

## **B-06: Interactive effects of lopping height and alley width in alley cropping on growth and yield of associated greengram crop**

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Alley cropping where food crops are grown between hedgerows of leguminous tree species has been proven to be an alternative to shifting cultivation in the dry zone of Sri Lanka. Proper tree management for optimum biomass production and to minimize competition for light, nutrients and moisture with the crop is essential for the success of this system. Although different tree management practices, have been adopted no attempt has so far been made to compare the effects of different tree management practices on the growth and yield of associated food crops.

A field experiment was carried out at the Field Crops Research and Development Institute, Maha Illuppallama to study the effect of tree management practices on the growth and yield of associated greengram crop in an alley cropping system. *Gliricidia* trees planted 0.5 m apart within the row had 9 tree management combinations consisting of 3 lopping heights (25, 75 and 150 cm) and 3 alley widths (2, 3 and 4 m). These were arranged in a Split-plot design replicated 3 times where lopping height was considered as the main plot treatment.

Seasonal tree biomass production and cumulative tree biomass production increased with increasing lopping height and decreasing alley width. When lopping height was increased from 25 to 150 cm, seasonal and cumulative tree biomass production increased by 30% from 2.0 t/ha and 24 respectively. There were 45% and 67% increases recorded in seasonal cumulative tree biomass productions respectively from 2 t/ha and 21 when alley width was narrowed down to 2 m from 4 m.

There was a strong interaction between lopping height and alley width on crop growth parameters and seed yield. For 150 cm height, when alley width was expanded from 2 to 4 m, plant height, crop dry matter production and seed yield increased by 15%, 49% and 31% from 25.1 cm, 394 g/10 m<sup>2</sup> and 454 kg/ha respectively. In the case of 25 cm height, increase of alley width from 2 to 4 m caused a reduction of above parameters by 18%, 24% and 17% from 29.8 cm, 599 g/10 m<sup>2</sup> and 601 kg/ha respectively. However, at 75 cm height, highest crop plant height, crop dry matter production and seed yield were observed at 3 m alley width.

This study shows that tree management practice can greatly influence the performance of associated food crops in alley cropping. Alley cropping with trees planted to form narrow alleys (2 m) pruned short (25 cm), wider alleys (4 m) pruned tall (150 cm) and medium wide alleys (3 m) pruned medium (75 cm) gave the highest crop yield.