

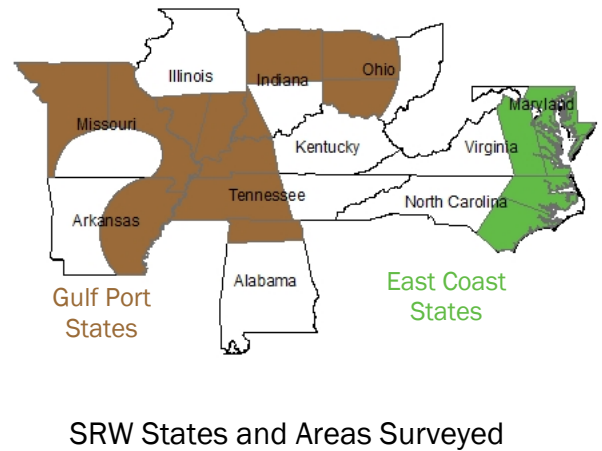
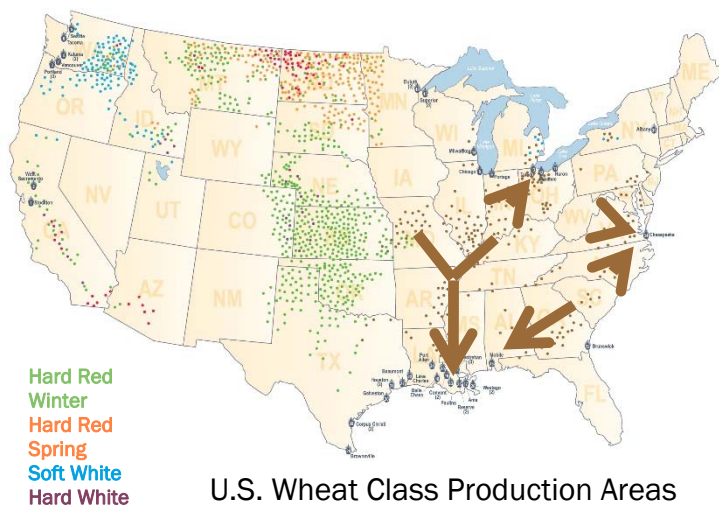


2017 QUALITY SURVEY

Soft Red Winter Wheat



Survey Overview



Weather and Harvest: Soft red winter wheat (SRW) is grown over a wide area of eastern United States. The area seeded to SRW in fall 2016 for the 2017 harvest is estimated by USDA at 5.6 million acres (2.3 million hectares), down from 6.6 million acres (2.7 million hectares) seeded for the 2016 harvest and well below the five-year average SRW planted area. The reduced area is attributed mainly to choices made by growers based on commodity prices. The 2017 SRW production, estimated at 8.3 million metric tons (MMT), is down from 9.4 MMT in 2016 and is well below the five-year average. However, USDA estimates that the total SRW supply (excluding imports) for the 2017/18 marketing year is 4% higher than 2016/17 because of higher 2017/18 beginning stocks.

Planting proceeded at a slightly slower than normal pace in fall 2016. However, the crop was in good condition by late fall with more than 90% of winter wheat rated fair to excellent in five of the six SRW survey states where wheat crop conditions are reported by USDA. While some of the southeastern SRW area was dry through the winter months, ample rain in March through early June provided adequate moisture for crop development. The beginning of SRW harvest was delayed somewhat by rain, but once started, harvest progressed rapidly.

Survey Methods: Sample collection and analysis were conducted by the Great Plains Analytical Laboratory, Kansas City, Missouri. In 2017, 270 samples were collected from elevators in 18 reporting areas across eleven states. Alabama and Tennessee were surveyed in 2017 for the first time. Test weight, moisture, protein, thousand kernel weight, wheat ash and falling number were determined on all individual samples, and the remaining tests were determined on 18 composite samples. The results were weighted by the estimated production for each reporting area and combined into “Composite Average”, “East Coast” and “Gulf Port” values. Gulf Port states include Alabama, Arkansas, Illinois, Indiana, Kentucky, Missouri, Ohio, and Tennessee, and accounted for 79% of the 2017 SRW production in the states surveyed. East Coast states include Maryland, North Carolina and Virginia and represent the remaining 21% of production in the states surveyed. The states surveyed account for an estimated 77% of total 2017 SRW production.

Wheat and Grade Data: When analysis results are weighted by estimated state production, the average grade of all samples collected for the 2017 SRW harvest survey is U.S. No. 2. The weighted average test weight is 59.1 lb/bu, above the five-year average and the 58.6 lb/bu average of 2016. The Gulf Port average of 59.2

lb/bu is similar to the 2016 average and above the five-year average of 58.6 lb/bu. The East Coast test weight average of 58.6 lb/bu is above both last year and the five-year average. The Gulf dockage value of 0.3% is lower than any recorded in the previous five years. Other grade factors as well as moisture and dockage for both areas are similar to or better than the five-year averages.

The Composite average wheat protein content of 9.5% (12% moisture basis) is similar to last year and only slightly below the five-year average of 9.8%. The 2017 East Coast and Gulf Port protein averages are similar. However, the East Coast average protein of 9.4% is below the region's 2016 and five-year averages, while the Gulf Port average of 9.5% is above the region's 2016 average of 9.1% and slightly below its five-year average of 9.7%. The Composite average falling number of 319 seconds is below 2016 but above the five-year average and indicates a generally sound crop. Fewer than 20% of samples had a falling number below 300 seconds in 2017, and only 4 of 270 were below 250 seconds. The Composite DON average of 0.4 ppm is below the 2016 value of 0.6 ppm and well below the five-year average of 1.3 ppm, indicating that the crop sampled is relatively free of DON. The East Coast value of 0.8 ppm and the Gulf Port value of 0.3 ppm are both below last year's values and five-year averages.

Flour and Baking Data: The Composite, East Coast and Gulf Port Buhler laboratory mill flour extraction averages are above 2016 but below the five-year averages. The Composite farinograph peak and absorption values are similar to five-year averages, but the stability value of 2.2 min is slightly shorter than last year and the five-year average. The Gulf Port peak and stability averages of 1.3 min and 2.4 min, respectively, are similar to last year and the five-year averages, while the East Coast peak and stability values of 1.2 min and 1.7 min are both shorter than last year and the five-year averages. The Composite and Gulf Port alveograph W values of 92 and 93, respectively, are higher than the five-year averages of 80 and 79. The other Composite, East Coast and Gulf Port alveograph values are all similar to the respective five-year averages given the variability of alveograph analysis. The Composite and Gulf Port cookie spread ratios are lower than last year and the five-year averages. Average loaf volumes are all similar to last year and the five-year averages.

Summary: Although reduced planted area decreased 2017 SRW production, the crop had generally favorable growing season and harvest conditions for both East Coast and Gulf Port states. Test weight is well above average and dockage is below average. The entire crop in the states sampled is largely free of sprout damage, and DON values are all below last year and the five-year averages. 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 Production

For the major producing states (million metric tons)

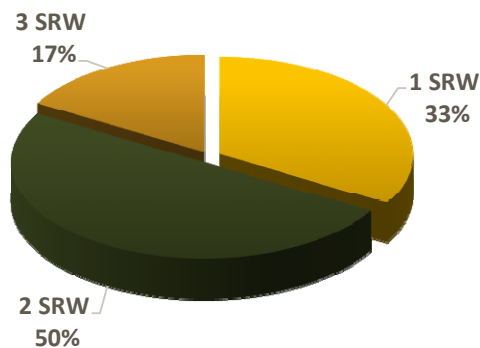
	2017	2016	2015	2014	2013
<i>Alabama</i>	0.2	0.3	0.4	0.4	0.5
<i>Arkansas</i>	0.2	0.2	0.4	0.7	1.0
<i>Georgia</i>	0.1	0.1	0.2	0.3	0.6
<i>Illinois</i>	1.0	0.9	0.9	1.2	1.5
<i>Indiana</i>	0.5	0.6	0.5	0.7	0.9
<i>Kentucky</i>	0.6	0.9	0.9	1.0	1.2
<i>Maryland</i>	0.4	0.5	0.5	0.5	0.5
<i>Michigan</i>	0.5	0.8	0.7	0.7	0.8
<i>Missouri</i>	1.0	1.1	0.9	1.2	1.5
<i>North Carolina</i>	0.6	0.4	0.8	1.2	1.4
<i>New York</i>	0.2	0.2	0.2	0.1	0.2
<i>Ohio</i>	0.9	1.2	0.9	1.1	1.2
<i>Pennsylvania</i>	0.3	0.3	0.3	0.3	0.3
<i>Tennessee</i>	0.5	0.7	0.7	0.9	1.1
<i>Virginia</i>	0.3	0.3	0.4	0.5	0.5
<i>Wisconsin</i>	0.3	0.5	0.4	0.4	0.4
Surveyed-States Total*	6.1	7.0	7.2	9.3	11.4
Sixteen-State Total	7.5	9.0	8.9	11.1	13.7
Total SRW Production	8.0	9.4	9.8	12.4	15.5

Based on USDA crop estimates as of September 29, 2017.

