33292

Al-kazafy Hassan Sabry and Mohamed Ragaei/ Elixir Agriculture 83 (2015) 33292-33293

Available online at www.elixirpublishers.com (Elixir International Journal)



Agriculture





Field bindweed, Convolvulus arvensis: A new host plant recorded to Tuta absoluta (Meyrick) in Egypt

Al-kazafy Hassan Sabry^{*} and Mohamed Ragaei Pests and Plant Protection, National Research Centre, Cairo, Egypt.

ARTICLE INFO

Article history: Received: 12 May 2015; Received in revised form: 20 June 2015: Accepted: 25 June 2015;

Keywords

Convolvulus Arvensis, Tuta Absoluta. New Host Plant.

ABSTRACT

Although the Solanaceae family leaves (tomato, eggplant, potato,...etc.) is a main host plant for the larvae of tomato leafminer, Tuta absoluta; field bindweed, Convolvulus arvensis is recorded as a new host plant to tomato leafminer, T. absoluta as a first time in Egypt. The larvae of T. absoluta were attacked the leaves of C. arvensis completely. This finding confirmed that the tomato leafminer is a polyphagous insect. This allows it to survive in many habitats in the absence of Solanaceae family crops. This result recommended that removing of field bindweed plants from tomato field may be reducing the tomato leafminer population.

© 2015 Elixir All rights reserved.

Introduction

leafminer Tuta absoluta The tomato (Meyrick) (Lepidoptera, Gelechiidae) is one of the most destructive pest of tomato in South America (Miranda et al.1998). The tomato leafminer invaded Egypt in Marsa Mtrooh Governorate in 2009 and by 2010 it had reached Giza, coming well established in all Governorates of Egypt and reaching the border and north part of Sudan on June 2011 (Tamerk, 2011). In South America, the preferred host of T. absoluta is tomato; the pest lays eggs in all aboveground portions of the plant (leaves, shoots and flowers) including on the fruit (Vargas, 1970). The tomato leafminer is able to complete its development (from egg to adult stage) on Solanum tuberosum, S. melongena, S. gracilius, S. bonariense and S. sisymbriifolium, but development was interrupted (at larval instars I and II) on Nicotiana tabacum and Solanum pseudo-capsicum (Galarza, 1984).

Field bindweed, Convolvulus arvensis is a perennial, noxious weed in Europe and many agricultural areas of the world (Weaver and Riley, 1982; Maillet, 1988). It is a member of the morning-glory family (Convolvulaceae) Field bindweed has been described as the twelfth worst weed in the world (Holm et al., 1977).

This work aim to record the field bindweed, C. arvensis as an alternative host for *T. absoluta* in the first time in Egypt **Materials and Methods**

Survey of Tuta absoluta hosts was conducted in tomato greenhouse during 2015 season. Field bindweed, Convolvulus arvensis leaves was collected and investigated. The larvae of T. absoluta were observed in field bindweed leaves. The larvae fed on field bindweed leaves as tomato leaves. All infested leaves were collected and photographed. The larvae fed on field bindweed and tomato leaves

Results and Discussion

The obtained results in figure 1A showed that the field bindweed is infested intensively by tomato leafworm larvae, *Tuta absoluta*. Although the tomato seedling (with red arrow in figure 1A) was existed, the larvae of T. absoluta fed on field bindweed leaves. The figure 1B showed that the T absoluta larvae were invaded field bindweed as tomato leaves in figure 1G.The obtained results show that the larvae of T. absoluta invaded the upper leaves not the lower (Fig. 1C, E and H). The larvae of T. absoluta are making a tunnel in field bindweed leaves (fig. 1D and F) and clearly observed as in tomato leaves. It was known that the tomato leafminer infested the plants of family Solanaceae, in this figures the larvae of T. absoluta invaded plants from other family (Convolvulaceae).

The obtained result was consistent with Portakaldali et al. 2013 in Turkey. The authors determined the field bindweed, Convolvulus arvensis (Convolvulaceae) and lambs-quarters, Chenopodiuum elbum (Chenopodiaceae) as host plants for T. absoluta in Turkey. Several insect and mite species in North America and Eurasia attack field bindweed. Tyta luctuosa has been tested and approved for release in parts of the US. Caterpillars of this European moth may defoliate field bindweed in the latter part of the growing season (Callihan et al. 1990).

