David Wood, head groundskeeper at The Richard Stockton College of New Jersey

The Soil Profile:

Stockton College of New Jersey

WHAT HAPPENS TO A PREMIER SOCCER FIELD that is predominantly annual bluegrass in the middle of a hot messy summer in southern New Jersey when they turn off the water for two weeks? A rhetorical question? Unfortunately no, this is what happened to David Wood, head groundskeeper at The Richard Stockton College of New Jersey when the school decided to resurface the track that circles the field.

"We were a month and a half away from when the team comes back to start practice for a September 1 opening day game when they started a two week resurfacing of the track that circles our field and I was informed that we could not run our irrigation system at all while the track cures for fear of getting water on the new surface," Wood said about the school located in Pomona, 15 minutes outside of Atlantic City. Summers in the mid-Atlantic states are not great as anyone managing turf knows, humidity is very high and the temperatures typically can reach into the high 90's.

The soccer field is a mix of many grasses according to Wood, the field is mostly *poa* but there is a little bit of everything there, some bluegrass, ryegrass, fescue and even some bentgrass.

"I guess we were lucky that they didn't do this last summer which was the worst summer I can remember but not long after they turned off my water we hit temperatures in the low 100's," Wood said.

Dave Roesch has been the Supervisor of Landscape Maintenance at the college for more than 20 years and described the original construction of this soccer field as less than ideal. "The field was build in the mid 1980's and was designed to have a herring bone drainage system through the whole site but the design was changed during construction and the decision was made to make this site a recharge storm water basin and because of the this the construction company didn't have room for a proper drainage system." A series of corrugated pipes were laid in a bed of gravel and covered with a landscape fabric 14 inches below a mix of native soil, which is predominately a sandy loam, and a collection of subsoils.

"The field has always caused us drainage problems especially before we broke through the landscape fabric that held water just below the playing surface, and the soil mix was not what anyone would want on their stadium field," Wood said.

Stockton College of New Jersey was established in the late 1960's and is the home of the Stockton Ospreys men's soccer team, the 2001 NCAA Division III national champions. The stadium field is currently used almost exclusively for the men's soccer games. Stockton College does not have a football team so men's soccer takes on a highlighted spot in the sports program at the college. David Wood manages this field along with four practice soccer fields, almost 20 acres of intramural fields, one baseball field, one softball field and a new synthetic sports turf field as well as turf and landscape responsibilities across the 1,600 acre campus.

On July 7 the resurfacing work began on the track that completely encompasses the main soccer field. A rubber based polymer composite was used and a total of five coats were needed to finish the project. "The coating only takes a few minutes to dry but they can only apply the material in perfect conditions so the process ended up taking a couple of weeks to finish. The material used on the track can easily drift so if

Soil Report

			SB	BB	Field	"F"	
Sample Location							
Sample ID					1	Field	
Lab Number			9	10	11	12	
Sample Depth in inches			6	6	6	6	
Total Exchange Capacity (M. E.)			6.58	6.19	9.11	8.53	
pH of Soil Sample			6.00	6.10	6.70	6.00	
Organic Matter, Percent			2.94	2.45	2.02	2.54	
ANIONS	**SULFUR:**	p.p.m.	15	16	21	16	
	Mehlich III Phosphorous:	as (P_2O_5) lbs / acre	812	466	1064	1591	
EXCHANGEABLE CATIONS	**CALCIUM:** lbs / acre	Desired Value	1790	1684	2478	2319	
		Value Found	1624	1533	2814	2152	
		Deficit	-166	-151		-167	
	MAGNESIUM: lbs / acre	Desired Value	200	200	262	245	
		Value Found	207	215	197	258	
		Deficit			-65		
	POTASSIUM: lbs / acre	Desired Value	205	200	284	266	
		Value Found	177	163	218	168	
		Deficit	-28	-37	-66	-98	
	SODIUM:	lbs / acre	40	45	62	54	
BASE SATURATION %	Calcium (60 to 70%)		61.69	61.88	77.22	63.10	
	Magnesium (10 to 20%)		13.10	14.46	9.01	12.61	
	Potassium (2 to 5%)		3.45	3.37	3.07	2.53	
	Sodium (.5 to 3%)		1.33	1.58	1.49	1.36	
	Other Bases (Variable)		5.40	5.20	4.70	5.40	
	Exchangable Hydrogen (10 to 15%)		15.00	13.50	4.50	15.00	
TRACE ELEMENTS	Boron (p.p.m.)		0.42	0.37	0.7	< 0.2	
	Iron (p.p.m.)		326	393	318	188	
	Manganese (p.p.m.)		5	4	6	6	
	Copper (p.p.m.)		1.22	1.13	1	1.55	
	Zinc (p.p.m.)		6.87	4.87	4.42	4.99	
	Aluminum (p.p.m.)		660	671	387	690	
OTHER							

