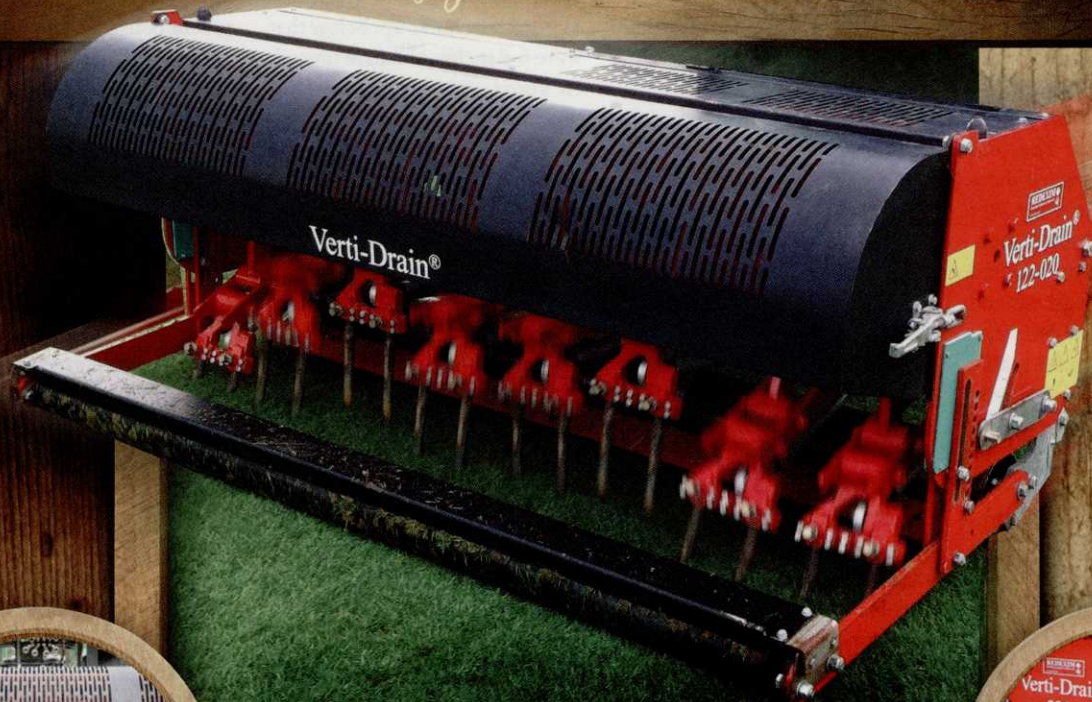


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WATER MANAGEMENT

respect the golf course by doing a good job of fully integrating these stormwater ponds as golf course features. It was Lohmann's job to find a way to enhance the course, and they did that."

Here's what went down, but first: A big shout out to course superintendent Doug DeVries, CGCS, and Ryan Inc. Central, the golf course contractor out of Janesville, Wis., who led the construction process. They did a fantastic job shepherding these changes through a very wet spring and summer in Appleton.

On the five directly affected holes, we rebuilt four greens and the equivalent of four fairways, moving them to maximize spatial relationships and improve risk-reward strategies at the edges of all these new water hazards. We also effectively preserved the original green contours thanks to a thorough mapping exercise prior to construction. We even recreated some coveted pin placements: On the front right portion of the original 11th green, for example, there had been a very steep back-to-front pitch. We duplicated that on the

"We couldn't simply treat this as a typical pond project. We knew we had to respect the golf course by doing a good job of fully integrating these stormwater ponds as golf course features."

– Pete Neuberger, City of Appleton

new 11th, while expanding the overall size of the putting surface. On the 2nd green, we more or less copied the original while again expanding its perimeters and making it tie in properly to the new surrounds.

Reid GC will never be lumped together with the Midwest's collection of Golden Age Designs, but it is an older course with some fun, long-standing grooming traditions. For example, they mow a unique, 10-15 foot collar around their greens. Accordingly, when we rebuilt and reshaped the new green surrounds, we kept the features low profile and expanded the bentgrass collars to enable continuance of this style.

Agronomically, the notable thing about the Appleton project is how we rebuilt the greens. Testing on the original soil profiles revealed a 3-4 inch layer of

top-dressing build-up. Below that were 6-8 inches of native topsoil. In short, we replicated that profile on the new greens, using a 6:3:1 mixture that matched the top-dressing mix – allowing these new greens to behave more or less like the old ones, in terms of required maintenance practices. We also grassed them to Putter bent, an older strain whose name superintendents are probably surprised to hear after all these years. But Putter's color best matched the color of the hold-over greens and is expected to perform well at the higher cuts (.120 to .130), with the conservative top-dressing program that Reid employs. For these reasons, we purposely avoided the newer, more aggressive bents that tend to get puffy when left at elevated heights of cut.

