VIRUS PREVENTION IN RIDGE GOURD (*LUFFA ACUTANGULA*)

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Luffa acutangula (ridge gourd – *Watakolu*) is grown widely both in the dry and wet zones of Sri Lanka. However its susceptibility to virus diseases causes considerable yield losses. Not only *Luffa*, but also other members of its family *Cucurbitaceae* such as bitter gourd, snake gourd, cucumber and pumpkin are also prone to similar virus diseases.

Cucumber mosaic cucumo virus (CMV) and Watermelon mosaic potyvirus (WMV) as single infections or as a mixed infection of both are common occurrences in these crops. The nature of symptoms depends on the host and the strain of the virus associated with the disease. If the infection is early symptoms are aggressive and losses are high.

Cucumber mosaic virus can spread through infected seed at a very low percentage (Walkey, 1985; Singh, 1985). However, both viruses are spread in the field by aphid vectors in a non-persistent manner (Walkey, 1985). Some aphid vectors colonize the crop while other vectors are visitors. Therefore, control of insect virus vectors by the application of recommended insecticides will not be always effective.

Under these circumstances, ways and means of preventing vectors coming into the crop at the appropriate time for infection has to be worked out. This method of prevention and delay in the establishment of virus diseases is the most suitable for short term crops like vegetables.

MATERIALS & METHODS

Luffa, cucumber, bitter gourd, snake gourd and pumpkin were selected for this investigation. All these crops are local cultivars and have been grown at Homagama research fields for several seasons. During the cropping period virus infections together with their severity of symptoms have been observed and recorded. These infections were confirmed by direct enzyme linked immunosorbent assay (Direct – ELISA) (Results not presented).

Depending on the virus reaction observed and presented in table 1, cropping of luffa was done in two different methods. In one cropping pattern the main crop luffa was grown surrounded either by snake gourd or bitter gourd (figure 1). as a border. The width of the border varied from 90 to 150 cm depending on the extent of the main crop.

In the second cropping pattern, strips of luffa were grown alternating with either bitter gourd or snake gourd (figure 2). Each strip consisted of a single crop. The two outermost strips were either snake gourd or bitter gourd to act as barriers to prevent or delay any vectors moving into the main crop.

Figure 1 (Border Method)

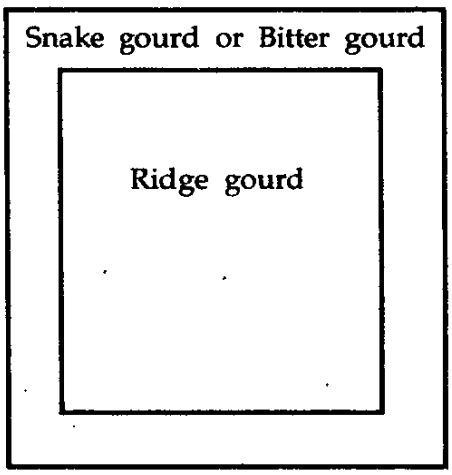
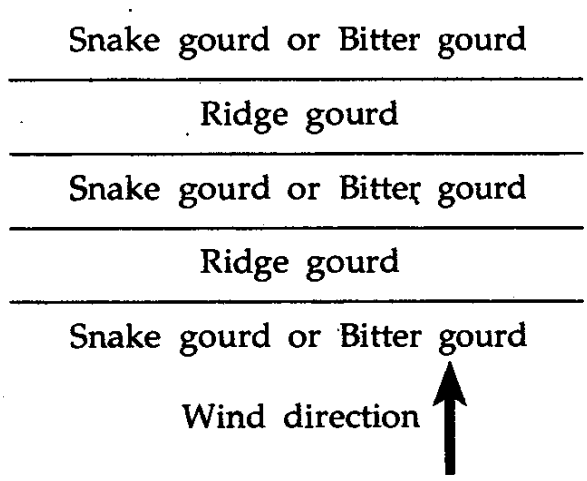


Figure 2 (Strip Method)



RESULTS & DISCUSSION

Reaction of *Cucurbitaceae* spp to virus diseases is given in table 1.

Table 1: Reaction of *Cucurbitaceae* spp. to CMV/WMV infection.

CROP	SYMPTOMS	SEVERITY	VIRUS
Ridge gourd	Yellow spotting, slight puckering	Very severe reaction	CMV
Snake gourd	Mosaic and slight leaf deformation	Mild reaction	CMV
Bitter gourd	Mosaic and slight leaf deformation	Mild reaction	CMV
Cucumber	Mosaic	Moderate reaction	CMV
Pumpkin	Mosaic	Severe reaction	WMV

WMV = Watermelon Mosaic Virus
CMV = Cucumber Mosaic Virus

Table 1 shows that CMV or WMV produced severe symptoms both in ridge gourd and pumpkin. Only mild reactions were observed insnake gourd and bitter gourd while cucumber was affected moderately. Depending on the time of infection, severe damage to the crop may occur. If plants get virus infection at an early stage of growth, then the yield could be reduced by more than 50%.

When planting pattern (1) or (2) was established during 1999 *maha* and 2000 *yala* seasons in farmers' fields at Kosgama and Angunakolepelessa, it was observed clearly that the onset of virus in ridge gourd was avoided or delayed. The vector aphids feed on the border crops of snake gourd or bitter gourd thus delaying their visit to the ridge gourd.

Therefore, the main crop was saved or as the virus infection was delayed and the economic losses were minimized. Percentage of virus infection in protected ridge gourd was 0 - 10% and 30-50% infection was recorded in un-protected crop. This is a very effective and practical way of preventing crop losses in a ridge gourd crop due to virus infections. There is hardly any additional expenditure and any harvest collected from the border row plants will be a bonus.

CONCLUSIONS

Chemotherapy as a method for virus control has not been successful so far. Use of insecticides to control insect vectors so as to prevent virus infection has been tried out but its practical difficulties outweigh any advantages. Careful observations of virus infection in plants and a study of vector behaviour can lead to developing strategies to prevent the onset of or reduce viruses transmitted by vectors.

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