

PROJECT TITLE: Early Generation Winter Wheat Screening for TCK (Dwarf Bunt) Fungus (*Tilletia controversa* Kuhn).

PROJECT LEADERS: Bob Stougaard, Weed Scientist, NWARC.

PROJECT COOPERATORS: Scott Halley, Research Associate, NWARC.  
Phil Bruckner, Winter Wheat Breeder, Bozeman.  
Jim Berg, Research Associate, Bozeman

OBJECTIVES:

To evaluate early generation winter wheat lines for agronomic performance and resistance to both introduced and natural TCK inoculum.

RESULTS:

Rainfall events were limited from early July through harvest.

There was only minor winter injury in the trial this year. Pythium developed throughout the nursery several weeks after winter dormancy had broken and this may have reduced the damage caused by TCK. Although TCK levels were less than previous years, differences were measured. 94X126E119, 93X234cE20-4, and 93X234cE50-6 had the greatest infection levels. Yields average 67.8 bu/acre for all lines. A low yield of 49.1 bu/acre was measured for 94X126E84 compared to a high yield of 101.3 bu/acre for 93X553E59-2. Test weights were generally good averaging 62.4 bu/acre. 93X500cE32-6 and 93X500cE73-5 had test weights under 60 lbs/bushel. Plant heights were short in 2001 with an average of 25.7 inches. Only three lines had heights exceeding 30 inches. Heading date ranged from 151 to 165 days.

SUMMARY:

Environmental conditions permitted an opportunity for screening of experimental lines for TCK fungus tolerance. These observations will further the selection process toward the release of cultivars suitable for planting in TCK prone areas.

FUTURE PLANS:

Continue to evaluate experimental winter wheat lines for resistance to TCK fungus.

Table 1. Agronomic data from the TCK Winter Wheat Screening Nursery grown at the Northwestern Agricultural Research Center Kalispell, MT.

Experimental Line	Yield	TWT	TCK	Height	Disease	Winter	Heading Date
	Bu/acre	Lbs/bu	Score 1-3	Inches	Score 1-3	Survival %	Julian
Yuma	61.8	62.3	1	21.7	2	100	151
Promontory	55.3	64.2	0	24.4	1	100	157
94X126E8	63.6	62.8	0	27.2	2	90	156
94X126E13	56.9	62.7	1	21.7	2	100	161
Promontory	56.1	64.3	0	24.8	1	97	157
94X126E29	57.9	62.1	0	24.4	1	100	158
94X126E31	55.0	61.1	0	22.8	2	100	161
94X126E35	61.0	62.5	0	25.6	1	100	160
94X126E40	63.9	62.8	0	25.6	2	100	159
94X126E43	72.2	62.6	1	26.0	1	100	158
94X126E45	63.8	62.0	0	24.0	1	97	158
94X126E62	64.8	62.6	1	25.6	1	100	158
94X126E64	60.8	63.5	0	25.2	2	100	160
94X126E66	52.4	62.0	0	23.2	1	100	161
94X126E68	na	62.4	0	20.9	2	100	155
94X126E70	53.3	61.6	1	20.5	2	100	161
94X126E80	57.4	62.3	1	23.6	1	100	160
94X126E84	49.1	63.4	1	22.8	2	97	155
94X126E87	62.1	62.4	0	24.0	2	100	161
94X126E90	60.7	62.9	1	23.6	1	100	158
94X126E95	59.9	62.1	0	23.6	2	100	160
94X126E98	62.2	62.1	0	23.6	1	100	158
94X126E101	65.5	62.4	1	24.8	1	100	161
94X126E108	68.3	62.7	0	24.0	1	100	158
94X126E119	60.8	62.8	2	22.8	2	100	159
94X126E126	61.1	62.0	1	24.4	1	97	160
94X126E139	74.7	62.7	1	26.8	1	100	158
94X126E143	70.3	62.1	0	25.2	1	100	160
94X126E158	64.5	63.0	1	22.8	2	100	158
94X126E161	65.7	62.4	1	22.8	1	97	157
94X126E165	58.0	62.5	1	23.6	2	100	161
94X126E169	52.1	62.5	1	25.2	1	100	159
94X126E173	56.3	62.6	1	22.8	1	100	161
94X126E184	51.3	63.8	0	22.8	1	100	158
94X126E186	56.0	63.2	0	25.6	2	100	159
94X126E192	62.1	62.7	0	23.6	1	95	162
94X126E194	58.1	63.0	1	23.6	1	100	158
94X126E197	60.4	62.3	1	25.2	1	100	159
94X126E203	67.4	63.1	0	27.6	1	100	159
93X231cE18-2	61.3	61.7	0	26.4	2	100	158
93X231cE21-1	73.1	61.8	1	26.8	1	95	161
93X231cE21-4	77.6	62.0	1	26.8	1	100	160
93X231cE25-6	71.1	61.6	1	28.7	1	100	158
93X231cE26-3	73.9	62.5	0	27.2	1	100	159
93X231cE36-2	80.5	63.5	0	26.8	3	97	158
93X231cE36-3	70.7	63.5	0	27.6	1	97	158
93X231cE51-3	59.8	62.7	0	27.6	1	100	157
93X231cE61-3	55.3	61.3	1	27.6	1	100	158

