Producing New Soil Products for Emerging Stormwater BMP Markets

Sharon Barnes
Barnes Nursery, Inc.
EPA Region 5 Webinar
March 10, 2009

The Soil Blender:
Where the Rubber Meets the Road


SPECIAL REPORT GLOBAL WARMING
TIME
BE WORRIED. BE VERY WORRIED.
Climate change isn't some vague future problem—it's already damaging the planet at an alarming pace. Here's how it affects you, your kids and their kids as well
EARTH AT THE TIPPING POINT
HOW IT THREATENS YOUR HEALTH
HOW CHINA & INDIA CAN HELP SAVE THE WORLD—OR DESTROY IT
THE CLIMATE CRUSADERS


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PLUS
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The Economist
Shake-up in Big Pharma
China's space blast
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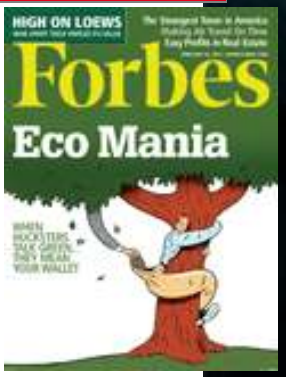
The greening of America


PACKAGING WORLD
SUSTAINABLE PACKAGING


HIGH ON LOEWS
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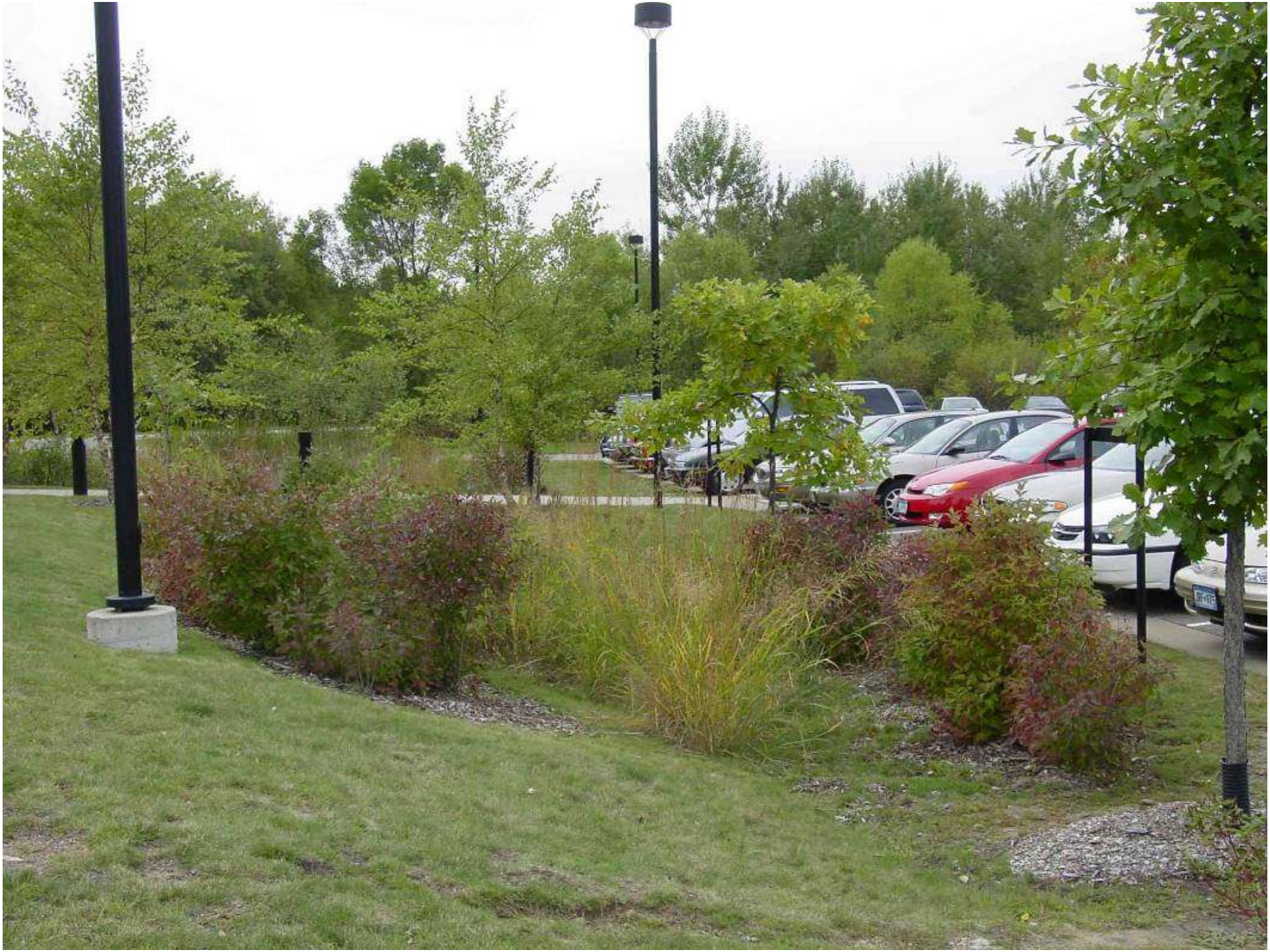
START YOUR OWN HEDGE FUND • THE FUTURE OF COMPUTING
FORTUNE
WAL-MART SAVES THE PLANET
Well, not quite. But CEO LEE SCOTT's green campaign, which started as PR, is becoming a force of nature.

