Windmill Ridge Golf Course

Soil Analysis 2 Green

October 26, 2011
Submitted by: Michael D. Vogt, CGCS, CGIA

NUMBER 2 GREEN AT WINDMILL RIDGE GOLF COURSE

Date of sample	Na PPM	Na #/Acre	CEC	Organic Material	Base Saturation: Calcium (Ca)	Magnesium (Mg)	Potassium (K)	Sodium (Na)	Other Bases	Exchangeable Hydrogen (H)	pH
5/11/2007	22.00	44.00	6.10	0.83	69.5	12.09	4.50	1.56	4.90	7.50	6.50
12/19/2007	52.50	105.00	5.29	1.33	76.94	11.03	3.76	4.31	4.00	0.00	7.40
3/11/2011	24.00	48.00	4.15	0.92	75.99	13.85	3.49	2.52	4.20	0.00	7.20
10/10/2011	69.50	139.00	3.65	0.68	65.93	19.18	5.53	5.52	3.90	0.00	7.50

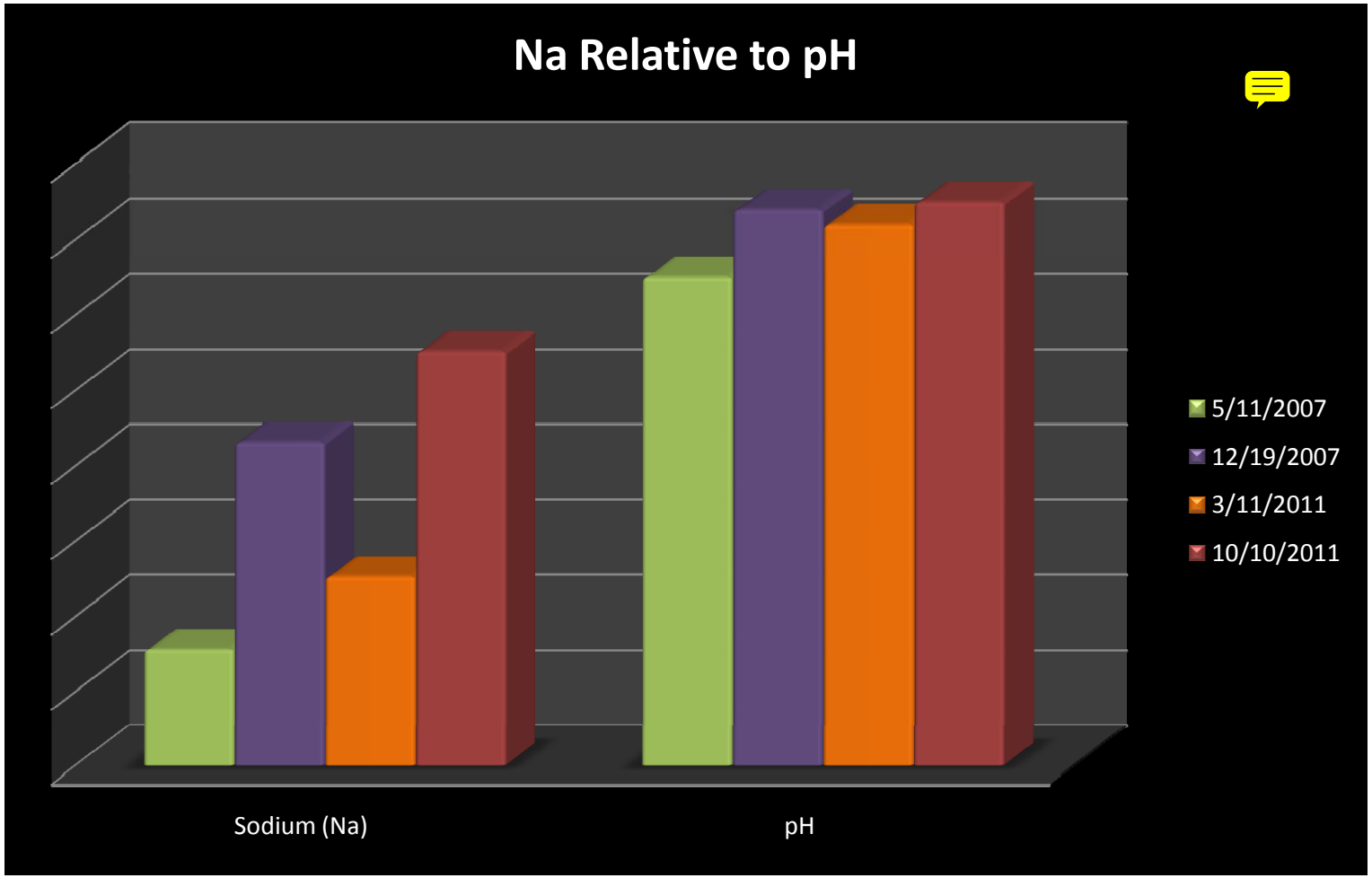
	P to Mg Ratio (should be 2:1)
5/11/2007	2.69 :1
12/19/2007	2.93 :1
3/11/2011	3.97 :1
10/10/2011	3.47 :1

