1116-92-1246 **Timothy D Comar*** (tcomar@ben.edu), Department of Mathematics, Benedictine University, 5700 College RD, Lisle, IL 60532, and **Olcay Akman** and **Daniel Hrozencik**. *Sensitivity Analysis and the Probability of Pest Eradication or Permanence in a Stochastic Model for Integrated Pest Management.*

We further explore the impulsive differential equations (IDE) models for integrated pest management we developed in [1]. This deterministic model includes stage structure for both predator and prey, and the stochastic version incorporates competing stochastic elements in the birth rate of the prey.Here we prove the conditions under which solutions to the deterministic model are permanent, this corresponds to an economically viable solution in which levels are of the pest species are maintained at a sufficiently low level to minimize crop damage and a negative economic impacts. Using the results in [1] about locally asymptotic stability, we determine the probabilities of having a pest eradication solution or a permanent solutions when the birth rates are randomly chosen from particular probability distributions. We also perform some sensitivity analysis to certain parameters in the model.

[1] Olcay Akman, Dana Cairns, Timothy D. Comar & Daniel Hrozencik (2014) Integrated Pest Management with a Mixed Birth Rate for Prey Species, Letters in Biomathematics, 1:1, 87-95, DOI: 10.1080/23737867.2014.11432419 (Received September 18, 2015)