Composting-Soil Blending Facility

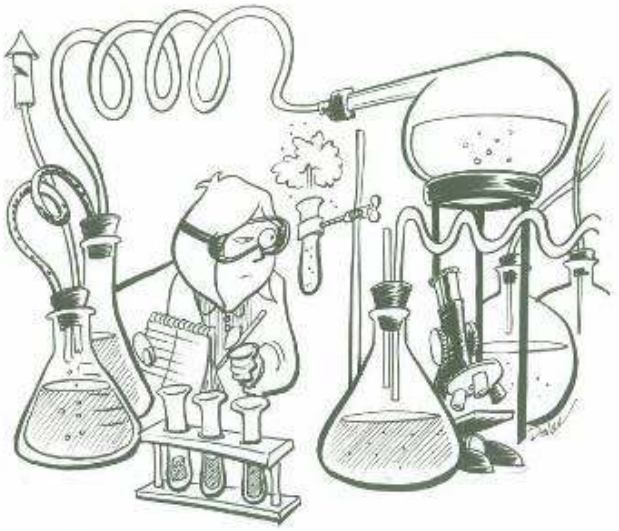
"Prescription" Soils/Media for Managing Stormwater

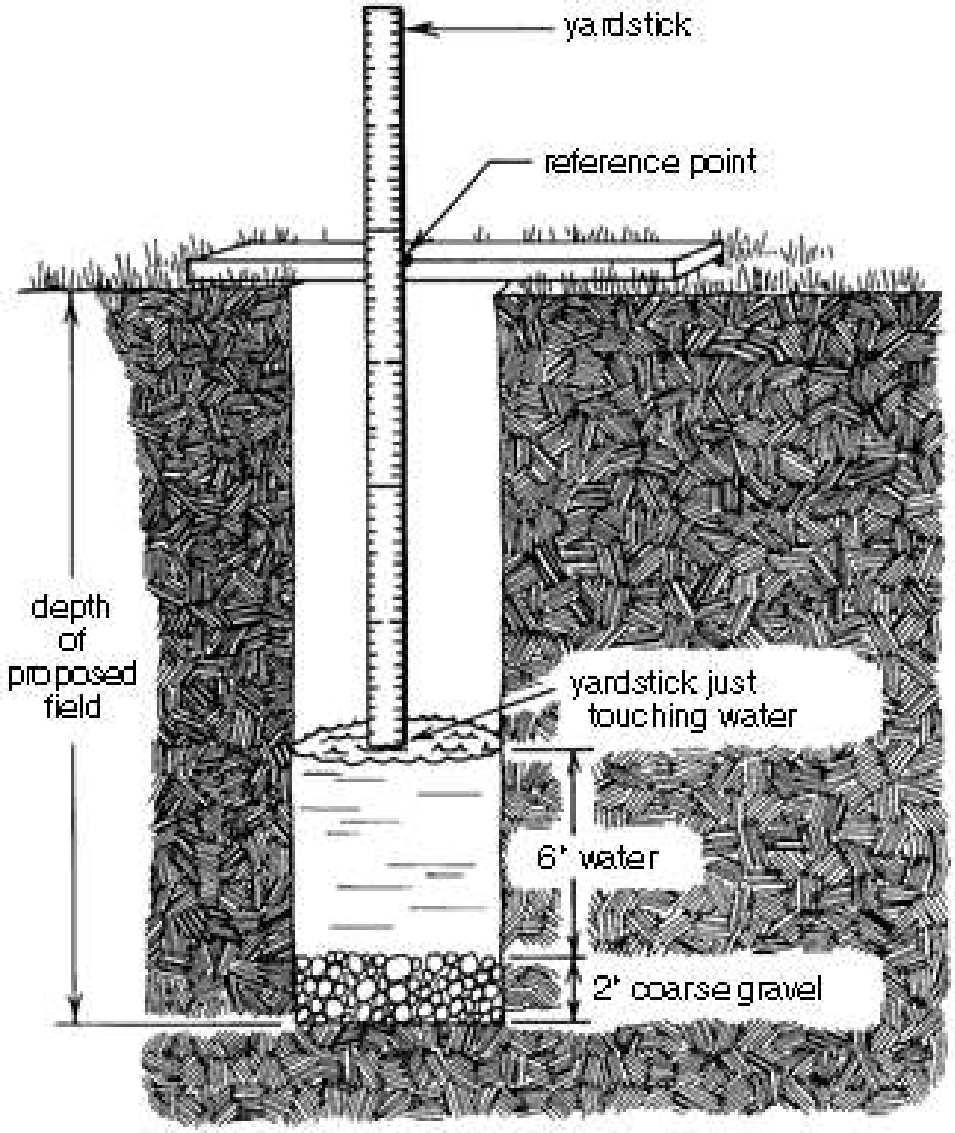
- **Rain Gardens**
- **Bio-Retention Swales**
- **Roof Top Media**
- **Compost Blankets**
- **Compost Socks**
- **Compost Berms**



About Mix Specifications

- **understand the material components and what they do**
- **know any percolation rate required**
- **overall project succ on:**
  - **good design**
  - **proper media**
  - **skillful installation**




yardstick
reference point
depth
of
proposed
field
yardstick just
touching water
6" water
2" coarse gravel

Media ingredients often include:

- Topsoil
- Sandy or Clay Loam
- Sand
- Silt
- Compost
  - Leaf
  - Biosolids
  - msw
- Hardwood Bark
- Pine Bark Fines
- Perlite/vermiculite
- C6 Aggregate
- Light Weight Aggregates:
  - Solite
  - Stalite
  - Haydite

Source Materials "Locally Produced"

