Soil Amendment Optimization, Phase III: Nutrient Analysis of Biochar and Hydrophilic Polymer Enriched Soils in a Simulated Large-Scale Agriculture Environment

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Biochar and hydrophilic polymers: although very different from each other, these soil amendments together have the potential to drastically improve the standards of agriculture, as well as increase the health benefits of produce. In previous experiments, it was determined that the ratio of 15% biochar and 1.5 g/L polymer in soil offers the most positive effects on plant growth, health/stability, drought resistance, yield, and even human preference in controlled and outdoor environments. This year's experiment was conducted to determine if the amount of Vitamin C (the most prevalent in vegetables) is affected by these soil amendments. It was hypothesized that vegetables grown in the experimental plots would have an increased growth, yield, and Vitamin C content versus the control, based on the amendments' previously shown ability to increase plant performance. Overall, the hypothesis was supported by the results. Biochar and polymer's potential to increase nutrient content was confirmed; most vegetables indeed saw an increase in Vitamin C content, up to 23.4%. In every aspect (root mass, yield, etc.), the biochar/polymer sample far surpassed the control, with only two minute exceptions. Of the data collected, the most notable include an incredible 466% increase in broccoli yield, with remaining increases between 41.9% and 299.4%. The taste test results indicate a juicier, stronger-flavored yield, which is an indicator of drought resistance. Of 100 participants, 77.8% preferred the biochar and polymer sample. These results display the combined effects of biochar and polymer; one can believe its potential effect as an addition to agriculture world-wide.

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