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# Field efficacy of thiamethoxam 25 WG (Actara 25 WG) against flea beetle, jassids and thrips in grapes

Grape is attacked by number of insect pests. Among those insects, fleabeetle *Scelodonta strigicolis* and sucking pests like thrips *Scirtothrips dorsalis* and jassids *Arboridia viniferata* are very important and they cause considerable damage to the grapes. Fleabeetle feeds on tender shoots and leaves, and tendrils causing substantial damage. The tender shoots may wither and drop down and feeding on mature leaves creates elongated holes (Trehan *et al.*, 1947). The loss is most when the sprouting buds are damaged after October pruning. The beetles remain active up to the end of November. In most parts of Maharashtra, severe damage has been reported after October when buds start sprouting. Both adult and nymphs of thrips cause damage by rasping the lower surface of the leaves, blossoms and developing berries. In case of heavy incidence, the leaves may dry up and drop off the vine. When the attacked leaves begin to dry up, adults as well as nymphs migrate to healthy leaves. The thrips are also considered to be responsible for the scab formation on the berries (Reddy, 1957). The affected berries develop a corky layer and become brown. Jassids feed almost exclusively on the underside of the grape leaves. Both the nymphs and adults suck sap from the leaves. The damage first appears as a scattering of small white spots. With severe infestation and continuous feeding, the spots become numerous and a grayish specking of the leaves results, so much so, that the entire leaf turns yellow, finally brown, dries up and drops off (Sohi,1966). In the present experiment, a new generation insecticide thiamethoxam 25 WG (Actara 25 WG) has been tested against fleabeetle, jassids and thrips in grape.

Evaluation of insecticides is a continuous process to find out effective insecticide in the management of various insect pests in grapes, in view of this the experiment was conducted during fruiting season. The experiment was conducted for two consecutive fruiting seasons during October – April in 2006-07 and 2007-08 on Tas-A-Ganesh variety trained to 'Y' system at the National Research Centre for Grapes, Pune. Experiments were laid out in a Randomised Block Design with eight treatments (Table 1) replicated four times containing four vines each. The block was pruned during first fortnight of October in both the years. The population count of fleabeetle, thrips and jassids was recorded a day before spray and at 3, 7 and 14 days after each spray. For the management of fleabeetle two sprays were given at an interval of 15 days immediately after pruning. For jassids and thrips, first spray was given on full bloom stage and second spray was given on berry setting stage. There was 30 days gap between first and second spray. Fruit yield was recorded at the time of harvest and expressed in kg/vine.

Pre-count of fleabeetle, jassids and thrips population taken before the start of experiment revealed that population was distributed uniformly in all the treatments. There was significant difference in treatments after 3, 7 and 14 days of spraying. Fleabeetle population was significantly reduced at 3 days after treatment in all thiamethoxam treated plots but was more visible at 7 days after treatment and the similar trend was continued even at 14 days after treatment during 2006-07. Same phenomenon was noticed even after second spray. Among the dosages, thiamethoxam 25 WG @ 25 g a.i./ha was found to be superior but was on par with the double dose of thiamethoxam WG @ 50 g a.i/ha. Both the doses were found to be superior to lower dose of thiamethoxam 25 WG @ 12.5 g a.i./ha. Among treatments of soil drench, thiamethoxam 25 WG @ 200 mg/plant was found to be significantly superior over lower doses of thiamethoxam 25 WG @ 100 mg/plant and found to be at par with thiamethoxam 25 WG @ 400 mg/plant. All the tested dosages of thiamethoxam 25 WG were found effective in reducing fleabeetle than dimethoate 30 EC @ 1.7 ml/l and untreated check (Table 1).

Significant reduction in jassids population was observed in all treatments over control within 3 days of spray. But treatment differences were conspicuous only at 7 and 14 days of spraying. Similar trend was noticed for second spray also. Among different dosages of foliar spray, thiamethoxam 25 WG @ 25 g a.i./ha was superior over thiamethoxam 25 WG @ 12.5 g a.i./ha, but it was at par with thiamethoxam 25 WG @ 50 g a.i./ha. Among dosages of soil drench, thiamethoxam 25 WG @ 200 mg/plant was significantly superior over thiamethoxam 25 WG @ 100 mg/plant but it was on par with thiamethoxam 25 WG @ 400 mg/plant. All dosages of thiamethoxam 25 WG were found effective in reducing

