

## Efficacy of Plant Products against Serpentine Leaf Miner and White fly on Tomato

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Field studies were conducted to evaluate different botanical insecticides against sucking insect pests on tomato. The experiment was carried out at College of Agriculture, Jabalpur during Rabi season 2005-06. Pusa Ruby variety was sown in 4.8 X 3.6meter square plots, with three replication in RBD. There were eight treatments including untreated control. It was revealed that the NSKP 10% was found most effective against leaf miner *Liriomyza trifolii* (Burgess) and neem oil 3% was considered the most effective treatments against White fly *Bemisia tabaci* (Genn.) and provided maximum protection and higher yield. It may be due to their antifeedant activity also.

**Keywords:** Tomato, Neem, Botanicals, Leaf miner, White fly.

Tomato (*Lycopersicon esculentum*.) is one of the most important vegetable crops attacked by several insect-pests from the time of planting till fruit is harvested. Insects can cause damage to crop in many ways. Some may also act as vector of many viral diseases. Leaf miner *Liriomyza trifolii* is a serious and a polyphagous pest of tomato crop. Its Maggot mines between two epidermal layers of the leaf and makes serpentine mines. Extensive leaf mining activity reduces photosynthetic process of plants, resulting in defoliation and produce unmarketable fruits. White fly *Bemisia tabaci* is another serious and Polyphagous sucking pest of tomato crop. The damage is caused by both nymphs and adults. They suck the plant sap from lower Surface of leaves. Severe infestation results in premature defoliation and plant unable to produce flowers and fruit

### MATERIALS AND METHODS

The experiment was carried out at College of Agriculture, Jabalpur during Rabi season 2004-05. Pusa Ruby variety was sown in 4.8 X 3.6meter square plots, with three replication in RBD. There were eight treatments including untreated control. The insecticides were sprayed thrice at insect population crossed ETL. The population was recorded on ten randomly selected plants/plots before 24 hours (Pretreatment) and after 3, 7, and 10 days of each spray. Data were analyzed after suitable transformation.

### RESULTS AND DISCUSSION

#### White fly

The results are depicted in Table – 1. On the basis of overall white fly population, all the botanical treatments differed significantly over untreated control (11.81 flies/10 twigs). However, among the botanicals, neem oil 3% (2.51 flies/10 twigs) and NSKP 10% (2.66 flies/10 twigs) proved superior to rest of the botanical treatments. The

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**Table 1.** Evaluation of botanicals against white fly on tomato

Treatment	Dose /ha	Pre treatment observation	Population of nymph and adult /10 twigs (Mean of three replication)									Overall Mean
			First spraying			Second spraying			Third spraying			
			3days after	7 days after	10 days after	3days after	7 days after	10 days after	3days after	7 days after	10 days after	
Neem oil 3%	18l/ha	6.66 (2.64)	2.66 (1.77)	3.33 (1.95)	6.66 (2.67)	3.33 (1.95)	2.33 (1.67)	1.66 (1.46)	2.33 (1.68)	0.33 (0.91)	0.00 (0.70)	2.51 (1.73)
Karanj oil 3%	18l/ha	8.66 (3.02)	3.00 (1.84)	6.00 (2.54)	10.33 (3.28)	4.00 (2.11)	3.33 (1.95)	4.00 (2.12)	4.00 (2.12)	1.73 (1.49)	0.66 (1.07)	4.11 (2.14)
Mahua oil 3%	18l/ha	6.00 (2.54)	4.33 (2.19)	7.33 (2.79)	7.00 (2.73)	5.33 (2.40)	4.00 (2.11)	3.00 (1.85)	3.33 (1.95)	2.00 (1.58)	1.00 (1.22)	4.14 (2.15)
Castor oil 3%	18l/ha	7.00 (2.69)	2.33 (1.67)	4.33 (2.18)	9.33 (3.12)	3.00 (1.85)	2.00 (1.58)	1.66 (1.46)	3.00 (1.87)	1.66 (1.47)	1.00 (1.22)	3.14 (1.90)
Ipomia leaf extract 10%	60l/ha	7.66 (2.85)	5.33 (2.41)	6.66 (2.67)	9.33 (3.12)	6.00 (2.54)	6.00 (2.54)	3.00 (1.85)	6.00 (2.54)	3.00 (1.87)	2.00 (1.58)	5.25 (2.39)
NSKP 10%	60kg/ha	7.00 (2.73)	1.66 (1.44)	4.00 (2.11)	7.33 (2.79)	3.33 (1.95)	2.00 (1.55)	2.33 (1.67)	2.66 (1.77)	0.66 (1.07)	0.00 (0.70)	2.66 (1.77)
Amrut neem 0.5%	6l/ha	8.33 (2.97)	6.00 (2.52)	7.33 (2.79)	10.66 (3.33)	6.66 (2.67)	5.00 (2.33)	5.00 (2.33)	5.33 (2.41)	3.32 (1.95)	2.33 (1.68)	5.73 (2.49)
Control	-	8.00 (2.91)	12.66 (3.62)	10.00 (3.24)	15.00 (3.93)	16.33 (4.10)	15.33 (3.97)	15.66 (4.01)	10.00 (3.24)	6.33 (2.61)	5.00 (2.34)	11.8 (3.50)
S.Em+	-	NS	0.13	0.11	0.12	0.12	0.13	0.09	0.01	0.01	0.01	0.04
C.D. at 5%	-	-	0.39	0.35	0.39	0.38	0.41	0.29	0.04	0.04	0.03	0.13