*Eleven states denoted by italics were surveyed accounting for 76% of 2017 SRW production.

SRW 2017 Grade Distribution

Based on 18 Composite Samples



Soft Red Winter 2017 Survey

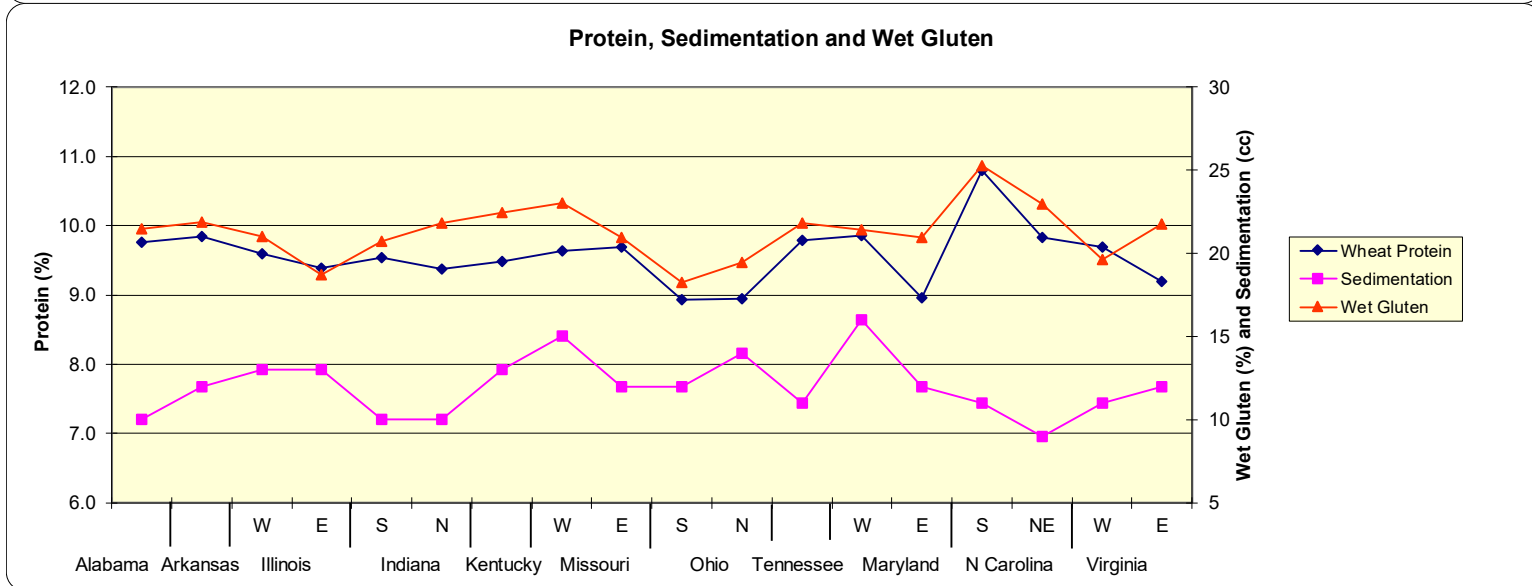
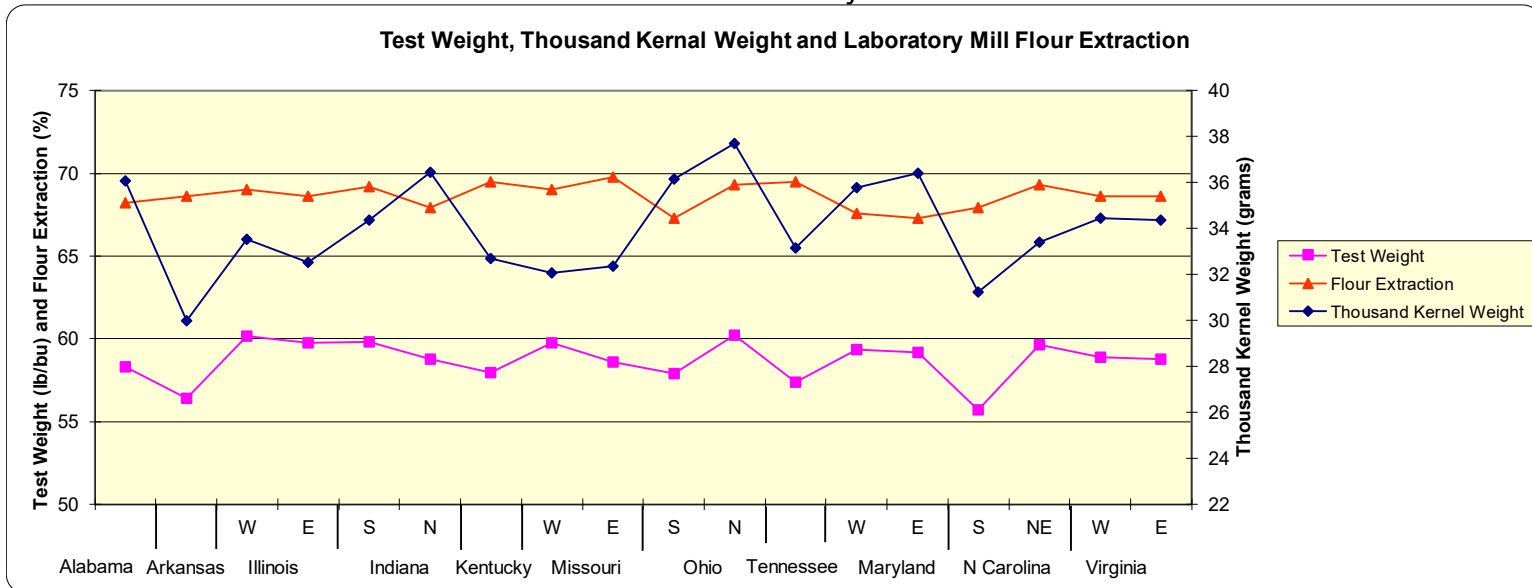
	Composite Average			East Coast*			Gulf Ports*		
	2017	2016	5-Year	2017	2016	5-Year	2017	2016	5-Year
Wheat Grade Data									
Test Weight (lb/bu)	59.1	58.6	58.4	58.6	56.0	57.7	59.2	59.3	58.6
Test Weight (kg/hl)	77.7	77.2	76.9	77.1	73.8	76.0	77.9	78.0	77.2
Damage - Total (%)	1.1	0.8	1.7	1.6	1.7	1.6	1.0	0.5	1.7
Foreign Material (%)	0.1	0.1	0.1	0.0	0.3	0.2	0.1	0.1	0.1
Shrunken and Broken (%)	0.5	0.5	0.5	0.5	0.7	0.5	0.4	0.5	0.5
Total Defects (%)	1.6	1.4	2.4	2.1	2.7	2.3	1.5	1.1	2.3
Grade	2	2	2	2	3	3	2	2	2
Wheat Non-Grade Data									
Dockage (%)	0.4	0.5	0.6	0.4	0.6	0.6	0.3	0.4	0.5
Moisture (%)	13.0	12.4	12.9	12.9	12.8	12.9	13.0	12.2	12.9
Protein (%) 12%/0% mb	9.5/10.7	9.4/10.7	9.8/11.1	9.4/10.7	10.4/11.8	10.1/11.5	9.5/10.8	9.1/10.3	9.7/11.0
Wheat Ash (%) 14%/0% mb	1.45/1.68	1.46/1.70	1.48/1.72	1.44/1.67	1.55/1.80	1.48/1.72	1.45/1.68	1.44/1.67	1.48/1.72
1000 Kernel Weight (g)	34.0	32.3	32.7	34.1	31.0	33.5	33.9	32.7	32.5
Wheat Falling Number (sec)	319	330	306	305	320	310	323	332	305
Kernel Size (%) lg/med/sm	88/12/00	83/16/01	84/15/01	88/11/01	80/19/01	84/15/01	87/13/00	84/15/01	84/15/01
Single Kernel Hardness	23.7	24.8	22.3	21.8	20.5	18.6	24.2	25.9	23.1
Single Kernel Weight (mg)	35.7	34.9	33.4	36.4	34.1	33.9	35.5	35.1	33.3
Single Kernel Diameter (mm)	2.63	2.61	2.63	2.65	2.61	2.64	2.63	2.61	2.63
Sedimentation (cc)	12.2	12.1	12.5	11.2	15.2	13.5	12.4	11.3	12.2
DON (ppm)	0.4	0.6	1.3	0.8	1.1	1.0	0.3	0.5	1.4
Flour Data									
Lab Mill Extraction (%)	68.9	67.3	70.9	68.2	66.9	70.9	69.1	67.5	70.9
Flour Color - *L	92.2	90.6	92.0	92.2	90.4	92.2	92.2	90.6	91.9
Flour Color - *a	-2.3	-2.1	-2.7	-2.4	-2.1	-2.8	-2.3	-2.1	-2.7
Flour Color - *b	8.4	9.3	8.3	8.6	9.5	8.5	8.4	9.3	8.3
Flour Protein (%) 14%/0% mb	7.7/9.0	7.6/8.8	8.2/9.6	8.1/9.4	8.4/9.8	8.5/9.9	7.6/8.9	7.4/8.6	8.1/9.5
Flour Ash (%) 14%/0% mb	0.44/0.52	0.43/0.50	0.45/0.52	0.44/0.51	0.44/0.51	0.45/0.52	0.44/0.52	0.43/0.50	0.45/0.52
Wet Gluten (%)	21.3	21.3	21.8	22.4	23.2	22.5	21.0	20.8	21.6
Gluten Index	75.6	87.6	83.2	77.5	84.6	82.0	75.1	88.4	83.5
Falling Number (sec)	307	330	304	299	320	312	309	332	303
Amylograph (65g) (BU)	536	588	442	445	488	405	561	614	451
Starch Damage (%)	5.1	4.4	4.8	5.3	4.3	4.5	5.0	4.4	4.8
SRC: GPI	0.59	0.61	0.58	0.54	0.61	0.58	0.59	0.60	0.58
Water/50% Sucrose	63/129	53/100	55/106	69/125	54/101	57/107	61/130	54/97	56/104
5% Lactic Acid/5% Na ₂ CO ₃	130/89	106/75	108/80	119/97	108/76	109/81	128/89	104/75	107/80
Dough Properties									
Farinograph Peak (min)	1.3	1.4	1.4	1.2	1.7	1.5	1.3	1.3	1.4
Farinograph Stability (min)	2.2	2.7	2.6	1.7	2.6	2.6	2.4	2.7	2.6
Farinograph Absorption (%)	53.2	52.6	52.9	53.6	53.5	53.2	53.1	52.4	52.8
Alveograph P (mm)	41	37	36	41	39	36	41	36	36
Alveograph L (mm)	89	96	89	83	111	93	90	92	87
Alveograph W (10-4 joules)	92	86	80	87	97	83	93	83	79
Alveograph P/L	0.46	0.38	0.41	0.49	0.35	0.39	0.45	0.39	0.41
Extenso Resistance (BU)	179	213	NA	166	200	NA	183	216	NA
Extenso Extensibility (cm)	15.7	15.7	NA	16.0	17.1	NA	15.6	15.3	NA
Extenso Area (sq cm)	50	59	NA	46	61	NA	51	58	NA
Baking Evaluation									
Bake Grain and Texture	5.1	5.4	5.1	5.3	4.9	5.1	5.1	5.5	5.1
Bake Absorption (%)	54.9	54.6	NA	55.4	55.6	NA	54.8	54.4	NA
Loaf Volume (cc)	720	718	703	731	743	724	718	711	698
Cookie Diameter (cm)	8.7	10.5	NA	8.6	10.4	NA	8.7	10.5	NA
Cookie Spread Ratio	8.8	9.6	9.4	7.7	9.2	9.2	9.1	9.7	9.5
% Area Production	100.0%			21.0%			79.0%		

