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Fruit Fly Research and Development in Africa - Towards a Sustainable Management Strategy to Improve Horticulture

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Background: The horticultural sub-sector presents many opportunities for economic development and improving livelihood of millions of growers of fruits and vegetables and other stakeholders. However, several factors constrain production and limit the potential for trade of these commodities. Tephritid fruit flies (Diptera: Tephritidae) constitute a major constraint. They cause enormous losses through direct feeding damage and loss of market opportunities through imposition of quarantine restrictions by importing countries to prevent entry and establishment of invasive species. In Africa, several native (*Ceratitis* and *Dacus*) and exotic (*Bactrocera* and *Zeugodacus*) species inflict considerable losses to horticulture ranging from 30 to 90%, thereby threatening the livelihood of vulnerable rural communities who rely exclusively on agriculture for their income generation, as well as jeopardizing the African economy at large.

Methodology: Over the past 20 years of R&D on the African mainland and adjacent islands, extensive information has been generated on several native and exotic fruit flies. Numerous studies have been conducted and papers published in several fields of taxonomy, biology, ecology and management. This output coincides with two elements: the changing fruit fly landscape in Africa – caused by arrivals of the highly destructive alien invasives (*Bactrocera dorsalis*, *B. zonata*, and *B. latifrons*) – and the priorities that African countries have placed recently on export of fruits and vegetables to international markets. As such it was deemed necessary that all this scattered information should be brought together in a reference work that collates the series of important and diverse achievements made over the last two decades.

Results: Sixty-five scientists from Africa and abroad present in 34 chapters the current state of the art in these different fields. They analyse the successes achieved in the identification of different species using both morphological and molecular tools. Also, the invasion histories of exotic species are documented, and information on behaviour, abundance, dynamics, host plants and damage levels of different species are presented. Management methods based on the use of baiting and male annihilation techniques, biopesticides, parasitoids, ant technology and field sanitation are discussed in line with the demand for socio-economic impact and ecosystem sustainability. The technical knowledge presented in this book is not unique to Africa, and lessons learnt from other successful fruit fly eradication/management programmes in the USA and Latin America are also captured.

Conclusion: As such it is hoped and expected that this work will serve as a reference tool for the current and future generation of fruit fly researchers in Africa.