



Prince George's Department of Parks and Recreation



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PALS + PG Parks Partnership

- PG Parks seeks to improve maintenance of fields
- Sports Turf Students from UMD asked to analyze and advise on agronomic practices.
- Three fields chosen as representative of the county
- End goal of partnership is to improve playing surfaces and increase overall safety of the community



Site Analysis - Acredale Park

Municipal athletic field (multi sport use)

Ground cover make up:

Tall Fescue, common Bermudagrass, broad leaf plantain, crabgrass, clover, goosegrass

Native soil profile

Goal: Safe playing conditions, full year use, improve turf to weed ratio



Site Analysis - Powder Mill Park

Municipal athletic field (multi sport use)

Ground cover make up:

Tall Fescue, Common Bermudagrass, broad leaf plantain, Crabgrass, clover, goosegrass

Native soil profile

Goal: Safe playing conditions, full year use, improve turf to weed ratio



Shockwave Linear De-Compacter



Courtesy: Campeyturfcare.com



Site Analysis - Riverdale Park

High School level maintenance

Ground cover:

Bluemuda mixture and clover

Native soil profile

Access to irrigation

Bluemuda requires little inputs

Goal: Safe playing surface in season,
improve infield skin surface drainage



Materials and Methods

Clegg hammer

- Clegg impact soil tester or Clegg Decelerometer.
- measures the deceleration of the free-falling hammer from a fixed height onto the surface test the hardness of the surface.
- Expressed in G-max.
- Higher the reading, greater the soil hardness.

Time domain reflectometry(TDR)

- Measures the soil moisture content as percentage of Volumetric Water Content (%VWC) in the soil based on the electrical conductivity of the soil.

Bulk density

- Defined as the dry weight of the soil divided by its volume.
- Expressed in g/cm³.
- Typically indicates the soil compaction.



Clegg hammer



Time domain reflectometry

Infiltration rate

- Calculated using double-ring infiltrometer
- Measures water infiltration rate of the soil.
- It is the measurement of the amount of water that enters the soil (depth in mm) in one hour.
- Expressed in inches / hour

Shear vane

- Measures the shear strength of the turfgrass.
- Instrument is rotated in clockwise or anti-clockwise direction with the handle at the top and the gauge at the top makes the reading.
- Higher the reading, greater the shear strength of the turfgrass.
- Expressed in Newton- meters (N-m).



Shear vane

Data means of %VWC, Clegg and Shear strength collected in Acredale Park

Quadrant	Mean		
	%VWC (Sep 22)	Clegg (G_{max}) (Dec 4)	Shear Strength (N-m) (Sep 22)
NE	31.2	73.7	21.5
SE	21.0	86.3	16.3
SW	25.6	111.7	17.7
NW	28.2	112.7	26.3

Data means of %VWC, Clegg and Shear strength collected in Powder Mill Park

Quadrant	Mean			
	%VWC	Clegg (G_{max})		Shear Strength (N-m)
		Before shockwave	After shockwave	
NE	37.3	107.3	61.0	10.5
SE	34.5			12.3
SW	37.7	122.3	72.3	12.2
NW	35.9			11.0

Data means of %VWC, Clegg and Shear strength collected in Riverdale Park

Quadrant	Mean		
	%VWC	Clegg (G_{max})	Shear Strength (N-m)
Left	27.7	48.0	12.0
Center	26.0	48.0	10.3
Right	25.5	46.7	13.0
Mound	42.2	57.5	10.5
Base Paths	34.0	45.0	12.5

Data of infiltration rate collected in Acredale, Powder Mill and Riverdale Park

Quadrant	Acredale (9/22/20)	Powder Mill (9/29/20)	Riverdale (11/3/20)
Reading 1	6/16" (South-central)	6/32" (South-central)	3/4" (3 rd Base Path)
Reading 2	1.5" (Northwest)	1" (Northwest)	2.6" (Left-center field)

Results

- In comparison with all three parks, percentage of volumetric water content (VWC) and shear strength were higher in Acredale Park respectively when compared to all the quadrants of the parks.
- In Powder Mill Park, there are some major differences in the Clegg hammer readings which are collected before and after shockwave. The readings taken after shockwave are pretty low compared to before shockwave.

Results

- The Clegg readings are moderate for Riverdale Parks indicating the safe surface and suitable for playing.
- By observing all the Clegg readings, we can say that the Riverdale park has a softer surface when compared to Acredale and Powder Mill Parks.



Recommendations for Acredale and Powder Mill

- Create the best playing surface with what the county can provide
- Introduce an Irrigation system
- Predominantly 1 turf type
- Weed prevention and control



Riverdale Baseball Field

- Introduce or audit irrigation system
- Field renovation
 - Surface drainage
 - Laser grade infield dirt
- Replace base paths and add cut outs



Benefits of Irrigation

- Less heat stress
- Better root growth
- More uniform turf grass
- Less stress from summer drought
- Creates a safer playing surface when used properly



Surface Drainage and Grading

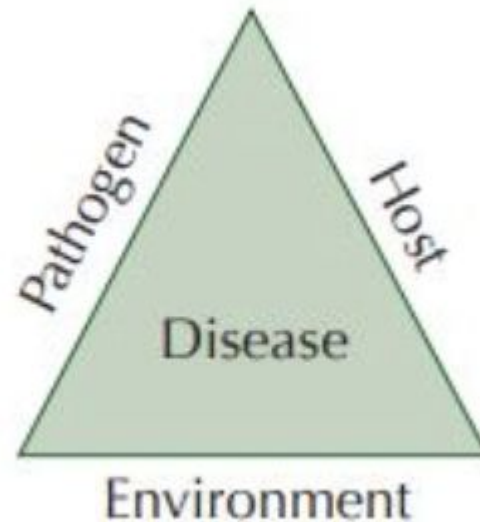
- A critical component to any sports field drainage system, if installed drainage is not an option maximizing the surface drainage can keep you playing.
- The other aspect to sports field drainage is making sure the field is graded properly to have positive flow to designated areas.
- Installing base paths and cut outs on the infield to create an easier maintenance practice and a safer playing surface



Cultivation Recommendations

Bermuda

- Proper mowing height ~ 1"
 - encourage lateral growth
 - force out weeds
- Aggressive decompaction over the peak growth period (summer months)
- Continue using best management practices



Tall Fescue

- Proper mowing height 2 1/2" - 3"
 - reduce weed pressure
 - cover bare spots
- Decompaction and seeding during the fall
- Continue using best management practices

Fertility Recommendations

- Continue current fertility program for Riverdale Baseball Field
- If changing Acredale or Powder Mill to bermuda follow the current practices that Riverdale Has
- Tall fescue Fertilization in early spring and in the fall with seeding
- Both fertility programs use slow release nitrogen at the state of Maryland recommended rates
- Return mowing clippings

Grass Type	Sept.	Oct. - Nov. 15th	May - early June	June- July	Aug.	Max. Nitrogen (Annually)
Tall fescue	0.7*-0.9lb**	0.7*-0.9lb**	0.5+-0.9lb**+	0	0	2.7 lbs of N
Kentucky bluegrass	0.7*-0.9lb**	0.7*- 0.9lb**	0.5+-0.9lb**+	0	0	2.7 lbs of N
Fine fescue	0.7*- 0.9lb** (any time before Nov. 15 th)	0	0.5 lb+	0	0	1.4 lbs of N
Zoysiagrass	0	0	0.7* - 0.9 lb**	0.5+-0.9lb**+	0	1.8 lbs of N
Bermudagrass	0	0	0.7* - 0.9 lb**	0.7*- 0.9lb**	***	2.7 lbs of N