



# Soil Amendments: High Tech Dirt!

**W**ith the advent of computerized irrigation systems and spray rigs, GPS mapping, infrared photography, electric mowers and new ultra grasses it shouldn't come as a surprise that scientists and innovators have found ways to improve the soil we use to grow turf!

There are a number of products out in the marketplace that have been designed and/or are claimed to create better porosity, percolation, higher CEC rates, and nutrient retention. We won't be able to discuss all of them but I will attempt to list as many as I can. Apologies to anyone I leave off the list. Alphabetically they are: Axis, Ecolite, Greenschoice, Isolite, Profile and PSA.

These and other products have undergone varying degrees of independent university testing. They also differ in their composition and the ways they are manufactured and produced. Because of this variability, you the consumer must use due diligence in researching these products before trying them.

It is pretty easy for a superintendent to evaluate the performance of hands-on equipment. You can see the computer printout, the mow or spray pattern, the clippings cleanup, irrigation run times and all sorts of results visible to the naked eye. When it comes to things that are happening under ground we get as skeptical as the man from Missouri — show me!

Organics, biologicals, microbes, adjuvants, and now soil amendments. Keep in mind there are no silver bullets anywhere in the turf-growing world. Technology keeps pushing the envelope and giving us more options. Some would argue that in the total scheme of things, basic agronomy without a lot of bells and whistles has produced some pretty good turf over the years and will continue to do so.

I think all these advancements can provide ways for the modern superintendent to correct or amend conditions that make it difficult or almost impossible to grow turf to the exacting expectations of many of today's golfers. If you must play the hand you are dealt, maybe soil amend-

ments can be a wild card you can use to stay in the game!

## PSA and Push-Up Greens

The greens at Mountain Lake are 80-year-old push-up greens that have been resurfaced several times, but have never had work done to the subsurface profile. Some are in full sun and some are in shade. Some drain very well and some don't.

I decided to give PSA a try to see if I could achieve some consistency.

I have been using PSA for three years. I use it once a year in conjunction with my deep tine aerification. The first year I used it, we aerified the greens and removed the cores. Then we spread the PSA with rotary spreaders and then topdressed on top of the PSA. Then we used a drag brush to work the PSA and topdressing into the aerification holes.

Using rotary spreaders didn't work very well. The material is very fine and dusty. The technicians had to wear spray suits and dust masks to keep from getting it all over them and breathing it in. The second year we used a Terra-Topper topdresser to spread the PSA. This worked better than the rotary spreaders, but it was still difficult to work with.

Finally, last year I had the PSA premixed into the topdressing sand prior to delivery, and that worked very well. The PSA was mixed at a rate of one ton of PSA with 22 tons of sand. This is roughly equal to an 80/20 mix. It spread real easy and the dust

was at an acceptable level.

This year I added a new wrinkle to the process. Instead of dragging with a brush, I tried the air brush from Precision Air Tech. This machine blows 99 percent of the sand off the surface and into the aerification holes. It is a little slow, but it works great. It is not as abrasive to the surface as the drag brush method.

Over the past three years I have observed fewer hot spots each year and better drainage on the wet greens. I also seem to encounter less algae on the shaded greens. I'm sure there are other factors contributing to the improved conditions, but PSA has definitely been and continues to be a useful tool.

STEVE CIARDULLO

Mountain Lake Country Club

## Test It Before You Use It!

Two years ago, while at The Forest Golf Club I tried using PSA to solve some localized dry spot problems on our greens. My plan was incorporate the PSA into our aerification program when we topdressed. We aerified, applied the material and brushed it in.

The next day I thought my greens were dead. In looking back, I feel the material was so sharp that it scoured and cut the grass plants in the dragging process. It took several weeks for all of the greens to recover and didn't solve my LDS problem.

If anyone is considering using one of these soil amendment products, I strongly suggest that they test them on a nursery green or practice green first to assess their performance. Since that experience I have learned that there are other products out there with different characteristics. I understand some even have nutrients embedded in them and have done well in grow-in situations.

RICK TATUM

Shadow Wood Country Club

## Good Advice

"When I was a young assistant superintendent coming up through the ranks, an old superintendent once told me, 'You just need two things to grow good turf. Common sense and drainage. If you don't have common sense, double up on the drainage.'"

Sam Strimmel

National Sales Manager  
Profile Products LLC

## New Technology Gets Back To Basics

There are several soil amendment products on the market today that strive to achieve a stable, well drained, moisture- and nutrient-retaining, high-CEC grow-

ing medium for golf greens. These products fall into five basic groups: 1) Kiln-fired porous ceramics, 2) Zeolites, 3) Kiln-fired diatomaceous earth, 4) Non-fired diatomaceous earth, and 5) Kiln-fired shales and granites.

These products are used in constructing the greens mix profile of new greens and can also be used as over-the-top or drill-and-fill applications during routine aerification. Thorough soil testing for stability, particle size, percolation, capillary and non-capillary pore space, and CEC rates are critical to assure desired performance. These products differ in the way they are manufactured and should be compared and contrasted for those characteristics along with cost considerations before purchase.

By using these amendments, superintendents can overcome some drainage and root zone oxygen problems resulting from old greens with a build-up of organic material or greens with non-spec (push-up) soils in the greens mix. These amendments can also be used to treat localized dry spots, help retain moisture and nutrients in the root zone and increase cation exchange capacity (CEC) for efficient nutrient uptake.

In new construction, a porosity of 50 percent is ideal. Most natural sands average 38 percent. By adding a porous ceramic product, a soil's capillary and non-capillary pore space can be increased. The capillary pores hold moisture and the non-capillary pores allow downward water movement and air/gas exchange for root growth.

The traditional method of amending sands with Canadian peat has been used for the past 30-35 years. The primary benefit is moisture and some nutrient retention at a sacrifice of some percolation ability. The peat will degrade over time and it takes up pore space. All greens' percolation rates will slow down over time as organic matter builds up naturally. Advocates of porous ceramics and similar products feel they can achieve the same moisture retention with higher percolation rates which will remain more efficient over time without the particle breakdown.

In correcting a drainage or percola-

tion problem on existing greens, the sub-surface drain system must be functioning. No over-the-top application will correct a crushed or non-functioning sub drain. However, if the soil and thatch layer have tightened up and are causing slow downward water movement, an application of these amendments can improve the surface drainage. An ideal program for a severe problem could combine a deep tine or drill-and-fill application and a traditional shallow core aerification set at a close interval pattern with these porous materials incorporated at 30-50 percent by volume of the mix.

In routine and light topdressing programs on greens without drainage problems, a top dressing mix containing 15 percent by volume can aid in algae control and provide good oxygen sources for the crown area of the turfgrass. This mix equates to about 60 bags of material to a typical truckload of topdressing sand. Most vendors can custom mix these amendments. If you wish to mix them yourself, they do come in 50-pound bags and half- and one- ton mini-bulk bags.

In an age where we are looking toward ultradwarf grasses, some of these amendments work into the turf more easily during frequent topdressing programs because of the size and stability controls used during the manufacturing process.

In recent years it has become very interesting to note that almost two-thirds of the exhibit space at the national trade show is dedicated to products designed for management of three or four acres of putting surface on a golf course. These new soil amendments are an attempt to get back to basics. They offer a golf course a way to improve their most important growing medium, the greens profile.

In a world headed for Integrated Plant/Pest Management, these amendments can help provide a balanced soil environment with good physical properties which can enhance the necessary chemical reactions and biological processes for a good healthy turf.

PAUL SALMON, REGIONAL MANAGER,  
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