



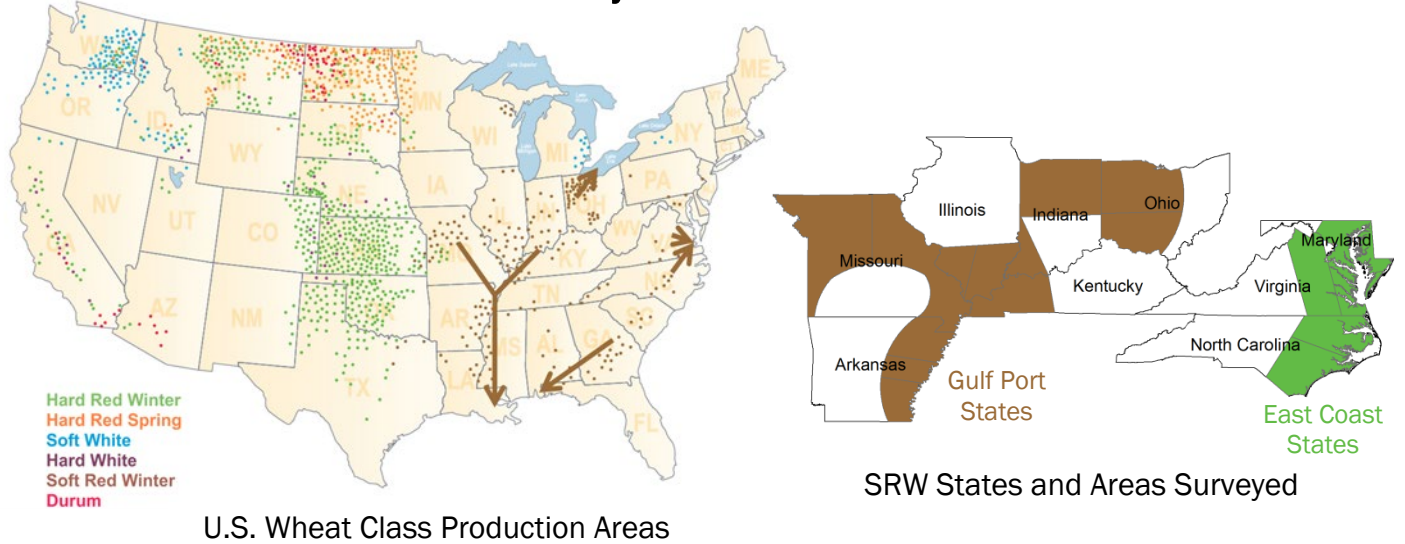
2013 Soft Red Winter Wheat Quality Survey



**U.S. WHEAT
ASSOCIATES**



Survey Overview



Weather and Harvest: Soft red winter wheat (SRW) is grown over a wide area of the eastern United States. The area seeded to SRW in the fall of 2012 for the 2013 harvest was about 10.0 million acres, up dramatically from 8.3 million acres the previous year. Average yield per acre is estimated to be the highest on record, up about 3% from the previous year. The 2013 SRW production, estimated at 14.8 MMT, is the largest since 2008/09 and much larger than the 11.4 MMT produced in 2012.

Crop development was slower than normal throughout the spring because of cool weather, and harvest, once it started, was repeatedly delayed by rain. As a result, quality parameters this year vary across the states and do not match the sound values found in the 2012 crop.

Survey Methods: Sample collection and analysis were conducted by the Great Plains Analytical Laboratory, Kansas City, Missouri. For 2013, 546 samples were collected from elevators in 18 reporting areas across nine states. Samples were collected at two different times reflecting early and late harvest. Test weight, moisture, protein, thousand kernel weight, wheat ash and falling number were determined on individual samples, while the remaining tests were determined on 36 composite samples. The results were weighted by five-year average production for the 18 reporting areas and combined into "Composite Average", "East Coast" and "Gulf Port" values. Gulf Port states include Arkansas, Illinois, Indiana, Kentucky, Missouri, and Ohio and account for about 80% of production in the states surveyed. East Coast states include Maryland, North Carolina and Virginia and represent the remaining 20% of production in the states surveyed. The states surveyed typically account for 60%-70% of total SRW production.

Wheat and Grade Data: The overall average grade of U.S. No. 2 and average protein of 9.9% are similar to the five-year averages, and average dockage of 0.5% is well below the five-year average of 0.8%. However, test weight and falling number values are lower than, and damaged kernels higher than, five-year averages. The samples from the East Coast show the adverse effects of harvest conditions more than the Gulf Port states.

The overall average test weight of 58.4 lb/bu (76.9 kg/hl) is 1.8 lb/bu (2.8 kg/hl) below 2012 and 0.3 lb/bu (0.4 kg/hl) below the five-year average. The Gulf Port average test weight of 58.7 lb/bu (77.3 kg/hl) is similar to the five-year average for these states, while the East Coast average of 57.2 lb/bu (75.3 kg/hl) is below last year and the five-year average. Average damaged kernel content is 2.8%, up from a low 0.5% last year and the five-year average of 1.3%. Both the East Coast (3.7%) and Gulf Ports (1.7%) damaged kernel values are higher

than five-year averages. Most of the increase in damage is reported to be sprout damage, which is consistent with the lower average falling number of 294 seconds compared to the five-year average of 328.

While wheat protein content is similar to the five-year average, sedimentation and wet gluten values are lower overall for both East Coast and Gulf Port states. The overall DON average of 1.4 ppm is higher than the five-year average of 1.2 ppm and much higher than the 0.2 ppm of the 2012 crop. The DON average for the three East Coast states is 2.2 ppm, well above the five-year average, while DON for the six Gulf Port states is about average at 1.2 ppm.

Flour and Baking Data: Flour, dough and baking properties are in most cases similar to five-year averages despite the adverse harvest conditions. Buhler laboratory mill flour extraction and flour ash are similar to the five-year averages overall for both East Coast and Gulf Port states, suggesting that the crop has typical SRW milling characteristics.

Overall farinograph absorption and stability values and alveograph W values are also similar to the five-year averages, though farinograph mix time averages 1.3 minutes compared with the five-year average of 1.6 minutes. Farinograph peak and stability values and alveograph W values are similar to the five-year averages for Gulf Port states, but are lower than average for East Coast. The East Coast cookie spread ratio exceeds the five-year average while the Gulf Port average is equal to it. The average loaf volume for East Coast samples is similar to the five-year average, but the Gulf Port average of 688 cc is below the five-year average of 716 cc.

Summary: The 2013 crop has variable quality which reflects the cool, wet spring weather and repeated rain delays during harvest that affected most areas. The East Coast states were more severely affected than the Gulf Port states. Buyers are encouraged to review their quality specifications to ensure that their purchases meet their expectations.

This survey was funded by U.S. Wheat Associates and USDA's Foreign Agricultural Service.

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Soft Red Winter 2013 Survey - All Samples

