

RESEARCH - EXTENSION COLLABORATIVE FARMER AWARENESS PROGRAMME ON CHILLI INTEGRATED PEST MANAGEMENT (IPM)

G.D.S.N. CHANDRASENA AND K.K. SENEVIRATNA BANDA
Field Crop research and Development Institute
Maha Ilupallama

Chilli Leaf Curl Complex (CLC) is one of the major constraints in chilli production in Sri Lanka. CLC is caused by several factors (thrips *Scirtothrips dorsalis* Hood, aphids *Aphis gossipii*, mites *Hemitarsonemus latus* and viruses) of which thrips are the most important. During the past few years thrips problem has aggravated to epidemic level in major chilli growing areas and farmers were unable control the thrips successfully.

As CLC caused by thrips was a major problem in Mahaweli 'H' area a survey was undertaken during September, 1994 to study the situation with special emphasis on use of insecticides. The survey revealed that farmers used insecticides indiscriminately in terms of types of insecticide, dosages, spray volumes and spray intervals (Chandrasena, *et. al.*, 1994). Due to lack of knowledge on integrated pest management strategies and total dependence on chemical control, cost of production has increased and pest population also has reached an

epidemic level owing to the destruction of natural balance in the farming system.

These results indicated the necessity to implement a farmer awareness programme paying special attention to judicious use of pesticides and adoption of other appropriate pest management strategies.

With this objective, a 'yaya' based pest management monitoring programme was implemented during *yala* 1995 by the Field Crops Research and Development Institute (FCRDI), Maha Ilupallama with the collaboration of the extension staff of Mahaweli - system 'H', Thambuttegama.

MATERIALS AND METHODS

'Seven acre yaya' located at Eppawela was selected where the land holdings ranged from 1/4 - 1 acre. Among the thirteen farmers identified, seven were selected and regularly monitored by the researchers while the rest of the farmers were allowed to

follow the practices adopted by the selected farmers.

At the beginning a farmer training class was held in order to make them aware of the objectives of the programme and to educate about the IPM package. The IPM package used in this study was developed by the chilli pest management committee comprising registrar of pesticides, entomologists, breeders, agronomists and extension officers of DOA. The practices adopted by the farmers were monitored at weekly intervals throughout the cropping period.

IPM package introduced to the farmers consisted of the following practices.

1. Selection of quality seeds from a reliable source.

2. Appropriate nursery management techniques.

Selection of a suitable nursery site, sterilization of nursery beds and seed treatments were some vital aspects demonstrated under nursery management.

3. Correct time of planting.

Planting chilli crop as early as possible i.e., in the early part of April is good. The objective of this strategy is

to obtain at least two or three plucking before thrips population reaches its peak level. Peak population of thrips occurs from July to mid September which is generally associated with high temperature and low relative humidity (Ketipearachchi, 1992).

4. Keep the selected field and surroundings free from the residue of previous chilli crop.

5. Use of wind break / barrier crop wherever possible.

Four or five rows of maize, sorghum or kurakkan can be planted in the bund around the field.

6. Use of recommended fertilizers at correct rates and at correct time.

High proportion of nitrogen may increase the susceptibility to thrips. Therefore, excessive use of nitrogen fertilizers must be avoided.

7. Continuous observations on crop performances and pest incidences.

8. Identification of different pests according to the symptoms of damage and selection of insecticides accordingly. Minimize the destruction of natural

balance by using only recommended insecticides at recommended rates whenever necessary.

Thrips prefer to feed on tender leaves resulting upward curling of leaf margin. When matured leaves are affected by thrips, bronze discolouration can be seen along the mid rib. In severe infestations leaves shed prematurely.

If the onset of aphid infestation is detected spot application of a recommended insecticide can be practiced.

The presence of mites can be identified by downward curling of leaves.

Farmers were requested to keep records regarding use of inputs (quantity, time of application, costs, etc.) and yield data. The same information for the previous *yala* crop (1994) was also gathered by interviewing them at the beginning of the programme. All these data are summarized and shown in Table 1 and 2.

Table 1. Adoption of proposed pest management strategies (based on the selected farmers).

