/3/ 2* Ernie) will be evaluated and validate dfor the presence of two major FHB resistant QTL on chromosome 3BS and 5AS among elite lines and backcross populations. Populations of BC_1F_2 and BC_1F_3 plants with AGS 2000 as the recurrent parent will be screened with markers for *Fhb1* (3BS) and *Xbarc117*, *Xgwm156*, *Xbarc100*, and *Xbarc186* for 5AS.

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KANSAS

KANSAS AGRICULTURAL STATISTICS
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Overley recaptures number one.

Overley became the leading cultivar of wheat seeded in Kansas for 2009. Jagalene held this position last year. Accounting for 13.7% of the state's wheat, Overley was the most popular cultivar in three of the nine districts. New to the top ten is Fuller, ranking second with 10.9% of the acreage. Santa Fe moved up to third place with 9.5% of the states acreage. Jagalene moved down to fourth place with 9.1% of the acreage. Jagger came in fifth at 8.5% down 6.2 points from last year. TAM 111 moved down to sixth place at 6.8% New to the top ten is Postrock, ranking seventh with 6.0% of the acreage. The KSU-maintained cultivar 2137 down to eighth place at 2.9%; T81 moved down to ninth place at 2.5%. TAM 112, rounded out the top ten at 2.0%. Acres planted with blended cultivars were not included in the rankings by cultivar. Blends accounted for 10.7% of the state's planted acres and were used more extensively in the north-central, northwest, and central areas of the State. Out of the total acres planted with blends, 37.5% included Santa Fe in the blend, and 33.1% had Jagalene in the blend. Hard white cultivars accounted for 1.0% of the state's acreage. Danby was the leading hard white cultivar, accounting for 70% of the state's white wheat. The majority of the white wheat was planted in the western third of the State. This Wheat Variety project is funded by the Kansas Wheat Commission.

Table 1. Top 10 cultivars grown in the state of Kansas in 2009 and their percent of seeded acreage.

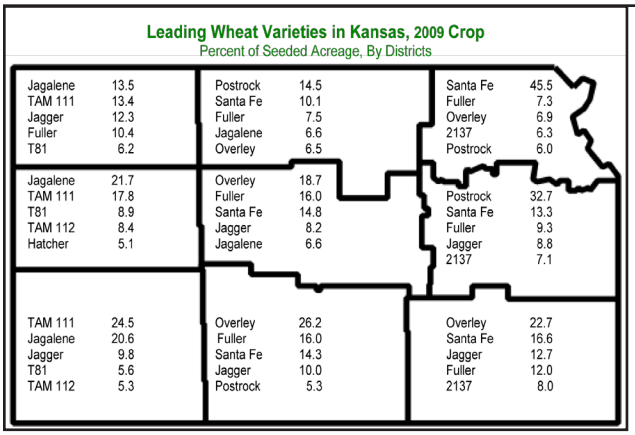
#	Cultivar	% of acerage
1.	Overley	13.7
2.	Fuller	10.9
3.	Santa Fe	9.5
4.	Jagalene	9.1
5.	Jagger	8.5
6.	TAM 111	6.8
7.	Postrock	6.0
8.	2137	2.9
9.	T81	2.5
10.	TAM 112	2.0

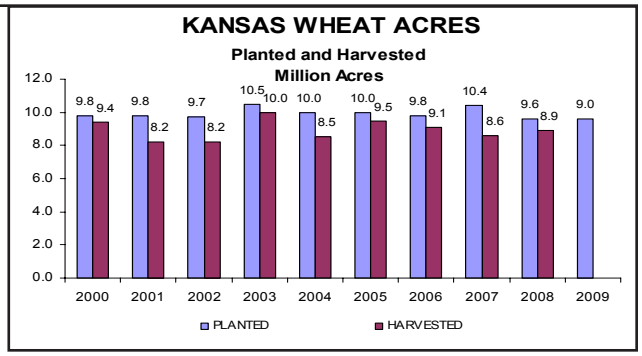
Table 2. Distribution of Kansas winter wheat cultivars, 2009 crop (— = cultivar not reported in this district; 0 = < 1%).

