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Evaluation of different ecofriendly botanicals against Yellow Vein Mosaic Virus disease of okra under terai agroecological zone of West Bengal

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Six different botanicals like Prozofora oil, Pamarosa oil, Citronella oil, lemon grass oil, coronza oil, neem oil and an insecticide Rogar (Dimethoate), were evaluated against Yellow vein mosaic virus disease of okra under terai agro ecological region of West Bengal. The oils were applied @ 1.25 ml per litre of water. Among the different oils lowest disease incidence was found in case of lemon grass oil treated plots (15.6%) followed by neem oil (20.33%) and Prozofora oil (20.7%). No significant differences exist between lemon grass oil and neem oil treatment but significant differences exist between Prozofora oil and other treatments. Average white fly population was lowest in case Rogar treated plots (1.33) followed by lemon grass oil treated plots (1.66) with no significant difference among them. Highest fruit yield was obtained from lemon grass oil treated plots (54.75 Q/ha) followed by Prozofora oil (48.89 Q/ha) and Rogar (47.67 Q/ha) with no significant difference among them.

Key words: Botanicals, Yellow vein mosaic virus, okra, white fly

INTRODUCTION

Okra (*Abelmoschus esculentus* L. Moench) is an important vegetable crop of tropics and subtropic for many centuries (Thompson and Kelly, 1957). The plants have an erect vegetative growth and produce tender, fleshy capsule like fruits. It is a rich source of vitamin and iodine which is very much useful for the control of goitar (Yawalkar, 1969). Among the different diseases affecting this crop, yellow vein mosaic virus disease is the most destructive one and incurred heavy loss by infecting all stages of plant growth (Sastry and Singh, 1974). The disease causes an average loss as high as 93.8% to the crop depending upon the age of the plant at infection (Sinha and Chakraborty, 1978). Because of the immense economic significance of this disease, investigations are being carried out both at national and international level on different aspects of the disease particularly on the management by means of controlling the vector white fly (*Bemisia tabaci* Genn) through application of insecticides. Considering this fact the experiment was conducted to manage the disease by alternative method like spraying of ecofriendly botanical pesticides. Spraying of the plant product or botanicals show delay in disease occurrence up to 60 DAS. However, root based products of drum stick showed promising result with considerable yield advantage (Debnath and Nath 2002).

MATERIALS AND METHODS

The field experiment was conducted during *Pre kharif* season 2007 at the experimental farm of Uttar Banga Krishi Viwavidyalaya, Pundibari, Coochbehar, for the evaluation of different ecofriendly botanical pesticides against the yellow vein mosaic virus disease of okra under terai zone of W.B. The experiment was conducted following RBD with three replications with a net plot size of 3 × 2.7 sq mt with a spacing of 60 cm × 30 cm. Parvani Kranti, a popular okra cultivar, was used for conducting the field experiment following normal

agronomic practices.In the present study different botanical pesticides like Prozofora, Pama rosa, Citronella, Lemon grass, Coronza, and Neem oil with a dose of 1 ml per litre of water and a recommended insecticide Rogar (Dimethoate) @ 1.25 ml per litre of water were used against white fly (*Bemisia tabaci*) vector of YVMV disease of okra. The test variety was sown on 27-02-2007. The first spraying was done on 28-03-2007 followed by a second spray after 15 days. Total three sprays were done at 15 days interval. Regarding observation first appearance of the disease was recorded. Incidence of the disease recorded at 90 days after sowing. Average population of white fly was also taken at 90 days after sowing. The incidence of the disease recorded by using the following formula.

Disease incidence = (No of plant infected in a plot/ Total no of plant in a plot) x 100.

RESULTS AND DISCUSSION

The first appearance of the disease varied from 15-24 DAS. The final disease incidence was recorded at 90 DAS. The incidence of the disease was low as compared with untreated control plots where the disease incidence was recorded as 50.04%. The botanicals and insecticide treated plants showed a range of disease incidence (15.6-28.77%). Significant lower disease incidence was recorded in the lemon grass oil treated plots (15.6%) as compared with the other treatments except neem oil treated plots (20.33%) with no significant difference among them. Though lemon grass oil gave best regarding lowest disease incidence but the symptom of the disease appeared at very early stage (17 DAS). Though neem oil treated plot showed lower disease incidence like 20.33% and 20.7% respectively with no significant difference among them. Significant lower population of white fly per plant was found in Rogar treated plots (1.33) as compared with other treatment except citronella (2.33), coronza (2.00) and lemon oil (1.66) treated plants. In case of average white fly population no significant difference was found among citronella (2.33), coronza (2.00) and lemon oil (1.66) treated plants.

Table 1 : Effect of different ecofriendly oils botanical pesticides on the Yellow vein mosaic virus disease incidence of okra.

Treatment (Botanicals)	Dose per litre of water (ml)	First appearance of the disease DAS	Disease incidence at 90 DAS	Average white fly population per plant at 90 DAS	Fruit yield (Q/ha)	Per cent yield increase over control
Prozofora oil	1	18	20.7 (27.06)	4.00	48.89	28.11
Pam Rosa oil	1	15	24.45 (29.63)	5.00	45.11	18.21
Citronella oil	1	15	21.5 (27.62)	2.33	43.38	13.68
Lemon grass oil	1	17	15.6 (23.26)	1.66	54.75	43.47
Coronza oil	1	21	28.77 (23.44)	2.00	41.19	7.94
Neem oil	1	24	20.33 (26.8)	4.33	45.67	22.30
Rogar (Recommended insecticide)	1.25	23	27.43 (31.58)	1.33	47.67	24.92
Control	—	15	50.04 (45.02)	15.66	38.16	
CD(0.05)			4.76	2.44	8.56	
SEm±			1.62	0.83	2.92	

* Figures in the parenthesis depicted angular transformed value.

Regarding the fruit yield significant highest fruit yield was obtained from lemon grass oil treated plots i.e.(54.75 q/ha) as compared with other treatments except neem oil (46.67 q/ha), Rogar (47.67) and prozofora oil (48.89 q/ha) treated plants. So it was found that lemon grass oil gave maximum yield with minimum incidence of YVMV disease. Root based plant products showed promising result in reducing the yellow vein mosaic virus disease with considerable yield advantage. (Debnath and Nath 2002).

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