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Oyita Udiani, Noa Pinter-Wollman and **Yun Kang*** (yun.kang@asu.edu), 6073 S. Backus Mall, Wanner 301G, Mesa, AZ 85212. *A simple model of foraging activity in colonies of seed harvester ants.*

We develop a compartmental model of foraging activity of social ants to explore the interplay among forager return rate, forager retirement rate, and the constraints on vestibule size. Our model assumes i) equilibrium resource dynamics; ii) forager return rates regulate overall foraging activity; and iii) there is a linkage between the timescales of forager activation based on interactions in the vestibule and forager availability based on indirect recruitment from the inner nest allow for flexible adjustment to variable foraging conditions. One of our interesting results reveals the possibility for bi-stability corresponding to all or nothing activity states which matches previous experimental observations by Gordon (2002) in red seed harvester colonies. In addition, we validate and parameterize the model with experiment data. The sensitivity indices of parameters defining the threshold forager return density are also provided. (Received September 04, 2013)