Effects of Relative Humidity on Efficacy of BotaniGuard™ (*Beauveria bassiana*) on Nymphs of Sweetpotato Whitefly, *Bemisia tabaci* (Hemiptera: Aleyrodidae), on Hibiscus in Greenhouses

Tong-Xian Liu¹ and Philip A. Stansly²

*Beauveria bassiana* (Balsamo) Vuillemin is a fungal pathogen that attacks many kinds of insects, including whiteflies (family Aleyrodidae) (Poprawski and Jones 2001, Shipp et al. 2003, Siongers and Coosemans 2003, Torrado-Leon et al. 2006). Susceptibility of a species of insect depends on the strain of *B. bassiana*, as well as environmental conditions (Ship et al. 2003). Growth and sporulation of *B. bassiana* are favored by warm temperatures and particularly by high relative humidity. Thus, the fungus might be expected to work well under conditions such as occur in greenhouses where hibiscus, *Hibiscus rosa-sinensis* L., are propagated, and where relative humidity normally is >90%.

The experiments simulated these conditions as a test of practical feasibility of utilizing *B. bassiana* to manage whiteflies and related pests of ornamentals and other crops grown in a greenhouse. The experiment was done in a greenhouse at the Southwest Florida Research and Education, Institute of Food and Agricultural Sciences, University of Florida at Immokalee. A commercial water-based formulation of *B. bassiana* strain GHA 1991, BotaniGuard ES™ (formerly Mycotech, Butte, MT; now Laverlam International Corporation, Butte, MT), containing 2.3 x 10¹⁰ viable *B. bassiana* spores/ml was used. Tap water was used as a check. The concentrations were 2.50 and 1.25 ml material per liter of water (1.0 and 0.5 quart per 100 gallons) as recommended to control whiteflies under greenhouse conditions (Olson and Oetting 1999b, Ship et al. 2003).

A hand sprayer was used to spray to runoff two young, fully expanded leaves of hibiscus bearing 61 to 148 second-instar nymphs of sweetpotato whitefly, *Bemisia tabaci* (Gennadius), biotype B. The plants were allowed to dry for 2 hours. Twenty plants were sprayed with each dilution of *B. bassiana*. Plants were sprayed by using overhead mist nozzles 1 minute every hour from 0700 to 1900 hours to increase humidity (>95%). Twenty-four hours after treatment, plants were divided into two groups of 10 for each rate. Plants of one group continued to be misted for 10 days, while the remaining plants were watered using a drip system. Relative humidity ranged from 65-75% during the daytime, and >90% at night. Hibiscus leaves were removed from the plants 10 days after treatment, and dead and live whitefly nymphs or pupae were counted with the aid of a stereoscopic microscope. Percentage of mortality was calculated, and the percentages were transformed with

¹Vegetable IPM Laboratory, Department of Entomology, Texas AgriLife Research, Texas A&M University, 2415 East Highway 83, Weslaco, TX 78596-8399
²University of Florida, Southwest Florida Research and Education Center, 2686 SR 29 North, Immokalee, FL 34142-9515