Date: 8/2019

Field experiment no. 102

**The effectiveness of the Bio T Plus preparation in controlling carob moth in almond, Sha'alvim, June 2019**

**By David Sarid, Eran Shilo—BioYome Company**

**Aim:**

To test the effectiveness of the Bio T Plus preparation in controlling carob moth (*Ectomyelois ceratoniae*) in almond.

**Methods and materials:**

**The crop:** The experiment was conducted in an orchard of the Umm el-Fahm almond variety, planted in Sha'alvim in 2006.

**Irrigation:** drip

**Soil:** medium

**Phenological stage**: fruit

**Weather conditions:**

26/6/2019: temperature: 31.1°C, relative humidity: 39%

4/7/2019: temperature: 28.4°C, relative humidity: 52%

**Experiment design:** The experiment was conducted in randomised blocks, with four repeats for each treatment, and four trees in each repeat.

**Application method and spraying volume:** Spray gun, volume: 120 L/dunam (10002)

**Application dates:**

* 26/6/2019, morning
* 4/7/2019, morning

**Evaluation dates:** 26/6/2019, 4/7/20189 18/7/2019

Four traps were placed on 26/6/2019 for evaluation of plot infestation.

**Evaluation method:** 1.Sampling of 50 fruit/experimental repeat. From the centre of the repeat.

2. Counting of male adults in delta traps with BioYome pheromone.

**Sample size:** 50 fruit/repeat (200 fruit/treatment).

**Analysis:** The JMP (version 5.1) software was used for statistical analysis**.** Results were analysed by ANOVA with a post hoc Tukey-Kramer test to determine statistically significant differences between treatments.

**Preparations:**

* Bio T Plus, SC containing Bacillus thuringiensis subsp. Kurstaki at 16,000 international units (ITU)/mg per litre
* Talstar, EC containing 100 g/L Bifenthrin

**Treatments:**

|  |  |  |
| --- | --- | --- |
| **No.** | **Preparation** | **cm3/dunam or %** |
| 1 | Bio T Plus | 0.2% |
| 2 | Bio T Plus | 0.4% |
| 3 | Bio T Plus | 0.8% |
| 4 | Talstar | 0.075% |
| 5 | Control | - |

**Results:**

At baseline, there were no significant differences between the treatments.

On the first evaluation date, eight days after the first spray application, Bio T Plus treatment at the target concentration (0.4%) was significantly different from the control.

On the second evaluation date, 14 days after the second spray application, all the Bio T Plus treatments were significantly different from the control.

No signs of phytotoxicity were observed with any of the treatments.

**Table 1. Almond fruit infestation by carob moth (%)**

|  |  |  |  |
| --- | --- | --- | --- |
| **No.** | **Treatment** | **cm3/dunam or %** | **Percentage of carob moth-infested fruit**  |
| **26/6/2019****(Baseline)** | **4/7/2019** **(First evaluation)****+8 days from spray I** | **18/7/2019** **(Second evaluation)****+14 days from spray II** |
| 1 | Bio T Plus | 0.2% | 1.5 a | 0.5 ab | 2.5 b |
| 2 | Bio T Plus | 0.4% | 2.0 a | 0.0 b | 1.5 b |
| 3 | Bio T Plus | 0.8% | 2.0 a | 1.0 ab | 0.5 b |
| 4 | Talstar | 0.075% | 1.0 a | 2.0 ab | 3.5 ab |
| 5 | control |  | 2.5 a | 3.5 a | 6.5 a |

\* Values labelled by different letters are significantly different from each other (P<0.05)

**Table 2. Carob moths (adults) captured in pheromone traps**

|  |  |
| --- | --- |
| **Trap no.**  | **Carob moths (adults) captured in monitoring traps** |
| **4/7/2019** | **18/7/2019** |
| **1** | 4 | 6 |
| **2** | 2 | 3 |
| **3** | 3 | 5 |
| **4** | 1 | 4 |

**Discussion and conclusions:**

Bio T Plus (0.4%) effectively eliminates carob moth larvae in almond. Larvae infestations in treated fruit were significantly lower than in the control.

No phytotoxicity was observed in the crop. No effect on foliage was observed during crop growth.

**Acknowledgements:**

We thank Avner for allocating the plot and assisting in the experimentation.