

The Fusarium head blight and barley yellow dwarf resistance make it especially well adapted to the eastern areas of the state. Everest has also done well in central Kansas and has good tolerance to acidic soils. It is not recommended for continuous wheat production due to its moderately susceptible reaction to tan spot. Everest has performed well in western Kansas and has tolerance to shattering. It is, however, moderately susceptible to wheat streak mosaic and should not be planted where there is a high risk of wheat streak mosaic infection.

Milling and baking quality. Using the recently developed Hard Winter Wheat Quality Targets as a guide, Everest has good milling quality and acceptable baking quality. Its test weight and thousand kernel weight has been superior to Jagger, but lower than Overley. The flour extraction rates of Everest have been comparable to Overley. The flour protein content of Everest is about 1 percentage point lower than Overley. In four years of bake tests, Everest has had shorter mix times and tolerances, as well as lower loaf volumes than Overley. Bake absorptions of Everest have been about 1 percentage point lower than Overley.

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Everest Hard Red Winter Wheat

Everest is a new hard red winter wheat variety developed cooperatively by K-State Research and Extension and the Agricultural Research Service, United States Department of Agriculture. Foundation seed of Everest was distributed to Kansas registered seed growers for fall planting in 2009. Foundation and registered seed was available for fall planting in 2010. Everest is named for the northeast Kansas community in Brown County. The name 'Everest' was chosen as an indication the variety is well adapted to eastern Kansas and to recognize the John Bunck family for their contributions to the Kansas wheat industry and the K-State wheat breeding program.

Origin and development. Everest is a hard red winter wheat selected from the cross HBK1064-3/Betty 'S'//VBF0589-1//IL89-6483 (Pioneer 9021L//Roland/IL77-2656). The pedigree of HBK1064-3 is Karl/HBY385D//2163. This line was a high-yielding experimental line from Pioneer germplasm that was increased but not released by K-State. Betty is a hard white wheat released by K-State Research and Extension. VBF0589-1 is a line selected from the Pioneer germplasm gift to K-State. IL89-6483 is a soft red winter wheat line that was tested in the Uniform Eastern Soft Winter Wheat trials in 1998 and 1999. The three-way cross was made in the greenhouse in 1996. F₂ seed of the population was grown in the field in 1998 and advanced by bulk selection to the F₃ generation. In 2001, 200 heads were selected from the F₅ population and grown as head rows in 2002. KS970093-8-9 was selected as a head row in 2002. At the time of harvest, eight heads were harvested before the remaining seed was bulked for yield testing. In 2003, KS970093-8-9 was tested in unreplicated yield trials at

Manhattan and Hutchinson using a repeating check design. Simultaneously, two of the eight F₆ derived head rows were selected. The first of these was designated KS970093-8-9-#1. The head row seed was used to plant unreplicated yield trials at five locations in 2004. Based on agronomic, disease, and quality data, KS970093-8-9-#1 was advanced to the Advanced Yield Nursery (seven locations) in 2005. It was then advanced to the 2006 Kansas Intrastate Nursery (17 locations) and retested in the 2007 (mostly lost to freeze damage), 2008, and 2009 KIN trials. It was also entered in the 2007, 2008, and 2009 Southern Regional Performance Nurseries and the 2009 Kansas Wheat Variety Performance Tests. KS970093-8-9-#1 was released as 'Everest' in July of 2009.

Agronomic characteristics. Everest is an awned, white-chaffed, semi-dwarf hard winter wheat, most closely resembling 2163. It is medium in height with somewhat above average straw strength and excellent yield potential (Tables 1 and 2). Everest is early maturing, heading at the same time as Jagger, and has test weight patterns superior to Jagger. Everest has good winter hardiness and a medium-long coleoptile. Everest is tolerant to acidic soils and has not been observed to shatter.

