

CONFIRMATION OF THE PRESENCE OF *TUTA ABSOLUTA* (MEYRICK) (LEPIDOPTERA: GELECHIIDAE) IN NIGER (WEST AFRICA)

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Abstract: *Tuta absoluta*, an invasive pest of tomato is found in Senegal and is suspected to be present in tomato growing areas of Niger where it causes economic damage to tomato producers. The objective of this study was to confirm the presence of this insect pest in Niger.

Infested plant organs were taken from many tomato fields and placed in boxes for emergence of adults of the insect. In addition, some other adults of the same insect were trapped using pheromone traps. All insect specimens were sent to Arizona State University and were identified as *Tuta absoluta* (Meyrick).

So, countries next to Niger as well as some central Africa countries should expect the attack of this insect owing to its rapid spread if necessary action is not taken.

Keywords: tomato borer, *Tuta absoluta*, *Lycopersicon esculentum*, invasive species, Niger.

Introduction

The tomato borer, *Tuta absoluta* (Meyrick) (Lepidoptera: Gelechiidae) is an invasive insect native of South America. It was declared as a major pest since 1964 in Argentina from where it spread over all other South American countries. Since then, it has continued its expansion and in 1962, it was found in Japan. This caterpillar was reported in Spain in 2006, Morocco, Algeria and France in 2008. From 2009, it was recorded around all the Mediterranean countries (Germain *et al.*, 2009; Desneux *et al.*, 2010).

In West Africa, Senegal was the first country to declare the occurrence of the *T. absoluta* in 2012 (Pfeiffer *et al.*, 2013). It was encountered in Egypt (Saad *et al.*, 2011), Sudan (Mohamed *et al.*, 2012) and Ethiopia (NAPPO, 2012). The presence of *T. absoluta* has been recently (August 2014) reported in Kenya (Maroo and Venter, 2015).

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Tomato is the preferred host of the larvae of *Tuta absoluta*, but it can attack several plants belonging to the Solanaceous family (cultivated or wild). It was found on potato, eggplant, peppers (Ferracini *et al.*, 2012) and some weeds of the same family e.g. *Lycopersiconhirsutum*, *Solanum lyratum*, *S. nigrum*, *S. elaeagnofolium*, *S. puberulum*, *Datura stramonium*, *Datura ferox*, and *Nicotiana glauca* (R. Muniappan, 2013). It was observed on *Chenopodium album* (Ögür *et al.*, 2014) and *Medicago sativa* (Abdul-Rassoul, 2014).

The tomato borer, *Tuta absoluta* Meyrick (Lep. Gelichiidae) is a small butterfly silver gray, 6-7 mm long and 10 mm wingspan. It has black spots on the forewings and threadlike antennae. *T. absoluta* goes through four development stages: egg, larvae, pupa and adult. According to Torres *et al.* (2001), female fecundity can be 60 to 120 eggs while each female can lay up to 260 eggs during its lifetime. The development from egg to adult can take place in 23.8 days at 27.1 ° C (CABI, 2011), meaning one generation per month in the tropics. Dissemination of *T. absoluta* can be done through the movement of fruits and infested plants and by contaminated baskets during the transport, by the wind and the flying adults (RECA, 2013).

According to Trottin-Caudal *et al.* (2011), the caterpillars bore mines into the leaves, stems, and buds and also in young and ripping fruit. They prefer apical buds, flowers and young fruits often covered with blackish droppings (Kaouthar *et al.*, 2011). 100 % yield damage can occur under heavy infestations. In greenhouse and opened fields in Europe, 25% of green and red fruits present on the plant are attacked, 46% of clusters are unmarketable and 34% of stems are destroyed (Trottin-Caudal *et al.*, 2011).

To minimize yield losses caused by this insect pest, several control measures are used. According to Kaouthar *et al.* (2011) the control measures are : (i) the hygiene of plots through adequate weed control and the removal of crop debris, (ii) trapping the adult insects with pheromone (4 delta traps per hectare); (iii) monitoring populations of *Tuta absoluta* by observing the plants regularly to detect possible attacks of leaf miner; (iv) chemical control by using of appropriate insecticides such as abamectin, indoxacarb, spinosad and the insect growth regulators, the spinosad, the tebufenozide or chlorfenapyre; (v) the introduction of natural enemies such as Trichogramma (*Trichogramma pretosium*, *T. bactrae*) or predators (*Nesidiocoris* (= *Cyrtopeltis*) *tenuis*, *Macrolophus caliginosus* and *Amblyseius swirskii*).

Material and methods

In Niger, the insect appeared simultaneously in two sites which are Burburkabé and Tolkoboye located respectively at 15 km and 70 km from Niamey, the capital city. For the first site, the insect was reported by the “Réseau des Chambres d’Agriculture” (RECA) in a technical note, while the alert was given by the extension service agents with regards to the second site. A Field visit was immediately undertaken in the infested sites to interview the producers whose plots were attacked. The presence of small caterpillars was observed on stems, leaves and fruits during the visit and samples of attacked plants parts were collected. These samples were incubated and few days later, butterflies emerged. An investigation was carried out to identify the insect and the results showed that it is the tomato borer (*Tuta absoluta*). Traps with pheromone of *T. absoluta* (Russell IPM-Morocco) were then placed in the different sites. The operation was even extended to several regions of the country by the Plant Protection services of the Ministry of Agriculture.

Results and discussions

Butterfly specimens caught in the traps were presented to Prof. Muniappan R. (Director, Feed the Future Innovation Lab. - IPM IL) who transferred them to Dr. Sangmi Lee (a taxonomist) at Arizona State University. Mr Lee confirmed that the insects are *T. absoluta*.

The presence of this insect is suspected in other regions of Niger such as Agadez towards the border with Algeria, where it is already established for nearly eight years. Other areas not yet explored, may not be free from the attacks of *T. absoluta*, if we take into account its very high capacity to spread (Gebrelibanos, 2015).

The neighboring countries such as Burkina Faso, Mali, Nigeria and Benin should expect an invasion by this insect pest because of the many trade links they have with Niger.

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1. Larvae on ripe fruit
2. Adult of *Tuta absoluta*
3. Pheromone trap with males of *T. absoluta*
4. Damage on tomato leaves
5. Damage on tomato fruits