Cotton Burr Story

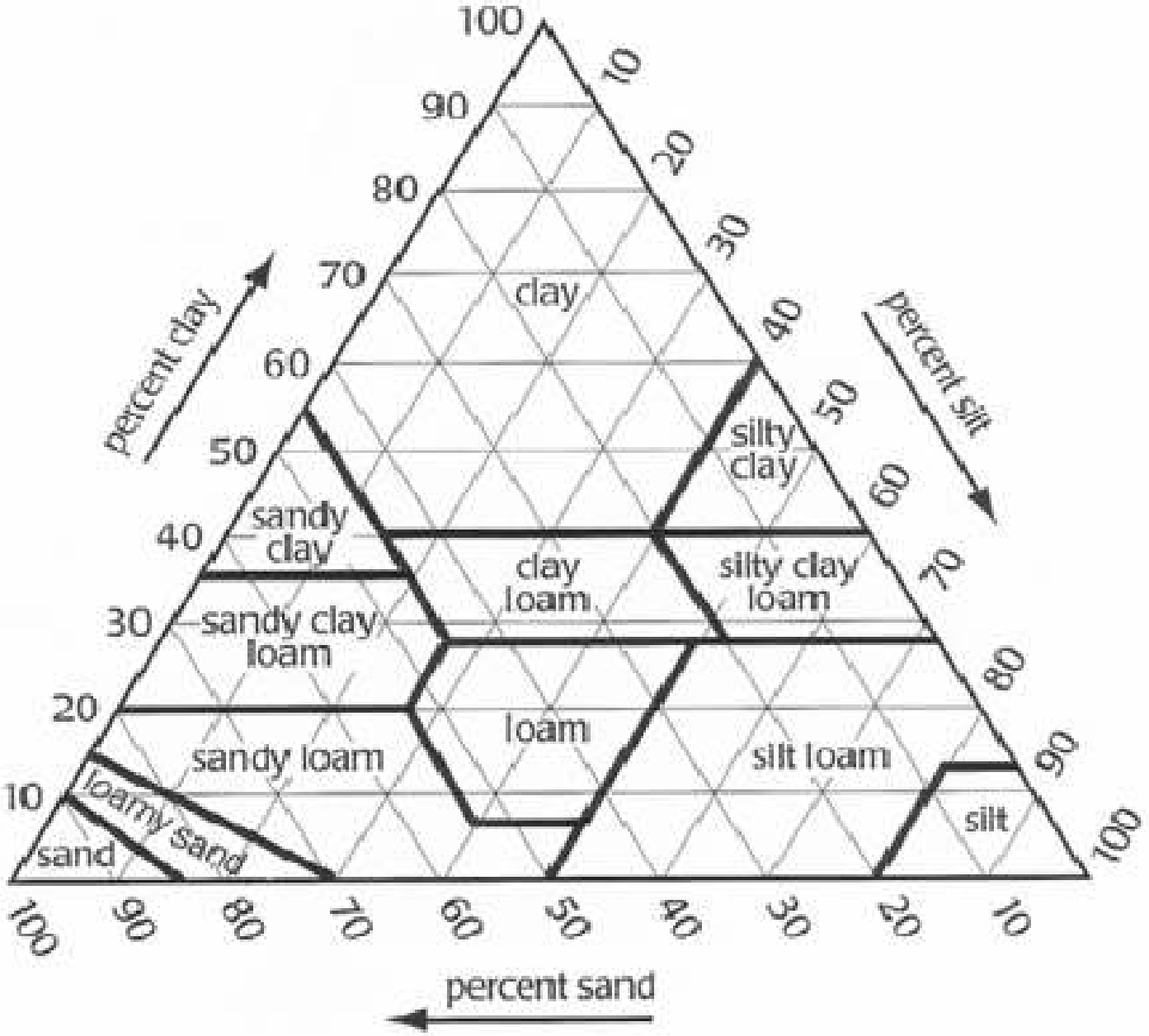
Volume Specifications

- Soil……20-40%
- Bark/leaf humus compost/peat……20-30%
- Sand……30-60%

Final Specifications Range

- Sand content…… 50-85%
- Silt content……0-50%
- Clay content……<5-20%
- OM……1.5-10%

