



# KASP markers for wheat greenbug resistance

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Dr. Xiangyang Xu, a USDA-ARS research geneticist, examines a greenbug infestation in wheat. Photo by Duanyu Zhang.

*Dr. Xiangyang Xu, a USDA-ARS research geneticist, examines a greenbug infestation in wheat. Photo by Duanyu Zhang.*

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Aphids not only cause the most wheat yield losses by pests globally, but also serve as vectors for many destructive viruses. Greenbug is one of the major yield-limiting aphids in the southern Great Plains of the USA where it afflicts wheat, barley, and sorghum. Currently, all wheat greenbug resistance genes (*Gb1-Gb8*) except *Gb1* originated from wild species, and only one of them, *Gb3*, has been deployed in wheat cultivars.

The greenbug resistance gene *Gb5*, identified in the *Triticum speltoides* chromosome segment 7S#1L and transferred to the long arm of wheat chromosome 7A, confers resistance to several economically important greenbug biotypes and has the potential to enhance greenbug resistance in wheat breeding. In an article published in *Crop*

*Science*, scientists from USDA-ARS and Oklahoma State University characterize 7S#1L with molecular markers. They found that 7S#1L is about 79.5–87.8 Mb and developed three Kompetitive Allele Specific PCR (KASP) markers that distinguish 7S#1L from the wheat chromosome.

These KASP markers were effective when used to select for *Gb5* in wheat breeding, indicating it is feasible to rapidly transfer *Gb5* into elite cultivars or breeding lines using marker-assisted selection. These markers can be also used to select other potential beneficial genes on 7S#1L.

### **Dig Deeper**

Xu, X., Li, G., Bai, G., Bernardo, A., Carver, B.F., St. Amand, P., & Armstrong, J.S. (2020). Development of KASP markers for wheat greenbug resistance gene *Gb5*. *Crop Science*. <https://doi.org/10.1002/csc2.20339>.

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