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T7AL·7Lr#1S is a genetically compensating wheat-*Leymus* translocation line (T09) involving wheat chromosome 7AL arm and *Leymus racemosus* (Lr) chromosome 7Lr#1S arm in CS (Chinese Spring) and was consistently resistant to FHB in greenhouse point-inoculation experiments. The novel FHB resistance gene was designated *Fhb3* and resides in the distal region of the short arm of chromosome 7Lr#1. T7AL·7Lr#1S was backcrossed twice to Overley and Jagger and ten lines homozygous for T7AL·7Lr#1S, three in Overley and seven in Jagger background, were evaluated for FHB resistance in a field nursery in Manhattan. All of the translocation lines except 08-183 had significantly lower mean disease ratings compared to their susceptible parent Overley. Unfortunately, the other backcross parent Jagger was not included in the test; however, three of the translocation lines (08-193, 08-189, and 08-184) had significantly lower ratings than Jagalene, which is known to be identical to Jagger in its reaction to FHB. It appears that *Fhb3* increased resistance in these entries. Similarly, the same three translocation entries had significantly lower DON levels than those of Overley and Jagalene and were statistically similar to moderately-resistant Truman. Simultaneously, chromosome engineering was initiated to reduce the genetic linkage drag associated with T7AL·7Lr#1S. Three PCR-based markers, BE586744-STS, BE404728-STS, and BE586111-STS, specific for 7Lr#1S, were developed to expedite marker-assisted selection of recombinants. Upon analysis of 1,118 progeny, three wheat-*Leymus* recombinants, one proximal (#124) and two distal (#679 and #989), have been isolated in homozygous condition. These lines along with resistant and susceptible controls, as well as 08-193, 08-189, and 08-184, will be evaluated for FHB resistance by single point inoculation method in the greenhouses.