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**Peng Zhong\*** (zhongpeng85@gmail.com) and **Suzanne Lenhart**. *Optimal Control of a Harvesting Problem Modeled by Integrodifference Equations.*

Integrodifference equations are discrete in time and continuous in space, and are used to model the spread of populations that are growing in discrete generations, or at discrete times, and dispersing spatially. We investigate optimal harvesting strategies, in order to maximize the profit and minimize the cost of harvesting. Theoretical results on the existence, uniqueness and characterization, as well as numerical results of optimized harvesting rates are obtained. This problem can be modified into a pest control problem by using a different objective functional. The order of how the three events, growth, dispersal and harvesting, are arranged affects the harvesting behavior. All six possible orders of arranging the three events are discussed. Considering how certain orders can be obtained through transformations to other orders, we show that the six cases can be reduced to analyzing three cases. (Received September 20, 2011)