	Composite Average			East Coast*			Gulf Ports*		
	2013	2012	5-Year	2013	2012	5-Year	2013	2012	5-Year
Wheat Grade Data									
Test Weight (lb/bu)	58.4	60.2	58.7	57.2	59.2	59.6	58.7	60.5	58.6
Test Weight (kg/hl)	76.8	79.2	77.3	75.3	77.9	78.4	77.3	79.5	77.1
Damage - Total (%)	2.1	0.8	1.3	3.7	1.1	1.2	1.7	0.8	1.3
Foreign Material (%)	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.2	0.2
Shrunken and Broken (%)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Total Defects (%)	2.8	1.5	2.0	4.3	1.7	1.8	2.3	1.4	2.0
Grade	2	1	2	3	2	2	2	1	2
Wheat Non-Grade Data									
Dockage (%)	0.5	0.7	0.8	0.5	0.8	1.0	0.5	0.7	0.8
Moisture (%)	13.4	12.7	12.9	13.4	13.1	12.9	13.4	12.6	12.9
Protein (%) 12%/0% mb	9.9/11.3	9.9/11.3	10.0/11.4	10.0/11.4	10.2/11.6	10.5/11.9	9.9/11.3	9.8/11.1	9.9/11.3
Wheat Ash (%) 14%/0% mb	1.49/1.73	1.50/1.74	1.54/1.79	1.48/1.72	1.46/1.70	1.50/1.74	1.50/1.74	1.51/1.76	1.55/1.80
1000 Kernel Weight (g)	33.6	34.2	32.8	34.5	35.9	34.2	33.3	33.8	32.5
Wheat Falling Number (sec)	294	329	328	262	306	332	302	334	327
Kernel Size (%) lg/med/sm	85/14/01	85/14/01	82/17/01	87/12/01	86/13/01	84/15/01	85/14/01	85/14/01	83/16/01
Single Kernel Hardness	16.4	29.2	22.6	13.4	23.3	24.1	17.1	30.5	22.3
Single Kernel Weight (mg)	34.2	33.9	32.0	35.3	34.8	33.3	34.0	33.7	31.7
Single Kernel Diameter (mm)	2.65	2.66	2.41	2.65	2.68	2.46	2.65	2.65	2.41
Sedimentation (cc)	11.4	13.4	12.2	11.5	14.6	14.7	11.4	13.2	11.7
DON (ppm)	1.4	0.2	1.2	2.2	0.5	0.7	1.2	0.2	1.3
Flour Data									
Lab Mill Extraction (%)	70.2	73.4	70.1	69.8	73.3	69.9	70.4	73.5	70.2
Flour Color - *L	93.4	93.2	93.4	93.3	93.0	93.4	93.4	93.2	93.4
Flour Color - *a	-2.8	-2.8	-3.0	-2.8	-2.8	-3.0	-2.8	-2.8	-3.0
Flour Color - *b	7.8	8.3	8.2	8.0	8.3	8.2	7.8	8.3	8.2
Flour Protein (%) 14%/0% mb	8.3/9.6	8.4/9.8	8.4/9.8	8.4/9.8	8.8/10.2	8.8/10.2	8.2/9.6	8.3/9.7	8.3/9.7
Flour Ash (%) 14%/0% mb	0.42/0.49	0.46/0.53	0.44/0.51	0.43/0.50	0.46/0.53	0.44/0.51	0.42/0.48	0.46/0.53	0.44/0.52
Wet Gluten (%)	20.7	22.2	22.4	21.6	23.6	23.3	20.4	21.9	22.2
Gluten Index	88.3	73.5	75.9	83.9	74.8	79.5	89.5	73.1	75.1
Falling Number (sec)	278	329	332	263	306	331	282	334	332
Amylograph (65g) (BU)	302	603	627	235	425	567	319	644	640
Starch Damage (%)	4.4	4.9	4.4	4.4	5.0	4.5	4.4	4.8	4.4
Solvent Retention Capacity									
Water/50% Sucrose	55/105	58/111	56/108	54/105	60/109	57/110	54/102	58/109	55/106
5% Lactic Acid/5% Na ₂ CO ₃	114/79	112/84	113/82	115/81	115/85	115/83	113/79	111/84	111/81
Dough Properties									
Farinograph Peak (min)	1.3	1.6	1.6	1.2	1.8	1.9	1.3	1.5	1.5
Farinograph Stability (min)	2.8	2.7	2.7	2.5	2.7	2.9	2.8	2.7	2.7
Farinograph Absorption (%)	53.2	53.2	52.2	53.2	53.3	53.0	53.2	53.1	52.0
Alveograph P (mm)	35	41	38	34	39	42	35	41	38
Alveograph L (mm)	94	87	84	96	99	90	93	84	82
Alveograph W (10-4 joules)	85	86	85	83	89	96	85	85	83
Alveograph P/L	0.37	0.47	0.46	0.35	0.40	0.46	0.38	0.49	0.46
Baking Evaluation									
Crumb Grain	5.1	5.2	5.3	4.9	5.3	5.5	5.2	5.2	5.2
Crumb Texture	4.5	5.5	5.3	4.6	5.6	5.6	4.4	5.5	5.2
Loaf Volume (cc)	695	676	717	722	700	721	688	671	716
Cookie Spread Ratio	9.2	7.9	9.1	9.0	7.7	8.5	9.2	8.0	9.2
% Area Production	100.0%			20.9%			79.1%		

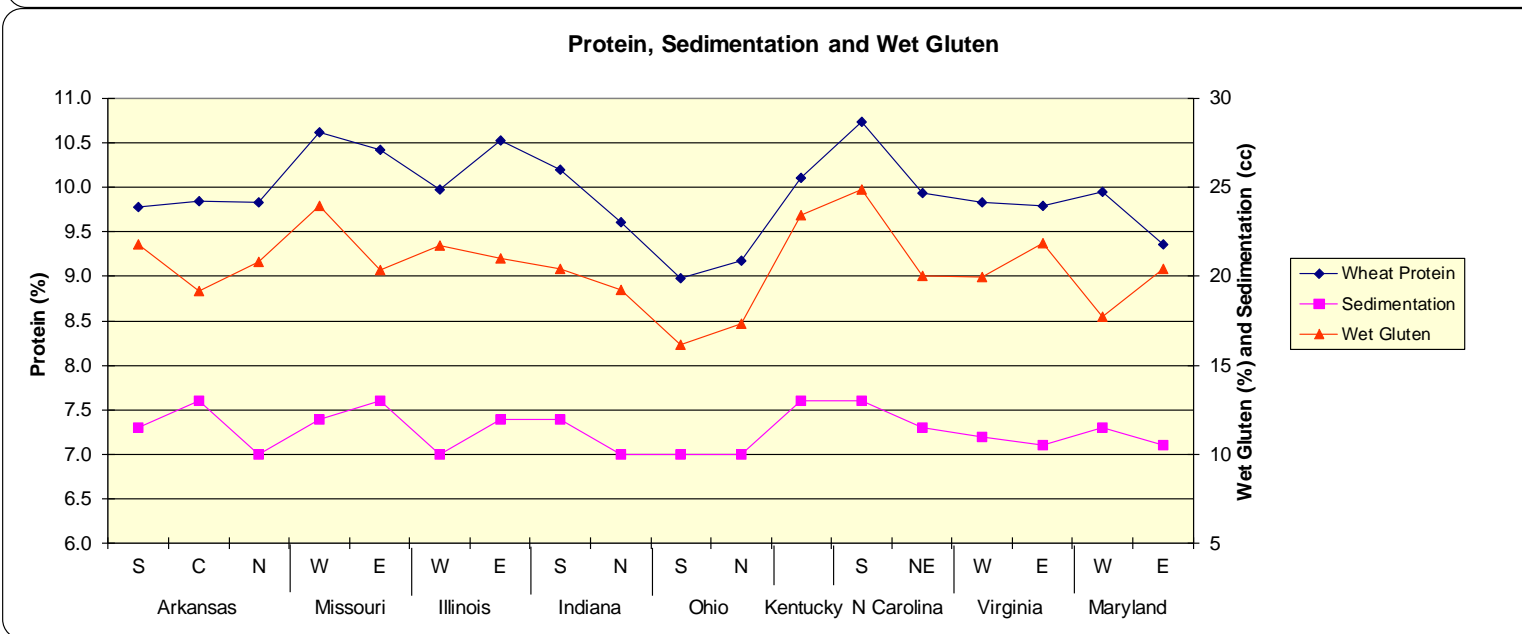
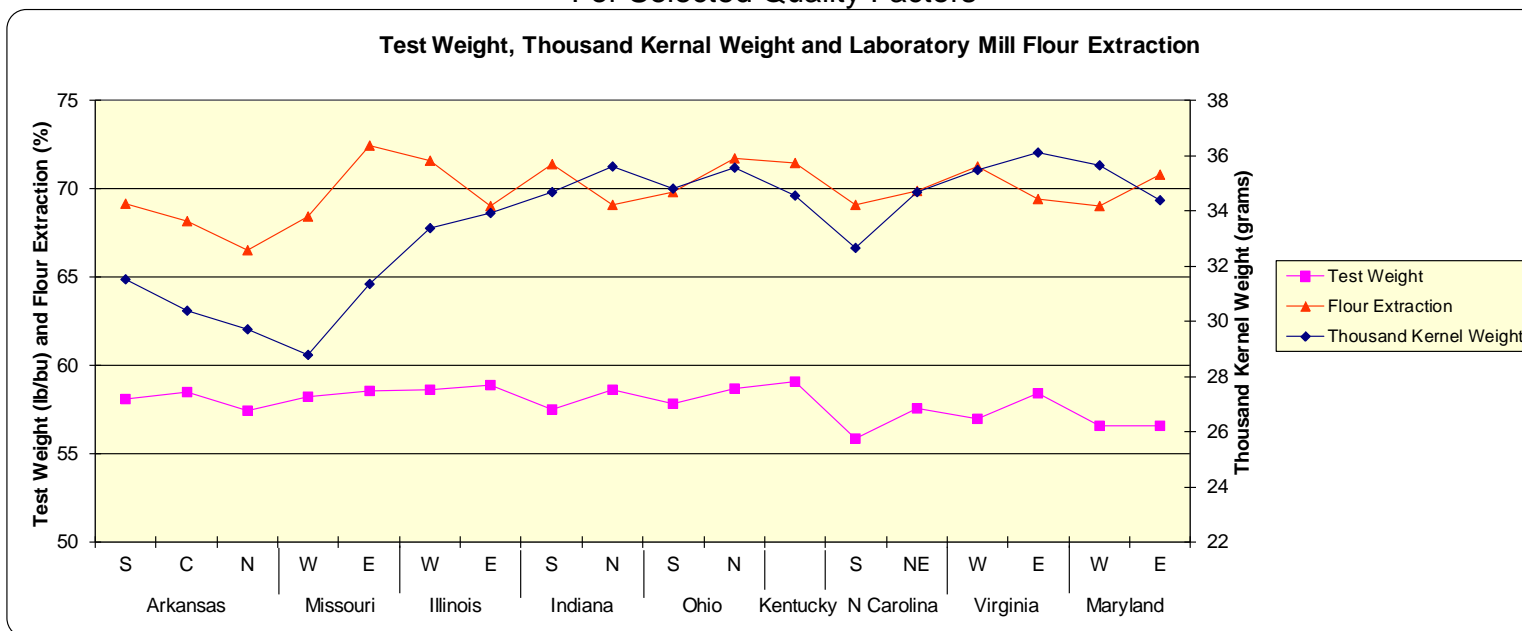
* East Coast - Maryland, Virginia, North Carolina; Gulf Ports - Arkansas, Illinois, Indiana, Kentucky, Missouri, Ohio

