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Interactive Effects of Host Genetic Background, Leaf Age and Isolate on the Inducibility of Tomato for Resistance to Late Blight, *Phytophthora infestans* by Baba (DL-3-Aminobutyric Acid)

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Abstract

Exploitation of induced resistance (IR) is a desirable strategy in plant protection since it involves enhancing natural defense mechanisms in plants. Despite the numerous instances in which induced plant responses have been demonstrated, only little use is made of these in crop protection so far. Before IR can be made use of in practice, it is important to understand as much as possible regarding the ecology and genetics of these inducing agents and their interactions with plants and pathogens. Effects of host genetic background were tested with thirteen tomato varieties. Leaf disks of plants that had been treated seven days before with BABA (DL-3-aminobutyric acid) or water were inoculated with two isolates of *P. infestans* ($20\ \mu\text{l}$ sporangial solution at 5×10^4 sporangia ml^{-1}). Leaf age and isolate effects were tested using six isolates, six varieties and three leaf ages. There was a significant variety by treatment interaction with the degree of induction varying among varieties. Disease reductions through BABA were not the same on varieties of the same level of susceptibility. The tomato varieties, pathogen isolates, leaf ages and treatments significantly affected late blight disease development with significant interactions among tomato varieties, pathogen isolates, leaf age and treatments. These interactions indicate differing disease responses and resistance induction to tomato varieties by different isolates at different leaf ages. Level of induction was not related to the degree of susceptibility of a variety and the isolates used. The protection induced by BABA was significantly higher on the youngest leaf in all combinations of tomato varieties and pathogen isolates than on the other leaf ages.

Keywords: genetic variation, induced resistance, isolates effect, leaf age effect, *Phytophthora infestans*, tomato cultivars