

MARYLAND GRAIN PRODUCERS UTILIZATION BOARD RESEARCH

Interim Report Falling Number Research on Wheat (pre-harvest sprouting) Grant No. 208222

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OBJECTIVE

To evaluate the level of resistance or susceptibility to field pre-harvest sprouting, measured by the *Falling Number* test, among varieties of soft red winter wheat currently grown in Maryland. This test is used by grain buyers to determine the baking quality of the grain. This information is valuable for MGPIB to aid in the planting choice of varieties of soft red winter wheat currently available to Maryland wheat growers.

PROCEDURE USED:

Alpha-amylase is an enzyme found in sprout-damaged wheat. If germination occurs there is a dramatic increase of this enzyme. The *Falling Number* is the time in seconds for a stirrer to fall through a hot slurry of ground wheat. The greater the amount of alpha-amylase in the wheat, the thinner the gelatinized starch paste and the faster the plunger will fall through the slurry.

A high falling number or the longer it takes the stirrer to fall **indicates the wheat is sound** and satisfactory for most baking processes.

Wheat grain with a score below 250 is discounted by grain buyers (Midstate Mills, NC).

Snyder's of Hanover (PA) requires a minimum of 275 for pretzel manufacturing.

The *Falling Number* test was evaluated among samples of soft red winter wheat from the **2007 MD state variety test** harvested at Queenstown (MD). In the 2006/2007 season conditions for harvest were dry and thus there were no locations that were exposed to field sprouting. We decided to take samples from a study at the normal harvest time (end of June or **early** harvest) and leave the study in the field past the normal harvest time and then take samples 40 days after that "normal" harvest (**late** harvest) so they would be exposed to weathering and sprouting.

After exposure to weathering several cultivars still had relatively **high** Falling Number values. These included: SS 8309, USG 3665, Coker 9553, Becker, Coker 9184, McCormick, SS 8404, SS 550, Branson, USG 3209, and FS 627.

Those with **low** Falling Number values after weathering were: Coker 9511, FS 621, FS 300, AGS 2026, V9510, 26R31, MD99W64-05-11, SS 520, USG 3592, Roane, Jamestown, V9713, and SW 27.

Detailed results from the 2007 harvest are presented in Table 1. Varieties are ranked from **most resistant (higher Falling Number)** to **least (lower Falling Number)** for the **late** (weathered) harvest.

Table 1. 2007 Maryland State Wheat Variety Performance Trial-Falling Number values.

Wheat Cultivar	Early harvest (sec)	Late harvest (sec)
SS 8309	406	428 h
USG 3665	453 h	413 h
Coker 9553	417	392 h
Becker	405	388 h
Coker 9184	417	384 h
McCormick	470 h	384 h
SS 8404	412	379 h
SS 550	494 h	368 h
Branson	376 l	358 h
USG 3209	464 h	348 h
FS 627	441	344 h
Exp. 701	368 l	323
Cooper	384 l	320
SS 8302	387 l	316
USG 3910	378 l	316
Tribute	427	311
AGS 2020	404	308
Sisson	477 h	301
Exp. 703	406	298
SW 55	460 h	290
Dominion	438	271
SS MPV 57	367 l	255
26R15	400	248
USG 3706	413	232
USG 3342	398 l	225
M01-4377	424	217
MD00W389-17	470 h	216
SS 560	407	211
Chesapeake	396 l	207
Oglethorpe	376 l	206
VA02W-555	463 h	201
FS 652	436	196
Coker 9511	417	191 l
FS 621	440	191 l
FS 300	410	185 l
AGS 2026	354 l	173 l
V9510	382 l	164 l
26R31	425	157 l
MD99W64-05-11	407	155 l
SS 520	433	146 l
USG 3592	389 l	142 l
Roane	468 h	131 l
Jamestown	415	129 l
V9713	418	114 l
SW 27	440	93 l
Average	418	258
LSD_(0.05)	47	98
CV (%)	6	19

The letter l or h following a value indicate not significantly different from the lowest or highest value, respectively.