1116-34-2175 **Carlos E Cruz*** (ccruz14@lion.lmu.edu), **Matthew Baca**, **Armando Salinas** and **Carlos Agrinsoni**. *Modeling the Interaction Dynamics between Honeybees and Food Availability.* Preliminary report.

The success of honeybee colonies is critical to the United States agriculture with 35% of American diets dependent on honeybee pollination. There are various complex factors that contribute to a colony's failure. Nutritional stressors primarily pertain to food scarcity, lack in diversity of food, and the availability of food with low nutritional value. Previous mathematical models have examined the impact of nutrition and the early recruitment on honeybee population dynamics. In this work, we use a mathematical model to investigate the impact of food scarcity and limited storage space on colony viability, early recruitment rates of workers into foragers, and the influence of these rates on the growth of a colony. We found conditions for the stable coexistence of a honeybee population and food supply as well as conditions for periodic behavior. Through sensitivity analysis we find that a honeybee colony is most sensitive to changes in the rate at which a worker bee encounters food and the rate food is entering the food supply. There are no qualitative differences between using a Holling Type I or Type II functional response in honeybee population persistence when modeling the interaction between a honeybee colony and the availability of food. (Received September 22, 2015)