The Application of Mycorrhizal Inoculation to Increase Agricultural Productivity and Carbon Sequestration in Hugelkultur Systems

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This experiment was designed to identify a correlation between mycorrhizae fungal inoculation, hugelkultur systems, and agricultural productivity. The alternative hypothesis, that a correlation would be present, was supported by the data. Three planters were set up in the lab—Control with traditional soil and no mycorrhizal inoculation, Experimental I with traditional soil with mycorrhizal inoculation, and Experimental II with both higelkultur and mycorrhizal inoculation. Each was seeded with squash, radishes, carrots, and wildflowers. Over the course of four weeks, several parameters were monitored. Upon comparing both Experimental sprout growth results against the Control results through an independent t-test, the results were determined to be significant. Combined with the quantitative data, qualitative observations of the systems provide insight into the methods of maximizing efficiency of small-scale regenerative farming. The overall sustained health of the sprouts was greater in the hugelkultur system, and while the two traditionally planted systems struggled with water storage, the hugelkultur system was able to mitigate variations of watering volume. As preliminary research suggests that the system can be effective without chemical inputs, hugelkultur has the potential to reduce the negative effects of agricultural production on the environment. And, especially given the increasing unpredictability of climate patterns, implementing resilient and low-impact agricultural systems will be key in maintaining food security in the future.

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