Food and Agriculture Organization of the United Nations

International Plant Protection Convention

African Union

USDA

Survey Guidance for *Diastocera trifasciata*

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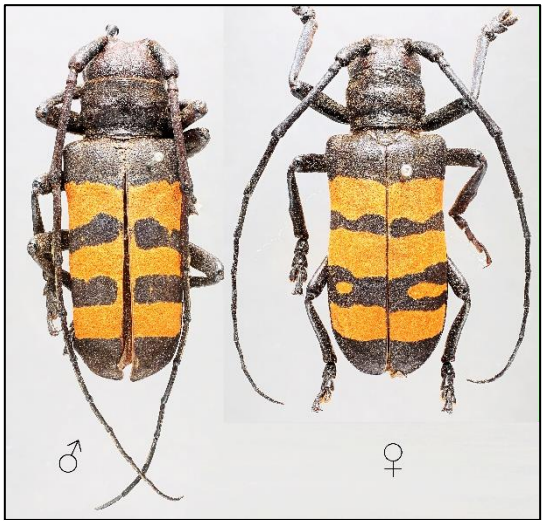

Figure 1. **Adults of *D. trifasciata*** (USDA)

Scientific Name

Diastocera trifasciata (Fabricius)
Synonym: *Analeptes trifasciata* Fabricius

Common Name

Stem girdler

Type of Pest

Flat-faced longhorn beetle, branch girdler

Taxonomic Position

Class: Insecta **Order**: Coleoptera
Family: Cerambycidae **Subfamily**: Lamiinae

Known Hosts

Preferred hosts

Anacardium occidentale (cashew), *Sterculia setigera* (kukkuki), and *Annona senegalensis* (wild soursop)

Other hosts

Adansonia digilata, Bombax costatum, Ceiba penlandra, *Eucalyptus saligna, E. camaldulensis, E. globulus, Lannea nigrilana, L. triphylia, Sclerocarya birrea, Spondias monbin,* and *Pseudospondias microcarpa*

Survey Protocol

Target Life Stage:

Visual survey for adults, however visual surveys of damage may be used to detect populations when adults are not present.

Time of year to survey:

- Visual surveys for adults on branches of host trees from the end of the dry season until flowers begin to appear on the trees.
- Visual surveys for cut branches containing eggs, larvae, and pupae can be carried out during the dry season when adults are not present.

The first generation of new adults appear at the end of the dry season and can persist for as many as 10 months. Attacks begin when trees are in the pre-flowering vegetative growth stage and peak during this time. When flowers begin to appear, attacks will begin to

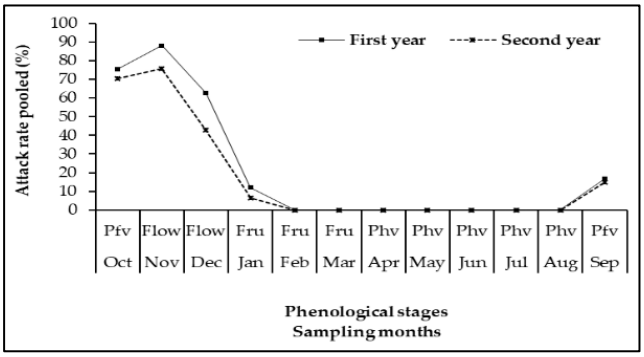

Figure 2. **Months where adult *D. trifasciata* were found attacking cashews related to plant phenology in central Côte d'Ivoire** (Image from Ouali-N'Goran et al., 2020).

decrease and stop at the fruiting and post-harvest vegetative growth stages of the cashew tree (**Fig. 2**).

Visual Survey

Visual inspection: Use tools such as beat sheets (light colored cloth or tarp) and poles to knock beetles off branches of potential hosts.

Signs and Symptoms:

During the rainy season look for girdling of branches in host trees, and beetles present on the branches near the girdled area. Girdled branches may show signs of girdling with leaves becoming yellow, and some branches may fall to the ground. You may also see signs of adult feeding, where bark has been scraped from the smaller branches of the tree (**Fig. 3)**.

