## Breaking news

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International Institute of Tropical Agriculture (IITA), Ibadan, Nigeria
21 May 2018

# New pest identified in West and Central Africa!

*A second armyworm from the Americas introduced into tropical Africa: Spodoptera eridania, the Southern Armyworm*

A new pest—a second armyworm species—has been discovered in West and Central Africa!

The pest was first found in cassava fields in December 2016 in the south-east of Nigeria and in 2017 in southern Benin, reported Dr Georg Goergen, Entomologist / Biocontrol Specialist and Head of IITA's Biodiversity Center in Benin. The presence of the southern armyworm *Spodoptera eridania* (Stoll) was confirmed by DNA barcode analysis at IITA headquarters in Ibadan.

The recent introduction of the fall armyworm (FAW) into the African continent and its growing threat to agriculture and food security has raised much concern in many of the 44 countries of tropical Africa invaded by this pest. Originating from the tropical regions of the Americas, the FAW adult has a remarkable long distance migratory capacity and a high female fertility. Its crop-destroying caterpillars can cause serious damage to maize but also to other important crops such as sorghum, rice, and vegetables. These attributes have made the control of FAW a challenging task. The development of management options adapted to Africa has mobilized international experts and national capacities of affected countries and has raised general attention to caterpillar attacks on various crops.

Thus, farmers in the Delta state of Nigeria were much alarmed when by mid-December 2016 an outbreak of caterpillars caused severe defoliation on cassava in a 450-hectare field near Ubiaja in South-East Nigeria. Alcohol-preserved samples of immatures (larvae) were sent for diagnosis to the biodiversity center at the IITA station in Benin, where a negative matching with the form and structural (morphological) characteristics of FAW caterpillars was established. However, the species appeared to have related origins and resembled closely the African cotton leafworm (*Spodoptera littoralis* [Boisduval]). In the absence of adult moths, it was concluded that the latter species, known to be polyphagous or feeding on various kinds of food and widespread in tropical Africa, must have attacked some sweet varieties of cassava that are less toxic to potential insect pests. Similar observations were made in early 2017, when farmers submitted alcohol-stored samples of immatures for identification following complaints about dense caterpillar colonies in their cassava fields in the surrounding areas of Dasso, in southern Benin.

According to Goergen, a decisive turn was made when instead of immatures, moths were finally obtained from tomato fields attacked in Yaoundé, Cameroon and samples of adults were made available from a scientist-colleague based at the University of Masuku, in

Franceville, Gabon. This time the examination of the outer features of the moths together with the genitalia of both sexes allowed an unambiguous identification of the southern armyworm *Spodoptera eridania* (Stoll). As a further means of control, larval and adult samples from all presently collected sites were sent to IITA headquarters at Ibadan at the germplasm health, virology, and diagnostics unit for DNA barcode analysis. Results confirmed these findings.

The southern armyworm belongs to the cosmopolitan genus *Spodoptera* that encompasses worldwide 31 species including many of the most important agricultural armyworm caterpillars such as FAW. The detection of the new pest adds to the eight species already known to occur on the African continent. Caterpillars, particularly mature instars of the southern armyworm, are extremely variable in their general appearance and can therefore hardly be identified based on morphological (physical) characters alone. Thus, in Africa, forms that bear a row of dark triangles on each side of the dorsum (back) along the length of the body can easily be mistaken with the African cotton leafworm or beet armyworm (*S. exigua* (Hübner)). Accurate identification of adults is not less challenging since *S. eridania* belongs to the category of *Spodoptera* moths lacking strong contrasting patterns on the forewings. They measure between 33-38 mm in length, are commonly cream or gray in ground color, bear a faint reniform (kidney-shaped) spot, and look identical in both sexes. The only constant feature is a dark brown streak at the inner margin of the forewing. Some forms exhibit a large bar extending from the center to the margin of the forewing (Fig. X upper specimen). The high variability and difficulty in the identification of the species is evidenced by its 20 Latin synonyms.

The southern armyworm is native to the Americas, occurring widely from southern USA to Argentina. With records of more than 200 host plants belonging to 58 plant families including many important crops, the species is probably the most polyphagous species within the genus *Spodoptera*. Depending on the host plant and temperature, the southern armyworm can complete its life cycle within 30-40 days and is able to produce 1500 to 3000 eggs over its lifetime.

Although the species is until now only sporadically known as a serious pest in southern USA, in recent years, however, it has emerged as an important pest of soybean in the cotton growing areas of South America. In addition, recurrent interceptions on internationally traded goods by quarantine authorities at entry points in Europe have led to a new risk assessment for the southern armyworm. Thus, in 2015 *S. eridania* was newly ranked as an A1 quarantine pest or pests recommended for regulation on the list of the European and Mediterranean Plant Protection Organization (EPPO). In Africa spectacular outbreaks comparable to those caused by the fall armyworm were not observed, however preliminary data show that the species is present in at least four countries in West and Central Africa, where it can be found on cassava, tomato, amaranth, and maize.

Goergen said that it is uncertain how long the southern armyworm has been present in West and Central Africa and its possible pathways of introduction into the continent. Since the species is difficult to identify, populations may have remained latent in the field and only sporadically noticed especially when young caterpillars aggregate on individual host plants before they disperse upon maturation. The fact that adult males react on pheromones of other *Spodoptera* species calls for a more thorough assessment of pheromone trapping

when FAW populations are monitored. An interesting circumstance is that the southern armyworm and the fall armyworm share many important natural enemy species in South America.

Dr May-Guri Saethre, IITA's Deputy Director General for Research for Development, said that while this trait may become a significant stabilizing factor for common natural enemy populations, more research is urgently needed to assess its effective pest status in tropical Africa.

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**About IITA,** www.iita.org
The International Institute of Tropical Agriculture (IITA) is a not-for-profit institution that generates agricultural innovations to meet Africa's most pressing challenges of hunger, malnutrition, poverty, and natural resource degradation. Working with various partners across sub-Saharan Africa, we improve livelihoods, enhance food and nutrition security, increase employment, and preserve natural resource integrity. IITA is a member of CGIAR, a global agriculture research partnership for a food secure future.

**Hashtags**: #southern_armyworm, #invasive_species

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