the wind is moving in the wrong directions we could have wound up with buildings painted red!" Wood said. One of the most damaging parts of the process was a tarp that they had to lay down around the entire parameter of the track over the turf, and without David's knowledge, this tarp was held down with 6-inch spikes one of which went through an irrigation line.

The soccer field is a mix of many grasses according to Wood, the field is mostly *poa* but there is a little bit of everything there, some bluegrass, ryegrass, fescue and even some bentgrass. "Last year was a tough year for this field, the weather was horrible and the *poa* started a slow decline in June and didn't recover until October," Wood said. It was at that point that he decided to make some changes in his agronomic approach to try to provide the field more sustainability and try to create a situation where the field could survive the tough New Jersey summers. David is a graduate of the turf management program at nearby Rutgers University and has many years of experience managing golf courses.

"I spent a lot of time managing *poa* on a golf course but it's not the same when you put a soccer team on that grass for a few hours of heavy play," said Wood.

Saturated Paste Report

			SB	BB	Field	"F"
Sample Location						
Sample ID					1	Field
Lab Number			39787	39788	39789	39790
Water Used			DI	DI	DI	DI
pH			6	6.1	6.7	6
Soluble Salts		ppm	56	119	160	97
Chloride (Cl)		ppm	22	27	30	19
Bicarbonate (HCO3)		ppm	66	98	129	42
ANIONS	SULFUR	ppm	17.51	15.47	17.56	14.81
	PHOSPHORUS	ppm	2.02	0.63	3.83	4.57
SOLUBLE CATIONS	CALCIUM	ppm	9.05	7.45	23.17	7.94
		meq/l	0.45	0.37	1.16	0.40
	MAGNESIUM	ppm	2.67	2.17	4.94	2.42
		meq/l	0.22	0.18	0.41	0.20
	POTASSIUM:	ppm	10.85	8.36	17.2	8.22
		meq/l	0.28	0.22	0.45	0.21
	SODIUM	ppm	20.47	20.09	25.19	19.76
		meq/l	0.89	0.87	1.10	0.86
PERCENT	Calcium		24.50	22.65	37.23	23.76
	Magnesium		12.04	10.99	13.22	12.09
	Potassium		15.26	13.22	14.36	12.76
	Sodium		48.20	53.14	35.19	51.39
TRACE ELEMENTS	Boron (p.p.m.)		0.09	0.1	0.08	0.09
	Iron (p.p.m.)		1.95	1.46	1.64	0.71
	Manganese (p.p.m.)		0.05	< 0.02	0.06	0.04
	Copper (p.p.m.)		0.03	0.03	0.03	0.03
	Zinc (p.p.m.)		0.07	0.05	0.02	0.04
	Aluminum (p.p.m.)		3.71	3.16	2.37	1.91
OTHER						

One of the concerns David expressed about the soils he was managing was the level of sodium. Test data showed that this field was consistently running at levels between 40 and 60 pounds per acre of sodium on the soil colloid but the water soluble paste extract was indicating an ever worse scenario. Along with the sodium concerns potassium levels were showing constant deficiencies which will only complicate the sodium problems creating added stress on an already stressed field. One recent water soluble paste extract showed a sodium percentage of 35 and a significantly lower potassium percentage which is often an indication for the potential of sodium induced wilt and more plant stress.

