

Utilizing electronic traps for early detection of *Bactrocera dorsalis* (Diptera: Tephritidae) in South Africa

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ABSTRACT

Bactrocera dorsalis (Diptera: Tephritidae) was declared present in the northern and north eastern areas of South Africa in 2013. The pest still has a restricted distribution in South Africa, being absent in the western and most of the south eastern parts. Monitoring for early detection of *B. dorsalis* in pest free areas in South Africa is routinely carried out. Conventionally, *B. dorsalis* populations have been monitored using ME (Methyl Eugenol) in bucket traps containing a toxicant strip (Conventional Trap). Traps are checked manually at specified intervals. Recently a McPhail type electronic trap (E-Trap) with a yellow sticky pad (to retain flies), a camera and a network device for image relay was developed to enable remote monitoring of *B. dorsalis* populations. The study aimed to assess the comparative efficacy of the E-trap and the conventional trap as early detection tools for *B. dorsalis*. The conventional trap and E-trap were compared in two locations (Schoemanskloof and Ermelo) in Mpumalanga Province, South Africa.

At Schoemanskloof 11 conventional traps and three E-traps were placed across 459 ha and at Ermelo seven conventional traps and six E-traps were placed across 1709.69 ha. In each area, traps were at least 1 km apart. The trapping systems were monitored over 16 months (November 2022 - February 2024). Conventional traps were checked fortnightly and E-trap images were checked daily. The first incursions of *B. dorsalis* in 2023 was detected by the Conventional trap in Schoemanskloof (2023/01/10; average flies/trap/day = 0.1) and by the E-trap in Ermelo (2023/01/10; average flies/trap/day = 0.006). The first incursions of *B. dorsalis* in 2024 were detected by Conventional traps in Ermelo (2024/01/18; average flies/trap/day = 0.004) and Schoemanskloof (2024/01/24; average flies/trap/day = 0.008). This suggests that conventional traps may be more reliable for early detection, but the number of traps and trap placement may also play an important role in *B. dorsalis* detection.

KEYWORDS: *Bactrocera dorsalis*, electronic-trap, detection, South Africa, Tephritidae