

## Localized Dry Spot – Part II Understanding its Causes and Management Approaches

by Wm. Byrnes

### B. "Chemical" and Biological Treatments

There are a number of soil amendment and treatment materials that can be quite effective in improving moisture availability to turfgrass where LDS exists. The degree of each materials effectiveness is directly tied to the nature and degree of the problem and the essential workings of the specific material.

#### Soil Wetting Agents (or Soil Penetrants)

"Wetting agent" and "penetrant" are common names applied to products that belong to a class of chemicals known as **SURFACTANTS**. They are "Surface Active" agents. The performance qualities of a surfactant depend upon the specific chemical nature of the surfactant molecule. In general, all surfactants can be positioned somewhere within the "Surfactant Property Triangle" shown in Figure 3.

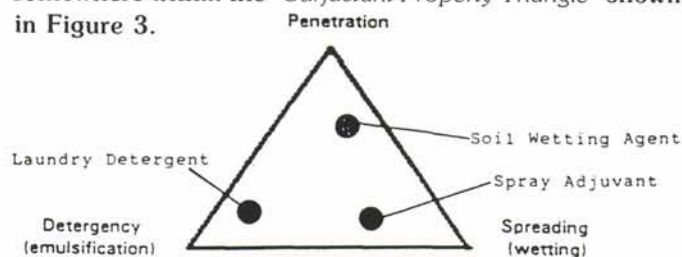


FIGURE 3- Surfactant Characteristics

While all surfactants exhibit some degree of all three of the properties, surfactants should be selected depending upon the emphasis needed, usually penetration and wetting. Their use will depend upon the nature of the LDS, and experimentation with application frequency and rates may be required to achieve maximum improvement. This may call for either treating only the LDS area or making a general application on the entire green and following with a heavier localized rate in the LDS area. In the case of poor infiltration, we may want to lightly treat only the high areas and slopes; this may be especially true on high sand content greens where heavier applications could actually magnify leaching. In cases of hydrophobic conditions caused by soil particle coatings, we may want to apply at very heavy rates to ensure emulsification (detergent) activity. The danger of the heavy rates, of course, is direct damage to the turfgrass if inadequately irrigated. While wetting agents can and will improve moisture movement in the soil, their effectiveness in any given situation correlates directly to their surfactant qualities and method of use.

#### Humid Acid

The unique characteristics of the humic acid fraction (as separated from the ulmic and fulvic fractions) of humus material make it arguably the single most useful soil amendment material available for managing LDS. Humic Acid is a long chain polymer with an extremely polar nature which has two distinct and decidedly beneficial ef-

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(LDS continued)

fects on soils in general and different LDS problems in particular (Figure 4). In instances of excessive gravitational water and hydrophobic soil coating conditions, introduction of humic acid coats sand and hydrophobic particles with appropriate negative affinity to hold cations. Additionally, humic itself is moderately hydrophylic; that is, it has quasi-hygroscopic characteristics enabling it to hold up to ten times its weight in moisture in an essentially capillary state. Water-content humic acid can also be absorbed by roots and taken into the plant where the absorbed water is released and the humic itself contributes to lignin formation. In the case of compacted and other hygroscopic water soil conditions, such as those with heavy clay and organic matter concentrations, humic acid's powerful polarity literally forces negatively charged colloids to separate and break apart, freeing up previously tied up cations and moisture and improving soil tilth and the soil's capacity for capillary water. In either situation, humic acid has distinct buffering properties which decrease the impact of accumulated salts.

#### Free Water



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**Figure 4 – Humic Acid in Soils**

Of course, humic acid, like all materials, has limitations.

As a long chain polymer, it normally reacts with each soil particle as it makes contact. Thus, it will not give the degree of immediate relief from symptoms of severe infiltration and percolation problems as will penetrants. It can only work on the soil it reaches. In some LDS situations, it is reasonable to think of soil wetting agents or penetrants as addressing the immediate symptoms and humic acid as addressing the long range cure. Elapsed time between beginning humic treatments and noticeable improvement can vary considerably depending on the cause and degree of the problem at hand. For instance, immediate moisture retention improvement might occur when humic is applied to a high sand mix, though the erosive effects of irrigation will diminish and then eradicate the humic over time, requiring re-application. On the other hand, several applications of concentrated humic, in conjunction with periodic aerification may be required before highly noticeable soil tilth improvement is achieved in a heavily compacted or layered area. All commercially available granular humic acid products and many liquids have significant fulvic acid contents. Such products may contribute to the "coating" phenomenon discussed earlier, particularly on sand mix greens. Finally, significant soil modification requires reasonably high rates of concentrated (above 10%) humic content. Do not expect

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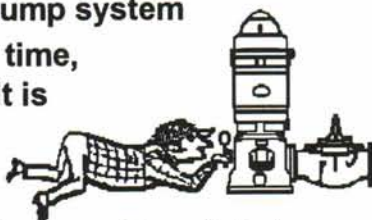
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(LDS continued)

it from low humic acid concentration products or low active ingredient application rates. Remember that we are attempting to alter the characteristics of around two million pounds of material per acre in the upper six inches of soil. It will take some active ingredient to accomplish that.

