Sources of Disease Resistance in Recent Virginia-type Cultivar Releases.

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Historically, the N.C. State University peanut (*Arachis hypogaea* L) breeding program has been developing large-seeded virginia-type cultivars for production in Virginia, North and South Carolina. The overall goal of our program is to produce high-yielding cultivars combined with multiple disease resistance and good flavor. Since 1999, our releases included Gregory, Perry, Phillips, Brantley, Bailey and Sugg. These cultivars are large-seeded, virginia-type with varying degrees of reaction to four of the most common peanut diseases in North Carolina including leaf spots (LS), Tomato spotted wilt virus (TSWV), Cylindrocladium black rot (CBR) and Sclerotinia blight (SB). In the 1990s to early 2000s, the last two diseases were the most prevalent in N. Carolina and resistant sources used as parents in crosses included NC 9 (a cultivar partially resistant to CBR), NC Ac 18229A (a descendant of NC 3033 and highly resistant to CBR,) and N96076L (resistant to SB). NC 12C was released in 1996 as a CBR-resistant cultivar.

Gregory was released in 1997 because of its high content of jumbo pods and extra large kernels (ELK) but was susceptible to LS, SB, CBR, and TSWV. Perry was released in 2000 with very good levels of CBR resistance and partial SB resistance; however, it was found to be highly susceptible to TSWV and LS. Because our newly released cultivars often had a severe susceptibility to one or more of the four prevailing diseases, we have initiated a program of multiple disease evaluation in 2003 for all four of the diseases and used N96076L and GP-NC WS 13 as sources of multiple disease resistance. N96076L was released as a germplasm line in 2005 with a broad array of resistances including, LS, CBR, SB and TSWV. It’s ancestry includes 25% GP-NC WS 4, a registered germplasm line derived from a cross between *A. hypogaea* PI 261942 and *A. cardenasii* Krapov. and W.C. Gregory, GKP 10017, a diploid wild species with multiple disease and pest resistance. Phillips (2005) and Brantley (2006) were not specifically bred for disease resistance with Phillips released as a cultivar with a high content of bright fancy pods and Brantley as a high-oleic backcross derivative of NC 7. The most recent cultivar releases from our program included Sugg and Bailey. Sugg was a single-backcross derivative of Gregory with SB resistance introduced from Tamrun 98. Bailey has about 25% of N96076L ancestry and in the 2011 growing season exhibited a broad range of disease resistance to the above four diseases. It is reasonable to suggest that the multiple disease resistance of Bailey traces back to *A. cardenasii*. Currently, we have several high-oleic experimental lines closely related to Bailey under field testing as well as several other interspecific breeding lines in our segregating populations. In conclusion, we believe that lines derived from the diploid wild species, *A. cardenasii* form the source of multiple disease resistance in our program.