*East Coast: Maryland, Virginia, North Carolina; Gulf: Alabama, Arkansas, Illinois, Indiana, Kentucky, Missouri, Ohio, Tennessee
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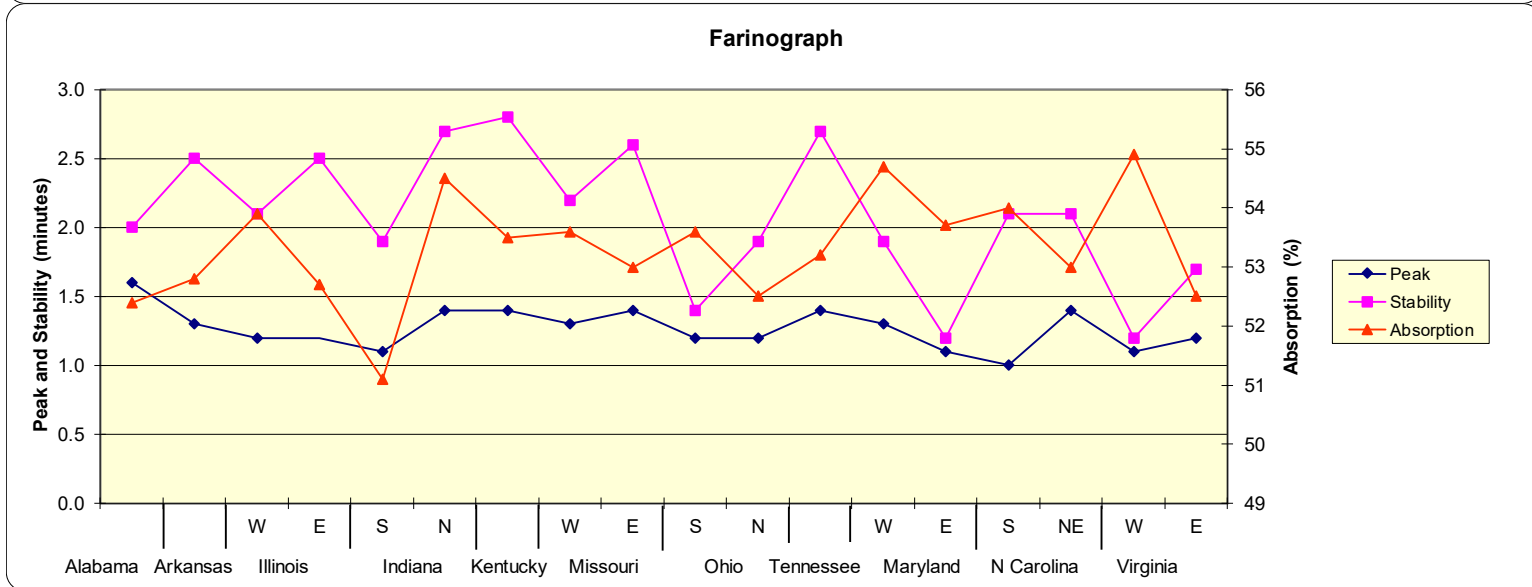
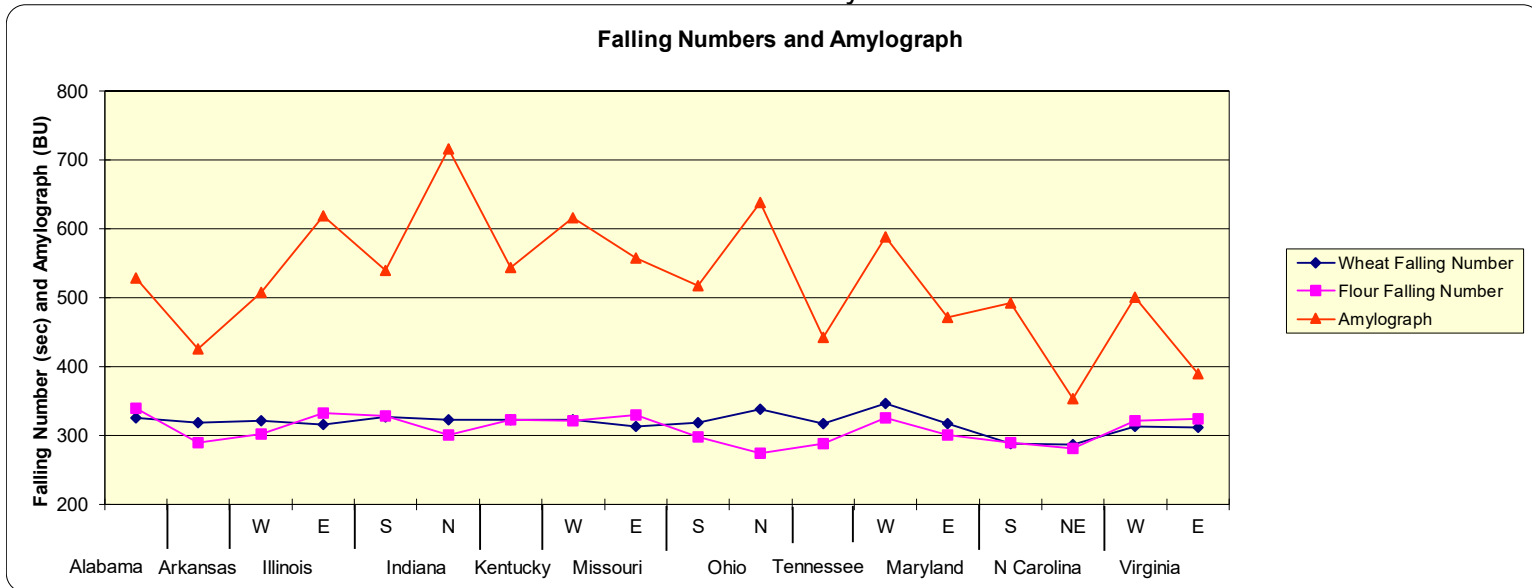
2017 State Summary

