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Seasonal Influences on Spatial Population Dynamics

Dynamics of many populations is greatly influenced by time-varying environments (e.g., due to seasonal variation). We describe this seasonal influence as time-periodic functions and investigate a nonlocal periodic reaction-diffusion population model with stage structure. In the case of an unbounded spatial domain, we establish the existence of the asymptotic speed of spread and show that it coincides with the minimal wave speed for monotone periodic traveling waves. In the case of a bounded spatial domain, we obtain a threshold result on the global attractivity of either zero or a positive periodic solution.