RAINFED CROPPING PATTERNS FOR MAHAWELI SYSTEM C

By

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ABSTRACT

A one-year cropping pattern study was conducted at the Regional Agricultural Research Station, Girandurukotte, from November 1985 to July 1986, to develop a profitable cropping pattern for the upland farmers of Mahaweli system C. During the maha season, 1985/86 four maize + legume intercropping models and a chilli + mung bean intercropping model were used as treatments, together with the sole crops of these components. Either 40,000 or 60,000 plants ha^{-1} of maize was combined with half the recommended population of mung bean and cowpea. During the yala season, 1986, intercropped plots were divided to half and assigned to gingelly and cowpea as sequential crops.

Dry matter accumulation of maize in maize-based models during the maha season, 1985/86 was similar from seeding to 8 weeks. From 10 to 12 weeks after seeding (WAS), maize (60,000 plants ha^{-1}) + mung bean intercrop had significantly lower dry matter accumulation of maize than that of other intercrop models. Dry matter accumulation of mung bean in maize + mung bean models decreased significantly from 8 WAS onwards, when compared to sole cropped mung beans, while dry matter accumulation of intercropped chilli significantly reduced only from 10 to 12 (WAS) when compared to sole cropped chilli. Dry matter accumulation of cowpea was not affected by the treatment throughout the study.

The highest nodule number per plant of mung bean and cowpea was observed at 6 WAS. The nodule number per plant of cowpea from 6 to 8 WAS was significantly reduced by intercropping but not that of mung bean. At 6 WAS, nodule dry weight of mung bean was lower in maize (60,000 plants ha^{-1}) + mung bean intercrop than in other treatments.

Intercropped cowpea had a significantly lower nodule dry weight from 6 WAS onwards than sole cropped cowpea.

Maize intercropped with mung bean had significantly lower grain yields (27 to 34%) than sole cropped maize (2.34 t ha^{-1}). However, grain yield of maize associated with cowpea (2.01 t ha^{-1}) was not affected by the cropping system. None of the treatment influenced the kernel number per cob, however maize (60,000 plants ha^{-1}) + mung bean intercrop had the lowest kernel weight and kernal number per cob.

Seed yield and the pod number per plant of mung bean in the maize (60,000 plants ha^{-1}) + mung bean model were very low. Mung bean in sole cropping (0.260 t ha^{-1}) and intercropped with chilli (0.257 t ha^{-1}) had similar yields and pod number per plant.

Intercropped cowpea had significant reduction in seed yield (37 to 45%) and pod number per plant (43 to 50%) than sole cropped cowpea (0.941 t ha^{-1}). 100-grain weight of cowpea was unaffected.

Dry pod yield of intercropped chilli (0.401 t ha^{-1}) was not affected by the cropping system.

The highest Land Equivalent Ratio (LER) of 1.91 was given by the chilli + mung bean intercrop. Maize + cowpea intercrops also had moderate LER values, but maize + mung bean associations had LER's less than unity. The highest gross income was also obtained from chilli + mung bean intercrop, the lowest from maize + mung bean, while maize + cowpea intercrops gave moderate income. Although the grain yields of cowpea and gingelly were not affected by the maha season cropping system, chilli + mung bean intercrop followed by cowpea during the yala season gave the highest total annual gross income in this study.