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Establishing Roots

A Medina, Wash., Residence Gets a Turf Overhaul

by Hendrikus Schraven
Hendrikus Schraven Landscape Construction & Design, Inc.

The dream of wanting a house with a white picket fence may still be on new homeowner's minds, but many are shifting their focus to a new dream; having the perfect lawn. Not to be confused with a pretty lawn that is admired from inside the residence, people want a plush, green carpet-like surface that invites the residents to walk bare-footed across the landscape. The owners of a home in Medina, Was. were no different.

The existing landscape suffered from insufficient surface and sub-surface drainage and was chemically dependent.

Furthermore, it required an enormous amount of irrigation due to insufficient root establishment and penetration, and it was planted on a clay basin. The original turf was basically seeded on a typical golf course soil mix which consisted primarily of sand and a very small amount of organic matter and silt.

Members of Hendrikus Schraven Landscape Construction & Design, Inc. knew the site was established on an area which was formerly a glacier-till clay basin. Knowing this, it was of great importance to install the right

drain system- one that would allow rapid departure of excess water from a variety of sources. They already knew that the organic soil profile had the permeability rate of course sand. The need for a complete and quick drainage system to respond to this level of permeability was going to be a key to the project.

Project Goals

The goal of the client was to have a lawn that would drain properly, have even, healthy growth and have a high resistance to disease. The client was extremely picky in that

he wanted a nice smooth golf-course type of look, as well as having it be functional with considerable use for entertaining.

With the clients goals in mind, the crew worked to meet the homeowner's goals while incorporating goals of their own. "We basically wanted to establish a new model of turf installation and maintenance- a model that would excel beyond current standards in the turf industry," said Hendrikus Schraven, owner of the company.

"Our primary goals in this turf project were to establish a turf area



that could be maintained without any chemicals or pesticides, have good drought-resistance and deep rooted turf as well as microbial sustainability," Schraven said. "In addition we designed a soil and turf profile that combined exceptional permeability with balanced water retention."

An additional factor that was important was to create an extremely fast root growing medium not only to reduce recreational down time but to make a very strong, durable, yet safe ball-field-type turf surface. Schraven also wanted to prove that all this could be done organically with no pollution to the environment while maintaining a very reasonable maintenance program.

Site Excavation and Installation

To alleviate each of the problems, the company had to deal with many factors. The glacier-till clay basin, and the soil that was on it, had gone anaerobic, causing lots of diseases and root-rot. The level of problems reached the extent that the grass had no roots deeper than 2 or 3 inches.

Curing this problem meant excavating the entire site and installing a completely new drain system. The excavation process required the top 2 feet of soil and glacier-till clay to be removed. From that grade they then dug the main drain trench within the clay basin with numerous lateral feeder lines.

The sub-surface of the glacier-till clay basin was graded to slope towards the main drain trench and the laterals were installed underneath the entire surface of the future turf area. "We basically installed a layer of 10 to 12 inches of pea gravel on top of and around the drain systems," Schraven said. "The drain was tied into an existing storm drain on the property. We ended up with a complete drain blanket beneath the soil."

A special filter fabric was then applied on top of the pea gravel. The filter fabric is special in that other filter fabrics will silt up and clog in a short period of time according to Schraven. "Normally we prefer to use layers of decreasing-diameter clean drain rock and sand to function as a filter, but in this case we didn't have the vertical room," Schraven said.

Following the installation of the filter fabric, the crew used a Telebelt conveyor system to place



the soil. A flexible drop tube was beneficial because it allowed for quick and precise soil placement using a minimum number of workers in a tight space. This system of soil installation prevents compaction and disturbance of the sub-grade.

Soil Characteristics

Schraven used his own EssentialSoil™ Turf soil mixture. "I designed this soil mixture to establish a turf area that could be maintained without any chemicals or pesticides, have good drought-resistance and deep rooted turf as well as microbial sustainability," Schraven said. "This soil is a 'bio-stable' soil, meaning that even with a high percentage of organic matter the soil will not settle, compact, or change dramatically in character compared with standard soils."

