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Luis F. Gordillo* (luis.f.gordillo@gmail.com), PO Box 7342, Mayagüez, PR 00681, and **Yongkuk Kim**. *Spread of pine wilt disease subject to early eradication of infected trees*. Preliminary report.

Pine wilt disease is currently among the most devastating pine trees plagues on earth. It is caused by the pinewood nematode *Bursaphelenchus xylophilus* in a perfect, and beautifully synchronized, mutualistic relationship with beetles of the genus *Monochamus*. The disease has a fast and efficient spread, which turns most of the efforts to control it practically insufficient. We investigate how early eradication of infected pine trees, i.e. eradication of trees which just ceased oleoresin exudation, may affect the disease spread. In contrast to the sole eradication of killed trees, our results show that under an appropriate combination of eradication strategies: (1) There is a significant increase in the minimum pine density below which the disease fails to invade, (2) The region where reproductive Allee effects may take place are significantly enlarged, (3) It is possible to design optimal policies for eradication through stochastic search optimization techniques, for instance. We conclude that disease extinction can be reached faster with appropriate combinations of eradication policies, which minimize the damage on healthy pine trees and operational costs. (Received September 13, 2010)