

Appendix A4 Custom Compost Application Rate Calculation

Where stockpiled site topsoil already contains some organic matter, it is often cost-effective to calculate the amount of compost amendment needed to achieve the recommended topsoil quality standard specific to the planting area type (i.e. 5 to 10% organic matter content for turf areas; 10 to 15% for planting beds and tree pits; see Section 2.3).

Custom compost application rates can be calculated using either the Equation below, or the Topsoil and Soil Amendment Calculator spreadsheet tool available for download at (www.sustainabletechnologies.ca). Alternatively, tables of custom compost application rates for some typical soil types are provided on the following pages.

Equation for Calculating Compost Application Rates:

Use this equation to calculate compost application rates to achieve the targeted final organic matter content (FOM) for a soil (either stockpiled site topsoil or site subsoil) with a known bulk density (SBD) and initial soil organic matter content (SOM) using a compost product of known bulk density (CBD) and organic matter content (COM).

$$CR = D \times [SBD \times (SOM\% - FOM\%) / SBD \times (SOM\% - FOM\%) - CBD \times (COM\% - FOM\%)]$$

Where:

CR = Compost application rate (centimetres) calculated to achieve the target final organic matter content (FOM).

D = Depth of incorporation or finished topsoil (centimetres)

SBD = Soil bulk density (grams per cubic centimetre, dry weight)

SOM% = Initial soil organic matter (percent, dry weight)¹

FOM% = Final target soil organic matter (percent, dry weight)^{1, 2}

CBD = Compost bulk density (grams per cubic centimetre, dry weight)

COM% = Compost organic matter (percent, dry weight)¹

Notes:

1. All organic matter measurements must be based on the commonly used "Loss On Combustion Test"
2. The following values should be used, depending on the planting area type: 7.5% for turf areas; 12.5% for planting beds; 12.5% for tree pits.

Table A4.1 Table of custom compost application rates for turf areas by soil type

	SBD	SOM%	TOM%	CBD	COM%	D	CAR
Soil Type	Soil Bulk Density (g/cm ³ dry weight)	Initial Soil Organic Matter Content (%)	Target Soil Organic Matter Content	Compost Bulk Density (g/cm ³ dry weight)	Compost Organic Matter Content (%)	Depth of Finished Topsoil (cm)	Custom Compost Application Rate (cm)
Sandy Soil	1.5	0.0	7.5	0.7	50	20	5
	1.5	1.0	7.5	0.7	50	20	5
	1.5	2.0	7.5	0.7	50	20	4
	1.5	3.0	7.5	0.7	50	20	4
	1.5	4.0	7.5	0.7	50	20	3
	1.5	5.0	7.5	0.7	50	20	2
Clayey Soil	1.0	0.0	7.5	0.7	50	20	4
	1.0	1.0	7.5	0.7	50	20	4
	1.0	2.0	7.5	0.7	50	20	3
	1.0	3.0	7.5	0.7	50	20	3
	1.0	4.0	7.5	0.7	50	20	2
	1.0	5.0	7.5	0.7	50	20	2

Table A4.2 Table of custom compost application rates for planting areas by soil type

	SBD	SOM%	TOM%	CBD	COM%	D	CAR
Soil Type	Soil Bulk Density (g/cm ³ dry weight)	Initial Soil Organic Matter Content (%)	Target Soil Organic Matter Content	Compost Bulk Density (g/cm ³ dry weight)	Compost Organic Matter Content (%)	Depth of Finished Topsoil (cm)	Custom Compost Application Rate (cm)
Sandy Soil	1.5	0.0	12.5	0.7	50	20	8
	1.5	1.0	12.5	0.7	50	20	8
	1.5	2.0	12.5	0.7	50	20	8
	1.5	3.0	12.5	0.7	50	20	7
	1.5	4.0	12.5	0.7	50	20	7
	1.5	5.0	12.5	0.7	50	20	6
	1.5	6.0	12.5	0.7	50	20	5
	1.5	7.0	12.5	0.7	50	20	5
	1.5	8.0	12.5	0.7	50	20	4
	1.5	9.0	12.5	0.7	50	20	3
	1.5	10.0	12.5	0.7	50	20	3
Clayey Soil	1.0	0.0	12.5	0.7	50	20	6
	1.0	1.0	12.5	0.7	50	20	6
	1.0	2.0	12.5	0.7	50	20	6
	1.0	3.0	12.5	0.7	50	20	5
	1.0	4.0	12.5	0.7	50	20	5
	1.0	5.0	12.5	0.7	50	20	4
	1.0	6.0	12.5	0.7	50	20	4
	1.0	7.0	12.5	0.7	50	20	3
	1.0	8.0	12.5	0.7	50	60	3
	1.0	9.0	12.5	0.7	50	20	2
	1.0	10.0	12.5	0.7	50	20	2

Table A4.3 Table of custom compost application rates for tree pits by soil type

	SBD	SOM%	TOM%	CBD	COM%	D	CAR
Soil Type	Soil Bulk Density (g/cm ³ dry weight)	Initial Soil Organic Matter Content (%)	Target Soil Organic Matter Content	Compost Bulk Density (g/cm ³ dry weight)	Compost Organic Matter Content (%)	Depth of Finished Topsoil (cm)	Custom Compost Application Rate (cm)
Sandy Soil	1.5	0.0	12.5	0.7	50	60	25
	1.5	1.0	12.5	0.7	50	60	24
	1.5	2.0	12.5	0.7	50	60	23
	1.5	3.0	12.5	0.7	50	60	21
	1.5	4.0	12.5	0.7	50	60	20
	1.5	5.0	12.5	0.7	50	60	18
	1.5	6.0	12.5	0.7	50	60	16
	1.5	7.0	12.5	0.7	50	60	14
	1.5	8.0	12.5	0.7	50	60	12
	1.5	9.0	12.5	0.7	50	60	10
	1.5	10.0	12.5	0.7	50	60	8
Clayey Soil	1.0	0.0	12.5	0.7	50	60	19
	1.0	1.0	12.5	0.7	50	60	18
	1.0	2.0	12.5	0.7	50	60	17
	1.0	3.0	12.5	0.7	50	60	16
	1.0	4.0	12.5	0.7	50	60	15
	1.0	5.0	12.5	0.7	50	60	13
	1.0	6.0	12.5	0.7	50	60	12
	1.0	7.0	12.5	0.7	50	60	10
	1.0	8.0	12.5	0.7	50	60	9
	1.0	9.0	12.5	0.7	50	60	7
	1.0	10.0	12.5	0.7	50	60	5