



Client: Rio Verde Country Club
Fall 2024 Report

	<u>9/25/23</u>	<u>10/14/24</u>
Humidity/Air Temperature	16%/100°	15%/96°
Green Temperature	(avg)75.5°	(avg)72°
Fairway Temperature	(avg)75.6°	(avg)75°

WATER	Acceptable Range For Water Sample	Quail Run <u>9/25/23</u>	White Wing <u>9/25/23</u>	Quail Run <u>10/14/24</u>
pH	6.0-6.5	8.73	7.71	8.45
EC	<2.25 mmhos/cm	1.13	1.95	1.03
Sodium		239.98	286.16	11.53
Calcium	20 - 60 ppm	15.29	50.75	13.94
Magnesium	10 - 25 ppm	3.81	28.48	3.95
Potassium	5 - 20 ppm	5.79	49.03	2.83
Sulfur	30 - 90 ppm	286.95	81.07	259.31
Bicarbonate	<120 ppm	171.19	305.20	230.62
Boron	<0.67 ppm	1.08	0.45	0.98
Chloride	<177 ppm	63.32	414.97	43.23



SOIL AND WATER CONSULTING

QUAIL RUN TEES	Acceptable Range For Alkaline Soils Sample	2,6,12(avg) 9/25/23	3,11,17(avg) 10/14/24
Organic Matter (Humus)	2 - 3%	2.59	1.13
Sulfur	12 - 16 ppm	299.33	23.33
Olsen - Phosphorus	13 - 20 ppm	2.67	2.67
Calcium - TEC of 6 - 12	1,000 lbs/acre	2,822.67	1,990.67
Magnesium	>7% base saturation or at least 200 lbs/acre	9.31%/293.33	8.32%/154
Potassium - TEC of 0 - 35	100 ppm	250.67	190.67
Manganese	>50 ppm	34.33	53.00

QUAIL RUN FAIRWAYS	Acceptable Range For Alkaline Soils Sample	2,6,12(avg) 9/25/23	3,11,17(avg) 10/14/24
Organic Matter (Humus)	2 - 3%	3.50	3.69
Sulfur	12 - 16 ppm	601.67	208.67
Olsen - Phosphorus	13 - 20 ppm	18.67	11.00
Calcium - TEC of 6 - 12	1,000 lbs/acre	4,246.00	3,556.00
Magnesium	>7% base saturation or at least 200 lbs/acre	8.46%/380	8.03%/266.66
Potassium - TEC of 0 - 35	100 ppm	343.67	295.00
Manganese	>50 ppm	42.67	28.33

QUAIL RUN GREENS	Acceptable Range For Alkaline Soils Sample	2,6,12(avg) 9/25/23	3,11,17(avg) 10/14/24
Organic Matter (Humus)	2 - 3%	1.18	0.27
Sulfur	12 - 16 ppm	39.67	20.33
Olsen - Phosphorus	13 - 20 ppm	2.00	3.00
Calcium - TEC of 6 - 12	1,000 lbs/acre	1,894.00	1,688.67
Magnesium	>7% base saturation or at least 200 lbs/acre	10.1%/177.33	9.09%/137.33
Potassium - TEC of 0 - 35	150 ppm	219.67	114.67
Manganese	>50 ppm	50.33	10.00

QUAIL RUN TEES	Acceptable Range For Saturated Paste Sample	2,12(avg) 9/25/23	3 10/14/24
Nitrate-Bermudagrass	5 - 10 ppm	12.00	<0.5
Phosphorus	2 - 10 ppm	3.60	2.08
Potassium	40 - 100 ppm	32.51	10.82
Calcium	60 - 200 ppm	91.77	22.30
Magnesium	20 - 70 ppm	13.64	8.98
Sodium	0 - 30 ppm	642.44	141.63
Soluble Salts	<1,920 ppm	1,730.00	460.00
Bicarbonate	<60 ppm	238.01	202.95
Chloride	<1,000 ppm	186.50	23.00
SAR	<4%	16.54	6.40

