1146-35-247   **N. Fonseka**, **J. Goddard**, **Q. Morris**, **R. Shivaji** and **B. Son*** (`byungjaeson@wayne.edu`), 2111 S Lovington Dr. Apt 205, Troy, MI 48083. *On the effects of the exterior matrix hostility and a U-shaped density dependent dispersal on a diffusive logistic growth model.*

We study positive solutions to a steady state reaction diffusion equation arising in population dynamics, namely,

$$\begin{cases} -\Delta u = \lambda u(1 - u); \ \Omega \\ \frac{\partial u}{\partial \eta} + \gamma\sqrt{\lambda}[(A - u)^2 + \epsilon]u = 0; \ \partial\Omega \end{cases}$$

where Ω is a bounded domain in $\mathbb{R}^N$; $N > 1$ with smooth boundary $\partial\Omega$ or $\Omega = (0, 1)$, $\frac{\partial u}{\partial \eta}$ is the outward normal derivative of u on $\partial\Omega$, λ is a domain scaling parameter, γ is a measure of the exterior matrix (Ω^c) hostility, and $A \in (0, 1)$ and $\epsilon > 0$ are constants. The boundary condition here represents a case when the dispersal at the boundary is U-shaped, that is decreasing for lower densities and increasing for higher densities. We will establish non-existence, existence, multiplicity and uniqueness results. In particular, we will discuss the occurrence of an Allee effect for certain range of λ. When $\Omega = (0, 1)$ we will provide more detailed bifurcation diagrams for positive solutions and their evolution as the hostility parameter γ varies. (Received January 23, 2019)