

2003 VARIETAL RECOMMENDATION

CDC FALCON

Western Plant Breeders, Inc. requests that 'CDC Falcon' hard red winter wheat be considered for "Variety Recommendation in the State of Montana".

We move that CDC Falcon be recommended as a red winter wheat for the non-sawfly infested areas of Montana.

CDC Falcon is a hard red winter wheat selected from the progeny of the cross Norstar*2/Vona//Abilene made in 1988 by Dr. Brian Fowler from the Crop Development Centre at the University of Saskatchewan. Western Plant Breeders, Inc. holds all rights and the PVP for the United States. (PVP granted May 2002).

For a 3 year period, 19 station years, of data CDC Falcon has performed as well as the check varieties. It has equaled the yields of the compared checks (Table 1). The average test weight is equal to Neeley and 2 lbs lower than Rocky (Table 2). Protein % of CDC Falcon is equal to that of Neeley and Rocky and 1% less than Tiber (Table 3). The average plant height of CDC Falcon is 26 inches, which is shorter than all of the check varieties (Table 4). CDC Falcon's average heading date is 163 days, (from Jan. 1,) which is one day later than Rocky and 2 days earlier than Neeley and Tiber (Table 5). Winter Survival data indicate that CDC Falcon is more winter hardy than all of the check varieties (Table 6).

Disease ratings from the University of Saskatchewan show that CDC Falcon is more resistant to leaf and stem rust than CDC Kestrel (Table 7). CDC Falcon is also resistant to the prevalent races of Stripe Rust in the Pacific Northwest.

Milling and baking data from MSU 2000 and 2001 trials indicate that CDC Falcon is comparable to the check varieties (Table 8 and 9). Data from Con Agra Flour shows CDC Falcon to be of acceptable quality (Table 10).

Submitted by: Craig Cook, Western Plant Breeders

Table 1. Yield in bushels per acre of CDC Falcon compared to check varieties in the MSU Intrastate Winter Wheat Trials.
2000-2002= 19 station years

Entry	Year	Bozeman irr	Kalispell irr	Conrad	Havre	Huntley	Moccasin	Sidney	Williston	Avg irr	Avg dry	Avg all
CDC Falcon	'00	115.7	115.2	45.3	66.0	60.3		68.8	64.6	115.5	61.0	76.6
	'01	92.2	62.5	8.9	27.5	11.1	50.8			77.4	24.6	42.2
	'02	86.7	117.1		41.4		45.5	53.0	40.8	101.9	45.2	64.1
	avg	98.2	98.3	27.1	45.0	35.7	48.2	60.9	52.7	98.2	44.9	58.2
Neeley	'00	117.6	120.3	45.3	68.0	74.6		69.5	71.3	119.0	65.7	80.9
	'01	104.5	72.7	10.2	19.7	18.0	44.3			88.6	23.1	44.9
	'02	88.0	121.1		35.8		47.9	45.1	36.0	104.6	41.2	62.3
	avg	103.4	104.7	27.8	41.2	46.3	46.1	57.3	53.7	104.0	45.4	60.0
Rocky	'00	114.2	115.0	49.5	64.2	63.5		69.1	59.6	114.6	61.2	76.4
	'01	92.3	69.5	13.6	25.0	12.6	50.7			80.9	25.5	44.0
	'02	86.4	125.5		35.6		47.0	39.9	29.7	106.0	38.1	60.7
	avg	97.6	103.3	31.6	41.6	38.1	48.9	54.5	44.7	100.5	43.2	57.5
Tiber	'00	102.1	112.4	39.0	64.1	79.9		67.1	59.0	107.3	61.8	74.8
	'01	107.3	84.9	13.4	22.3	17.0	43.7			96.1	24.1	48.1
	'02	81.0	114.4		30.8		48.4	39.6	28.4	97.7	36.8	57.1
	avg	96.8	103.9	26.2	39.1	48.5	46.1	53.4	43.7	100.4	42.8	57.2

Table 2. Test Weight in pounds per bushel of CDC Falcon compared to check varieties in the MSU Intrastate Winter Wheat Trials.