### 3. Sodium Reduction Materials

Excessive soil salts are the scourge of plant growth. Through the ages conquering armies salted the fields of their foes to ensure that their enemies would not rise again to smite them down. Salt ties up nutrients and can even cause the phenomenon of "soil collapse". But above all else, salt is a moisture thief.

Hopefully, Mother Nature's rain and intelligent irrigation practices will leach enough sodium to preclude damaging build-ups. However, receding water tables and roadway run-off have enormously increased salts in irrigation water supplies, increasing the need for amendments. Traditionally, sulfur and bulk calcium materials (gypsum, lime, etc.) have been applied. Sulfur's long term effects are of dubious merit; the calcium materials are effective but are slow acting, have limited solubility, and provide only a couple of months of reasonably high activity in the soil. More rapid responses can be obtained from sulfuric acid and calcium chloride, but each of these can create distinct soil problems of their own such as the destruction of microorganisms populations. While liquid calciums have been around for many years, a major innovation — cyclic acid chelation — is proving to be a great improvement over the traditional liquid products. The cyclic acid chelation increases effective calcium activity by as much as eight times by solubilizing otherwise unavailable calcium reserves of the soil, thus activating additional calcium for sodium reduction.

### 4. Thatch Reduction Compounds

Undecomposed thatch reduction compounds are relatively new in the market place. Dead (or dormant) grass is composed of up to 90% cellulose, and all newer products seem to rely on cellulase, the enzyme which breaks down non-chlorophyll producing (dead) cellulose. Some products consist of microorganisms which in turn manufacture cellulase. Others package the cellulase itself. Both will accelerate thatch decomposition. The limitations of microbial products are the obvious delay in cellulase availability and the certainty that the microorganisms will not remain in a non-sustaining environment. Products containing cellulase itself are somewhat subject to the erosive effects of irrigation, though the active ingredient is actually absorbed by the dead cellulose. Both the microorganisms and cellulase itself are relatively inactive below 60° F and increasingly active as temperatures rise above that mark. The decomposition of thatch is a slow process by nature. These products can accelerate thatch reduction, but do not expect radical activity in a week or two. Some products contain nitrogen, presumably to feed the microorganisms, and humic acid to promote a more desirable habitat for the microorganisms.

## 5. Fungicides

Fairy Ring is a fungus, and provided that the fungi reside in the upper inch or so of the soil the condition sometimes responds favorably to fork tyning, wetting agents, and the high label rate of Prostar or Benlate. At least one old hand states, "If you don't tyne first, you're wasting your time and money."

### Causes and Management

All of the management measures can be valuable in dealing with LDS.

*So what should any given turf manager do?*

An LDS problem may require from a single to multiple management measures. More and more, management measures may be preventative or curative and may address either the actual causes or their symptoms.

**First**, discover what are the factors causing the scarcity of available water. This will typically involve careful physical inspection by soil horizons and interpretation of soil analysis. It will involve understanding of original and reconstruction materials and past management practices and historical events. It may also involve analysis of the water supply. In short, be Sherlock Holmes and identify the culprits.

**Second**, understand the various tools available for combating your conditions — what they will and will not do to improve your situation.

**Third**, formulate and diligently implement a plan of action utilizing the appropriate measures to counteract the problem or problems identified.

**Fourth**, adjust your management practices to discourage re-occurrences of LDS. It is always better to diagnose and treat a problem early, but the very best cure is preventative maintenance.

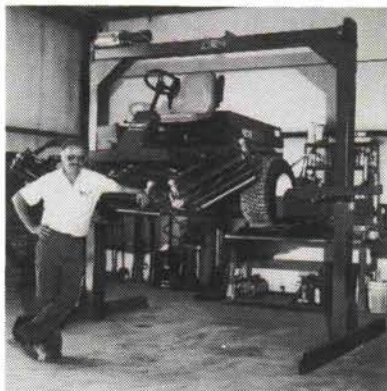
In the real world there is no such thing as perfect soil for turfgrass growth, or, if there is, wait a few months and it won't be. We are attempting to manage a moving target. Localized Dry Spot is one of many challenges facing today's superintendent. It is an especially difficult one, and one that seems to be increasing in incidence, particularly as "spec" greens gather age. The bad news is that LDS is difficult to manage. The good news is that it **can** be managed if we are willing to work at it.