2013 State Summary

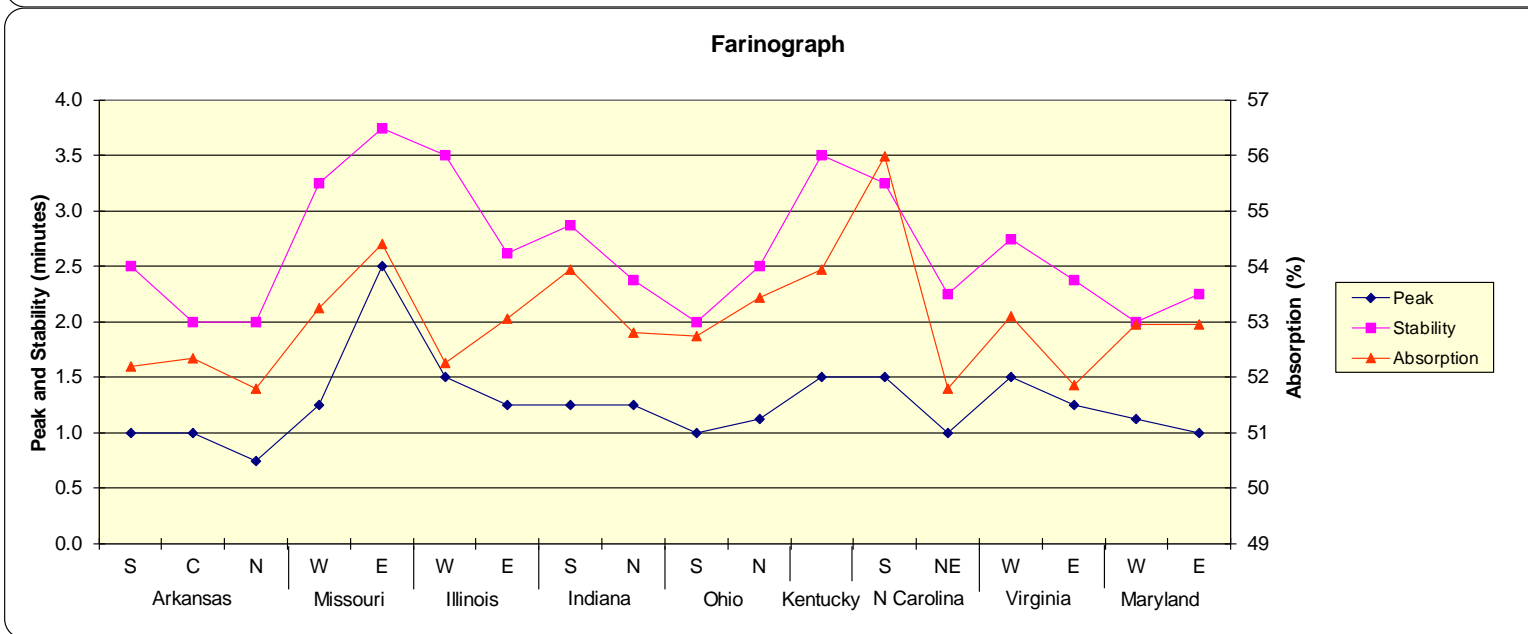
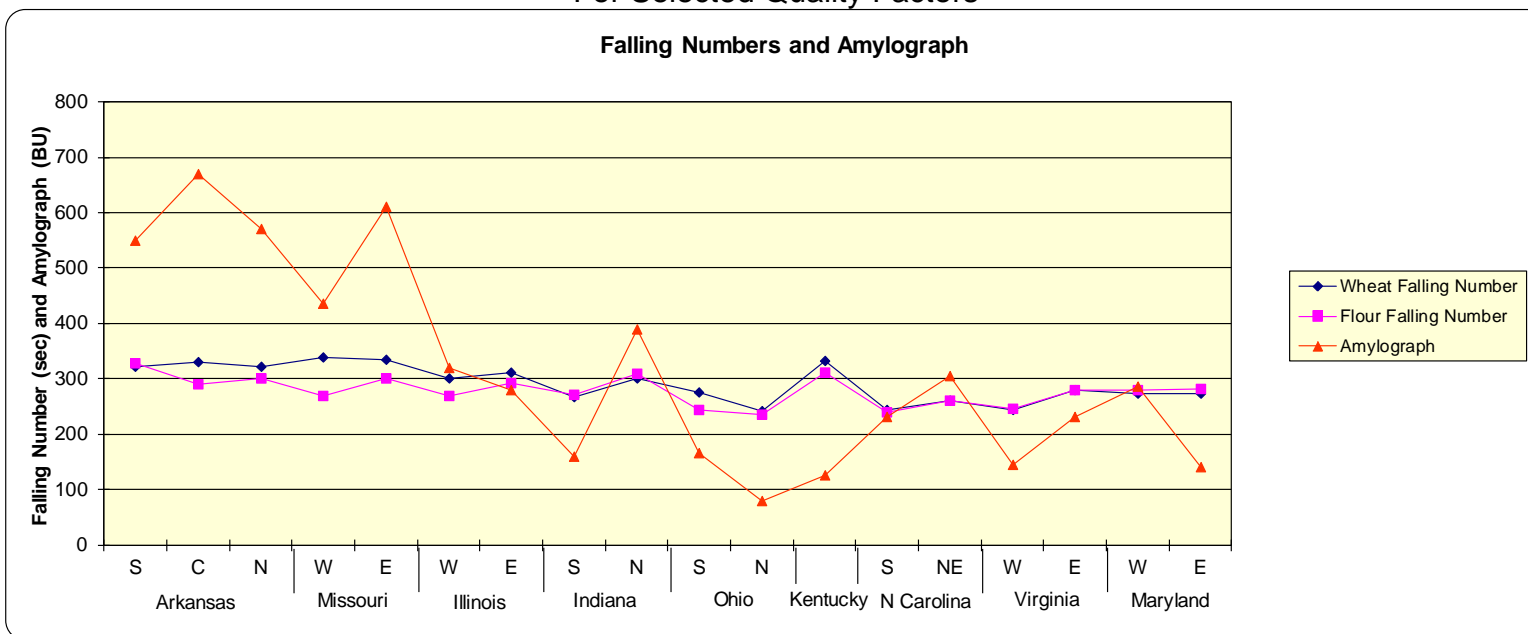
All Samples

