

1077-35-244

Bonni J Kealy* (bkealy@math.wsu.edu), Department of Mathematics, Washington State University, Pullman, WA 99164-3113, and **David J Wollkind** (dwollkind@wsu.edu), Department of Mathematics, Washington State University, Pullman, WA 99164-3113. *Vegetative Pattern Formation Model Systems: Comparison of Turing Diffusive and Differential Flow Instabilities.*

A particular interaction-diffusion plant-surface water model system for the development of spontaneous stationary vegetative patterns in an arid flat environment is investigated by means of a weakly nonlinear diffusive instability analysis. The main results of this analysis can be represented by closed-form plots in the rate of precipitation versus the specific rate of plant loss parameter space. From these plots, regions corresponding to bare ground and vegetative patterns consisting of tiger bush, labyrinth-like mazes, pearled bush, irregular mosaics, and homogeneous distributions of vegetation may be identified in this parameter space. Then those Turing diffusive instability predictions are compared with both relevant observational evidence and existing numerical simulations involving differential flow migrating stripe instabilities for the associated interaction-dispersion-advection plant-surface water model system. (Received August 30, 2011)