



October 16, 2020

To Whom it May Concern:

Land management and management of our waterways go hand in hand. In fact the first function of any plant ground cover is water filtration and erosion control, which is another form of water filtration! As stated by the Lawn Institute on their website, "The biology of turfgrass makes lawns a near ideal medium for the biodegradation of all sorts of environmental contamination."

The Long Island Sound Study, an organization conducting a long term study of water runoff and its contribution to algal blooms and eutrophication, defines stormwater runoff as a non-point source of nitrogen loading. It also defines agricultural runoff as a non-point source. Agricultural runoff is water runoff from agricultural fields where *ground cover is not present*. In other words: agriculture fertilizer, including nitrogen, will leave the field with rainwater and enter the waterways in the presence of *any* bare soil. It is in fact plant roots and the microbiological system that lives among plant roots that filter, stabilize, and utilize nitrogen and other solutes, whether contaminants or plant essential nutrients.

It has come to my attention there is concern that a natural turfgrass field will contribute to contaminated water runoff. The specific concern is over a phenomenon called "nitrogen loading," where nitrogen is dissolved into runoff water and enters waterways, eventually making its way to surrounding marshes, bays, and the ocean.

Below are the major differences between a constructed synthetic turf field and natural turfgrass field, as related to runoff water, percolation, and ultimate discharge to waterways:

Much like the scenario of the bare soil agricultural field that adds solutes and suspended particles to runoff water, a synthetic turf field will allow stormwater to enter the waterway without the chance to be filtered, contributing solutes and suspended particles. So any solutes that are in that water (i.e. nitrogen), will immediately enter the waterway system. In fact, because synthetic turf field is man-made, an engineered internal drainage system will move water as quickly and efficiently as possible to be discharged without any biological filtration.

On the other hand, turfgrass, like an iceberg, is mostly below the surface. It grows long, intertwined, fibrous roots that, in conjunction with root zone microbiology, filter contaminants from runoff water. In fact, the filtration abilities of turfgrass are utilized by many communities that irrigate effluent water onto turfgrass, specifically to remove nitrogen.

Evident on the soil test from the West Tis School and North sites, resilient natural turfgrass fields are properly maintained with very little soluble nitrogen in the soil. It is because of the living system that is a natural turfgrass field, the soluble nitrogen, (the waterway pollutant of concern) is not higher. If runoff water simply flowed through an *abiotic* (non-living, plastic) system it would carry more contaminant.

As published by the International Turfgrass Society in their Research Journal Volume 10, 2005; researches A. Martin Petrovic and Zachary M. Easton write:

“With established turfgrass, clippings are generally the largest sink of N, accounting for 25-60% of applied N. Miltner et al. (1996) recovered well over 50% of N in clipping, verdure, and thatch. The N bound in turfgrass tissue does not generally represent a threat to water quality as it is utilized by the plant and prevented from entering water supplies.”

Further turfgrass builds organic matter on earth, commonly called topsoil. This organic matter, soil carbon, is made of the very same carbon dioxide that is in excess in the atmosphere. This excess causes destructive weather events across the globe. Turfgrass and its accompanying root zone microbial team captures and transforms carbon dioxide making our natural grass fields Climate Change Mitigators.

For these reasons, your community should strongly consider utilizing natural turfgrass fields: the preferred and responsible choice.

