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PAPER

**Making Nitrogen Enriched Biochar and its Effect on Crop Performance and Soil Properties**

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Nitrogen is an essential plant nutrient. Since it is a limiting nutrient in soil, nitrogen based fertilizers are extensively used in agriculture to enhance crop production. Biochar (BC) on the other hand, has a greater surface area and has the ability to retain nutrients.

The objective of this study is to evaluate the performance of N enriched BC as a nitrogen input for tomato under greenhouse conditions. Treatments used were Soil (control), Soil + BC, Soil + 100% N in the form of Urea, Soil+ 100% N in the form of BC ( N enriched biochar), Soil + 75% N in BC, Soil + 50% N in BC and Soil + 25% N in BC. All the pots were equally treated with potassium and phosphorus. Coconut shell charcoal was enriched with N using urea for different rates. Rate of BC application was 5 T/ha. Soil and BC samples were analyzed for pH, Electrical conductivity (EC), organic carbon, available phosphorus and exchangeable potassium prior to the application of treatments. Plant height, fresh weight, dry weight, nitrogen uptake at harvesting and root dry weight were considered as crop parameters. Soil pH, EC, total nitrogen and available nitrogen were determined after harvesting.

According to the results, Soil + 75% N treated BC showed the highest plant height and root dry weight. Soil (control) alone and BC + soil showed the lowest plant height, plant fresh and dry weights and nitrogen uptake. Nitrogen enriched BC at 75% N level gave comparable plant dry weight and N uptake with 100% inorganic N application. Root weight was more pronounced in BC with 75% N level and the application of inorganic fertilizer showed poor root weight compared to BC treated plants. Addition of BC raised soil pH and lowered EC. The study showed that the addition of N enriched BC at 75% n could produce comparable dry matter yield with standard NPK fertilizer application. BC addition improved the available N presence in soil at harvesting.