

year of growth may be the only practical way of using them for alley cropping.

Establishing leguminous trees or shrubs for alley cropping in the derived savanna. Establishment and early maintenance costs appear to be major deterrents in the use of leguminous trees or shrubs for nutrient recycling in alley cropping. To overcome these problems, the legumes are being established by interplanting through maize. A trial evaluating the potential of this method in the derived savanna was initiated in 1980. In the interplanting, the legumes are spaced at 400 cm \times 50 cm and the maize at 100 cm \times 100 cm with 3 plants/hill. Seeds were used for *Tephrosia candida*, *Cajanus cajan* and *Leucaena leucocephala* and cuttings for *Gliricidia*.

Because of adverse rainfall during the first season, maize yields were lower than expected (Fig. 44). The legumes had no significant effect on maize yield, and the maize had no significant effect on legume yield; legumes planted without maize were the same size as those planted with maize.



Twenty-month-old *Albizia falcataria*. Among the fastest growing trees in the world, they are suitable agro-forestry species in the humid lowland tropics for control of *Imperata cylindrica* grass as well as for site fertility improvement and in the derived savanna as a planted fallow species.

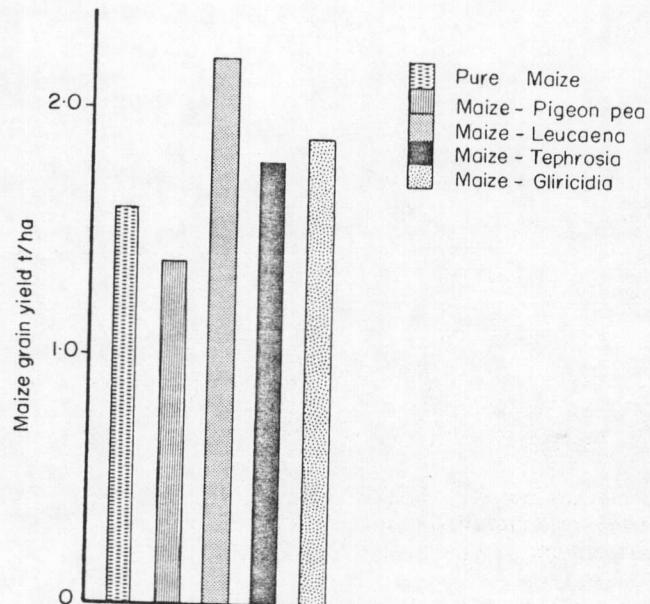


Fig. 44. Effect of shrub legumes on single maize crop.

Establishment of *Tephrosia* was very poor while that of the other legumes was good. Growth of both *Leucaena* and *Gliricidia* was poor even though adequate weed control was practised during the intercropping phase. By November (6 months after sowing), these 2 legumes were growing slowly with no marked effect on the adjacent vegetation. On the other hand, *Cajanus cajan* grew vigorously and by November dominated the field. A well developed canopy shaded out weeds preventing many from flowering (Fig. 45). A closer between row spacing (about 300 cm) could produce better weed control although a closer spacing may hamper tractor drawn implements.

The slow growth of *Leucaena* and *Gliricidia* suggests that these legumes may require more than 1 growing season to significantly affect field ecology. Vigorous growing *Cajanus cajan* interplanted with maize in the

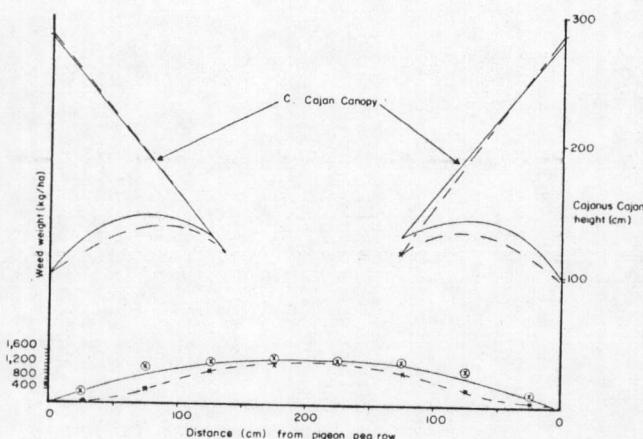


Fig. 45. Pigeon pea canopy structure and weed distribution in 4 m alley, 3 months after maize harvest, (maize/pigeon pea —, \otimes , pure pigeon pea ---, $- * -$).