Respectfully,

Jack Higgins  
EarthWorks Agronomist

# Soil Report

Job Name: **The Field Fund Inc**

Date: 4/25/2019

Company: **Soil First Consulting**

Submitted By: **Jack Higgins**

<i>Sample Location</i>		Chimark				
<i>Sample ID</i>						
<i>Lab Number</i>		253				
<i>Sample Depth in inches</i>		6				
<i>Total Exchange Capacity (M. E.)</i>		2.47				
<i>pH of Soil Sample</i>		6.2				
<i>Organic Matter, Percent</i>		3.53				
<b>ANIONS</b>	<b>SULFUR:</b> p.p.m.	12				
	<b>Mehlich III Phosphorous:</b> as (P <sub>2</sub> O <sub>5</sub> ) lbs / acre	246				
<b>EXCHANGEABLE CATIONS</b>	<b>CALCIUM:</b> lbs / acre	Desired Value Value Found Deficit	671 558 -113			
	<b>MAGNESIUM:</b> lbs / acre	Desired Value Value Found Deficit	200 122 -78			
	<b>POTASSIUM:</b> lbs / acre	Desired Value Value Found Deficit	200 70 -130			
	<b>SODIUM:</b> lbs / acre		24			
	<b>BASE SATURATION %</b>	Calcium (60 to 70%)	56.47			
		Magnesium (10 to 20%)	20.58			
		Potassium (2 to 5%)	3.63			
		Sodium (.5 to 3%)	2.11			
	Other Bases (Variable)	5.20				
	Exchangable Hydrogen (10 to 15%)	12.00				
<b>TRACE ELEMENTS</b>	Boron (p.p.m.)	< 0.2				
	Iron (p.p.m.)	155				
	Manganese (p.p.m.)	10				
	Copper (p.p.m.)	0.77				
	Zinc (p.p.m.)	6.86				
	Aluminum (p.p.m.)	537				
<b>OTHER</b>						

# Soil Report

Job Name: **The Field Fund Inc**  
 Company: **Soil First Consulting**

Date: **4/25/2019**  
 Submitted By: **Jack Higgins**

Sample Location		Edgartown				
Sample ID						
Lab Number		254				
Sample Depth in inches		6				
Total Exchange Capacity (M. E.)		3.44				
pH of Soil Sample		6.4				
Organic Matter, Percent		5.09				
<b>ANIONS</b>	<b>SULFUR:</b> p.p.m.	13				
	<b>Mehlich III Phosphorous:</b> as (P <sub>2</sub> O <sub>5</sub> ) lbs / acre	400				
<b>EXCHANGEABLE CATIONS</b>	<b>CALCIUM:</b> lbs / acre	Desired Value Value Found Deficit	936 815 -121			
	<b>MAGNESIUM:</b> lbs / acre	Desired Value Value Found Deficit	200 173 -27			
	<b>POTASSIUM:</b> lbs / acre	Desired Value Value Found Deficit	200 112 -88			
	<b>SODIUM:</b> lbs / acre		28			
	<b>BASE SATURATION %</b>	Calcium (60 to 70%)	59.17			
		Magnesium (10 to 20%)	20.93			
		Potassium (2 to 5%)	4.17			
		Sodium (.5 to 3%)	1.78			
	Other Bases (Variable)	5.00				
	Exchangable Hydrogen (10 to 15%)	9.00				
<b>TRACE ELEMENTS</b>	Boron (p.p.m.)	0.31				
	Iron (p.p.m.)	241				
	Manganese (p.p.m.)	9				
	Copper (p.p.m.)	1.34				
	Zinc (p.p.m.)	4.06				
	Aluminum (p.p.m.)	677				
<b>OTHER</b>						

# Soil Report

Job Name: **The Field Fund Inc**  
 Company: **Soil First Consulting**

Date: **4/25/2019**  
 Submitted By: **Jack Higgins**

<i>Sample Location</i>		Oaks Bluff					
<i>Sample ID</i>		Front					
<i>Lab Number</i>		255					
<i>Sample Depth in inches</i>		6					
<i>Total Exchange Capacity (M. E.)</i>		3.87					
<i>pH of Soil Sample</i>		6.5					
<i>Organic Matter, Percent</i>		4.29					
<b>ANIONS</b>	<b>SULFUR:</b> p.p.m.	12					
	<b>Mehlich III Phosphorous:</b> as (P <sub>2</sub> O <sub>5</sub> ) lbs / acre	205					
<b>EXCHANGEABLE CATIONS</b>	<b>CALCIUM:</b> lbs / acre	Desired Value	1051				
		Value Found	1012				
		Deficit	-39				
	<b>MAGNESIUM:</b> lbs / acre	Desired Value	200				
		Value Found	160				
		Deficit	-40				
	<b>POTASSIUM:</b> lbs / acre	Desired Value	200				
		Value Found	112				
Deficit		-88					
<b>SODIUM:</b> lbs / acre	22						
<b>BASE SATURATION %</b>	Calcium (60 to 70%)	65.43					
	Magnesium (10 to 20%)	17.24					
	Potassium (2 to 5%)	3.71					
	Sodium (.5 to 3%)	1.26					
	Other Bases (Variable)	4.90					
	Exchangable Hydrogen (10 to 15%)	7.50					
<b>TRACE ELEMENTS</b>	Boron (p.p.m.)	0.3					
	Iron (p.p.m.)	433					
	Manganese (p.p.m.)	11					
	Copper (p.p.m.)	1.11					
	Zinc (p.p.m.)	3.6					
	Aluminum (p.p.m.)	615					
<b>OTHER</b>	Ammonium (p.p.m.)	0.6					
	Nitrate (p.p.m.)	1.5					