Continued

Experimental Line	Yield	TWT	TCK	Height	Disease	Winter	Heading Date
	Bu/acre	Lbs/bu	Score 1-3	Inches	Score 1-3	Survival %	Julian
93X234cE20-3	61.8	61.9	1	26.8	1	95	161
Neeley	69.7	63.5	1	27.2	1	100	161
Yuma	60.5	62.6	1	22.4	1	100	151
Promontory	61.9	64.4	0	25.2	1	100	157
93X234cE20-4	70.3	61.6	2	28.0	2	100	161
93X234cE30-3	71.4	62.6	0	26.8	1	100	158
93X234cE34-2	76.9	62.8	1	21.7	1	100	161
93X234cE50-6	78.0	62.0	2	23.2	1	100	161
93X234cE60-2	78.8	62.1	1	23.2	1	100	158
93X234cE65-6	76.1	63.3	1	22.8	2	100	158
93X234cE71-4	81.2	61.9	1	29.5	1	100	160
93X234cE76-2	65.1	62.9	0	23.2	2	97	161
93X542cE5-2	65.0	62.5	0	24.4	2	100	162
93X542cE7-2	60.8	62.1	0	25.6	2	100	162
93X542cE7-4	59.4	62.3	0	24.4	2	100	163
93X542cE15-1	63.0	63.2	0	26.8	2	100	154
93X542cE30-4	68.1	62.6	1	29.1	2	100	158
93X542cE33-2	70.2	63.2	1	28.7	1	100	156
93X542cE35-1	72.6	62.2	0	26.8	2	100	162
93X542cE58-1	87.6	62.3	0	29.1	1	100	162
93X542cE63-2	79.6	63.2	0	30.3	2	100	160
93X542cE63-3	84.6	63.3	0	30.7	1	100	160
93X542cE67-1	90.6	61.7	0	29.9	2	100	162
93X542cE67-6	93.5	61.8	1	28.7	2	100	162
93X542cE71-1	88.9	62.7	1	29.1	1	100	158
93X553E59-2	101.3	60.8	0	34.6	2	100	162
93X500cE32-6	50.7	59.6	0	24.4	2	100	158
93X500cE73-5	75.6	59.4	0	25.2	2	100	164
93X502cE5-5	78.8	63.2	0	27.2	2	100	161
93X510cE4-5	71.6	62.4	0	25.2	1	100	158
93X510cE5-3	76.2	63.3	0	26.4	2	100	161
93X510cE39-3	68.8	60.1	0	26.0	1	100	162
93X510cE42-2	69.2	61.1	0	24.8	1	100	165
94X128E10-2	74.6	63.3	0	26.4	2	100	164
94X128E10-4	76.9	62.8	0	28.7	2	100	164
94X128E10-6	82.6	63.0	0	28.7	3	100	162
94X128E13-4	73.8	62.9	1	27.6	1	100	162
94X128E16-2	77.5	63.3	0	26.0	1	100	161
94X128E16-6	81.1	62.8	0	25.6	2	97	161
94X128E40-2	84.1	61.9	1	27.6	1	100	161
94X128E40-3	81.6	61.0	0	25.6	1	97	162
94X128E47-2	68.1	62.7	1	27.2	2	100	163
94X128E47-6	59.1	63.0	0	25.6	2	100	161
93X619cE18-2	51.2	62.0	1	29.1	1	100	158
93X619cE33-3	58.4	61.9	1	26.4	1	100	157
93X619cE33-6	58.4	61.9	0	26.0	1	97	157
93X88E22-4	59.0	61.3	2	29.5	2	100	157
93X88E33-2	61.5	61.2	1	27.2	2	100	158
93X88E50-1	60.6	61.6	1	25.2	2	100	158
Yuma	72.2	61.7	2	25.2	1	100	151
Promontory	79.2	63.4	0	26.8	2	100	158
Mean	67.08	62.4	0.51	25.7	1.4	99.4	159