EFFECT OF ATMOSPHERIC CARBON DIOXIDE ENRICHMENT DURING DIFFERENT DEVELOPMENTAL STAGES ON DINITROGEN FIXATION AND YIELD OF MUNG BEAN (VIGNA RADIATA (L.) WILCZEK.)

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The effects of carbon dioxide enrichment on dinitrogen fixation, vegetative and reproductive parameters were measured at different growth stages of pot grown mung bean (Vigna radiata (L.) Wilczek). The CO_2 enrichment of 1000 ($\pm$ 150) ppm for 8 day periods corresponding to vegetative, flowering and pod filling stages of development was practised.

Nitrogenase activity was measured in situ at 4 different growth stages. Carbon dioxide enrichment increased the acetylene reduction activity till 71 days after planting. The highest activity was observed with CO_2 supply till the pod filling stage. The effect on leaf area, dry matter production, number of pods and seed weight increased significantly for all CO_2 treatments. The effect was enhanced by increasing the period of enrichment. However, the additional effect of the third enrichment period is minimal except for the nitrogenase activity. The effect of 8 day CO_2 enrichment was not significant for the reproductive parameters. The nitrogen balance was positive and increased with the amount of CO_2 supplied but not significantly.

The effect of incubation with acetylene (C_2H_2) on plant growth parameters was also observed in this study as the in situ design was used to measure the nitrogenase activity. No effect with C_2H_2 on plant growth parameters was observed.