



**2005 Evaluation of Converted Organics Granular 3-2-1  
 and Converted Organics LC 1-0-2  
 For a Reduced Nutrient and Fungicide Management Program**

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Dates: July 5, 2005 – September 16, 2005

**Objective**

The objective of this study was to evaluate the effect of Converted Organics 3-2-1 and LC 1-0-2 on golf turf fairway performance under reduced fertilizer and fungicide programs.<sup>1</sup>

**Methodology**

The experimental design was split plot with three replications on a mixed stand of creeping bentgrass and annual bluegrass managed to golf turf fairway conditions. The soil type is an Arkport fine sandy loam with pH 6.6. The soil nutrient levels are adequate for macro and micronutrients needed to sustain a mature fairway turf.

Soil Analysis (reported in ppm)

Date Reported	Sample Location	CEC	pH	OM	S	P	Ca	Mg	K	Na	B	Fe	Mn	Cu	Zn	Al
5/20/05	Converted Organics Trial	9.2	5.9	4.7	25	575	1138	203	60	37	0.8	348	22	3.4	12	328

The main treatments included standard fertilizer at 100, 75, 50, 25 and 0% of normal rate. Normal fertilizer rate was 0.2 lbs.N, 0.05 lbs. P, 0.20 lbs K and 0.2 lbs. Fe per 1000 squarefoot every 14 days. The goal is to supply approximately 3.5 lbs. N for an eight-month growing season.

Converted Organics LC 1-0-2 was applied separately as listed in Table 1. The plots are subjected to 30,000 rounds of simulated non-metal spike traffic. Plots were mowed three times per week at 0.4" and clippings were collected.

Applications were initiated on July 5, 2005 and continued for ten weeks. Applications were made with a handheld CO<sub>2</sub> sprayer at 40 psi (276 kPa) fitted with TeeJet XR8015 nozzles calibrated to deliver 2 gallons (7.6 liters) of water per 1,000 ft<sup>2</sup> (92.9 m<sup>2</sup>). All treatments were watered in with 0.125" of water following application.

<sup>1</sup> Converted Organics 3-2-1 and Converted Organics 1-0-2 were first generation products, but are representative of Converted Organics' current granular and liquid products. Converted Organics 3-2-1 is the base product for current Converted Organics 8-1-4 and 4-1-8 formulas. Converted Organics 1-0-2 is comparable to our current Converted Organics LC 1-1-1 fertilizer.

In 2005, average daily temperatures ranged from a low of 60° F (13° C) to a high of 84° F (24° C). The four months of June through September were the warmest such period on record, averaging 4.2 degrees warmer than normal. Precipitation was below normal; 38% of normal for July, 83% for August and 55% for September. Supplemental irrigation was applied as needed.

Pest management was strictly on a curative basis when severity would significantly challenge treatments ability to sustain turf cover.

Data were collected for turfgrass quality on a 1 to 9 rating scale where 1=poor turf, 9=perfect turf and 6=acceptable turf. In addition, we monitored disease incidence, growth indirectly through clipping production, tissue nutrient content and rooting.

Data analysis was conducted using linear mixed models. For the turfgrass quality and disease data, differences of least squares means were used to compare treatments. For the clippings, tissue nutrients and root mass data, treatment differences were evaluated using analysis of variance and Fisher's protected least significant difference (LSD). The MIXED and GLM procedures in SAS/STAT software version 9.1 (SAS, Cary, NC) were used to perform the analyses.

**Figure 1. Treatment application regimes.**

<b>Trtmnt</b>	<b>Product</b>	<b>Rate/1000</b>	<b>Interval</b>
1	Converted Organics 3-2-1	50 lbs	14 days
2	Converted Organics 3-2-1	25 lbs	
3	Converted Organics 3-2-1	10 lbs	
4	Converted Organics 1-0-2	60 oz	
5	Converted Organics 1-0-2	30 oz	
6	Converted Organics 1-0-2	15 oz	

<b>Standard Fertilizer</b>			
<b>Trt</b>	<b>Product</b>	<b>Rate/1000</b>	<b>Interval</b>
<b>100%</b>	NH4SO4	0.2 lb N	14 days
	MAP	0.05 lb P	
	KSO4	0.2 lb K	
	Iron	4 oz.	
<b>75%</b>	NH4SO4	0.15 lb N	14 days
	MAP	0.04 lb P	
	KSO4	0.15 lb K	
	Iron	3 oz.	
<b>50%</b>	NH4SO4	0.1 lb N	14 days
	MAP	0.025 lb P	
	KSO4	0.1 lb K	
	Iron	2 oz.	
<b>25%</b>	NH4SO4	0.05 lb N	14 days
	MAP	0.013 lb P	
	KSO4	0.05 lb K	
	Iron	1 oz.	

## Turfgrass Quality

There was a significant main effect (direct effect of each treatment viewed independently) of standard fertilizer and the interactive effect between standard fertilizer and Converted Organics rate and formulation. In general there was a proportional rate response, i.e., as standard fertilizer rate declined below 50%, Converted Organics cannot sustain acceptable turf quality without supplemental fertilizer applications.

Clearly there is significant potential for a 25 to 50% reduction in traditional fairway fertilizer programs regardless of food waste compost formulation. A significant rate response suggests additional reductions could be found when Converted Organics rates are increased.

