1077-92-2521   **Kamuela E Yong*** (`kamuela-yong@uiowa.edu`), 14 MacLean Hall, Iowa City, IA 52242, and **Yi Li** (`yi.li@wright.edu`) and **Stephen D Hendrix** (`stephen-hendrix@uiowa.edu`). *A numerical approximation and parameter estimation for modeling bee pollination: an application of the Shigesada-Kawasaki-Teramoto model.* Preliminary report.

California's almond industry, valued at \$1.9 billion per year depends on successful cross-pollination. Almond growers mainly depend on honey bees, although other insects are being investigated as alternatives due to honey bee declines. Our objective is to model the movements of honey bees to determine if in the presence of other pollinators, honey bees will forage in less favorable areas of a tree and its surroundings. We use the SKT model (1979) which describes the density of two species in a 2D environment of variable favorableness with respect to intrinsic, self, and cross-diffusions. This model is applied to almond pollination by honey bees and other pollinators with environmental favorableness based on empirical data measuring the attractiveness of the canopy for honey and other pollinators. We found cross-diffusion effects of other pollinators on honey bees result in honey bees foraging in less favorable areas of a tree and the area surrounding a tree. We hypothesize that increased honey bees in unfavorable environments will increase the probability of movement to a different variety of tree, thereby increasing successful pollination and fruit production. Using empirical data, we estimate the diffusion parameters using COPASI and compare with the model. (Received September 22, 2011)