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# Effect of different insecticides against thrips, *Thrips tabaci* and leafhoppers, *Amrasca biguttula biguttula* of cotton

**Naveena JB and Sharanabasappa**

**Abstract**
Investigation on different insecticides against sucking pests of cotton like, thrips and leafhoppers were carried out during 2016-17 in farmer field Kommanalu village, Shivamogga and Agricultural and Horticultural Research Station (AHRS), Honnavile farm Shivamogga. The result raveled that thrips population was recorded least imposition in dinotefuran 20 SG @ 0.3g/ l (8.69 thrips/ 3 leaves), thiamethoxam 25 WG @ 0.25g/ l (4.81 thrips/ 3 leaves) and imidacloprid 17.8 SL @ 0.25 ml/ l (2.59 thrips/ 3 leaves) were most effective treatments in reducing incidence of thrips on *Bt* cotton as compared to other chemicals. However, in leafhoppers population significantly lowest number of leafhoppers was recorded in thiamethoxam 25 WG @ 0.25 g/ l (4.30 leafhoppers/ 3 leaves), imidacloprid 17.8 SL @ 0.25 ml/ l (3.64 leafhoppers/ 3 leaves) and imidacloprid 70 WG @ 0.25g/ l (2.43 leafhoppers/ 3 leaves) were effective chemical against cotton leaf hopper compared to other chemicals.

**Keywords:** Thrips, leafhopper imidachloprid, dinotefuran, thiamethoxam

## Introduction
Cotton (*Gossypium* spp.) is a commercial crop unanimously designated as "King of Fiber crops" and grown under diverse agro-climatic conditions around the world. It provides fiber, an important raw material for textile industry which is supposed to be a number one enterprise in the country and consumes nearly 65 percent of total fiber produced in India (Anon., 2016). Main losses in cotton production are due to its susceptibility to about 162 species of insect pests and a number of diseases (Manjunath, 2004) [3]. Among insects, cotton bollworms are the most serious pests of cotton in India causing annual losses to the tune of Rs.1200 Crores. After introduction of Bollgard technology (*Bt*) in 2002, the productivity of cotton is increased, losses due to insect pests are decreased and the insecticide use is also reduced. However, these changes have allowed other pests to survive and emerge as economic pests. Among the important key pests of cotton the sucking pests *viz.,* leafhopper, *Amrasca biguttula biguttula* (Ishida), aphid, *Aphis gossypii* (Glover), whitefly *Bemisia tabaci*(Gennadius) and thrips, *Thrips tabaci* (Linnman) cause severe damage and serious threat to the crop at early stage of the crop growth and can also affect the crop stand and yield of cotton. Heavy infestation at times reduces the crop yield to the extent of 21.2 per cent (Patil, 1998 Dhawan and Sidhu, 1986) [2, 1]. Some sucking pests are cosmopolitan, polyphagus, widely distributed in tropical, subtropical and temperate regions and are also vectors for a number of viral diseases in large number of plants (Serdar *et al.,* 1999). Therefore chemical control is necessary to keep the population of sucking pests below ETL. In the present study some new insecticides have been used to test their efficacy against the sucking pests. Dhawan *et al.* (2013) [5] reported that Thiamethoxam proved better control of sucking pests but reduction of natural enemies (Coccinelids, Chrysoperla spp. and spider) varied from 23.32 to 3 Raghuraman *et al.* (2008) studied that spraying of Imidachloprid 17.8 SL @ 20 g a.i/ha Acetamiprid 20 per cent SP at three doses (20, 40, 80 g a.i. /ha) was effective in suppressing the population of leafhoppers and whiteflies up to nine days. The maximum yield (955.5 kg/ha, 1128.8 kg/ha) was recorded in spraying of 0.66, 25.10 to 32.67 and 23.66 to 30.89 per cent after 3, 7 and 10 days after spray, respectively. Acetamiprid 80 g a.i./ha followed by its next dose of 40 g a.i./ha (727.7 kg/ha, 922.2 kg/ha) during cotton season 2002-03 and 2003-04, respectively.

## Material and Methods

This study was carried out at Farmer field, Kommanalu Village, Shivamogga, during *Kharif* 2016 with plot size of 3m x 5m of 300 m2 areas. The *Bt* hybrid MRC-7918 was sown with a spacing of 90 cm X 60cm and maintained as per package of practices (spacing, fertilizers, weeding, etc.) except plant protection measures. The treatments were imposed when the pest population *viz.*, leafhoppers (2 leafhoppers/leaf), thrips (5-10 thrips/ leaf), whiteflies (5-10 whiteflies/ leaf) and aphids 10 percent affected plant counted randomly crossed ETL and insecticidal spray was taken up. The observations were made on the top, middle, and bottom of leaves on 5 randomly selected plants from each plot. The population of the insect pest was recorded at 1 day before and 1, 3, and 7 day after spraying insecticides. Then the data was subjected to statistical analysis. The yield from each treatment was recorded and B: C ratio was worked out. The statistical analysis of the data obtained from managemental trails was done using analysis of variance (ANOVA) using Web Agri Stat Package (WASP-2) developed by Indian Council of Agricultural Research, Research Complex, and Goa. Data were transformed by Arc sin transformation before subjecting to ANOVA. The standard procedures in Agriculture Statistics given by Gomez and Gomez (1976) were followed. The interpretation of data was done by using the critical difference value calculated at 0.05 probability level. The level was significance was expressed at 0.05 probability level.