	Arkansas	Missouri	Illinois	Indiana	Ohio	Kentucky	North Carolina	Virginia	Maryland
Wheat Grade Data - from Individual Samples									
Test Weight (Lab) (lb/bu)	58.1	58.4	58.8	58.2	58.6	59.1	56.1	58.1	56.6
Count	56	75	79	72	88	37	60	39	40
Wheat Grade Data - from Area Composite Samples									
Test Weight (lb/bu)	58.2	58.7	59.1	58.3	58.6	59.0	56.0	58.3	56.9
Test Weight (kg/hl)	76.7	77.3	77.8	76.8	77.1	77.6	73.7	76.7	74.9
Damage - Total (%)	1.4	0.8	1.5	2.9	2.2	1.7	5.7	3.2	2.8
Foreign Material (%)	0.1	0.0	0.2	0.1	0.2	0.2	0.3	0.2	0.1
Shrunken and Broken (%)	0.5	0.8	0.6	0.4	0.2	0.4	0.6	0.3	0.5
Total Defects (%)	2.0	1.6	2.4	3.4	2.6	2.2	6.5	3.7	3.4
Grade	2	2	2	2	2	2	3	2	3
Wheat Non-Grade Data - from Individual Samples									
Moisture (%)	12.5	12.9	13.3	13.6	13.7	13.2	13.6	13.3	13.6
Protein (%) 12%/0% mb	9.6/10.9	10.2/11.6	10.1/11.5	9.7/11.1	9.1/10.3	10.2/11.6	10.5/11.9	9.7/11.0	9.7/11.0
Ash (%) 14%/0% mb	1.50/1.74	1.57/1.82	1.50/1.75	1.46/1.70	1.45/1.68	1.50/1.74	1.45/1.69	1.50/1.74	1.48/1.72
1000 Kernel Weight (g)	30.4	30.4	33.7	35.2	35.5	34.6	33.0	36.0	34.7
Wheat Falling Number (sec)	325	337	307	288	246	331	247	272	274
DON (ppm)	0.3	0.8	0.8	2.7	1.0	2.7	1.3	2.5	4.1
Wheat Non-Grade Data - from Area Composite Samples									
Dockage (%)	0.6	0.6	0.4	0.5	0.4	0.4	0.8	0.4	0.4
Moisture (Lab) (%)	12.7	13.0	13.6	13.7	14.2	13.3	13.7	13.4	13.6
Protein (Lab) (%)	9.8	10.5	10.3	9.8	9.2	10.1	10.6	9.8	9.5
Kernel Size (%) lg/med/sm	78/21/01	80/19/01	85/14/01	89/10/01	92/08/00	88/12/00	83/16/01	90/10/00	88/11/01
Single Kernel Hardness	17.2	21.5	17.0	13.6	14.7	19.2	14.9	13.4	12.9
Single Kernel Weight (mg)	31.2	31.1	34.3	36.8	35.4	35.2	33.9	36.7	35.7
Single Kernel Diameter (mm)	2.56	2.56	2.66	2.73	2.70	2.69	2.61	2.69	2.67
Sedimentation (cc)	11.6	12.6	11.1	10.8	10.0	13.0	12.8	10.6	10.8
DON (ppm)	0.3	0.7	0.8	2.9	1.1	1.9	1.2	1.9	3.5
Flour Data									
Lab Mill Extraction (%)	67.9	71.0	70.2	70.0	71.5	71.5	69.2	69.8	70.3
Flour Color - *L	93.6	93.6	93.6	93.3	92.9	93.3	93.1	93.4	93.2
Flour Color - *a	-3.1	-2.9	-2.7	-2.9	-2.8	-2.7	-2.7	-2.9	-2.7
Flour Color - *b	8.4	7.9	7.5	7.7	7.6	7.7	7.8	8.2	7.6
Flour Protein (%) 14%/0% mb	8.1/9.4	8.7/10.1	8.3/9.6	8.1/9.5	7.8/9.1	8.6/10.0	9.0/10.5	8.4/9.8	8.0/9.3
Flour Ash (%) 14%/0% mb	0.40/0.47	0.44/0.51	0.40/0.47	0.41/0.48	0.42/0.49	0.43/0.50	0.42/0.49	0.41/0.47	0.45/0.53
Wet Gluten (%)	20.3	21.7	21.4	19.7	17.2	23.5	24.1	21.5	19.7
Gluten Index	89.9	83.9	81.5	98.1	95.2	91.6	85.8	77.2	87.5
Falling Number (sec)	303	289	281	295	236	311	243	273	281
Amylograph (65g) (BU)	607	548	299	303	91	125	242	213	178
Starch Damage (%)	4.4	5.4	3.8	4.3	4.3	4.4	5.6	3.6	4.1
Dough Properties									
Farinograph Peak (min)	0.9	2.1	1.4	1.3	1.1	1.5	1.4	1.3	1.0
Farinograph Stability (min)	2.1	3.6	3.0	2.6	2.4	3.5	3.1	2.5	2.2
Farinograph Absorption (%)	52.1	54.0	52.7	53.2	53.4	54.0	55.3	52.1	53.0
Alveograph P (mm)	35	41	33	40	32	35	37	31	30
Alveograph L (mm)	90	110	101	83	82	90	97	92	100
Alveograph W (10-4 joules)	81	109	86	95	68	83	90	74	74
Alveograph P/L	0.39	0.37	0.33	0.48	0.39	0.38	0.38	0.34	0.30
Baking Evaluation									
Crumb Grain	4.8	4.8	5.2	5.4	5.5	5.0	5.4	4.6	4.6
Crumb Texture	4.3	4.0	4.3	4.8	4.5	5.0	4.9	4.1	5.0
Loaf Volume (cc)	676	716	686	622	676	750	716	727	713
Cookie Spread Ratio	9.7	9.4	9.4	9.4	8.9	8.9	8.7	9.5	8.3

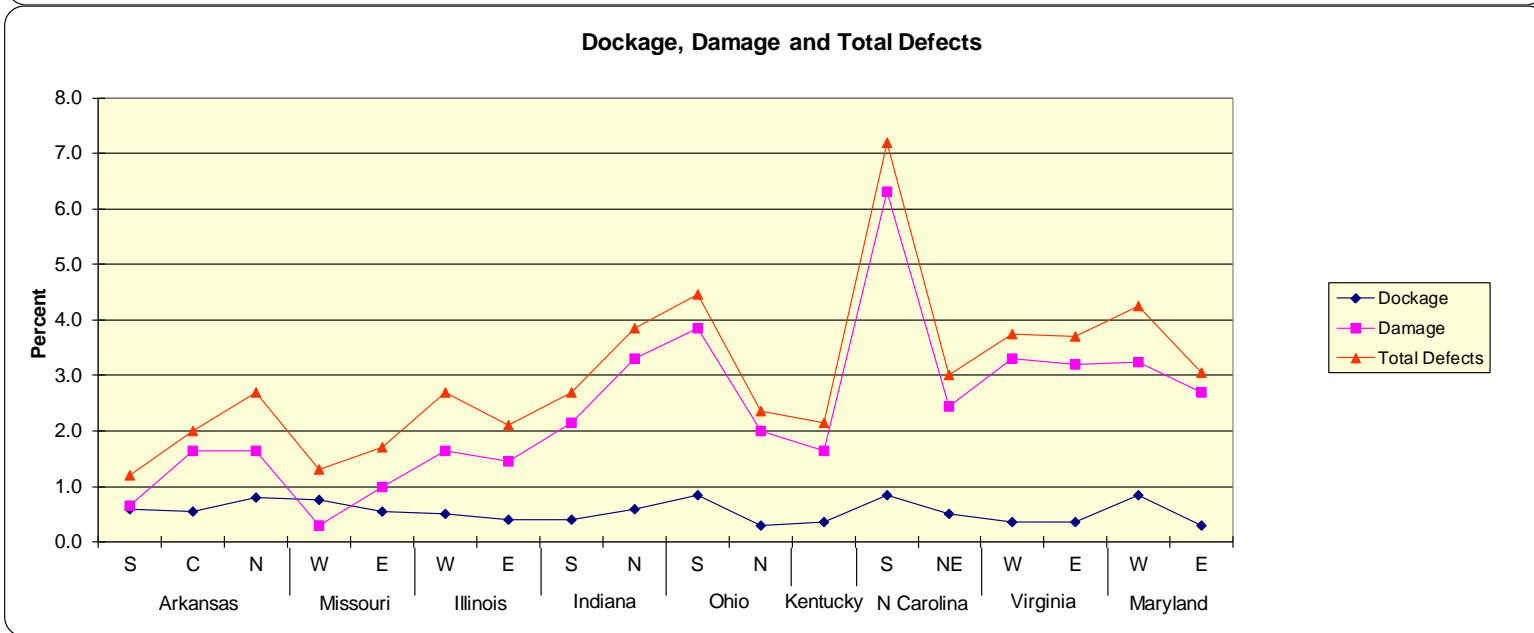
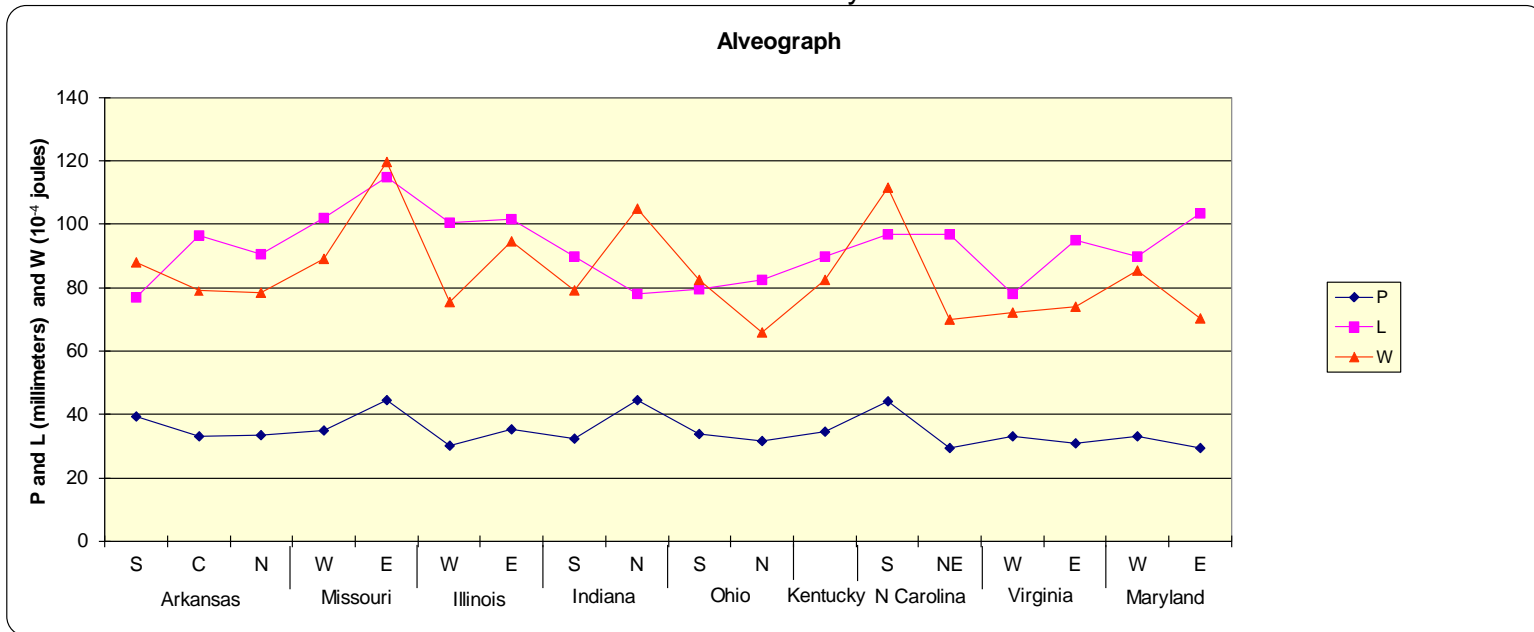
Comparisons of 2013 Results For Selected Quality Factors



