RAINFED UPLAND CROPPING FOR MAHAWELI SYSTEM C

By

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ABSTRACT

During maha 1984/85, on the rainfed upland of Mahaweli System C, main crops of maize and chilli were intercropped with 50% stands of cowpea or mung bean. Intercrop performance was compared with the four sole crops in terms of emergence, leaf area development, land equivalent ratio and gross income. The possibility of reducing fertiliser usage was also investigated by applying 50 and 100% of the recommended Department of Agriculture (DA) rates to subplots. In yala 1985 sesame and cowpea were grown on the same plots with 50 and 100% DA recommended rates. Finally, total gross income was computed for each pattern.

Maha. Maize, chilli, cowpea and mung bean were grown in maha. Main crops maize and chilli were planted over a month earlier than the intercrops (cowpea and mung bean). Emergence was at least 85% by 10 days after sowing and was unaffected by treatment; chilli seedling survival was 100% at 40 days after transplanting (DAT).

Peak leaf area indices (LAIs) were 5.2 (maize), 2.6 (chilli), 2.2 (cowpea) and 2.6 (mung bean). Halving the fertiliser rate reduced the maximum LAIs of maize (23%) and cowpea (14%), but chilli and mung bean were unresponsive because of leaf disease. Maize LAI was further reduced by 23% when intercropped with cowpea, but was unaffected by the presence of mung bean; chilli LAI was reduced by 50% when intercropped with cowpea, but was unaffected by the presence of mung bean up to 42 DAT. LAIs of the intercrop were also reduced, mung bean by 70% in the presence of maize but only 24% when intercropped with chilli. Cowpea LAI was reduced by 16% in the presence of maize but was almost unchanged when intercropped in chilli.

Flowering and pod formation of the legume crops were severely reduced (42 to 92%) when intercropped with maize or chilli. The only exception was mung bean intercropped in chilli wherein the reduction was non significant.

The sole crops yields at half and the full DA recommended fertiliser rates were 5.4 and 5.7 t ha^{-1} maize, 715 and 965 kg ha^{-1} dry chilli pods, 627 and 834 kg ha^{-1} cowpea, 706 and 856 kg ha^{-1} mung bean.

All crops had lower yields when intercropped. Maize yields were

reduced by 6% when intercropped with mung bean but declined by 12% when intercropped with cowpea. Chilli yields declined by 17% in the presence of mung bean, and 41% when intercropped with cowpea. If the 50% stand of the legumes is taken into account, the reductions in yield in the maize+legume intercrops were 29% (cowpea) and 38% (mung bean), whereas in the chilli+legume the reductions were less than 15% for the legumes.

There was interaction between fertiliser rate and yield in the chilli+mung bean intercrop. At half the fertiliser rate the yield reduction of chilli by intercropping was only 5%, compared with the above mentioned 17% at the full rate of fertiliser, and vice versa for the mung bean (25 vs. 15%).

Land equivalent ratios (LER) was 1.16 for the maize+cowpea intercrop and 1.55 for chilli+mung bean intercrop, the chilli+cowpea intercrop had the lowest LER of 0.96.

Gross income of sole crops in maha were computed to be Rs 22,800 for maize, Rs 25,090 for chilli, Rs 7,089 for cowpea and Rs 8,560 for mung bean. Incomes were up to 30% less from intercrops, except for chilli+mung bean where income was virtually unchanged. Halving fertiliser rates reduced gross income from maize and its intercrops by only 3 to 5%, but income loss from chilli and its intercrops were 13 to 27%.

Yala. Cowpea and sesame were grown as sole crops in the same plots with the same half and full DA fertiliser rates. Plots that received the full fertiliser rate received the same treatment in yala. Yield reductions on halving the fertiliser rate were 16% for sesame and 36% for cowpea. Dry matter accumulation was significantly less in both cowpea and sesame with half the DA fertiliser rate. Cowpea and sesame produced gross incomes of Rs 6,433 and Rs 2,552.