Jordan Biochar Research Initiative (JBRI)

The Jordan Biochar Research Initiative (JBRI) was initiated in Jordan on 2014 by Prof. Osama Mohawesh at Mutah University, with "Support Research and Technological Development and Innovation initiatives and Strategies in Jordan" funding from the European Union (EU-SRTDII) and Fulbright fund in 2022. A number of researchers with related expertise have joined the research efforts of JBRI, which is aimed primarily at improving our understanding of how biochar functions in modern agricultural systems. We see an intensive and broad-based scientific program as providing essential background and knowledge in advance of advocating the large-scale use of biochar in soil.

Sustainable agriculture and water productivity in Jordan need enhancement by integration of innovative methods, knowledge, and extension that allow stakeholders and farmers to evaluate the feasibility of new, user-friendly, and cost-effective technologies. The main objective is to start a research program that aimed to implement biochar use in agriculture to evaluate the benefits of biochar as a soil amendment to enhance nutrient and water use efficiency for different cropping systems in Jordan, and demonstration activities related to the use of biochar as a possible strategy to improving crop yield and reduce economic and health vulnerability to climate change.

http://www.biochar-international.org/regional/Jordan

JORDAN BIOCHAR RESEARCH INITIATIVE (JBRI)

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JBRI

BIOCHAR

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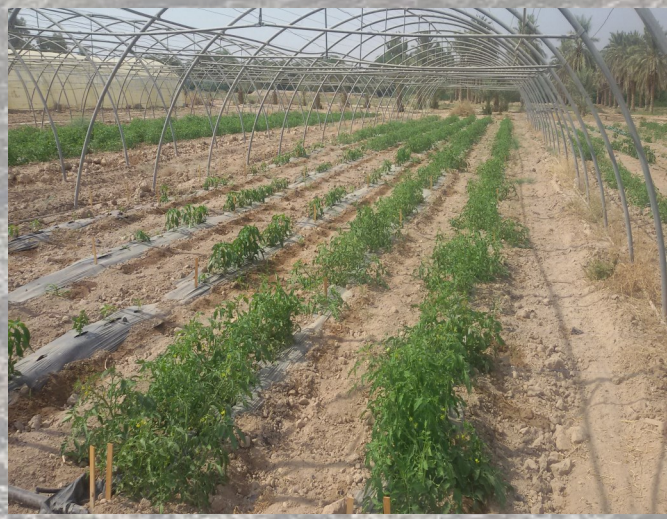

International Biochar Initiative

Jordan Biochar Research Initiative (JBRI)

المبادرة البحثية الاردنية للفحم الحيوي

SRTD-II Bridging Science and Business

FULBRIGHT فولبرايت JORDAN

What is Biochar?

Caption describing picture or graphic.

Biochar is a soil amendment with the potential to revolutionize soil management, biomass waste and carbon sequestration. Biochar has been used in traditional agricultural practices for millennia,[1] as well as in modern horticulture. Biochar's unique properties make it exceptional for sustainable soil management, effective con-version of biomass to energy and long term sequestration of carbon..

What does it do?

Biochar has outstanding characteristics significant to climate change and soil fertility.

Nutrient and Water Affinity:

Organic matter added to soil significantly improves soil functions, including retaining nutrients essential to plant growth

Persistence:

It is undisputed that biochar is much more persistent in soil than any other form of organic matter that is commonly applied to soil. Thus, all associated benefits with respect to nutrient retention and soil fertility are longer lasting than with alternative management or common fertilizers.

Caption describing picture or graphic.

How is Biochar carbon sink?

Biochar can store carbon in soil for thousands of years, improving soil fertility and stimulating plant growth, which then consumes more CO_2 from the atmosphere. Heat produced from making biochar can be used or turned into electricity. Captured gas and liquid by-products can be used as fuels. Under decomposition or open burning, most CO_2 from biomass would be released back into the atmosphere. Biochar captures 50% of the original carbon in the biomass and stores it in soil. The net amount of CO_2 in the atmosphere from this process is thus reduced while enhancing soil fertility and displacing the use of fossil fuel based fertilizers, making the biochar process carbon negative as long as biomass production is managed sustainably.

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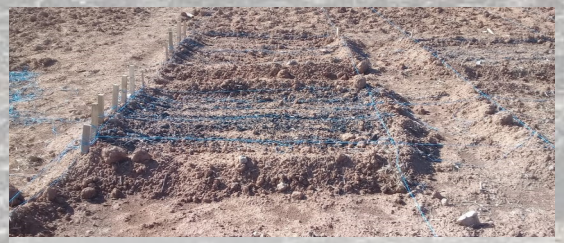

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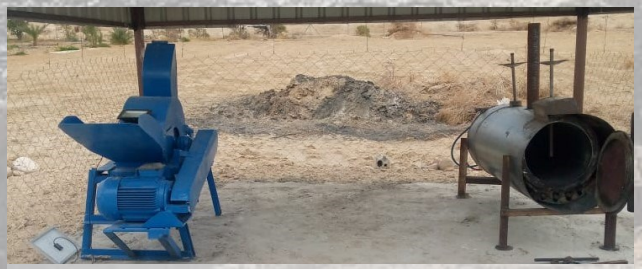
How is Biochar made?

Biochar is made by **pyrolysis**: heating biomass (wood chips or pellets, bark, manure, crop residues, etc.) with limited oxygen. Energy crops , such as short -rotation woody plants or grasses, can be grown for biomass, or biomass waste can be collected.



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Biochar production byproducts:

Heat for heating or conversion to electricity

Hydrogen and carbon monoxide (both combustible gases) and bio-oil are additional energy byproducts.

Carbon sequestration for 1000's of years.

Biochar-amended soil reduces the total fertilizer requirements and the climate and environmental impact on croplands.

Char-amended soils have 50-80% reductions in NO_2 emissions and reduced runoff/leaching of phosphorus and nitrogen into surface and groundwater. Biochar enhances crop yields and growth.

Combined heat and power

Heat produced from pyrolysis can generate electricity and provide heat. Family –sized installations can provide cooking, heating and hot water. Large scale facilities can provide power and heat for industrial or community applications.

Biofuel

Liquids released during pyrolysis are valuable fuels.

Costs

Biochar production is completely scalable in mobile or stationary ovens. Ovens can be homemade for house-hold use in developing countries or industrial sized for power generation and heating. Demonstration projects are active throughout the world. Sequestering carbon from biochar production is economically competitive.