Entry	Year	Bozeman	Kalispell	Conrad	Havre	Huntley	Moccasin	Sidney	Williston	Avg irr	Avg dry	Avg all
CDC Falcon	'00	60.3	61.0	61.7	61.5	62.3		61.2	62.3	60.7	61.8	61.5
	'01	63.3	60.8	59.1	57.2	58.8	58.8			62.1	58.5	59.7
	'02	53.9	61.6		57.0		59.1	58.8	53.4	57.8	57.1	57.3
	avg	59.2	61.1	60.4	58.6	60.6	59.0	60.0	57.9	60.2	59.1	59.5
Neeley	'00	61.8	62.2	59.6	61.8	62.9		62.8	62.9	62.0	62.0	62.0
	'01	63.7	60.7	56.0	58.3	59.7	53.6			62.2	56.9	58.7
	'02	57.5	62.9		57.0		59.1	58.2	54.0	60.2	57.1	58.1
	avg	61.0	61.9	57.8	59.0	61.3	56.4	60.5	58.5	61.5	58.7	59.6
Rocky	'00	62.8	64.4	63.1	62.4	63.7		63.3	63.1	63.6	63.1	63.3
	'01	64.6	63.2	61.7	60.1	59.5	58.9			63.9	60.1	61.3
	'02	57.6	64.2		59.7		61.9	60.6	56.3	60.9	59.6	60.1
	avg	61.7	63.9	62.4	60.7	61.6	60.4	62.0	59.7	62.8	60.9	61.5
Tiber	'00	62.2	63.4	58.5	61.1	63.0		63.8	62.7	62.8	61.8	62.1
	'01	64.2	63.1	59.4	60.7	58.6	55.0			63.7	58.4	60.2
	'02	58.7	63.5		60.7		59.8	60.8	56.5	61.1	59.5	60.0
	avg	61.7	63.3	59.0	60.8	60.8	57.4	62.3	59.6	62.5	59.9	60.8

Table 3. Protein% of CDC Falcon compared to check varieties in the MSU Intrastate Winter Wheat Trials.

Entry	Year	Bozeman	Kalispell	Conrad	Havre	Huntley	Moccasin	Sidney	Williston	Avg irr	Avg dry	Avg all
CDC Falcon	'00	12.4	11.7	14.6	11.0	14.5		10.5	12.6	12.1	12.6	12.5
	'01	13.2	13.0	14.0	13.7	14.2	14.8			13.1	14.2	13.8
	'02	15.6	12.0		14.2		14.9	13.0	14.7	13.8	14.2	14.1
	avg	13.7	12.2	14.3	13.0	14.4	14.9	11.8	13.7	13.0	13.6	13.5
Neeley	'00	13.8	12.2	14.3	11.3	14.4		10.8	13.6	13.0	12.9	12.9
	'01	12.5	11.8	13.2	13.2	14.8	15.1			12.2	14.1	13.4
	'02	15.8	12.5		14.3		15.0	12.8	14.4	14.2	14.1	14.1
	avg	14.0	12.2	13.8	12.9	14.6	15.1	11.8	14.0	13.1	13.7	13.5
Rocky	'00	12.5	12.5	14.5	10.7	13.9		11.8	13.6	12.5	12.9	12.8
	'01	13.1	13.0	13.7	13.6	15.7	14.5			13.1	14.4	13.9
	'02	14.9	12.1		14.2		14.7	13.3	14.4	13.5	14.2	13.9
	avg	13.5	12.5	14.1	12.8	14.8	14.6	12.6	14.0	13.0	13.8	13.6
Tiber	'00	13.7	12.6	14.5	11.9	14.2		12.6	15.0	13.2	13.6	13.5
	'01	13.8	13.4	14.2	14.1	17.2	15.7			13.6	15.3	14.7
	'02	15.4	12.8		14.9		15.3	13.9	15.2	14.1	14.8	14.6
	avg	14.3	12.9	14.4	13.6	15.7	15.5	13.3	15.1	13.6	14.6	14.3

Table 4. Plant Height in inches of CDC Falcon compared to check varieties in the MSU Intrastate Winter Wheat Trials.

Entry	Year	Bozeman	Kalispell	Conrad	Havre	Huntley	Moccasin	Sidney	Williston	Avg irr	Avg dry	Avg all
CDC Falcon	'00	32.7	43.4	27.0	28.0	29.6		27.4	27.2	38.1	27.8	30.8
	'01	24.5	21.7	18.0	18.1	11.6	25.4			23.1	18.3	19.9
	'02	35.6	32.4		22.1		27.3	28.0	23.5	34.0	25.2	28.2
	avg	30.9	32.5	22.5	22.7	20.6	26.4	27.7	25.4	31.7	24.2	26.1
Neeley	'00	40.3	49.7	33.0	33.7	32.7		31.4	27.6	45.0	31.7	35.5
	'01	31.7	26.8	22.0	20.3	17.4	30.7			29.3	22.6	24.8
	'02	46.5	3.1		26.0		30.2	33.9	29.1	24.8	29.8	28.1
	avg	39.5	26.5	27.5	26.7	25.1	30.5	32.7	28.4	33.0	28.4	29.6
Rocky	'00	38.9	50.3	31.0	33.6	34.9		31.0	27.6	44.6	31.6	35.3
	'01	28.6	26.1	19.0	18.2	12.6	33.7			27.4	20.9	23.0
	'02	46.2	40.3		26.8		33.8	32.0	28.5	43.3	30.3	34.6
	avg	37.9	38.9	25.0	26.2	23.8	33.8	31.5	28.1	38.4	28.0	30.6
Tiber	'00	43.6	51.7	31.0	33.9	36.1		33.0	31.8	47.7	33.2	37.3
	'01	32.5	31.9	21.0	18.5	16.5	31.4			32.2	21.9	25.3
	'02	48.3	41.7		27.3		34.1	33.5	29.5	45.0	31.1	35.7
	avg	41.5	41.8	26.0	26.6	26.3	32.8	33.3	30.7	41.6	29.3	32.3

