

Supplemental Information D.

Only five out of 136 marker-based kinship relationships among the top 17 Cd genotypes (those with Cd concentration in the top 10% of the trial in both 2012 and 2013) were above the level expected for half-sibs ($A = 0.5$): OK06319 and OK Bullet ($A = 0.73$), OK1068026 and TX05V7259 ($A = 0.77$), OK Bullet and TAM 401 ($A = 0.79$), TAM 111 and TX05V7259 ($A = 0.84$), and Wichita and 'Kaw 61' ($A = 0.63$). The relationship of Wichita and Kaw 61 is anticipated because the maternal parent of Kaw 61 was a sib selection of Wichita (Heyne et al. 1963). The relationship of TAM 111 and TX05V7259 also is consistent with pedigree as TAM 111 was the maternal parent of TX05V7259. TAM 111 also contributed 25% of the pedigree of OK1068026. OK Bullet and TAM 401 also are half-sibs as both result from crosses to 'Jagger,' which had grain Cd concentration below the panel mean in each environment.

Heyne, E.G., C.O. Johnson, K.F. Finney, E.D. Hansing. 1963. Registration of Kaw wheat. *Crop Sci* 3(4):370.