Schraven's soil is stable by virtue of the biological and mineral processes that occur within its matrix. The process is called cycling. When some minerals and compounds are degraded others are made. When some organic matters have decomposed other organic matter is manufactured by the life within the soil itself. Minerals then cycle from organism to organism and back again. The bio-stable soil owes much of its drainage, strength and stability to the fact that it is a "living soil."

Approximately 2 1/2 feet of the turf mix was applied on top of the completed drain system in 8 inch lifts or less, rolling each layer and firming it up. The soil was then inoculated with a microbial compost tea solution to energize the soil matrix with life. Schraven blows the soil in place using their air placement technology (for distances of 500 feet or more) and will inoculate the soil as it is being installed. In this case inoculation followed installation since the soil was placed by a Telebelt conveyor system. The soil surface then received standard hydroseeding, blended without chemical fertilizers.

One benefit of the soil mixture is that it does not require fertilizing when installed or for the following 3 months or so. Ongoing maintenance of the project was done using only his own organic based fertilizers and with continued applications of the microbial compost tea. "We use compost tea in all of our

Top of Opposite Page: The Medina residence's original lawn had root that ran no deeper than two or three inches. Within six months of completing the project, Schraven noted that the turf can develop 18- to 20-inch roots. **Bottom of Opposite Page:** Due to the extensive moisture in the northwest region, great care was needed when bringing heavy equipment to prevent it from becoming bogged down in the mud. **Top:** A conveyor system was used to import the soil to prevent it from becoming compacted. **Second from Top:** Heavy equipment was brought in to perform site excavation in which the top two feet of earth was removed. **Third from Top:** One reason the existing lawn couldn't establish good root depth was due to poor site drainage. **Bottom:** The conveyor system was able to deposit soil in remote spots of the site without damaging the area.



Left: Crew members begin the excavation process that removed poor soil conditions and made way for the installation of a new drainage system. **Middle:** Once the drainage system was in place, Schraven's soil was imported in and graded to the proper height. **Right:** The finished project met the homeowner's goal of establishing a functional lawn with a golf-course type appearance.

turf projects as well as golf courses," Schraven said. "Using a specialized mix of high quality microbially diverse compost and our own Growing Solutions brewers, it provides us with an excellent compost tea."

What is Bio-Stable Soil?

Bio-stable soil is a soil that is alive, sustainable and structural. The soil is alive because it contains a diversity of beneficial microorganisms. It is sustainable because there is enough organic matter in the soil to sustain it. Finally, the soil has a structural value in that once it is applied, the area can be driven over by golf carts or support a number of sports on it without the area sinking or settling.

"We basically wanted to establish a new model of turf installation and maintenance - a model that would excel beyond current standards in the turf industry,"

"Most of the time we apply the soil using blowing equipment or conveyors so that during the process no heavy equipment is on the drain field," Schraven said. According to him, this helps to avoid any collapsing or changing of sub-grade contours.

Soil Depth

Schraven wanted a turf with better than exceptional root structures. "We wanted to blow the socks off the standards for root growth," Schraven said. "Why? Because I knew that quicker and more extensive deep root growth would mean healthier thicker turf that would be more resilient, disease resistant and drought resistant. Some of our projects have seen a 70 percent reduction in irrigation. If you take these figures and apply them to whole communities, the water savings alone throughout a year would be truly outstanding."

However, if Schraven doesn't have 24 inches to spare for pure turf root zone, he notes that he can still achieve great results with only 18 inches; sometimes even less. "It depends on the sub-grade and what you are capable of doing with the sub-grade," he said.

He stressed the importance of the combined role of thick bio-stable living soil with the microbial compost tea. "The two work hand in hand; compost tea and living soil, living soil and compost tea," Schraven said.

According to him, there is not one component in the soil that makes it work so well; it's the combination, the sum of the whole mixture, that makes the soil work. With his mixture, he can have 18 to 20 inches of healthy root growth within the first 6 months.

Site Maintenance

For maintenance purposes, Schraven developed very pure organic fertilizers and micro-nutrients that work extremely well for organic turf systems. He states that organic fertilizers are as easy to apply as chemical fertilizers.

