D11 QUANTITATIVE ESTIMATION OF NITROGEN FIXATION BY *AZOLLA* UNDER FIELD CONDITIONS

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Field grown Azolla while fixing nitrogen from the atmosphere, also assimilates combined nitrogen from the water in which it grows. Conventional methods based upon Kjeldahl analysis of total nitrogen or the application of the acetylene reduction assay do not permit the quantitative estimation of nitrogen fixation by field grown Azolla, as distinct from the absorption of combined nitrogen from the solution in which it grows. Based on the methodology used for legumes[1], the substrate labelling technique using ^{15}N-labelled fertilizer, was applied to measure nitrogen fixation by A.pinnata, R. Brown and A.microphylla Kaulfuss grown in rice fields at Ambalantota, with Salvinia molesta Mitchell, and Lemna perpusilla Torrey as reference plants. Azolla was grown in monoculture as well as in dual culture with rice.

Depending upon the reference plant used and the type of culture adopted (mono or dual), the % nitrogen derived from fixation by A.pinnata ranged from 55 to 61, while that derived by A.microphylla ranged from 51 to 60. With regard to N-yield during this 28 day period, the amount of nitrogen fixed ranged from 12 to 14 kg/ha for A.pinnata and 11 to 12.5 kg/ha for A.microphylla. These results confirm the ability of Azolla to fix substantial amounts of nitrogen within a short period of time.

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Reference

1. Fried, M & Middleboe, V (1977) Measurement of amount of nitrogen fixed by a legume crop. Plant & Soil 47 713-715