

Deahl, K. 2010. Science of the epidemic. *Phytopathology* 100:S161.

Late blight caused by *Phytophthora infestans* is one of the most destructive diseases of potato and tomato worldwide due to rapid asexual reproduction of the pathogen under conducive weather conditions. A total of 155 isolates of *P. infestans* were collected from the major crop production areas during 2007 to 2009 in the US. Isolates were characterized by their pathogenicity, mating type, and in vitro metalaxyl sensitivity. They were also subjected to molecular genotyping, by allozyme pattern, mitochondrial genomic haplotype, and DNA fingerprinting using the multilocus RFLP probe RG57. Before 2007, isolates collected from tomato and potato crops were mainly the US-8 or US-11 clonal lineage. However, *P. infestans* populations in the U.S.A. underwent a significant genetic shift in the 2007–2009 growth seasons; isolates with unique genotypes and epidemiological parameters including increased aggressive were detected in Florida and throughout the northeastern region of the United States. The greatest concern relating to the introduced new A1 + A2 populations was the potential impact of sexual recombination. Although sexual recombination was not yet detected, a decrease in the percentage of the US-8 clonal type implied that genomic diversity of the pathogen is changing quickly. Despite introduction of both mating types, in many regions new, but largely clonal populations have become established.