Ideally, the process starts with the soil. He will design and install a thick layer of bio-stable living soil. With the turf installed on the living soil, Schraven says that it will not get diseases to the same extent as in other types of soils.

According to Schraven, pesticides, herbicides, and chemical fertilizers have a tendency to disarm the plants and "pull the rug out" from under the soil's natural ability to fend off diseases. "Our whole process avoids using chemicals, pesticides, etc.," he said. "We maintain healthy turf and landscapes on an absolutely organic program by starting with the soil and adding organic fertilizers, microbial compost tea and micronutrients."

Another concern with maintenance is thatch build up. Usually on large areas like golf courses the clippings are removed. On residential turf/lawns installed using his soil mixture, he often recommends that lawn clippings be left so that they can be broken down in a natural process by the microbial activities and therefore become additional food for the soil. The compost microbial tea helps break down thatch to such an extent that it rarely becomes a problem.

Sturdy Results

Schraven's soil has been tested by the Soil Erosion Research Laboratory at San Diego State University. These tests included sedimentation, erosive properties, run off, water retention, etc. It has also been through heavy metal tests, permeability, shear strength as well as microbial analysis tests. The EssentialSoil™ Turf used in this project in Medina has also received an infiltration test, precipitation tests, and what Schraven calls the test of hard knocks... time and lots of foot traffic.



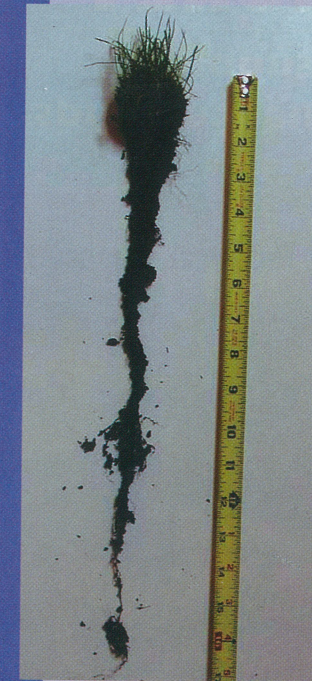
The purpose for using a conveyor system to import the dirt was to reduce the traffic within the turf replacement area. Limiting the traffic also reduces the compaction of the soil, which in turn give the turf roots a better chance to get established in a short period of time.

"In the last couple of years, the storms in the Northwest have been incredible with rainfall way above normal," said Schraven, whose business is based out of Issaquah, Was. "The owner likes the lawn short- more like a golf course look, and regardless, the turf has not puddled under these extreme conditions, nor has it become soggy or spongy."

Normally he does not advise cutting lawns short for residential use - it is best to let it grow a bit longer to create less stress and better turf health. "The turf on this site has done extremely well. It is thriving on our program that includes organic fertilizing, inoculating with compost tea and micro-nutrients, organic pre-emergent for weeds, and organic weed killers when needed," Schraven said.

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Do these organic turf building methods work for other turf applications such as professional, active ball fields?



Using Schraven's organic soil, he produces root systems that reach up to 18 inches deep.

"Many professional ball fields have an incredibly high maintenance demand. Some even have to replace the entire turf grass as often as every year or two. I wanted to demonstrate that a really durable turf can be made that can reduce the overall maintenance.

"This turf project has demonstrated that a durable, safe, and tough turf can be made and maintained organically.

The deep root mat is firm, strong, and yet has a quick spring-like feel.

"At some time or other, all ball fields or sports turfs will need repair. Typically this repair happens in between games or other recreational activities by seeding, spot repairs or replacing shallow rooted sections - both take a long time to grow.

"Our organic turf system allows for an almost instant fix for spot repairs by having some EssentialSoil™ turf growing just for spot repairs. When a repair is needed, carve a deep plug of turf with 12 to 18 inches of root growth and install it in a hole dug out for this purpose in the repair area. Lightly tamp and settle the deep turf plug, apply some compost microbial tea and the turf will be up and running in a fraction of the time.

"The extreme speed on which this turf develops is actually due to its food content. And as we know, it's not fertilizer that feeds the plant, it's the soil that feeds the plant, and in this case, it's the microbes that feed the nutrients to the grass roots."

• Hendrikus Schraven