Soil Amendment Optimization, Phase IV: Enhancing the Performance of Biochar and Hydrophilic Polymer Enriched Soils with the Incorporation of Corn Gluten Meal

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In previous experiments, it was determined the ratio of 15% biochar and 1.5 g/L hydrophilic polymers in soil offers the most positive effects on plant growth, health/stability, drought resistance, yield, Vitamin C content, and human preference in controlled and outdoor environments. This year's experiment was conducted to determine if a 1 kg/10 m² addition of corn gluten meal (CGM), an inexpensive source of nitrogen and pre-emergent herbicide, could further enhance the effects of biochar and polymer. It was hypothesized that vegetables grown in experimental plots containing CGM would have an increased overall performance and fewer weeds than the control and biochar/polymer plots, based on the amendments' previously shown abilities to increase plant performance and CGM's dual purpose as natural fertilizer and herbicide. Overall, the hypothesis was supported by the results. CGM's potential to increase performance from biochar/polymer alone was confirmed; most vegetables indeed saw a significant increase in yield, up to 223%. In nearly every aspect (root mass, yield, etc.), the biochar/polymer sample surpassed the control, and was then typically surpassed by the biochar/polymer/CGM samples. Of the data collected on CGM trials, the most notable include a 100% increase in quantity of zucchini production and a 108% increase from the control in kohlrabi root mass. The taste test results indicate a juicier, sweeter and crisper yield, indicators of drought resistance, and many participants preferred the GCM samples. These results display the combined effects of biochar, polymer, and CGM; one must consider their potential effects as an addition to agriculture world-wide.

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