

# Building Urban Soils

**Building Spectacular Gardening Soils**

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**Great for Gardening**




Nothing could be finer than...

Gardening in North Carolina

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**Mentor: JC Raulston**



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**Experience: 45 Years 26 Countries**

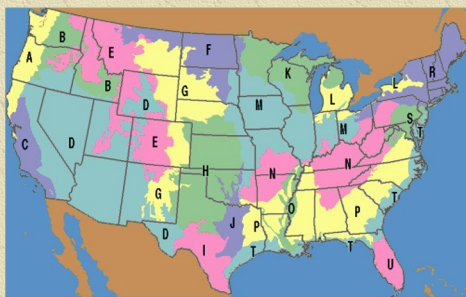


MULCH & SOIL COUNCIL CERTIFIED

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**Natural Resource Conservation Service**

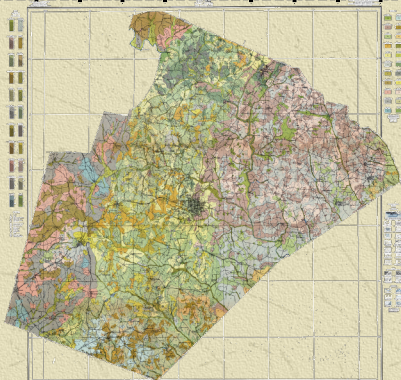
33,000 Detailed Soil Types



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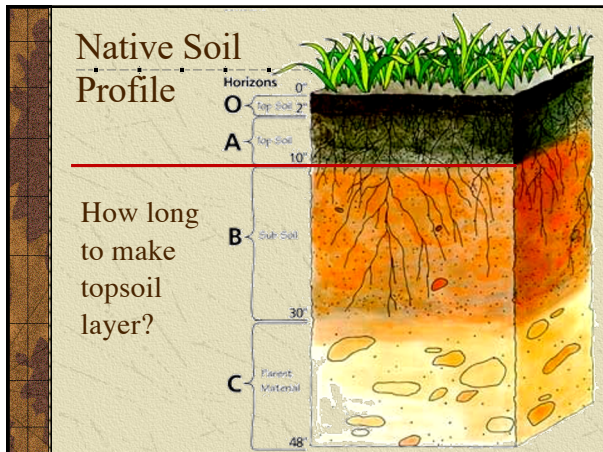
**Soils in Wake County**

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# Building Urban Soils



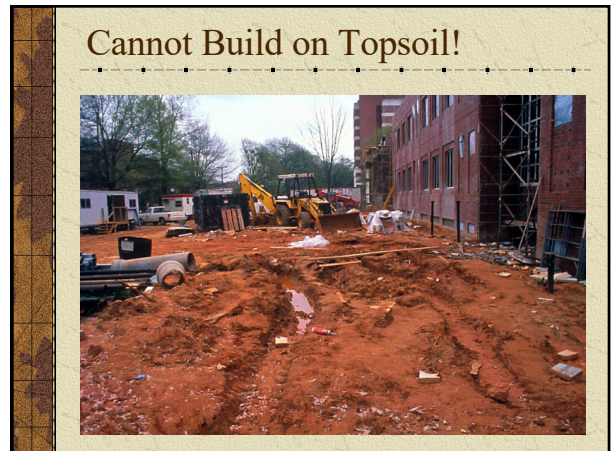
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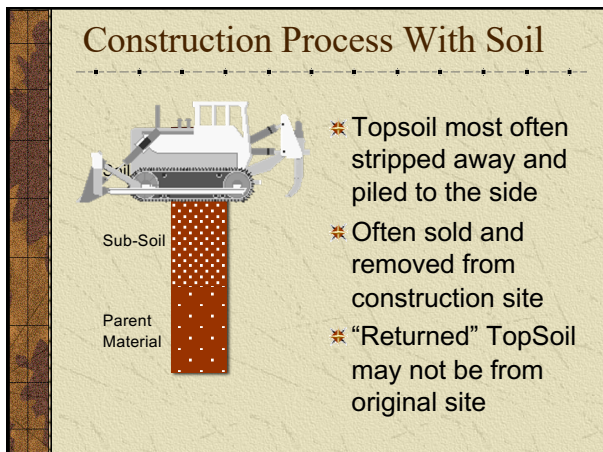
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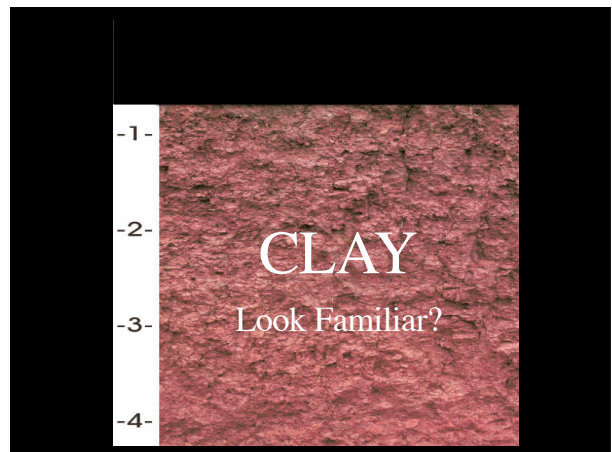
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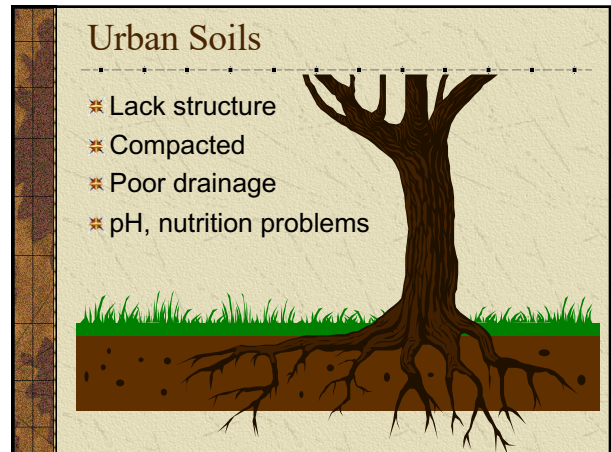