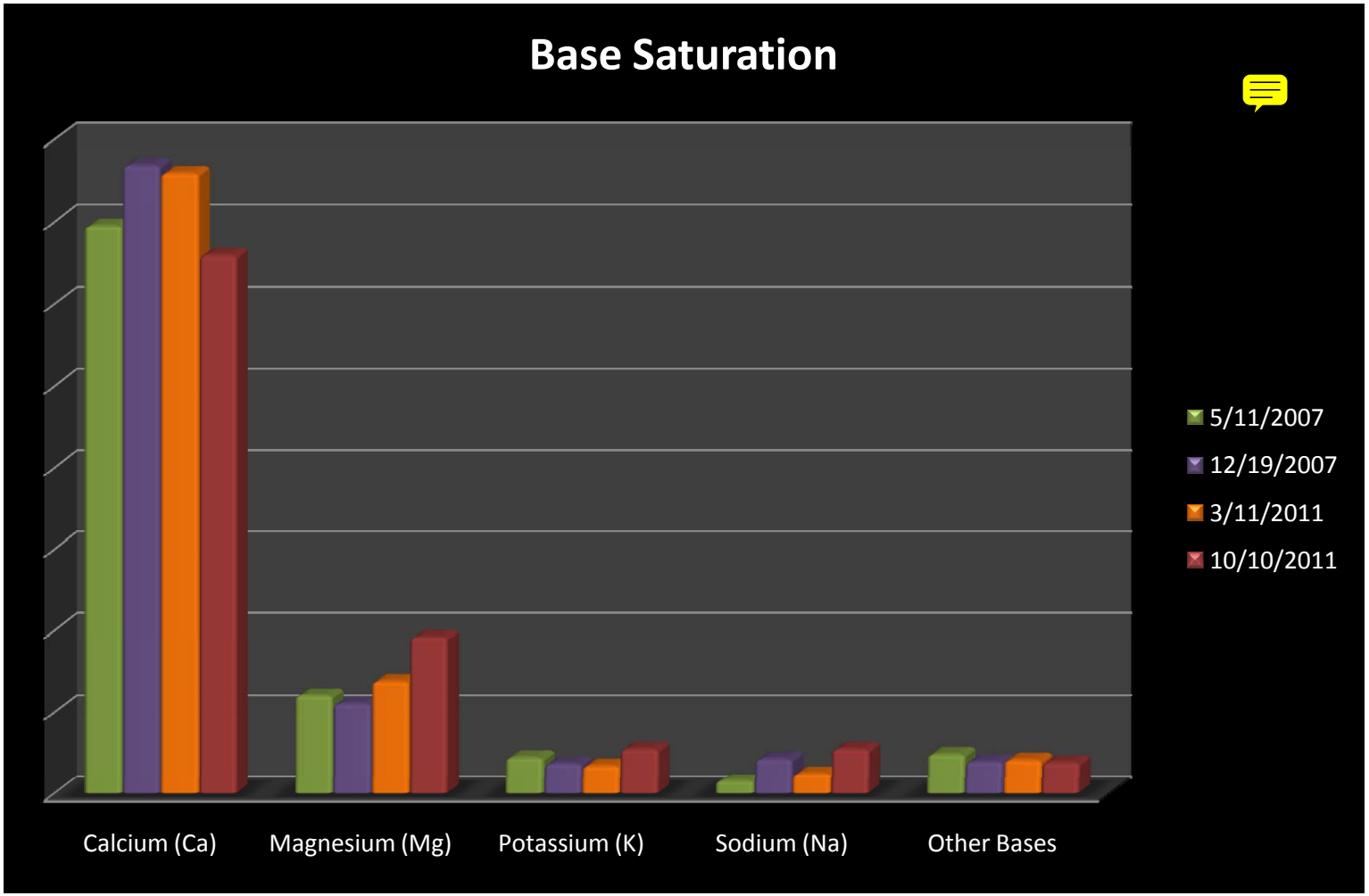
	SAR Saturated Paste 12/19/2007	
1	Ca	1.58
1	Mg	3.14
1	SUM	4.72
2		2.36
3	Square root	1.54
4	Na	1.77
4	SAR	**1.15**