A more recent study (Cardozo et al., 1994) reported that T. absoluta is able to complete development on Nicotiana tabacum, and can use Solanum elaeagnifolium as an alternate host plant. Mohamed et al. (2015) carried out a survey in greenhouses and open-field vegetable production areas between the years 2011 and 2014 using pheromone traps. The survey showed that the main host plant of T. absoluta is tomato (Lycopersicon esculentum), but it also attacks potato, Solanum tuberosum, eggplant, S. melongena Jimson weed, Datura stramonium and S. dubium in the family Solanaceae, and broad bean, Vicia faba and alfalfa plant, Medicago sativa in the family Fabaceae. This survey found that also the first case of T. absoluta invaded the watermelon (Citrullus lanatus) in the family Cucurbitaceae, Physic nut (Jatropha curcas) in the family Euphorbiaceae, spiny amaranth (Amaranthus spinosus) in the family Amaranthaceae, Ramtouk (Xanthium brasilicum) in the family Asteraceae and S. dubium. The study showed that the leafminer male numbers and the symptoms were significantly increased in S. melongena and S. dubium after severe damage and complete loss of the main host, the tomato crop and these two species may be the preferred alternative host plants.

This result recommended that remove of field bindweed plants from tomatoes fields or greenhouse may be reducing the



Figure 1. The larvae of *T. absoluta* infested field bindweed leaves A, the seedling of tomato (with red arrows), the larvae infested the upper leaves B, C, E and H, the larvae in

leafmines D and F, the larvae infested tomato leaves G. tomato leafworm population. The result also recommended that all field bindweed plants must be treated with suitable insecticides when the tomato leafworm controlled.

References

[1]Callihan RH, Eberlein CV, McCaffrey JP, Thill DC.. Field Bindweed: Biology and Management. 1990, Bull No. 719. University of Idaho, College of Agriculture, Cooperative Extension Syste

[2]Cardozo R, López MB, Evert MT, Palacio C, Yasuda S, Sugiyama H, Mori K, Kajita H, Sato T. Control integrado de la Palomilla del Tomate: *Scrobipalpula absoluta* (Meyrick, 1917). Caacupé, PY: MAG -IAN / 1994, JICA 173 p.

[3]Galarza J. Evaluacion en Laboratorio de Algunas Plantas Solanaceas. Posibles Hospederas de la Polilla del Tomate *Scrobipalpula absoluta* (Meyr.) (Lepidoptera: Gelechiidae). IDIA, 1984, 421-424:30-32.

[4]Holm LG, Plucknett DL, Pancho JV, Herberger JP.. The World's Worst Weeds: Distribution and Biology. 1977, pp 609. University of Hawaii Press, Honolulu.

[5]Maillet J. Les liserons. Phytoma. Defense de Culture, 1988, .399: 11–15.

[6]Miranda MMM, Picanco M, Zanuncio JC, Guedes RNC. Ecological Life Table of *Tuta absoluta* (Meyrick) (Lepidoptera :Gelechiidae). Biocont Sci Technol. 1998. 8:597–606

[7]Mohamed ESI, Mahmoud MEE, Elhaj MAM, Mohamed SA Ekesi S. Host plants record for tomato leaf miner *Tuta absoluta* (Meyrick) in Sudan. EPPO Bull. 2015, 45 (1): 108–111.

[8]Portakaldali M, Öztemiz S, Kütük H. A new host plant for *Tuta absoluta* (Meyrick) (Lepidoptera: Gelechiidae) in Turkey. J Entomol Res Soc. 2013, 15 (3): 21-24

[9]Tamerak SA. The status of *Tuta absoluta* in Egypt. EPPO/IOBC/FAO/NEPPO joint International Symposium on management of *Tuta absoluta* (tomato borer)., pp– 18, 16 November 2011 Agadir, Morocco

[10]Vargas HC Observaciones sobre la biologi´a y enemigos naturales de la polilla del tomate, *Gnorimoschema absoluta* (Meyrick) (Lepidoptera: Gelechiidae). Idesia 1970, 1:75–110

[11]Weaver SE, Riley WR. The biology of Canadian weeds. 53. Convolvulus arvensis. Can J Plant Sci. 1982, 62, 461–72.