Resistance to Pests. KS Dallas has good resistance to wheat streak mosaic virus, leaf rust, and stem rust. Its wheat streak mosaic virus resistance can hold up to 70 degrees Fahrenheit, which is about 5 degrees higher than those resistant varieties with *Wsm2*, such as Joe, Clara CL, and Oakley CL. It has intermediate reaction to barley yellow dwarf virus. It had moderate resistance to stripe rust before 2019. With the appearance of a new race in 2019, it became moderately susceptible to stripe rust. It is moderately susceptible to powdery mildew, head scab, and Hessian fly, and it is susceptible to soilborne mosaic virus. A summary of pest resistance for KS Dallas is presented in Table 1.

Area of Adaptation. KS Dallas performed very well under dryland production in western Kansas (Table 2). KS Dallas has good drought tolerance, which is similar to Tatanka. It has higher yield potential than Tatanka. It is expected that KS Dallas can adapt well to semi-arid areas in western Kansas and neighboring states, especially for those areas with the wheat streak mosaic virus issue. KS Dallas is not recommended for production under irrigation or in high rainfall areas because of its average straw strength. Due to the lack of stripe rust resistance, fungicide application is recommended.

Milling and Baking Characteristics. KS Dallas has an average test weight, but good milling and baking qualities. In general, its grain protein content is similar to Joe. Its flour extraction rate is about two percentage points more than Joe. KS Dallas has very good mixing tolerance, which is similar to Tatanka and SY Monument.

Guorong Zhang
Wheat Breeder
Agricultural Research Center-Hays

Allan K. Fritz
Wheat Breeder
Department of Agronomy

Romulo P. Lollato
Wheat and Forage Extension Specialist
Department of Agronomy

Erick De Wolf
Plant Pathologist
Department of Pathology

Jessica Rupp
Plant Pathologist
Department of Pathology

Kansas State University
Agricultural Experiment Station
and Cooperative Extension Service

L941 September 2021

K·STATE
Research and Extension

KS Dallas Hard Red Winter Wheat

KS Dallas 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 Dallas was selected from a three-way cross of KS08HW112-6//TX03A0148/Danby TR through a modified bulk breeding method. In its pedigree, KS08HW112-6 is a hard white breeding line developed by the K-State wheat breeding program at Hays and it has wheat streak mosaic virus resistance with *Wsm2* in its pedigree. TX03A0148 is a hard red breeding line developed by Texas A&M University. Danby TR is a breeding line derived from virus-treated Danby, a hard white variety released by Kansas State University. The three-way cross was made in the spring of 2009 and its F_1 was planted in the 2010 crop year. The F_2 and F_3 populations were grown in the fields in 2011 and 2012. Individual heads were selected from the F_3 generation and planted as head rows at the F_4 generation in 2013. Superior head rows were advanced to an unreplicated yield trial in 2014, and KS Dallas was derived from one of them. KS Dallas has been tested in replicated yield trials since 2016. KS Dallas was tested in the Kansas Intrastate Nursery in 2017, 2018, and 2019. In 2019, KS Dallas was tested in the Kansas Winter Wheat Performance Test with its experimental line name of KS15H116-6. KS Dallas was released in August 2019. KS Dallas was named after retired Kansas

Kansas State University Agricultural Experiment Station and Cooperative Extension Service

State University pathologist Dallas Seifers, who had made great contributions to the wheat streak mosaic virus resistance. The development of KS Dallas was supported by the Kansas Wheat Commission and Kansas Wheat Alliance.

Agronomic Characteristics. KS Dallas is an awned, white-glumed, hard red-seeded winter wheat. It has a medium maturity with a heading date similar to Tatanka and two to three days earlier than Joe. It has a medium height, which is about 3 inches shorter than Joe. Its coleoptile length is medium long. Its straw strength is about average, which is similar to T158. KS Dallas has good winter-hardiness. It has good tolerance to grain shattering. Its threshability is better than Tatanka. It is not tolerant to acid soil. Ratings for agronomic characteristics of KS Dallas and other varieties are given in Table 1.

continued on back

Table 2. *Yield (bu/a) summary for KS Dallas 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 Dallas	HRW	100.4	57.1	98.6	79.8
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 Dallas and other varieties*

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

[1]HRW: hard red winter; HWW: hard white winter
[2]Ratings 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.
[3]SBMV – Soilborne mosaic virus
[4]WSMV – Wheat streak mosaic virus
[5]BYDV – Barley yellow dwarf virus
-- Not rated.