

October 9, 2018

2018 PRM RESULTS

Hillcrest Country Club, Boise ID



INTRODUCTION

Performance Resource Management is a premium agronomic service designed to deliver superior results. PRM improves playing conditions while saving water and other operational costs, which greatly benefits the business of operating a golf course.

Qualitative results that have been recorded this season include:

1. Improved turf density
2. Less irrigation maintenance (due to clogged sprinkler heads)
3. Reduced hand watering
4. A reduction in the severity of wet spots

PRM has monitored multiple, quantitative data points that have contributed to the qualitative results that were observed over the season.

This report highlights the agronomic improvements that have been observed at Hillcrest Country Club over the course of the 2018 season. Notable, quantitative improvements include:

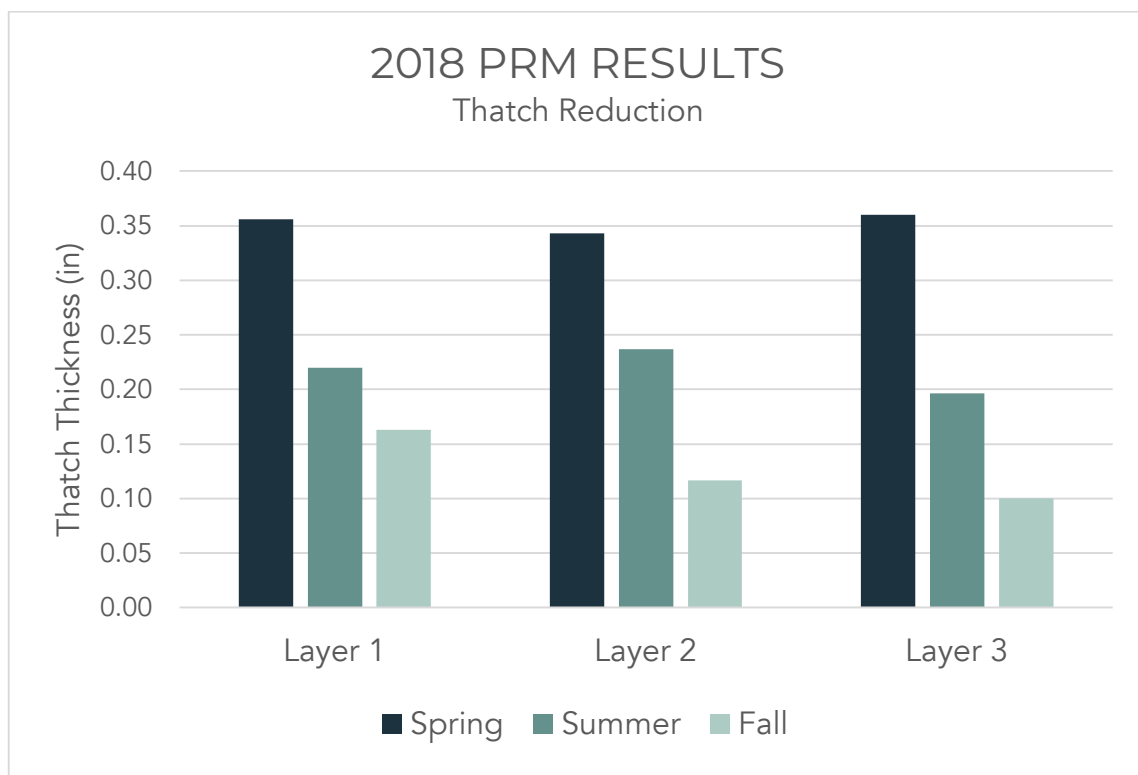
1. Thatch Reduction
2. Root Zone Expansion
3. Drainage Improvement

Charts, graphs, and tables included in the '18 PRM Results Report reference data representative of trends observed across the course. Agronomic data has been gathered by PRM. We expect to see continued improvements throughout next year with the 2019 PRM program.

THATCH REDUCTION

Excess thatch is a problem many golf courses struggle with across the valley. Thatch layering creates a perched water table, limiting drainage, the effectiveness of irrigation and the efficiency of root development. Managing organic material has posed a challenge for decades, and significant progress has been recorded this year.

