

1138-37-295

Zhaosheng Feng* (zhaosheng.feng@utrgv.edu), 1201 W. University Drive, Edinburg, TX
78539. *Dynamics of a diffusive plant invasion model.*

In this study, we consider a diffusive plant invasion model with delay under the homogeneous Neumann boundary condition. The qualitative properties, including the existence and uniqueness of a nonnegative solution, persistence property, and local asymptotic stability of the constant steady states are established. We investigate the Hopf bifurcation of this model and obtain some criteria by analyzing the associated characteristic equation and by taking τ as the bifurcation parameter. Under special circumstance, we also consider the system's discontinuous Hopf bifurcation. Then we explore the existence and non-existence of nonconstant positive steady states of this model through considering the effect of large diffusivity. Our simulations demonstrate that the numerically observed behaviors are in good agreement with the theoretically proposed results. (Received February 12, 2018)