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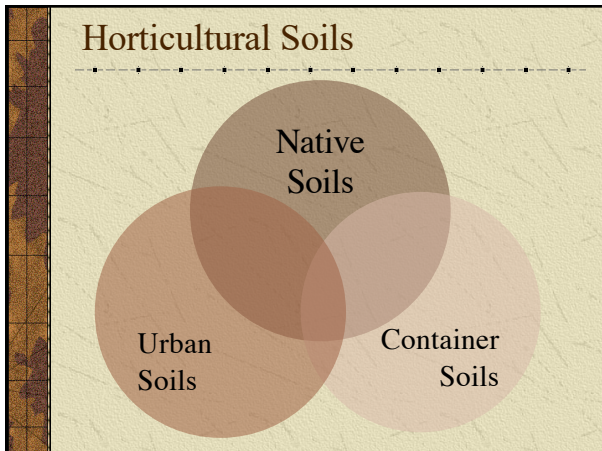
# Building Urban Soils



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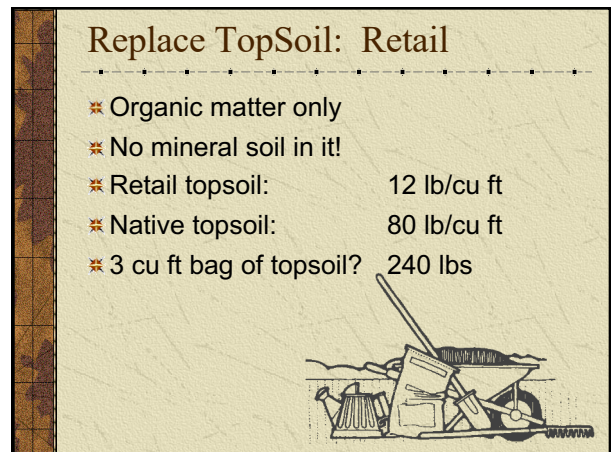
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# Building Urban Soils

Urban Soils → Garden Soils

We can build good garden soil!



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Gardeners' Advice



*"Gardeners are like Chefs"*




*"There are many ways to prepare a meal"*

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Building Garden Soil

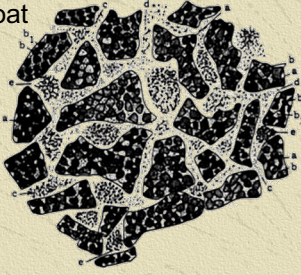
- ✦ What is missing in subsoil?
- ✦ Organic matter
- ✦ Soil microbes
- ✦ How do we fix it?
- ✦ Add organic matter



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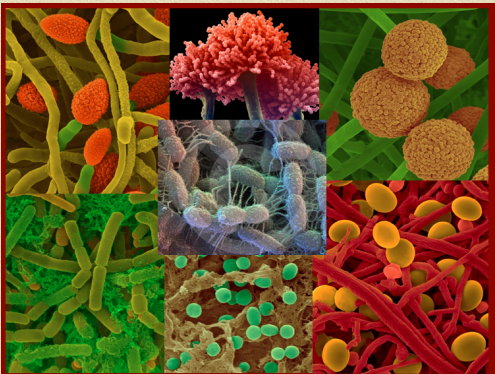
Organic Matter Builds Soils

