

Short Communication

EFFECTIVE INTEGRATED MANAGEMENT PACKAGE FOR MINIMIZING YELLOW MOSSAIC VIRUS INFESTATIONS IN MUNGBEAN

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INTRODUCTION

Mungbean suffers from several viral diseases. Among them, yellow mosaic disease caused by Mungbean yellow mosaic virus (MYMV), a member of gemini virus group transmitted through whitefly (*Bemisia tabaci* Gen.), is a very severe disease. Yield losses due to this disease vary from 5 to 100 % depending upon disease severity, susceptibility of cultivars and population of whitefly (Dhingra and Chenulu, 1985). The infection not only drastically reduces yield but also severely impairs the grain size and quality. The affected plant showed typical symptoms of mild scattered yellow spots on young leaves. The next trifoliolate leaf emerging from the growing apex showed irregular alternating yellow and green patches. The leaves showed slight puckering with reduction in size. The size of yellowing areas increased further resulting with complete yellow of apical leaves. The infected plants usually mature late and bear very few flowers and pods. So far, no feasible measures are available to control this disease. (Rathi and Nene, 1974) Productivity of mungbean is low because of MYMV infections. This study was undertaken to evaluate the influence of other cultural practices on suppression of mosaic virus incidences in mungbean.

MATERIALS AND METHODS

The research was conducted at the research field of the Grain Legume and Oil Crops Research and Development Centre, Angunakolapelessa under upland rainfed conditions with supplementary irrigation. Seven treatments, including untreated control, were replicated three times on two blocks, they are: T1=Seed treatment by Thiomethoxam 70 WS and spraying of Thiomethoxam 25 WG and Buprefezin at 10 days intervals; T2=Seed treatment by Thiomethoxam and establishment of Yellow sticky traps; T3=Seed treatment by Thiomethoxam, establishment of yellow sticky traps, intercropping Finger millet and repelling with Marygold; T4=Establishment of Yellow

sticky traps and repelling with Marygold; T5=Establishment of Yellow sticky traps and Intercropping Finger millet; T6=Seed treatment by Thiomethoxam70 WS and Intercropping Finger millet; and T7=Untreated Control (sole crop). Square shape sticky traps made with yellow polythene (15" x 15") were placed horizontally at a height of 25 cm and uniformly coated with a thin layer of castor oil on both sides placed at a height of 25 cm. Marygolts were planted around the bunds of the treated plots as single rows and flower buds were removed to enhance the insect repellent nature of the plant. Application of insecticides for some selected plots commenced from 10 days after planting. Disease incidence was calculated by counting number of plants infected in a plot at weekly intervals throughout the cropping period. Data were analyzed statistically using SAS statistical package. The number of whiteflies on top 3 trifoliolate leaves/plant was also recorded in each treatment from each of five randomly selected plants at weekly intervals throughout the cropping period.

RESULTS AND DISCUSSION

During *ya'a* 2011 season, when no integrated techniques were followed, viral infected plant count/plot varied from 1.23 to 10.6 (Table 1). The highest vector population was recorded in untreated control (3.0-7.0/five plants). With respect to viral infected plant count, establishment of yellow sticky traps and cultivating marigold with removal of flowers without any chemical treatment were found equally effective in recording lower viral infected plant count (1.6 to 6.4) in each week plants treated with seed treatment Thiomethoxam along with finger millet intercrop, establishment of yellow sticky traps and cultivating marigold with removal of flower buds recorded significantly lowest whitefly population/five plants/plot (0.33-1.0) (Table 2). Singh (1985) also reported that barrier crops sprayed with endosulfan were more effective in reducing incidence of mungbean yellow mosaic compared to unsprayed barriers.

During *maha* 2011/12 season, when no integrated techniques were followed, the number of viral infected plants/plot varied from 3.5 to 12 (Table 1). Seed treatment with Thiomethoxam along with sprays of Thiomethoxam followed by Buprefezin in ten day intervals recorded significantly lowest viral infected plant count/plot (0.23-4.02). The whitefly population/five plants/plot (0.6-3.0) was comparatively low in the package of practices including seed treatment Thiomethoxam along with finger millet intercrop, and yellow sticky traps and cultivating marigold with removal of flowers at one week after given sprays. The highest vector population was recorded in chemical free plots with the establishment of yellow sticky traps and cultivating marigold with removal of flowers (0.6-7.3/five plants) (Table 2).

Table 1. Incidence of viral infected plant count in mungbean during *yala* 2011 and *maha* 2011/12 seasons.