Table 5. Heading Date from Jan. 1 of CDC Falcon compared to check varieties in the MSU Intrastate Winter Wheat Trials.

<u>Year</u>	<u>Bozeman</u>	<u>Kalispell</u>	<u>Conrad</u>	<u>Havre</u>	<u>Huntley</u>	<u>Moccasin</u>	<u>Sidney</u>	<u>Williston</u>	<u>Avg irr</u>	<u>Avg dry</u>	<u>Avg all</u>
'00	164.0	159.0	160.0	154.2	150.7	163.3	155.3	155.7	161.5	156.5	157.8
'01	162.1	157.3	163.0	159.6	160.0	165.2			159.7	162.0	161.2
'02	175.3	164.7		175.7		173.7	169.6	174.3	170.0	173.3	172.2
avg	167.1	160.3	161.5	163.2	155.4	167.4	162.5	165.0	163.7	162.5	162.8
'00	167.7	160.3	160.0	156.2	150.7	167.0	157.0	156.7	164.0	157.9	159.5
'01	167.8	158.7	166.0	162.3	158.6	169.9			163.3	164.2	163.9
'02	176.3	167.3		177.0		176.0	172.9	174.7	171.8	175.2	174.0
avg	170.6	162.1	163.0	165.2	154.7	171.0	165.0	165.7	166.4	164.1	164.6
'00	162.3	157.0	159.0	153.5	148.0	162.2	154.3	155.7	159.7	155.5	156.5
'01	161.9	156.3	161.0	159.7	158.2	166.3			159.1	161.3	160.6
'02	173.3	165.0		174.0		173.0	171.4	175.0	169.2	173.4	172.0
avg	165.8	159.4	160.0	162.4	153.1	167.2	162.9	165.4	162.6	161.8	162.0
'00	167.3	159.7	164.0	155.5	150.7	166.0	156.7	158.0	163.5	158.5	159.7
'01	167.0	160.3	165.0	161.0	160.2	167.6			163.7	163.5	163.5
'02	175.0	168.0		177.3		175.0	173.5	175.7	171.5	175.4	174.1
avg	169.8	162.7	164.5	164.6	155.5	169.5	165.1	166.9	166.2	164.3	164.8

Table 6. Winter Survival of CDC Falcon compared to check varieties in the MSU Intrastate Winter Wheat Trials.

<u>Entry</u>	<u>Year</u>	<u>% Stand Conrad</u>	<u>% Stand Havre</u>	<u>% Stand Moccasin</u>	<u>AVG</u>	<u>% Winter Survival</u>		<u>Avg</u>
						<u>Sidney</u>	<u>Williston</u>	
CDC Falcon	'00					89.9	66.7	78.3
	'01	60.0	84.0	76.2	73.4			
	'02		77.3	83.3	80.3	84.4	27.2	68.1
	avg	60.0	80.7	79.8	76.9	87.2	47.0	73.2
Neeley	'00					83.4	61.9	72.7
	'01	56.7	74.9	70.6	67.4			
	'02		77.1	81.9	79.5	57.8	26.1	60.7
	avg	56.7	76.0	76.3	73.5	70.6	44.0	66.7
Rocky	'00					79.9	66.9	73.4
	'01	61.7	68.0	77.9	69.2			
	'02		75.3	83.9	79.6	51.5	17.2	57.0
	avg	61.7	71.7	80.9	74.4	65.7	42.1	65.2
Tiber	'00					91.7	70.9	81.3
	'01	65.0	75.6	68.0	69.5			
	'02		72.4	83.8	78.1	61.1	14.9	58.1
	avg	65.0	74.0	75.9	73.8	76.4	42.9	69.7

Table 7. Disease reaction of CDC Falcon compared with CDC Kestrel. Data from artificial rust infections at the University of Saskatchewan, Saskatoon. Recorded in % infection.

