

Abstract. Tuber blight may result from infection of wounded or unwounded potato tubers exposed to sporangia from foliar blight, soil, or blighted tubers. However, there are limited data on the prediction of tuber blight in field or storage environment based on in vitro assays. To assess this relationship, potato cultivars with foliar blight resistance (Rgenes) and general resistance were evaluated for tuber blight incited by *Phytophthora infestans* (US-1) based on wound-induced and unwounded tuber inoculations. Surface lesion diameter, lesion depth, and frequency distribution of blighted tubers were assessed in in vitro assays and tuber blight incidence determined in field experiments. Significant differences ($P < 0.05$) in lesion diameter and depth were recorded among cultivars. Surface lesion diameter, depth, and index ranged from 5 to 40, 2 to 16.3, and 15 to 656 mm, respectively, in wound-inoculated tubers. In nonwounded tuber assays, the incidence of blighted tubers ranged from 0% to 8.7% in both years. Tuber blight infection of potato cultivars varied between years in field studies. Although tuber infection differed among cultivars, the frequency of blighted tubers had a normal statistical distribution irrespective of R-genes, implying that foliar resistance may have limited effect on tuber blight occurrence based on in vitro experiments. Prediction of tuber blight based on inoculation assays can be effectively used to estimate and manage blight development in storage environments.

Late blight, caused by *Phytophthora infestans* (Mont.) de Bary, accounts for significant losses in potato production worldwide (Erwin and Ribeiro, 1996). The pathogen infects foliage and tubers resulting in tuber yield loss attributable to premature death of the potato plant and tuber rot in the field and storage. Tubers become infected