## Result

The result on the efficacy of different insecticides against thrips and leafhopper after first spray was furnished here in the Table 1. The spraying of the insecticides were taken when the population of thrips cross ETL of (5-10/ leaf). The population of thrips was recorded after spraying the insecticides showed significant difference across the different treatments although there was no significant difference among the treatments prior to spraying. The population of thrips was recorded least after one, three and seven day after treatment imposition in dinotefuran 20 SG @ 0.3g/ l (8.69 thrips/ 3 leaves) thiamethoxam 25 WG @ 0.25g/ l (4.81 thrips/ 3 leaves) and imidacloprid 17.8 SL @ 0.25 ml/ l (2.59 thrips/ 3 leaves) followed by other chemicals as showed in the table. (1) While, The spraying of the insecticides were taken when the population of leafhoppers cross ETL of (2 nymphs/ leaf). The population of leafhopper was recorded least after one, three and seven day after treatment imposition in thiamethoxam 25 WG @ 0.25 g/l (4.30 leafhoppers/ 3 leaves), imidacloprid 17.8 SL @ 0.25 ml/ l (3.64 leafhoppers/ 3 leaves) and imidacloprid 70 WG @ 0.25g/ l (2.43 leafhoppers/ 3 leaves) followed by other as shown in the table. (1) Whereas, significantly higher population (14.92 leafhoppers/3 leaves) was recorded in untreated check.

**Table 1:** Effect of different insecticides against thrips, *Thrips tabaci* and leafhoppers, *A. biguttula biguttula* of cotton

| S. No. | Treatments | Dosage | No. of *Thrips tabaci* /3 leaves | | | | Post Treatment mean | No. of *A. biguttula biguttula* / 3 leaves | | | | Post Treatment mean |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 DBS | 1 DAS | 3 DAS | 7 DAS | | 1 DBS | 1 DAS | 3 DAS | 7 DAS | |
| 1 | Dinotefuran 20 SG | 0.30 g/l | 20.33 (4.56) | 8.69 (3.01)$^{b}$ | 5.83 (2.51)$^{bc}$ | 4.22 (2.05)$^{b}$ | 9.76 (2.10)$^{b}$ | 11.17 (3.40) | 5.65 (2.46)$^{bc}$ | 4.26 (2.15)$^{c}$ | 2.49 (1.73)$^{d}$ | 5.89 (2.45)$^{b}$ |
| 2 | Thiamethoxam 25 WG | 0.25 g/l | 20.89 (4.62) | 9.30 (3.12)$^{b}$ | 4.81 (2.29)$^{c}$ | 3.50 (1.96)$^{b}$ | 9.63 (3.02)$^{b}$ | 10.46 (3.30) | 4.30 (2.19)$^{bc}$ | 3.76 (2.06)c | 3.65 (2.04)$^{cd}$ | 5.54 (2.40)$^{bc}$ |
| 3 | Acetamiprid 20 SP | 0.25 g/l | 20.3 (4.56) | 11.11 (3.40)$^{b}$ | 5.95 (2.32)$^{c}$ | 4.97 (2.54)$^{b}$ | 10.58 (3.21)$^{b}$ | 10.92 (3.37) | 5.96 (2.53)$^{b}$ | 3.86 (2.08)$^{c}$ | 3.56 (2.01)$^{cd}$ | 6.13 (2.54)$^{b}$ |
| 4 | Imidacloprid 70 WG | 0.25 g/l | 19.62 (4.49) | 9.20 (3.11)$^{b}$ | 5.15 (2.37)$^{bc}$ | 3.44 (1.98)$^{b}$ | 9.35 (2.99) | 11.9 (3.51) | 5.98 (2.54)$^{b}$ | 4.23 (2.17)$^{c}$ | 2.43 (1.71)$^{d}$ | 6.13 (2.49)$^{b}$ |
| 5 | Acephate 75 SP | 1.00 g/l | 19.87 (4.51) | 9.51 (3.16)$^{b}$ | 5.59 (2.46)$^{bc}$ | 5.59 (2.46)$^{b}$ | 10.14 (3.15)$^{b}$ | 10.63 (3.33) | 5.66 (2.48)$^{b}$ | 6.3 (2.60)$^{b}$ | 6.62 (2.67)$^{b}$ | 7.30 (2.77)$^{b}$ |
| 6 | Buprofezin 25 SC | 2.00 ml/l | 20.01 (4.53) | 9.6 (3.18)$^{b}$ | 7.00 (2.74)$^{b}$ | 5.22 (2.39)$^{b}$ | 10.46 (3.21)$^{b}$ | 10.03 (3.23) | 6.86 (2.61)$^{b}$ | 5.89 (2.42)$^{b}$ | 4.45 (2.10)$^{bc}$ | 6.80 (2.60)$^{b}$ |
| 7 | Imidacloprid 17.8SL | 0.25 ml/l | 20.05 (4.49) | 10.22 (3.26)$^{b}$ | 5.12 (2.36)$^{bc}$ | 2.59 (1.75)$^{c}$ | 9.49 (2.98)$^{b}$ | 10.71 (3.34) | 5.98 (2.54)$^{b}$ | 3.64 (2.03)$^{c}$ | 2.58 (1.75)$^{d}$ | 5.73 (2.42)$^{b}$ |
| 8 | Untreated check | - | 23.49 (4.89) | 24.34 (4.98)$^{a}$ | 24.38 (4.99)$^{a}$ | 26.32 (5.18)$^{a}$ | 24.63 (5.01)$^{a}$ | 10.86 (3.37) | 12.65 (3.62)$^{a}$ | 14.92 (3.92)$^{a}$ | 15.71 (4.01)$^{a}$ | 13.54 (3.74)a |
| | S.E.m± | - | 0.19 | 0.16 | 0.12 | 0.13 | 0.21 | 0.14 | 0.12 | 0.11 | 0.10 | 0.16 |
| | CD(0.05) | - | 0.58 | 0.59 | 0.38 | 0.39 | 0.63 | 0.45 | 0.36 | 0.35 | 0.30 | 0.48 |
| | CV (%) | - | 7.23 | 8.92 | 9.98 | 10.10 | 12.07 | 7.69 | 8.07 | 8.96 | 7.61 | 9.10 |

