Amending Urban Soils
Solids, Water, & Air

- **Ideal Soil**
  - Solids: 50%
  - Water: 25%
  - Air: 25%

- **Sandy Soil**
  - Solids: 55%
  - Water: 36%
  - Air: 9%

- **Clay Soil**
  - Solids: 45%
  - Water: 40%
  - Air: 15%

- **Compacted Clay**
  - Solids: 54%
  - Water: 44%
  - Air: 3%
Recommendations

How much?

25 to 50% by volume

1.5 - 3”

6”
Recommendations

How Deep?

As deep as you can get it!
DATA?
Soils

- Loamy sand
  - 82% sand
  - 12% silt
  - 6% clay

- Clay
  - 38%
  - sand
  - 12% silt
  - 50% clay
Amendments

- Canadian sphagnum peat moss
- Aged pine bark ($\leq 0.5$ in.)
- Rates: 10, 20, 30, 40, 50%

by volume
Drainage Profile

Sandy Soil - Peat Additions

Water Content (% Volume)

Depth

0% 10% 20% 30% 40% 50%
Clay Soil - Bark Additions

- 0%
- 10%
- 20%
- 30%
- 40%
- 50%

Air Space (% Volume)

Depth

Drainage Profile
Amendment Strategies

- Untreated
- Tilled 6 inches
- Tilled 6 inches
  - Subsoiled 18 inches
Clay Soil - Unamended

Compacted

Tilled 6 inches

Tilled 6 inches

Subsoiled
Clay Soil - 30% Bark

- **Compacted**: 54% Compacted, 3% Tilled, 44% Tilled 6 inches
- **Tilled**: 45% Compacted, 15% Tilled no bark, 33% Tilled 6 inches
- **Tilled 6 inches**: 45% Compacted, 21% Tilled no bark, 21% Tilled 6 inches
- **Subsoiled**: Tilled 6 inches

Note: The percentages are approximate and may vary.
Clay Soils - Bark

- Biggest improvement: tilling / subsoiling
- 10% & 20% - no improvement over tilling/subsoiling alone
- 30% best air/water balance
Clay Soils - Peat

- Biggest improvement: tilling / subsoiling
- 10% & 20% - decreased air
- 30% improved air but also increased water content
Sandy Soil - 20% Peat

- Untreated
  - Tilled no peat
    - 50%
    - 30%
    - 20%
- Tilled
  - 6 inches
    - 44%
    - 42%
    - 14%
  - 6 inches
    - 32%
    - 24%
- Tilled
  - 6 inches
    - Subsoiled
Sandy Soils - Peat

- 20% best air/water balance
- Subsoiling - no improvement
- 10% - no help
- > 20% no improvement
Sandy Soil - 20% Bark

Untreated

Tilled no bark

Tilled 6 inches

Subsoiled
Sandy Soils - Bark

- 0 & 10% - same
- Improved water content (20-30) & (40-50)
- Subsoiling - no improvement
What does all this mean?
Recommendations

30% pine bark (6 inches) & Subsoil

Clay Soils
Recommendations

≥20% peat (6 inches)

Sandy Soils