Efficacy of Selected Insecticides against Sucking Insect Pests
[Amrasca biguttula biguttula (Ishida) and Bemisia tabaci (Gennadius)]
of Okra [Abelmoschus esculentus (L.) Moench]

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Abstract

The field studies were conducted during kharif 2016 to determine the
efficacy of selected insecticides against sucking insect pests Amrasca
biguttula biguttula (Ishida) and Bemisia tabaci (Gennadius) of okra at
Central agriculture field, SHUATS (Sam Higginbottom University of
Agriculture, Technology and Sciences), Allahabad, Uttar Pradesh (India).
Studies revealed that all the treatments were found effective in reducing
the population of whitefly and jassid as compared to control, Imidiacloprid
17.8SL was the most effective treatment indicating reduction in population
of whitefly (1.33/3leaves) and jassid (1.26/3leaves), followed by
Thiamethoxam 25WG.

Keywords
Okra, Amrasca biguttula biguttula, Bemesia tabaci, Insecticides.

Introduction

Okra [Abelmoschus esculentus (L.) Moench] is most popular vegetable of the family
Malvaceae. In India, it is grown both in summer and rainy seasons (Lal and Sinha,
2005). Tender fruits of okra are used as vegetable or in culinary preparations as sliced
and dried pieces. It is also used for thickening gravies and soups, because of its high
mucilage content. They are also good source, vitamins, proteins, carbohydrates, minerals,
iron, calcium, potassium and acids viz., rhamnose (22%), galacturonic acid (27%) and
amino acid (11%). It is an important vegetable crop cultivated all over India with a
major share in state of Maharasstra, West Bengal, Uttarpradesh, Karnataka, Gujrat and
Madhya Pradesh (Shinde et al., 2007).

One of the important limiting factors in the
cultivation of okra is insect pests. Many of the
pests occurring on cotton are found to ravage
okra crop. As high as 72 species of insects
have been recorded on okra (Srinivasa and
Rajendran, 2003), of which, the sucking pests
comprising of Aphids, Aphis gossypii
(Glover), leafhopper, Amrasca biguttula
biguttula (Ishida) and whitefly, Bemisia
tabaci (Gennadius) causes significant damage
to the crop.

Among different sucking insect pests, jassid
and whitefly are more serious (Atwal, 1994)
and transmit certain viral diseases. Moreover,
they cause a great damage by sucking the
plant sap. Pests cause 35-40% crop yield
losses and ultimately increase the level of damage up to 60-70% in optimal conditions (Salim, 1999).

Jassids both nymphs and adults suck the cell sap usually from the ventral surface of the leaves and while feeding inject toxic saliva into plant tissues, affected leaves turn yellowish and curl. Whitefly are the milky white minute flies; nymphs and adults suck the cell sap from the leaves. The affected leaves are curled and dried. The affected plants show a stunted growth. Whiteflies are also responsible for transmitting yellow vein mosaic virus (Singh et al., 2008).

**Materials and Methods**

The experiment was conducted during the kharif season 2016 at Central field, SHUATS, Allahabad. The okra seeds of variety BND777 were sown by dibbling method with spacing of 45 cm×30 cm by placing 2-3 seeds per hill. Gap filling and thinning was done to maintaining the optimum plant density and prevents competition among the plants.

The experiment was laid out in randomized block design with eight treatments and three replication. The observations on the number of leafhoppers and whiteflies were made, a day before followed by 3rd, 7th, 14th days after spraying and data were recorded from three leaves each from top, middle and bottom leaves from the five randomly selected and tagged plants from each plot without disturbing the plants to minimize the observational errors. Population of sucking pest was recorded from each net plot and the population was worked out per three leaves. The data were subjected to statistical analysis.

**Results and Discussion**

The results of the study on the efficacy of selected insecticides against whiteflies and jassid population are presented in Table 1 and Table 2 respectively.

**Whiteflies**

The overall mean result represented in the table reveals that all the treatments were significantly superior over control. Among all the treatments Imidacloprid (1.33 whiteflies/3leaves) is most effective and recorded lowest population followed by Thiamethoxam (1.46 whiteflies/3leaves), followed by Fipronil (2.06 whiteflies/3leaves) and Dimethoate (2.18 whiteflies/3leaves) are at par with each other, next treatment followed by lambdacyhalothrin (3.03 whiteflies/3leaves), Malathion (3.50 whiteflies/3leaves), while Azadirachtin (4.10 whiteflies/3leaves) is least effective among all the treatments.

These findings are in accordance with the findings of Begum and patil (2016) reported that imidacloprid 17.8SL was the most effective treatment indicating reduction in population of leafhoppers and whiteflies. Similarly, Pawar et al., (2016) reported that mean population of aphids, jassids, and whiteflies after three sprays revealed that imidacloprid was effective and superior, the next best were thiomethoxam. Preetha et al., (2009) reported that imidacloprid was found effective against jassids and whiteflies, the other neonicotinoid, thiamethoxam also provided similar levels of protection as that of imidacloprid.

Sarkar (2016) performance of insecticides against whitefly was recorded in imidacloprid treated plots with lowest mean population.

