

Results of the incubation experiment revealed that the available P has been decreased in all treatments during incubation period. However available P in poultry manure incorporated treatment was significantly higher than all the other treatments from second week to the end of the incubation period. It was also observed from uptake experiment that there was a significant difference in P uptake and dry matter production between poultry manure incorporated treatment and all the other treatments. Therefore the results of the study conclude that poultry manure may reduce the fixation of P in RBE soil. However to confirm the results further long term investigations are required.

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The possibility of substituting chemical fertilizer by organic manure in cattle – coconut integrated system

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Cattle integration with coconut can replace some amount of chemical fertilizer applied to coconut with dung and urine. The paper describes how much of fertilizer can be replaced by organic manure and the cost reduction in fertilizing coconut.

Cattle were employed into two treatments;

T1 - Cattle fed with natural herbage

T2 - Cattle fed with natural herbage + tree fodder (*Gliricidia*) + low cost concentrate ("Gava Thripsha" which contains rice bran - 30 %, molasses - 40 %, urea - 10 %, mineral mixture - 8 %)

Dung patches of 6 cattle (3 cattle from each treatment) were counted and weighed randomly for 9 days for the estimation. It is estimated that each coconut palm received 141 kg of fresh dung / year in T1 and 146 kg / year in T2 along with 66.6 kg of urine / year in T1 and 69.6 kg / year in T2. (13 cattle / ha; under tethering system) Cattle's rope was shortened up to 2 m at night to allow more dung and urine to be collected into the manure circle as they defecate 66 % and urinate 76 % at night. The dung and urine could replace Nitrogen fertilizer and Phosphorus fertilizer totally. Also it could reduce the Potassium fertilizer (MOP) applied to coconut by 84.56 % in T1 and by 88 % in T2 while Magnesium fertilizer (Dolomite) applied by 85.4 % in T1 and by 88.5 % in T2. This substitution can reduce the cost of fertilizing coconut by 85.77 % in T1 and by 88.92 % in T2. There's no significant difference between T1 and T2 as expected.

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Assessment of metal (Pb²⁺) stress recovery of *Spirulina platensis*, an edible cyanobacterium

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Spirulina platensis is a well known source of protein comprising all the essential amino acids. As metal toxicity is becoming a matter of great concern, the present study focused on the metal stress

recovery of *S. platensis*. The species was grown in Zarrouk liquid medium adjusted to pH 7.0 at 25 °C. At the exponential growth phase, algal mass was harvested and resuspended in fresh medium to be used in metal treatments. Algal suspensions were treated with various initial Pb²⁺ concentrations (1, 5, 10, 25 and 50 µg/mL) and incubated for 10 days. The algal cells without Pb²⁺ in the medium served as the control. The growth was monitored by measuring the optical density at 560 nm. At day 10, the algal cells were separated, washed and resuspended in fresh Zarrouk medium (free from Pb²⁺) to assess metal stress recovery. Experiments were conducted in triplicate and repeated twice to confirm the reproducibility of the results.

Exogenous addition of lead showed varying toxicity to *S. platensis*. At a low concentration (1 µg/mL), Pb²⁺ positively influenced the growth by 2.6 %. However, at higher concentrations, the growth was adversely affected and the extent of toxicity increased with increasing Pb²⁺ concentration in the medium. The inhibitions at 10 d were 5, 40, 49 and 78 % respectively for 5, 10, 25 and 50 µg/mL of Pb²⁺. Once introduced to the Pb²⁺ free medium, all the cultures were found to grow well irrespective of the severity of the initial stress. However, cultures treated with high concentrations of Pb²⁺ were slow to recover from the transferring shock. Results could be concluded that *S. platensis* is quick to recover from the initial metal stress.

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Effect of different mixtures of vermicompost and coir dust on soil microbial activity

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Vermicompost is a nutrient-rich, natural fertilizer and soil conditioner. Coir dust, on the other hand, is a widely used component in potting media, despite its poor nutrient contents. A mixture of these two ingredients could thus provide a better growing media for plants. The present laboratory study was undertaken to assess the effect of different mixtures of vermicompost and coir dust on soil microbial activity as measured by carbon mineralization.

Four different vermicompost and coir dust mixtures [100 % vermicompost (T₁), 75 % vermicompost : 25 % coir dust (T₂), 50 % vermicompost : 50 % coir dust (T₃) and 25 % vermicompost : 75 % coir dust (T₄)] were applied to the soil. The control soil was free from vermicompost and coir dust (T₅). A Completely Randomized Design (CRD) was used in the experiment with four replicates. Carbon mineralization was determined at 3, 7, 14, 21, 28, 35, 42, 49, 56, 63 and 70 days after the treatments. Data were statistically analyzed using SAS package.

Results at day three showed no significant ($P \leq 0.05$) variation among the treatments. However, treatments T₁, T₂ and T₃ were significantly ($P \leq 0.05$) different from the control at day 7 and treatments T₂ and T₃ were significantly ($P \leq 0.05$) different at day 14. Since then, significant ($P \leq 0.05$) differences were no longer observed for any treatment until the end of the incubation. In contrast, treatment T₂ exhibited higher carbon mineralization than any other treatment throughout the incubation. Results could therefore be concluded that T₂ was proved to be the best mixture to enhance the microbial activity.

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