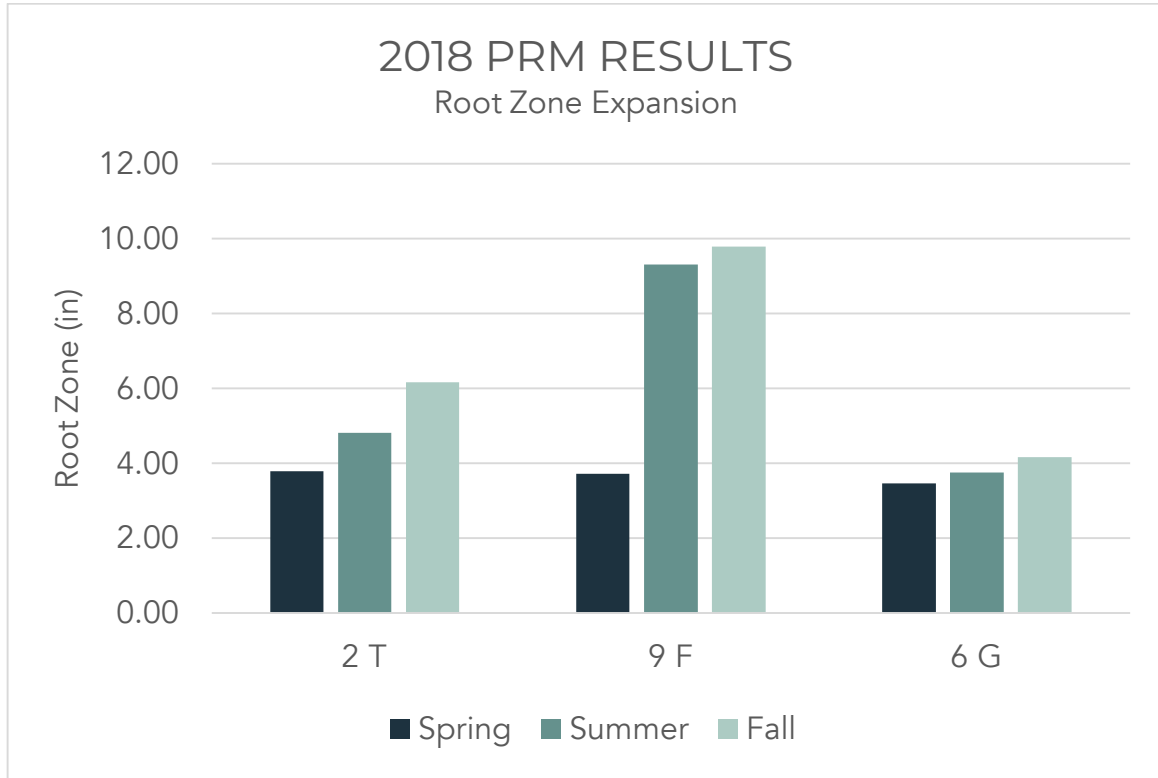
The first 3 prominent layers of thatch were measured in the Spring, Summer, and Fall. The chart below shows the decrease in thatch, by layer, over time. For example, the first layer of thatch decreased from 0.36 inches in the Spring to 0.16 inches in the Fall, a 54% reduction in the first layer of thatch (chart derived from table below).



Average Thatch Thickness (in)				
2 Tee	Spring	Summer	Fall	% reduction
Layer 1	0.36	0.22	0.16	54%
Layer 2	0.34	0.24	0.12	66%
Layer 3	0.36	0.20	0.10	72%

ROOT ZONE EXPANSION

The deeper roots can go into the soil, the more efficient the plant can be in transporting nutrients and surviving extreme temperature and drought. Running PRM this season caused the root zone to expand course wide, on greens, tees, and fairways.