	Alabama	Arkansas	Illinois	Indiana	Kentucky	Missouri	Ohio	Tennessee	Maryland	North Carolina	Virginia
Wheat Grade Data - from Individual Samples											
Test Weight (Lab) (lb/bu)	58.3	56.4	60.0	59.2	58.0	59.1	59.9	57.4	59.3	58.0	58.8
Count	5	14	40	36	18	36	54	11	19	25	15
Wheat Grade Data - from Area Composite Samples											
Test Weight (lb/bu)	58.3	56.4	60.3	59.6	58.4	59.6	59.9	57.4	59.3	57.8	59.5
Test Weight (kg/hl)	76.7	74.3	79.3	78.4	76.9	78.4	78.8	75.6	78.0	76.1	78.3
Damage - Total (%)	1.3	2.0	0.3	0.9	1.3	0.7	0.7	2.0	1.7	2.0	0.2
Foreign Material (%)	0.3	0.3	0.0	0.1	0.0	0.1	0.3	0.0	0.1	0.0	0.0
Shrunken and Broken (%)	0.6	0.6	0.4	0.5	0.3	0.5	0.4	0.5	0.8	0.5	0.3
Total Defects (%)	2.2	2.9	0.7	1.6	1.6	1.3	1.4	2.5	2.5	2.5	0.5
Grade	2	3	1	2	2	2	2	3	2	3	2
Wheat Non-Grade Data - from Individual Samples											
Moisture (%)	11.8	13.0	11.9	13.1	12.5	12.4	13.7	11.8	13.1	12.1	12.0
Protein (%) 12%/0% mb	9.8/11.1	9.8/11.2	9.5/10.8	9.4/10.7	9.5/10.8	9.7/11.0	8.9/10.2	9.8/11.1	9.2/10.4	10.2/11.6	9.4/10.6
Ash (%) 14%/0% mb	1.38/1.60	1.50/1.74	1.49/1.73	1.42/1.65	1.45/1.69	1.48/1.72	1.40/1.63	1.44/1.67	1.45/1.68	1.45/1.69	1.38/1.61
1000 Kernel Weight (g)	36.1	30.0	33.1	35.6	32.7	32.2	37.5	33.2	36.2	32.5	34.4
Wheat Falling Number (sec)	325	318	319	325	322	317	335	318	325	288	312
DON (ppm)	0.1	0.4	0.3	0.2	0.2	0.3	0.2	0.6	1.4	0.5	0.6
Wheat Non-Grade Data - from Area Composite Samples											
Dockage (%)	0.3	0.5	0.3	0.5	0.4	0.3	0.2	0.4	0.5	0.4	0.2
Moisture (Lab) (%)	12.3	14.1	12.4	13.4	13.0	12.4	14.1	13.1	13.8	12.2	12.9
Protein (Lab) (%)	9.6	9.4	9.7	9.5	9.6	9.8	8.9	9.2	8.5	10.0	9.5
Kernel Size (%) lg/med/sm	91/09/00	81/18/01	88/12/00	90/10/00	88/12/00	81/18/01	92/08/00	85/14/01	90/10/00	87/12/01	88/12/00
Single Kernel Hardness	10.9	23.3	27.2	25.0	18.8	28.9	26.2	19.8	28.6	17.0	21.3
Single Kernel Weight (mg)	39.6	31.6	35.1	36.3	35.5	33.0	38.3	35.4	37.9	35.9	34.4
Single Kernel Diameter (mm)	2.73	2.47	2.64	2.65	2.63	2.55	2.69	2.60	2.68	2.65	2.58
Sedimentation (cc)	10.0	12.0	13.0	10.0	13.0	13.2	13.7	11.0	13.0	9.8	11.7
DON (ppm)	0.2	0.3	0.2	0.3	0.2	0.4	0.2	0.6	0.9	0.2	0.5
Flour Data											
Lab Mill Extraction (%)	68.2	68.6	68.8	68.4	69.5	69.5	69.0	69.5	67.4	68.7	68.6
Flour Color - *L	92.1	91.8	92.1	92.3	92.4	92.2	92.6	92.0	92.4	91.9	92.4
Flour Color - *a	-2.4	-2.3	-2.3	-2.3	-2.3	-2.3	-2.4	-2.3	-2.3	-2.4	-2.5
Flour Color - *b	8.4	8.5	8.4	8.3	8.5	8.2	8.4	8.5	8.4	8.8	8.5
Flour Protein (%) 14%/0% mb	7.8/9.0	7.7/9.0	7.7/9.0	7.5/8.7	7.7/8.9	7.9/9.2	7.2/8.3	7.6/8.8	7.5/8.7	8.7/10.1	7.7/9.0
Flour Ash (%) 14%/0% mb	0.53/0.62	0.47/0.55	0.44/0.51	0.43/0.50	0.44/0.51	0.45/0.53	0.41/0.48	0.45/0.52	0.43/0.50	0.44/0.51	0.46/0.53
Wet Gluten (%)	21.5	21.9	20.0	21.4	22.4	21.8	19.3	21.9	21.0	23.9	21.1
Gluten Index	81.1	85.8	80.3	80.0	61.7	69.3	84.2	67.1	76.2	75.3	86.1
Falling Number (sec)	340	290	315	313	323	327	278	288	307	284	323
Amylograph (65g) (BU)	529	425	555	644	544	581	619	442	499	412	427
Starch Damage (%)	4.6	5.3	4.9	5.2	4.6	5.3	4.5	5.8	5.5	5.3	4.8
Dough Properties											
Farinograph Peak (min)	1.6	1.3	1.2	1.3	1.4	1.4	1.2	1.4	1.1	1.2	1.2
Farinograph Stability (min)	2.0	2.5	2.3	2.4	2.8	2.4	1.8	2.7	1.4	2.1	1.5
Farinograph Absorption (%)	52.4	52.8	53.4	53.1	53.5	53.2	52.7	53.2	53.9	53.4	53.3
Alveograph P (mm)	38	45	42	48	39	35	41	42	48	36	42
Alveograph L (mm)	102	113	85	81	104	112	57	97	61	101	80
Alveograph W (10-4 joules)	99	114	86	110	102	93	72	101	92	83	87
Alveograph P/L	0.37	0.40	0.49	0.59	0.38	0.31	0.72	0.43	0.78	0.35	0.53
Extenso Resistance (BU)	200	202	157	243	170	181	175	186	172	162	167
Extenso Extensibility (cm)	15.0	16.5	16.4	14.4	16.1	16.0	14.6	16.1	15.5	16.5	15.6
Extenso Area (sq cm)	53	60	46	61	48	53	45	53	46	47	45
Baking Evaluation											
Bake Grain and Texture	6.0	5.5	5.4	5.0	5.5	4.7	4.2	5.5	5.4	4.9	6.2
Bake Absorption (%)	54.5	55.0	54.6	54.8	55.5	55.2	54.2	55.0	55.7	55.4	54.7
Loaf Volume (cc)	780	735	698	699	750	734	669	750	708	757	705
Cookie Diameter (cm)	8.7	8.3	9.0	8.6	8.5	8.9	8.8	8.6	8.8	8.6	8.2
Cookie Spread Ratio	8.9	7.6	9.9	8.9	7.9	9.4	9.1	9.2	8.0	8.0	6.6

