Registration of WCL-LO3 High Oil *Lesquerella fendleri* Germplasm

Lesquerella [*Lesquerella fendleri* (A. Gray) S. Watson] germplasm WCL-LO3 (Reg. no. GP-33, PI 642047) was released by the USDA-ARS, U.S. Arid Land Agricultural Research Center, Maricopa, AZ, in 2005. WCL-LO3 has an improved oil concentration, harvest index, and seed yield compared to previously released germplasms. This germplasm should be suitable for geographic regions similar to the arid southwestern USA.

WCL-LO3 was developed through mass selection with seed originating from WCL-LY2 (Dierig et al., 2001). Fifteen hundred plants of open-pollinated WCL-LY2 were individually harvested by selecting for superior plant size from a field grown population at The University of Arizona, Maricopa Agricultural Center (MAC) Maricopa, AZ, in the spring of 2000. Plants were intermated by natural insect pollination. Seeds from the selected 1500 individual plants were evaluated for oil concentration by a calibrated pulsed NMR analyzer. The seed from 150 individual plants with the highest oil concentration were combined and subsequently planted the following season in 2001. The process was repeated again in 2002. After oil analysis and seed yield determination in the spring of 2003, the line was designated WCL-LO3. An irrigated yield trial was planted at two locations in the fall of 2003, one at MAC, Maricopa, AZ, and the other at the U.S. Water Conservation Laboratory, Phoenix, AZ, in a completely randomized block design with four replications. The trial included WCL-L03, WCL-LY2, and A4042, an unselected accession collected in Mexico (Salywon et al., 2005), that was used as a control.

At Maricopa, AZ, the seed oil concentration of WCL-LO3 was 330 g kg\(^{-1}\), which was significantly higher than the 298 and 172 g kg\(^{-1}\) for WCL-LY2 and the control A4042, respectively. At Phoenix, AZ, the seed oil concentration of WCL-LO3 was 335 g kg\(^{-1}\), also significantly higher than 301 and 183 g kg\(^{-1}\) for WCL-LY2, and the control A4042, respectively. Seed yield of WCL-LO3 was 42.7 g plant\(^{-1}\) at Maricopa, AZ, significantly higher than the 34.5 and 5.3 g plant\(^{-1}\) for WCL-LY2 and the control A4042, respectively. Seed yield at WCL-LO3 was 37.8 g plant\(^{-1}\), also significantly higher than 33.5 and 5.3 g plant\(^{-1}\) for WCL-LY2 and the control A4042, respectively. At Maricopa, AZ, WCL-LO3 had a harvest index of 27.7 that was significantly different from 18.3 of WCL-LY2 or the control A4042, respectively. At Phoenix, AZ, harvest index of WCL-LO3 was 30.1, significantly higher than the 18.2 and 17.0 for WCL-LY2, and the control A4042, respectively.

Plants begin flowering in early February and reaching full flowering by mid-April when planted in October. Plants require insect pollinators for seed-set.

U.S. Plant Variety Protection will be sought for WCL-LO3. Contact the corresponding author for all seed requests. No seed will be distributed without written permission from the date of publication in *Crop Science* by the USDA-ARS, at which time seed will also be available from the National Plant Germplasm System (NPGS). Recipients of seed are asked to make appropriate recognition of the germplasm source if it is used in the development of a new cultivar, germplasm, parental line, or genetic stock. Requests from outside the U.S. should be accompanied by the appropriate customs control documents.

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References


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doi:10.2135/cropsci2006.02-0103