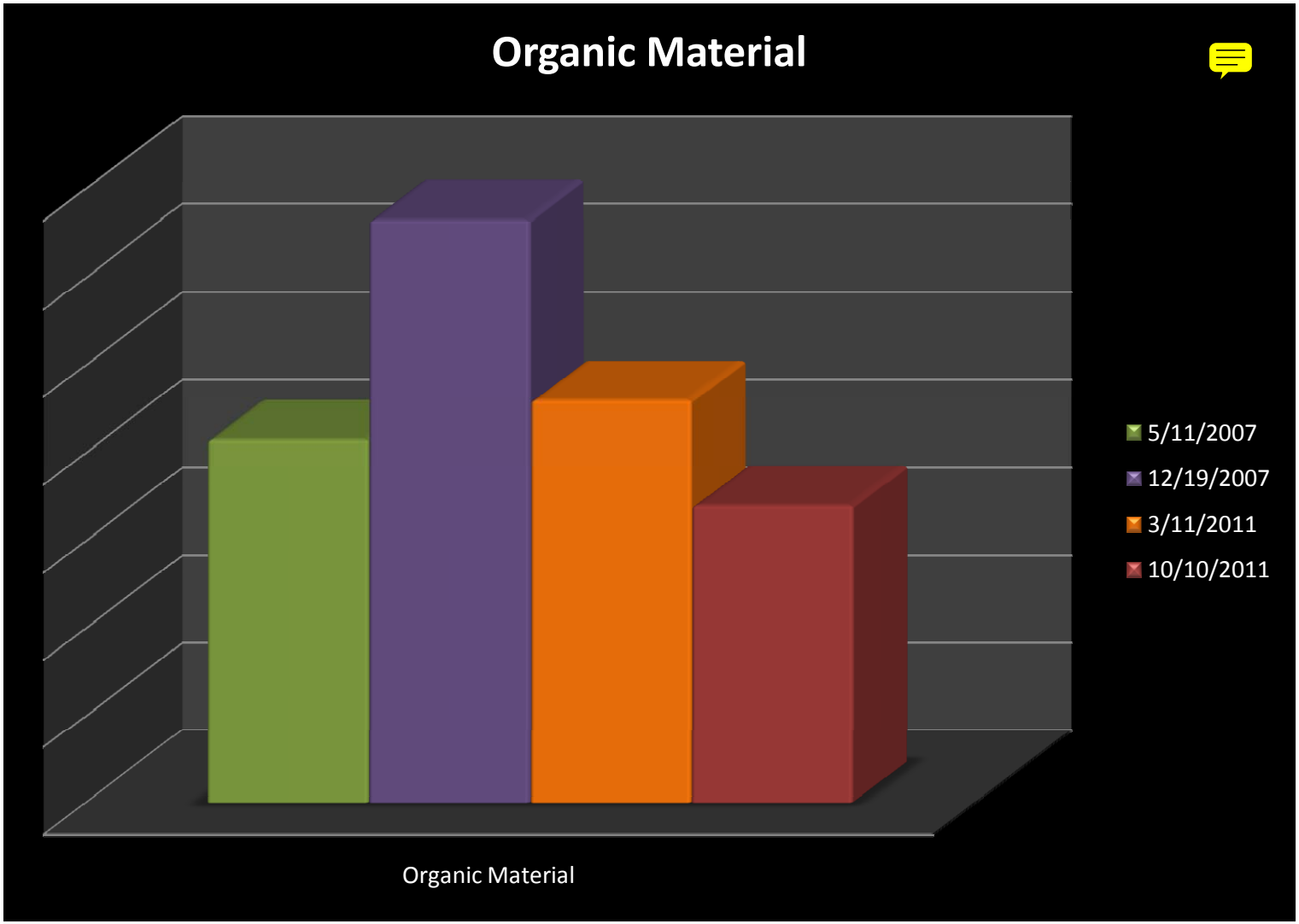
1 Slightly reduce sand topdressing to build more organic matter and increase CEC
2 Apply gypsum; minimum of 5 applications per year, March, April, June, August, September, approximately two (2) bags per green
3 After gypsum application water no less than 30 minutes per green head to flush salts
4 On a regular basis attempt to water heavy and less frequently to move salts away from root-zone between gypsum applications
5 pH is moving up slightly but even at 7.5 it is not a problem, high pH will almost always be associated with high salts
6 At current levels Na (sodium) is not a problem alone but is at sufficient levels to contribute to a slightly weakened turf stand
7 Use ammonium sulfate ($(NH_4)_2SO_4$ for your nitrogen source) to fertilize, should be beneficial in bringing down pH
8 Venting greens will increase drainage and air exchange with roots, venting should take place twice per month weather permitting

To Find Sodium Adsorption Ratio

1. Add together the concentrations of calcium and magnesium ions, measured in milliequivalents per liter. If the soil contains 15 milliequivalents per liter of calcium and 19 milliequivalents per liter of magnesium: 15 + 19 = 34.
2. Divide your answer by 2: 34 / 2 = 17.
3. Find the square root of your answer: 17 ^ 0.5 = 4.12.
4. Divide the sodium concentration by your answer. If the soil has a soil concentration of 20 milliequivalents per liter: 20 / 4.12 = 4.85. This answer is the SAR.


Na Relative to pH
5/11/2007
12/19/2007
3/11/2011
10/10/2011
Sodium (Na)
pH


Base Saturation
5/11/2007
12/19/2007
3/11/2011
10/10/2011
Calcium (Ca)
Magnesium (Mg)
Potassium (K)
Sodium (Na)
Other Bases


Organic Material
5/11/2007
12/19/2007
3/11/2011
10/10/2011
Organic Material