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ALLELOPATHIC EFFECTS OF GLIRICIDIA (GLIRICIDIA SEPIUM) AND IPIL IPIL (LEUCAENA LEUCOCEPHALA) GREEN MANURE ON SEEDLING GROWTH OF RICE MAIZE AND COWPEA

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There are ample evidences that some plants found in intercropping systems and organic residue of those produce and release chemicals to the environment which may interfere the performances of other crops. Such chemicals cause reductions of the growth of neighbouring crops which is termed as allelopathy.

Hence the allelopathic effects of Gliricidia and Ipil-Ipil green manure on seedling growth of rice, maize and cowpea were tested adopting a pot experimental technique as these are been frequently used as green manures for other crops. Seedling bioassays were conducted in acid washed sand, in a Reddish Brown Earth soil (RBE) and in a Immature Brown Loam soil (IBL) of Sri Lanka to ascertain the modifications of the allelopathic effects by soils. The experiment was conducted in a poly-tunnel and duration was 5 weeks. Green manures were incorporated to above substrata at a rate representing 3t/ha dry matter. Each pot was consisted of 500 g of substratum and moisture levels were maintained at 60% maximum water holding capacity throughout. The treatments tested were substratum alone, substratum with Gliricidia and substratum with Ipil- Ipil. The treatments were triplicated. Plant heights and internode lengths were measured at weekly intervals. Root and shoot dry matter were determined at the harvest. N,P and K taken up by the plants in each pot was also determined.

The results showed that the Gliricidia has negatively affected the growth performance of cowpea, rice as well as maize. This effect was to be seen only in relation to shoot dry weight in cowpea , root dry weight in rice and maize and N uptake in rice. N uptake in Ipil-Ipil treatment was reduced in rice. Besides, the modification of the possible allelopathic effect could be observed by different substrata. Growth performances by Gliricidia in RBE soil was significantly lower than the control whereas in the IBL the effects were not much considerable.

When growth parameters were considered the plant heights were not affected by green manure, but the dry matter yields and N, P and K uptake have shown negative and positive differences. Negative effects observed may have been caused either by allelochemicals already present in green manure or by the chemicals produced in the process of decomposition.

Hence, it could be concluded that there may be negative effects of green manure on different crops which may be modified by different substrata. Thus it is appropriate to test the compatibility of crops to different green manure before use to achieve maximum benefits in improved cropping systems.