

Case Study – Golf Course – Mesa, Arizona

A three-year old, nineteen-hole golf course in the foothills of east Mesa, Arizona began a sustainable fertilizer program the fall of 1998. To obtain a 6.5 pH of the water put on the course, the N-Phuric acid (49% sulfur) was injected every time an irrigation event occurred. This practice was stopped 10-21-98 and a humic acid based product (Humega) was started 10-24-98. Humega was put in the same 500 gallon tank that has previously held the N-Phuric acid. Humega was dispensed at the rate of 200 gallons per month on 3 acres of greens and 78 acres of fairways, tees, collars and driving range. The greens are SR 1020 Bent Grass and the fairways 419 Bermuda Grass.

The greens were suffering from excessive ball marks, black layer, the usual disease problems and slow ball speed. Winter play in 1998 saw a dramatic reduction in ball marks and an increase in ball speed. Over the next three years black layer was reduced through better water management and the hole reconfiguration, overall reduction in disease and fertilizer occurred and the root length was developed to 3-4 inches with better water and nutrition retention.

Other bio-products used with the Humega were a 2.5% iron, a 4-9-4 fish/kelp, a 0-0-15-1 Ca, and additionally in 2001, a dry 4-6-3 chicken manure crumble on the fairways and tees. Traditional sources of NPK were a 20-20-20 on greens a 46-0-0 and 12-8-16 on fairways and tees and miscellaneous 'clean out the storeroom' nitrogen products.  $FeSO_4$  was the iron choice for fairways and tees.

Table 1. POUNDS ACTUAL PER 1000 SQUARE FEET

YR	GREENS					FAIRWAYS					TEES				
	N	P	K	Ca	Fe	N	P	K	Ca	Fe	N	P	K	Ca	Fe
1998	8.55	6.11	7.09	1.002	0.122	11.99	5.17	9.56	-	0.389	9.98	4.05	7.43	-	-
1999	3.12	3.14	3.16	0.004	0.052	11.45	2.75	6.16	-	0.370	4.19	0.66	1.48	-	0.180
2000	2.88	2.88	2.93	0.006	0.070	10.70	4.64	8.65	0.11	0.180	5.98	2.74	4.22	-	0.090
2001*	2.52	2.54	2.26	0.004	0.038	3.90	3.24	3.60	-	-	3.64	2.65	4.29	-	-

\* Jan-Sept (New Superintendent after Sept.)

Table 1. This table reviews the reduction of the NPK, Ca and Fe values after the introduction of the Humega product late October of 1998. Reduction of the NPK values for greens, fairways and tees are as follows:

Greens – N=65% P=51% K=57%  
 Fairways – N= 8% P=29% K =23%  
 Tees - N=49% P=58% K=62%

Overall course NPK values were reduced 40%, 46%, 47% respectively. Only the NPK totals of 1999 and 2000 were averaged against 1998.

Table 2. FUNGICIDE USE		
1998	24 lbs/A	3 Fungicides
1999	26 lbs/A	2 Fungicides
2000	15 lbs/A	1 Fungicide
2001*	14 lbs/A	2 Fungicides

\* Jan-Sept (New Superintendent after Sept.)

Table 2. This table reviews fungicide usage on the same nineteen-hole golf course. Disease incidence has all but disappeared through the summer of 2001. In 2001 once broad – spectrum fungicide was applied prophylactically and one was used against fairy ring.