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Jordan West Bostic* (kjwest@ncsu.edu), North Carolina State University, Department of Mathematics, Campus Box 8205, Raleigh, NC 27695-8205. *Results on the dynamical behavior of a one island, selection-migration model with partial dominance*. Preliminary report.

As genetically engineered crops become more prevalent, one topic to be studied is the effect of the new gene, the transgene, on the natural population. The interaction of the transgene and its effects in a natural population are studied using a two-allele, single locus model from population genetics. Selection and migration influence the genetic makeup and demographics of a population. In the one-island model under study, the island population (the natural population) receives immigrants (the transgenic population) from a continent population. Density-dependent selection takes place within the island population and then population migration occurs. A two-dimensional system of nonlinear difference equations describes the changes in allele frequency and population density over generations. A polymorphic equilibrium exists under biologically reasonable conditions for the case of partial dominance in fitness. Finding conditions on the degree of dominance and the frequency of the transgene in the continental population are necessary to show uniqueness and stability of the equilibrium. Some results of the existence and location of attractors are discussed. (Received September 20, 2007)