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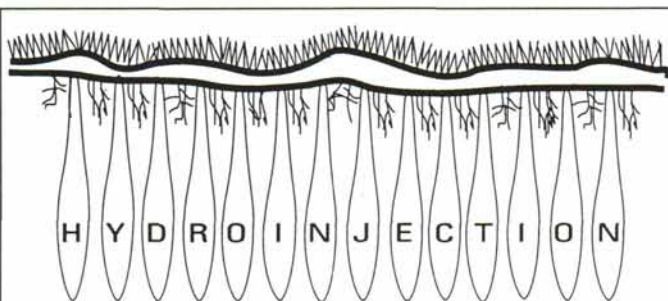
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## How Ya Looking?

by Brian Bossert

It has been a long time since I penned an article for **The Bull Sheet**. In fact, I have never written an article and if you can last the six or seven minutes it takes to read this one, you may wonder why I ever bothered.

For starters, I had a hard time coming up with a topic. I was going to inform everyone about the ins and outs of erecting a new maintenance building, but I've talked plenty on that subject in the last year. Then I thought I could tell you about what a great PR tool our new goose chasing Border Collie has turned out to be. However, I think TR more or less covered that before he went north of the border to grow turf. Then I thought I could share my experience with Prograss on greens, but I didn't know if John Turner would like that because, "That product isn't labeled for greens, you know". Then reality started kicking in and I realized that I don't really know anything about anything that no one else doesn't know. But, in the back of my mind this professional image business kept popping up and I knew that was the theme I should write about.

In fact, I wanted to directly address clothing and what the superintendent wears to work. Furthermore, I wanted to tell you about particular brands and good and bad shoes, etc. (I told you that you may wonder why I ever bothered). Admittedly, I am stepping out on a limb here. I have never seen an article on this subject matter and I am going to attempt to write it without consulting with Al Fierst, the snappiest dresser I know. I'm asking for trouble.

I am going to work from head to toe, but before getting started, I am going to make a few assumptions. I am assuming that not all superintendents have turned into white collared pencil pushers and that a coat and tie is not part of the standard outfit. I am also going to assume that occasionally a glob of grease or a can of marking paint graces your shirt sleeve or pant leg. Lastly, I am assuming that your wife doesn't buy your clothes for you.

A hat isn't a must for the superintendent, but it most certainly keeps the sun's dangerous rays off your face. People in our line of work should take skin cancer seriously. I recommend with hats and shirts, to endorse your own clubs logo, the MAGCO logo or the GCSAA logo. If you can't spring for one of those, there is always a Chipco or Cushman hat to be found. One of the biggest superintendent lies is "Hey, I paid for this cap!"

Sunglasses are a great idea. I don't know if the purple Oakley's are going to win any points with the members, but BluBlocker's actually help you see wilt before the naked eye can spot it. They are especially helpful for the handwatering crew who may need extra help in identifying those summer "hot spots".

Shirts are a personal thing, but being comfortable is the most important consideration. I wear large for the extra room even though medium fits just fine. Dark colors attract heat on summer days and should be avoided. However, getting soiled is not against my religion, so I usually avoid white. The 100% pique cotton shirts require little or no ironing, and that is important to us single types.

A circular graphic with concentric circles. At the top, the text "Wadsworth Pumps" is written in a bold, sans-serif font. Below this, the text "Sales • Service • Repair" is written in a similar font. Underneath, there are two columns of text. The left column lists "Watertronics", "Air-O-Lator", "Cla-Val", and "Crispin". The right column lists "• prefabricated pump stations", "• floating fountains & aerators", "• automatic control valves", "• air release, foot, & check valves", and "• water-features •". At the bottom of the circle, the phone number "(708) 394-4490" is written in a large, bold font, followed by "• Arlington Heights •" in a smaller font.

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Finally, project the spirit of teamwork by wearing your club's logo. I was flat out told not to wear my former employees logo. It was in turn agreed that my current employer would buy me several shirts and sweaters annually. I am sure there is room in the uniform budget for you to get the same, if you are not already.

As far as sweaters and the like, I think a high quality sweatshirt is appropriate. Pete Leuzinger looked just fine donning one in today's Daily Herald. Don't skimp when it comes to other forms of outer wear. Cheap rain suits are a waste of money. I have had my Gore-tex rain suit for four years and it still keeps the water out. In the long run it beats those fifty dollar pieces of plastic which don't do much for keeping the cold out either.

