

Resistance to Pests. KS Western Star is resistant to stem rust and soilborne mosaic virus. It has moderate resistance to stripe and leaf rust. It has intermediate reactions to barley yellow dwarf virus, *Triticum* mosaic virus, and head scab. KS Western Star is moderately susceptible to wheat streak mosaic virus and susceptible to Hessian fly. A summary of pest resistance for KS Western Star is presented in Table 1. Preliminary data show that KS Western Star has wheat curl mite resistance (data not shown). Due to its reactions to wheat curl mite (vector of viruses that cause wheat streak mosaic disease) and *Triticum* mosaic virus (another important virus causing wheat streak mosaic disease besides wheat streak mosaic virus), KS Western Star showed moderate resistance to wheat streak mosaic disease in the field.

Area of Adaptation. KS Western Star had competitive yield under dryland production in western Kansas (Table 2). KS Western Star has very good drought tolerance, and its yield potential is similar to Tatanka. It is expected that KS Western Star can adapt well to semi-arid areas in western Kansas and surrounding states.

Milling and Baking Characteristics. KS Western Star has good test weight, and good milling and baking qualities. In general, its grain protein content is similar to Joe. Its flour extraction rate is very high, which is about five percentage points more than Joe. KS Western Star has good mixing tolerance, which is similar to Tatanka and SY Monument. It has more water absorption than Joe.

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KS Western
Star Hard Red
Winter Wheat

KS Western Star is a hard red winter wheat variety developed and released by the Kansas Agricultural Experiment Station in 2019. Foundation seeds were distributed to Kansas registered seed producers in 2019. Registered/certified seeds have been available since the fall of 2020.

Origin and Development. KS Western Star was selected from a single cross of Byrd/KS05HW121-2 through a modified bulk breeding method. In its pedigree, Byrd is a hard red winter wheat variety developed by Colorado State University, and KS05HW121-2 is a hard white breeding line developed by the K-State wheat breeding program at Hays. The cross was made in 2009 and its F₁ was planted in the 2010 crop year. The F₂ and F₃ populations were grown in the field in 2011 and 2012, respectively. Individual heads were selected from the F₃ generation and planted as head rows at the F₄ generation in 2013. Superior head rows were advanced to an unreplicated yield trial in 2014, and one of them was advanced and became KS Western Star. KS Western Star has been tested in replicated yield trials since 2016. KS Western Star was tested in the Kansas Intrastate Nursery in 2017, 2018, and 2019. In 2019, KS Western Star was tested in the Kansas Winter Wheat Performance Test with its experimental line name of KS15H161-1. KS Western Star was released in August 2019. KS Western Star was named after a flour mill in Salina, Kansas, whose original owner (Vanier family) made a generous donation to the Kansas Wheat Commission Research Foundation. The development

of KS Western Star was supported by the Kansas Wheat Commission and Kansas Wheat Alliance.

Agronomic Characteristics. KS Western Star is an awned, white-glumed, hard red-seeded winter wheat. It has a medium maturity with a heading date similar to Tatanka and two days earlier than Joe. It has a medium height, which is 3 inches shorter than Joe. Its straw strength is good, which is similar to SY Monument. KS Western Star has good winter-hardiness and its coleoptile length is intermediate. It has very good tolerance to grain shattering, which is similar to Tatanka. Ratings for agronomic characteristics of KS Western Star and other varieties are given in Table 1.

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Table 2. Yield (bushels) summary for KS Western Star and check varieties in Kansas Intrastate Nursery in western Kansas.

Entry	Class	2017 Dryland	2018 Dryland	2019 Dryland	3 Year Dryland Avg
Joe	HWW	101.2	56.1	102.5	80.4
KS Western Star	HRW	98.0	61.1	90.6	79.3
Tatanka	HRW	97.2	57.8	89.8	77.3
WB-Grainfield	HRW	97.1	48.8	82.1	71.6
SY Monument	HRW	85.3	50.0	89.1	69.6
Trial Mean		91.8	52.6	87.5	72.6
Locations		5	7	3	15

Table 1. Agronomic and pest resistance characteristics for KS Western Star and other varieties.

Variety	Class ¹	Coleoptile length	Winter hardiness	Maturity	Lodging resistance	Grain shattering	Test weight	SBMV ³	WSMV ⁴	TriMV ⁵	BYDV ⁶	Stripe rust	Leaf rust	Stem rust	Head scab	Hessian fly
KS Western Star	HRW	5 ²	2	5	2	1	3	1	7	5	5	3	3	2	5	9
Tatanka	HRW	5	2	5	7	1	3	1	7	6	5	3	6	2	7	9
WB-Grainfield	HRW	5	1	5	3	3	5	1	8	7	7	7	6	2	7	8
SY Monument	HRW	3	1	7	2	2	6	1	7	7	6	7	4	2	7	6
T158	HRW	5	1	1	6	2	4	2	5	6	6	2	8	8	7	9
Byrd	HRW	3	2	6	5	2	4	2	5	6	7	8	8	8	7	9
Joe	HWW	7	3	7	5	4	3	8	3	8	6	3	2	1	6	9

¹HRW: hard red winter; HWW: hard white winter

²Ratings are based on 1-9 scale where 1=longest, most resistance or the best and 9=shortest, most susceptible or poorest, except for maturity where 1=earliest and 9=latest.

³SBMV – Soilborne mosaic virus

⁴WSMV – Wheat streak mosaic virus

⁵TriMV – Triticum mosaic virus

⁶BYDV – Barley yellow dwarf virus

-- Not rated.