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Late blight of potato (*Solanum tuberosum*) and tomato (*Solanum lycopersicum*) is caused by the Stramenopile *Phytophthora infestans*. Late blight is common in south Florida during the winter months, where both crops are produced, and environmental conditions are extraordinarily favorable for disease development. Over the past five years, a shift in *P. infestans* populations recovered from tomato has been observed. In an attempt to assess late blight resistance to *P. infestans* isolates collected in Florida, seed from 13 cultivars were obtained from the Asian Vegetable Research and Development Center. Six different late blight resistance genes (*Ph*+, *Ph*-1. *Ph*-2, *Ph*-3, *Ph*-4, and *Ph*-6) have been introgressed into these 'differential lines'. Using a detached leaf assay, resistance to five Florida *P. infestans* genotypes are being compared to that of the susceptible tomato cultivar 'FL-47'. The results of the detached leaf assays and the implications of P. infestans race structure in Florida will be presented.