- ✦ Breakdown releases (liquid) humates that coat soil particles
- ✦ Physically separates particles & aggregates
- ✦ Provides food



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Soil Microbes



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Soil "Critters"

- ✦ Bacteria
- ✦ Fungi
- ✦ Algae
- ✦ Protozoa
- ✦ Nematodes
- ✦ Earthworms

They feed on organic matter

**5 tons per acre**

↓

**1 million per acre**

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# Building Urban Soils

Building Garden Soil: Set the Table

**If you build it-  
they will come!**



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Amending Amounts

5ft x 20ft = 100 ft<sup>2</sup>

≥ \$4 per bag	25 to 50% by volume 1.5 to 3-inch layer
\$25 to \$50	0.5 to 1.0 cubic yards 6 to 12 2-cu ft bags

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Types of Organic Matter



- ✦ Top Soils
- ✦ Soil Conditioners
- ✦ Manures
- ✦ Worm castings
- ✦ Compost
- ✦ Plant Residues
  - ◆ Grass clippings
  - ◆ Fall leaves
  - ◆ Yard trimmings
  - ◆ Barks
  - ◆ Wood chips

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Building Garden Soil: How



Traditional Garden Beds

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Building Garden Soil: How

Traditional Garden Plot



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Building Garden Soil: How

Raised Garden Beds



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# Building Urban Soils



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## Raised Garden Beds



- ✦ More intense production
- ✦ Can be "in the garden" without compaction
- ✦ Can have specialized beds
- ✦ Can rotate crops among beds
- ✦ Visually appealing & funtional

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## Soil Depth Needed

Depends on what you are planting...  
Good turf is no sign of a good soil!

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## Grass on Parking Lot

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## Soil Depth Needed (inches)

- ✦ Turf: 2-4
- ✦ Annuals: 3-5
- ✦ Vegetables: 3-6
- ✦ Shrubs: 6-8
- ✦ Trees: 12-18+

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## Soil Depth Needed

Turf: 3", Shrubs: 6", Trees: +12"

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# Building Urban Soils

## Adding Organic Matter

- ✦ Incorporation
- ✦ Traditional
- ✦ Hand tools
- ✦ Tillers
- ✦ Takes patience and/or strength!



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## Incorporation: Tillers

1. Till soil
2. Layer organic matter
3. Till again



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## Incorporation Amounts

25 to 50% by volume

1.5 - 3 inches

6 inches

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## Mulch Research

- ✦ Mulches break down rapidly & release humates into soil
- ✦ Humates aggregate soils
- ✦ Mulches ALONE can build soil in 3-4 years!
- ✦ Use mulches that break down easily



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## No-Till Gardening: Layering



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## No-Till Gardening: Layering

- ✦ Lasagna gardening
- ✦ Sheet mulch
- ✦ Wood chips



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# Building Urban Soils

## Layering Organic Matter



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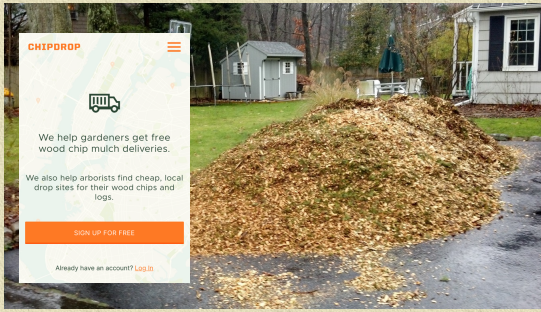
## Wood Chips: From Arborists



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## Wood Chips: From Arborists

Can get for free!



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## Layering: Raised Beds

Without Sides

With Sides



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## Raised Beds: Hugelkultur



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## Raised Beds: Hugelkultur



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# Building Urban Soils

## Building Urban Soils


- ✦ Incorporation
  - ◆ Faster
  - ◆ Can be done right before planting
  - ◆ Add mulch every year
- ✦ Layering
  - ◆ No-tilling
  - ◆ Takes longer
  - ◆ Done in the fall/winter
  - ◆ Add mulch every year

### Raised Beds?



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## Incorporation vs Layering



- ✦ Either can work
- ✦ Layering and raised beds great for annuals, vegetables, perennials
- ✦ Trees?
  - Need stable soils
  - Usually better in the ground

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## Gardening Advice



*"Gardeners are like Chefs"*



*"There are many ways to build a soil"*

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## Great Soils: Build Them



*finer than...*

*ardening in North Carolina*

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