Title Factors affecting susceptibility to - and management of - postharvest soft rot of sweetpotatoes caused by *Rhizopus stolonifer*

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Abstract

Studies were undertaken to explore the relationship of *R. stolonifer* susceptibility with preharvest growing conditions and postharvest handling of sweetpotatoes. Additional studies were also completed to identify effective decay control products.

A three-year study investigated the effect of preharvest conditions on *R. stolonifer* and *Erwinia chrysanthemi* susceptibility. Roots were harvested from 75 sweetpotato fields and information collected including soil samples, weather during the growing season, weed density, and insect injury (153 predictors). Roots were inoculated after 100 days in storage. Mean *R. stolonifer* incidence was 34.9% (standard deviation=31.7%) and mean *E. chrysanthemi* incidence was 51.0% (standard deviation=30.5%). Predictive models were developed using forward stepwise regression to identify predictors of interest, followed by mixed model analysis (p-value<0.05) to produce a final model. *R. stolonifer* susceptibility is best predicted by soil calcium (% CEC), plant-available soil phosphorus, soil humic matter (%), mean air temperature, mean volumetric soil moisture at 40 cm, and mean soil temperature at 2 cm (all over the growing season). *E. chrysanthemi* susceptibility is best predicted by soil pH and days that soil temperature exceeds 32 oC (14 days pre- harvest).

Studies were also conducted to define the relationship between postharvest handling and susceptibility to *R. stolonifer* . Experiments designed to simulate packingline handling found root ends are more susceptible that mid-sections and that increasing the number of time a root is dropped as well as increasing the impact force resulted in increased decay susceptibility. 'Hernandez' roots were significantly more susceptible than 'Beauregard' in all experiments. To confirm the relationship of impacts and disease development, Beauregard roots were sampled from locations along commercial packinglines. High decay in inoculated as compared to non-inoculated roots indicates that wounding is occurring that could result in disease if the pathogen was present at higher levels.

Evaluations of reduced-risk fungicides, bio-fungicides and generally recognized as safe products for efficacy against *R. stolonifer* found that reduced-risk chemistries boscalid+pyraclostrobin and fludioxonil

significantly reduced *R. stolonifer* development and performed similarly to dicloran. *Pseudomonas syringae* based products were moderately effective although results were extremely variable among tests. Generally recognized as safe treatments were ineffective by testing methods used.