealing with high sodium or high bicarbonate water that acid injection of the water or sulfur treatment of the soil is needed to counteract the affect of the water's chemistry on the soil's physical and chemical properties.

Acid materials reduce the tie up of calcium by the bicarbonate ion and make it easier to flush out the sodium. They do not reduce the salt level or get rid of the sodium; you still need a good flushing rain, or excess irrigation and good drainage. Sodium has a tendency to seal the soil so that even greens with great percolation rates may have infiltration rates of less than one inch per hour. Clay fairways become excellent pond bottoms. The main function of the urea in this acid/urea material is to react with the sulfuric acid and thus give you a relatively safe acid fertilizer.

Sulfuric acid could be injected more economically and just as effectively put would require all sorts of safety measures which would quickly eliminate the money saved with the low cost of sulfuric acid. Sulfur can be applied to the soil at five pounds per thousand. With bad water quality several applications per year will be needed. On bentgrass greens fall applications are much safer than those made in spring or summer.

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*For clarification: the Trinity Group Aquifer consists of several formations lying on top of each other in which the waters from one formation appear in many cases to now be mixed with the others due to the numerous old wells connecting them. The formations are the Paluxy, Glen Rose and Travis Peak (Twin Mountains) Formations. The Paluxy and Travis Peak Formations are not always separated by the Glen Rose. Where they are not these two formations combined are called the Antlers Formation. The depth and saltiness of the formations increase going from west to east. These formations in Texas go south from the Oklahoma border under the Greater D/FW area south to an area several counties below Austin, TX.

DESALINIZATION: Wouldn't it be nice to remove sodium salts from brackish water at 1/10th the cost of the current day reverse osmosis systems or electrical dialysis reduction systems? According to a recent Science News story a microbiologist at the Illinois Institute of Technology thinks he is on the way to using an unusual bacterium to do this.

All those cries that we are running out of water would be silenced if we could find a way to get fresh water from the oceans at a reasonable cost. It currently cost between $1000 to $2000/acre foot to desalinate seawater and $500 to $800/acre foot to desalinate brackish water according to Peter Weber in World Watch Vol. 4, #6. An acre foot is 325,851 gallons, with many Southwest golf courses using a million gallons a day $1000/acre foot is just a tad expensive. Maybe in my lifetime we'll get desalinization to a cost that makes its use for irrigation of turf acceptable - don't count on it.

One club in Texas is using electrical dialysis reduction on all their irrigation water for bentgrass greens. This necessitates having a separate irrigation system for greens. Something I feel maybe necessary as clubs are forced to use poorer and poorer quality water for irrigation.

HOW TO OBTAIN PERMISSION TO AERIFY GREEN: So they won't let you aerify greens, well here is a procedure you may attempt to demonstrate the need. Obtain a half dozen 13 ounce coffee cans open at both ends. Other cans will do but, these being four inches in diameter will leave a plug scar that looks just like a cup plug. Also you can shove 2.5 inches in the ground and still have another three inches above ground. You probably got the idea now.

You're going to evaluate your infiltration rate on greens by shoving coffee cans open on both ends down into the putting surface two and one half to three inches. To do that you will probably need a 5x5 square piece from a 2x6 to sit on top of the can and a hammer or rubber mallet to drive the can into the ground without doing damage to the can or your hands. The foot works so so if you practice but, it doesn't look as professional.

Now that you have the cans driven into the surface two to three

inches fill the cans to overflowing and time the movement of water into the surface. You should wait at least fifteen minutes. The percolation rate (perc. rate) on a green built to USGA specifications should be six or more inches per hour. The infiltration rate will only equal the perc. rate before planting or after aerification with 5/8 inch tines. Therefore don't expect infiltration rate to be too great. Four inches per hour isn't bad at all. I did some greens recently that had infiltration rates lower than one inch to a high of 2.5 inches per hour. The superintendent was losing them so had already got the aerifiers out. After aerification with 3/8 inch tines the infiltration rate went up by a factor of four.

You'll need leather gloves for the next step. Pull the cans up. You want the plug to come out. Push the plug out of the bottom and set it aside for now. Reinsert the can into the hole left by the plug. Go down another inch or so. pour in about three inches of water. Measure, time and wait another 15 minutes or until the water drains out. You now can calculate the perc. rate. If it went down two inches in 15 minutes then the percolation rate is 2" x 4 = 8"/hour. If all the water disappeared into the mix in some time less then a quarter of an hour divide 60 by that amount of time and multiply your answer times the inches of water that disappeared to obtain the percolation rate in inches per hour.

Another approach to the perc. rate that works well for the bottom of the mix is to use the cup on the green. Remove the flag. Fill it to over flowing and wait till the water level gets to the top of the liner. Begin timing as above.

Greens having layers will give you different perc. rates depending upon how deep a plug you take out. The greens above had a perc. rate of greater than 30 inches per hour using this technique. These are not true perc. rates but will help convince the powers that be of the need for aerification.

Now beware if your greens are like another set I was on recently this will backfire or must be used to convince the powers that be to rebuild greens. Many old soil greens now have three to four inches of topdressing on the soil base. If you try the above procedure on them you probably will find little difference between infiltration rate and perc. rate. In that case shove the can down only one inch for the infiltration test, and only two inches for the perc. test. If you want to show the need to rebuild shove the can done five or six inches and show how the water drains very slowly thru the mix below.

By the way, a hole without the can or an impermeable liner of some sort is not a worth while approach. The lateral movement of water thru the mix will be very great. And as always, try this out a few times before putting on the big demonstration on the 18th green before the powers that be.

WORTH REPEATING: From Lawn Institute's HARVESTS, OCT. '91.

A Scientific Viewpoint:

Dr. Thomas L. Watschke

Research Finding 1
Water running off or passing through a well managed lawn is not likely to be of significantly lower quality than the tap water available in many cities.

Research Finding 2
Most chemicals applied to turfgrass are trapped withing the thatch and root-zone areas of the plant and do not contaminated water supplies.

Research Finding 3
Lawns established with turfgrass sod are up to 15 times more effective in controlling runoff than seed-established Lawns, even after three years.

THE LAWN INSTITUTE: Dr. Eliot C. Roberts, Executive Director of the Institute, retired back in May. Dr. Roberts and I started our formal turf education together according to him. He at the time had a Ph.D. in Soil Science and Plant Physiology from Rutgers University. I was a new enrollee at the Stockbridge School of Agriculture. Dr. Roberts had accepted the position that Dr. Joseph Troll was to be in for so many years, turf professor for the winter school, two year and four year programs at the Univ. of Mass. He claims to have had no turf experience or education prior to starting that position. He sure fooled me. I have him to thank for encouraging me to go on for my B.S. He did that and then left for Iowa State Univ.

THE ECONOMIST: I have been taking a trial subscription to Economist for the last few months. If you would like a magazine that's a lot more international than Times, or Newsweek on a weekly basis, and if you're willing to pay $87.50 for 51 weekly issues of "trenchant commentary and analysis" without fancy photographs this magazine maybe for you. The last issue, July 18-24, even had a page on the world golf situation. I have found the magazine very interesting although a little too much to read. Couldn't finish one issue before the next one had arrived. If your looking for a different perspective - give it a try. The Economist, P.O. Box 58525, Boulder, CO 80321-8525, that's the address for subscription renewals but it is written in Britain, no mistake about that.

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