

Comparison of jalapeños performance against *Phytophthora* blight caused by *P. capsici* under greenhouse and field conditions

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Phytophthora blight caused by *Phytophthora capsici* is a devastating disease of chile pepper causing losses of more than \$100 million per year, worldwide. Chemical, biological, and cultural management strategies are options available for Phytophthora blight, but no single method has been effective. The use of resistant or less susceptible cultivars offers one of the most ecofriendly and sustainable methods for managing Phytophthora blight. It has been previously observed that Phytophthora blight develops slower in jalapeño cultivars than in other chile pepper types. In this study eight chile varieties, six jalapeño and two non- jalapeño genotypes, were evaluated for resistance to Phytophthora blight under greenhouse and field conditions. Chile varieties were inoculated at fruiting stage with an inoculum concentration of 10,000 zoospores (per pot) in the greenhouse evaluation and 100,000 zoospores (per microplot) in the field evaluation. The greenhouse study was conducted three times and the field study was carried out twice in the growing seasons of 2019 (trial 1) and 2020 (trial 2). Disease incidence (DI), disease severity index (DSI), and area under disease progress curve (AUDPC) were measured for each cultivar in both greenhouse and field studies. Results showed that there were significant ($P < 0.05$) differences among cultivars in the response to infection by *P. capsici* in both greenhouse and field evaluations. Among the jalapeño varieties, NuMex Orange Spice, NuMex Jalmundo, and NuMex Pumpkin Spice had higher values of DI, DSI and AUDPC, making them the most susceptible. In contrast, TAM Jalapeño, Early Jalapeño and NuMex Vaquero had lower values of DI, DSI and AUDPC, making them the least susceptible. The chile cultivar NM 6-4, a susceptible control, showed symptoms five days after inoculation (DAI) in greenhouse evaluation, and 21 DAI in trial 1 and 10 DAI in trial 2 in field evaluations. No symptoms were observed on the resistant control CM-334. The appearance of early disease symptoms in greenhouse evaluations than in field evaluations may be due to more conducive conditions such as temperature and humidity. The results obtained from both greenhouse and field evaluations can provide future directions for disease resistance breeding in Chile peppers.

Keywords: Phytophthora blight, jalapeño, screening, disease severity index, area under disease progress curve.