Biochar Production and Feedstock Effects

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Biochar: Production, Properties, & Agricultural Use

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Biochar Production

• Reason for Biochar Production:
  – Sole Product or Co-Product

• Different Biochar Making Processes:
  – Slow Pyrolysis, Fast Pyrolysis,
  – Hydrothermal, Micro-Wave and Gasification

• Devices for Biochar Production:
  – Low Cost Simple Home-Made
  – High Cost Complex Precision Engineering
  – Chip Energy Biomass Furnace, Biochar Co-Product
Types and Uses of Biochar

“All chars are black, but are not created equal.”

- **Fuel Biochar:** High Energy Clean Burning.
- **Environmental Biochar:** Sequestration of CO2.
- **Industrial Biochar:** Filtration.
- **Ag Biochar:** Adsorption capacity and % fixed carbon
Markets should lead with Biochar Specifications.

- Current markets purchase whatever biochars are available.
- Sustainable business practices will meet market needs.
- Current Biochar production is not driven by market specification requests.
Chip Energy Biochars

- Chip Energy can meet market specifications.
- We control time, temperatures and feedstock type during the production of our Biochars.
- Varieties of feedstock will influence the characteristics of the chars.
- The details of production methods are propriety and are secondary to meeting the specifications.
# Chip Energy Biochar Characteristics

**Chip Energy**

**Biochar Material**

Received | Optimum
---|---
2.6 Water | 0
0.0 Volatile (HO) | 0
4.8 Volatile (C) | 0
0.1 Volatile (N) | 0
36.7 Fixed (HO) | 39.7
50.6 Fixed (C) | 54.7
0.3 Fixed (N) | 0.3
4.1 Sol. Ash | 4.4
0.8 non-Sol Ash | 0.9
100.0 SUM | 100.0
Chip Energy Biochar Production

• Chip Energy has a distinctive process of up-draft gasification, with the DUAL purposes of making thermal energy and biochar.
• For centuries, furnace innovations have been focused on NOT leaving behind any carbon atoms.
• Chip Energy Technology can control carbon utilization.
Chip Energy Biomass Furnace

- Per 24 hr period, input of 500 lbs of biomass will yield nearly 100 lbs of biochar and produce 200,000 Btu HR of thermal energy.
- Small size favors decentralized applications, widely distributed feedstocks, and local control.
Varieties of Feedstocks

- Woody Biomass
- Corn Stover
- Pine Cones
- Cherry Pits
- Mesquite
- Paper
- Corn Cobs
- Tropical Maze
- Miscanthus
- Poultry Litter
- Peanut Shells
- Cow Manure
- Wheat Straw
- Cardboard
- Grasses
- Sorghum
- Rice Husks
- Cotton Seed
- Potato Peel
- Penny Cress
- Horse Manure
- Bio Solids
Handling of Feedstocks

• Economical biomass recovery and processing is possible with the Chip Energy Biomass Conversion Facility.
Chip Energy’s Position

• Our future can be advanced by:
  – Furnaces for needed thermal energy
  – Economical supplies of biomass fuels
  – A market for quality biochar

• Chip Energy is active in Illinois, sells biochar to several states, has outreach for international projects, and is attending the International Biochar Initiative (IBI) Conference in Rio de Janeiro this month.
We look forward to working with you!!

Thank You

For MORE INFORMATION
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