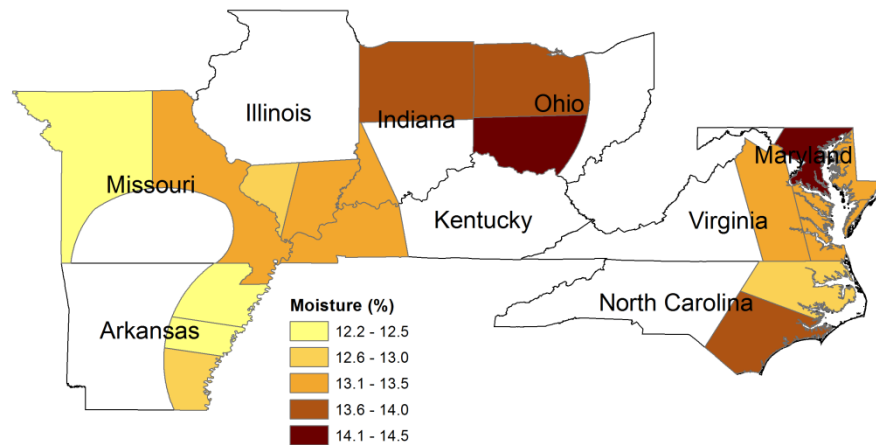
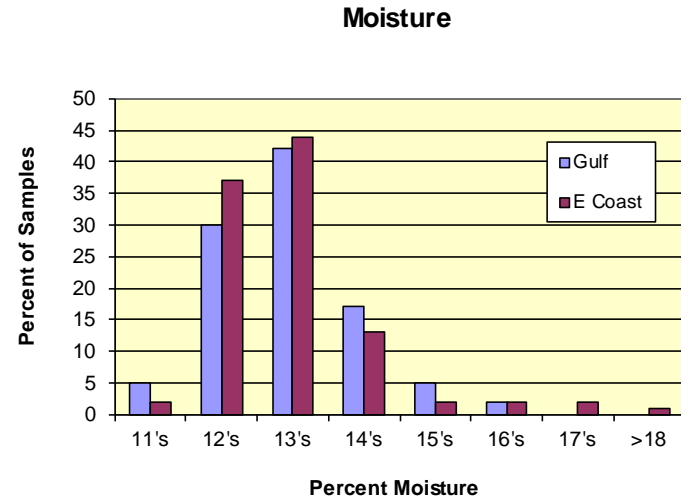
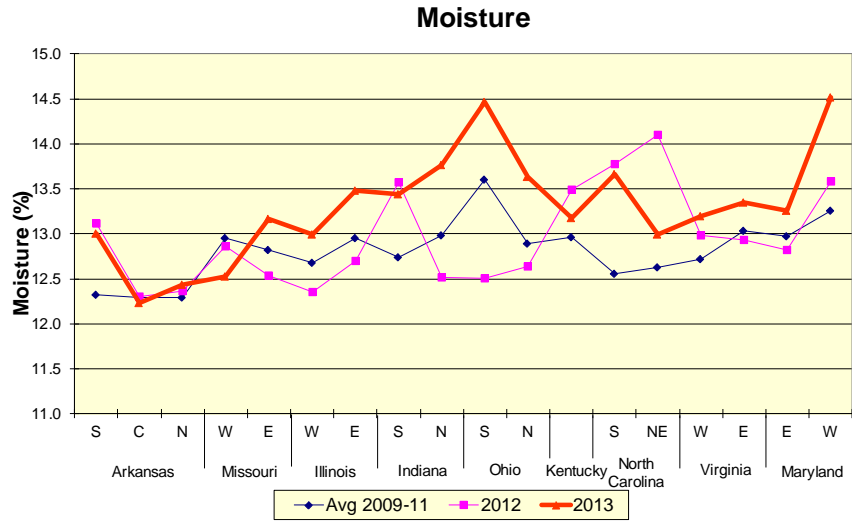
Comparisons of 2013 Results For Selected Quality Factors



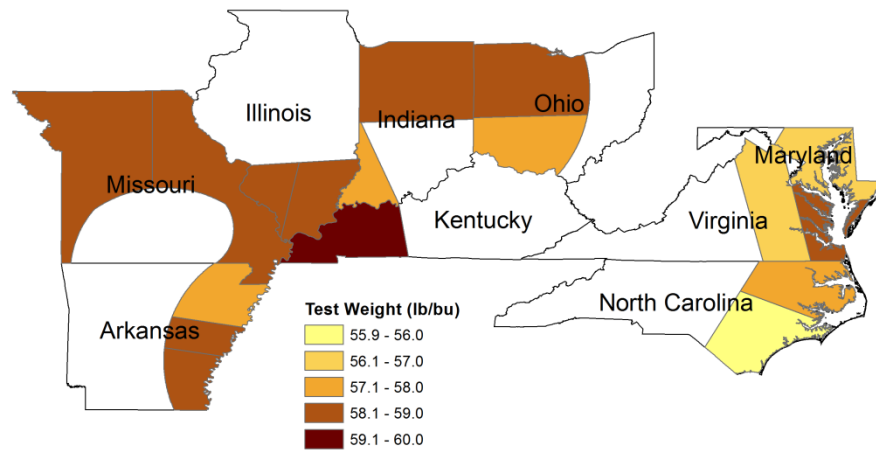
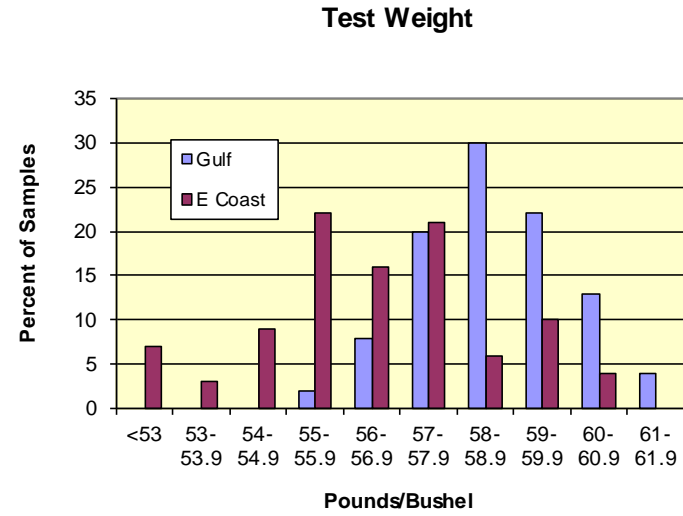
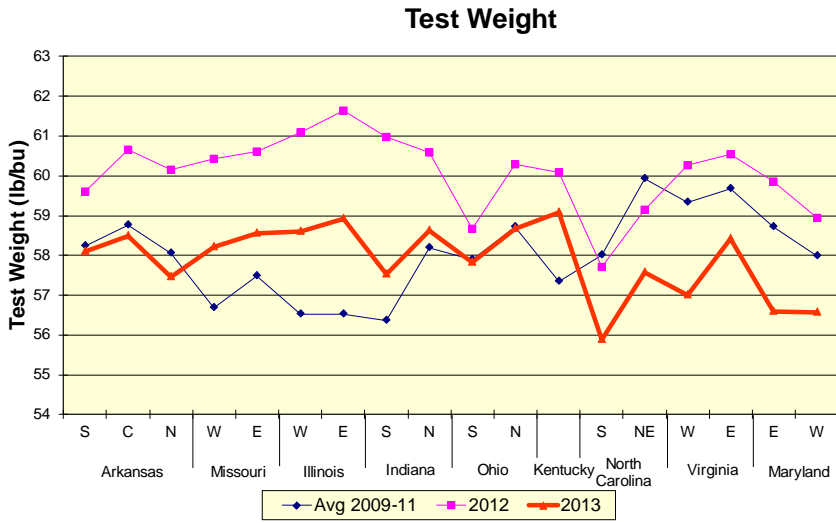
Comparisons of 2013 Results For Selected Quality Factors



