

# Landscape Soil Preparation

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# Today's Agenda

- Pre-Planting Preparation
- Bed Preparation
- Amendments
- Additives
- Questions



# Soil's Role

- Provides 4 of 5 properties necessary for plant survival.
  - Water retention
  - Nutrient retention
  - Air reserves for roots
  - Plant support
- Light is the only essential property not provided by the soil
- Lesson: Properly prepared soil is essential for plant growth & success.



# Soil Texture – It's Not About Feel.

- Soil Composition
  - Solids: sand, silt, and clay
  - Pores: air and water
- Coarse soils (sandy): good drainage and oxygen, but little water retention
- Fine soils (clay): drainage and aeration are poor, water is plentiful





## Pre-Plant Bed Survey – Know Before You Grow

- Avoid areas where shallow rooted trees grow
- Leave adequate buffers around established plants
- Know the history of the area – past species grown, herbicides, etc.



# Pre-Plant Bed Preparation

- Rake off existing mulches
- Do not incorporate non-composted organic materials
- Amendments
  - Improves drainage
  - Water infiltration
  - Moisture retention
- Take soil samples before adding chemical amendments
- Add fertilizer and lime based on test results



# Water Infiltration

- Infiltration- rate of water movement into the soil
- Subsoil compaction or hard pans impact drainage and aeration
- Clay soils – 4 to 20 times slower than sands
- Rate of drainage – impacts soil oxygen content
- Weekly watering (time of year, sun or shade, plant growth, etc..)
  - 1 to 2 times in clay soils
  - 2 to 3 times in sandy soils



## Infiltration Rates for Common Soil Types

Soil Type	Infiltration rate (inches/hour)
Sands	> 0.8
Sandy and silty soils	0.4 to 0.8
Loams	0.2 to 0.4
Clay loams	0.04 to 0.2



# General Rules For Amending Soils

- Do not add decomposing materials
  - Competition for nutrients – sulfur and nitrogen
  - Nutrient disorders
  - Poor plant growth



# How to Play in Clay

- Clay soil amendments
  - Pine bark humus
  - Composted leaf mold (fully composted)
  - Prepared soil improvement mixes
    - Tend to be the best option – contain fert. and other additives.
    - Free of weed seeds and other contaminants



## Not For Use in Clay

- Do not add to clay soils:
  - Sand
    - Stratification
  - Hardwood bark
    - Tannins
  - Wood chips (cellulose)
    - Nitrogen pull
  - Pine straw
    - Very acidic
    - No bulk
- Will not adequately improve physical properties



# Soil Amendments- Clay

- Amendments to clay must be over 25% by volume
- Example: 8 inches of amended soil = 2 in. should be in top 6 in.
- Raises the bed
  - Drainage
  - View of ornamental plants
- Up to 50% by volume should improve growth
- Over 50% may result in negative growth
- Less than 25% would be a waste of resources





# Amending Sandy Soils – A day at the beach!

- Materials to improve water & nutrient retention
  - Pine bark humus
  - Composted leaf mold
  - Peat moss
  - Prepared soil improvement mixes
- 25% to 50% by volume for water retention and improved plant growth





