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Short Communication

EFFICACY OF THREE TRAP CROPS AGAINST WHITEFLY TO MANAGE TOMATO YELLOW LEAF CURL VIRUS

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Production of tomato is hampered by many diseases in the field. Tomato yellow leaf curl virus (TYLCV) is the major limiting factor for tomato cultivation all over the world. Its incidence is higher in tropical and subtropical areas mainly because of higher activities of whitefly *(Bemisia tabaci)* (Kung. 1999: Lapidot *et al.,* 2001). It is also an important disease of tomato in Bangladesh (Rashid *et al.,* 2001). Application of pesticides is generally suggested for the management of virus diseases in Bangladesh, but in most cases it is ineffective. Therefore, vigorous search for finding other effective alternatives is necessary. Some researchers found that trap crops may reduce incidence of TYLCV and other viruses due to delay in initial infection (Al-Musa, 1982: El-serwiy *et al.,* 1987; Ahmed *et al*., 1996). But there is no report on the effect of trap crop on virus diseases prevalent in Bangladesh. The present experiment was conducted to find out the efficacy of brinjal, cucumber and okra as trap crops against whitefly to manage TYLCV on tomato.

The experiment was conducted in the experimental farm of Bangabandhu Sheikh Mujibur Rahman Agricultural University, Gazipur, Bangladesh during winter seasons of 2003-04 and 2004-05. Seedlings of brinjal *(Solanum melongena),* cucumber *(Cucumis sativus)* and okra *(Abelmoschus esculentus)* were raised in polyethylene bags. Seven days old seedlings of the three trap crops were planted in the experimental plots 5 days before planting tomato seedlings in between spaces kept for planting tomato seedlings. Seedlings of a susceptible tomato variety Ratan (BARI Tomato-2) were raised in a seed bed. Four weeks old apparently healthy seedlings were planted in the field maintaining 60 cm row to row and 50 cm plant to plant spacing on 30 November in both the seasons. Seven weeks after transplanting tomato seedlings, all three trap crops were removed from tomato plots. The experiment was laid out in a randomized complete block design with four replications. The unit plot size was 2m × 3m. Plots under control did not receive any trap crop.

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Tomato plants were checked regularly to record the incidence of' TYLCV. Infected tomato plants were identified based on characteristic symptoms of the virus as described by Green and Kallo (1994) and Sinistera *et al.* (2000), such as upward curling, cupping with or without marginal chlorosis, smaller leaflets and general stunting of plants. The disease incidence was expressed in percentage based on total number of tomato plants per plot. The disease incidence was recorded 8 weeks after transplanting and before final harvest. Data on population of whitely and fruit yield were also recorded. Data were analyzed for ANOVA after square root transformation and mean was compared using MSTAT-C computer program.

Maximum of 9 whitefly adults per leaf was recorded on brinjal, followed by cucumber showing 8 adults per leaf. On tomato, the insect vector was 4 per leaf and only one adult per leaf was recorded on okra (Table 1). The results indicated that brinjal was a good trap crop against whiteflies, followed by cucumber. Okra was not an effective crop to trap the insect vector of TYLCV.

Brinjal, cucumber and okra were tested as trap crop against TYLCV. They did not influence the incidence of the virus on tomato significantly (Table 1).

Significant increase in fruit number and fruit weight per plant (kg/plant) was obtained from okra and cucumber as compared to control where no trap crop was used. However, efficacy of the two crops to increase yield was not significantly different. Effect of the trap crops on fruit size (weight/fruit) was not significant as compared to control (Table 1).

Table 1. Effect of trap crops on whitefly population, incidence of TYLCV and fruit yield of tomato.

Trap crop	No. of whiteflies/ leaf	Disease incidence after 8 weeks of transplanting (%)	Disease incidence after14 weeks of transplanting (%)	Fruit yield (kg/plant)	Fruit number/ plant	Fruit wt (g/fruit)
Brinjal	9a	32.0 a	69.52 a	1.36 bc	30 b	42.20 s
Cucumber	8a	33.0 a	62.26 a	1.48 a	35 a	45.04 a
Okra	1c	40.0 a	86.19 a	1.43 ab	34 a	42.20 a
Control	4b	50.0 a	67.52 a	1.31 c	32 ab	40.04 a

Means within the same column with common letter(s) do not differ significantly (p=0.05)

Trap crops were not found to be effective in reducing the TYLCV incidence, but it could delay the virus infection to some extent. When 50% of the plants

were infected in control plots, it was around 30% in cucumber and brinjal inerplanted plots. It might he the reason for higher yield in the trap cropped plots. Among the trap crops, brinjal and cucumber seem to be more effective as trap crops of whiteflies than okra. Al-Musa (1982) reported the effectiveness of cucumber in delaying the incidence of TYLCV and increase of yield of tomato. Whiteflies are polyphagous insects. They tend to colonize the suitable or better host when several host plants are available. But that does not ensure that they will not feed on the less preferred host. That is why, use of trap crops can increase the disease incidence in some cases. In that situation, trap crops act as source or reservoir instead of sink (Hilje *et al.*, 2001).

Results of the present study suggest that interplanting of cucumber could increase the yield of tomato by delaying the incidence of TYLCV.

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