NS= Non significant.

Figures in parentheses are transformed value =  $0+0.5$

**Table 2.** Evaluation of botanicals against leaf miner in tomato

Treatment	Conc.	Percentage infestation of leaf miner (mean of three replications)							Fruit yield Mean	Q/ha
		Pre treatment observation	First spraying			Second spraying				
			3DAT	7 DAT	10 DAT	3DAT	7 DAT	10 DAT		
Neem Oil	3%	30.55	15.55	12.22	20.00	6.67	7.77	9.33	11.92	67.1
Karanj oil	3%	28.89	22.22	16.67	24.44	12.22	15.55	17.77	18.15	44.5
Mahua oil	3%	25.55	16.67	13.33	21.11	5.55	8.89	10.00	12.59	43.1
Castor oil	3%	23.33	22.22	16.67	24.44	14.44	17.77	17.77	18.89	46.4
Ipomoea leaf extract	10%	26.67	23.33	17.77	26.67	16.67	18.89	22.22	20.93	35.5
Neem seed kernel powder (NSKP)	10%	25.55	15.55	11.11	21.11	4.44	6.67	6.67	10.93	64.1
Amrut Neem	0.5%	20.73	20.00	14.44	24.44	13.32	15.55	16.67	17.40	36.6
Check (Control)		22.22	37.77	41.11	42.00	45.55	50.00	52.22	44.78	20.7
S.Em+		NS	0.50	0.31	0.58	0.45	0.28	0.27	0.41	1.96
C.D. at 5%		-	1.53	0.94	1.77	1.36	0.85	0.84	1.27	5.96

next better treatment was castor oil 3% (3.14 flies/10 twigs). In the present investigation, NSKP 10% and neem oil 3% were found most effective treatments against white fly in tomato. Earlier workers also tested the plant products against white fly in tomato and found reduction in the pest population by two plant extracts neem and karanj derivatives also obtained population reduction of white fly in neem treated plots which also produced higher yield than other treatments. Some findings were reported by previous workers Dimetry *et al.*, 1996, Sabillon and Bustamante (1995) Somsekhar, *et al.* 1997 Singh *et al.* 2006.

#### Leaf miner

The results are depicted in Table – 2. All the treatments had less leaf infestation than untreated control (44.78%). Among the botanicals, NSKP 10% (10.93% leaf infestation) and neem oil 3% (11.92% leaf infestation) treatments proved significantly superior than other treatments. The next better treatment was mahua oil 3% (12.59%). Thus, neem products were found superior to other botanicals. Trinidad *et al.* (2000) also reported 82 to 94.7 per cent mortality of eggs and larvae of tomato leaf miner fourth day after the treatment of neem seed kernel extract (NSKE). However, 100 per cent mortality was caused by all the concentrations after sixth day of the treatment. Jayakumar and Uthamasamy (1997) also reported that neem oil 3% and mahua oil 3% caused 93.3 per

cent and 90 per cent larval mortality of *Liriomyza trifolii*. Viraktamath *et al.* (1993) also reported the effectiveness of neem seed kernel extract 4% against *Liriomyza trifolii* on tomato. Azam (1991) reported that the neem oil 1.0 and 1.25 per cent caused more than 80 per cent mortality of the larvae and pupae of *L. trifolii* and other similar findings were reported by Murthy and Prasad (1996) Wankhede *et al.*, (2007) Mishra and Shantipriya (2008). The maximum fruit yield was recorded in neem oil 3% (67.1 q/ha) which was at par with NSKP 10% (64.1 q/ha) proved significantly superior to other treatments. The Minimum fruit yield was rerecorded in untreated control plot (20.7q/ha) it is three times less than neem oil 3. %.

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