

**EPIDEMIOLOGY, APHID VECTORS, IMPACT AND MANAGEMENT OF TOBACCO
ETCH POTYVIRUS IN HOT PEPPERS IN JAMAICA**

by

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Abstract

Production of hot peppers, *Capsicum* spp., in Jamaica is constrained by the aphid-transmitted potyviruses, *tobacco etch virus* (TEV) and *potato virus Y* (PVY). The virus epidemiology was not understood and no effective virus management system existed for these viruses. This study sought to identify possible management strategies for aphid-transmitted viruses of hot peppers in Jamaica, using TEV and *Capsicum chinense*, var. 'Scotch Bonnet' and 'West Indian Red', as models.

Field spread of TEV to pepper was mainly by secondary spread from primary infections. Secondary infections were spatially correlated to primary infections for up to 25 meters. Natural infections of TEV were associated with aphid flight activity. Over 30 species of aphids were collected on pepper farms in St. Catherine parish. These aphids included five known vectors of TEV, *Aphis gossypii* Glover, *A. craccivora* Koch, *A. spiraecola* Patch, *Lipaphis erysimi* Hille Ris Lambers and *M. persicae* (Sulzer), and 12 new records for Jamaica, *Aphis amaranthi* Holman, *Brachycaudus helichrysi* (Kaltenbach), *Capitophorus hippophaes* (Walker), *Geopemphigus floccosus* (Moreira), *Hysteroneura setariae* (Thomas), *Lipaphis erysimi* Hille Ris Lambers, *Rhopalosiphum padi* (Linnaeus), *Schizaphis graminum* (Rondani), *Schizaphis rotundiventris* (Signoret), *Trichosiphonaphis poligoni* (van der Goot), *Uroleucon ambrosiae* complex (Thomas) and *Uroleucon pseudoambrosiae* (Olive). *A. amaranthi* and *U. ambrosiae* were associated with TEV spread. Weeds on and near farms influenced the abundance and species of aphids captured.

West Indian Red pepper showed tolerance to TEV. Scotch Bonnet pepper yield reduction was greater if plants were infected with TEV during the vegetative stage through flower initiation rather than after the start of fruit set. Stylet oil and reflective mulch used together delayed the incidence of TEV in pepper plots for over two months. TEV management programs should aim to delay the virus from infecting peppers during the first two months after transplanting. A risk analysis is proposed for management of TEV and other aphid-borne viruses.

Dedication

This dissertation is dedicated to my family and the Bethel family at South Camp Road, Kingston, Jamaica. They were always with me in spirit, constantly supporting me in prayers, word and deeds.

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