INSECTICIDE USAGE FOR THE CONTROL OF PESTS OF CHILLI IN MAHAWELI SYSTEM 'H' [1]

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Chilli is an important cash crop in Sri Lanka and the total extent of chilli cultivation is about 20,500 ha. Nearly 1/5 of the total acreage is confined to Mahaweli System 'H'. Chilli pod borer (*Helicoverpa armigera*), leaf curl complex and narrow leaf disorder are the major limitations for the chilli production in the Mahaweli System 'H'. Farmers used insecticides extensively to overcome these problems.

It was reported by the extension officers of Mahaweli system 'H' that the insecticides recommended by the Department of Agriculture were not effective in controlling the chilli pod borer. As there were no special recommendations for the control of chilli pod borer, farmers used to spray Monocrotophos, Methamidophos and Methomyl as these insecticides had been recommended for the control of same pest in grain legumes. In view of this situation, a survey was conducted to find out how correctly farmers use insecticides for the control of pests in chilli crop and the problems associated with insecticide usage during 1988 *yala* season.

METHODOLOGY

Mahaweli system 'H' comprises of about 25,000 farm families and 52 units to look after their needs with special emphasis on agriculture. For this survey, 20 units were randomly selected and 6 - 8 farmers in each selected units were interviewed. Altogether, 142 farmers were interviewed using a well planned questionnaire.

RESULTS AND DISCUSSION

It was revealed that 37 percent of the farmers sought instructions from the field officers in selecting insecticides while 51

1. This article was submitted for publication in 1990 and revised by the author in 1994.

percent of them selected insecticides based on their own experience or the experience of the neighbouring farmers. Ten percent of the farmers consulted pesticide dealers for this purpose. Only 2 percent made use of the mass media, mainly radio, for the selection of insecticides. It was found that 64 percent of the farmers had applied recommended insecticides for the control of pests of chilli. The above findings reveal that many farmers follow the correct method of selecting insecticides.

During this season 39 percent of the farmers applied insecticides 6 - 8 times for the chilli crop which appeared to be reasonable. Nearly 32 percent of the farmers applied insecticides more than 8 times while 28 percent applied less than 6 times during the season. Two percent of the farmers applied insecticides weekly and sometimes twice a week. These figures show that 67 percent (39% + 28%) of the farmers adopted correct time interval in the insecticide application.

A transplanted chilli seedling reaches the flowering stage in about 6 weeks. Three application of insecticides during this period is enough to reduce the chilli leaf curl incidence to a reasonable level. Chilli leaf curl virus is transmitted by the white fly (*Besmia tabaci*). Thrips (*Scirtothrips dorsalis*) and mites (*Hermitarsonomus latus*) cause leaves to curl by damaging them mechanically. These three pests can survive on the weeds which grow in the dry zone of Sri Lanka. Therefore, removal of weeds in and around the chilli crop is an effective method of reducing the incidence of leaf curl in chilli. Hence, this practice can help to reduce the number of insecticide application.

In a chilli crop of 5 months duration, flowers and pods are available during the last 3 - 3 1/2 months. Application of insecticides during the last 4- 5 weeks of the crop is not profitable because the number of pods available during this stage is low. Hence, 4 - 5 applications of insecticides during the 6th - 16th week (post flowering stage) are adequate to minimize pod borer damage in chilli. Insecticides should be sprayed only when the pest is found in the field, but 75 percent of the farmers applied insecticides on a calendar basis. This kind of application leads to reduction of natural enemies of the pests and also increases the cost of production. The chilli pod borer *Helicoverpa armigera* is nocturnal in habit. They are

active from 6 - 8 in the evening. Both the adults and larvae can be seen during this time period. It is advisable, therefore, to apply insecticides in the evening so that the pod borers come into contact with the insecticides. Contact insecticides are effective in controlling chilli pod borer. However, it is not necessary to apply insecticides during night as practised by some farmers in the 'H' area.

Sixty seven percent of the farmers reported that chilli pod borer had been the most serious constraint, while 23 percent complained the leaf curl complex as the major problem in the cultivation of chilli. Only 8 percent reported the unidentified problem, referred to as narrow leaf disorder, as the important constraint.

Extension officers of the area reported that the Regional Technical Working Group meeting held during 1988 *yala* season that the insecticides recommended for the control of pod borers were not effective. It was found that most of the farmers had applied the recommended insecticides; Monocrotophos, Methamidophos and Methomyl. It was also observed that 21 percent and 27 percent of them had applied the recommended dosages of Monocrotophos and Methamidophos, respectively. The reason for the lower efficiency of the insecticides used was that they had not used the correct concentration and spray volume.

The correct concentration of Monocrotophos and Methamidophos for the control of pod borer was 30 - 45 ml/10 l. Though 67 percent of the farmers had reported that the major pest was the pod borer, only 11 percent had used the appropriate concentration while 45 percent had used the correct spray volume. The volume of the spray mixture depends on the age of the crop. On and average 450 litres of spray volume is enough for a hectare. However, if the canopy is big, it might require up to 700 litres for the effective control of pod borers. Application of higher spray volume results in the draining of the insecticide solution on to the ground. Therefore, spraying excess spray mixtures is a wastage and it leads to reduction in the efficiency of the insecticide. Even distribution of fine

droplets of insecticide solution sprayed all over the canopy minimizes the pest population effectively. According to my knowledge and experience, most farmers apply insecticides only to the upper surface of the chilli leaves. Therefore, the mites which are found on the lower surface of the leaves are not affected.

No farmers have mixed additives such as surfactant, stickers, etc. for the spray mixtures to increase the effectiveness of the insecticide. However, few farmers had mixed soap. Mixing of additives is useful for a crop like chilli which has a waxy surface layer of the leaves and on pods.

Forty eight percent of the farmers had used a special cup or a small bottle to measure insecticide while 45 percent had used the lid of the insecticide bottle for this purpose. Only 7 percent of the farmers used the visual level of the bottle as the measurement. Therefore, it was obvious that most of the farmers did not measure insecticide correctly.

It was also found that farmers used to pay less attention to repair their sprayers or replace the nozzle when it is necessary. Only 16% of the farmers reported that they repaired their sprayers. Repairing the sprayers is useful in order to have fine droplets which are necessary for increased effectiveness of the insecticide and to reduce unnecessary contamination of insecticides to the user.

CONCLUSION

It was found that many farmers were not aware of the correct ways of insecticide application. Therefore, it is important to train farmers on the correct application of insecticides. This would definitely improve the effectiveness of insecticides applied and will lead to fewer application of insecticides. Consequently, farmers will obtain better profits by reducing the expenditure on insecticides and by obtaining higher yields.