

PRODUCTIVITY PATTERN OF RICE BASED CROPPING SYSTEMS
IN RELATION TO GREEN MANURE APPLICATION

By

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Thesis

Submitted in partial fulfilment of the requirements
for the degree of

MASTER OF PHILOSOPHY

in the

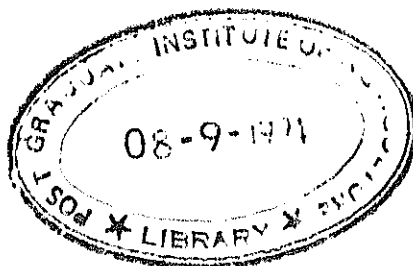
POSTGRADUATE INSTITUTE OF AGRICULTURE

of the

UNIVERSITY OF PERADENIYA

SRI LANKA.

April 1993.



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ABSTRACT

Sesbania rostrata and Leucaena leucocephala were evaluated as green manure sources in terms of their potential for enhancing soil and crop productivity and economic potential when fitted into a rice based cropping pattern of the lowcountry intermediate zone of Sri Lanka.

S. rostrata was grown during the fallow period between cropping in the maha (1991/1992) and yala (1992) seasons. The plants were incorporated into the soil at 45 days after sowing and 10 days before transplanting of rice or large onions. Similar quantities of L. leucocephala leaves were also incorporated simultaneously.

Comparisons were made between the total nitrogen, and the organic matter content of soil, growth parameters, yield components, and yields of crops, from the different green manure sources alone and in combination with total and 50% of the recommendation of inorganic nitrogen recommended inorganic nitrogen alone and a control. A financial analysis was also carried out to determine the benefit from cropping pattern of rice and large onions under various nitrogen levels. Green manure sources were analyzed for their nutrient contribution. S. rostrata at a plant density of 660,000 and 400,000 per ha and similar quantity of

L.leucocephala could contribute the inorganic nitrogen recommendation of rice and large onions crops (100 kg and 60 kg per ha respectively).

The relative growth rate, leaf area index, tiller numbers, panicle number per plant and percentage of filled grains contributed positively to enhance rice grain yields. In rice S.rostrata green manure alone and both green manures in combination with varying nitrogen levels produced grain yields comparable to that of recommended inorganic nitrogen levels. However, the financial analysis suggested that benefits can be obtained only in S.rostrata in combination with the recommended inorganic nitrogen levels, or with 50% of the inorganic levels.

In large onion, the total bulb yield and marketable yield under both green manure in combination with the recommended and 50% of the recommended inorganic nitrogen levels were comparable to the yield of recommended inorganic nitrogen level. The financial benefit could be obtained only with the recommended nitrogen level in combination with both green manures.

The marketable yield of large onions was less than the total bulb yield in all treatments. The varying nitrogen levels did not affect the total bulb yield:marketable yield ratio.