Textural Triangle



USDA
Sand Particle Classification

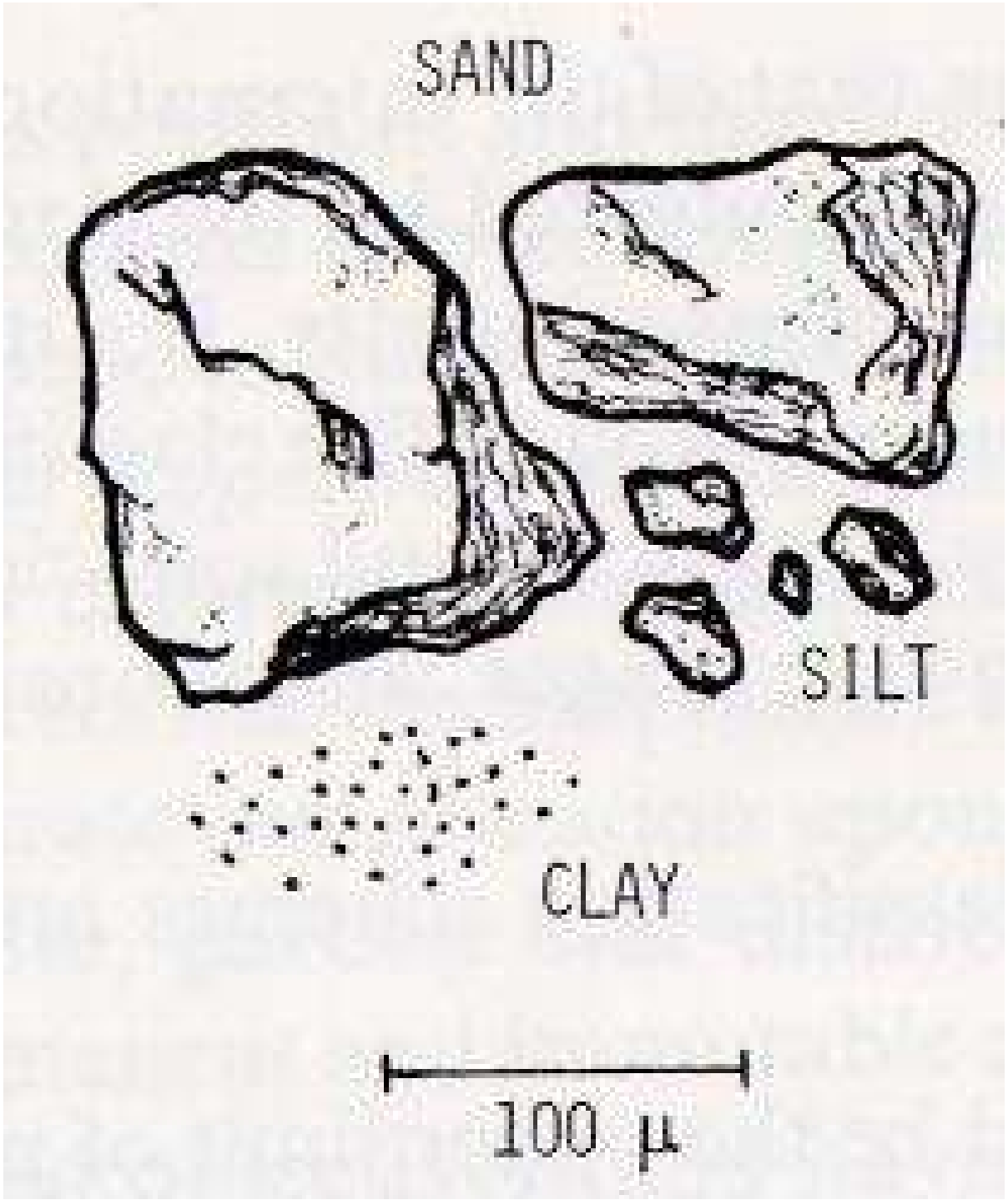
Soil Separate	Diameter Limits/mm
• Clay……	<0.002
• Silt……..	0.002-0.05
• Very fine sand……..	0.05-0.10
• Fine sand…….	0.10-0.25
• Medium sand……..	0.25-0.50
• Coarse sand……	0.50-1.00
• Very coarse sand……	1.00-2.00

