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Margaret-Rose Leung* (rleung@uw.edu) and **Vrushali Bokil**. *A Vector-Host Model for Coinfection by Barley Yellow Dwarf Virus.*

Barley and cereal yellow dwarf viruses (B/CYDV) are aphid-vectored pathogens that affect diverse host communities, including economically-important crop species. Coinfection of a single host by multiple strains of B/CYDV can result in elevated virulence, incidence, and transmission rates. We develop an ODE model for a single host, two pathogen strains, and n vector species. A single parameter describes the degree of relatedness of the strains and of cross-protection between them. We compute the basic and type reproduction numbers of the model and demonstrate that, although the basic reproduction number describes stability of the disease-free equilibrium, the type reproduction numbers better describe the individual behavior of each strain and the dynamics of coinfection. We then conduct a sensitivity analysis on the components of the endemic equilibrium. Our results indicate that disease transmission rates and vector birth and mortality rates are the most influential parameters on the equilibrium prevalences of infection and coinfection. (Received January 27, 2014)