Questions & Answers from Jan 2012 IBI Biochar Guidelines Webinars

Note: Most questions were answered during the post webinar Q&A sessions, however, only a few of the answers were recorded. This document captures most of the questions and some of the answers.

Q. Specify the % of CO2 that can be sequestered under various circumstances (i.e. temperate climates, subtropical climates, tropical climates and extreme northly or southerly climates.

Q. Would it be wise to add a germination test?

Q. Will there be recommended testing standards based on currently accepted tests?

Q. Will there be any sort of certification process?

Q. What wood is the best, turned into biochar, to best habitate micro organisms in the soil?

Q. The ash contain minarals and Carbon keep and store the moisture in the soil, correct?

Q: Will there be a database of various feedstocks & the range of their characteristics available to IBI members which can be used as benchmarking information?

Q: Will the webinar slides be available vial powerpoint or whatever?

Q: Will IBI be providing specific USEPA guidance for PAHs, Furan and Dioxin - the current citations do not specify specific analytical methods, just some year of reference

A:(see Table 2, page 14.)

Q: Will IBI be citing the literature that Kelpie alluded to - I am not aware of any studies that produce such compounds at levels of concern from clean (unprocessed) biomass. Testing for endocrine disrupters is much more likely, but not on the public's list of toxics.

Q: While will "existence" of PAHs or heavy metals in biochar outputs, without either quantification or qualification be used as a test criteria?

Q: what "things" can be produced, at what levels, etc?

Q: This is a follow-on to the question about heavy metals for unprocessed feedstocks. For example, phytoremediation using willows is an established technique and could result in high cadmium, zinc, and copper levels. A less than honest producer could take advantage of this loophole. We may need to have the producer certify that the unprocessed feedstock did not come from a phytoremediation site.

A: Good point. We could add such material to the "Processed Feedstocks" category so that it gets tested for metals.

Q: This effect pH. Who is testing pH content in biochar?

Q: There are many detractors of biomass conversion using the word "incineration". Is this term covered anywhere (trying to prove biochar production is NOT incineration.)

Q: The levels of these things matter! The specific qualities of specific biochar outputs matters.

Q: The effect of ash content on biochar outputs is to raise pH. WHo is testing the effect of pH content on biochar as a soil amendment?

Q: the connection is great, the volume is on maximum

Q: that's 30% O-Carbon of total content?

Q: Shouldn't testing for heavy metals be a Category B test - they can be present in unprocessed feedstocks.

Q: Reduction of ash content/increase levels of carbon content seems to make biochar more useful as a soil amendment

Q: pure oxygen is a potent toxin at highly elevated levels

Q: Please let people know that we have draft Sustainabilty Guidelines, which USBI intends to turn into a smaller set of sustainabilty standards. Please go to www.biochar-us.org and comment on the draft.

A: Informed the audience about the USBI sustainability guidelines.

Q: pH of the biochar output seems to have the most immediate impacton usfulness as a soil amendment. Are there any guidelines about combining alkaline biochar with other soil amendments to neutralize the biochar amendment?

Q:PAH is a very general term and covers both toxic and non-toxic compounds (Q: excuse the capslock)

Q: page 27 identifies the source of the PCDF & PCDD threshold, cited on page 28. The link does not contain any guidance on these compounds - it seems that readers are not allowed to trace the source of these concerns, nor the specific analytical methods. Why the ambiguity - did IBI research the sources or inherit them from a reviewer without vetting.

Q: My point is that heavy metal content is ONLY in the biochar, if it was in the feedstock, so measure the biochar output.

Q: May biochar producers may be blending with compost, adding minerals, inoculating with microbes, or other BEFORE offering product for sale. What are implications for labeling in these circumstances?

Q: Material safety data sheets imply quantities of the various contents. Not all materiasl at all levels, even very low levels need to be reported.

Q: John Meidema wrote a report on CO2 output from the production of biochar, just the CO2 from the biochar and ignored CO2 emissions from the use of fossil fuels in the transport of feedstocks, transport of biochar output, and the poroduction of the biochar. Now, when will the fossil fuel CO2 emissions matter in comparison to the release of "recycled carbon" for the CO2 emissions from the organic material?

Q: Is there any differentiation of PAH's that are content in biochar outputs? Or, are they lumped together as "all toxins"

Q: Is there a plan to incorporate sustainability standards for the biomass in the future?

Q: Is IBI aware that virtually all Nitrogen contained in the Test Catagory A is not bioavailable (it is aromatic nitrogen - does not release) and of no value to plants.

