

RESPONSE OF COWPEA AND GREENGRAM TO FOLIAGE LOSSES IN THE DRY ZONE OF SRI LANKA

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A number of insect pests damage the foliage of cowpea (*Vigna unguiculata*) and greengram (*Vigna radiata*) at the vegetative stage of the crops. The important defoliators of these crops recorded in the Dry Zone of Sri Lanka are lepidopteran caterpillars, army worm, *Spodoptera litura* sp. F; tusker caterpillar, *Dasichira mendosa* Hb; and leaf folder, *Hadylepta indicata* F.

Knowledge of yield losses caused by the feeding behaviour of these insects is an important aspect of any pest management programme. The ability to determine the yield loss caused by natural insect population is limited when target insect is not a problem in each year and when the population numbers of the insect is not sufficient to cause economic damage. Therefore, the effective alternative method has been simulation of insect damage (Hammond and Pedigo, 1982).

The purpose of the experiments described herein was to determine the response of cowpea (Variety MI-35) and green gram (Variety Type 77) to different degrees of foliage losses at vegetative stage of these crops in order to develop threshold values which would determine the time of insecticide application to control them.

EXPERIMENTS

Cowpea variety MI-35 was planted in 3 x 3 m plots during *maha* 1981/82 in a Randomized Complete Block Design with 3 replicates. There were 6 treatments including the untreated control. A spacing of 30 cm between rows and 15 cm within row was used. The crop was managed in accordance with the agronomic practices recommended by the Department of Agriculture under rainfed conditions. Natural foliage losses due to insect pests were controlled

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with Monocrotophos sprayed at 0.31% concentration of ai. In the first 4 treatments foliage was removed by cutting (with scissors) 1/2 of a leaflet from each leaf for 17% defoliation, 1 leaflet for 33% defoliation, 1 1/2 leaflets for 50% defoliation, and 2 leaflets for 67% defoliation at 25 days of emergence of the crop. In the 5th treatment 33% foliage was removed at 25 days of emergence and another 33% of foliage was removed after further 7 days. In *yala* 1982 similar experiment was carried out under irrigated condition. Irrigation was provided at weekly intervals until the last pick was obtained.

Responses of the greengram variety type 77 to various levels of defoliation was determined in *maha* 1983/84 and *yala* 1984. A spacing of 30 cm between rows and 10 cm within row was used. Crop was managed in accordance with the agronomic practices given by the Department of Agriculture. Removal of foliage was done as described above in the cowpea experiments. *Maha* 1983/84 crop was entirely rainfed where as *yala* 1984 crop was irrigated at weekly interval till the last pick was obtained.

The yields of all the treatments were obtained from an area of 4 m² in the middle

of each plot. The pods were threshed dried and the weight of seeds were recorded.

RESULTS AND DISCUSSION

In both cowpea and greengram, the yields obtained in *maha* were higher than the yields obtained in *yala*. Nevertheless, the removal of foliage up to 67% at the vegetative stage of cowpea or greengram did not affect the yield significantly (Table 1 and 2). These findings agrees with Ezedinma (1973), and Rahaja (1976) who found that the artificial defoliation up to 60-70% at vegetative stage of legumes crops does not show detrimental effect on the yield. However, Wein and Tayo (1978) reported that under moisture stress defoliation of certain legumes such as cowpea and soybean could lead to yield losses.

Leaf consumption by insects has been very difficult to simulate and measure because feeding by insect is a prolonged and a discontinuous activity. In addition damaged leaves consist of many holes or edge indentations. Therefore, around 60% of defoliation in cowpea and green gram at the vegetative stage may be considered as a point at which the grower should take up control measures to prevent an economic damage to the crop .

Table 1: Yield of cowpea variety MI-35 at different percentage of defoliation at vegetative stage

% defoliation	Mean yield (kg/ha)	
	1981/82 <i>maha</i>	1982 <i>yala</i>
17	1930 a	1351 a
33	1953 a	1406 a
50	1910 a	1350 a
67	1860 a	1310 a
33 + 33	1865 a	1343 a
0	1944 a	1373 a
CV (%)	21.6	18.2

Mean yields in columns followed by the same letter are not significantly different at 5% level.

Table 2: Yield of greengram variety type 77 at different percentage of defoliation at vegetative stage

% defoliation	Mean yield (kg/ha)	
	1983/84 <i>maha</i>	1984 <i>yala</i>
17	1595 a	1380 a
33	1658 a	1478 a
50	1580 a	1373 a
67	1527 a	1355 a
33 + 33	1540 a	1365 a
0	1605 a	1389 a
CV (%)	23.8	20.7

Mean yields in columns followed by the same letter are not significantly different at 5% level.

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