<u>Entry</u>	<u>Year</u>	<u>Stem Rust</u>	<u>Leaf Rust</u>
CDC Falcon	'95	0 R	
	'96	0 R	
	'97	0 R	5 MR
	'98	0 R	TR
CDC Kestrel	'95	60 S	
	'96	40 S	
	'97	60S	45 S
	'98	20 MS	20 MS

Table 8. Quality evaluation of CDC Falcon compared to check varieties in the 2000 MSU Intrastate Winter Wheat Trials

Means across locations: Bozeman, Havre, Conrad, Huntley, MT.

Variety	Wheat Protein, % (12% m.b.)	Wheat Ash, %	Flour Yield, %	Flour Protein, % (14 % m.b.)		Mixograph				Test Bake				Wheat Protein- Flour Protein
						Type	Tolerance	Mixing Time, min	Water Absorption, %	Mixing Time, min	Water Absorption, %	Loaf Volume	Crumb Grain Score	
CDC Falcon	12.5		64.6	10.9	0.35		3.0	3.6	60.0	5.3	69.9	1004	3.0	1.6
BigSky	14.1		64.4	12.0	0.31		4.0	3.7	62.5	5.6	72.6	1014	4.0	2.1
Neeley	13.4		65.9	11.5	0.31		4.0	3.2	60.8	4.6	71.1	1008	4.0	1.9
Rocky	12.9		64.8	11.2	0.34		4.0	3.7	60.9	5.6	71.7	975	4.0	1.7
Tiber	13.6		64.0	11.6	0.30		2.0	2.9	61.2	4.8	71.7	993	3.0	2.0
Average	13.3		64.7	11.4	0.3		3.4	3.4	61.1	5.2	71.4	998.8	3.6	
Min	12.5		64.0	10.9	0.30		2.0	2.0	60.0	4.6	69.9	993	3.0	
Max	14.1		65.9	12.0	0.35		4.0	3.7	62.5	5.6	72.6	1014	4.0	

Table 9. Quality evaluation of CDC Falcon compared to check varieties in the 2001 MSU Intrastate Winter Wheat Trials

Means across locations: Bozeman, Havre, Moccasin and Conrad, MT.

Variety	Wheat Protein, % (12% m.b.)	Wheat Ash, %	Flour Yield, %	Flour Protein, % (14 % m.b.)	Flour Ash, %	Mixograph				Test Bake				Wheat Protein-Flour Protein
						Type	Tolerance	Mixing Time, min	Water Absorption, %	Mixing Time, min	Water Absorption, %	Loaf Volume	Crumb Grain Score	
CDC Falcon	13.7	1.5	60.5	11.8	0.37		3.8	4.4	59.1	7.5	69.3	1070	3.0	1.9
BigSky	15.0	1.4	65.0	12.7	0.30		4.5	4.5	59.1	7.5	69.3	1099	3.8	3.2
Neeley	13.5	1.5	63.5	11.6	0.37		3.8	3.6	60.2	6.0	69.7	1036	3.0	1.9
Rocky	13.6	1.4	63.7	11.6	0.36		4.3	4.6	60.4	7.5	71.5	1014	4.0	2.0
Tiber	14.5	1.4	64.3	12.4	0.33		2.8	3.5	61.5	6.7	70.8	1086	3.3	2.1
Average	14.1	1.4	63.4	12.0	0.3		3.8	4.1	60.1	7.0	70.1	1061	3.4	
Min	13.6	1.4	60.5	11.6	0.30		2.8	3.5	59.1	6.0	69.3	1014	3.0	
Max	15.0	1.5	65.0	12.7	0.37		4.5	4.6	61.5	7.5	71.5	1099	4.0	

Table 10.

Quality analysis of HRS and HRW samples sent to Conagra 2000

<u>Description</u>	<u>OriginCity</u>	<u>Moisture</u>	<u>Protein</u>	<u>Wheat Ash</u>	<u>Fall No.</u>	<u>TW</u>	<u>Flour Ash</u>	<u>SKCS Hrdness</u>	<u>SKCS TKW</u>
CDC Falcon	BZ	8.3	14.4	1.213	560	62.7	0.447	78	29.8
Rampart	BZ	8.8	15.3	1.281	459	63.6	0.413	85	28.8
Neeley	BZ	8.6	13.9	1.224	465	63	0.371	83	30.2

<u>Description</u>	<u>OriginCity</u>	<u>BAKE ABS</u>	<u>BAKE MIX</u>	<u>BAKE VOLUME</u>	<u>DOUGH TOTAL SCORE (45)</u>	<u>EXTERNAL SCORE</u>	<u>INTERNAL TOTAL (45)</u>	<u>SPONGE & DOUGH TOTAL (100)</u>
CDC Falcon	BZ	62.5	30	2625	40	9	39	88
Rampart	BZ	62.5	60	2725	28	9	43	80
Neeley	BZ	64	20	2700	38	10	37	85

