

Sustainable biochar production and application in vegetable production in Nepal

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Biochar is a solid material obtained from the thermochemical conversion of biomass in an oxygen-limited environment which has inherent properties of carbon sequestration and improvement of soil function if used in soil. It has potential as soil amendment and increases soil organic carbon and nutrient availability in soils and hence increases the productivity and growth of crops. The concept of biochar is receiving increased attention in research areas as it has economic and environmental protection benefit. Traditionally, biochar productions are made on pit or kilns but nowadays, modern biochar production systems are also in place. There has been no clear understanding about the biochar production methodology and which biochar application rates are most effective to enhance soil capacity to enrich carbon sequestration and to maintain or improve the soil production function. Therefore, an experimental research was conducted to build up the knowledge base on production and application of biochar which would support in the improvement of soil properties and enhance yield. In these experimental research two types of biochar namely mixed biochar and coffee biochar were applied in 20 different experimental plots in four different concentrations: 5%, 10%, 15% and 20% of total fertilizers required for the growth of vegetables. Two seasonal vegetables, onion and prickly seeded spinach were selected for plantation and sowing in their growing season (December-April). Productivity of vegetables were measured based on the height and weight of their harvest. The application of both type of biochar shows variation in productivity in terms of mean height and weight but was not found to be statistically significant ($\alpha=0.005$). Soil analysis showed change in pH, %N, OM and CEC after the application of biochar. Significant change was observed in pH and %N of soil.

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