

Fusarium Head Blight Screening Nurseries for Barley, Durum and Hard Red Spring Wheat

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Introduction. Three evaluation nurseries were established in 2007 at the North Dakota State University Langdon Research Extension Center (LREC). The objective of these studies is to compare the resistance differences among cultivars when weather conditions create infectious epidemic type environments so that growers can evaluate cultivars that would be least affected by the disease. A group of cultivars and lines were selected for evaluation by Bryan Hanson, LREC Agronomist. The lines were planted in hills in rows spaced 1 foot apart separated by 2 feet in length in a randomized complete block design with four replicates. The nursery was inoculated with three isolates of *Fusarium graminearum* by hand broadcasting infected grain on the ground. Supplemental water was applied daily as a fine mist to encourage the development of Fusarium head blight (FHB). At maturity 10 heads from each of the hills were evaluated to determine the head severity. Average incidence was also calculated. At maturity the plots were hand cut and threshed with our Hege plot combine and the samples submitted to NDSU to determine the deoxynivalenol concentration of the seed.

Discussion. Small grain breeders use information from several of this type of nurseries to compile comparative information for growers and to determine if new material is as good as or better than cultivars growers currently may be planting or considering. Growers should use data from one location cautiously. Direct comparisons between crops should be avoided although the general differences among crops will be similar. Two-row barley cultivars are generally more resistant to DON accumulation than 6-row barley types (Table 1). No statistical differences were determined among the durum cultivars (Table 2). The widest range of resistance to FHB occurs in the HRSW germplasms pool (Table 3).

Table 1. FHB incidence, head severity and deoxynivalenol concentration by barley cultivar.

Cultivar	FHB		DON (PPM)
	Incidence (%)	Head Severity (%)	
Conlon (2-row)	85.0	17.8	1.73
ND20448*	100.0	8.6	2.67
Pinnacle (2-row)	97.5	14.2	3.28
Lacey	87.5	10.7	4.07
Tradition	95.0	13.1	4.66
Rasmussen	100.0	7.5	5.50
Legacy	92.5	12.4	6.47
Stellar-ND	100.0	11.4	6.62
Robust	97.5	7.6	6.67
Drummond	100.0	8.7	8.22
LSD	6.2	5.9	2.3
% C.V.	4.5	40	32.1

*Experimental 6-row lines being considered for release.

Table 2. FHB incidence, head severity and deoxynivalenol concentration by durum cultivar.

Cultivar	FHB		DON (PPM)
	Incidence (%)	Head Severity (%)	
DG Star	100	86.6	10.6
Alkabo	100	82.1	15.4
Grande Doro	100	98.6	16.4
Lebsock	100	72.3	17.1
Grenora	100	69.1	18.4
Divide	100	72.2	18.6
LSD		NS	NS
% C.V.		18.7	35.7

Table 3. FHB incidence, head severity and deoxynivalenol concentration by hard red spring wheat cultivar.

Cultivar	FHB		DON (PPM)
	Incidence (%)	Head Severity (%)	
Bigg Red	100.0	25.4	2.6
Kelby	92.5	16.8	2.7
Freyr	100.0	36.3	2.9
Alsen	92.5	15.5	3.3
Briggs	90.0	13.4	3.4
Glenn	95.0	16.3	3.4
Faller	97.5	20.4	3.9
Hotshot	100.0	43.8	3.9
Traverse	95.0	18.0	4.1
Trooper	97.5	29.9	4.6
Oklee	100.0	26.3	4.8
Rush	100.0	29.7	5.1
Knudson	100.0	23.9	5.3
Howard	100.0	31.6	5.4
Ada	100.0	23.3	5.6
Bakker Gold	100.0	84.0	5.6
Fireball	100.0	31.1	5.9
RB07	100.0	32.8	7.8
LSD	NS	13.6	3.17
% C.V.	6.2	36.9	62.6*

*P ≤ 0.10