

## Abstract

Onion thrips, *Thrips tabaci* Lindeman, are an economic pest of Alliums worldwide, Thrips infestation can cause yield loss ranges from (18-60)% . During the past two decades, onion thrips has become a global pest of increasing concern in commercial onion (*Allium cepa* L.) because of it development of resistance to insecticides and ability to transmit plant viruses . Onion thrips is considered as an important pest infesting onions and other crops in Iraq and there is no detailed studies about their biology and control . Laboratory and field studies were conducted during the growing season of 2010/2011 in the fields of the college of Agriculture, Abu- Ghraib, Baghdad, to evaluate sampling and 3 counting methods for onion thrips, Sesonal abundance, susceptibility of some onion cultivars against the infestation by onion thrips, and the integration of some bio-pesicides and colored sticky traps as alternative methods for controlling onion thrips, *Thrips tabaci* . Results are summarized as the following :

1– Three different methods for counting onion thrips , The direct method (Visual plant counts) , Smoking method and washing method were tested and results indicated the superiority of the visual plant counts in estimating thrips numbers.

2- Seasonal abundance of onion thrips from seedlings to crop maturity were studied by the means of direct plant counts and sticky traps . onion thrips (larvae and adults) were recorded by plant counts on onion seedlings, numbers were low after germination then, thrips numbers began to increase gradually during the season to reach a peak during March and April , and suddenly dropped in the end of the growing season in May . Thrips population declined because of the maturity of the crop , the unsuitability of leaves for thrips feeding , and the activity of predators such as , predatory thrips , *Orius albidipennis* Reut. and some species of coccinillids . Efficiency of light blue traps , white and yellow sticky traps in

estimating population density, monitoring of onion thrips was investigated . light blue and white sticky traps captured significantly higher numbers of 1431.16 and 1605.03 thrips / trap / month , than numbers captured in yellow sticky traps (174.33 thrips / trap) .

3 – Results indicated that there is interference between thrips generation , from seedling stage to the end of the season , However , it very difficult to distinguish these generations precisely in the field using these two methods visual count method or sticky traps , because the rain during the season will wash off thrips from plants to the soil causing thrips numbers to drop down suddenly So, white or light-blue traps may be used in population monitoring or used in combination with other methods to control onion thrips .

4 – Results indicated that seed treatment with Cruiser , Spinosad and the local isolate (BSA3) of *B. bassiana* by the rate of  $1 \times 10^8$  spores / ml significantly reduce the numbers of onion Thrips to (1.74 , 2.10 and 2.18) Thrips / plant for the 3 treatment above respectively , compared with 3.21 Thrips / plant for the 2<sup>nd</sup> isolate BSA1 of *B. bassiana* and 3.91 Thrips / plant for the control treatment bulb yields increased , by (25.8 , 20.4 , 13.9 %) for the treatment of Spinosad , Cruiser and the isolate BSA3 respectively. The Role of the bio-pesticides spinosad , Mycotal and *B. bassiana* isolates in combination with white sticky traps or light blue sticky traps as alternatives to chemical pesticides in the integrated control programs for the onion thrips , *Thrips tabaci* also discussed .

5 – There were no significant differences in the numbers of onion thrips recorded between the three cultivars , Early Texas Grano , White Grano and Geza1 in the seedlings stage , However , A significant differences was observed on these cultivars in the field . The highest numbers of 22.14 thrips / plant were recorded on cultivar Early Texas Grano , the lowest on Geza 1 (12.7 thrips / plant) .

6- Field studies on susceptibility of 5 onion cultivars to *T. tabaci* indicated that cultivar Early Texas Grano was the most susceptible for onion thrips , followed by white Granex and local white ; The percentage of thrips infestation were 60.55 % , 53.77 % and 43.88 % for the three cultivars respectively , low infestation of 37.77 % and 42.77 % was recorded on cultivars red local and Geza 1 respectively .

7- Results indicated that foialr application of onion plants with different treatments significantly reduced the population density of onion thrips, *T. tabaci* compard with control treatment . Application of Spinosad and the BSA3 isolate were superior over other treatments, BSA1 isolate and Trigard, Relative efficacy of these treatment were, (45.10 , 44.08 , 40.07 and 29.69)% for Spinosad ,BSA3 , Trigard and BSA1 isolate respectively . The relative efficacy for the chemical insecticide (Dozer) was 63.46 % . All treatments caused a significant increase in bulb weight from the control treatment , bulbs weight were 3920 , 3663 and 3577 gm for the treatments , spinosad , BSA3 isolate and Dozer respectively . The Spinosad and Trigard 100 SL increased the percentage of the first class onions (Grade 1) by 75% and 63.88% respectively .

8 - Results indicated that foliar spraying of onion plants with Spinosad in combination with blue or white sticky traps has led to a significant reduction in numerical density of onion Thrips 48 hours after application. *T. tabaci* population density were decreased by percentage (45.99 and 63.12) % for treatments of Spinosad with white and blue sticky traps respectively, A continued effect of spinosad on onion thrips still until the third week after application . Spinosad treatment increased onion yields by 19.7 % , 27 % for the treatments of Spinosad in combination with blue or white sticky traps .

9 - Application commercial formulation of the fungus *Lecanicillium muscarium* (Mycotal) significantly reduced population density of Thrips by 36.58 % , 73.83 % , 72.11 % and 44.63 % after a week, two weeks, three weeks and four weeks after spraying respectively, and keep the population density low till the end of the season. Also Mycotal treatment resulted in 13.1 % .

10 - The possibility of using white or blue sticky traps in monitoring and set a date for the abundance of peaks onion thrips, and integration of the bio-pesticides so Spinosad , two isolates BSA3 and BSA1 of *B. bassiana* and (Mycotal) *Lecanicillium muscarium* in combination with white or blue traps as alternatives to chemical pesticides in the Integrated control program for onion thrips, *T. tabaci* also discussed .