Mycorrhizal Fungi as an Alternative to Conventional Fertilizers

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Commercial fertilizer usage has caused drastic environmental impacts. Its use has lead to the overgrowth of bacteria, causing death to aquatic ecosystems, carcinogenic effects in humans, and the utilization of millions of dollars to resolve contamination. Mycorrhizal fungi are capable of increased nutrient uptake by plant roots during nitrogen and carbon fixation. Therefore, it is hypothesized that the utilization of these fungi could reduce commercial fertilizer. This project investigated the effects of fertilizer and Mycorrhizal fungi on plant height, biomass, and root development. A total of sixty-four Zea mays (dent corn) plants were germinated in a controlled indoor environment for four weeks. Sixteen of each plant were grown in soil containing the following: control, fungi alone, fertilizer (Miracle-Gro All-Purpose Plant Food) alone, and fertilizer and fungi. After four weeks, the plants were moved outside to stimulate photosynthesis and growth. Each week, the plants' height was measured. During the fifth week, each plant's weight was obtained. The plants receiving fertilizer alone were twenty-five percent taller than the fungi group on average. The biomasses for the fungi alone and fertilizer alone groups were nearly identical and had the highest average biomass. Plants grown with fungi alone appeared to have the most complex root systems. This investigation concluded that while adding Mycorrhizal fungi may compromise initial above-ground growth, the increased complexity of the root systems would improve the plants' durability; therefore, using mycorrhizal fungi may help reduce pollution, save money, preserve biodiversity, and reduce negative health effects.

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