Figure 3. **Adult *D. trifasciata* shown feeding and scraping off bark from the branch of a host tree** (Image from Asogwa et al., 2011).

Fig. 4 shows the stages of attack on cashew tree branches caused by a mating pair of adult *D. trifasciata*. The adults girdle and eventually cut the branches of cashew trees over the course of 9-15 days. Branches range in size form 8.5 cm to 35 cm around and 1 m to 4.9 m long. Females lay an egg in the cut branch that either falls to the ground or remains attached to the tree.

Adults are large (30-45 mm length) and conspicuous and can typically be seen from the ground as they begin to girdle tree branches. When the girdle reaches the sapwood, yellowing of the leaves on the girdled branch may be observed. Cut branches look like they have been cut with a saw (**Fig. 4f**). The oviposition holes made on the cut branches, as well as the exit holes made by the newly emerged adults may also be easily seen on cut branches that have fallen to the ground.

Figure 4. **Sequence of damage to cashews by *D. trifasciata*** (Images from Ouali-N'Goran et al., 2020).

Survey Site Selection

Cashew plantations or other places where host material is abundant.

Sample Collection

Collect adults with beat sheets, or by hand if they are within reach. Place them in a jar with 70% alcohol to be sent for final identification. If cut branches are present with clear oviposition holes they can be collected and wrapped with a mesh bag until the adults emerge. Pictures from the field can also be helpful to identifiers to see the location, full host, symptoms, or how the suspect insect looked in the field prior to sampling.

Pest Identification and Diagnostics

Morphological examination of adults using a microscope with 50x zoom is needed to confirm identification. Final identification by a Cerambycid expert may be made based on external structures.

Pest Description

Diastocera trifasciata are large (4-6 cm) longhorn beetles that attack cashews. They can be seen crawling on or flying near cashew tree branches. Females lay a single egg in each cut branch where the larvae develop. They produce one generation per year.

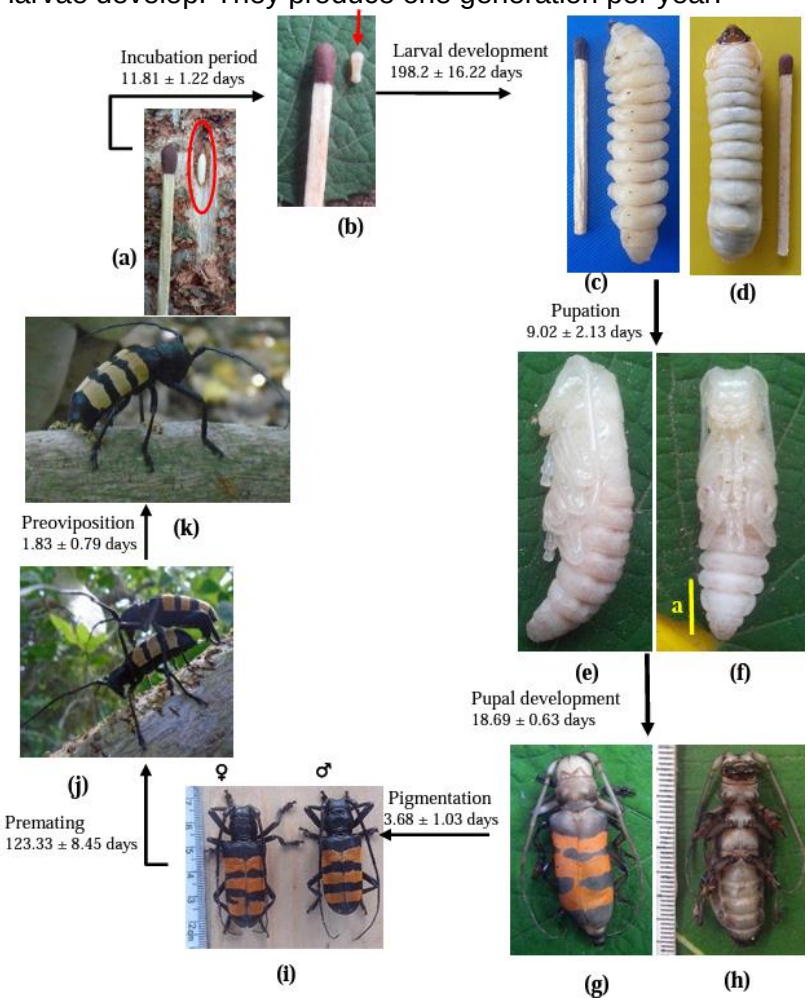

Figure 5. **Life cycle of *D. trifasciata*** (Image from Akessé and Ouali-N'Goran, 2018)

