

PROJECT TITLE: Early generation winter wheat screening for TCK.

PROJECT LEADERS: Bob Stougaard, Weed Scientist, NWARC
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PROJECT PERSONNEL: Phil Bruckner, Winter Wheat Breeder, Bozeman, MT
Jim Berg, Research Associate, Bozeman, MT

OBJECTIVES:

To evaluate winter wheat germplasm responses to introduced and natural TCK (Dwarf Bunt) infection. Agronomic characteristics and additional disease reactions will be documented as well.

RESULTS:

Emergence problems and light winterkill resulted in plant populations averaging 80 percent stand survival. However, cool and dry spring conditions resulted in extensive tillering and little to no disease pressure. Documentation of genetic TCK responses were not possible as winter conditions prevented spore germination and plant infection. Conditions throughout grain fill were hot and dry with timely rainfall events and adequate soil moisture. Yields were high ranging from 113 to 160 bu/A with a 98 entry mean of 137 bu/A. Test weights were average (59.8 lbs/bu) with no significant lodging.

SUMMARY:

Growing season precipitation and temperatures resulted in high yields and average test weights in the absence of lodging and disease pressure. The winter of 1998-99 was not favorable for TCK infection in that continuous days of snow-cover never approached the approximated 60 needed to begin the fungus' life-cycle.

FUTURE PLANS:

NWARC will continue to conduct this nursery in an attempt to identify those early generation cultivars with tolerance or resistance to TCK while also evaluating all agronomic attributes.

