SSR MARKERS ASSOCIATED WITH ROOT-KNOT NEMATODE RESISTANCE

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Abstract

Auburn 623 RNR was developed from a cross of Clevewilt 6 x Mexico Wild (PI 1593649) and was reported to have root-knot nematode resistance genes from both parents. M-240 RNR is reported to carry the same genes as Auburn 623. We developed and used RIL lines to establish SSR markers and specific chromosomes associated with root-knot nematode resistance genes in lines derived from the Auburn 623 source of resistance. We developed three RIL populations by single seed descent from the crosses of resistant M-240 RNR (M240), moderately resistant Clevewilt 6 (CLW6), and susceptible Stoneville 213 (ST213). We hypothesized that the CLW6 x ST213 cross should segregate for the resistance gene(s) from CLW6; the M240 x CLW6 cross should segregate for the gene(s) from MW; and the M240 x ST213 cross should segregate for genes from both CLW6 and WM . Replicated plants of RILs from these populations were grown under greenhouse conditions, inoculated with RKN eggs, and scored for gall index and number of eggs per plant. Parents and RIL plants were genotyped with SSR markers. Results indicated a minimum of two major genes involved in the RKN resistance of M240. One gene was linked to the marker CIR 316-201 on chromosome 11. The CIR 316-201 allele was present in CLW6 but not in MW. A second gene was linked to the SSR markers BNL 3545-118 and BNL 3661-185 on chromosome 14sh. These two marker alleles were not present in CLW6 but were present in MW. The SSRs identified in this study should be useful to select plants with high levels of RKN resistance in breeding programs using the M240 RNR source of resistance.