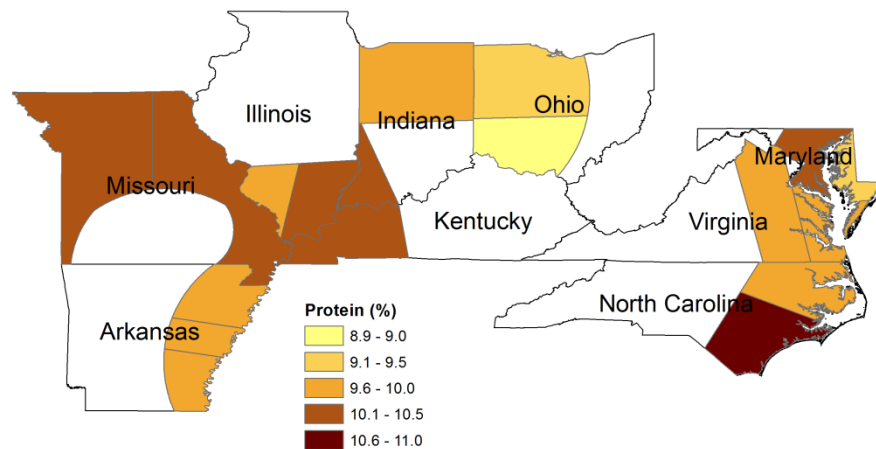
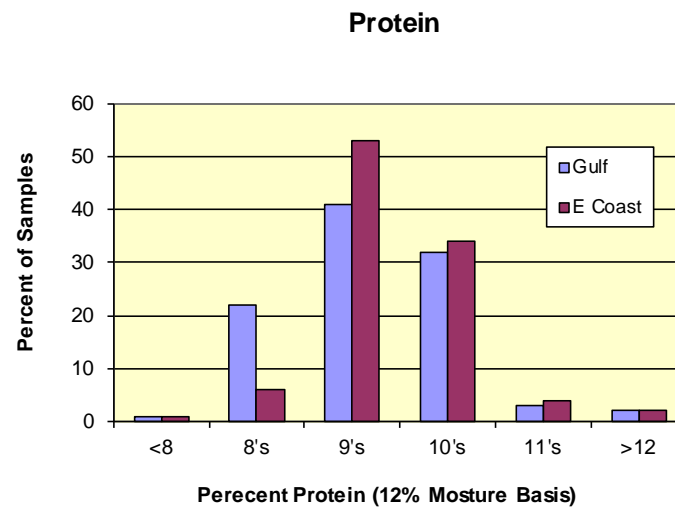
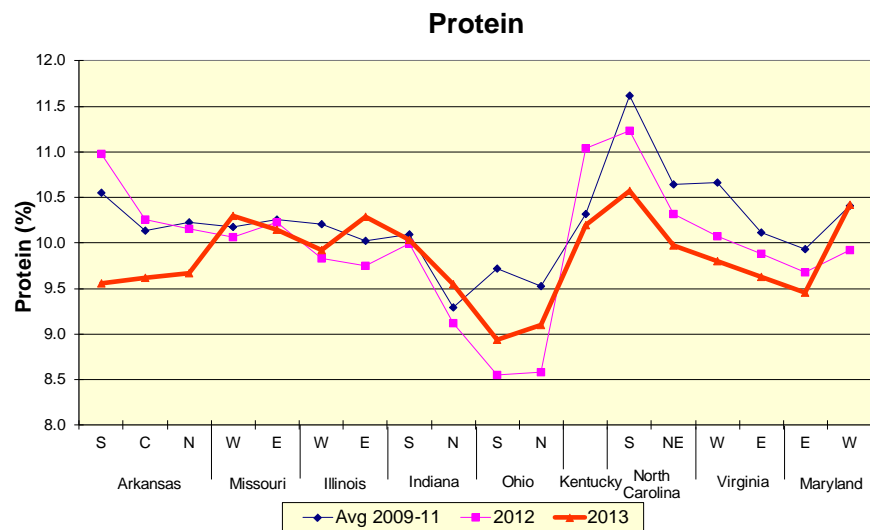
Distribution of 2013 Results and Comparisons with Previous Years For Selected Quality Factors



Distribution of 2013 Results and Comparisons with Previous Years For Selected Quality Factors

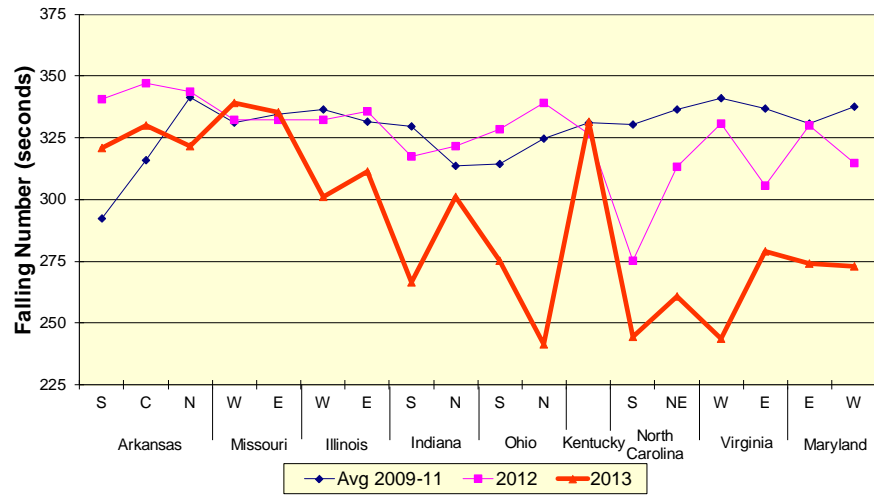


Distribution of 2013 Results and Comparisons with Previous Years For Selected Quality Factors

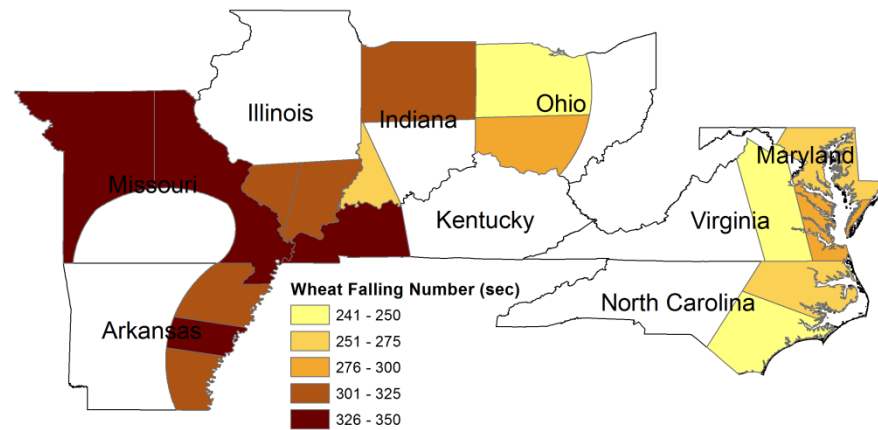
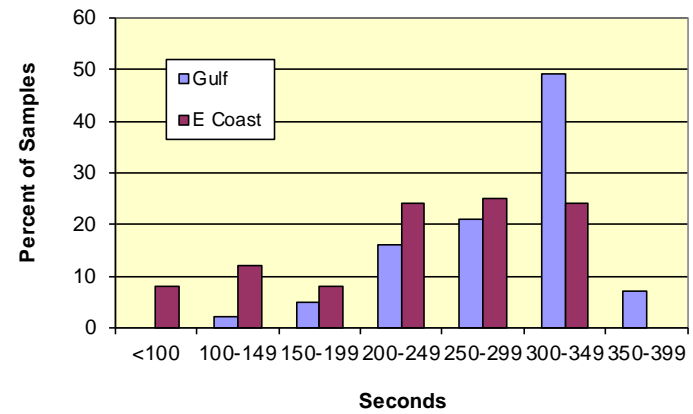


Distribution of 2013 Results and Comparisons with Previous Years For Selected Quality Factors

