Dr. Johannes Lehmann to Give Biochar Seminar

Friday – 20 August 2010, 1:00 – 4:30pm

Burlington, Vermont

Sheraton and UVM Conference Center

870 Williston Rd., S. Burlington, Vermont 05403 (802) 865-6600

The 'Biochar Vermont Initiative' has asked Professor Lehmann to focus his comments on this question:

Is the strength of what is thus far known about biochar sufficient to initiate a significant investment to study the manufacture, use and efficacy of char applications to our farm, forest and garden soils?

Dr. Lehmann leads the Soil Biogeochemistry & Soil Fertility Management Program at Cornell University's Dept. of Crop and Soil Science. He is arguably the lead scientist – worldwide – in the study of biochar. Please review his CV at:
http://css.cals.cornell.edu/cals/css/people/faculty.cfm?netid=cl273

Professor Lehmann is also co-founder and Chair of the Board of the International Biochar Initiative (IBI), and member of the editorial boards of Nutrient Cycling in Agroecosystems, Plant and Soil. From the IBI website:
http://www.biochar-international.org/board/advisorycommittee#johannes

This important seminar is hosted by UVM and Vermont's 'Biochar Project,' a collection of academics, farmers, forest owners, policy makers and others that have developed an interest in bringing biochar to Vermont for the purposes of improving our forests, producing green energy, sequestering carbon in soils while at the same time exploring the prospects of a new, very 'green' industry that can provide jobs manufacturing and marketing the type of earth-friendly products that have become Vermont's trademark.

TO RESERVE A SEAT AT THE SEMINAR, YOU MUST PAY IN ADVANCE

Cost is $20 per person. Please make checks payable to**: 'Biochar Vermont Initiative', c/o Thom McEvoy, 705 Spear St., S. Burlington, VT 05403**. Registrations WILL NOT be confirmed, but those who pay in advance are guaranteed a seat. If you're feeling lucky, we will accept registrations at the door but the price is $25 per person.

MEDIA

Credentialed media representatives are invited to join the seminar at no charge but must take standing room if all seats are sold. We are also hosting a 'Media Room' with easy-to-understand literature on all aspects of biochar, including a ready-to-print press release covering the seminar. There will also be opportunities to interview Dr. Lehmann, and other 'dignitaries' who will join us at the seminar.

A Future for Biochar in Vermont?

Biochar is a carbon-rich product that results from the low temperature, oxygen-starved combustion (also known as pyrolysis) of carbonaceous biomass such as crop residues, stall bedding, cull timber and sawmill wastes. Although very similar to charcoal, evolving current technologies are carbon-negative since the volatile byproducts (mostly hydrogen, nitrogen, carbon monoxide and small amounts of methane) are gathered and used to fuel the making of biochar, and excess volatiles are recovered, filtered and used as 'synfuels;' an increasingly promising substitute for fossil fuels, especially on a local scale. The science surrounding the manufacture and use of biochar, although modeled on the *terra pretas del indios* recently rediscovered in the Amazon Basin, has already demonstrated promising results, but there is much to be learned about the process of making biochar, how best to characterize it, application rates, its longevity in soils (since it should qualify for carbon offsets under a 'cap-and-trade' system) and – when used in forest soils – how best to get it into otherwise undisturbed soil ecosystems. Even though biochar is capable of becoming the soil innovation of the 21st Century, and possibly one of the most cost-effective ways of sequestering large amounts of carbon, it may not be a panacea for all soils. Notwithstanding, very recent studies suggest that it may be possible to use biochar as a tool for maintaining productivity with reduced – or less frequent – applications of soil amendments. The science is evolving daily, but reliable scientific sources (Lehmann & Joseph 2009) also suggest that the application of biochar (inoculated with favorable soil organisms – easily introduced with a small amount of healthy forest soil – coupled with small amounts of nitrogen, and a carbonaceous material such as sawdust) can increase yields on formerly abused soils by as much as 300 percent or more.

In Vermont, and much of the Northeast, land-clearing and cultivation practices have fueled significant soil losses, mostly in areas that now support forests, and on often highly acidic, nutrient-poor soils in cultivated bottom lands and toe-slopes. Already confirmed results to date show that we have an opportunity to significantly improve our soils while also improving our forests by converting millions of tons of cull timber and sawmill wastes into local-use biofuels and biochar. Instead of just burning waste wood, we can easily extract a significant amount of energy by 'gasifying' the material then stopping combustion and recovering the charcoal for use as biochar. To do so, however, we need to launch investigations into the following areas:

1) Improvements in the manufacture of biochar, including systems that allow extraction of dried and partially pyrolyzed material for use as fuel during the winter months.

2) Pyrolysis equipment that is both scalable and portable, allowing families to lease or borrow equipment for use on their lands, thus eliminating transportation costs.

3) A repeatable 'protocol' for the manufacture of biochar with equipment that recovers and uses syngases and can be used by any farm or forest family.

4) A low-cost test kit that will help users make the best biochar possible for the intended application (such tests now cost up to $500).

5) Improvements in the handling of biochar so that it is most effective when applied to and mixed with soils.

6) Further understanding of the chemistry of biochar.

7) Development of equipment for application of biochar to ag. soils; and – especially – how to apply char to forest soils with minimal disturbance to fine root systems and soil biota.

8) An application protocol so there are no questions about application rates and how best to mix with soils.

9) Initiation of long-term studies that explore the longevity of biochar in soils (based on studies of *terra pretas* in the Amazon Basin, the carbon in biochar will last for hundreds and possibly thousands of years). Good science that proves the validity of these observations means that biochar applications will qualify for CO_2 sequestration offsets (in a 'cap-and-trade' economy).

10) Explorations into other uses of biochar, such as for filtration of agricultural runoff which is often highly laden with phosphates, nitrogenous compounds and infectious bacteria such as *E. coli.*

11) How best to sustain the production of biochar when easily accessible sources of waste wood have been expended?

12) What are the highest and best uses for biochar given such a broad range of opportunities and competing uses for feedstocks, especially wood fiber.

In late November, 2009, a small group of scientists, policy-makers, farm and forest owners, extension faculty and others met for the first time to consider the future of biochar in Vermont. We met again in mid-January 2010. Our discussions have been far ranging and stimulating, but we've come to the conclusion that it is time to stop talking and start acting.

The problem is there are virtually infinite points of departure that can confuse the important issues and delay action. Nevertheless, we have settled on four tasks that will help us decide if the study of biochar is something we can do in Vermont.

First, we need to build awareness and interest in biochar.

Second, on 20 August 2010 at the Sheraton and UVM Conference Center in S. Burlington (802-865-6600) we are hosting a half-day symposium featuring Professor Johannes Lehmann from Cornell University, one of the most prominent biochar scientists in the world. We will videotape the seminar and make it widely available on-line.

Third, we are discussing the possibility of making a bid to host a major North American Biochar Conference at UVM in the summer of 2011.

Fourth, we have been discussing the prospects of forming a 'Center for the Study of Biochar' connected with the most appropriate institution in Vermont. Obviously, this is not something we take lightly and are seeking the broad support of Vermonters.

Evidence so far is sufficiently convincing that the 'biochar effect' in soils is real. But we have much to do before publishing guidelines on how best to make and use biochar in our soils.

CITATION

Lehmann, J. and S. Joseph (eds.). 2009. *Biochar for Environmental Management: Science and Technology*. Earthscan, London & Sterling, VA. 416p.