

Role of Biochar in Sustainable Agriculture

Jnana Bharati Palai

M.S. Swaminathan School of Agriculture, Centurion University of Technology and Management, Paralakhemundi, India

Corresponding author: jnana@cutm.ac.in

ABSTRACT

Biochar concept is as old as the slash and burn method of agriculture. Biochar is prepared from different types of waste material or by-products by following pyrolysis process in commercial purpose. It helps in carbon sequestration along with that minimizes other green house gases like CO₂, sulfur oxides, nitrogen oxides etc. major focus on this concept is good soil health, benefits of environment and improvement of crop performances. It has been observed that soil application of biochar increases availability of essential nutrients, water holding capacity and microbial population etc. and these are the alternative options of high yield of crops on a sustainable manner.

Keywords: Biochar, crop production, environment, soil health

Other name of biochar is “black carbon”, which is made up of carbon rich organic materials and found in solid and stable form in the soil. Charcoal derived from wood is a very good example of biochar, which stays for long time at different depths of soil. The *Terra Preta* soils of the Amazon Basin are also one commonly known examples biochar (Rao *et al.* 2019). Biochar is an old concept, which was discovered, when “slash and burn” agricultural method was under process. In old days biochar as soil deposits were also resultant of natural forest fires. There are various types of biochar according to its parent material, which describes about their physical and chemical properties. Artificially biochar is prepared by heating the biomass or wastes under limited oxygen supply and the process is named as pyrolysis. According to Glaser *et al.* (2001) a high temperature between 300°C–1000°C is maintained during biochar production. The reason behind limited supplement of oxygen is to avoid complete burning of the material. It has be found that maintain a low temperature around 300°C–600°C results in more solid biochar, while high temperature above 700°C results in more liquid or gas biochar than solid biochar. Basically

this is a waste to energy project, which produces 20% syngas (used for internal combustion of engines viz. carbon monoxide and hydrogen) along with bio-oil and biochar. Different types of by-products are used for biochar production in commercial scale viz. agricultural and forestry by-products (such as straw, nut shells, rice hulls, wood chips, wood pellets, tree bark, and switch grass), industrial by-products (such as bagasse from the sugarcane industry, paper sludge, and pulp), animal wastes (such as chicken litter, dairy and swine manure), and sewage sludge. This is a good method of waste material reduction from the earth surface. Preparation of biochar with desired properties can be used as a soil amendment and a cheaper absorbent of different organic and inorganic pollutants (Chen *et al.* 2011; Novak *et al.* 2009). Biochar in combination with some fertilizers results significant benefits in agriculture (Schulz

How to cite this article: Palai, J.B. (2020). Role of Biochar in Sustainable Agriculture. *Agro Economist - An International Journal*, 7(2): 73-75 (Special Issue), November 2020.

Source of Support: None; **Conflict of Interest:** None

