



Integrated control of thrips in vegetables in Eastern Africa

The International Centre of Insect Physiology and Ecology (icipe)

Country/Region:	Kenya, Uganda
German participation	Leibniz University, Hannover; Martin-Luther-University, Halle-Wittenberg
Leading scientist:	Dr Sevgan Subramanian
Duration:	Jan 2008 – Dec 2010

Initial situation

The horticulture sub-sector in East Africa contributes around US\$ 1 billion annually to the value of exports. More than 80% of the vegetables grown are produced by smallholders. Invasive western flower thrips (*Frankliniella occidentalis*), native onion thrips (*Thrips tabaci*), bean flower thrips (*Megalurothrips sjostedti*) and tospoviruses vectored by thrips seriously constrain production of vegetables. Indiscriminate use of synthetic insecticides is common, however ecologically unsustainable. Often resistances to pesticides render them ineffective. Efforts to promote Integrated Pest Management (IPM) strategies for thrips are largely lacking.

Approach of the project

The project focuses on evaluation of diversity and field ecology of thrips and tospoviruses, and validation of IPM tools and strategies. The project further seeks to build capacity for thrips research in the region and disseminate IPM strategies to smallholders in partnership with the national agricultural research system (NARS).

Major results achieved

Surveys in Kenya and Uganda revealed that onion thrips, western flower thrips, yellow flower thrips (*F. schultzei*), bean flower thrips and tomato thrips (*Ceratothripoides brunneus*) were most abundant. A geo-referenced database of over 4000 slide-mounted thrips specimens has been established. Widespread occurrence of invasive chilli thrips, *Scirtothrips dorsalis*, was also observed on chillies, capsicum and bitter melon. Eulophid parasitoids (*Ceranisus menes* and *C. femoratus* associated with *Frankliniella* sp. and *M. sjostedti*, respectively) and anthocorid predators (*Orius* sp.) were relatively more abundant in wild habitats compared to cultivated fields. Detailed surveys on the diversity of tospoviruses are currently underway.



A complex of western flower thrips, yellow flower thrips, bean flower thrips and *Hydatothrips adolffriderici* damaged French beans, and weeds around the fields were found to act as infestation source. Western flower

thrips were abundant in fields with intensive pesticide sprays, indicating the need for integrated management. Evaluation of cropping systems taking into consideration the commonly adopted mixed cropping of vegetables among smallholders revealed that intercropping French beans with baby corn and sunflower reduced thrips damage and increased marketable yield by over 50%.



A *M. anisopliae* (icipe 69) isolate was found to be most effective against western flower thrips larvae. Further studies into mass production, formulation and interaction of this strain with other natural enemies, pesticides and fungicides are underway. icipe has also initiated a public-private partnership with Real IPM (Kenya) for its commercialization. Application of botanical pesticides and dry grass/black polythene mulching signifi-

cantly reduced thrips damage and enhanced French bean yield. Evaluation of coloured sticky traps with Lurem®, a kairomonal attractant for effective monitoring and timely application of botanical pesticides is underway.

Dr Gerald Moritz, Martin Luther University, Germany, trained members of partner institutes on thrips identification and management. Three PhD students and three Masters students are currently trained by the project.

Expected impact

Pest status of thrips on vegetables will be reduced through dissemination of effective IPM strategies among smallholders. Therefore it can be expected to further reduce smallholders' reliance on pesticides, to enhance yields and to facilitate their participation in domestic as well as export markets. User-friendly taxonomic tools, such as keys for the identification software LuCID (www.lucidcentral.org) will be developed and made available to NARS partners.

Collaborating institutions

Leibniz Universität, Hannover, Germany; Martin-Luther-University of Halle-Wittenberg, Germany; KARI, Kenya; KEPHIS, Kenya; Real IPM, Kenya; East African Growers Association, Kenya; NaCRRI, Uganda; Makerere University, Uganda; Plant Research International, Wageningen University; Netherlands; Washington State University, Pullman, USA

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