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A novel Russian wheat aphid resistance gene: *Dn11*

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Aphids on a wheat leaf. Photo courtesy of Adobe Stock.

Russian wheat aphid (RWA, *Diuraphis noxia*) is a major wheat pest globally due to its ability to rapidly increase population size via parthenogenetic reproduction and its large number of compatible hosts. The pest causes leaf rolling, plant stunting, and chlorotic and longitudinal streaks (discoloration), with up to 50.2–82.9% of yield losses and 55.2–76.5% of biomass reduction reported due to RWA feeding. Host resistance is preferred for managing RWA because the aphid can avoid insecticides by living inside rolled wheat leaves. However, RWA evolves quickly to overcome host resistance, necessitating continuous discovery of new resistance genes.

USDA–ARS scientists and collaborators at Stillwater, OK identified a novel RWA resistance gene, permanently designated *Dn11*, in the Iranian landrace PI 626575 and mapped it to the long arm of chromosome 7D. User-friendly, high-throughput KASP (kompetitive allele-specific polymerase chain reaction) genetic markers closely linked to *Dn11* were also developed.

Dn11 confers resistance to RWA biotype 2, the most widely virulent biotype overcoming many known RWA resistance genes. The KASP markers developed in this study can further facilitate the rapid introgression of *Dn11* into locally adapted breeding lines and cultivars. The novel resistance gene thus can be widely used in wheat breeding to enhance pest resistance.

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Xu, X., Li, G., Wolabu, T. W., Chamberlin, K., Bernardo, A., Jordan, K., Carver, B. F., & Wu, Y. (2026). Characterization of *Dn11*, a new Russian wheat aphid resistance gene in Iranian landrace PI 626575. *Crop Science*, *66*, e70320.

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