Stability Analysis of Tomato Spotted Wilt Tospovirus Incidence in Virginia-Type Peanut Cultivars.


Tomato spotted wilt tospovirus (TSWV) has become an increasingly major pest in peanuts (Arachis hypogaea L.) in North Carolina and Virginia over the past two decades. Reactions of 16 peanut genotypes to TSWV were monitored in a set of tests conducted from 1993 to 2011 in North Carolina. Linear regression stability analysis was applied to disease incidence data collected in 57 trials conducted over 17 years to determine if an array of virginia-type cultivars exhibited variation in their reactions to increasing levels of disease intensity compared with the resistant standards for this disease. There was considerable variation for TSWV incidence among both genotypes and environments. In the stability analysis, NC 10C had a slope significantly greater than one, as did Phillips, Wilson, NC 7 and Brantley. The slopes for two genotypes (Bailey and PI 576636) were significantly (P<0.05) less than one and significantly (P<0.05) less than the slope of any other genotype. The slope for Georgia Green, the standard TSWV-resistant runner-type cultivar, did not differ from the average of those for all genotypes. Bailey and PI 576636 showed the lowest average incidence of TSWV, however, their coefficients of determination ($R^2_i$) were very low, indicating that they were responsive to changing environments. The TSWV incidences of Wilson, Sugg, and Gregory were lower than that of Georgia Green, with relatively stable slopes and higher $R^2_i$, suggesting that they could be used in a breeding program as better sources of TSWV resistance than could Georgia Green.