Strategies	No. of farmers	
	94 Yala	95 Yala
1. Time of planting		
Early planted (April)	-	7
Late planted (May)	7	-
2. Insecticide use		
10 - 12 application	-	4
13 - 15 application	1	3
16 - 30 application	6	-
3. Use of Sulphur along with insecticides		
Users	7	2
Non users	-	5
% of S applications **	94.1%	3.3%
4. Fertilizer application		
Recommended rates	1	6
> recommended rates	6	1

** Percentage values were estimated on the basis of total number of sprays applied by all the selected farmers.

RESULTS AND DISCUSSION

All the selected farmers followed the recommended nursery management practices and planted their crops in April.

Information collected about *yala* 94 crop revealed that majority of the farmers had sprayed insecticides 16 - 30 times (Table 1). However, during *yala* 95 none of the farmers had gone to that level. The number of application has been reduced to 10-15 during the season. However, there was a possibility to reduce the number of applications further. But it was very difficult to change their practices within a season as they had been applying more chemicals earlier.

All farmers applied only the recommended insecticides except one who sprayed a non-recommended insecticide, pirimiphos methyl (Actellic) for two applications among thirteen.

Usually mite infestation is not prevalent in the dry zone of Sri Lanka (Wijetrathne Banda, 1994). But surveys have revealed that chilli farmers used to mix sulphur along with insecticides at each application even in the absence of mite infestation

(Chandrasena *et al.*, 1994). All the selected farmers also had sprayed sulphur to the previous *yala* crop and 94% of insecticide applications were done mixing with sulphur. Therefore, farmers were advised to apply sulphur if damage symptoms were present i.e., downward curling of leaves and not to apply sulphur as a prophylactic treatment. Thereby, the unnecessary use of sulphur was reduced significantly (Table) 1.

Furthermore, most of them followed the fertilizer recommendation of the DOA but non of the farmers maintained a good barrier crop around the field.

Though it was expected that the other farmers in the 'yaya' follow the farmers who were monitored regularly, some of them had late plantings, applied both recommended and non-recommended insecticides and higher rates of fertilizers. In general their crops were damaged more by thrips compared to the crops of the selected farmers. Table 2 compares some salient economic aspects of the crops of farmers who followed the IPM package with their practices in *yala* 94 season.

Table 2. Economics of demonstrated IPM package (*yala* 95) and farmers' method (*yala* 94) at prices prevailed during the season.

Item	1994 <i>Yala</i> (Rs./ha)	1995 <i>Yala</i> (Rs./ha)
1. Cost of insecticides	34200 (19200 - 43000)	24000 17900 - 27900)
2. Cost of fertilizers	11500 (6400 - 18800)	7100 6100 - 8600)
3. Costs other than insecticides and fertilizers	51350 (26300 - 75500)	52900 28500 - 62000)
4. Total Cost	97000 (51900 - 137300)	84000 52500 - 98500)
5. Total yield of dry chilli (kg / ha)	1512 657 - 2964)	2470 (1647 - 3950)
6. Average price of dry chilli	94 (90 - 100)	106 (100 - 110)
7. Gross income	142100 (59100 - 296400)	261820 (164700 - 434500)
8. Net return	45100 (7200 - 159100)	177800 (112200 - 336000)
9. Net return to investment Rs./Rs.	0.45	2.12

(Figures in the parenthesis indicates the range of each value.)

These results show that a farmer who cultivates one hectare of chilli was able reduce costs of insecticides and fertilizers by Rs. 10,000.00 and Rs. 4,400.00, respectively without having any

yield reduction. Expenditure for items other than insecticides and fertilizers increased by Rs. 1,500.00 per hectare in *yala* 1995. By adopting the IPM package the total cost decreased

by Rs. 13,000.00 per ha. while the average dry chill yield increased by about 950 kg per hectare.

Average farm gate price of dry chilli increased from Rs. 94.00 to Rs. 106.00 per kg. The difference in average gross income and net return between the two management practices in two *yala* seasons were Rs. 1,19,700 and Rs. 1,32,700 respectively.

In general, by adopting the introduced IPM package for chilli cultivation, farmers were able to earn about 210% of the total investment as net profit instead of 45% earned by following their own cultivation practices.

At the termination of this pilot programme, all the selected farmers were convinced about the advantages of the IPM package and its economic return.

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