What is biochar?
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Biochar
• Charred organic matter

• Pyrolysis
  – High heat
  – Low oxygen

• Similar to charcoal

Biochar
• Terra preta
  – Brazil

• Alternative energy
  – Pyrolysis of biomass
  – Volatile organics removed
  – Charred remains

• Long-term C sequestration

Biochar
• Properties extremely variable
  – Starting feedstock
    • Content
    • Particle size
  – Processing variables (200 – 900 C), time
  – Post storage

Torrefaction  Fast pyrolysis  Gasification

200 C  600 C  800 C
Biochar effects in soils

- Raises pH...liming effect
- Increases CEC
- Changes biological diversity and activity
- Interacts with specific ions
- Positive results in poor soils

Biochar in substrates

- Very little scientific literature
  - But growing
- Effects similar to those in soils

Biochar

- C, H, O burned off.
- Mineral salts remain, but concentrated.
- Our research
  - Physical properties
  - Mineral salt interactions

Nutrient retention/release

- Leaching columns
- Very precise
Nutrient retention

• Nitrates and phosphates temporarily retained.

Phosphate

• Rice hull biochar
• Extremely high P concentration
• Si

Rice hull biochar

• Very high plant available P and K.
• Very high Si.
• Can rice hull biochar replace P and K fertilizers?
Geranium growth and chlorosis

Summary

• Biochar materials vary greatly.
• Generally, limited value in container crops.
• Specific properties, beneficial
  – Phosphate and potassium
  – Silicon
  – pH increase
• Rice hull biochar
  – Vast supply
  – Not commercially available for horticulture

Questions