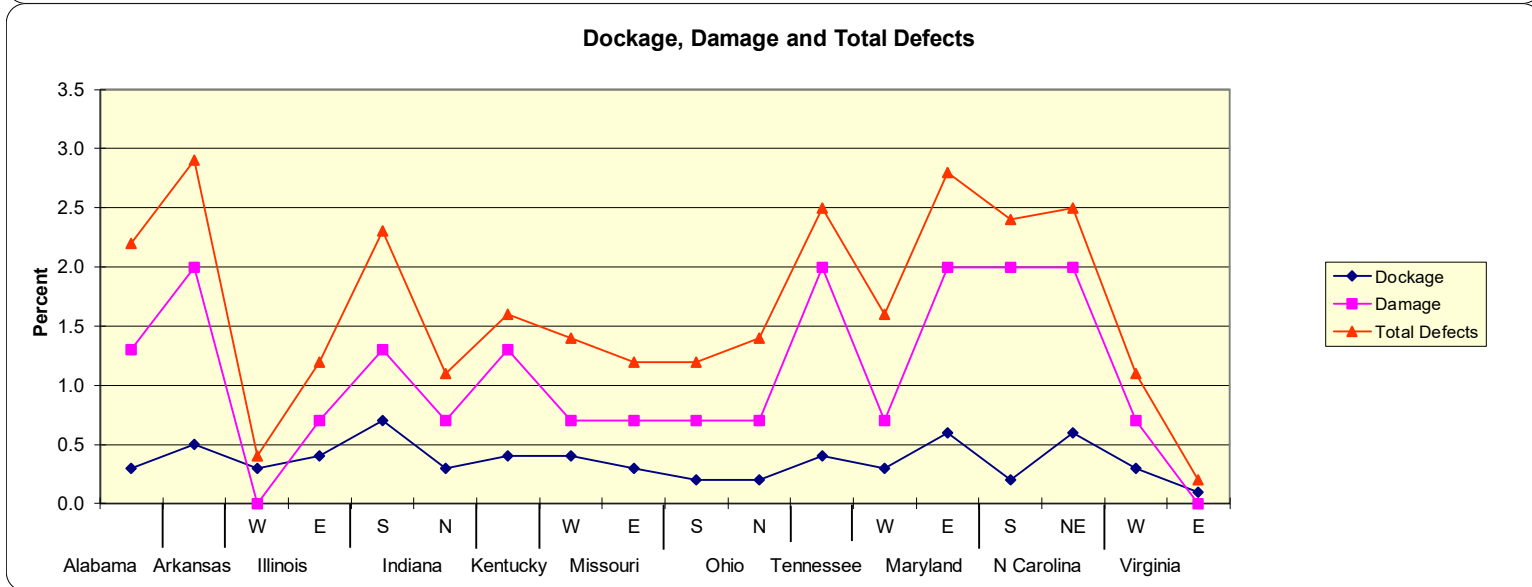
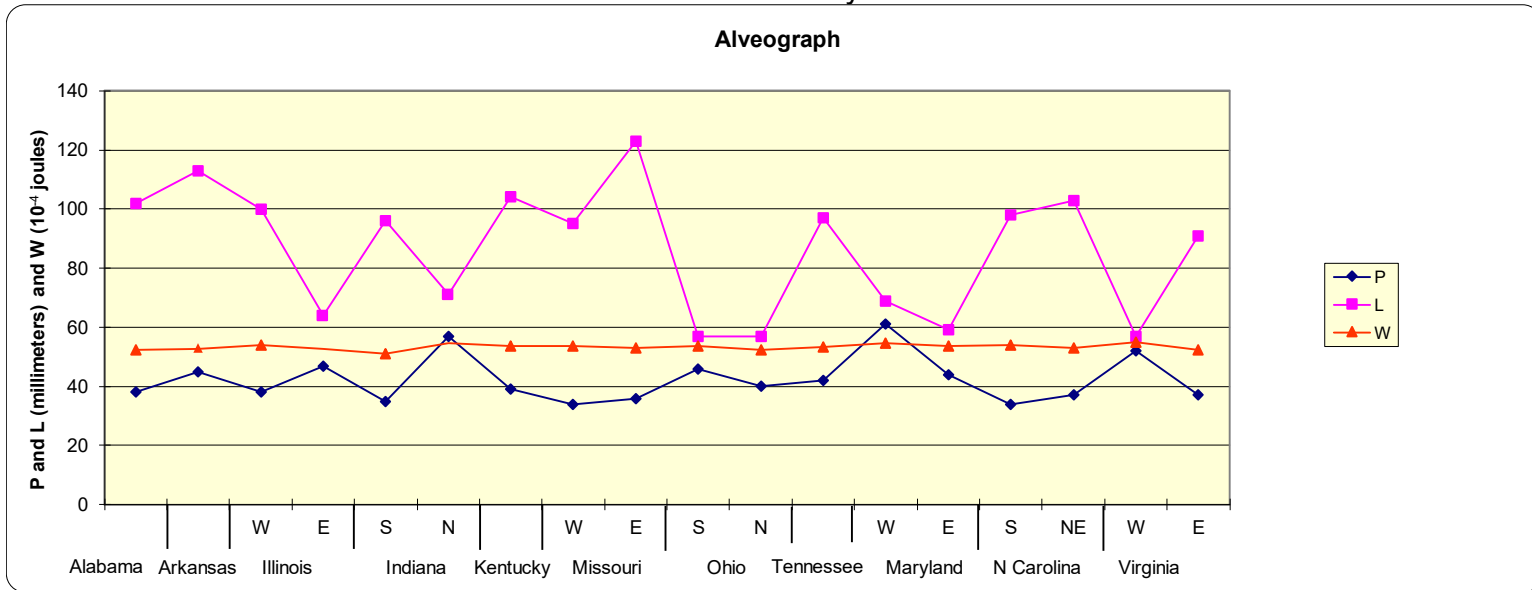
Comparisons of 2017 Results For Selected Quality Factors



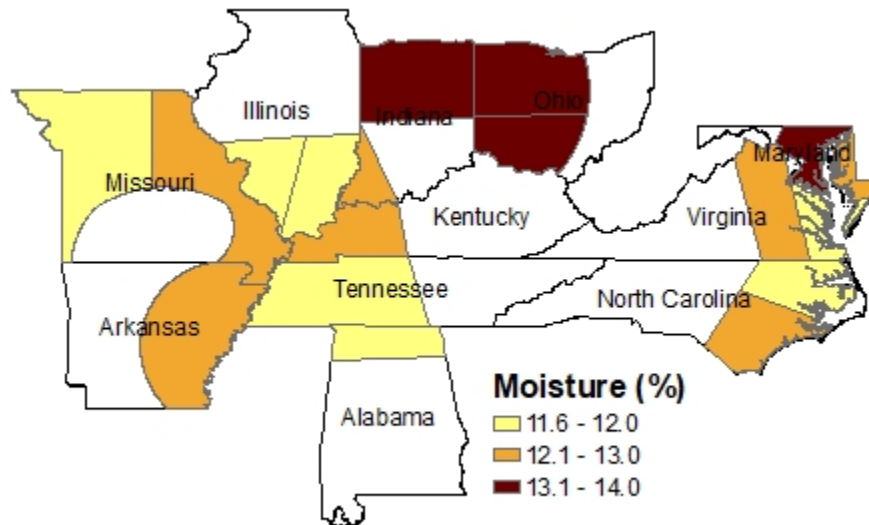
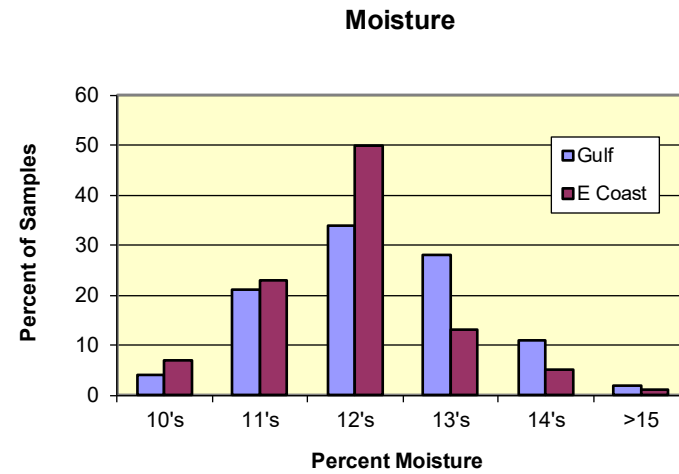
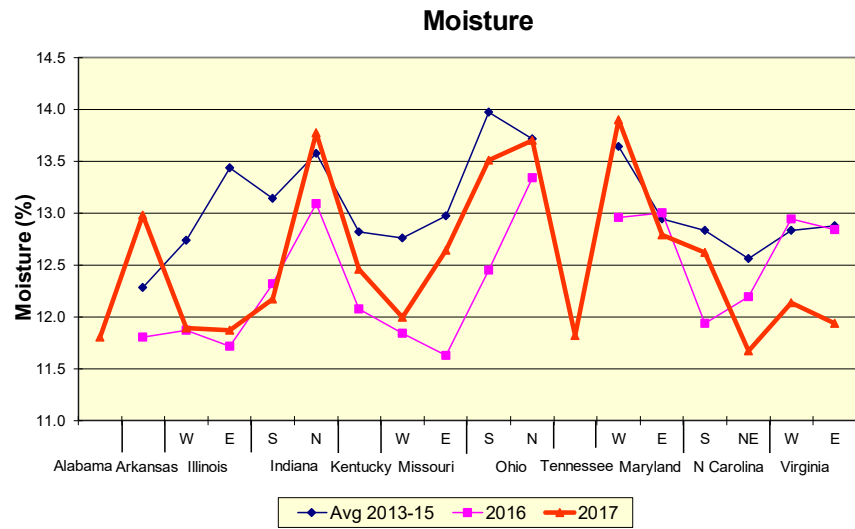
Comparisons of 2017 Results For Selected Quality Factors