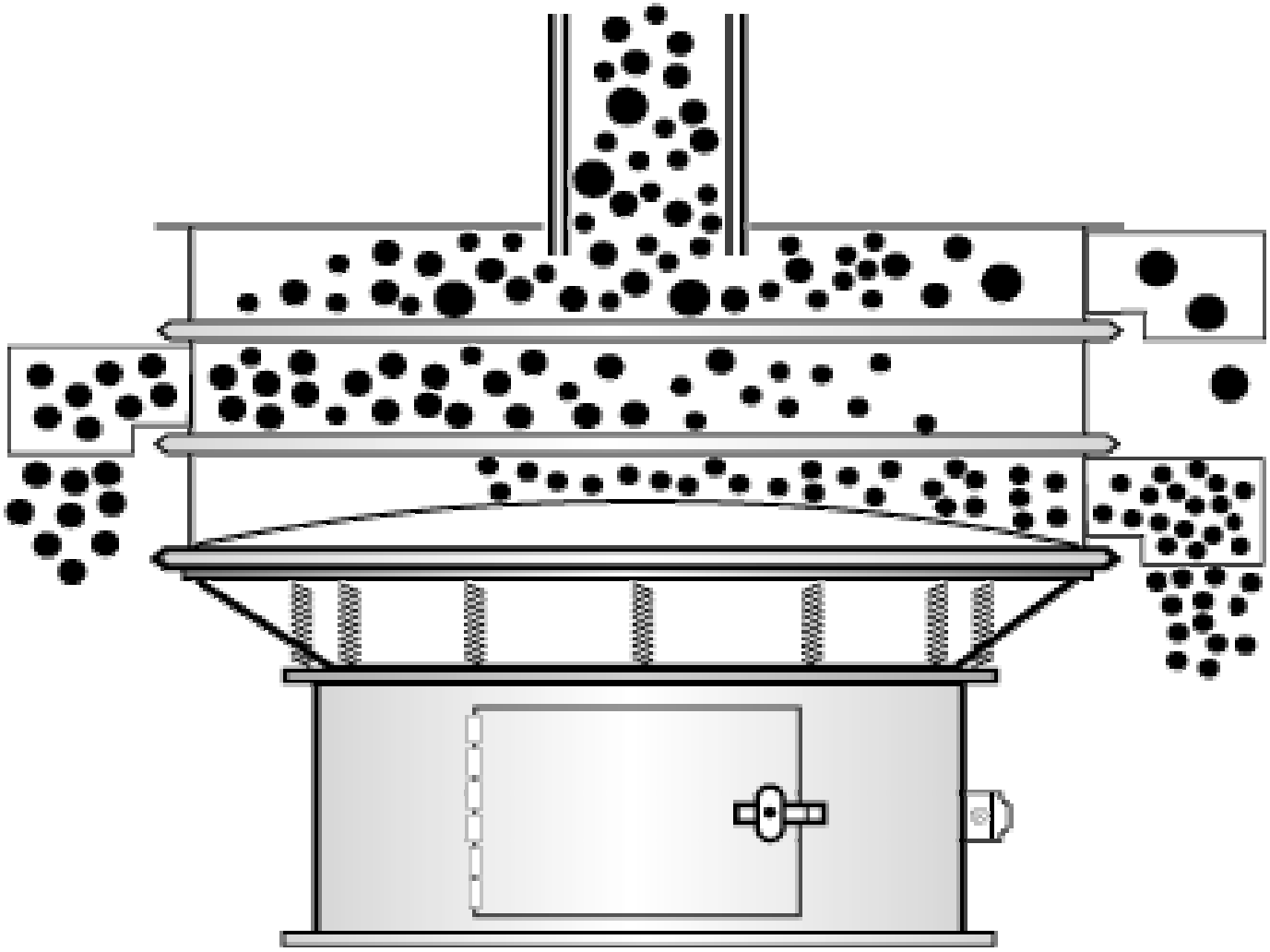
Other Notable Specifications

- AASHTO: American Association of State Highway and Transportation Officials
  - Soil and Soil Aggregate Classification System
- ASTM: American Society for Testing and Materials
  - Establish test methods
  - Establish classifications

Meeting the Specifications

- Send samples of all components to soil lab:
  - Soil & Sand:
    - Textural Analysis
    - Organic Matter Content
    - pH
  - Compost:
    - STA testing
    - Textural Analysis
  - Light Weight Aggregate, etc.
- Send media specifications to soil lab
- Ask soil lab to formulate “recipe” to meet specifications based on the test results


SAND
SILT
CLAY
100 μ



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SUBMITTED BY:
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HURON, OH 44839

ACCOUNT NO.: T1256

SUBMITTED FOR:

REPORT DATE: MARCH 6, 2009
REPORT REF.: 92.084

SOIL TEXTURAL ANALYSIS REPORT

LAB. NO.	SAMPLE IDENTIFICATION	MECHANICAL ANALYSIS % SAND	% SILT	% CLAY	U.S.D.A. TEXTURE CLASS
878420	#1 TOPSOIL	57	21	22	SANDY CLAY LOAM

Method Used: Conforms to ASTM D 422-63

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REPORT DATE: MARCH 6, 2008
REPORT REF.: 92.084PHOM

REPORT OF ANALYSIS

LAB. NO.: 878420
SAMPLE ID: #1 TOPSOIL

TEST PARAMETER	RESULT	UNITS
Organic Matter	7.4	%

METHOD: Organic matter reported as Loss on Ignition at 440°C on oven dry (105°C) soil according to ASTM D2974-87 Method C.