Q: IBI has a mission to promote the production and use of biochar as a beneficial soil amendment. Paying credence to every possible measureable non-pure carbon compound at any possible level or of any quality does not seem to be promoting that. Why do this ?

Q: I would like to see specific quantites of non-carbon content in biochar with quallities that are specifically detrimental to use as a soil amendment that improves plant growth.

Q: I think what is lacking in the proposed standardization table is a quality scale for the products. A good pure biochar (for soil amendment) is a material with good adsorptive properties.That can be measured by several carbon surface propertiy methods. A well known property is the surface area. This is proposed in the proposed Level 3 package. However, I think a smple method such as the residual volatile matter content using a MAC 400 LECO equipment can be a reliable, REPRODUCIBLE method for material evaluation. For instance a batch produced wood charcoal will probably pass the H/C test proposed but it is a much poorer material for soil amendment than a biochar produced in a continuous feed system at higher temperature. The poorer quality is due to the lower surface area. The batch material would also exhibit a rather high volatile matter content because it has been produced at too low a temperature. I propose inclusion of VM content test or surface area test at least for pure biochar.

Q: How was it established that thermochemical processes can produce furan and doixin (the chlorinated versions, I trust)

Q: How is the biochar class defined? I don't see it in the document, although in the sample label we wee 32% carbon - class 1 biochar A: explained the Corg classification system

Q: How in the world will mentioning the mere existence of endocrin disruptors, dioxin, furan, carcinogenic toxins, heavy metals, severe inhalent problems ever allow biochar to be used?

Q: heavy metals are present only in biochar, if they were present in feedstock

Q: heavy metals are not created in thermochemical conversion and they are not volatilized either they are left as part of the ash fraction

Q: Have you started a list of approved labs capable of conducting these tests? If not, do you plan to create one in the future?

Q: Has consideration been given to declaring the means of conversion (TLUD, retort, downdraft gassifier, etc)?

Q: Fossil carbon versus , terrestrial carbon metters.

Q: FOrcing repoorting ofpossible effects from only existent toxins will prevent use of biochar becasue the specific quantities and qualities matter. Not just the mere existnece of these materials

Q: For Test Catagory D, the test for porosity and surface area is spec'd as ASTM D6556-10. This is a test for carbon black, which is the name for a fossil fuel based product used in rubber, typically automobile tires. IBI is aware that "Black Carbon", as used in the bichar literature, is not the same as "Carbon Black". As such, the "Carbon Black" tests are totally irrelevant for predicting properties of biochars.

A more appropriate source of test is the ASTM testing for activated carbons. The tywo tests that are relevant to biochar are ASTM D5742 and ASTM D7385.

Q: Dr. Spokas makes a big deal of handling of the char after production. Was it dunked in water, etc. A declaration?

Q: Do Biochars differ in their inhalation risks and will this be on the label?

A: Particle size reporting addresses this. Also the included MSDS will need to list this sort of hazard.

Q: DIOXINS: You need Cl, O and very high temperature to produce dioxins. This question will be raised when MSW or treated wood are used as feedstocks. I have a problem including these sorts of feedstocks for soil amendment. There is a serious perception problem here in the eyes of public and the IBI does not want to miss the boat.

Q: a problem with that MSW is not allowed ... he sit on several thousand tons of MSW and thinks it can be used for biomass feedstock for biochar

Q: Can you explain in more detail why there are different standards for toxins in different countries. It seems that toxins should be based on human, plant and animal health, not politically defined levels.

Q: Can we be clear that we are talking about the chlorinated versions of dioxin and furan, since the non-chlorinated versions are farily common and harmless organics.

Q: But, the recommendation wass to measure heavy metal content in the feedstock?!

Q: Biochar Solutions has a specfic recommendation on the type of respirator that is most appropriate for working with biochar but I can't remember the exact specs.

Q: Are there any best guesses available for the cost of this certification process?

A: Not yet, we won't focus on certification in this presentation but the certification work (i.e. process, costing, labs, etc) is beginning now.

Q: I think many will want to know something about "average" temperature, if know (a declaration).

Q: Our Biochar is virgin wood-OMRI appr. Tests differ re % ash occassional 2%+. Used in my organic fields its made huge benefit-meets IBI goal to sequester as much Carbon as possible-heals the soil..Perhaps% ash should allow a RANGE "biochar" 25%= -/+ 3%?

Q: More info on the projections for Grades of biochar and approved processes.

importance and problems of PAC and their behave during fermentation;

Q: how to evaluate the assess micropore and macropore of a biochar product

Q: how to evalaute the stability of biochar

Q: HOW FAR HAS RESEARCH GONE IN OVERCOMING HEALTH HAZARDS?

