Comparing Different Applications of Indigenous Microorganisms With Synthetic Fertilizer on the Growth of Abelmoschus esculentus (Okra)

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This study compares the impact of applying Indigenous Microorganisms (IMOs) cultivated through Natural Farming practices (IMO2-5) and the legume Coastal Jack-bean (Canavalia rosea) with synthetic fertilizer (Triple-19) on the growth of okra (Abelmoschus esculentus). The IMOs made through Natural Farming, IMO2-5, were applied to okra alongside Triple-19 fertilizer, and the legume was companion planted with the okra, while a control group was kept with no treatments. During a span of 12 weeks the height, number of leaves, and the yield of the okra was measured weekly. After that, the leaves were scanned for leaf surface area and nitrate levels. The soil was also tested to assess electrical conductivity (EC), potential of Hydrogen (pH), and soil nitrate levels. Results show that the fertilizer excels in impacting the height and yield, although IMO2 came second, it had the largest leaf surface area. IMO4 exhibited the highest plant nitrate level and IMO5 with the most numerous leaves. The legume treatment shows minimal growth effects but had the highest soil nitrate levels, likely due to competition between the plants. Lastly, the soil EC and pH had no drastic effects between the treatments. Utilizing IMOs as an alternative to synthetic fertilizer could be a way to offset its harmful effects on the environment and human health, aiding many farmers here in American Samoa. Future research could explore varieties of different formulations of IMOs and its application to more plants in American Samoa; more testing would also be needed on the specific varieties of microbes present.

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