Urban Soils Remediation and Use of Organic Amendments

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Issue: Remediating compromised urban soils with organic matter.
• How much organic amendment is enough?
• Why amend with organic compost?
• How to retain organic compost over time (12 year study)
How to incorporate organic matter into urban soils
• Apply @6-8” of compost to compacted soil
• Use backhoe bucket to dig down to @18”
• Dump combined soil and compost creating veins of compost through compacted soil
• Plant and then mulch with 2-3” of shredded bark
• Re-mulch yearly to maintain 2-3” surface layer
Methods: Sampling Scheme

Study Site: In garden bed

Control Site: In turf

Mulch

Scoop & Dump

Sub Soil (OR)

Turf

Resident Sub Soil

U1

U2

S&D

Sub
Available Water Holding Capacity by Site Type (n=80)
Average Soil Depth of Root Limiting Resistance (PSI>300) by Site Type

Site Type

Unamended Soil

Scoop & Dump Soil

Soil Depth (cm)
Potentially Mineralizable Nitrogen Over Time for S&D Sites

- $R^2 = 0.61$
- $p < 0.0001$
- $n = 30$
Bulk Density Over Time for S&D Sites

- $R^2 = 0.50$
- $p < 0.0001$
- $n = 30$

Bulk Density (g/cm$^3$) vs. Years After Disturbance
This method has shown:

• Soil resistance decrease
• Pore volume increase
• Reduction in bulk density
• Increased Carbon & Nitrogen
• Improved soil structure
• Improved aggregate stability
• Improved plant growth response
• **Long term improvement of soil conditions and plant growth (12 years)**