Adults: Adult male and females are similar in size (30-45 mm) and appearance with black bodies and typically three, wide, horizontal, orange stripes on the elytra. Males tend to be larger than females with noticeably longer antennae (**Fig. 1**). Females live longer than males (178-208 days) and will lay eggs for about 64 days, for a total of 126-200 eggs per female.
Eggs: Eggs look like a grain of rice, about 6 mm in length, oval, and white. Eggs hatch about 12 days after being laid.
Larvae: Larvae are translucent to a cream-white color and grow from about 5 mm in length to 48 mm as final instars in 169 to 226 days.
Pupae: Pupae are white or black depending on the stage of development with a length of 23.5-46.9 mm and take 16 to 19 days to transform into adults. After the pupae emerge as adults, they spend about 3 days in the pupal chamber as their cuticle hardens. When they emerge, they chew a circular exit hole in the cut branch that is about 18 mm across. The entire life cycle can last 167-240 days.

Identification and Diagnostic Resources

Morphological characters are described in N'Goran et al., 2020 and additional photos of similar beetles can be found in Cerambycoidea.com. There is no key specific to the tribe Ceroplesini, to which *D. trifasciata* belongs, but there is an online key to the tribes of Lamiinae that could be useful at Lamiines of the World

Easily Mistaken Species

Ceroplesis aestuans (Olivier, 1795) (**Fig. 6**)

Ceroplesis aestuans guineensis Hintz looks like *D. trifasciata* and is present in Africa where it has been found on cashew and on mango in Morrocco. This beetle is smaller in size (23-35.5 mm) and the antennae do not extend beyond the length of the body on the females.

There are several other species of *Ceroplesis* that have similar coloring to *D. trifasciata*, but most are smaller in size. We suggest final identification be made by an expert on Cerambycids.

Figure 6. **Female (30 mm) left, and Male (25 mm) right, of *C. aestuans* from Senegal** (photos from Roguet, J.P., 2023).

Commonly Encountered Non-targets

Apate terebrans Pallas (Coleoptera: Bostrichidae) does not look like *D. trifasciata*, but is more common in some cashew orchards, and causes the same type of damage. *Paranaleptes reticulata* Thomson (Coleoptera: Cerambycidae) also girdle cashew trees, is present in Africa, but is smaller is size, and does not have stripes like *D. trifasciata*.

Image Citations:

Akesse, N.E. and M.S.-W. Ouali-N'Goran. 2018. Population fluctuation of *Diastocera trifasciata* (Fabricius, 1775) (Coleoptera: Cerambycidae), cashew branches girdler in the Brobo locality (Central Côte d'Ivoire). Journal of Entomology and Zoology Studies. 6(5): 1064-1070. **(Fig. 5)**

Asogwa, E.U., T.C.N. Ndubuaku, and A.T. Hassan. 2011. Distribution and damage characteristics of *Analeptes trifasciata* Fabricus 1995 (Coleoptera: Cerambycidae) on cashew (*Anacardium occcidentale* L. 1753 in Nigeria. Agiculture and Biology Journal of North America. 2(3): 421-431. **(Fig. 3)**

Ouali-N'Goran, M. S.-W., E.N. Akessé, G.M. Ouattara, and D. Koné. 2020. "Process of Attack on Cashew Tree Branches by *Diastocera trifasciata* (Coleoptera: Cerambycidae) and the Relationship between These Attacks and the Phenological Stages in the Gbêkê Region (Central Côte d'Ivoire)" *Insects* 11, no. 8: 456. https://doi.org/10.3390/insects11080456 (**Fig. 2 and 4**)

Roquet, J.P. 2023. Lamiines of the World. Lamiinae.org (**Fig. 6)**

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