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EFFICACY OF CERTAIN INSECTICIDES AGAINST *BEMISIA TABACI* (GENNADIUS) IN OKRA

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ABSTRACT

A field experiment was conducted at the Research Farm of Tirhut College Agriculture Dholi, Muzaffarpur (Bihar) during kharif 2018 and 2019 to evaluate the efficacy of insecticides against whitefly *Bemisia tabaci* (Genn.) on okra. The results revealed that thiamethoxam 25WG @ 25 g a.i./ ha after three applications, at 15 days interval gave maximum reduction of incidence (0.50/ 3 leaves). The next effective ones were acetamiprid 20SP 20 g a.i./ ha and profenophos 50EC 500 g a.i./ ha which was at par with thiamethoxam 25WG @ 25g a.i./ ha. Among the botanicals, the yam bean seed extract (YBSE) 5% was superior followed by neem seed kernel extract (NSKE) 5% and neem oil 3%.

Key words: Efficacy, insecticides, okra, *Bemisia tabaci*, thiamethoxam, acetamiprid, profenophos, spinosad, deltamethrin, neem oil, YBSE and NSKE

Okra is a crucial fruit vegetable cultivated throughout the tropics and warm part of the temperate regions (Lal and Sinha, 2005). In India it is extensively grown during kharif (Singh et al., 2008). The incidence of insect pests is a major problem for low productivity. Like other vegetable crops, okra is also damaged by many insect pests. Okra crop harbours nearly, 72 insect species (Srinivasa and Rajendran, 2003)) including vectors (Showkat et al., 2010). Among these the whitefly *Bemisia tabaci* (Genn.) is the most destructive polyphagous sucking insect pest. In addition, to sap sucking, whitefly also acts as vector of yellow vein mosaic viral disease (Raghuraman and Birah, 2011). Farmers mainly rely on conventional synthetic insecticides. In past years many chemicals and botanicals have been introduced to control sucking pests. In the present study, an attempt has been made to evaluate the efficacy of certain chemicals and botanicals against *B. tabaci* under field condition.

MATERIALS AND METHODS

A field trial was laid out in randomized block design at the Research Farm of Tirhut College of Agriculture, Dholi, Muzaffarpur (Bihar) with nine treatments, replicated thrice. Kashi Pragati okra variety was grown following all the recommended package of practices. The crop was sown on 13th June 2018 and 15th June 2019 in a plot size of 3x 2 m with a row spacing of 50x 20 cm during kharif 2018 and 2019, respectively. All the nine treatments viz. T_1- spinosad 45SC @ 50 g a.i./ ha, T_2- thiamethoxam 25WG @ 25 g a.i./ ha, T_3- acetamiprid 20SP @ 20 g a.i./ ha, T_4- deltamethrin 2.8EC @ 15 g a.i./ ha, T_5- profenophos 50EC @ 500 g a.i./ ha, T_6- neem oil 3%, T_7 - neem seed kernel extract (NSKE) 5%, T_8- yam bean seed extract (YBSE) 5% and T_9- untreated control. The treatments were applied thrice at fortnightly interval starting after one month of sowing. Incidence of *B.tabaci* was observed by counting both nymphs and adults on three leaves i.e. top, middle and bottom of each ten tagged plants using a magnifying lens (10x) a day before spraying and three and seven days after each spray. Mean number. three leaves worked out were used to compute % reduction over control. Data so obtained were subjected to statistical analysis using OPSTAT software, after $\sqrt{x+0.5}$ transformation.

RESULTS AND DISCUSSION

The pooled data given in Table 1 reveals that *B. tabaci* incidence/ counts. three leaves varied significantly among the treatments and ranged from 1.93 to 6.23, 0.67 to 5.92, 0.33 to 5.57 and 0.50 to 5.74 at 1 days before spraying (DBS) as well as 3 and 7 days after spraying (DAS) and cumulative mean, respectively. On cumulative mean basis counts/ three leaves was observed to be the least with thiamethoxam 25WG (0.50) which was at par with acetamiprid 20SP (0.58). Among the plant products, least count (2.33) was obtained from YBSE 5% followed by NSKE 5% (2.55) and neem oil 3% (2.89). All the treatments were found significantly superior over untreated control (5.74 whitefly/ 3 leaves). The maximum reduction over control after third spray was observed with thiamethoxam 25WG (91.29%) while

Table 1. Efficacy of insecticides and botanicals against *B.tabaci* on okra (pooled data, kharif 2018 and 2019)

Treatments	Dose (a.i./ha)/ Concentration	Mean number of whitefly/ three leaves			Cumulative Mean	Mean % reduction over control
		1 DBS	3 DAS	7 DAS		
T_1 – Spinosad (45SC)	50 g	2.48 (1.86)	1.07 (1.44)	0.65 (1.28)	0.86 (1.36)	85.01
T_2 – Thiamethoxam (25WG)	25 g	1.93 (1.71)	0.67 (1.29)	0.33 (1.15)	0.50 (1.22)	91.29
T_3 – Acetamiprid (20SP)	20 g	2.02 (1.74)	0.77 (1.33)	0.40 (1.18)	0.58 (1.26)	89.89
T_4 – Deltamethrin (2.8EC)	15 g	2.40 (1.84)	1.18 (1.48)	0.79 (1.34)	0.99 (1.41)	82.75
T_5 – Profenophos (50EC)	500 g	2.13 (1.77)	0.92 (1.38)	0.53 (1.24)	0.72 (1.31)	87.45
T_6 – Neem oil	3%	4.27 (2.29)	2.78 (1.94)	3.00 (2.00)	2.89 (1.97)	49.65
T_7 – NSKE	5%	3.97 (2.23)	2.40 (1.84)	2.70 (1.92)	2.55 (1.88)	55.57
T_8 – YBSE	5%	3.75 (2.18)	2.20 (1.79)	2.45 (1.86)	2.33 (1.82)	59.41
T_9 – Untreated control		6.23 (2.69)	5.92 (2.63)	5.57 (2.56)	5.74 (2.60)	-
S.Em (±)		(0.04)	(0.03)	(0.02)	(0.02)	-
CD (p=0.05)		(0.12)	(0.08)	(0.06)	(0.05)	-
CV (%)		8.82	7.93	6.25	5.05	-

DBS- Days before spray; DAS- Days after spray; YBSE- Yam bean seed extract; NSKE- Neem seed kernel extract; #Figures in parentheses √x+0.5 transformed values

it was minimum in neem oil 3% (49.65%). The present results agree with those of Raghuraman et al. (2008) on acetamiprid 20SP. Bajpai and Jeengar (2014) evaluated some insecticides and observed that tolfenpyrad treated plot followed by imidacloprid 17.85SL and acetamiprid 20WP were the best. Gadekar et al. (2016) observed that acetamiprid (0.004%) was the most effective followed by thiamethoxam (0.005%) and acephate (0.05%). More or less similar results were also reported by Rajveer et al. (2017).

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