**Jassid**

The result represented in the table reveals that all the treatments were significantly superior over control.
Table 1: Efficacy of selected insecticides on Whitefly in okra

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Treatments</th>
<th>Number of whiteflies/3 leaves</th>
<th>Overall Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>First spray</td>
<td>Second spray</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 DBS</td>
<td>3 DAS</td>
</tr>
<tr>
<td>1</td>
<td>Thiamethoxam 25 % WG</td>
<td>7.53 (2.74)</td>
<td>1.53 (1.23)</td>
</tr>
<tr>
<td>2</td>
<td>Azadirachtin 5 % EC</td>
<td>7.46 (2.73)</td>
<td>3.54 (1.88)</td>
</tr>
<tr>
<td>3</td>
<td>Imidacloprid 17.8 % SL</td>
<td>7.66 (2.76)</td>
<td>1.46 (1.21)</td>
</tr>
<tr>
<td>4</td>
<td>Fipronil 5% SC</td>
<td>7.93 (2.81)</td>
<td>1.94 (1.39)</td>
</tr>
<tr>
<td>5</td>
<td>Dimethoate 30EC</td>
<td>7.74 (2.77)</td>
<td>2.15 (1.43)</td>
</tr>
<tr>
<td>6</td>
<td>Malathion 50EC</td>
<td>7.34 (2.70)</td>
<td>3.31 (1.80)</td>
</tr>
<tr>
<td>7</td>
<td>Lambda cyhalothrin 5% EC</td>
<td>7.13 (2.66)</td>
<td>2.86 (1.59)</td>
</tr>
<tr>
<td>8</td>
<td>Untreated</td>
<td>6.93 (2.63)</td>
<td>7.26 (2.69)</td>
</tr>
</tbody>
</table>

S. Ed. (±) 0.23 0.02 0.04 0.03 0.23 0.04 0.03 0.02 -
C. D. (P = 0.05) NS 0.06 0.14 0.08 NS 0.11 0.08 0.07 -

Table 2: Efficacy of selected insecticides on jassid (Amrasca biguttula biguttula) in okra

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Treatments</th>
<th>First spray</th>
<th>Second spray</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1 DBS</td>
<td>3 DAS</td>
</tr>
<tr>
<td>1</td>
<td>Thiamethoxam 25 % WG</td>
<td>6.94 (2.62)</td>
<td>1.45 (1.21)</td>
</tr>
<tr>
<td>2</td>
<td>Azadirachtin 5% EC</td>
<td>6.93 (2.63)</td>
<td>3.66 (1.91)</td>
</tr>
<tr>
<td>3</td>
<td>Imidacloprid 17.8% SL</td>
<td>6.80 (2.60)</td>
<td>1.26 (1.12)</td>
</tr>
<tr>
<td>4</td>
<td>Fipronil 5% SC</td>
<td>6.86 (2.18)</td>
<td>1.72 (1.31)</td>
</tr>
<tr>
<td>5</td>
<td>Dimethoate 30EC</td>
<td>6.93 (2.62)</td>
<td>1.85 (1.36)</td>
</tr>
<tr>
<td>6</td>
<td>Malathion 50EC</td>
<td>6.53 (2.55)</td>
<td>2.86 (1.69)</td>
</tr>
<tr>
<td>7</td>
<td>Lambda cyhalothrin 5% EC</td>
<td>6.86 (2.61)</td>
<td>2.51 (1.59)</td>
</tr>
<tr>
<td>8</td>
<td>Untreated</td>
<td>6.86 (2.61)</td>
<td>7.46 (2.73)</td>
</tr>
</tbody>
</table>

S. Ed. (±) 0.28 0.03 0.05 0.03 0.28 0.02 0.03 0.02 -
C. D. (P = 0.05) NS 0.09 0.10 0.09 NS 0.07 0.08 0.07 -

Among all the treatments Imidacloprid (1.26 jassid /3leaves) recorded lowest population followed by Thiamethoxam (1.43 jassid/3leaves), followed by next effective treatment Fipronil (1.96 jassid/3leaves), Dimethoate (2.11 jassid/3leaves), followed by treatment lambda Cyhalothrin (2.99 jassid /3leaves), Malathion (3.52 jassid /3leaves), while Azadirachtin (4.01 jassid/3leaves) is least effective among all the treatments.
These findings are in accordance with the findings of Preetha et al., (2009) reported that imidacloprid was found effective against jassids and whiteflies, the other neonicotinoid, thiomethoxam also provided similar levels of protection as that of imidacloprid. Similarly, Begum and patil (2016) reported that imidacloprid 17.8SL was the most effective treatment indicating reduction in population of leafhoppers and whitefly. Pawar et al., (2016) reported that mean population of aphids, jassids, and whiteflies after three sprays revealed that imidacloprid was effective and superior, the next best were thiomethoxam. Dabhi et al., (2014) reported that imidacloprid and dimethoate found to be effective against leafhopper (81%) infesting okra. From the critical analysis of the present findings it can be concluded that insecticides like imidacloprid (1.33 whiteflies/3 leaves), Thiamethoxam (1.46 whiteflies/3 leaves) are the best suitable for whiteflies and Imidacloprid (1.26 jassid/3 leaves), Thiamethoxam (1.43 jassid/3 leaves) for jassid are the best suitable insecticides among other group of insecticides can be suitably incorporated in pest management against sucking pest like whitefly and jassid.

Acknowledgement

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References


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