

# #137

## Winter Canola Requires Unique Adaptation to the U.S. Southern Great Plains

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Winter canola (*Brassica napus*) is an alternative broadleaf crop that benefits cereal-based cropping systems of the U.S. Southern Great Plains. Planted hectares in the region have increased from a few thousand in 2010 to a record 125,000 in 2013. However, erratic weather is mostly to blame for the recent downturn, as less than 50,000 hectares were planted in 2018. The southern Great Plains canola industry is supported by regionally-developed winter canola cultivars and European hybrids. Extreme climatic variability has revealed some limitations to the adapted and introduced genetics nonetheless. For instance, warm autumn temperatures in 2014 followed by a rapid blast of cold air on a poorly acclimated crop resulted in fields with zero surviving plants. Thus, cultivars must overcome these harsh environmental conditions that are becoming all too common. Open-pollinated cultivars have shown consistent winter survival and yield in challenging years but in less challenging years they tend to lag behind hybrids. Heterosis has been observed as high as 40%. Although open-pollinated cultivars are planted on a majority of U.S. winter hectares, hybrid cultivars are gaining acceptance and a new hybrid breeding program has been established at Kansas State University (KSU). Experimental semi-dwarf hybrids from Europe have shown above average winter survival and yield across environments in the region. Yield of the semi-dwarf hybrids was 102% of conventional hybrids at Pond Creek, OK and Hutchinson, KS, in 2017. Two of three testcross hybrids created from a semi-dwarf female and a winter hardy KSU male line had winter survival ratings that were 11% higher than the semi-dwarf parent alone and only slightly less than the male parent. The combination of KSU winter hardy materials with a semi-dwarf parent could create a step change in survival and increased yield potential.

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