# Soil Report

Job Name: **The Field Fund Inc**  
 Company: **Soil First Consulting**

Date: **4/25/2019**  
 Submitted By: **Jack Higgins**

<i>Sample Location</i>		Oaks Bluff				
<i>Sample ID</i>		Back				
<i>Lab Number</i>		256				
<i>Sample Depth in inches</i>		6				
<i>Total Exchange Capacity (M. E.)</i>		3.42				
<i>pH of Soil Sample</i>		6.5				
<i>Organic Matter, Percent</i>		3.83				
<b>ANIONS</b>	<b>SULFUR:</b> p.p.m.	12				
	<b>Mehlich III Phosphorous:</b> as (P <sub>2</sub> O <sub>5</sub> ) lbs / acre	220				
<b>EXCHANGEABLE CATIONS</b>	<b>CALCIUM:</b> lbs / acre	Desired Value Value Found Deficit	931 864 -67			
	<b>MAGNESIUM:</b> lbs / acre	Desired Value Value Found Deficit	200 155 -45			
	<b>POTASSIUM:</b> lbs / acre	Desired Value Value Found Deficit	200 113 -87			
	<b>SODIUM:</b> lbs / acre		22			
	<b>BASE SATURATION %</b>	Calcium (60 to 70%)	63.07			
		Magnesium (10 to 20%)	18.86			
		Potassium (2 to 5%)	4.23			
		Sodium (.5 to 3%)	1.39			
<b>TRACE ELEMENTS</b>	Boron (p.p.m.)	0.3				
	Iron (p.p.m.)	483				
	Manganese (p.p.m.)	12				
	Copper (p.p.m.)	1.03				
	Zinc (p.p.m.)	3.34				
	Aluminum (p.p.m.)	597				
<b>OTHER</b>	Ammonium (p.p.m.)	0.4				
	Nitrate (p.p.m.)	1.6				

# Soil Report

Job Name: **The Field Fund Inc**  
 Company: **Soil First Consulting**

Date: **4/25/2019**  
 Submitted By: **Jack Higgins**

<i>Sample Location</i>		West Tis				
<i>Sample ID</i>		Town				
<i>Lab Number</i>		257				
<i>Sample Depth in inches</i>		6				
<i>Total Exchange Capacity (M. E.)</i>		4.62				
<i>pH of Soil Sample</i>		6.7				
<i>Organic Matter, Percent</i>		5.16				
<b>ANIONS</b>	<b>SULFUR:</b> p.p.m.	13				
	<b>Mehlich III Phosphorous:</b> as (P <sub>2</sub> O <sub>5</sub> ) lbs / acre	71				
<b>EXCHANGEABLE CATIONS</b>	<b>CALCIUM:</b> lbs / acre Desired Value Value Found Deficit	1257 1208 -49				
	<b>MAGNESIUM:</b> lbs / acre Desired Value Value Found Deficit	200 230				
	<b>POTASSIUM:</b> lbs / acre Desired Value Value Found Deficit	200 128 -72				
	<b>SODIUM:</b> lbs / acre	24				
<b>BASE SATURATION %</b>	Calcium (60 to 70%)	65.32				
	Magnesium (10 to 20%)	20.73				
	Potassium (2 to 5%)	3.55				
	Sodium (.5 to 3%)	1.14				
	Other Bases (Variable)	4.70				
	Exchangable Hydrogen (10 to 15%)	4.50				
<b>TRACE ELEMENTS</b>	Boron (p.p.m.)	0.23				
	Iron (p.p.m.)	137				
	Manganese (p.p.m.)	2				
	Copper (p.p.m.)	0.39				
	Zinc (p.p.m.)	2.44				
	Aluminum (p.p.m.)	809				
<b>OTHER</b>						