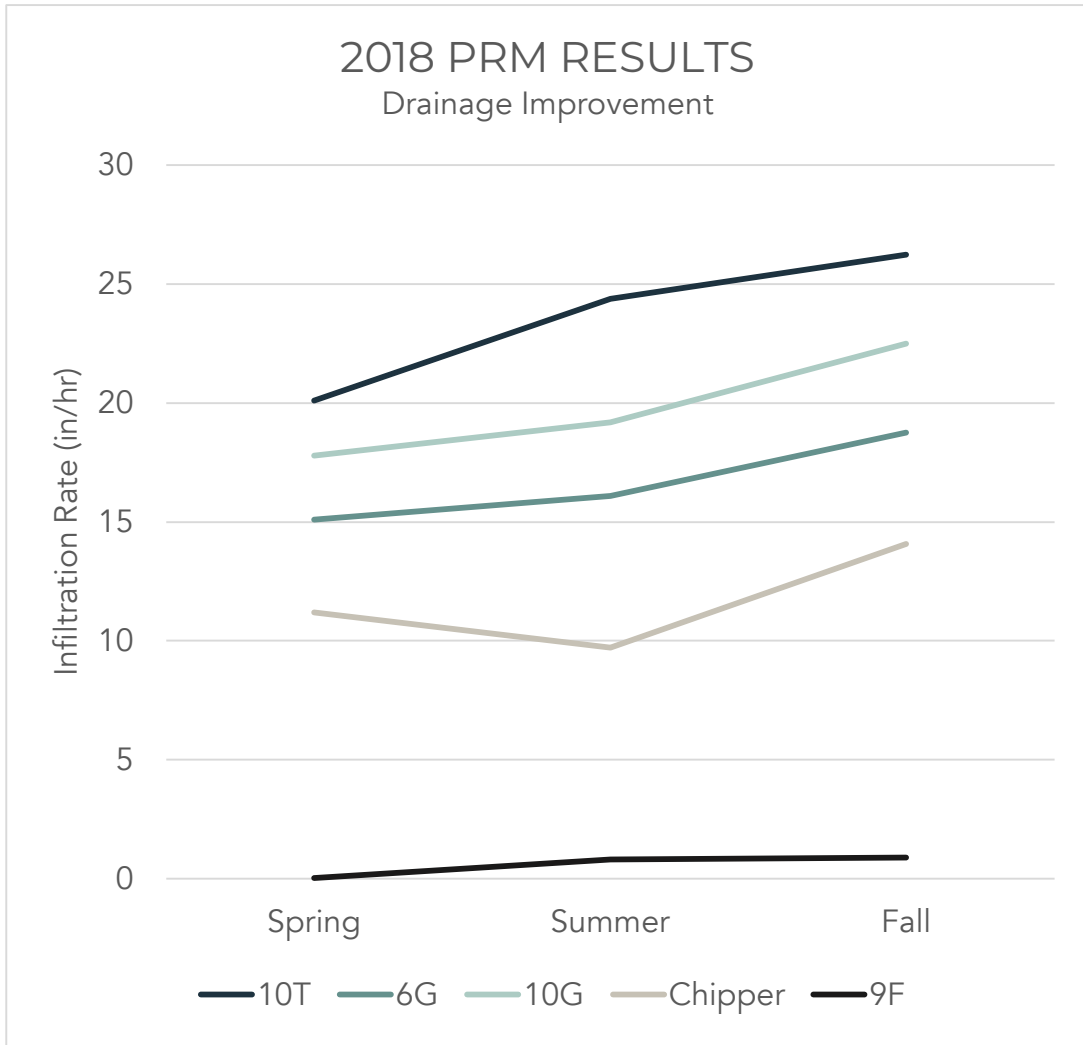


Average Root Depth (in)				
Location	Spring	Summer	Fall	% increase
2 T	3.80	4.82	6.17	63%
9 F	3.72	9.31	9.79	163%
6 G	3.46	3.76	4.16	20%

DRAINAGE IMPROVEMENT

Drainage is the result of a combination of agronomical factors that are interrelated. Reducing thatch and compaction allows water to flow through the soil profile, causing increased root development. All have been observed over the 2018 season.

Drainage is measured with an infiltrometer, which measures the rate water goes into the ground in inches per hour.



Location	Drainage Improvement (in/hr)			
	Spring	Summer	Fall	% increase
10T	20.10	24.38	26.25	31%
6G	15.10	16.10	18.75	24%
10G	17.80	19.20	22.50	26%
Chipper	11.20	9.70	14.06	26%
9F	0.03	0.80	0.88	2723%