He started in October of last year with a recovery program of over seeding ryegrass with a starter fertilizer and frequent applications of gypsum to help knock off the excess sodium. In November he aerified with hollow tines in a 2-inch spacing and applied a combination zeolite, compost, rock mineral product at 25 pounds per 1000 square feet in the aerification holes and a composted 5-4-5 organic fertilizer to help recovery. He repeated this process again this past April.

"I wanted to get some recovery in this field and knew the organics would help but I also changed my topdressing program from a straight sand to a 70/20/10 mix incorporating a little peat moss and soil," said Wood. In the spring he incorporated a new fertility spray program using a 5-ounce mix of each of three products, a soil conditioner/bio-stimulant, a liquid calcium product and a carbon based NPK product. "What really sold me on this new approach was how well the soccer field recovered after 2 weeks with virtually no water. The *poa* is now strong and well rooted, last year at this

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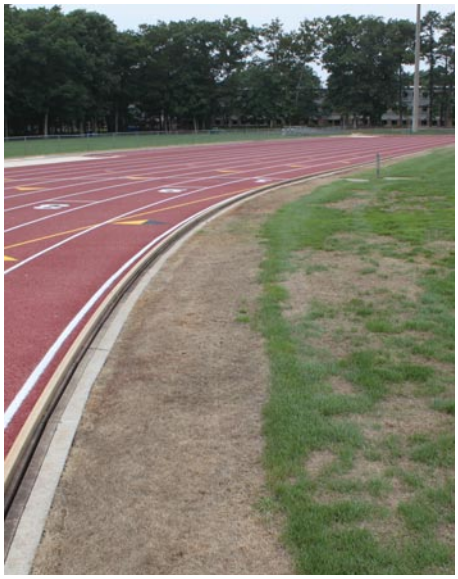

time you could pull it up with your hand so you could imagine what the soccer team did to it, but now it is holding up to everything!" said Wood.

I asked David what the first thing he did after he was able to get back on the soccer field after the track resurfacing project and with a laugh he quickly replied, "I watered it heavily!" He also went back with some zeolite and organic fertilizers to help recovery. He plans on continuing a regular gypsum program to fight the sodium that is coming in from the 10,000 gallons of water that he enjoys irrigating nightly. He has noticed a slight magnesium deficiency in recent soil tests and plans on making a couple of sul-po-mag applications this fall but will also continue the use of potassium sulfate to fight potassium deficiencies and stay ahead of the sodium to potassium balance.

I wouldn't wish 2 weeks of no irrigation on any turf manager let alone to have it happen in the middle of July and I have to say my expectations upon visiting David's field were pretty low, but I was overly impressed with the recovery that has occurred in such a short period of time. He still has some work to do and the weather has not helped much but the field is definitely playable, the few weak areas and field edges will be managed and over seeded. By opening day September 1 the players and spectators will not know there was ever a point of concern and David and his team will look back at this experience with a chuckle and a sigh of relief. ■

Joel Simmons is the president of EarthWorks Natural Organic Products and Soil First consulting and teaches the Soil First Academy. He holds a master's degree from Penn State University and is a former Penn State extension agent and instructor of soils at Rutgers University, joel@soilfirst.com.

The Soil Profile is a quarterly interview series that will be accompanied by soil test audits of a selected field from all corners of the sports turf world. Our goal is to evaluate the soil and water tests from a selected sports field and build a fertility program based on the soil profile. We would like to encourage all sports field managers who would like to be interviewed for this piece to contact the magazine. Along with Logan Labs he will provide free soil test work and consulting to the selected site.