**Table 2. Effect of standard fertilizer and Converted Organics products on turfgrass quality**

Trt	Product & Rate	% Std Fert	12-Jul	26-Jul	9-Aug	23-Aug	6-Sep
1	Converted Organics 3-2-1 (50 lb)	100	6.9	6.6	7.0	6.2	7.1
2	Converted Organics 3-2-1 (50 lb)	75	6.7	6.4	6.8	6.0	6.9
3	Converted Organics 3-2-1 (50 lb)	50	6.6	6.3	6.7	5.9	6.8
4	Converted Organics 3-2-1 (50 lb)	25	4.7	4.5	4.8	4.2	4.9
5	Converted Organics 3-2-1 (50 lb)	0	4.4	4.2	4.5	4.0	4.6
6	Converted Organics 3-2-1 (25 lb)	100	6.7	6.4	6.8	6.0	6.9
7	Converted Organics 3-2-1 (25 lb)	75	6.5	6.2	6.6	5.9	6.7
8	Converted Organics 3-2-1 (25 lb)	50	4.4	4.2	4.5	4.0	4.6
9	Converted Organics 3-2-1 (25 lb)	25	3.8	3.6	3.9	3.4	3.9
10	Converted Organics 3-2-1 (25 lb)	0	3.6	3.4	3.7	3.2	3.7
11	Converted Organics 3-2-1 (10 lb)	100	7.5	7.1	7.6	6.8	7.8
12	Converted Organics 3-2-1 (10 lb)	75	5.7	5.4	5.8	5.1	5.9
13	Converted Organics 3-2-1 (10 lb)	50	5.2	4.9	5.3	4.7	5.4
14	Converted Organics 3-2-1 (10 lb)	25	4.1	3.9	4.2	3.7	4.2
15	Converted Organics 3-2-1 (10 lb)	0	3.8	3.6	3.9	3.4	3.9
16	Converted Organics 1-0-2 (60 oz)	100	7.4	7.0	7.5	6.7	7.7
17	Converted Organics 1-0-2 (60 oz)	75	7.2	6.8	7.3	6.5	7.5
18	Converted Organics 1-0-2 (60 oz)	50	6.3	6.0	6.4	5.7	6.5
19	Converted Organics 1-0-2 (60 oz)	25	5.5	5.2	5.6	5.0	5.7
20	Converted Organics 1-0-2 (60 oz)	0	4.0	3.8	4.1	3.6	4.1
21	Converted Organics 1-0-2 (30 oz)	100	7.6	7.2	7.7	6.8	7.9
22	Converted Organics 1-0-2 (30 oz)	75	6.4	6.1	6.5	5.8	6.6
23	Converted Organics 1-0-2 (30 oz)	50	5.2	4.9	5.3	4.7	5.4
24	Converted Organics 1-0-2 (30 oz)	25	4.5	4.3	4.6	4.1	4.7
25	Converted Organics 1-0-2 (30 oz)	0	4.4	4.2	4.5	4.0	4.6
26	Converted Organics 1-0-2 (15 oz)	100	7.6	7.2	7.7	6.8	7.9
27	Converted Organics 1-0-2 (15 oz)	75	5.4	5.1	5.5	4.9	5.6
28	Converted Organics 1-0-2 (15 oz)	50	4.2	4.0	4.3	3.8	4.3
29	Converted Organics 1-0-2 (15 oz)	25	4.5	4.3	4.6	4.1	4.7
30	Converted Organics 1-0-2 (15 oz)	0	3.4	3.2	3.5	3.1	3.5
	LSD (p=0.05)		0.4	0.6	0.7	0.5	0.4

### **Clipping Production/Root Growth/Tissue Nutrients**

There was a significant main effect of standard fertilizer on clipping production, root growth and tissue nutrient content. There was no significant main effect of Converted Organics formulation for these parameters. In addition there were no interactive effects on these parameters either. (Data not shown)

There appears to be no measurable contribution of Converted Organics to clipping production. It appears the turf is able to sustain acceptable quality without any measurable increase in clipping production. This might be viewed as a positive response in light of the sustained turfgrass quality.

The lack of effect on rooting and tissue nutrient content is not surprising as these parameters tend to be difficult to assess under field conditions. In addition, with regard to rooting often several years of applications to the same plots are required to establish differences.

### **Turfgrass Disease/Fungicide Use**

As with turfgrass quality there were significant main effects of standard fertilizer and a strong interactive effect of standard fertilizer and Converted Organics and required rates.

In general, as standard fertilizer rates decreased there was an increase in turfgrass disease, however this was dependent on disease. For example, the rate response was not as pronounced for the liquid formulation as it was for the granular on primarily foliar diseases such as brown patch and dollar spot. Additionally it was not as important for the granular formulation effect on root infecting diseases such as summer patch.

There was a significant effect of the liquid formulation on the foliar diseases and although dependent on standard fertilizer rate, demonstrated some important disease suppression that could lead to significant reductions in fungicide use. Also, with regard to root diseases such as summer patch, a prophylactic application of the granular formulation when disease pressure might be anticipated could reduce overall fungicide use.

The obvious effects on turfgrass disease indicate the Converted Organics products have substantial suppressive effects that warrant further investigation.

## **Summary**

Based on the results of this one-year evaluation, it appears Converted Organics offers some benefit for reducing fertilizer use and significant benefits for reducing overall fungicide use. Turfgrass quality exhibited a proportional rate response to standard fertilizer that was influenced by Converted Organics application rates but not formulation (both solid and liquid were effective in reducing nitrogen and phosphorous requirements). However, as might be expected, turfgrass disease suppression was influenced by formulation. The liquid product was more effective against foliar diseases and soil borne diseases were more influenced by the granular. There appears to be significant potential for additional fertility and fungicide trials to derive optimal formulations to reduce overall inputs while maintaining championship golf fairway conditions.