Q: how do the different feedstock affect the micro and the macro pore of the biochar

Q: how can a level of competency be acheived by individuals seeking to become experts/educators re:Biochar?

Q: Excellent intiatives and in these times there is increasing value in fielding a wide view

Q: Eco-effective knowledge transfer and dissemination

Q: differences and kind of microbes between conventional agriculture and Terra Preta

Q: consequenses and causes of nutrient binding in soils accordingly plant nutrition;

Q: Can the ash content in the Biochar be the most important factor on sandy acid Kalahari soils, apart from the carbon?

Q: A persistent resistance from governmental agencies has been the lack of operations in the US that can prove environmental impact

Q: Which soil types lend itself to the optimum sequestration medium

Q: Activating Bio-char with compost helps but has any research been done in the activation process using EM-1(Effective Microorganisms) due to the fact that EM-1 inoculates putrefying bacteria and attracts beneficial bacteria?

Q: Do the guidelines reflect analytical capacities in developing countries?

Q: Do you need to disk the Biochar into the soil and if so how deep?

Q: Does the specification of Biochars relate to value of the product for gaining carbon credits?

Q: environmental lobby has so many arguments against the claims of biochar fans in particular its real impact on climate and its economics

Q: Give More detail information of biochar like composition and the way to use it.

Q: How do you prepair the Biochar for the soil?

Q: How does an addition of biochar to soil improve its biological properties

Q: How is the average fertilization and irrigation reduction that biochar can promote in agricultural crops?

Q: How is the market price for the biochar in different countries/regions?

Q: how to condition different types of biochar for different types of soil

Q: How would one estimate the cost of setting up a cooperative lab for crowd funding, cooperative CSA, and tranche investing?

Q: I am new to Biochar but we want to initiate research in Alaska so working in cold soils is of interest to me.

Q: I hope IBI has now addressed that information should be on the bag not just a website given for people to look up; also level 1 should not say certified for food production because have not done testing for heavy metals or organics at that level

Q: is the lifecycle of biochar assessed compared to other treatments?

Q: Is there a flexible technology to process different biomass?

Q: Legislation

Q: I am concerned about the answer to the question on routine, seasonal feedstock changes being processed by the same equipment. Surely, there is likely less variation in such repeated, routine changes than in the changes that would occur within a single feedstock given that living things vary from place to place and in time.

Q: Any progress in getting Biochar soil sequestration qualified for future Carbon Credits?

Q: Are there any predictions as to the rigger and cost of commercial product certification

Q: Are today's presentation slides posted on the IBI website?

Q: As a corollary, the pyrolyzer parameters will change slightly for each of the three feedstocks.

Q: Can char that is produced from a hydrothermal process (in hot, compressed water) be considered biochar?

Q: Chain of Custody: This is a great quality through supply chain practice. However, how do you invisage this operating when biochars may be altered, diluted etc as the product passes down the supply chain from biochar manufacturers to ultimate end user?

Q: Comment on rate of testing: This really is a matter of manufacturing facilitiies implementing proper quality management (eg. QA systems, particularly HACCP based systems) that over time provide increasing confidence in consistency of quality.

Q: COMMENT: We need to fix the use of the word "toxin" in this document. In most all places, we are probably meaning 'toxic' not 'toxin'. See discussion of the difference here; http://greensighted.blogspot.com/2009/09/toxic-vs-toxin.html

Q: Determining material change: no reassessment needed where feedstock changes to similar material. But if the source is different the constituents may vary, eg again, trees grown on a contaminated site.

Q: For a 8000 4 t/h facility processing 32,000 tons of biomass a year what will the proposed testing cost me. Did you say every 600 t feed in or biochar out. For feed in the cost would be 32,000/600*1500=$80,000 if its biochar out assuming a 20% biochar yield the cost is 16,000. Am I understanding this correctly?

Q: H:C ratio as a indicator of stability: This is interesting and perhaps a little simplistic as the stability of biochar in soil will be determined also by the physical structure of the input material. For example some manure based biochars can degrade in soil quite rapidly. The H:C ratio should perhaps be renamed as indicator of how complete carbonization of input material is.

Q: Hi - We are working in an engineering capacity in Vermont where we are dealing with a phosphorous runoff problem into Lake Champlain and many other regional lakes. Does Biochar help soak up the runoff? thanks tom harty

Q: How much of a change in the percent of a given feed stock, in a mixed feedstock that is going into a kiln dictates a need for a new test. I often make different mixes in a given week. This is going to be a problem for designer chars.