I guess pants are a personal matter as well. If you are over 55 years of age, polyester is a viable option. However, cotton slacks are the ticket for me. Dockers make a pleated, wrinkle free "classic fit" style and are available in a wide assortment of colors. There is also a brand by the name of Savane that comes in a wrinkle free, pleated and cuffed style. I picked up three pair at J.C. Penney and they have worn well for over three years. If I were to black ball any slacks, it would be anything from the American Eagle store. I have had several pair of slacks tear on the seam and their merchandise is overpriced.

I am sure plenty of people still wear jeans, but I don't think that projects the image of today's superintendent. I do occasionally wear them in the winter when my club is closed, but never in season. In fact, I wear shorts on Mondays when my club is closed and the weather is warm. I get as hot and uncomfortable as the next guy, but I don't think someone responsible for the better part of a million dollars of my member's money commands much respect in a pair of glorified swim trunks.

(continued page 28)



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(How Ya Looking? continued)

So, that gets us down to the toe tops. If you feel lucky in your favorite pair of socks with the golfer on them, by all means wear them. I prefer the short, white athletic socks. My legs stay cooler without a long sock and athletic socks are absorbent and offer support. Your shoes should offer support as well. Even though all we do is ride around in our cart and tell people what to do, we still end up on our feet a great deal.

I admit to being a name brand guy and have purchased at least a half dozen pair of Timberlands. My experience is that the best shoes don't last any longer than some of the less costly shoes and I replaced those Timberlands inside of a year every time. I found a great leather boot from Carolina that costs less than \$70 and a good one from Bay Colony that didn't last as long, but only went for \$50. I think some of the outdoor tennis style shoes that Reebok makes are a great option once the dew burns off. They come in conservative colors, so they don't look like tennis shoes. Even though my boots are only ankle tops, they get heavy after those 14 hour days.

Finally, I suggest that each superintendent wear what he feels is appropriate. The key is that we are neat and clean. However, remember that people do make judgements, fair or not, based on appearance and the era of blue jeans and flannel shirts is one of the past. I think our pay scales have elevated to the point where we can afford to look better. In fact, we can't afford not to. If you pay for your own clothing, put the expenses into next years budget. For \$500, you can drastically change your look, but you won't please everyone. I once had a fellow tell me after a Green Committee meeting that I was overdressed and that he would prefer to see a little more dirt on my hands.

In closing, I think this article writing stuff isn't so tough. There are obviously an abundance of aspects to our profession; pick a topic and let your colleagues laugh at what you have to say. If you hung in there until the end of this article, I appreciate your patience and you can give me a call if you are interested in putting Prograss somewhere it isn't labeled to go.



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*Latest NGF Annual Activity Report Shows 381 Projects Completed in '94*

JUPITER, Fla. — According to NGF's latest audit of golf course construction in the U.S., 1994 was another good year for both project completions and new starts.

The 70-page document, *Golf Facilities in the U.S./1995 Edition*, shows that 381 new layouts of various sizes came on line last year, making it the fourth straight year that the number of completions increased. It also brought the number for the past five years to 1,733 ... which is an average of 347 per year.

*Due to the fact that nearly two-thirds of the courses built last year were of the nine-hole variety, the 381 courses for the year translates into 262.5 18-hole equivalents. The fact that this 18-hole equivalency total is identical to the one for 1993 when 358 project completions were recorded reflects the increase that occurred in 1994 in the number of nine-hole projects that opened for play.*

In all, 4,725 golf holes were added to the U.S. supply in 1994; increasing this total by 2%. The national course count at year-end stood at 14,393.

The report also shows that another 769 projects — representing 10,611 holes — were under construction as of Dec. 31, 1994, and that as many of 400 of these projects could open for play this year. This would be the highest one-year total recorded in the 34 years the NGF has been tracking golf course construction activity. At the moment, however, the 381 recorded last year stands as the new high-water mark.

An analysis of the top line numbers for 1994 provides several insights into today's facility development and operations market. For example, it shows that:

☐ **Public golf continues to dominate development.**

Eighty-eight percent of the courses that came on line last year were public ... and 84% of these were daily fee. Furthermore, the chances of this trend continuing is reflected in the fact that over 80% of those courses currently under construction or in planning also are public.

Over the past 20 years, the number of public facilities in the U.S. has increased about 40% while privates have declined 8%. Today, nearly 70% of the nation's golf facilities are public. (The NGF makes a distinction between facilities and courses; defining a facility as an operation consisting of one or more golf courses.)



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