

Using Compost on Liner Beds

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We all know that organic matter improves soil. There are several materials we can use to accomplish this. Manure, cover crops, leaves, peat, and nursery and yard waste are examples. More recently in several areas of the country, commercially composted materials have become available. These come in the form of composted yard waste, municipal sludge, and even municipal garbage. Getting enough organic matter to replenish our soils is a continuing problem and looking into these composted alternative sources became a reality over 3 years ago when we started testing the use of composted municipal sludge from the city of Akron, Ohio.

As we looked into the use of composted material we found some interesting facts. The composting process ensures that nutrients normally lost through leaching from uncomposted materials will be retained due to their altered chemical state in mature composts. We also found that applying composted material to our fields gives us a far greater amount of organic matter than if we were to use uncomposted raw materials. In fact, composted material can deliver 10 to 20 times the organic matter that will be found in raw material. For example, a cover crop such as Sudan grass can give us about 10 tons of material per acre. This is good except that 90% of it is water leaving only 1 ton of dry material as a potential soil amendment. After the crop is plowed under and decomposes another 50% is lost reducing the amount of material to 1/2 ton. If only half this material is organic, we are left with only a 1/4 ton per acre of organic material. By comparison, applying 1-in. compost per acre gives us about 62 tons of material. If 30% of the compost is water, that leaves 43 tons of dry matter per acre. If the material is 70% organic this provides 30 tons of organic material per acre (Tyler, 1991).

The most obvious benefit of composted organic material is its ability to break up clay soils and add moisture retention to sandy soils. Other benefits include a source of nutrients, improved cation exchange (CEC), disease suppression, and the enhancement of healthy soil microflora to name a few.

We found an initial application of 2-in. compost per acre would be the most beneficial to amend our fairly heavy soils for bed production (refer to Table 1 for application rates). We accomplished this by applying 1 in. of material to the area with a manure spreader and working it into the top 4 to 5 in. of soil with a rototiller. We shaped our beds with a bed maker and planted them. After planting, we applied another 1 inch of material as a mulch. After harvesting the beds, we cover crop the area when possible and start the process over again. After the first planting we do not add the initial 1 in. to the area, but simply mulch the new beds as a supplement to the organic matter already present.

Since we have begun using the compost we have noticed a significant change in our soil composition and significant improvement in certain crops such as ornamental grasses and *Buxus*.

Not all commercial composts are created equal. Know your source and the composition of the material you are going to try. Maturity is important, the compost

should be stable, and consistent from batch to batch. Organic content can vary with the source, ranging from 30% to 75%. Be aware that potential variables between composts exist and ask for test results that can show if heavy metals or other inert contaminants such as glass, metal or plastics are present and that EPA guidelines for eradicating pathogens have been followed. Watch for safe levels of soluble salts. The pH should be between 6 and 8.

Table 1. Cubic yards of compost required for various depths of compost desired.

Area (ft ²)	Inches of compost to be applied ¹				
	1/4	1/2	1	1.5	2
5000	4	8	16	24	31
10,000	8	16	32	48	62
15,000	12	24	48	72	93
20,000	16	32	64	96	123
25,000	20	40	80	120	154
30,000	24	48	96	144	185
35,000	28	56	112	168	216
40,000	32	64	128	192	246

Acres	1/4	1/2	1	1.5	2
1	33.5	67	134	201	268
2	67	134	268	402	536
3	100.5	201	402	606	804
4	134	268	536	804	1072
5	167.5	335	670	1005	1340
6	201	402	804	1206	1608
7	234.5	469	938	1407	1876
8	268	536	1072	1608	2144
9	301.5	603	1206	1809	2412
10	335	670	1340	2010	2680

¹ Suggested amounts of compost for liner beds. Numbers indicate cubic yards of compost; for instance, applying a 1-in. layer of compost to a 5000 ft² area requires 16 yd³ of compost. Applying 1 in. to an acre requires 134 cubic yards (Tyler, 1993).

The initial cost of the material and application can seem high—about 1 to 2 thousand dollars per acre—but the results have been obvious to us and well worth the investment especially where high intensity crops are produced.

LITERATURE CITED

- Tyler, R. 1991. Benefits of using compost in the nursery. *The Buckeye*. October, 1991.
 Tyler, R. 1993. Calculating compost capacity. *Lawn and Landscape Magazine*. March, 1993.