

## WELCOME TO THE LATEST ISSUE OF G.A.I.A NEWS!

### Fun facts:

- The pore structure of Biochar mimics the cellular structure of the original plant material.
- The addition of Biochar to soils can influence soil physical properties (e.g., porosity and density) which further influences the availability of water and air to plant roots.
- A key property of Biochar is its stability. This is characterized by the period of time that a portion of its carbon remains in the soil.

### Notable Happenings at GAIA International

The Annual Meeting of GAIA International will be held in December. Look for announcements regarding the appointment of new Board members in our first quarterly newsletter of 2015.

A warm welcome goes out to our newest team member, Karishma Thakkar. She is working as a research assistant for GAIA and has already made significant contributions. Thanks Karishma!



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# G.A.I.A. NEWS

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## GAIA experiment in Cuzco, Peru underway

One of GAIA's first goals was to undertake a pilot study of biochar use in the developing country of Peru. In order to ensure that their biochar study was conducted in a scientific manner, GAIA partnered with the *Universidad de San Antonio de Abad UNSAAC-KAYRA* at Cuzco, Peru.

The first task of experimenters was to undertake an analysis of both the parent soils and the biochar produced (including the original feedstocks). This is important since different types of plants require different soil conditions. After completing the soil analysis, experimenters could then implement a design of statistically significant numbers of plots in scientifically organized rows of biochar plantings. The design would allow for numerous replications of both controls and various experimental conditions.

By enlisting the help of the University, GAIA has been able to achieve a rigorous experiment along with a resource for collecting and analyzing samples for soil testing and biochar analysis. In addition, the University was able to establish clear metrics



**Our partner, Ryan Delaney (Carbon Roots) teaching about biochar at the Cuzco University**

and processes to be used in the experiment, and ensure an ability to monitor results with the necessary frequency and documentation. In time, GAIA hopes the University will serve as a regional agricultural center for teaching sustainable farming methods to smallholder farmers.



## Thesis work completed on biochar topic

GAIA's founder, Kathleen Stefanik, recently completed her thesis defense in mid-November. Her paper is titled "From Subsistence to Surplus: Helping Farmers in Rural Peru to Increase Crop Production by Improving Soils." Kathleen not only writes about GAIA's work in Peru in the 87-page document; but she also gives an overview of some of the biochar research being done around the world.

According to Kathleen, the section on biochar "is not intended to be an exhaustive review of the literature surrounding biochar systems, but it does give an overview of the elements inherent in the deeper and more extensive topic. Given the complexities of soil interactions and chemical properties of biochar interaction within soils, the discussion serves to economically capture some of the existing research in this area."

Kathleen was thrilled to have passed on her first time through the committee. She commented that her thesis director and second committee member were both "invaluable aids" to her success in achieving a paper that she can be proud of.

## Congratulations to our Director, Dr. Mark Henderson!!

GAIA is extremely proud of our board member, Dr. Mark Henderson, for winning the "Making a World of Difference" award. Tempe Sister Cities honored Dr. Henderson with this award for empowering student innovation to solve national and global challenges. He was also recognized for involving students in worldwide technology

projects that improve the lives of under-privileged people in developing countries and for co-founding Global Resolve (a GAIA partner). Dr. Henderson gave a moving acceptance speech where he spoke extensively about the work that both GAIA and Global Resolve are doing around the world.



Photo courtesy of Dennis Ederer Photography