EFFICACY OF INSECTICIDE MODULES AGAINST THRIPS AND MITES IN CHILLI

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ABSTRACT

Experiments conducted during 2016-17 and 2017-18 on chilli var. Tejaswini evaluated the efficacy of pest management modules at the Vegetable Research Station, Sri Konda Laxman Telangana State Horticultural University, Hyderabad. Biointensive, integrated and chemical modules were evaluated against thrips Scirtothrips dorsalis Hood and mite Polyphagotarsonemus latus Banks. Integrated module (seedling dip with imidacloprid 17.8%SL @ 1ml/1 of water; spraying of buprofezin 25%S @ 1 ml/1 at 25 Days after transplanting; spraying of fipronil 5%SC @ 2ml/1 at 35 DAT; spraying of Lecanicillium (=Verticillium) lecanii (1x 10^8cfu/ g) @ 5 g/1 at 45 DAT; spraying of chlorfenapyr 10%SC @ 1.5 ml/1 at 55 DAT; spraying of neem oil 1% at 65 DAT; and subsequent rotation were the most effective modules, also giving maximum yield. The least incidence of mite was observed with the integrated module, and that of thrips, in the integrated module, the next best being the chemical module; and in terms of cost benefit ratio too, integrated module was the best (1: 4.2).

Key words: Chilli, Scirtothrips dorsalis, Polyphagotarsonemus latus, Lecanicillium lecanii, integrated, chemical and biointensive modules, imidacloprid, buprofezin, fipronil, chlorfenapyr, neem oil, seedling dip

Chilli, Capsicum annum L. is one of the important commercial spice crops grown in India. The important chilli growing states in India are Telangana, Andhra Pradesh, Orissa, Maharashtra, and Karnataka. The crop is attacked by various pests and the yield is affected mainly by the sucking pests like chilli thrips Scirtothrips dorsalis (Hood), green peach aphid Myzus persicae (Sulzer), chilli mite, Polyphagotarsonemus latus (Banks), which affect the crop from nursery till harvest and also transmit several diseases like leaf curl and mosaic viruses (Abdul Kareem et al., 1977; saivaraj et al., 1979). Gundannavar et al. (2007) observed that among the IPM modules, marigold trap crop, vermicompost 2.5 t/ ha + neem cake 250kg/ ha (without application of recommended dose of fertilizers, superimposed with sprays of neemazal @ 2 ml/1 of water; spraying of acriflavine @ 1g/l at 5 week after transplanting (WAT), diafenthiuron @ 2g/l (8 WAT), profenophos @ 2 ml/1 (11 WAT) and neemazal @2ml/1 of water at the time of transplanting were the most effective on against aphids, thrips, and mites. Module with root dip of imidacloprid 17.8SL @ 0.5 ml/1 for 30 min at the time of transplanting accompanied with one spray each of azadirachtin 10000 ppm @ 2ml/l @ two, cyantraniliprole 10% OD @ 1.2 ml/1 @ five, L. leacanii @ 2g/l + spinosad 45 SC @ 0.25 ml/l @ seven, M. anisoplea @ 2g/l + spiromesifin 2 ml/1 @ nine and flubendiamide 48 SC @ 0.2 ml/l @ 11 WAT can be recommended. Efficacy of new insecticides needs to be evaluated in such modules, and the present study attempts this with certain newer insecticide modules and also integrate botanicals and entomopathogens against sucking insect pests infesting chilli.

MATERIALS AND METHODS

The experiment was conducted during kharif seasons of 2016-17 to 2017-18 at the Vegetable Research Station, Sri Konda Laxman Telangana State Horticultural University, Rajendranagar, Hyderabad, Telangana. The experiment was laid out in a completely randomized block design with five replications on Tejaswini variety. The treatments include- 1. Biointensive module (M1):
Table 1. Efficacy of pest management modules against (Polyphagotarsonemus latus and Scirtothrips dorsalis) in chilli.

<table>
<thead>
<tr>
<th>Modules</th>
<th>Number of yellow mites per terminal leaves</th>
<th>Number of thrips per terminal leaves</th>
<th>Yield (q/ha)</th>
<th>Increase in yield per hectare</th>
<th>Increase in yield percent over control</th>
<th>Net profit</th>
<th>Cost of increased yield per hectare</th>
<th>Cost of treatment</th>
<th>Net profit</th>
<th>B:C ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2016-17</td>
<td>2017-18</td>
<td>Pooled mean</td>
<td>Mean</td>
<td>Mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M1</td>
<td>2.07</td>
<td>11.20</td>
<td>(4.58)</td>
<td>14,340</td>
<td>7,840</td>
<td>7,440</td>
<td>6,500</td>
<td>7,840</td>
<td>7,440</td>
<td>1:01.2</td>
</tr>
<tr>
<td>M2</td>
<td>1.62</td>
<td>5.95</td>
<td>(2.81)</td>
<td>78.9</td>
<td>14.51</td>
<td>35.4</td>
<td>11,000</td>
<td>43.540</td>
<td>18,340</td>
<td>1:04.2</td>
</tr>
<tr>
<td>M3</td>
<td>1.61</td>
<td>8.52</td>
<td>(2.68)</td>
<td>14.51</td>
<td>14.51</td>
<td>35.4</td>
<td>11,000</td>
<td>43.540</td>
<td>18,340</td>
<td>1:01.7</td>
</tr>
<tr>
<td>M4</td>
<td>2.93</td>
<td>21.68</td>
<td>(8.65)</td>
<td>14.74</td>
<td>7.92</td>
<td>14.74</td>
<td>11,000</td>
<td>43.540</td>
<td>18,340</td>
<td>1:01.6</td>
</tr>
<tr>
<td>CD(%)</td>
<td></td>
<td></td>
<td>0.54</td>
<td></td>
<td>0.54</td>
<td>0.54</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CV%</td>
<td></td>
<td></td>
<td>16.83</td>
<td></td>
<td>16.83</td>
<td>16.83</td>
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</tr>
<tr>
<td>SEM</td>
<td></td>
<td></td>
<td>0.12</td>
<td></td>
<td>0.12</td>
<td>0.12</td>
<td></td>
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</tr>
</tbody>
</table>