An additional note on the

greens construction: We've done similar soil matching elsewhere, deploying variations on this 6:3:1 theme. When watering in these new greens, however, we've found they are not equipped to absorb water like a USGA green might – after all, these greens are built with a heavier soil profile that retains moisture and has more limited ability to convey it like modern greens can, even with slit drainage installed in the subgrade. So the greens rely heavily on surface drainage, which exposes them to erosion potential while you're waiting for seed to germinate. Bottom line: They are tough to establish.

At Reid, we followed the advice of the USGA's Bob Vavrek, who recommended (several years back in a Green Section

(FLOODING continues on page 64)

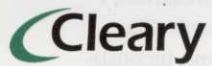
The third hole at Reid GC. Top left: Grassing. Bottom left: Shaping and earthwork. Right: Grow-in from the tee.





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Andrew Hardy is the Superintendent at Pheasant Run Golf Club located just outside of Toronto, Ontario. Andrew is a noted leader in environmental and sustainable golf maintenance efforts, and an avid member of the broad social media turf community.

WHEN LIFE'S LESSONS COME FROM ADVERSITY

Sometimes when it comes to your course, you have “bigger fish to fry.”

Retrospect is always one of the great traits that we use in life. It allows us to take stock in what has worked and what has failed. As I sit here in my office on a beautiful Tuesday afternoon I am reflective on a year that so far has been less than stellar. I will recount and rethink how I managed the golf course this year and make the necessary changes to improve myself and the course.

“Under fire” is always an interesting term used in any workplace. The failure of our greens to adapt to temperature swings in the spring, and the 11 day run of stifling heat in July that has me still staring at the aftermath on my Poa greens will provide another lesson. With full support of my Owner we have agreed to move forward and

give them their due by naming it) that has a five page thread on my failures. People have called me a quitter, a horrible superintendent and incompetent. I gave consideration to replying to these shots, but their minds are made up about me and my course and nothing I say is going to change that. I guess taking the high road is a practice they could have used too.

Legendary Canadian superintendent Paul White once told me years ago that “once you’re comfortable at your job is when you’ll get fired” and those words have stuck with me ever since. If there has been a year where I have been so uncomfortable, this is the one. But I was given a true perspective from one of my members Mr. Fawcett last week. He said to me “Andrew, I can see in your eyes

golf course, but I get to see the golf course and spend time with my sons.

Time with my boys at a young age is very important for me, as the stakes for us are much higher. Liam and Luke are diagnosed with moderate to severe Autism. They communicate with sign language as they don’t have any verbal abilities. At nine years old they are just now toilet trained and face an uncertain and scary future. They love the course, and for that it has nurtured my love of Saturday afternoon at “work”. For one moment in a hectic week, work doesn’t actually feel like work.

I have always struggled with the definition of home life and work life. The broad line that defines them sometimes becomes skewed and work gets brought home. But what one may view as Liam and Luke’s weakness, I can now see is their strength. They don’t care about bad greens, inconsistent bunkers or unrepaired ball marks. They love me, and my place of work to them is a good place, a place where time spent trumps all things bad.

So you can call me a quitter or a bad superintendent, but what matters most to me is that I’m a good father and a supportive and loving husband. I have learned in our quests in life you cannot and will not ever appease the masses. So I have put stock in appeasing the ones that rely on me the most. My owner put everything in perspective this week by stating “its only grass, you have bigger fish to fry.”

In retrospect today’s tour was the best one ever, and one I won’t forget for a very long time.

“Life’s difficulties can seem overwhelming, and you may face times when problems seem encompassing. Don’t look back at what you’ve lost, for the road of life is never meant to be traveled backwards. Just move on and say: Things always happen for a reason. Trust the process.” - Unknown GCI

“So you can call me a quitter, a horrible superintendent and incompetent, but what matters most to me is that I’m a good father and a supportive and loving husband.”

fix the problem, rather than dwelling on what has happened. Many of my brothers and sisters in the same situation won’t be as fortunate.

How many summers do you see where it’s hotter in Ontario, Canada than Florida for weeks at a time? I see on Twitter many clubs in the south converting greens and then not having the heat they need to establish them. Then they incur devastating rain storms that wash away all their blood, sweat and tears. I have always deferred to Mother Nature as all of our boss in golf. After all I watched rain wipe out friends’ golf courses in Toronto and Calgary this summer. She is cruel and to that there is little doubt.

There is a local web-based forum here in the Toronto area (I refuse to

you are hurting. But you need to ask yourself about the important things in life.” He then went on to ask about my wife and children and whether I was getting enough sleep. I was caught off guard and almost became emotional.