Table 1. Bio-efficacy of thiamethoxam 25 WG (Actara 25 WG) for the management of flea beetle during 2006-07

| Treatment | Pre count of fleabeetle/ vine | Flea beetles/vine after I Spray DAS | | | Flea beetles/vine after II Spray DAS | | |
|---|---|---|---|---|---|---|---|
| | | 3 | 7 | 14 | 3 | 7 | 14 |
| T-1. Foliar sprays of thiamethoxam 25 WG @ 12.5 g a.i./ha | 4.08 | 4.00 | 3.50 | 3.50 | 3.33 | 2.25 | 2.08 |
| T-2. Foliar sprays of thiamethoxam 25 WG @ 25 g a.i./ha | 4.08 | 3.50 | 2.50 | 2.67 | 2.50 | 1.25 | 1.00 |
| T-3. Foliar sprays of thiamethoxam 25 WG @ 50 g a.i./ha | 3.92 | 3.50 | 2.33 | 2.58 | 2.25 | 1.25 | 0.92 |
| T-4. Soil drenching of thiamethoxam 25 WG @ 100 mg/plant | 4.17 | 4.08 | 3.50 | 3.33 | 3.08 | 2.42 | 2.00 |
| T-5. Soil drenching of thiamethoxam 25 WG @ 200 mg/plant | 3.92 | 3.75 | 3.08 | 2.75 | 2.58 | 1.83 | 1.25 |
| T-6. Soil drenching of thiamethoxam 25 WG @ 400 mg/plant | 4.00 | 3.83 | 2.92 | 2.58 | 2.50 | 1.42 | 1.17 |
| T-7. Sprays of dimethoate 30 EC @ 1 ml/l | 3.92 | 4.08 | 3.00 | 3.00 | 3.08 | 2.33 | 1.83 |
| T-8. Control (Water Spray) | 4.08 | 5.00 | 4.42 | 4.75 | 4.33 | 3.58 | 3.00 |
| S.Em.± | 0.17 | 0.15 | 0.13 | 0.14 | 0.12 | 0.13 | 0.14 |
| C.D. at 5% | NS | 0.46 | 0.40 | 0.44 | 0.35 | 0.41 | 0.43 |
| C.V. (%) | 5.2 | 8.4 | 9.4 | 12.4 | 13.6 | 11.8 | 14.2 |

*DAS-Days after spraying    NS-Non significant

Table 2. Bio-efficacy of thiamethoxam (Actara 25WG) in the management of jassids (pooled )

| Treatment | Pre countof Jassids/ shoot/vine | Jassids/ Shoot/vine after I Spray DAS | | | Jassids/shoot/vine after II Spray DAS | | |
|---|---|---|---|---|---|---|---|
| | | 3 | 7 | 14 | 3 | 7 | 14 |
| T-1. Foliar sprays of thiamethoxam 25 WG @ 12.5 g a.i./ha | 6.62 | 5.56 | 4.33 | 4.62 | 4.33 | 2.91 | 2.50 |
| T-2. Foliar sprays of thiamethoxam 25 WG @ 25 g a.i./ha | 6.46 | 4.71 | 3.50 | 3.71 | 3.33 | 1.95 | 1.62 |
| T-3. Foliar sprays of thiamethoxam 25 WG @ 50 g a.i./ha | 6.62 | 4.75 | 3.54 | 3.67 | 3.12 | 1.79 | 1.29 |
| T-4 Soil drenching of thiamethoxam 25 WG @ 100 mg/plant | 6.75 | 5.91 | 4.75 | 4.50 | 4.66 | 3.71 | 2.91 |
| T-5. Soil drenching of thiamethoxam 25 WG @ 200 mg/plant | 6.41 | 5.41 | 4.66 | 4.21 | 4.08 | 3.00 | 2.50 |
| T-6. Soil drenching of thiamethoxam 25 WG @ 400 mg/plant | 6.54 | 5.45 | 4.91 | 4.04 | 3.96 | 3.08 | 2.16 |
| T-7. Sprays of dimethoate 30 EC @ 1 ml/l | 6.21 | 5.70 | 4.91 | 4.50 | 4.54 | 3.41 | 3.00 |
| T-8. Control (Water Spray) | 6.37 | 7.04 | 6.87 | 6.75 | 6.29 | 5.12 | 4.50 |
| S.Em.± | 0.18 | 0.11 | 0.18 | 0.14 | 0.09 | 0.15 | 0.12 |
| C.D. at 5% | NS | 0.32 | 0.56 | 0.41 | 0.29 | 0.46 | 0.36 |
| C.V. (%) | 6.2 | 10.2 | 8.4 | 12.2 | 13.2 | 9.6 | 10.8 |

