

Ferdinand Villanueva Salazar 2012: Characterization of the BG-Sentinel™ Trap for Integration into an *Aedes aegypti* L. (Diptera:Culicidae) Push-Pull Control Strategy. Doctor of Philosophy (Tropical Agriculture), Major Field: Tropical Agriculture, Faculty of Agriculture. Thesis Advisor: Professor Theeraphap Chareonviriyaphap, Ph.D. 179 pages.

The study aimed at evaluating and characterizing a peridomestic trap (BG-Sentinel™) to understand its role as part of a novel push-push dengue vector control strategy. The process involved modelling the relationship between BG-Sentinel™ trap operation time and female *Ae. aegypti* capture rates and quantification of the impact of trap density on capture rates against varying *Ae. aegypti* adult population sizes using a semi field system built in Pu Teuy, Kanchanaburi, Thailand. Results showed a recapture range of 66-98% with 2-3 traps as statistically effective in recapturing mosquitoes as 4 traps for all mosquito release numbers (10, 25, 50, 100, 150, 200 and 250).

The effect of spatial repellents (DDT, metofluthrin and transfluthrin) exposure in experimental hut simulated home condition on BG-Sentinel™ *Ae. aegypti* recapture was quantified through screen house post exposure releases. Varying effects were observed with the use of three repellents from either without recovery period (immediate release population) or with recovery time (delayed release population) experiments. Both BGS recapture rates and data from interception traps from the experimental huts also showed best BGS location was opposite portals of entry at 0 m distance from the experimental huts. Using the best location and distance, BG-Sentinel™ functioned to collect *Ae. aegypti* populations under two different Thai household conditions, raised-wooden and non-raised-cemented house, documenting differences in densities between periods of monitoring (rainy and dry seasons), between times of collection and between locations around households. BGS collected not only *Ae. aegypti* females but also males and also the secondary vector *Ae. albopictus* in the presence of possible competing resting and breeding sites found within 0-3 m distance from local house. Implications of the results of this study to push-pull control strategy were discussed.

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Student Signature

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Thesis Advisor's Signature

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