Saturday afternoons at the golf course for me carry a very different meaning. Today is no different, given the kind words of Mr. Fawcett and the weight that family carries in my life. Saturdays are reserved for me and my three sons Liam, Luke and Ethan. We tour the golf course together, eat lunch in the clubhouse, chase geese and from time to time play a few holes of golf. This ritual has been a part of our family fabric (and the club loves and encourages it as well) for three years now. Not only do I get to see the



By the Numbers

A typical soil test can guide you in the type of aerification you should be doing to strike the right balance between air-filled and capillary porosity. by Jason Stahl

Many golf course superintendents believe that soil testing is the most critical element of course maintenance. Without it, you're really shooting in the dark as far as trying to figure out what your turfgrass needs to be healthy.

A soil test can tell you a lot of things, including what type of aerification you should be doing. And aerification has become even more important to do today with the new grasses being greater thatch producers than the old ones.

Of course, in today's economy, superintendents are being asked to

aerify less in order to minimize disruption and maximize the number of play days.

That aside, it's critical to understand the different types of soil tests out there that can shed light on what you should be doing aerification-wise: a physical soil test and a chemical soil test.

A physical soil test can give you the air-filled and capillary porosity of your soil, but also the organic content. Some labs that do mostly chemical tests also do organic content tests, too.

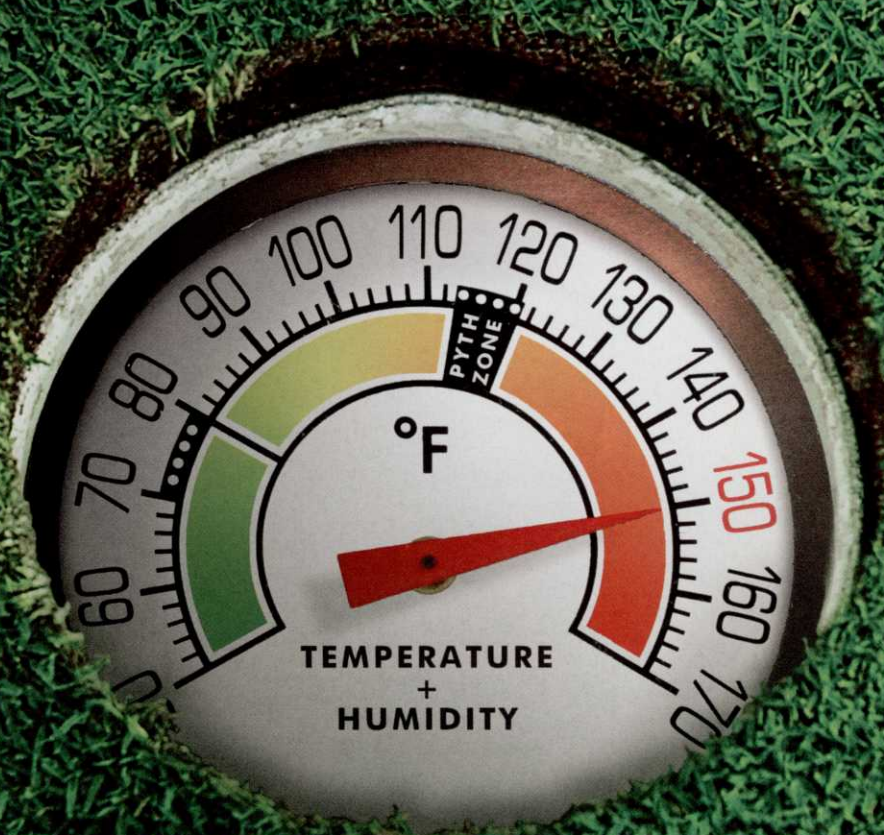
Sometimes it's an added analysis for an additional fee. But figuring

Key points

- It's critical to understand the different types of soil tests: a physical soil test and a chemical soil test.
- A physical soil test provides the air-filled and capillary porosity of the soil, as well as the organic content.
- Greens should have no more than 2 percent organic content, and native fairways should have from .5 to 3 percent.
- The more organic matter content you have, the more water holding capacity.
- A soil test won't spell out the tine size you should be using or how many times you should aerate.
- An accredited lab can offer information on the percentage of organic material in different layers and what the dilution rate is, or the percentage of sand versus organic material.

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CULTIVATION

out a soil's organic content is relatively easy to do, so it's usually not that much more expensive, says Dara Park, assistant professor, turfgrass, soil and water quality at Clemson University.

"Sometimes organic matter content can tell you a lot, and sometimes you don't need to do a physical test just to get that data," says Park.

"You may already have it on your other soil test, so check there first. Doing a physical soil test is important, but you may not have to do it with the frequency you do a regular chemical soil test."