Treatment	Virus affected plant count/plot							
	Yala 2011					Maha 2011/12		
	2 WAP	3 WAP	4WAP	5WAP	6 WAP	3 WAP	4WAP	5WAP
T1	0.4 b	0.7 a	4.6 ab	10.9 b	6.3 a	0.23 b	0.49 b	4.02 b
T2	1.65 ab	1.96 a	3.4 b	8.8 b	5.6 a	0.56 b	1.66 ab	7.42 ab
T3	1.6 ab	0.56 a	7.7 a	21.0 a	15.0 ab	0.52 b	1.17 ab	7.48 ab
T4	1.6 ab	2.76 a	3.7 b	5.0 b	6.4 b	2.01 ab	4.45 a	12.05 a
T5	2.42 a	4.0 a	7.9 a	10.8 b	8.6 ab	3.57 a	2.42 ab	12.05 a
T6	0.57 b	1.7 a	6.7 ab	13.5 ab	18.3 a	1.05 b	2.11 ab	9.06 ab
T7	1.23 a	2.2 a	4.8 ab	10.6 b	5.6 b	3.57 a	2.42 ab	12.05 a

Note: T1=Seed treatment by Thiomethoxam70 WS and spraying of Thiomethoxam 25 WG and Buprefezin at 10 days intervals; T2=Seed treatment by Thiomethoxam and establishment of Yellow sticky traps; T3=Seed treatment by Thiomethoxam, establishment of yellow sticky traps, intercropping Finger millet and repelling with Marygold; T4=Establishment of Yellow sticky traps and repelling with Marygold; T5=Establishment of Yellow sticky traps and Intercropping Finger millet; T6=Seed treatment by Thiomethoxam70 WS and Intercropping Finger millet; and T7=Untreated Control (sole crop). WAP=Weeks after planting. Within each column, the means followed by the same letter are not significantly different at p=0.05.

Table 2. Whitefly count in mungbean during *yala* 2011 and *maha* 2011/12 seasons.

Treatment	Virus affected plant count/plot							
	Yala 2011					Maha 2011/12		
	2 WAP	3 WAP	4WAP	5WAP	6 WAP	3 WAP	4WAP	5WAP
T1	1.0 b	0.33 b	0.66 b	3.0 ab	0.66 c	3.0 a	4.3 abc	1.3 a
T2	2.3 b	0.0 b	0.0 b	2.3 ab	3.6 a	1.6 a	2.6 bc	0.0 b
T3	0.66 b	0.33 b	1.33 b	1.0 b	1.0 c	1.6 a	3.0 abc	0.6 a
T4	2.6 b	0.33 b	0.33 b	3.0 ab	1.6 abc	2.0 a	7.3 a	0.6 ab
T5	2.6 b	0.0 b	0.33 b	2.0 ab	1.6 abc	3.3 a	1.3 c	0.3 ab
T6	1.0 b	0.0 b	1.33 b	2.6 ab	2.6 abc	2.3 a	3.6 abc	1.0 ab
T7	7.0 a	3.33 a	3.0 a	4.3 a	3.0 ab	2.3 a	7.0 ab	0.0 b

Note: T1=Seed treatment by Thiomethoxam70 WS and spraying of Thiomethoxam 25 WG and Buprefezin at 10 days intervals; T2=Seed treatment by Thiomethoxam and establishment of Yellow sticky traps; T3=Seed treatment by Thiomethoxam, establishment of yellow sticky traps, intercropping Finger millet and repelling with Marygold; T4=Establishment of Yellow sticky traps and repelling with Marygold; T5=Establishment of Yellow sticky traps and Intercropping Finger millet; T6=Seed treatment by Thiomethoxam70 WS and Intercropping Finger millet; and T7=Untreated Control (sole crop). WAP=Weeks after planting. Within each column, the means followed by the same letter are not significantly different at p=0.05.

With respect to viral infected plant count, package of practices including seed treatment Thiomethoxam along with sprays of Thiomethoxam followed by Buprefezin in ten day intervals were found equally effective in recording lower viral infected plant

count (0.23-4.02) in each week. Plants treated with seed treatment Thiomethoxam along with finger millet intercrop, also recorded significantly lower whitefly population (Table 2).

CONCLUSIONS

Mungbean yellow mosaic virus incidences could be significantly reduced by implementing the following package of integrated management practices consisting, field establishment of three weeks aged finger millet plants one week prior to plant mungbean as an intercrop, treating mungbean seeds with Thiomethoxam 70 % WS at the rate of 3.5 g/kg of seeds 24 hours prior to planting, establishment of yellow sticky traps and cultivating marigold with removal of flower buds. In a heavy infestation under large scale farming, seed treatment with Thiomethoxam 70 % WS along with sprays of Thiomethoxam 25 WG and Buprefezin in 10 days intervals is effective for managing whitefly vectors and prevent the resurgence simultaneously.

REFERENCES

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