DBS: Day before spray; DAS: Days after spray; Values in the parentheses are $\sqrt{x+1}$ transformed value; Means followed by same letters do not differ significantly by DMRT (P=0.05)

## Discussion

The mean thrips population after spraying the insecticides across the treatments, least population of thrips were recorded in one, three and seven day after treatment imposition in dinotefuran 20 SG @ 0.3g/ l (8.69 thrips/ 3 leaves) thiamethoxam 25 WG @ 0.25g/ l (4.81 thrips/ 3 leaves) and imidacloprid 17.8 SL @ 0.25 ml/ l (2.59 thrips/ 3 leaves) followed by other chemicals as showed in the table.(1) significantly higher population (24.64 thrips/ 3 leaves) was recorded in untreated check. The present findings are in agreement with (Raghuraman *et al*.,). Who reported that the imidacloprid 17.8 SL and dinotefuran 20 SG had successfully controlled thrips up to seven days after Application. The mean leafhoppers population after spraying the insecticides across the treatments indicated that, least population of leafhoppers were recorded in one, three and seven day after treatment imposition in thiamethoxam 25 WG @ 0.25 g/ l (4.30 leafhoppers/ 3 leaves), imidacloprid 17.8 SL @ 0.25 ml/ l (3.64 leafhoppers/ 3 leaves) and imidacloprid 70 WG @ 0.25g/ l (2.43 leafhoppers/ 3 leaves) followed by other as shown in the table(1) Whereas, significantly higher population (14.92 leafhoppers/ 3 leaves) was recorded in untreated check.

The present findings are in agreement with Raghuraman and Gupta (2006) [4] who reported that the acetamiprid 40g a.i/ ha, imidacloprid 50 g a.i/ha proved to be the most effective in

reducing leafhoppers population below ETL (1-1.5/ leaf) up to seven days after application.

**References**

1. Dhawan AK, Sidhu AS. Assessment of losses due to attack of cotton jassid on hirsutum cotton. Indian J Plant Prot. 1986; 14:45-50.
2. Patil. Developing IPM schedule. Proc. Seminar on IPM. Special issue. ICPA. Mumbai, 1998, 101-110.
3. Manjunath TM. Bt cotton in India: The technology wins as the controversy wane (November). s. In 63rd Plenary Meeting of International Cotton Advisory Committee (ICAC) Meeting, Mumbai, 2004, 28.
4. Raghuraman M, Gupta GP. Effect of Neonicotinoids on Jassid, Amrasca devastans (Ishida) in cotton. Annals of Plant Protection Sciences. 2006; 14(1):17-21.
5. Dhawan AK, Vijay K, Kamaldeep S. Field evaluation of Thiamethoxam 75 SG as soil application against sucking pests in cotton. Journal of Cotton Research and Development. 2013; 27(2):260-266.