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

Planted: September 24, 1998

Harvested: August, 18, 1999

Variety	Yield Bu/A	Stand %	Test Wt Lbs/Bu	Lodge 0-9	Ht Inch	Hd Date Julian
1 Judith	148.4	90.0	58.9	1.0	37.4	154.0
2 Promontory	139.4	75.0	61.3	0.0	35.0	156.0
3 Blizzard	152.2	85.0	62.9	0.0	39.8	162.0
4 Yuma	143.7	88.0	60.0	1.0	33.1	154.0
5 399 HBC197F/Meridian	151.8	95.0	60.4	1.0	32.3	162.0
6 400 HBC197F/Meridian	128.2	88.0	59.2	1.0	32.3	156.0
7 403 HBC197F/Meridian	155.4	72.0	60.0	1.0	33.5	157.0
8 404 Blizzard/Arapahoe	132.5	85.0	60.5	0.0	37.4	157.0
9 405 Blizzard/Arapahoe	151.5	80.0	59.9	1.0	36.2	155.0
10 406 Blizzard/Arapahoe	159.7	82.0	60.6	1.0	40.6	160.0
11 407 Blizzard/Arapahoe	141.1	75.0	59.6	1.0	39.4	156.0
12 408 Blizzard/Arapahoe	149.9	80.0	60.3	1.0	39.8	161.0
13 409 Jud/Bliz//Jud/Pion	139.8	70.0	59.2	0.0	38.6	155.0
14 410 Jud/Bliz//Jud/Pion	136.5	65.0	59.5	0.0	36.6	155.0
15 411 Jud/Bliz//Jud/Pion	155.9	80.0	57.6	2.0	36.2	160.0
16 412 Jud/Bliz//Jud/Pion	128.9	70.0	57.8	0.0	40.2	160.0
17 413 Jud/Bliz//Jud/Pion	139.7	75.0	57.8	0.0	40.6	162.0
18 414 Jud/Bliz//Jud/Pion	126.5	65.0	56.8	1.0	42.5	162.0
19 415 Jud/Bliz//Jud/Pion	146.2	50.0	58.3	1.0	38.6	157.0
20 416 Jud/Bliz//Jud/Pion	159.6	75.0	58.8	0.0	37.0	157.0
21 417 Jud/Bliz//Jud/Pion	156.1	75.0	58.3	0.0	42.5	162.0
22 418 Jud/Bliz//Jud/Pion	139.5	75.0	58.7	1.0	41.3	158.0
23 419 Jud/Bliz//Jud/Pion	131.2	82.0	58.5	1.0	36.2	157.0
24 420 Jud/Bliz//Jud/Pion	145.8	88.0	57.6	2.0	38.6	160.0
25 421 Jud/Bliz//Jud/Pion	157.3	83.0	57.7	2.0	37.8	158.0
26 422 Jud/Bliz//Jud/Pion	134.2	80.0	59.5	1.0	40.6	158.0
27 423 Jud/Bliz//Jud/Pion	150.3	83.0	58.5	1.0	42.5	162.0
28 424 Jud/Flm85//UT182016	142.9	75.0	60.4	1.0	37.8	165.0
29 425 8713/Arp//Bliz/Arp	152.6	93.0	60.2	1.0	35.4	154.0
30 426 8713/Arp//Bliz/Arp	138.3	98.0	60.0	0.0	31.9	154.0
31 427 8713/Arp//Bliz/Arp	150.2	90.0	59.4	1.0	32.3	154.0
32 428 8713/Arp//Bliz/Arp	145.1	89.0	60.2	0.0	29.5	155.0
33 429 8713/Arp//Bliz/Arp	142.0	95.0	60.1	0.0	34.6	153.0
34 430 8713/Arp//Bliz/Arp	146.4	90.0	60.0	1.0	29.1	156.0
35 431 8713/Arp//Bliz/Arp	137.4	88.0	59.4	2.0	31.5	154.0
36 432 8713/Arp//Bliz/Arp	135.7	85.0	60.8	0.0	33.1	153.0
37 433 Jud/Arp//A851020W	151.7	90.0	57.8	2.0	34.6	157.0
38 434 Jud/Arp//A851020W	138.0	85.0	59.2	0.0	35.0	162.0
39 435 Jud/Arp//A851020W	132.3	88.0	59.8	0.0	30.7	153.0
40 436 Jud/Arp//A851020W	130.5	88.0	59.6	0.0	37.0	160.0
41 437 Jud/Arp//A851020W	144.3	85.0	60.8	0.0	37.4	155.0
42 438 Jud/Arp//A851020W	120.1	85.0	59.3	0.0	39.8	164.0
43 439 Jud/Arp//A851020W	148.6	60.0	60.5	0.0	37.4	162.0
44 440 Jud/Arp//A851020W	119.1	60.0	60.8	0.0	37.4	164.0
45 441 Jud/Apr//A851020W	122.0	55.0	59.9	0.0	33.5	158.0
46 442 Arp/Kes//Jud/Bliz	136.4	60.0	60.7	1.0	39.0	158.0
47 443 Arp/Kes//Jud/Bliz	140.3	75.0	60.0	1.0	36.6	161.0
48 Judith	141.4	78.0	59.4	1.0	35.8	155.0
49 Promontory	136.4	70.0	61.1	0.0	33.9	157.0

