The Utilization of Bambusa vulgaris Biochar to Address Runoff Contamination Following Intense Forest Fires

Forgas, Rachel (School: Wiregrass Ranch High School)

My research was centered around finding an effective soil remediating alternative to cattle manure in replenishing soil nutrients in areas damaged by intense forest fires. Bamboo Biochar was the focus of my study due to its remarkable remediating properties in agriculture, purifying capabilities, and nutrient-rich composition. Cattle manure, while effective in acting as a soil fertilizer, can cause an over production of nitrates in soil runoff which eventually makes its way into aquatic ecosystems. The presence of nitrates in lakes, streams, or oceans can cause algal blooms, hypoxia, and eutrophication. For this reason, it was hypothesized that bamboo biochar could increase soil fertility while reducing nitrate concentrations in runoff. In the procedure, generic topsoil was degraded using a small blow torch in order to decrease soil fertility and simulate an intense forest fire. Afterwards, soil fertility measurements were taken over time for the soil aided with biochar, manure, or the control. Rainfall was then simulated and runoff collection samples were gathered for each variable and tested for 5 separate nitrate concentrations overtime . The results indicated that biochar was both capable of increasing soil fertility and reducing nitrate concentrations in soil runoff. Bamboo biochar produced a range of 2.5-5 ppm (mg/L) of nitrates as opposed to manure's range of 10-20 ppm (mg/L) of nitrates. It is also noteworthy that each variable reduced nitrate levels compared to the control group. This conclusion would most ideally be used in rebuilding following natural disasters while also shifting towards greener, more resourceful remediation practices in agriculture.

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