

Winter Wheat Cultivar Susceptibility to Preharvest Sprouting at Kalispell in 1997

Favorable environmental conditions make pre-harvest sprouting in small grains an annual concern for District 1 producers. Sprout damaged grain results in substantial economic losses as kernels are no longer agronomically sound and the functional quality of the flour is negatively affected. This study was conducted to evaluate winter wheat class and cultivar susceptibility to pre-harvest sprouting and the effect of sprout damage on seed characteristics and quality.

Included in the study were five hard red (Judith, Rocky, Neeley, Tiber, and Kestrel), five soft white (Lewjain, Cashup, Malcolm, Stevens, and Daws), and one hard white (NuWest) cultivar. In an attempt to initiate some level of sprouting in all cultivars, irrigation was applied daily beginning at physiological maturity to augment natural precipitation. Harvests began one week after the earliest cultivar reached physiological maturity and continued weekly for a total of six. Harvests were made over time to document when and to what degree sprout was occurring in each cultivar. The presence or absence of sprout damage was assessed with visible sprout observations and falling number determinations (FN) conducted by inspectors at the State Grain Lab. Other measured responses included test weight, % germination, protein, lodging, heading date, and physiological maturity.

Harvest maturity was identified on 8-18 for the hard red and hard white cultivars and 8-25 for the soft whites. Based on percent visible sprout, hard reds were more resistant to sprout damage than soft whites. With the exception of Rocky, red cultivars performed equally as well. Malcolm was considerably better than the other four soft whites. In general, as % sprout increased, test weight, and falling numbers decreased. These decreases were more rapid and severe in soft whites. Percent germination declined steadily over time in the soft whites but held constant in the hard reds and hard white.

Site Description

Crop: Winter Wheat	Variety: 5 Hard Red, 5 Soft Whites, and 1 Hard White
Planting Date: 9-26-96	Planting Method: Disc Drill
Rate, Unit: 77 Lbs/A	Depth, Unit: 1.5"
Soil Moisture: Good	Row Spacing, Unit: 6"
	Emergence Date: 10-6-96
Plot Width, Unit: 4.2 FT	Plot Length, Unit: 10 FT
Site Location: X-5	Reps: 3
Plot Maintenance:	Study Design: RCB
Fertility:	9-23-96 24 Lbs. N, 30 Lbs. P, 16 Lbs. K, 21 Lbs. S, & 15 Lbs. Cl
	5- 2-97 51 Lbs. N
Weed Control:	Hand weeded throughout season
Irrigation:	.1" daily thru 9-9-97
Harvest Dates:	8- 4-97 Harvest #1
	8-11-97 Harvest #2
	8-18-97 Harvest #3
	8-25-97 Harvest #4
	9- 1-97 Harvest #5
	9-10-97 Harvest #6

Soil Description

Texture: SiL % OM: 5.1 pH: 7.6 Soil Name: Creston Silt Loam

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Trt No	Treatment Name	WNTR WHT GERM PERCENT 8-4-97	WNTR WHT GERM PERCENT 8-11-97	WNTR WHT GERM PERCENT 8-18-97	WNTR WHT GERM PERCENT 8-25-97	WNTR WHT GERM PERCENT 9-1-97	WNTR WHT GERM PERCENT 9-10-97
1	JUDITH	94	95	93	92	94	96
2	ROCKY	98	95	97	98	95	94
3	NEELEY	82	95	91	86	83	93
4	TIBER	90	91	92	89	84	94
5	KESTREL	96	95	94	93	98	98
6	NuWEST	87	86	85	81	75	83
7	LEWJAIN	87	80	80	71	65	67
8	CASHUP	86	78	83	67	63	73
9	MALCOLM	86	76	68	70	66	76
10	STEVENS	93	84	83	83	80	81
11	DAWS	86	77	78	70	64	60
LSD (.05)		= 7	6	9	7	10	8
Standard Dev. =		3.96500	3.68412	5.25299	4.16552	6.10886	4.62667
CV =		4.43	4.26	6.12	5.09	7.75	5.56
Treatment F		4.552	14.000	8.007	20.760	14.055	23.423
Treatment Prob (F)		0.0019	0.0001	0.0001	0.0001	0.0001	0.0001

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Trt No	Treatment Name	WNTR WHT HD DATE JULIAN	WNTR WHT PHYS MAT JULIAN	WNTR WHT LODGING 0-9 8-28-97
1	JUDITH	159.7	211.7	4.7
2	ROCKY	159.0	207.7	5.3
3	NEELEY	161.0	213.3	6.3
4	TIBER	162.0	214.0	3.0
5	KESTREL	161.3	216.0	5.0
6	NuWEST	160.7	213.0	4.7
7	LEWJAIN	166.0	222.3	4.3
8	CASHUP	163.3	218.3	6.0
9	MALCOLM	161.0	217.3	2.3
10	STEVENS	161.3	218.7	4.0
11	DAWS	163.0	217.3	6.3
LSD (.05)	=	0.9	1.6	1.6
Standard Dev. =		.539360	.953463	.917837
CV	=	0.33	0.44	19.42
Treatment F		37.813	53.100	5.921
Treatment Prob(F)		0.0001	0.0001	0.0004

Winter Wheat Cultivar Susceptibility to Preharvest Sprouting at Kalispell in 1997

Trt No	Treatment Name	WNTR WHT SPROUT PERCENT 8-4-97	WNTR WHT SPROUT PERCENT 8-11-97	WNTR WHT SPROUT PERCENT 8-18-97	WNTR WHT SPROUT PERCENT 8-25-97	WNTR WHT SPROUT PERCENT 9-1-97	WNTR WHT SPROUT PERCENT 9-10-97
1	JUDITH	0.07	0.00	0.33	1.63	1.23	3.23
2	ROCKY	0.03	0.00	0.03	4.27	2.60	9.53
3	NEELEY	0.00	0.00	0.00	0.93	0.70	1.40
4	TIBER	0.20	0.00	0.03	0.00	0.10	0.50
5	KESTREL	0.00	0.00	0.10	0.53	0.93	1.17
6	NuWEST	0.10	0.00	0.00	3.27	2.37	5.60
7	LEWJAIN	0.87	2.10	8.50	26.63	28.70	45.90
8	CASHUP	4.17	2.20	2.90	22.33	29.63	49.73
9	MALCOLM	1.47	1.93	3.83	6.60	7.60	11.63
10	STEVENS	1.13	1.50	2.37	6.10	9.53	25.83
11	DAWS	2.87	2.77	6.03	22.73	26.73	62.20
LSD (.05) =		1.59	0.79	1.52	7.38	4.96	9.17
Standard Dev. =		.935884	.466645	.893749	4.33582	2.91157	5.38217
CV =		94.45	48.89	40.74	50.19	29.08	27.32
Treatment F		6.515	17.730	31.748	16.235	52.295	53.001
Treatment Prob(F)		0.0002	0.0001	0.0001	0.0001	0.0001	0.0001