Seedling dip with imidacloprid 17.8% SL @ 1 ml/1 of water; spray of abamectin 1.8% EC @ 0.75 ml/1 at 25 days after transplanting (DAT); spray of Lecanicillium (=Verticillium) lecanii (1x 108cfu/g) @ 5 g/l at 35 DAT; spray of pongamia oil @ 1% at 45 DAT; spray of buprofezin 25% SC @ 1 ml/l at 55 DAT; spray of neem oil @ 1% at 65 DAT; and subsequent rotation. 2. Integrated module (M2): Seedling dip with imidacloprid 17.8% SL @ 1 ml/l of water; spray of buprofezin 25% S @ 1 ml/l at 25 DAT; spray of fipronil 5% SC @ 2ml/l at 35 DAT; spray of Lecanicillium (=Verticillium) lecanii (1x 108cfu/g) @ 5 g/l at 45 DAT; spray of chlorfenapyr 10% SC @ 1.5 ml/l at 55 DAT; spray of neem oil 1% at 65 DAT; and subsequent rotation. 3. Chemical module (M3): Seedling dip with imidacloprid 17.8% SL @ 1 ml/l of water; spray of dicofol 18.5% EC @ 2.5 ml/l at 25 DAT; spray of propargite 57% EC @ 2.5 ml/l at 35 DAT; spray of spirofensil 22.9% SC @ 0.8 ml/l at 45 DAT; spray of fenazaquin 10% EC @ 2.5 ml/l at 55 DAT; spray of quinalphos 25% EC @ 2 ml/l at 65 DAT; and subsequent rotation). Untreated control (M4).

The chilli seedlings were transplanted at spacing at 60x 45 cm during 2nd fortnight of July. From each plot, five spots were selected randomly for counts. Spray fluids were prepared as per standard practice and sprayed with hand compression knapsack high volume sprayer during morning hours. Observation on the thrips and mite incidence was done one day before the spraying as pre-treatment count and third, seven and tenth day after spraying (DAS) with both nymphs and adults counted during early morning hours on terminal six leaves from five randomly selected plants/plot. Likewise, coccinellids and spiders were also counted from five randomly selected plants/plot. Observations were made at weekly interval with the yield data at harvest and converted on/ha basis. The data were subjected to statistical analysis, and the cost benefit ratio calculated [net return (Rs/ha)/ cost of treatment (Rs/ha)]

RESULTS AND DISCUSSION

The results revealed that the incidence of thrips and mites varied with the evaluated treatments, and among the four modules evaluated, the integrated module was found significantly effective; least mite counts were observed in both 2016-17 (1.62) and 2017-18 (5.95). Likewise, the least thrips incidence was observed in 2016-17 (2.28/terminal leaves) and 2017-2018 (4.25/terminal leaves) (Table 1). Tatagar et al. (2009) reported that the insect and mites were the least and fruit yield of 7.48 q/ha was
observed with flubendiamide. Similarly, Samota (2016) observed that imidacloprid, followed by thiamethoxam, acetamiprid, dimethoate and fipronil were effective. The present results corroborate with those of Haldar et al. (2016) obtained in the study at Varanasi. The integration of insecticides like imidacloprid, fipronil and chlorfenapyr, plant origin pesticides (neem oil), entomopathogenic fungus *Lecanicillium* (= *Verticillium lecanii*), insect growth regulator (buprofezin) has been proved effective. Fipronil 80% WG was found effective against chilli yellow mites and thrips (Halder et al., 2015). Patil et al. (2018) found that fipronil 0.005% and fenpropathrin 0.03% were significantly superior against thrips. Maximum yield was also obtained with the integrated module during 2016-17 (33.07 q/ha) and 2017-18 (31.07 q/ha) followed by the chemical module. Integrated module was observed to provide maximum cost benefit ratio of 1:42. followed by the chemical module (1: 1.66). The chilli samples from the integrated module sent to Food Safety Referral Laboratory, IIHR, Bangalore did not reveal any detectable residues.

**REFERENCES**


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