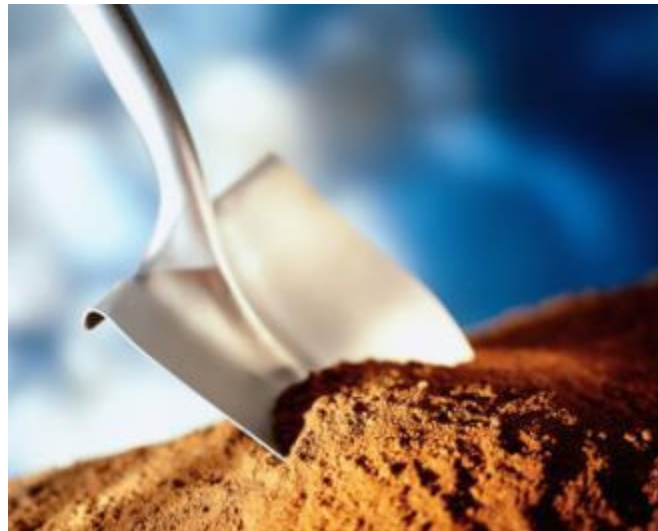
# Planting Trees

- Backfill Soil Mix
  - 1 part planting mix OR ½ part mushroom compost and ½ part organic soil conditioner to 2 parts soil
- Place enough of this soil under the tree so that rootball sets 1 to 2 inches above the soil line
- Mix can be used as water basin
- Apply 3 inches of mulch around tree and away from trunk



# Rose Bed Preparation

- Each rose should receive 9 ft<sup>2</sup> of growing space
- Remove sod or ground cover
- Till mix 10 to 12 inches deep
  - Mushroom compost– 2 inches of material
  - Organic soil conditioner- 2 inches of material
  - Rose fertilizer (use label rates)
- Place enough of this soil under the rose so that rootball sets slightly above the soil line



# Annual and Perennial Beds

- Soil Mix- Individual holes
    - 1 part planting mix OR 1/2 part mushroom compost and 1/2 part organic soil conditioner to 2 parts soil
  - Bed Preparation
    - Remove sod or groundcover
    - Till the amendments below to 6 to 8 inches deep
      - Planting mix with fertilizer (granular and CRF)- 2 inches
- OR
- Mushroom compost -1 inch
  - Organic soil conditioner- 1 inch
- Mulch with desired mulch to required depth.



# Soil Additives- Polymers

- Water absorbing materials that increase nutrient retention in soils
- Potassium salt polymers
- Zeba
  - Starch-based
- Stockosorb
  - Synthetic



# Sustainably Grown for Landscape Success



- Eco-friendly medium
  - Peat
  - Rice hull
  - CRF
  - Biological package
  - Polymer





# Soil Additives- Biologicals



- *Trichoderma harzanium* - Rootshield
  - *Pythium*, *Rhizoctonia*, *Fusarium* prevention
  - Compatible with pesticides
  - Colonizes root zone (>50F)
- *Streptomyces lydicus* – Actino-Iron
  - Contains agricultural iron (22%) and humate (fulvic and humic acids)
  - Iron: darker toned foliage
  - Humate: Food source for microbes
- Mycoblend package
  - Ectomycorrhiza, Endomycorrhiza and *Bacillus*
    - *Bacillus subtilis* - Root and crown rot prevention

# Mulching Color Beds

- Mulches
  - Retain moisture
  - Suppress weed growth
  - Prevent soil adhering to plants
  - Attractive vs bare soil
- 2 to 3 inches between color plants (1/2-inch around collar)
- Materials
  - Bark nuggets
  - Pine straw
  - Bark chips
  - Composted leaf molds
- Herbicides may become de-activated on organic material

A photograph of a garden bed covered in brown mulch. In the foreground, there is an orange wheelbarrow. The background shows various green plants and trees under a clear sky.

## Mulch Requirements

- Total area to be mulched = square feet x desired depth x 0.0031  
= total cubic yards
- Example: 2500 square feet X 4-inch depth x 0.0031 = 31 yards

## Bag Mulch Coverage

3 ft <sup>2</sup> Bags	2 inches	3 inches	4 inches
1	18ft <sup>2</sup>	13ft <sup>2</sup>	9ft <sup>2</sup>
2	36ft <sup>2</sup>	26ft <sup>2</sup>	18ft <sup>2</sup>
3	54ft <sup>2</sup>	39ft <sup>2</sup>	27ft <sup>2</sup>
4	72ft <sup>2</sup>	52ft <sup>2</sup>	36ft <sup>2</sup>

1 bale of pine needles covers 45 square feet

# Questions? Thank You.