Q: How will the labs be certified for doing the testing and where we find those approved labs

Q: I am again confused about the carbon type. If you have for example diamond that is very presist for of carbon and it is mineral carbon and not organic

Q: I am mostly interested in community based charcoal production in raice farmers environment in Thailand. Production units will be decentralized and standardized inputs will be rice straw and husk. what we would need is a systematic verification / certification of our process system not per single kiln. Is that covered?

Q: I don't understand why it is thought that unprocessed feedstocks could not contain heavy metals, eg trees grown on a contaminated site, bearing in mind that pyrolysis will concentrate these? Seems like another example of unforeseen consequences.

Q: I have a comment regarding the H:C ratio pass/fail requirement. Why the focus on stability over soil fertility? Is it true that most low-temperature biochars would fail this stability requirement, even if they work well to enhance soil fertility?

Q: I have not read through the guidelines recently so disregard the questionif it is addressed there. The validity of any analysis wil clearly depend on the extent to which the samples selected for testing are representative of the biochar produced. Some production techniques do not/ cannot produce a consistent product throughout the batch. Are there sampling procedures int he guidelines?

Q: I suggest an optional declaration about biochar pore size. This is important for mycorrhyzal fungi colonization.

Q: I think that pyrolysis process rearranges carbon and make it more crystalline form which can not be consider as organic carbon or can it be considered?

Q: I think the label should also indicate the percentage of biochar in the commercial product.

Q: I'm seeing companies emerging that are testing carbon negative gasoline for retail sales, dose this lead to a market for small farm biooil sales ?

Q: in defining biochar, you mentioned it is the material produced through "thermochemical conversion of biomass...". Where is the chemical portion of the conversion process? why not keep it as "thermal conversion" of biomass?

Q: In relation to the first question. There is a treatment process that is similar to steam activation. It changes nutrient value, it is like innoculating or blending. Problem is! this treatment process does have to be coupled with the thermal degredation. I don't think there is anyway to sample the char between thermal degredation and treatment.

Q: Is it biochar if it is mixed into a sedimite or brownfield--is this for a later document/standard?

Q: is it necessry to know the coposition of the cyclic C in product ?

Q: Is there any way to scale the level of biochar required for testing (currently 600 metric tons/test) according to the total expected output from a plant. The current level will require larger producers to test every few weeks!

Q: Lower temperature chars with H/C greater than 0.7 will have maximum acid functional groups, a very positive aspect. Therefore 0.7 seems a very arbitrary value.

Q: Maybe you will get to this. I'm interested to hear how the standard would deal with a situation where in formulating a product containing biochar a post pyrolysis process or manipulation is used to change the biochars inherrent properties - measured by the tests being proposed. For example manipulation of CEC, pH or water holding characteristics.

Q: Must the feed stock declaration include deliberately added inorganic diluents? I believe it should.

Q: please see Jerry Scharf's greenpyro.com method of treating biochar - I would like to hear your feedback later

Q: for Ms. Lennie. have you received input from many different biofuels companies? Any biomass heat or power developers?

Q: Question on testing: is a test required each time a feedstock changes among three different types (hardwood, software, straw) if tests have been conducted for each of 3 different feedstocks within the preceding year?

Q: Thanks for adressing ash content in relation to manures.

Q: The lists of characterics & criteria are closed lists based on a priori assumptions about every biochar characteric that might be harmful, ie you have predefined all eventualities. This ignores the principle of unforeseen consequences. In fact, it's worse than that because the list ignores some well documented problems with biochar, ie its potential to absorb herbicides. Not only should herbicide absorption be included (because this will vary with type of biochar and type of herbicide) but there also needs to be a requirement category of "other".

Q: This begs the question will it be possible to sell a biochar product made from a variable waste stream such as tree chips. (or) will any certified product need to be made from a known feed stock

Q: Torrefied biomass has a significant amount of hydrocarbons as well as a smaller percentage of fixed carbon. It was my understanding from literature searches that the microorganisims in the soil get a propagation boost from the hydrocarbons that help with colonization of the char particle and around the plant root filaments. Will torrefied biochar be acceptable if the testing determines that there is an acceptable level of fixed carbon?

Q: Using inputs to define or describe products can be problematic in that the image of the input material can unnecessarily influence the view of a consumer. This can often be the case with sewerage or sludge related products. Surely the only thing that matters is the properties of the end product and that these are consistently achieved through manufacturing?

Q: We intend to have continuous biochar production operation in BC, Canada, that will produce 1500-3000 tonnes/yr biochar. The requirement to test every 600 t of feedstock would mean 15 tests per year. This could result in significant expense/delays if we need to wait for a 3rd party lab to conduct tests. Can we qualify internal lab to do tests?

