Title Evaluation of dry heat treatments for eradicating *Acidovorax avenae* subsp. *citrulli* from watermelon seeds

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Abstract

Acidovorax avenae subsp. *citrulli* (Aac), causes bacterial fruit blotch (BFB) of watermelon and other cucurbits. Losses associated with possible infected seeds have threatened the existence of the watermelon seed and transplant industries. The most effective control of BFB is exclusion of the bacterium from the field along with the use of pathogen-free seeds. Presently, dry heat treatment (DHT) has been employed for controlling seed-transmitted viruses or other pathogens. However, no reliable DHT for eradication of Aac from watermelon seeds is available. We evaluated eight different DHT protocols for eradication of Aac from inoculated triploid watermelon seeds cv. Jingxin No.5 and No.6 using growout and Bio-PCR assays. The results showed that temperatures from 35 to 50 ºC cannot effectively eradicate the pathogen, and temperatures from 75 to 80 ºC followed cooling without buffer temperatures eradicated the pathogen but significantly decreased seed germination and vigor. The following protocol resulted in effective eradication of Aac without significant impact on germination and seedling vigor: 1) pre-treatment of 35 ºC for 24h followed by 50 ºC for 24 h; 2) treatment of 75 ºC for 72 h; and 3) post-treatment of 50 ºC for 24 h followed by 35 ºC for 24. This work using inoculated seeds suggests that this dry heat treatment protocol may be used in commercial production and marketing.