Abstract

Blueberry fruit infected by *Monilinia vaccinii-corymbosi*, the causal agent of mummy berry disease, are unsuitable for use in processed food products. Fruit shipments that exceed a disease incidence threshold of 0.5% are redirected to alternative markets with substantial reductions in economic return to the producer. Because of this low tolerance, a sampling procedure with defined statistical properties is needed to determine disease incidence in the packinghouse. In this study, a sequential sampling plan was developed based on counts and dispersion patterns of infected fruit in 23 loads of mechanically harvested rabbiteye blueberries. Each load was sampled 20 to 100 times, with each sample containing 550 cm3 of fruit. Various dispersion statistics (k of the negative binomial distribution, Lloyd's index of patchiness, and Iwao's b) were computed, all of which suggested aggregation of infected fruit. Because k was variable across loads, Iwao's regression procedure, which does not assume a single frequency distribution with fixed parameters describing the counts of infected fruit, was used to develop upper and lower stop lines for sequential sampling. For alpha = 0.05 and assuming a total of 250 fruit per 550-cm3 sample, the resulting sampling plan would require only one sample to conclude that a load exceeds the threshold if the number of infected fruit in that sample is greater than four. A minimum of six samples would be needed to conclude that disease incidence in a load is below the threshold if the cumulative total of infected fruit in these samples is zero. Resampling analysis showed that most fruit loads could be classified reliably with <10 samples per load; for loads with a disease incidence very close to the 0.5% threshold, <50 samples were needed on average. Stop lines for sequential sampling for different fruit size classes are presented.