With that in mind, there are USGA standards as guidelines: greens should have no more than 2 percent organic content, and native fairways should have between .5

percent and 3 percent.

"There is that range there because it is a native fairway, so you may have a native soil that is sandy that could really benefit by having more organic content up towards that high end of three percent," Park says.

"Sometimes organic matter content can tell you a lot, and sometimes you don't need to do a physical test just to get that data... You may already have it on your other soil test, so check there first. Doing a physical soil test is important, but you may not have to do it with the frequency you do a regular chemical soil test."

– Dara Park, Clemson University

"Or you may have a clay soil, in which case you don't want a lot more organic matter because the more organic matter you have, the more water-holding capacity you'll have, and it's already a clay soil. Therefore, you may want to stay closer to .5."



Aerification has become even more important to do because new grasses are greater thatch producers than old ones.

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Choosing a Lab

Choose a lab you're happy with for your soil testing and stay with it. That's the advice Dara Park, assistant professor, turfgrass, soil and water quality at Clemson University, has for superintendents confused on what lab to choose for their soil test.

"Different labs have different procedures, so if you're working with one lab and they do a soil analysis for you following one procedure, and then you decide to switch labs to get another soil analysis, but in between that time you followed a rigorous control program and want to see how it's working, the numbers may not be relative to each other," says Park. "If you stick with one lab, even though those values may not be exactly correct, you can see how they change relative to each other."

Park uses an example: if you did a soil test with one lab and found an organic matter content of three, then followed a strong treatment program and used the same lab to do another soil test the following year and got a two, you would know what you're doing is working. If you had switched labs, you very well might have gotten a three because of the different methods it was following.

"Some methods are very detailed, and the value takes into consideration not only the method but also the lab tech performing the analysis," Park says. "Everyone is a little different. It's not so much of a problem for physical properties as it is for chemical properties, but it does happen. So stick with the same lab."

Another thing to keep in mind is that many labs have contract pricing, so if you sign a contract for X amount of samples per year, you get a certain price.

Bud White, director of the USGA's Mid-Continent Region, suggests checking out the USGA's website to see a list of accredited labs.

"As long as the lab is accredited and tests for USGA specs and chooses proper ASTM standards, you'll get good results," White says.

A chemical test will show whether you need to do more aeration and venting or not.

There are standards for air-filled porosity, capillary porosity, water-holding capacity and saturated hydraulic conductivity (KSAT), as well. And the KSAT seems to be the one that superintendents want to make sure their soil is hitting, says Park.

"It's always in inches per hour, and it's at least six for a USGA standard green," she says. "Because fairways aren't as important as putting surfaces, they can be lower, so the threshold value is two inches per hour. But superintendents need to keep in mind that the more organic matter content you have, the more water holding capacity you'll have."

The first number Park advises to look at is organic content, which you can typically get on a regular soil test, which means you don't have to do a physical soil test. If it's a little high, you should probably do a physical test, which will confirm it's high and indicate what it's doing to your water-holding capacity, porosity, KSAT, etc.

What a soil test won't do is spell out the tine size you should be using and how many times you should aerate. There are some popular recommendations in the industry, but it depends on the resources available to you.

Some superintendents have started to

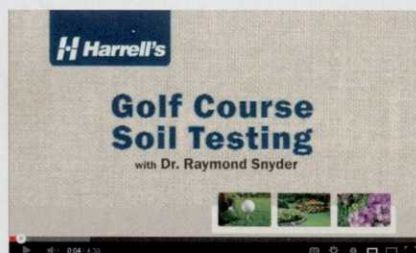
buy aeration equipment together and share it so they can have a greater variety of equipment at their disposal: solid tine, hollow tine, bayonet, different spacing, diameter, depth, etc.

Speaking of depth, it's not a bad idea to take soil samples at different depths. For example, if you've been going down four inches for years and want your roots to go deeper, you could take two soil cores, one from a four-inch depth and one from four to eight inches.

"You will be able to see how much organic matter is in that lower depth and look at the physical properties and see if they're not conducive to root growth," says Park. "If not, then you'll know you need to get a longer tine in there."

Golf course turf is so intensely managed that Park feels any course would benefit from doing a soil test at least on an annual basis.

Superintendents new to a course should take soil cores right away and send them out for physical and chemical analyses. But once you have a good program going and know your soils, you may not have to take samples as often.



Watch it

Check out these informative online videos from Harrell's for more information about soil testing and interpreting their results. Enter the following urls into your browser to watch these videos.

Golf course soil testing with Dr. Snyder
youtu.be/U-nCCxjomIE

Interpreting soil test results for turf
youtu.be/EwhHuPIFnVQ