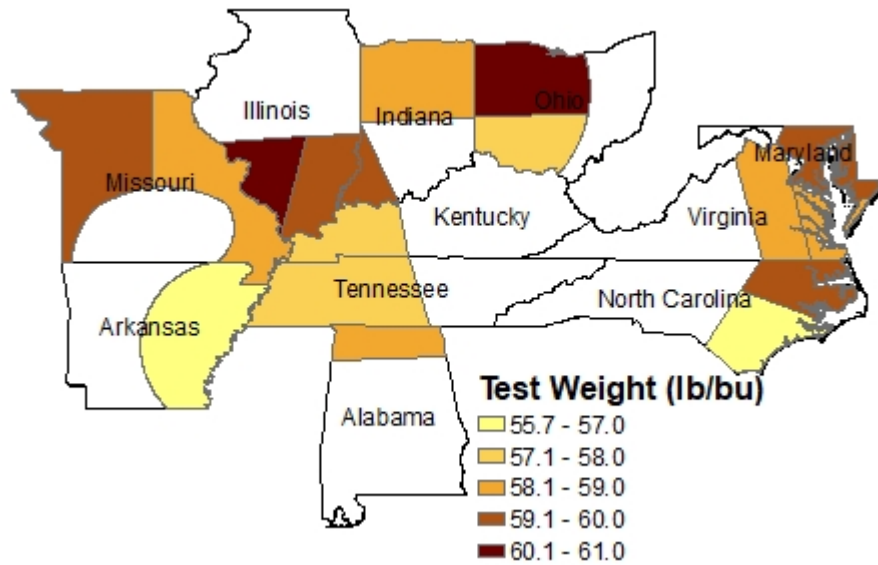
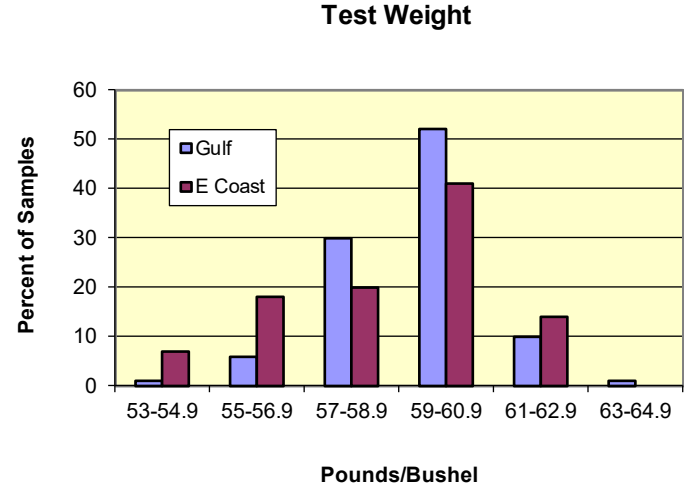
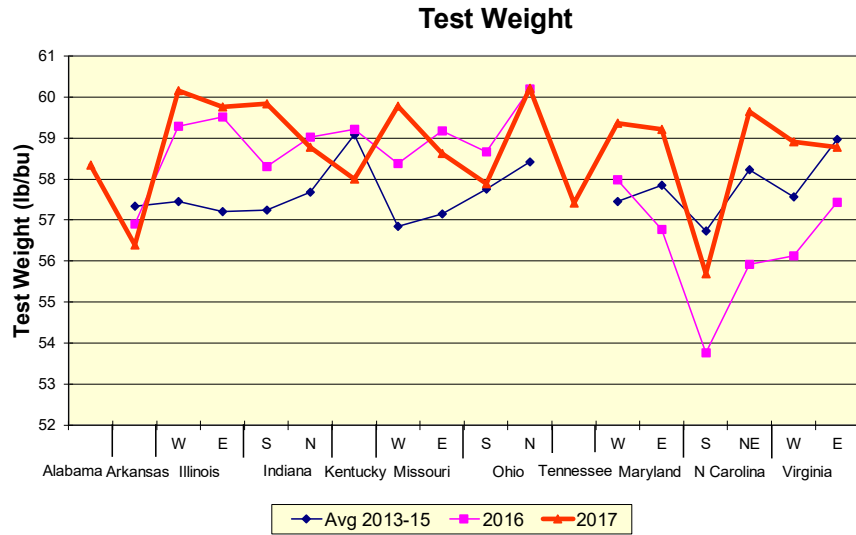
Comparisons of 2017 Results For Selected Quality Factors



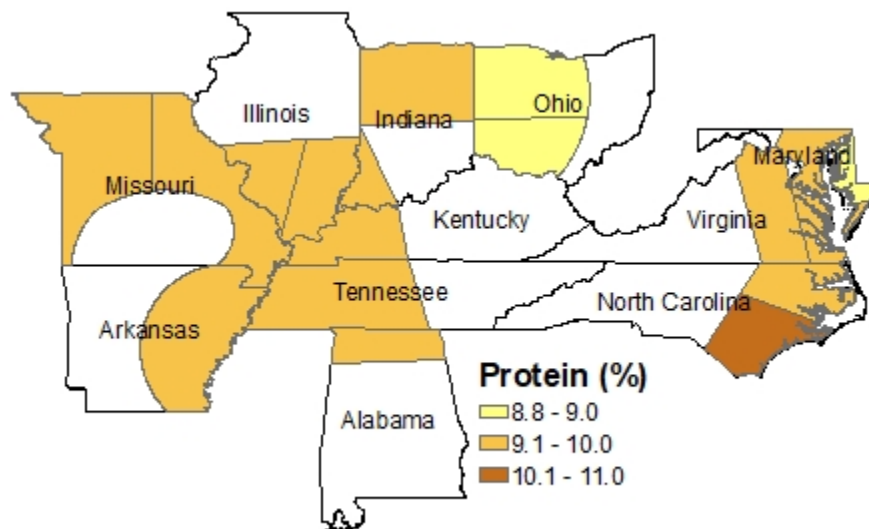
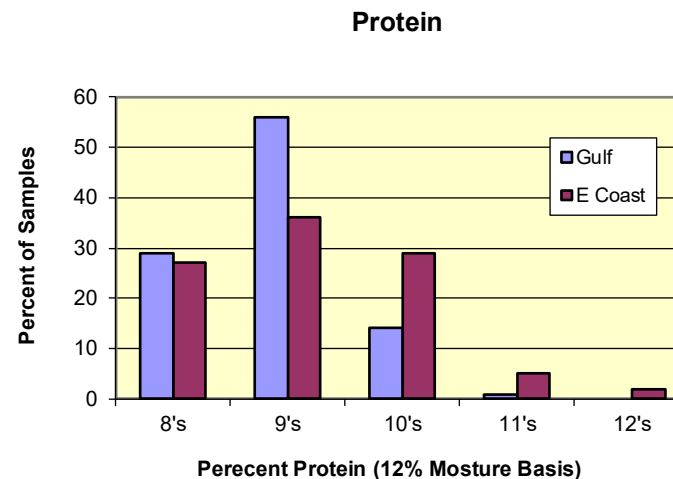
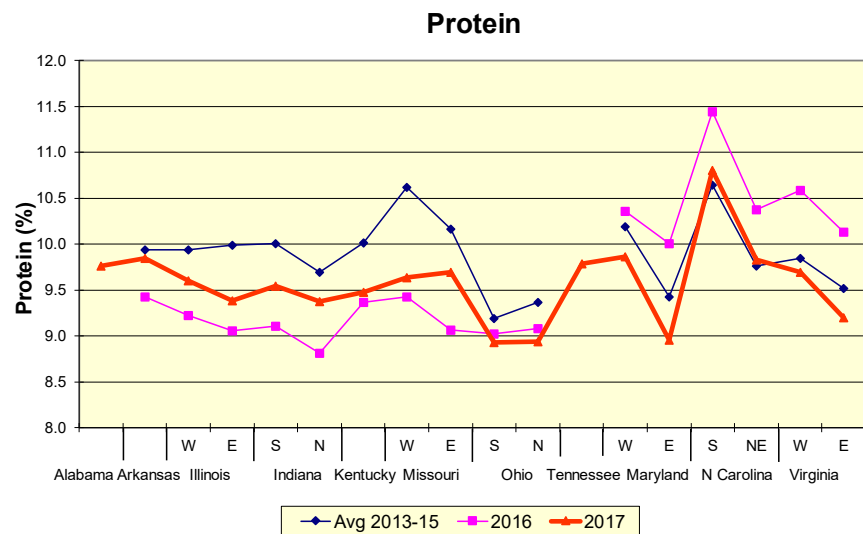
Distribution of 2017 Results and Comparisons with Previous Years For Selected Quality Factors



