

PROJECT TITLE: Seed Treatment Dwarf Bunt Control in Winter Wheat

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OBJECTIVE: Evaluate Dividend seed treatment for control of Dwarf Bunt in eight winter wheat varieties.

RESULTS: Four soft white and four hard red winter wheat varieties of varying susceptibility to TCK dwarf bunt were selected for the 1992-93 trial. These eight varieties were seeded non-treated as well as treated with 1 oz Dividend per hundred weight. A research plot seeder was used to seed varieties on 9/22/92 in four-row plots, ten feet in length at a rate of 60 lb / acre. Seeding depth was 3/4 - 1 inch and row spacing was 12 inches. On October 1, 1992 an inoculum solution was applied to the test area using a research plot sprayer when winter wheat was in the three leaf stage. The TCK inoculum was prepared using screenings and smut balls from infected wheat samples. One bushel of screenings was soaked in 10 gallons of water for 15 minutes and then filtered twice through fine mesh cheese cloth to make the inoculum solution. The final application rate of the inoculum solution was approximately 100 gallons per acre. TCK ocular estimations were taken June 12 and July 1, 1993.

There were 105 days continuous snow cover from Dec 4, 1992 until Mar 18, 1993. Total snow cover days were 120 for the 1992-93 winter. Previous total days of snow cover for 1990, 1991, and 1992 were 65, 69, and 55 respectively. The environmental conditions were favorable for TCK infection and combined with successful inoculation techniques, assured high infection levels on susceptible cultivars of winter wheat.

SUMMARY: 1993

As in the 1992 Seed Treatment Study control of TCK, dwarf bunt was complete in all varieties treated with 1 oz Dividend per hundred weight. Hard red winter wheat varieties showed a higher degree of susceptibility to the disease with Judith having the highest disease infection (49.5 % ocular, 25.3% count). The check varieties Lewjain and Winridge demonstrated a high degree of resistance to TCK.

Yields did vary significantly when comparing similar varieties of treated versus nontreated winter wheat. The higher yields taken from Dividend treated plots of Nugaines, Judith, Tiber, and Rocky could be related to less winter kill in those plots but most likely is a reflection of the seed treatment protection of additional diseases by Dividend. Dividend has offered partial protection against other smuts ( loose and flag ), Septoria, common bunt, leaf stripe, scab, foot rot, Rhizoctonia root rot, speckled snow mold, strawbreaker foot rot, and mildews. Septoria, scab, and snow mold infection were yield limiting factors in winter wheat nurseries this year.

FUTURE PLANS: TCK Dwarf Bunt evaluations will be continued in cooperative efforts with regional personnel.

Table 1. 1993 Agronomic Data from the Seed Treatment Dwarf Bunt Study.  
Northwestern Agricultural Research Center, Kalispell, MT.

Variety	Trtmt 1/	Yield Bu/A	Test Wt Lb/Bu	Height Inches	Winter Kill %	% TCK 7/1 * Ocular Count	
Luke	Treated	86.1	49.3	37.9	28.8	0	0
Nugaines	Treated	59.7	46.9	33.1	78.8	0	0
Stephens	Treated	96.3	50.0	39.9	13.5	0	0
Lewjain	Treated	80.6	47.5	35.9	13.5	0	0
Judith	Treated	111.7	55.4	45.0	33.8	0	0
Tiber	Treated	101.4	58.1	50.4	24.8	0	0
Rocky	Treated	116.1	58.3	48.2	58.7	0	0
Winridge	Treated	98.9	54.3	51.5	30.0	0	0
Luke	Untreated	75.3	49.4	35.9	42.5	2.5	7.8
Nugaines	Untreated	40.2	44.6	34.8	85.0	5.8	11.2
Stephens	Untreated	83.0	50.6	39.2	30.0	.1	.3
Lewjain	Untreated	75.3	46.9	36.6	25.0	0	0
Judith	Untreated	78.5	52.8	45.1	46.3	49.5	25.3
Tiber	Untreated	79.9	56.2	50.4	55.0	15.5	17.3
Rocky	Untreated	88.7	56.5	46.0	80.0	16.0	17.7
Winridge	Untreated	99.3	53.3	51.3	28.0	.1	0
OVERALL MEAN =		85.7	51.9	42.6	42.1	5.58	4.97
P-VALUE TRTS =		.000	.000	.000	.000	.000	.000
LSD(0.05 by t)=		13.7	3.13	2.06	20.37	9.73	9.50

1/ Seed treatment for treated varieties was Dividend at 1 oz/cwt

\* Percent TCK = % TCK Dwarf bunt per plot. COUNT is determined by average number of infected heads per foot of row. OCULAR rating is visual estimate of percent TCK.

Table 2. 1992 Data from the Seed Treatment Dwarf Bunt Study

Variety	Trtmt 1/	Yield Bu/A	Test Wt Lb/Bu	Height Inches	Heading Date	% TCK 7/9 *	Count Ocular
Luke	Treated	121.3	58.9	34.5	160	0	.1
Nugaines	Treated	112.2	57.4	34.5	158	0	0
Stephens	Treated	114.1	57.4	37.4	159	0	0
Lewjain	Treated	119.7	57.3	33.0	161	0	0
Judith	Treated	123.3	59.2	42.8	155	0	.1
Tiber	Treated	102.4	60.8	46.8	157	0	.1
Rocky	Treated	96.3	57.8	46.3	154	0	.0
Winridge	Treated	98.4	59.2	47.3	159	0	.0
Luke	Untreated	109.9	58.7	30.0	159	1.0	.3
Nugaines	Untreated	115.6	57.9	34.5	158	.7	1.0
Stephens	Untreated	119.0	58.8	36.0	158	.9	.4
Lewjain	Untreated	120.9	57.0	33.0	161	0	0
Judith	Untreated	118.7	58.7	40.4	156	20.0	15.0
Tiber	Untreated	111.6	61.2	45.8	158	6.9	5.8
Rocky	Untreated	91.8	58.3	45.3	154	18.4	19.8
Winridge	Untreated	109.6	60.2	46.3	160	0	0
OVERALL MEAN =		111.5	58.66	39.8	158	.039	2.76
P-VALUE TRTS =		.0012	.0000	.000	.00	.000	.000
LSD(0.05 by t) =		15.52	1.541	2.58	1.1	.059	5.07