Cultivar	Agricultural Statistics Districts									
	NW	WC	SW	NC	C	SC	NE	EC	SE	State
Overley	1.5	0.3	0.1	6.5	18.7	26.2	6.9	4.7	22.7	13.7
Fuller	10.4	1.6	0.7	7.5	16.0	16.0	7.3	9.3	12.0	10.9
Santa Fe	—	—	—	10.1	14.8	14.3	45.5	13.3	16.6	9.5
Jagalene	13.5	21.7	20.6	6.6	6.6	2.7	1.5	2.3	7.5	9.5
Jagger	12.3	4.6	9.8	4.2	8.2	10.0	3.2	8.8	12.7	8.5
TAM 111	13.4	17.8	24.5	1.5	2.3	0.4		0.4	—	6.8
Postrock	4.9	1.9	2.0	14.5	6.3	5.3	6.0	32.7	0.7	6.0
2137	1.7	4.4	2.2	3.0	4.0	2.2	6.3	7.1	8.0	2.9
T81	6.2	8.9	5.6	1.4		0.5	—	—	—	2.5
TAM 112	2.6	8.4	5.3	0.3	1.4	—	0.1	—	—	2.0
Hatcher	4.0	5.1	3.0	0.3	0.0	—	—	—	—	1.3
Shocker	—	—	—	0.2	2.0	1.7	—	1.6	0.1	1.0
Karl / Karl 92	0.2	0.9	0.1	4.3	0.3	—	5.0	0.9	—	0.8
Ike	2.3	0.3	4.4	0.1	0.2	—	0.3	—	—	0.8
Art	—	—	—	0.2	1.2	1.5	0.8	0.7	0.6	0.8
2174	—	—	—	—	0.4	1.6	—	0.1	3.6	0.7
Danby – HWWW	1.7	1.6	2.7	0.1	—	0.1	—	0.5	—	0.7
T136	—	3.6	1.5	0.0	—	0.5	—	—	—	0.7
TAM 107	1.2	1.5	0.6	0.1	—	0.7	—	—	—	0.6
Bullet	—	—	—	—	—	1.4	—	—	—	0.5
Endurance	—	—	0.3	—	0.1	0.9	—	1.3	3.7	0.4
Larned	1.1	0.7	1.1	—	0.3	—	—	—	—	0.4
Above	0.4	3.6	0.2	—	—	—	—	—	—	0.4
Stanton	2.5	1.0	0.6	0.1	—	—	—	—	—	0.4
Smokey Hill	0.5	0.1	—	0.8	0.5	—	0.2	—	—	0.3
Thunderbolt	0.7	1.0	0.1	0.2	0.0	0.2	—	—	—	0.3
Cutter	—	—	—	0.1	1.0	0.4	0.3	—	—	0.3
Dominator	—	—	—	0.6	1.0	—	0.1	2.2	—	0.3
Coronado	—	—	—	0.5	0.1	0.4	—	—	—	0.2
Hawk	0.2	—	—	1.3	—	—	0.0	—	0.2	0.2
Keota	1.2	—	—	—	0.1	—	—	—	0.8	0.2
2145	—	—	—	1.2	0.2	—	2.1	0.2	—	0.2
Protection	—	—	0.2	0.0	0.7	0.2	—	0.2	—	0.2
Scout / Scout66	—	—	0.5	—	—	—	—	—	—	0.2
Blends	11.6	2.8	6.4	29.1	11.5	7.1	3.3	4.4	0.2	10.7
Other hard white cultivars	0.1	0.7	1.6	0.0	—	0.0	—	0.6	—	0.3
Other hard red cutlivars	5.7	7.5	4.9	5.2	2.1	5.7	11.1	8.4	6.4	5.1
All soft red cultivars	—	—	—	—	—	—	—	0.1	4.2	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 3. Distribution of Kansas winter wheat cultivars, 2000–2009. (— = cultivar not reported in this district; 0 = < 1%).

