

Sensitivity Analysis of Pest Eradication and Permanence Solutions in a Model for Integrated Pest Management

Timothy D. Comar¹, Olcay Akman², Daniel Hrozencik³

¹*Department of Mathematics, Benedictine University, 5700 College RD, Lisle, IL 60532*

²*Department of Mathematics, Illinois State University, Campus Box 4520, Normal, IL 61790-4520*

³*Department of Mathematics and Computer Science, Chicago State University, 9501 S. King Drive, Chicago, IL 60628*

Phone: 630-829-6555, Fax: 630-829-6551, tcomar@ben.edu

Abstract

We investigate the dynamics of deterministic and stochastic models for integrated pest management. The stochastic version incorporates competing stochastic elements in the prey birth rate. We prove the conditions under which solutions to the deterministic model are permanent, which correspond to economically viable solutions with minimal negative impacts. We also perform sensitivity analysis for certain model parameters for both pest eradication and permanent solutions.

Keywords: Integrated Pest Management, Sensitivity Analysis, Permanence, Pest Eradication