Falling Number

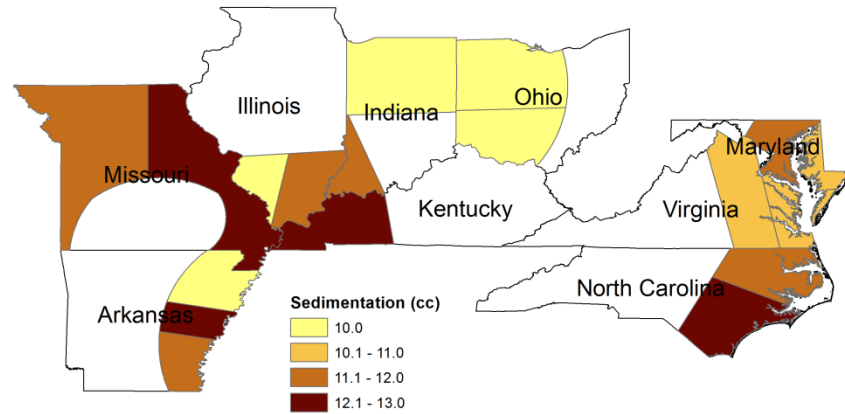
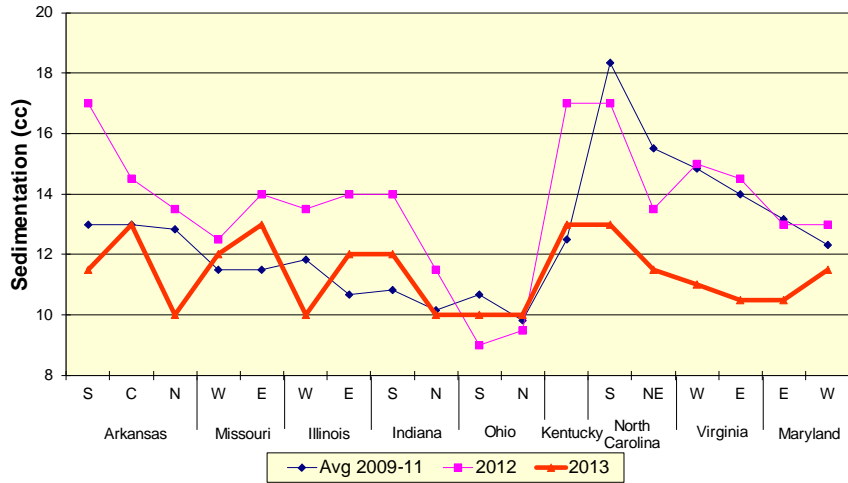


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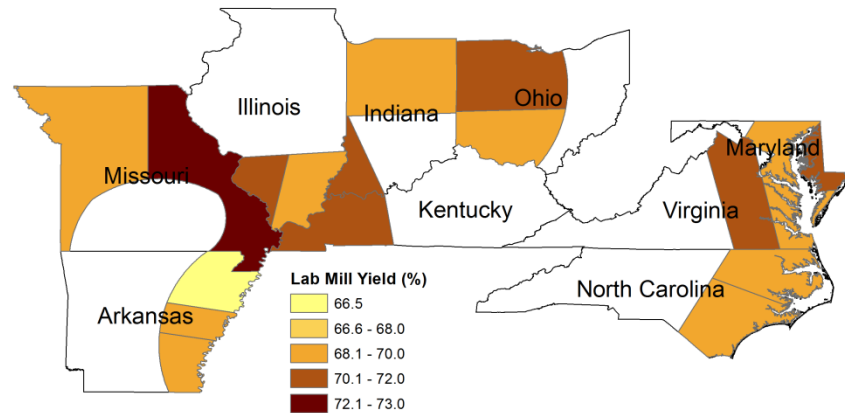
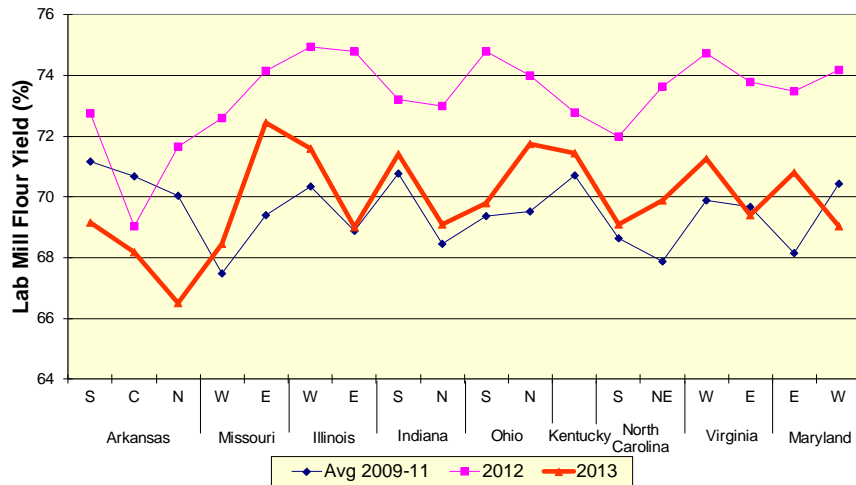


Distribution of 2013 Results and Comparisons with Previous Years For Selected Quality Factors

Sedimentation

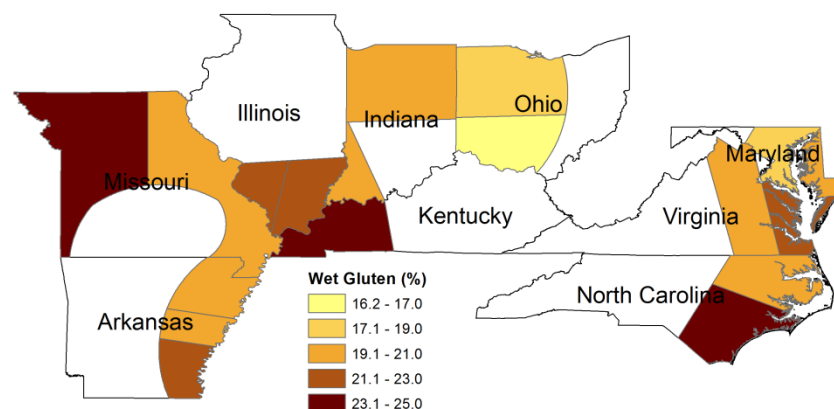
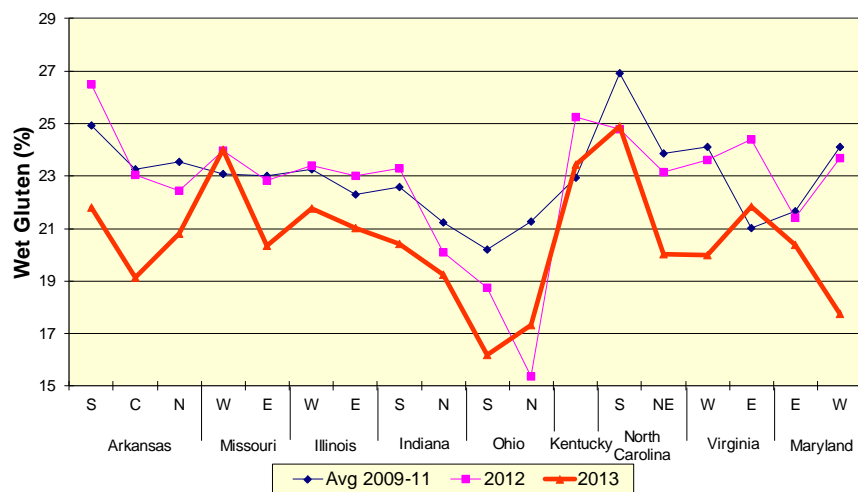


Laboratory Mill Flour Yield

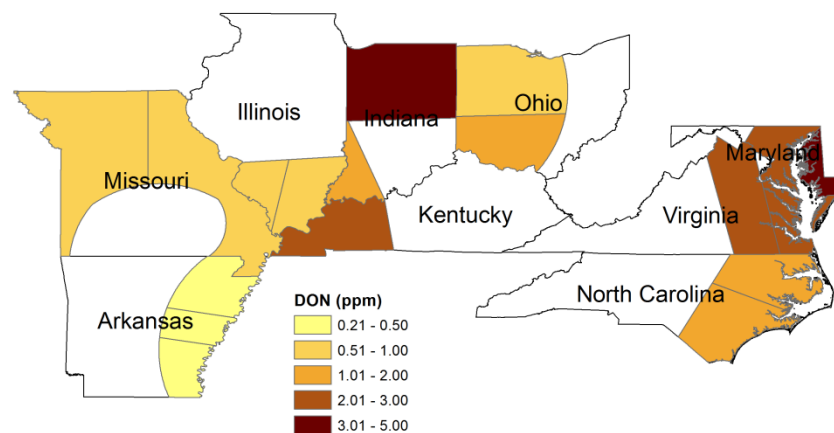
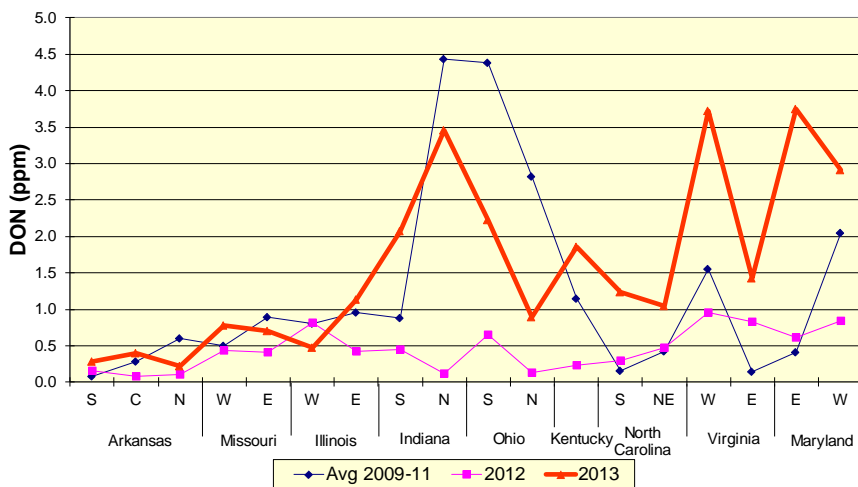