Cultivar	By crop year									
	2000	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**
Overley	—	—	—	—	0.1	2.2	15.3	23.3	17.3	13.7
Fuller	—	—	—	—	—	—	—	—	0.3	10.9
Santa Fe	—	—	—	—	—	—	0.2	1.3	5.8	9.5
Jagalene	—	—	—	—	3.0	21.2	27.2	23.1	18.0	9.1
Jagger	34.0	35.8	42.8	45.2	40.9	28.2	19.7	17.1	14.7	8.5
TAM 111	—	—	—	—	—	0.2	2.2	4.0	7.3	6.8
Postrock	—	—	—	—	—	_	—	—	0.9	6.0
2137	23.1	22.3	15.5	13.3	8.6	5.7	3.1	2.9	2.8	2.9
T81	0.2	0.2	0.8	0.6	1.8	1.6	2.6	2.0	2.8	2.5
TAM 112	—	—	—	—	—	—	—	0.4	1.6	2.0
Hatcher	—	—	—	—	—	—	—	—	0.3	1.3
Shocker	—	—	—	—	—	—	—	—	0.2	1.0
Karl / Karl 92	3.5	3.3	3.6	3.2	2.3	1.5	1.1	1.0	0.8	0.8
Ike	4.1	3.6	2.6	2.1	2.0	1.4	1.1	1.2	0.5	0.8
Art	—	—	—	—	—	—	—	—	0.1	0.8
2174	1.1	3.0	3.1	3.1	2.8	3.0	1.2	1.1	0.9	0.7
Danby – HWWW	—	—	—	—	—	—	—	0.7	1.2	0.7
T136	—	—	—	—	—	—	—	—	0.3	0.7
TAM 107	6.3	5.3	2.9	2.3	1.3	1.0	0.4	0.1	0.2	0.6
Bullet	—	—	—	—	—	—	—	—	0.0	0.5
Endurance	—	—	—	—	—	—	—	—	0.1	0.4
Larned	1.2	1.0	0.9	0.8	0.4	0.3	0.2	0.3	0.2	0.4
Above	—	—	—	—	0.2	0.1	0.1	0.0	0.2	0.4
Stanton	—	—	0.1	0.6	1.4	1.4	0.8	0.2	0.3	0.4
Smokey Hill	—	—	—	—	—	—	—	—	0.1	0.3
Thunderbolt	—	0.2	0.6	0.8	1.4	1.7	1.1	0.4	0.9	0.3
Cutter	—	—	—	—	0.7	1.7	1.6	2.1	0.9	0.3
Dominator	1.4	1.5	2.0	2.2	1.5	1.1	0.8	0.4	0.2	0.3
Coronado	1.0	1.1	0.7	0.8	0.5	0.4	0.4	0.2	0.1	0.2
Hawk	—	—	—	—	—	—	—	0.0	0.0	0.2
Keota	—	—	—	—	—	—	—	0.0	0.2	0.2
2145	—	—	—	—	1.5	2.2	0.8	0.5	0.6	0.2
Protection	—	—	—	—	—	—	0.2	0.3	0.4	0.2
Scout / Scout66	0.3	0.1	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.2
Blends	7.5	7.0	11.5	12.8	15.2	11.3	10.0	10.4	10.4	10.7
Other hard white cultivars	0.2	0.8	1.1	2.7	4.9	3.9	1.7	1.0	0.7	0.3
Other hard red cutlivars	16.1	14.8	11.5	9.2	9.3	9.8	7.9	5.8	8.5	5.1
All soft red cultivars	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0





KANSAS STATE UNIVERSITY
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Increasing atmospheric carbon dioxide (CO_2) and water use efficiency.

The Environmental Physics Group (formerly the Evapotranspiration Laboratory) at Kansas State University was the first to carry out experiments with winter wheat under elevated levels of carbon dioxide (CO_2) in the field. For three years (1984–87), we grew winter wheat under elevated levels of CO_2 in closed top chambers at the Rhizotron Facility of the Evapotranspiration Laboratory, located at the Ashland Experimental Field Site, about eight miles south of the Kansas State University campus in Manhattan, Kansas. The research was funded by the Department of Energy (DOE), and the detailed data were published in three reports to the DOE (Chaudhuri et al. 1986, 1987, 1989). The results were summarized in two journal articles (Chaudhuri et al. 1990a, 1990b).

When we started the experiments, the concentration of CO_2 in the atmosphere was 330 ppm. Our control (the ambient CO_2 concentration) was 330 ppm. The four atmospheric CO_2 concentrations that we used were 330, 485, 660, and 825 ppm. The CO_2 concentration in the air in 2007, the last year for which data are compiled, was 382.7 ppm (Schnell 2008) or, rounding off, 383 ppm. Because the concentration of CO_2 in the atmosphere has increased 53 ppm since we started our experiments, it is time to revisit the earlier data, in particular the data that dealt with water use efficiency, to determine how much the water use efficiency has increased as a result of increased levels of CO_2 in the atmosphere. Elevated CO_2 increases water-use efficiency because it closes the stomata, and this conserves water.

The closed-top chambers, which we used to control the CO_2 concentration, were placed over underground boxes (rhizotrons) that could be pulled out of the ground and weighed to determine water lost. Water in half of the boxes, which contained a silt loam soil, was maintained at a high water level (field capacity; 0.38 m^3/m^3) and the other half was maintained at a low-water level (half field capacity). The amount of

Table 1. Water requirement (mL/g) for winter wheat grain grown under high and low water levels as affected by CO_2 concentrations during a three-year study (1984–87) (* = estimated).

CO2 concentration (ppm)	Well watered				Drought stressed			
	84–85	85–86	86–87	Average	84–85	85–86	86–87	Average
330	680	530	710	640	860	670	870	800
383 (surrent)				599*				739*
485	510	470	570	517	810	450	590	617
660	490	450	460	467	730	440	530	567
825	500	430	440	457	670	450	520	547