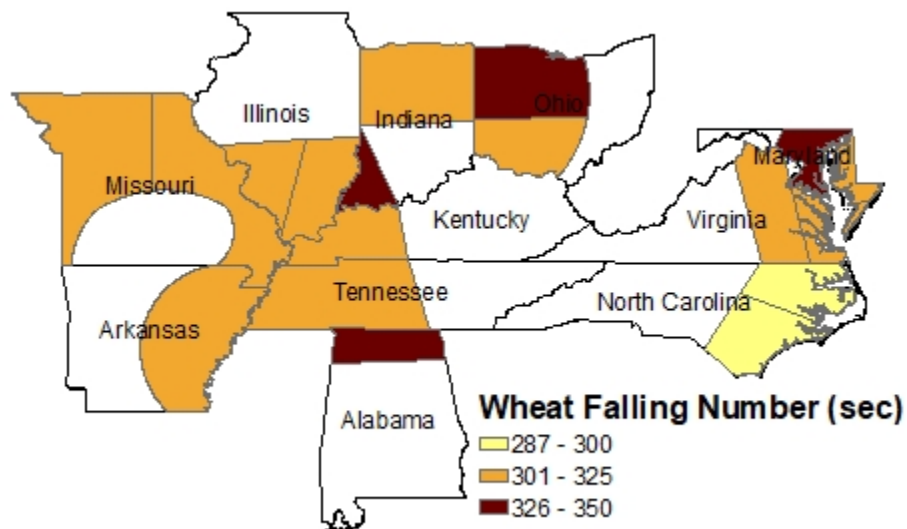
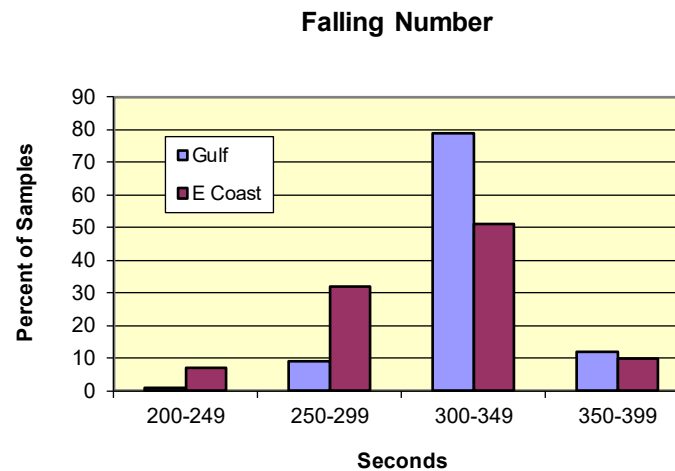
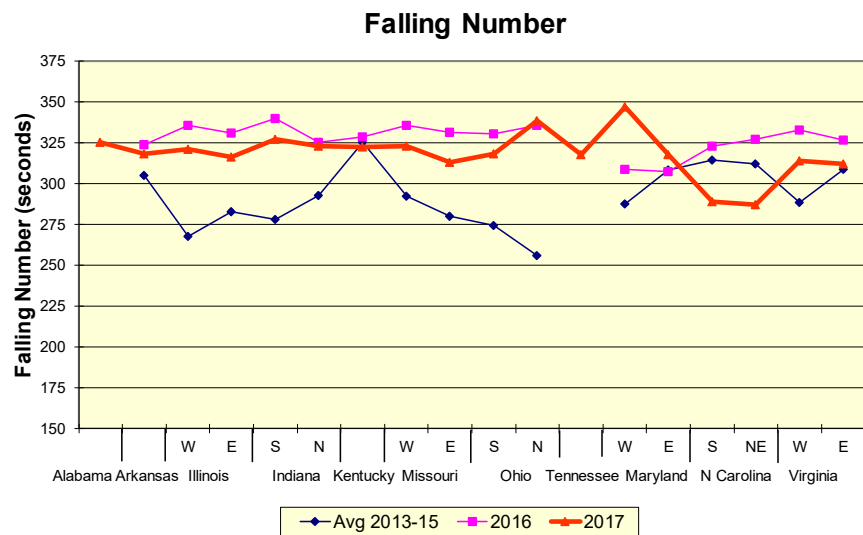
Distribution of 2017 Results and Comparisons with Previous Years For Selected Quality Factors



Distribution of 2017 Results and Comparisons with Previous Years For Selected Quality Factors

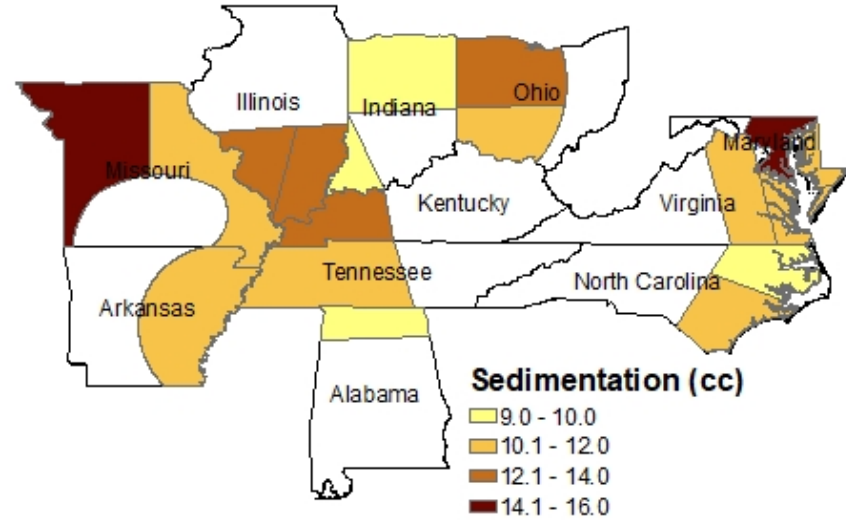
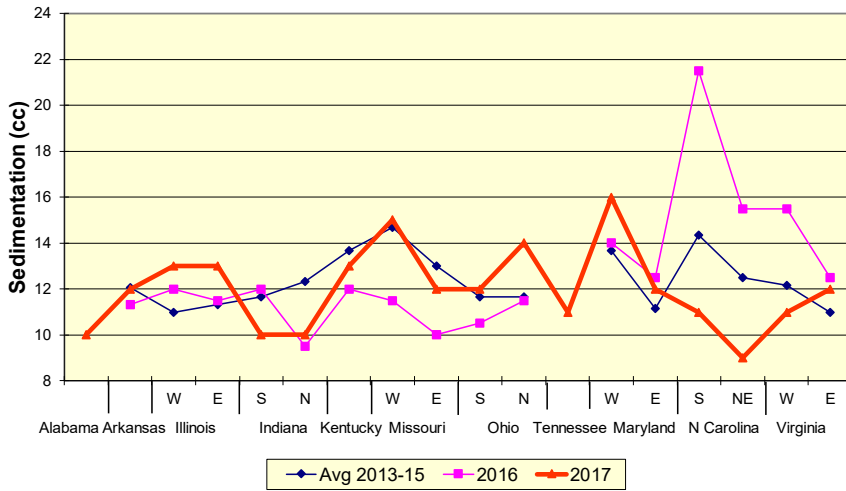


Distribution of 2017 Results and Comparisons with Previous Years For Selected Quality Factors

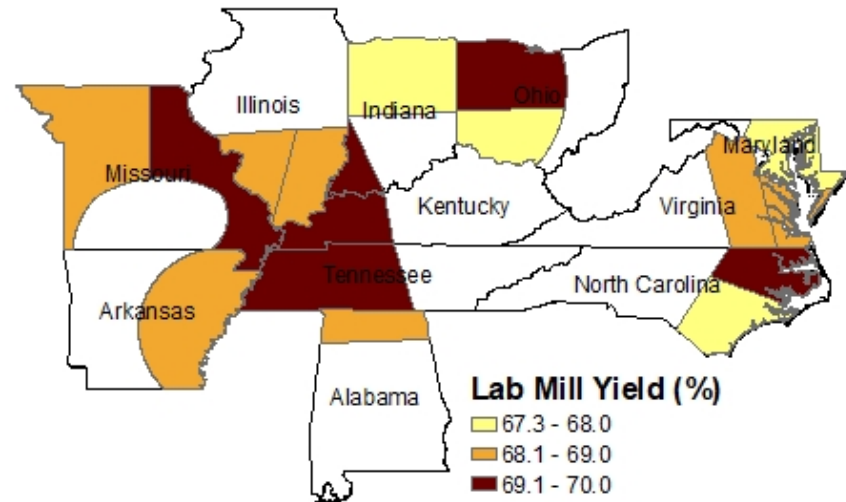
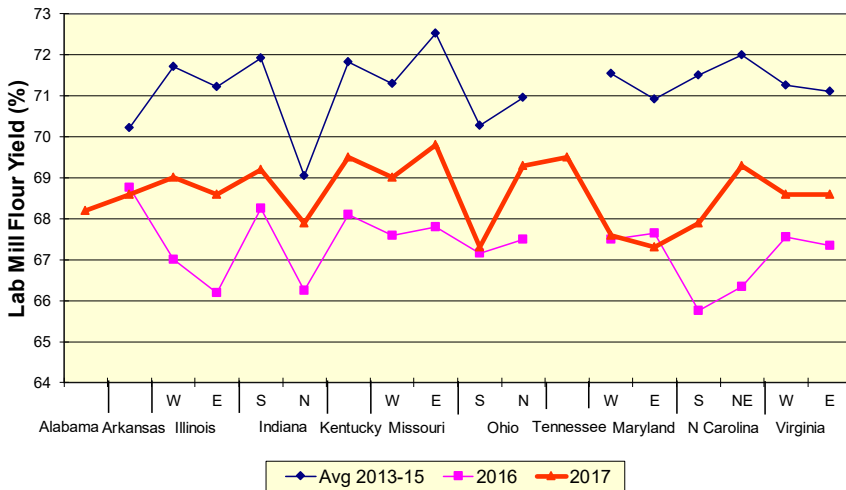


