

Genetic Studies of Resistance to Bacterial Spot Race T4 in Tomato

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Resistance to bacterial spot of tomato, race T4 (*Xanthomonas perforans*), in three advanced breeding lines was characterized. Populations were developed for generation means analysis (GMA) with Fla. 8326, Fla. 8233, and Fla. 8517. GMA of Fla. 8326 (resistance derived from PI 126932) in the fall of 2005 indicated resistance is additive and controlled by one gene, with a moderate to high heritability. When the experiment was repeated in the spring of 2006, additive, dominant and epistatic effects were all significant. GMA of Fla. 8233 (resistance derived from PI 114490) in the spring of 2007 indicated resistance is controlled by additive, dominant and epistatic effects. Generation means analyses were repeated in the summer of 2007 on each of these breeding lines, and performed on Fla. 8517 (resistance derived from PI 114490 and/or PI 128216). Resistant and susceptible F₂ plants were selected from each of the three populations to identify markers linked to resistance by bulk segregant analysis (BSA). The F₂ and F₃ progeny of these selections were evaluated to confirm the resistance or susceptibility prior to including them in the BSA. Approximately 300 PCR-based markers, located near areas of the genome where resistance genes to various bacterial diseases have previously been identified, were screened for polymorphisms between the three PIs and susceptible breeding lines. The polymorphic markers were used to screen for introgressions of PI germplasm into each of the resistant breeding lines. BSA will be used to determine which of these introgressed areas are linked to resistance. The possibility to enhance resistance by combining resistance genes from the three sources will be discussed.