



Foo Foo Dust

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Last fall, a unique opportunity arose to test a turf product **before** it was marketed. The product? Earthworm casts. The casts presumably have wondrous effects on sod establishment that go well beyond that of a nutrient source.

With Randy Smith's cooperation and assistance, a segment of an abandoned fairway was stripped and earthworm casts, as well as composted municipal solid waste, Milorganite and Scotts ProTurf 19-26-5, were soil-applied. Half the plots were rototilled and the entire area sodded on August 28 with a commercially grown Kentucky bluegrass sod.

Chemical analyses of the earthworm casts and composite municipal solid waste are presented in Table 1. Both materials were touted as having 2% N. As shown, neither product came close to this N content.

TABLE 1.
CHEMICAL ANALYSES OF EARTHWORM CASTS
AND COMPOSTED MUNICIPAL SOLID WASTE.

	Earthworm Casts	Composted Municipal Solid Waste
Macronutrients (%)		
N	1.15	0.44
P	0.54	0.24
K	1.05	1.03
Ca	8.80	2.61
Mg	1.94	0.88
S	0.56	0.32
Micronutrients (ppm)		
B	67	39
Cu	139	159
Fe	30,630	28,990
Mn	922	474
Zn	466	394
Organic C (%)	30.9	15.5
C:N Ratio	26.9	35.2

Observations

Our observations focused on root development, since this is the primary concern in sod establishment. Soil samples removed on October 14, 48 days after sodding, revealed that no rooting extended more than two inches into the underlying soil. The earthworm casts and composite municipal solid waste did appear to have enhanced rooting at this time (Table 2).

After an additional 44 days, on November 27, maximum rooting depth was 3.5 inches and occurred where the composite municipal solid waste and Milorganite had been applied (Table 2). Apparently by this time, all the foo foo dust in the earthworm casts was exhausted or was inactivated by cool weather.

Root development beneath the sod was examined again this spring (Table 2). We found that between November 27, 1989, and the May 14, 1990, sampling date depth of root-

TABLE 2.
EFFECTS OF VARIOUS SOIL TREATMENTS
ON SOIL ROOT DEVELOPMENT

Soil Treatment	Root Density			Rooting Depth on November 27
	Oct. 14 0-6"	May 14 0-6" 6-12"		
	mg roots/cm ³ Soil			inches
Earthworm Casts	1.00	0.92	0.24	2.6
Composted Waste	0.73	1.18	0.26	3.5
Milorganite	0.51	1.14	0.22	3.5
19-26-5	0.63	1.15	0.19	3.3
Control (no treatment)	0.54	0.77	0.23	2.9

ing had increased from approximately 3 inches to nearly 12 inches. Root densities in the 0 to 6 inch soil depth were enhanced by all of the soil treatments, but more so by composite municipal solid waste, Milorganite and the 19-26-5 than by the earthworm casts. Treatment effects on rooting at the 6 to 12 inch soil depth were slight and not significant.

Color of the turfgrass was rated twice last fall and again on two dates this spring. Fall color in the earthworm cast and municipal solid waste plots was worse than in the control plot (Table 3). An explanation for this is the fact that these materials have C:N ratios that range from 26.9 to 35.2 (Table 1). Rapid microbial decomposition of any organic material with a C:N ratio of approximately 30 or more can occur only if the microbes have access to inorganic N in the surrounding soil. In effect then, the microbes compete with plants for available N. The microbes have never been known to lose this battle.

TABLE 3.
EFFECTS OF VARIOUS SOIL TREATMENTS
ON SODDED TURF COLOR RATINGS*

Soil Treatment	COLOR RATINGS	
	Fall 1989	Spring 1990
Earthworm Casts	7.6	7.1
Composted Waste	7.6	6.8
Milorganite	8.4	7.9
19-26-5	8.6	8.2
Control	8.0	6.8

* Scale 1-9; 1 = Brown, 7 = Minimally acceptable, 9 = Very dark green

This spring the turf established on soil treated with Milorganite and 19-26-5 had decidedly better color (Table 3) and faster growth rates than where the earthworm casts and composite municipal solid waste had been applied. These differences probably reflect differences in the amounts of N applied. The Milorganite and 19-26-5 appli-

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cations each provided 2 lb. N/M while the earthworm cast and composite municipal solid waste treatments provided only 1.15 and 0.44 lb. N/M respectively.

**TABLE 4.
EFFECTS OF ROTOTILLING ON
SOD ROOTING AND COLOR.**

	Rototilled	Not Rototilled
Root Density, mg/cm³ Soil		
October 14, 1989	0.77	0.59
May 5, 1990	1.07	0.99
Rooting Depth, inches		
October 27, 1989	3.3	3.0
Turfgrass Color		
Fall, 1989	7.8	8.2
Spring, 1990	7.3	7.2

Effects of rototilling on turfgrass root development were quite pronounced in the fall of 1989 (Table 4). On average, rototilling increased root growth 30% and rooting depth by 10%. On the other hand rototilling resulted in poorer turfgrass color. By May 5 of this year, these effects of rototilling on root development and turfgrass color were virtually non-existent.

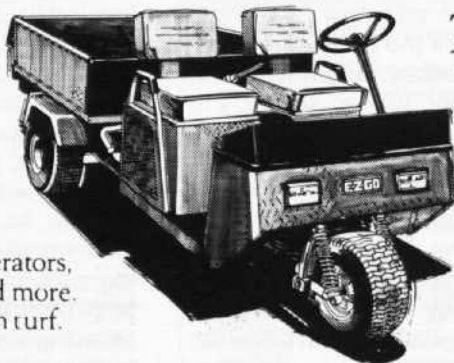
Summary

Earthworm casts are not a miracle turf product, nor do they necessarily contain that 2% N that is often cited in literature. What little response there was to the product was temporary and of no real consequence as far as sod establishment and turf quality were concerned.

The most important lesson learned from this study has nothing to do with turf per se. Promises of financial support for this study were never fulfilled. Thus, foo foo dust and fairy dust are very similar — one puff of hot air and they are gone, never to be seen again!

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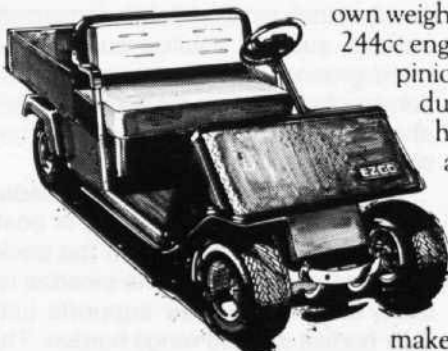


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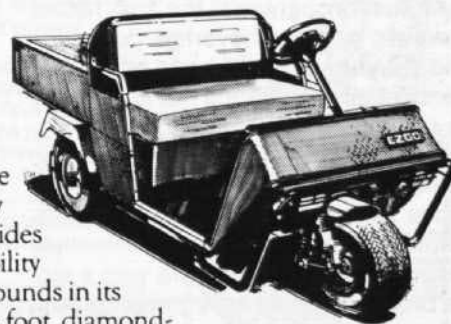
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