DAS- Days after spraying NS-Non significant

Table 3. Bio-efficacy of thiamethoxam (Actara 25 WG) in the management of thrips (pooled )

| Treatment | Pre count of thrips/ shoot/vine | Thrips/shoot/vine after I Spray DAS | | | Thrips/shoot/vine after II Spray DAS | | | Fruit Yield (kg/vine) |
|---|---|---|---|---|---|---|---|---|
| | | 3 | 7 | 14 | 3 | 7 | 14 | |
| T-1. Foliar sprays of thiamethoxam 25 WG @ 12.5 g a.i./ha | 12.04 | 10.08 | 7.21 | 8.42 | 7.42 | 5.54 | 4.87 | 10.77 |
| T-2. Foliar sprays of thiamethoxam 25 WG @ 25 g a.i./ha | 11.87 | 8.12 | 5.25 | 6.21 | 5.50 | 3.50 | 3.46 | 12.28 |
| T-3. Foliar sprays of thiamethoxam 25 WG @ 50 g a.i./ha | 11.83 | 8.33 | 5.21 | 5.92 | 5.46 | 3.33 | 3.46 | 12.53 |
| T-4 Soil drenching of thiamethoxam 25 WG @ 100 mg/plant | 11.66 | 9.92 | 7.37 | 8.20 | 7.37 | 5.29 | 4.83 | 9.95 |
| T-5. Soil drenching of thiamethoxam 25 WG @ 200 mg/plant | 11.83 | 9.42 | 7.50 | 7.58 | 6.71 | 4.79 | 4.50 | 10.83 |
| T-6. Soil drenching of thiamethoxam 25 WG @ 400 mg/plant | 11.62 | 9.16 | 7.37 | 7.46 | 6.71 | 5.17 | 4.37 | 11.22 |
| T-7. Sprays of dimethoate 30 EC @ 1 ml/l | 12.29 | 10.62 | 8.37 | 8.46 | 7.33 | 6.29 | 5.24 | 7.57 |
| T-8. Control (Water Spray) | 12.00 | 12.00 | 10.62 | 11.16 | 9.79 | 8.54 | 6.66 | 5.93 |
| S.Em.± | 0.30 | 0.21 | 0.10 | 0.15 | 0.12 | 0.12 | 0.16 | 0.10 |
| C.D. at 5% | NS | 0.64 | 0.29 | 0.46 | 0.39 | 0.36 | 0.48 | 0.29 |
| C.V. (%) | 6.2 | 8.4 | 9.4 | 12.4 | 11.4 | 12.6 | 10.4 | 13.4 |

DAS-Days after spraying NS-Non significant

jassids population than dimethoate 30 EC @ 1.7 ml/l and untreated check (Table 2). Similar trend was noticed for reduction of thrips population also (Table 3).

Bio-efficacy of thiamethoxam 25 WG in reducing sucking pests in other crops was reported by earlier workers. Efficacy of thiamethoxam in reducing thrips (Nali *et al*., 2004 and Sreekanth *et al*., 2004) jassids (Patel *et al*., 2003) and in reducing Colorado beetle (Surkus, 2003) was reported in various crops. Highest yield of 14.07 kg/vine was recorded in thiamethoxam 25 WG @ 50 g a.i./ha treated plot, but was at par with thiamethoxam 25 WG @ 25 g a.i./ha (13.57 kg/vine) but both the dosages were significantly superior over thiamethoxam 25 WG @ 12.5 g a.i./ha (12.33 kg/vine). Among soil drench doses, thiamethoxam 25 WG @ 200 and 400 mg/plant were at par with each other and better over thiamethoxam 25 WG @100 mg/plant. All the tested dosages of thiamethoxam 25 WG either by foliar spray or in the form of soil drench recorded higher fruit yield than standard check, dimethoate 30 EC @ 1.7 ml/l and untreated check.

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