QUAIL RUN FAIRWAYS	Acceptable Range For Saturated Paste Sample	2,12(avg) 9/25/23	3 10/14/24
Nitrate-Bermudagrass	5 - 10 ppm	24.25	4.40
Phosphorus	2 - 10 ppm	1.73	1.64
Potassium	40 - 100 ppm	60.40	26.41
Calcium	60 - 200 ppm	266.68	52.30
Magnesium	20 - 70 ppm	35.15	11.81
Sodium	0 - 30 ppm	1,116.50	283.54
Soluble Salts	<1,920 ppm	3,013.50	935.00
Bicarbonate	<60 ppm	253.30	164.16
Chloride	<1,000 ppm	304.00	99.00
SAR	<4%	17.13	9.21

QUAIL RUN GREENS	Acceptable Range For Saturated Paste Sample	2,12(avg) 9/25/23	3 10/14/24
Nitrate -Bermudagrass	1-3 ppm	65.00	0.80
Phosphorus	2 - 7 ppm	1.39	0.44
Potassium	25-40 ppm	14.33	3.43
Calcium	50- 75 ppm	68.88	10.85
Magnesium	15-30 ppm	9.12	2.88
Sodium	0 - 30 ppm	146.36	91.97
Soluble Salts	<1,000 ppm	659.50	315.00
Bicarbonate	<60 ppm	81.24	138.19
Chloride	<200 ppm	25.00	19.00
SAR	<4%	4.40	6.41

WHITE WING TEES	Acceptable Range For Alkaline Soils Sample	3,6,18(avg) 9/25/23	2,11,15(avg) 10/14/24
Organic Matter (Humus)	2 - 3%	2.43	1.46
Sulfur	12 - 16 ppm	274.67	204.67
Olsen - Phosphorus	13 - 20 ppm	6.33	5.67
Calcium - TEC of 6 - 12	1,000 lbs/acre	2,628.67	2,486.67
	>7% base saturation or at least 200 lbs/acre	12.15%/355.33	8.54%/202.66
Magnesium	100 ppm	337.33	246.67
Potassium - TEC of 0 - 35	>50 ppm	37.00	15.33
Manganese			

WHITE WING FAIRWAYS	Acceptable Range For Alkaline Soils Sample	3,6,18(avg) 9/25/23	2,11,15(avg) 10/14/24
Organic Matter (Humus)	2 - 3%	3.19	3.30
Sulfur	12 - 16 ppm	452.00	180.00
Olsen - Phosphorus	13 - 20 ppm	8.33	12.33
Calcium - TEC of 6 - 12	1,000 lbs/acre	3,613.33	3,095.33
	>7% base saturation or at least 200 lbs/acre	9.63%/349.33	9.66%/288.66
Magnesium	100 ppm	331.00	251.00
Potassium - TEC of 0 - 35	>50 ppm	27.67	21.00
Manganese			

WHITE WING GREENS	Acceptable Range For Alkaline Soils Sample	3,6,18(avg) 9/25/23	2,11,15(avg) 10/14/24
Organic Matter (Humus)	2 - 3%	0.98	0.90
Sulfur	12 - 16 ppm	24.00	36.67
Olsen - Phosphorus	13 - 20 ppm	<2.67	8.33
Calcium - TEC of 6 - 12	1,000 lbs/acre	1,570.00	1,583.33
	>7% base saturation or at least 200 lbs/acre	12.06%/180.66	7.21%/106.66
Magnesium	150 ppm	204.33	175.67
Potassium - TEC of 0 - 35	>50 ppm	43.67	41.33
Manganese			