Resistance to pests. Everest provides some relatively unique attributes as it is resistant to Hessian fly and is moderately resistant to barley yellow dwarf virus. Among currently available hard winter wheat varieties, Everest offers the best protection against Fusarium head blight (intermediate reaction). Everest has been resistant to leaf rust and stripe rust throughout its testing. Everest is resistant to soil-borne mosaic virus and spindle streak mosaic virus. Also, it is moderately resistant to stem rust and powdery mildew, intermediate to speckled leaf blotch, and moderately susceptible to wheat streak mosaic virus and tan spot. A summary of Everest's pest resistance is presented in Table 3.

Area of adaptation. Everest has performed well across Kansas, with its strongest performance in central and eastern Kansas.

Table 2. Yields of Everest and checks averaged over locations.

	Average Yields (bu/a)				
	4-year	2009	2008	2007	2006
Everest	55.4	58.7	48.8	56.2	56.5
Overley	46.6	51.3	38.4	30.9	53.9
Fuller	49.9	52.5	42.9	35.9	57.9
Santa Fe	53.9	55.7	48.6	56.6	54.9

Table 1. Central and Eastern Kansas yields of Everest and checks (bu/a) from 2006-2009.

	2009						2008				2007		2006				
	K	CW	SU	BA	GY	BE	GY	EV	BE	SU	BE	EV	GY	K	M	EV	HE
Everest	68.1	62.0	45.9	55.0	60.4	60.5	55.1	58.7	38.0	43.3	57.3	55.0	44.5	46.9	66.2	78.1	46.8
Overley	48.8	54.1	45.7	43.6	67.3	48.3	52.6	44.3	27.2	29.3	40.4	21.4	41.6	49.0	56.8	74.2	48.0
Fuller	46.8	55.6	44.0	50.4	62.4	55.5	58.5	46.4	31.6	35.1	36.8	35.0	51.5	47.6	61.5	79.6	49.4
Santa Fe	64.6	60.4	46.3	46.3	64.2	52.6	62.4	56.3	41.2	34.3	60.5	52.7	44.7	45.1	63.1	78.0	43.6
LSD*	7.2	6.6	5.5	7.2	5.2	8.2	5.2	5.9	4.2	4.8	6.2	4.9	4.4	4.6	9.1	8.5	3.5

Location Code: K=Hutchinson, CW=Caldwell, SU=Sumner Co (Conway Springs), BA=Barber Co., GY=Gypsum, BE=Belleville, EV=Everest, M=Manhattan, HE=Hesston

* If the yield difference between two varieties is less than the LSD value, the varieties are not statistically different.

Table 3. Agronomic and pest resistance characteristics of Everest¹.

	Mat	TW	WH	CL	Lod	Shat	Pm	Lr	Sr	Yr	Slb	Ts	SBMV	WSMV	HF	Fhb	BYD
Everest	1	2	3	6	3	2	3	3	7	3	5	7	1	7	4	4	3
Fuller	1	4	5	6	5	3	6	5	7	7	6	6	1	5	9	7	6
Santa Fe	2	4	5	5	4	3	6	3	4	7	3	5	1	7	9	7	6
Armour	1	2	3	6	3	2	2	5	4	3	5	5	1	6	9	7	6

¹ Rated on a scale of 1 to 9. Except for maturity (where 1 means earliest and 9 means latest), 1-3 is good or resistant, 4-6 average or intermediate and 7-9 is poorest or susceptible.

Mat-Maturity; TW-Test weight; WH-Winterhardiness; CL-Coleoptile length; Lod-Lodging; Shat-Shatter tolerance; Pm-Powdery mildew; Lr-Leaf rust; Sr-Stem rust; Yr-Stripe rust; Slb-Speckled leaf blotch;

Ts-Tan spot; SBMV-Soilborne mosaic virus; WSMV-Wheat streak mosaic virus; HF-Hessian fly; Fhb-Fusarium Head blight; BYD-Barley yellow dwarf