Application Rates and Techniques for Using Composted Materials in Florida DOT Projects[1]

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Application rates of composted materials will differ depending on whether they are being used as soil amendments, mulches, or topdressing fertilizer. This fact sheet is designed to help a user determine the amounts of materials to apply for each use in Florida Department of Transportation (FDOT) Projects. The following are some of the common ways that rates of application are expressed:

- weight per unit area (e.g., metric tons per hectare or U.S. tons per acre)
- dry matter per unit area (e.g., oven dry weight per unit area)
- volume per unit area (e.g., cubic meters per hectare or cubic yards per acre)
- thickness of layer (e.g., centimeters or inches)

Composts can contain a large percentage of water, so it is necessary to distinguish if the weight is being expressed on an as-received basis or an oven-dry basis. The oven-dry basis provides a constant reference point and is usually used for expressing the nutrient content of composts.

Soil Amendment

Roadside soil is amended with compost to improve the soil as a medium for plant growth. This is especially important when establishing utility turf on road shoulders and other areas of exposed soil. Soil that is good for building roadbeds is usually not good for growing plants.

Compost used as a soil amendment is usually mixed in the top 15 to 20 cm (6 to 8 in) of soil. Rototilling generally gives the most complete mixing, but disking is also used for incorporation of compost. The recommended rate of application of compost in FDOT projects is 100 metric tons of dry matter per hectare. Several expressions of this rate, given different known quantities of the compost, are presented in Table 1.

Mulch

Mulch is a layer of material placed on the soil surface. Mulch protects soil from the direct impact of rain and wind. Mulch can be very useful in protecting steep slopes from erosion while vegetation such as shrubs and groundcovers are becoming established. It also shades the soil and helps control weeds in plantings. Compost used as a mulch is applied at much higher rates than when it is used as a soil amendment. Coarse mulch such as ground-up urban plant debris (yard waste) should be applied in a layer 5 to 10 cm (2 to 4 inches) thick. Fine-textured organic materials are usually not appropriate for use as a mulch in FDOT projects.

Topdressing (fertilizer)

Compost that is rich in plant nutrients can be used as a fertilizer (a topdressing) and spread over the top of grasses growing on the roadside. Such nutrient-rich compost is an excellent substitute for chemical fertilizer. Additionally, its use helps the FDOT meet state guidelines for use of recycled materials. However, fertilizing roadsides is not appropriate in the following circumstances:

- the grass is growing very well;
- there is very little grass to start with (i.e., poor stand).

In the first case, fertilizing will only increase the need for mowing and will not increase the soil protecting benefits of good soil cover. In the second case, there is little grass to take up the fertilizer, so the fertilizer is wasted. Poor stands are usually the result of other limiting factors such as droughty soil. Those will not be corrected by fertilizer.

How to use Table 1. Table 1 provides the amount of as-received compost to be applied to achieve the FDOT recommended amendment rate of 100 metric tons dry matter per hectare (45 US tons per acre). In the table, find the moisture content and bulk density of your material. Read across to the column which has the units you wish to use in applying the compost. Rates will be about three times greater when mulching. Topdressing (fertilizing) rates will depend on the nitrogen (N) content of the compost but will likely be approximately 5% of the amendment rate.

Table

Table 1. Amount of as-received compost to apply to achieve the FDOT recommended amendment rate of 100 metric tons dry matter per hectare.

Moisture content	Bulk density		Weight per unit area		Volume per unit area		Thickness of layer	
(% by wt)	g/cm^3	lb/cu yd	metric tons per hectare	U.S. tons per acre	cu meters per 10 sq meters	cu yards per 100 sq feet	centi-meters	inches
30	0.42	700	143	64	0.34	0.42	3.4	1.4
	0.48	800	143	64	0.30	0.37	3.0	1.2
	0.54	900	143	64	0.27	0.33	2.7	1.1
35	0.59	1000	143	64	0.24	0.29	2.4	0.9
	0.42	700	154	69	0.37	0.45	3.7	1.5
	0.48	800	154	69	0.32	0.39	3.2	1.3
	0.54	900	154	69	0.29	0.35	2.9	1.1
	0.59	1000	154	69	0.26	0.32	2.6	1.0
40	0.42	700	167	74	0.40	0.49	4.0	1.6
	0.48	800	167	74	0.35	0.43	3.5	1.4
	0.54	900	167	74	0.31	0.38	3.1	1.2
	0.59	1000	167	74	0.28	0.34	2.8	1.1
45	0.42	700	182	81	0.44	0.53	4.4	1.7
	0.48	800	182	81	0.38	0.47	3.8	1.5
	0.54	900	182	81	0.34	0.41	3.4	1.3
	0.59	1000	182	81	0.31	0.37	3.1	1.2
	0.42	700	200	89	0.48	0.59	4.8	1.9
	0.48	800	200	89	0.42	0.51	4.2	1.7
	0.54	900	200	89	0.37	0.46	3.7	1.5
	0.59	1000	200	89	0.34	0.41	3.4	1.3
55	0.42	700	222	99	0.54	0.65	5.4	2.1
	0.48	800	222	99	0.47	0.57	4.7	1.8
	0.54	900	222	99	0.42	0.51	4.2	1.6
	0.59	1000	222	99	0.37	0.46	3.7	1.5

Footnotes

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