WHITE WING TEES	Acceptable Range For Saturated Paste Sample	3,18(avg) 9/25/23	2 10/14/24
Nitrate-Ryegrass	5 - 10 ppm	1.25	1.20
Phosphorus	2 - 10 ppm	3.46	2.74
Potassium	40 - 100 ppm	48.80	32.47
Calcium	60 - 200 ppm	86.36	87.87
Magnesium	20 - 70 ppm	19.18	14.05
Sodium	0 - 30 ppm	508.60	356.30
Soluble Salts	<1,920 ppm	1,476.50	356.30
Bicarbonate	<60 ppm	245.83	240.90
Chloride	<1,000 ppm	171.50	109.00
SAR	<4%	13.02	9.31

WHITE WING FAIRWAYS	Acceptable Range For Saturated Paste Sample	3,18(avg) 9/25/23	2 10/14/24
Nitrate-Ryegrass	5 - 10 ppm	3.20	<0.5
Phosphorus	2 - 10 ppm	1.68	1.45
Potassium	40 - 100 ppm	51.60	28.71
Calcium	60 - 200 ppm	188.03	51.65
Magnesium	20 - 70 ppm	26.37	13.30
Sodium	0 - 30 ppm	555.91	346.63
Soluble Salts	<1,920 ppm	1,817.00	1,073.00
Bicarbonate	<60 ppm	186.45	42.91
Chloride	<1,000 ppm	156.50	111.00
SAR	<4%	10.29	11.12

WHITE WING GREENS	Acceptable Range For Saturated Paste Sample	3,18(avg) 9/25/23	2 10/14/24
Nitrate - Poa Trivialis	1-3 ppm	23.50	3.20
Phosphorus	2 - 7 ppm	2.91	1.28
Potassium	25-40 ppm	8.85	7.28
Calcium	50- 75 ppm	29.74	10.89
Magnesium	15-30 ppm	4.72	2.66
Sodium	0 - 30 ppm	99.76	92.77
Soluble Salts	<1,000 ppm	423.00	308.00
Bicarbonate	<60 ppm	101.87	40.42
Chloride	<200 ppm	21.50	27.00
SAR	<4%	4.51	6.53

Nutrient Deficiencies

		P	Mg	K
QUAIL RUN COURSE	TEE	2	146	204
QUAIL RUN COURSE	TEE	3	146	221
QUAIL RUN COURSE	TEE	3	170	147
QUAIL RUN COURSE	GREEN	3	172	122
QUAIL RUN COURSE	GREEN	3	130	111
QUAIL RUN COURSE	GREEN	3	110	111
WHITE WING COURSE	TEE	< 2	168	208
WHITE WING COURSE	TEE	10	218	241
WHITE WING COURSE	TEE	5	222	291
WHITE WING COURSE	GREEN	5	112	212
WHITE WING COURSE	GREEN	11	114	182
WHITE WING COURSE	GREEN	9	94	133

Phosphorus can be added to the Tees and Greens in the form of 11-55-00 at a rate of 3 pounds of product per 1,000 sq ft 2 times before Spring

Magnesium can be added Tees and White Wing Greens in the form of 0-0-22 at a rate of 5 pounds of product per 1,000 sq ft in November

Comments and Next Level Cultural Practices

- The Quail Run greens soils results didn't change much except for pH. It seems to be driven higher because the sodium is now more dominant. Going from 1.1% OM to under 0.3% OM just means there is more room for Na to hang around. Also, the samples are 6" deep. The mix was removed and replaced to 4" deep. So, is most of that sodium sitting in the 4"-6" area in the profile? If you are comfortable with flushing the Quail Run Greens, I would use a sprayable acid, flush for at least 2 hours and apply 0-0-50 after the flush is complete.
- The project's results on the greens and tees was solid. Keeping up with aerification, verti-cutting and topdressing all those areas on Quail Run Course will be critical.
- We discussed some of the new tees grow-in through Summer being more difficult due to the irrigation set up around the tee complexes. Due to the bigger heads, the banks were getting wet while new sod was being watered.

