

## BIOCHAR CHARACTERIZATION AND EU27 LAW HARMONIZATION: REFERTIL RESULTS

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The FP7 REFERRIL biochar applied research and economical industrialization project (EU contract no 289785, 2011-2015) developed a strong policy support for the European Commission Fertilizer Regulation revision biochar case. Wide range of different biochar types characterized, including relationships among feedstock, production technology in viable industrial scale and characteristics, which results, summarized in this presentation, reflected to economical industrial scenarios under market competitive conditions, for the interests and benefits of the SME farmers. Environmental and ecological impacts and risks considered.

Biochar is plant and/or animal bone biomass by-product origin stable carbon carboniferous and legally labelled product with functionality of solid organic fertilizer and/or solid organo-mineral fertilizer and/or organic soil improver. Biochar is a chemically modified substance, which – depending on the highly variable feed materials – may have either variable composition and complex reaction products (REACH-UVCB) or well defined mono and multiconstituent character. Biochar is not a fine ground charcoal, not a labile carbon, not hydrochar, not activated carbon and not torrefraction processed energetic char. Carbon products with no biochar specific and mandatory EU and MS Authority permits, no REACH certification, not labelled and/or having no Extended Producer Responsibility certificate, are not biochar products. Waste derived carbon products require special considerations, if these products can be characterized as biochar or not. All biochar products in the EU are characterized by:

- 1) mandatory EU and MS Government Authority permitted for import, manufacturing, placing on the market and application above 1 t/year capacity,
- 2) REACH certified above 1 t/year capacity import, manufacturing, placing on the market and application,
- 3) labeled and full value chain safe product,
- 4) having Extended Producer Responsibility product guarantees,
- 5) the input material made from is sustainable sourced, e.g. not competing with human food, animal feed and plant nutrition supply, not from primarily and secondarily land use and having environmentally sustainable logistics, while meets the EU Circular Economy incentive relevant sections.

In this context the safe biochar product equally importantly meets all the four elemental criteria:

- a) commonly used for specific purposes with functionality of natural solid organic fertilizer and/or solid organo-mineral fertilizer and/or organic soil improver; and
- b) there is an existing market and demand for safe biochar; and
- c) the use is lawful, fulfils the technical requirements for the specific purposes and meets all the existing legislation and standards applicable to biochar product; and
- d) the use will not lead to overall adverse environmental and/or human health impacts.

The high mineral content animal bone based biochar (ABC Animal Bone bioChar) is organic P/Ca fertilizer at 200-1000 kg/ha dose rate (in average 300 kg/ha) and growing media in the horticultural sector. The high carbon content plant based biochar is soil improver usually at approx. 5000-20000 kg/ha dose rate (in average 10 t/ha) for water/nutrient retention and carbon sequestration applications, but providing no fertilizer effects with economical importance. For both biochar types there is a long list of additional beneficial effects.

The Fertilisers Regulation revision aims at establishing a regulatory framework enabling production of fertilisers from recovered bio-wastes and other secondary raw materials. This would boost domestic sourcing of plant nutrients which are essential for a sustainable European agriculture, including the critical raw material phosphorus. In this context the STRUBIAS TWG is a technical working group for the development of possible process and product criteria for sturvite, biochar and ash based products for use in innovative fertilising and soil improver products.