Distribution of 2013 Results and Comparisons with Previous Years For Selected Quality Factors

Wet Gluten

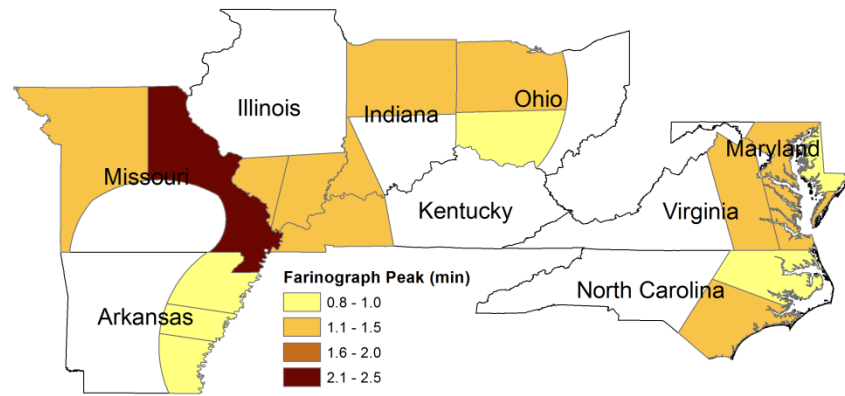
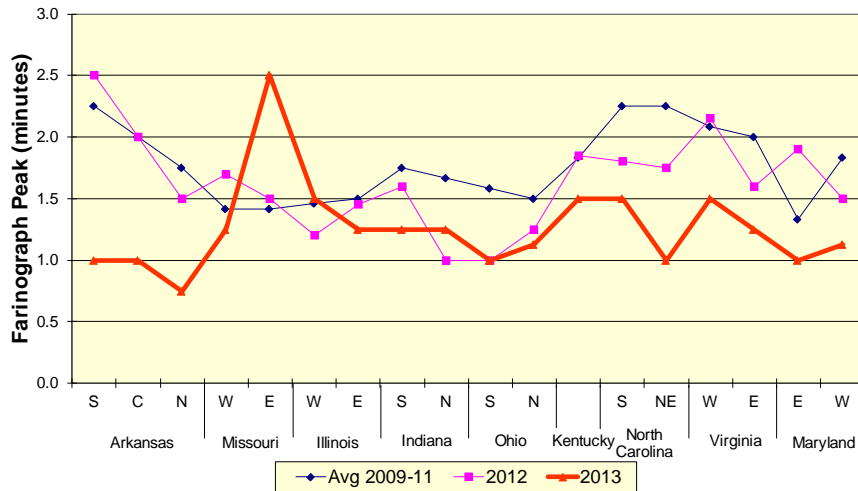


DON

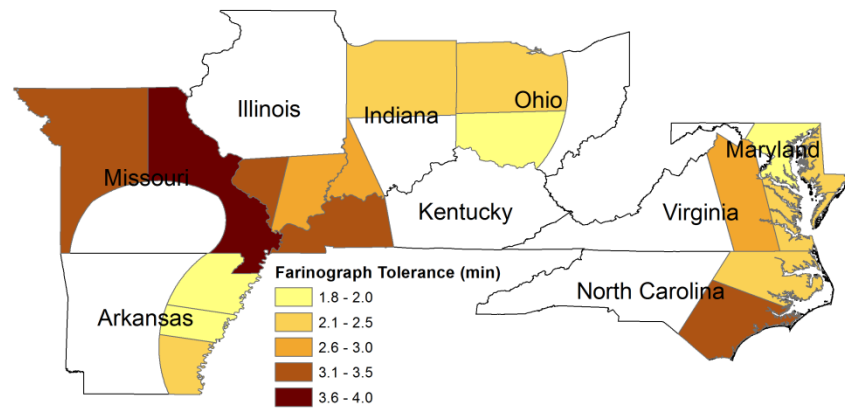
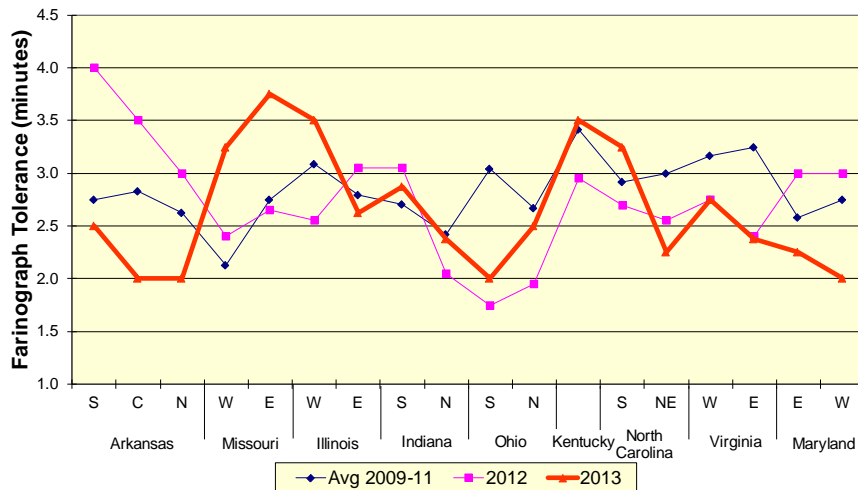


Distribution of 2013 Results and Comparisons with Previous Years For Selected Quality Factors

Farinograph Peak

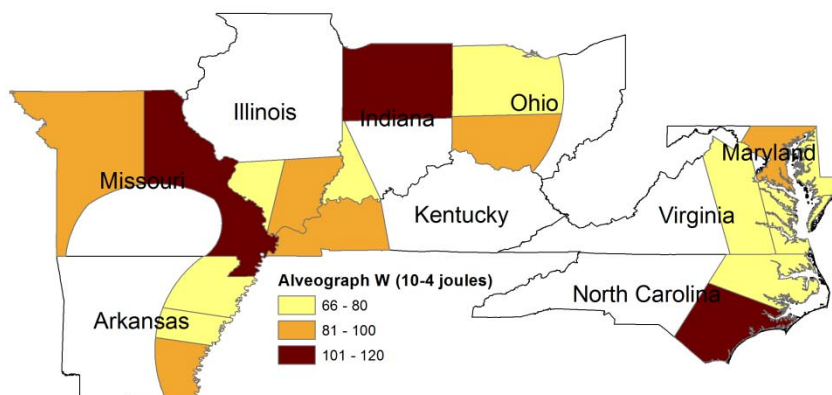
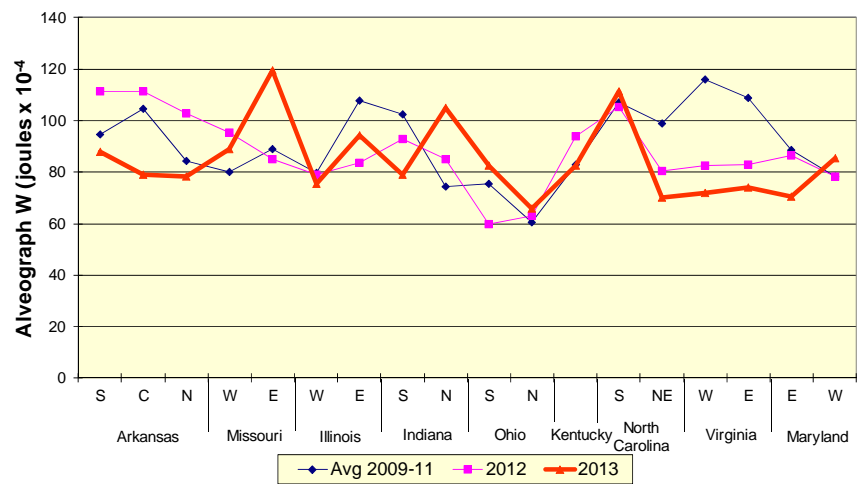


Farinograph Tolerance



Distribution of 2013 Results and Comparisons with Previous Years For Selected Quality Factors

Alveograph W Value



Alveograph P/L