LAB. NO.: 878420
SAMPLE ID: #1 TOPSOIL

TEST PARAMETER	RESULT	UNITS
Soil pH	7.6	SU

METHOD: Soil pH determined on a 1:1 soil/deionized water slurry according to NCR-221.

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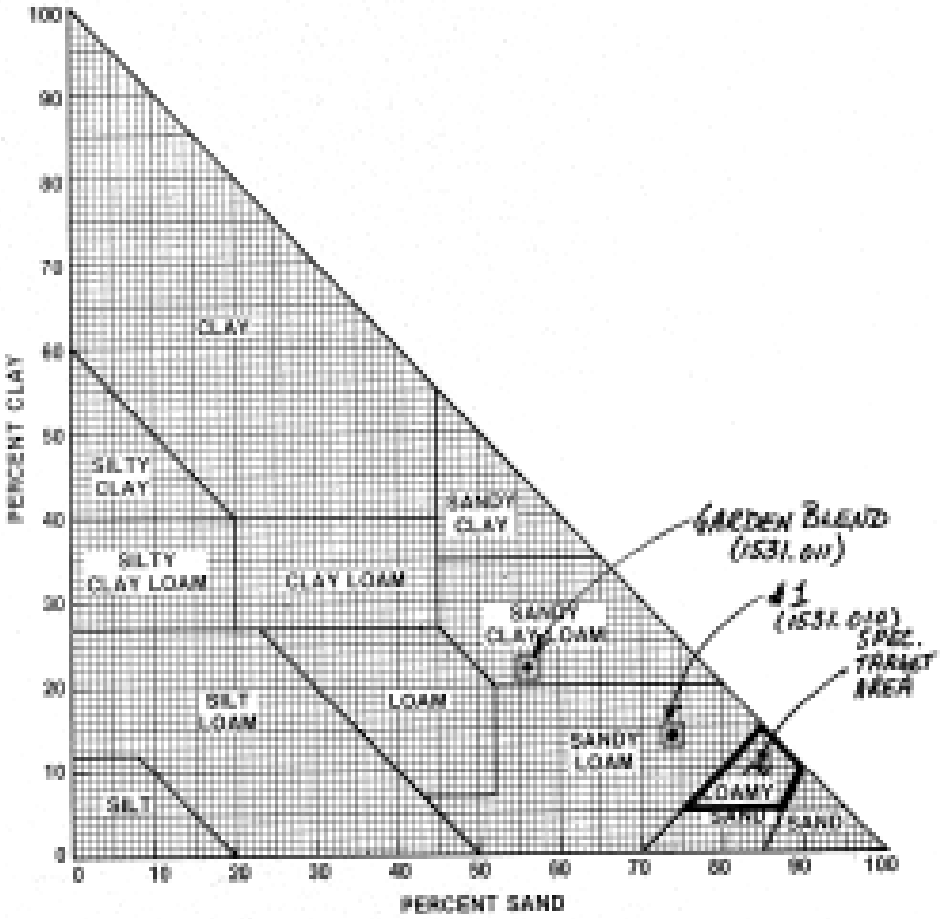

Fig. 15-3. Textural triangle for soil textural analysis using the USDA classification scheme.


MAGNUM

Economic Opportunities

- New end product markets with Bio Soil Mixes
  - Opportunity to “raise the bar” in soil quality produced
  - Chance to source new, appropriate alternative materials
    - Recycled aggregate
    - Recycled sands (foundry sand)
  - Sustainable Sites Initiative

New Feedstock Opportunities

Organic Industrial Residuals

- Fly ash
- FGD
- Foundry sand
- Alum sludge
- Gypsum sludge
- Spent lime
- Steel slag
- Papermill sludge

Foundry Sand