Population Density, And The Efficacy Of Some Integrated Control Elements For Onion Thrips, *Thrips Tabaci* Lindeman (Thysanoptera: Thripidae) On Onions

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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 studided 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 begans 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 X 108 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 2nd 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 respictively.

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% respictively.

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.