

Identification of useful sources of bacterial wilt resistance in tomato

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Bacterial wilt (BW), caused by *Ralstonia solanacearum*, is a devastating disease of tomato and potato world-wide. Although it has long been a severe disease in tropical areas, it is becoming more widespread and severe in more temperate climates. It is especially severe where plastic mulch and drip irrigation are practiced, likely because of increased moisture and temperature in the soil being more conducive to its development. In North Carolina, severity and incidence of BW has increased in recent years. In an effort to combat the problem by breeding, evaluation of potential resistant breeding lines derived from Hawaii 7998 was started in 2009 in a field in western NC which had a history of severe bacterial wilt on tomatoes in previous years. Incidence of bacterial wilt was high in this field in 2009, 2010 and 2011. Disease-free plants selected from the 2009 and 2010 study and putative resistant lines from the World Vegetable Center (formerly AVRDC) were used as parents in crosses to advanced breeding lines lacking BW resistance. The resistant and susceptible parent lines and their hybrids were evaluated in two 6-plant replicates for each trial location in two fields in 2011, one in piedmont NC, and the other in the same field as used in 2009 and 2010 in western NC. With the exception of one line derived from Hawaii 7998, the lines and their hybrids had high incidence of bacterial wilt at both locations. As in 2010, the BW resistant AVRDC lines and their hybrids as well as the BW resistant cultivar Neptune had high incidence of bacterial wilt at both locations. The known sources of bacterial wilt resistance, Hawaii 7997 and Hawaii 7998, exhibited high resistance to BW. A sister line derived from Hawaii 7998 that showed good resistance to BW in 2009 and 2010, was also found to be resistant in 2011. Similar observations found in these lines and hybrids derived from them in both years indicated that these lines may have useful resistance to BW.