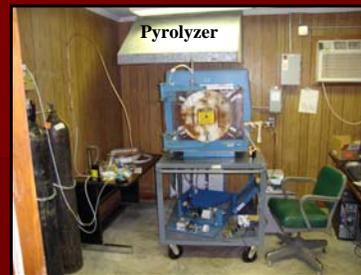
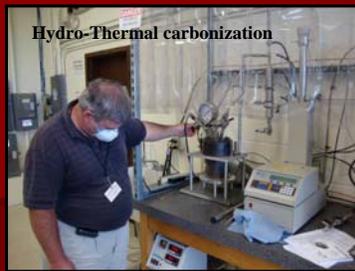


## ARS-FS Agroforestry Workshop Jeff Novak

### ARS-Florence Location

1. Physical equipment: Computer controlled Lindberg oven for pyrolysis of feedstocks, Hydro-Thermal carbonization, digesters, pelletizers (soon)
2. Laboratory equipment: TGA, ICP, LECO, GC, contract for FT-IR, NMR, SAA, etc.
3. Feedstocks: switchgrass, pecan shells, hardwood, peanut hull, poultry litter, swine manure, rye grass, bermuda grass, cotton gin trash, forestry products



## Scientists at Florence with Biochar

- Jeff Novak and Warren Busscher – evaluation of designer biochar to influence specific soil and physical properties,
- Kyoung Ro -Producing bio chars using hydrothermal carbonization processes, sorption reactions with metals and gasses,
- Keri Cantrell -producing biochars using pyrolysis of different feedstocks and evaluating their thermal chemical signatures,
- Tom Ducey – biochar influence on soil microbial populations and nutrient turnover processes.

## Biochar experiments



## Location specific accomplishments

- Biochar incubation in Norfolk Ap
  - a. (2007) pecan shell biochar lab incubation
    - 1. Soil Science (2009)-shows soil fertility improvements
    - 2. Soil Science (in review)-soil strength improvements
    - 3. Geoderma (in review)-shows biochar C & N biochemistry
  - b. (2009) high/low temp biochars lab incubation
    - 1. Annals of Env. Sci. (2009)-shows biochar characterization
    - 2. AIChE Proc. (2009)- shows increase in soil water holding capacity after biochar additions.

## **Complementary research with Agroforestry at Florence**

- **Planning our new NP 214 Bioresource program**
- **Blending biochars made from manures, grasses, forestry products;**
- **Goal is to evaluate blended biochars for use as slow release fertilizers, designed for improvement of distinct soil properties, sorbent for chemicals;**
- **Established collaborations with FS scientists (Tom Ebberhart @Pineville La. & Carl Trettin @ SRNL);**
- **Our location needs: forestry products and FS char-ash**
- **We can offer: biochar characterization, reaction in soil, thermal energy signatures, sorptive properties (need money).**