

**2009 Crop
Advanced Milling and Baking Evaluation
Set 2009 A03**

**UEWWN
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Entries # 920799 - 920840**

A total of 42 samples were composited by the Soft Wheat Quality Laboratory (SWQL) from samples produced at Ohio State University in Wooster, Ohio, Agripro in Indiana, and University of Illinois, in Urbana, IL. The standard quality data was compared to the “historical average” for the cultivar Branson, and quality scores for all entries are adjusted to this average. Of the 831 cultivars in the SWQL database of Allis-milled cultivars, Branson ranks 503rd for Milling Score based on data from 1 milling. The following table compares the checks, Branson, Roane, and INW 0411, with their “historical data” from the Advanced Milling databases. We have coded in blue text the values for the checks that are within two standard deviations of the mean of the previous observations in the micro database for that cultivar. Values in black are outside of the normal range observed for the check cultivar.

The samples showed signs of FHB infected kernels but pre-harvest sprouting was not obviously present in this nursery. Weathering was detected but did not play a major factor within this nursery when compared with historical values for the checks. In this set, the test weights of the check standards were higher than average and had a decreased softness equivalent percentage. They also had lower than average gluten strength, based on the lactic acid SRC values. Sucrose SRC, in general, was lower than normal, causing an increase in cookie diameter. Branson, Roane, and INW 0411 was consistent with the historical data from the advanced milling data set as it was within two standard deviations of the mean of its Micro-milling database average. The values for flour quality measures among the checks were consistent with expectations from previous evaluations and the relative rankings of the cultivar. Therefore, we expect the results of the evaluations to be predictive of future performance of these breeding lines.

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ENTRY	MILLING	BAKING	SOFT.	TEST	ADJ.	SOFT.	FLOUR	LACTIC	SUCROSE	COOKIE	TOP
	QUALITY	QUALITY	EQUIV.	WT.	YIELD	EQUIV.	PROT.	ACID	SRC	DIAM.	GRADE
	SCORE	SCORE	SCORE	LB/BU	%	%	%	SRC %	%	CM.	
Nursery Average	57.81	43.68	60.04	61.76	70.05	56.45	8.63	105.17	96.21	18.54	5.69
Allis Database - Branson	64.36	55.00	74.57	60.20	76.39		8.24	95.70		17.45	
Branson	64.36	55.00	74.57	61.29	71.35	61.54	8.29	109.47	88.71	18.88	7.00
Branson - Average	67.08	67.94	80.99	60.78	71.11	63.24	8.27	112.08	89.51	18.57	5.47
Branson - Standard Deviation	6.24	13.16	4.50	2.15	0.78	2.57	0.55	9.10	7.14	0.63	1.22
Roane	51.80	30.48	63.92	63.75	68.85	57.81	8.53	113.82	97.84	18.14	6.00
Roane - Average	59.82	40.32	72.54	63.75	69.09	59.43	8.64	116.23	99.06	17.51	3.26
Roane - Standard Deviation	6.14	14.51	5.65	2.74	1.27	2.36	0.67	9.89	6.41	0.57	1.33
INW 0411	59.88	39.74	57.58	60.61	70.46	55.59	8.91	95.24	97.69	18.42	6.00
INW 0411 - Average	66.78	48.93	64.87	59.80	69.63	56.74	8.91	100.84	92.33	17.72	4.00
INW 0411 - Standard Deviation	6.36	15.96	8.30	2.67	1.19	3.25	0.90	6.92	4.13	0.42	1.20

Conditional formatting set:

Blue = values less than two standard deviations from the mean of the database average

Black = values greater than two standard deviations from the mean of the database average

Comments from Ed Souza

The Uniform Eastern Soft Red Winter Wheat Nursery represents one of the last stages of testing by wheat breeding programs before release of a breeding line as a new cultivar. In this trial, a composite of grain samples from three locations representative of the region were evaluated for milling and baking quality using methods approved by the American Association of Cereal Chemists.

Flour yield is commonly the most heritable trait evaluated by the SWQL. In this nursery, Roane had a flour yield of 68.8%. Breeding lines with flour yield similar or less than Roane, should be viewed as having poor milling quality. Lines with flour yield more than a percentage point less than Roane are likely unacceptable for commercial milling. The second most heritable trait evaluated by the SWQL is softness equivalent. Softness equivalent is a predictor of break flour yield. It also is a measure of flour particle size as it is estimated as the percent of break flour passing through a standard 94 mesh screen. Larger values are preferred for most soft wheat products, particularly cakes and other high sugar baked products. All of the breeding lines in the nursery were true soft genotypes as graded by the softness equivalent. For commercial use, Bess is typically a low softness equivalent genotype and had a softness equivalent of 51.6%. Cultivars with softness equivalents similar or less than Bess may not be acceptable for use in cake flours.

Selecting sequentially for the following traits, greater flour yield, greater softness equivalent, smaller values of sucrose SRC, and larger cookie diameter identifies the following lines: KY97C-0519-04-07, IL04-11003, G89209, G89201, B040798, W06-089, and W06-522A. These are the best quality soft wheat lines in the nursery for general use in the widest range of soft wheat products. They have value both as potential cultivars but also as breeding parents for subsequent improvement of the soft winter wheat germplasm pool.

Lactic acid SRC is a measure of the strength of the native glutenin macro-polymer in flour. Although many soft wheat products do not require excess gluten strength, most commercial food production requires some gluten strength. Therefore very weak gluten strength lines (below 85% in this evaluation) would cause problems for the manufacturers if they dominated the grain production of a region. Currently most soft wheat cultivars are in a middle range between Bess and Branson for gluten strength. A few genotypes in this trial were exceptionally strong for glutenin, as measured by lactic acid SRC. The strongest of these were KY97C-0508-01-01A-1 and OH04-264-58. These lines may have added value for the production of crackers, due to the extra gluten strength. OH04-264-58 in previous studies has been shown to carry, the strongest high molecular weight glutenin alleles at the *Glu-1B* and *Glu-1D* loci, the *Glu-1D_{al}* and *Glu-1D_a*, respectively (the Bx-7 overexpressed allele and the 5+10 allele).

Please contact me if you have questions concerning the evaluations of this trial.

Best regards,
Edward Souza