EFFECT OF CULTIVATION PRACTICES ON THE GROWTH AND YIELD OF COWPEA CULTIVARS IN MAHAWELI SYSTEM B

By

GALEARACHCHI SUNIL

Thesis

Submitted in partial fulfilment of the requirements

for the degree of

MASTER OF PHILOSOPHY

in the

POSTGRADUATE INSTITUTE OF AGRICULTUR

of the

UNIVERSITY OF PERADENIYA

SRI LANKA

Approved :

Supervisor

(Prof. H.P.M. Gunasena)

Examiner

(Dr. U.R. Sangakkara)

Examiner

(Dr. M. Sikurajapathy)

July 1989.

ABSTRACT

Cowpea field trials were conducted on Reddish Brown Earths in Mahaweli system B. The factors in maha 1987/88 were plant population, NPK fertiliser and variety and in yala 1988: plant population, irrigation and variety. Plant populations were from 0.33 to 0.11 m (million) plants ha^{-1}, including the recommended population of 0.22 m plants ha^{-1}. The fertiliser treatments consisted of Department of Agriculture recommended fertiliser rates (27N, 27P, 32K) and a 25% increment over the recommended. For recommended irrigation the soil was saturated at 4 to 6 day intervals during the first month after planting, thereafter the frequency of irrigation was increased from 8 to 12 days. In a second treatment, irrigation was to field capacity at flowering only. There was a rainfed control; maximum depletion achieved was 50% of available soil moisture. In both experiments the cultivars were determinate MI-35 and indeterminate Arlington.

In maha the seed yield was 1586 kg ha^{-1}, whilst in yala it was 1048 kg ha^{-1}.

Population alone did not affect yield in maha, but in yala yield increased by 18% due to increased population from 0.111 to 0.333 m plants ha^{-1}. At 0.33 m plants ha^{-1}, MI-35 yield was 25% greater than at the recommended populaton, when rainfed or with medium irrigation. Variety Arlington yield was unaffected by population or irrigation in yala.

Fertiliser alone did not affect yield but MI-35 recorded 23% more yield with the recommended fertiliser than with the increased rate. In contrast, Arlington had 21% more yield with the 25% more fertiliser.

High LAI and greater dry matter/unit area was observed with the maximum population (0.333 m plants ha^{-1}). Light interception was 15% greater at high population. The number of pods per plant decreased with increasing population, by 19% (maha) and 46% (yala). Other yield components, such as seed/pod, hundred seed weight and seed weight/plant, were only marginally affected by treatments.

There was no response to irrigation. The soil moisture content was only marginally affected by irrigation or population. In irrigated plots moisture extraction was negligible beyond 40 cm depth, but

continued down to 80 cm in the rainfed plots. Between 40 and 80 cm depletion was greater with high population, especially in the rainfed plots.