# Soil Report

Job Name: **The Field Fund Inc**  
 Company: **Soil First Consulting**

Date: **4/25/2019**  
 Submitted By: **Jack Higgins**

<i>Sample Location</i>		West Tis				
<i>Sample ID</i>		School				
<i>Lab Number</i>		258				
<i>Sample Depth in inches</i>		6				
<i>Total Exchange Capacity (M. E.)</i>		3.44				
<i>pH of Soil Sample</i>		6.1				
<i>Organic Matter, Percent</i>		5.47				
<b>ANIONS</b>	<b>SULFUR:</b> p.p.m.	13				
	<b>Mehlich III Phosphorous:</b> as (P <sub>2</sub> O <sub>5</sub> ) lbs / acre	92				
<b>EXCHANGEABLE CATIONS</b>	<b>CALCIUM:</b> lbs / acre Desired Value Value Found Deficit	935 792 -143				
	<b>MAGNESIUM:</b> lbs / acre Desired Value Value Found Deficit	200 149 -51				
	<b>POTASSIUM:</b> lbs / acre Desired Value Value Found Deficit	200 117 -83				
	<b>SODIUM:</b> lbs / acre	21				
<b>BASE SATURATION %</b>	Calcium (60 to 70%)	57.58				
	Magnesium (10 to 20%)	18.05				
	Potassium (2 to 5%)	4.36				
	Sodium (.5 to 3%)	1.35				
	Other Bases (Variable)	5.20				
	Exchangable Hydrogen (10 to 15%)	13.50				
<b>TRACE ELEMENTS</b>	Boron (p.p.m.)	0.33				
	Iron (p.p.m.)	366				
	Manganese (p.p.m.)	3				
	Copper (p.p.m.)	0.52				
	Zinc (p.p.m.)	2.92				
	Aluminum (p.p.m.)	774				
<b>OTHER</b>	Ammonium (p.p.m.)	0.6				
	Nitrate (p.p.m.)	4				



# Soil Report

Job Name: **The Field Fund Inc**

Date: 4/25/2019

Company: **Soil First Consulting**

Submitted By: **Jack Higgins**

<i>Sample Location</i>		West Tis				
<i>Sample ID</i>		North				
<i>Lab Number</i>		259				
<i>Sample Depth in inches</i>		6				
<i>Total Exchange Capacity (M. E.)</i>		2.51				
<i>pH of Soil Sample</i>		6.2				
<i>Organic Matter, Percent</i>		5.19				
<b>ANIONS</b>	<b>SULFUR:</b> p.p.m.	12				
	<b>Mehlich III Phosphorous:</b> as (P <sub>2</sub> O <sub>5</sub> ) lbs / acre	62				
<b>EXCHANGEABLE CATIONS</b>	<b>CALCIUM:</b> Desired Value lbs / acre Value Found Deficit	682 540 -142				
	<b>MAGNESIUM:</b> Desired Value lbs / acre Value Found Deficit	200 129 -71				
	<b>POTASSIUM:</b> Desired Value lbs / acre Value Found Deficit	200 113 -87				
	<b>SODIUM:</b> lbs / acre	21				
	<b>BASE SATURATION %</b>					
	Calcium (60 to 70%)	53.80				
	Magnesium (10 to 20%)	21.42				
	Potassium (2 to 5%)	5.77				
<b>TRACE ELEMENTS</b>						
Boron (p.p.m.)	0.23					
Iron (p.p.m.)	274					
Manganese (p.p.m.)	4					
Copper (p.p.m.)	0.55					
Zinc (p.p.m.)	3.21					
Aluminum (p.p.m.)	691					
<b>OTHER</b>						
Ammonium (p.p.m.)	0.7					
Nitrate (p.p.m.)	1.4					