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

Planted: September 24, 1998

Harvested: August, 18, 1999

Variety	Yield Bu/A	Stand %	Test Wt Lbs/Bu	Lodge 0-9	Ht Inch	Hd Date Julian
50 Blizzard	138.5	85.0	62.0	0.0	39.4	162.0
51 Yuma	131.0	75.0	59.3	1.0	31.9	153.0
52 444 Arp/Kes//Jud/Bliz	142.7	75.0	60.5	2.0	35.8	157.0
53 445 Arp/Kes//Jud/Bliz	131.3	70.0	59.9	1.0	36.6	157.0
54 446 Arp/Kes//Jud/Bliz	132.1	75.0	59.3	0.0	36.2	159.0
55 447 Arp/Kes//Jud/Bliz	145.9	80.0	59.6	2.0	37.4	157.0
56 448 Arp/Kes//Jud/Bliz	141.4	70.0	59.9	2.0	37.8	156.0
57 449 Arp/Kes//Jud/Bliz	147.4	75.0	60.3	1.0	35.8	156.0
58 450 Arp/Kes//Jud/Bliz	144.5	80.0	59.6	1.0	37.0	158.0
59 453 Arp/Kes//Jud/Bliz	136.5	85.0	59.9	2.0	38.6	155.0
60 454 Arp/Kes//Jud/Bliz	144.6	85.0	59.4	2.0	37.0	158.0
61 455 Arp/Kes//Jud/Bliz	128.2	90.0	60.4	0.0	36.2	155.0
62 456 Arp/Kes//Jud/Bliz	139.0	85.0	59.7	1.0	35.8	162.0
63 457 Arp/Kes//Jud/Bliz	136.4	88.0	59.2	1.0	34.6	157.0
64 458 Arp/Kes//Jud/Bliz	129.6	85.0	59.8	1.0	35.0	155.0
65 459 Arp/Kes//Jud/Bliz	134.5	85.0	59.2	3.0	35.8	156.0
66 460 SD88191//Jud/Bliz	134.4	85.0	58.9	2.0	33.9	160.0
67 461 SD88191//Jud/Bliz	126.2	88.0	61.2	0.0	33.5	157.0
68 462 SD88191//Jud/Bliz	136.5	88.0	59.1	2.0	35.4	161.0
69 463 SD88191//Jud/Bliz	129.2	85.0	61.2	0.0	35.8	158.0
70 464 SD88191//Jud/Bliz	138.4	85.0	61.0	1.0	36.6	158.0
71 465 SD88191//Jud/Bliz	126.6	85.0	59.6	2.0	31.5	152.0
72 466 SD88191//Jud/Bliz	128.9	85.0	61.2	0.0	29.1	155.0
73 467 SD88191//Jud/Bliz	127.1	77.0	59.4	0.0	35.0	154.0
74 468 SD88191//Jud/Bliz	130.0	83.0	58.9	3.0	32.7	153.0
75 469 Sd88191//Jud/Bliz	132.0	85.0	59.2	1.0	32.3	153.0
76 470 SD88191//Jud/Bliz	113.2	90.0	60.8	1.0	34.6	157.0
77 471 Bliz/Arp//SD88191	126.7	93.0	60.1	1.0	28.7	152.0
78 472 Bliz/Arp//SD88191	135.2	98.0	61.4	3.0	29.9	152.0
79 473 Bliz/Arp//SD88191	136.2	93.0	61.7	0.0	37.0	154.0
80 474 Bliz/Arp//SD88191	138.4	90.0	58.3	0.0	29.9	154.0
81 475 Bliz/Arp//SD88191	125.3	95.0	59.8	0.0	37.8	157.0
82 476 Bliz/Arp//SD88191	137.2	95.0	57.4	1.0	31.5	160.0
83 477 Bliz/Arp//SD88191	136.9	98.0	58.1	1.0	31.9	157.0
84 478 Bliz/Arp//SD88191	131.6	92.0	61.1	0.0	37.4	156.0
85 479 Bliz/Arp//SD88191	129.9	80.0	59.8	1.0	40.9	157.0
86 480 Bliz/Arp//SD88191	128.9	85.0	59.9	3.0	40.9	154.0
87 481 Bliz/Arp//SD88191	130.2	75.0	60.2	0.0	35.4	156.0
88 482 Bliz/Rdwn//SD88191	126.4	80.0	61.2	0.0	36.6	156.0
89 483 Bliz/Rdwn//SD88191	131.4	82.0	60.9	0.0	38.2	155.0
90 484 Bliz/Rdwn//SD88191	124.7	84.0	61.7	0.0	34.3	157.0
91 485 Bliz/Rdwn//SD88191	136.5	85.0	61.3	0.0	36.6	157.0
92 486 Bliz/Rdwn//SD88191	128.7	83.0	61.1	0.0	38.2	157.0
93 487 Bliz/Rdwn//SD88191	133.7	75.0	58.5	1.0	32.3	161.0
94 488 McGuire/Tomahawk	116.0	70.0	61.2	0.0	31.5	152.0
95 489 Promontory/Judith	122.0	60.0	62.3	0.0	34.6	157.0
96 490 Promontory/Judith	119.7	45.0	59.4	1.0	34.3	156.0
97 491 Promontory/Judith	138.6	45.0	60.8	1.0	32.3	157.0
98 492 HBC197F/S86-740//	112.9	50.0	61.9	0.0	33.9	158.0

Mean	137.0	80.0	59.8	0.8	35.8	157.0
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