Lemna minor Fertilizer as an Alternative to Commercial Fertilizer for the Growth and Runoff Quality of Glycine max

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The purpose of this research was to determine how Lemna minor could supplant commercial fertilizers and result in lower nitrate and phosphate levels in runoff. A null hypothesis states that the fertilizer treatments will have no significant impact on the early growth of Glycine max. An alternative hypothesis states that a Lemna minor fertilizer and a commercial fertilizer will show no significant difference in growth of Glycine max, but both treatments will result in significantly taller plants than the control. A second null hypothesis states that the fertilizer treatments will have no significant impact on nitrate and phosphate levels in runoff. An alternative hypothesis predicts the Lemna minor will result in runoff with lower nutrient concentrations than commercial fertilizers. In a controlled environment, 90 Glycine max plants were grown in a tilted structure. Runoff and plant heights were collected every five days. Two treatments (commercial fertilizer and Lemna minor) and a control of no fertilizer were applied to plants. The data fails to reject the null hypothesis regarding fertilizer impact on the growth of Glycine max, meaning that there is no consequential relationship between treatment groups. Since there was no statistical difference between treatments and the alternative hypothesis was not supported, the data supports that Lemna minor fertilizer could have the same impact on early growth as commercial fertilizers. The ANOVA test performed on nitrate and phosphate data rejected the null hypothesis, stating that the data is significant. This supports the alternative hypothesis that Lemna minor will result in runoff with lower concentrations of nutrients than commercial runoff.

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