Q: What about a char that is produced in a furnace /boiler grate --oxegen rich atmosphere --

Q: What about char that intended use is for filtration of nutrients, metals or chemicals—is this biochar

Q: What about mixed feedstocks. What if you process a blended material that is 40% hardwood, 40% softwood, and 20% cow manure. What if the percentages of these feedstocks in the aggregate feedstock changed from the above to 60% hardwood, 30% softwood, 10% manure

Q: What are the criteria for the legal review as it is to be validin very different legal environments?

Q: Where did the requirement for a maximum 0.7 H/C ratio come from? This is a very restrictive requiremnt and will elliminate most low temperature chars.

Q: Who will Certify Biochars in different countries and how will this be managed internationally to ensure consistency?

Q: Why can't a material with less than 10% organic carbon be considered a biochar?

Q: Why is there a requirement for testing every 600 metric tons of feedstock? A requirement for annual testing or testing when the feedstock or process changes is reasonoable. But the 600 metric ton testing requirement appears unreasonable, and to be designed primarily to exclued or disadvantage large industry.

Q: Will testing be able to be done in-house or is there a requirement to use a certified lab for test results?

Q: Will the IBI charge a fee to companies that choose to adopt the certification guidelines and label their product as an "IBI Certified Biochar".

Q: Would these guidelines cover biochar used as a barrier to go on a landfill?

Q: Yes, but economic viability is very important!

Q: We are cleaning soils , stripped by Hurrican Irene, high phosphorous runnoff - can carbon char assist in the soak if applied on acreage surrounding rivers/lakes/streams?

Q: What are the most important of chemical composition of biochar? such as: ash, organic carbon, organic matter..etc"

Q: What are your safety recommendations for handling and applying biochar in a small plot-less than 500 sq ft?

Q: What are your safety recommendations for storage of biochar?

Q: What is the partical size of Biochar when adding to the soil?

Q: What is the plan to stir up interest for biochar at the highest levels, EPA, USDA, etc. ?

Q: What technologies and suppliers will be available to provide this material?

Q: What wood is best, when made into biochar, for micro organisms to habitate.

Q: Where are the labs to test biochar or how does one go about setting one up?

Q: Where to get biochar production equipment that efficiently captures the heat and liquid biofuel, besides www.gekgasifier.com.

Q: Will the material be approved for carbon sequestration credits?

Q: Would like to understand guidelines and best practice on overall CO2 efficiency of biochar production and sequestration - ie What are total net tonnes of CO2 abated per tonne of CO2 sequestered as biochar.

Q: Has IBI developed a database of biochar characteristics following the guidelines in the way EPA does for prpose guideline? IF s where can we caccess it?

Q: What is the cost to the biochar producer of the typical A-B analysis? Are any labs offerring analysis packages following IBI guidelines?

Q: Is C:N ratio important? Because for fertilizer, C:N ratio larger than 20 is not suitable and can cause harm to plants.

Q: Will this guidelines depends on the types of soil? I mean, at this range of porosity, it may suit with this kind of soil, but for peat soil, it might be not. Same for other requirements.

Q: The world wide Zero Waste and Industrial Ecology movements worldwide use the term Source Separation to ensure clean inputs for materials reuse - could Source Separation not also be applied to Biochar inputs. The process can then be accredited and certified both Nationally and Internationally

Q: Boron treated rubber wood is considered as class 1 timber. If we use saw dust from this timber processing mills to make biochar, would it be considered as processed feedstock. If yes, would we need to test these biochar under category C?

Q: Thanks for the answer on rubberwood biochar. I feel it is not necessary to test for all tests under category C, since only Boron has been added to the biomass. If the producer can certify this, can he have a option to test only the relevant tests in category C. (May be I am wrong, as I can't remember all the stest under category C right now).

Q: When should moisture content be measured? immediately after pyrolysis stabilisation or prior to mixing or prior to point of packaging.

Q: does IBI recognize uncertified biochar which is produced and used as a direct contract between a single producer and user?

Q: I see that yard waste is considered MSW. In Florida we have huge amounts of this produced which is almost exclusively ground tree trimmings etc. Is this to be considered ""processed feedstock"".

Q: I've seen no comment on ""charging"" biochar.

Q: One of the common feedstocks from Local Governemtns , here in the Mid-West Region of Western Australia, is processed and/or unprocessed Greenwaste. As it originates from vergeside collections by the LGAs themselves or are brought out by the residents to the storage area, how are you able to classify for testing in the various categories?

Q: Is there documented use of biochar in starter compost recipes?