Distribution of 2017 Results and Comparisons with Previous Years For Selected Quality Factors

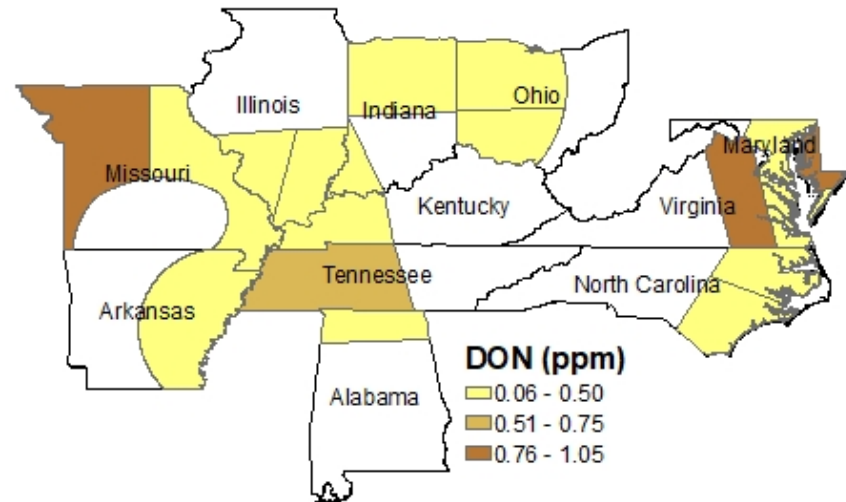
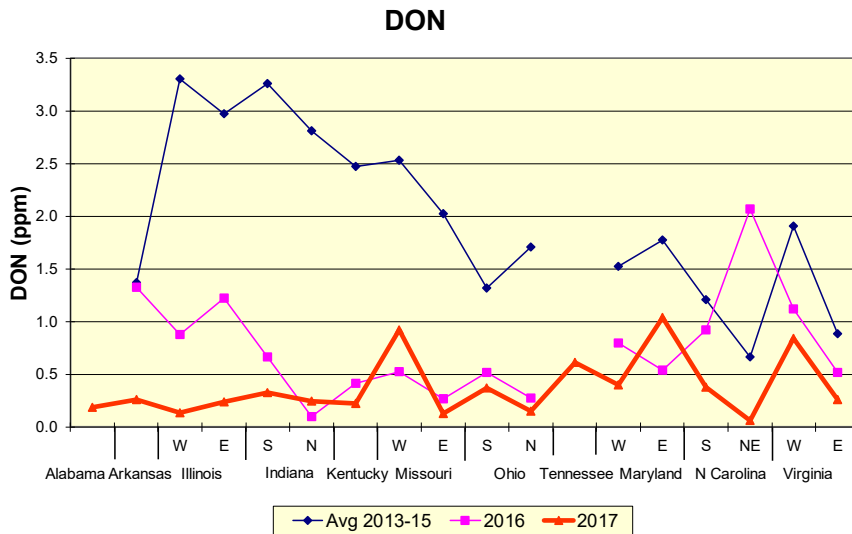
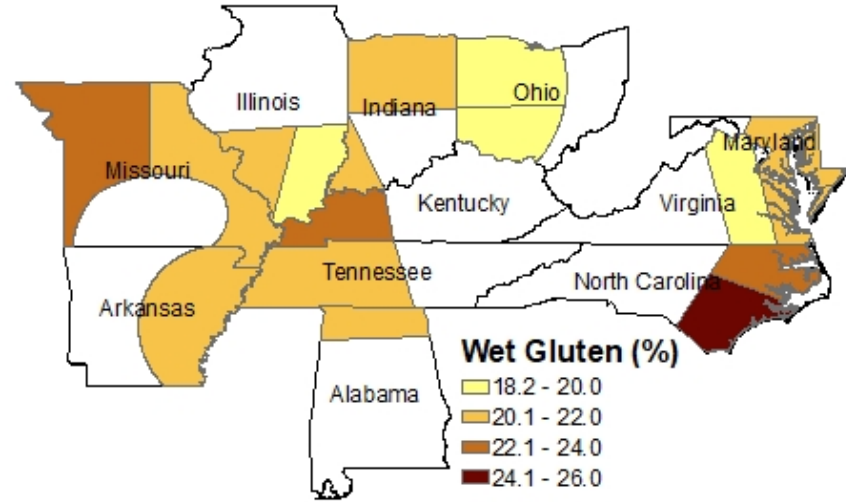
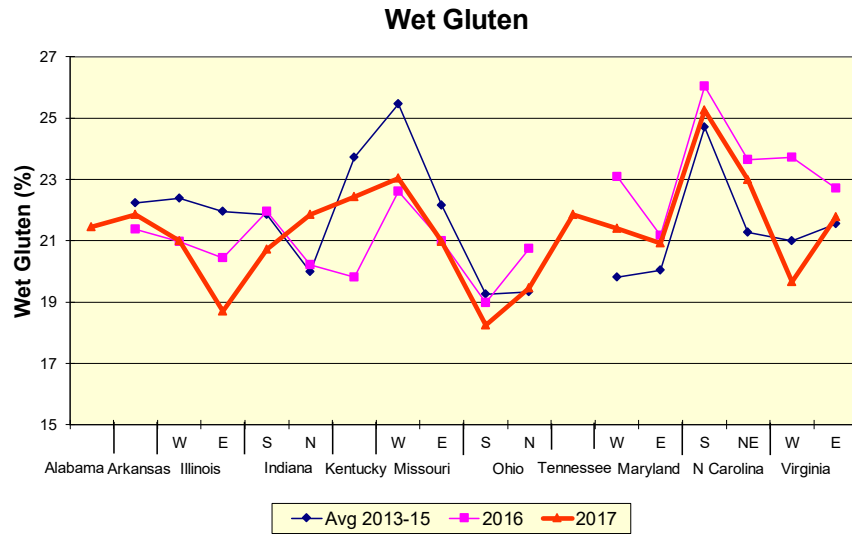
Sedimentation



Laboratory Mill Flour Yield

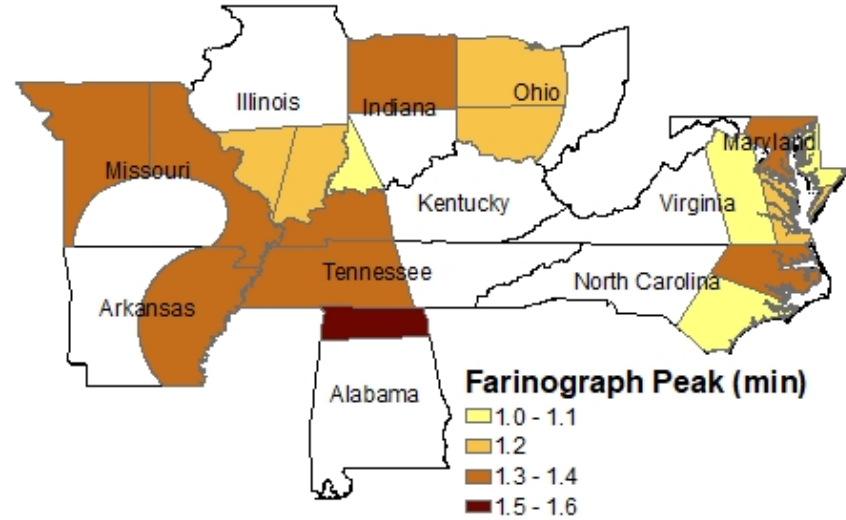
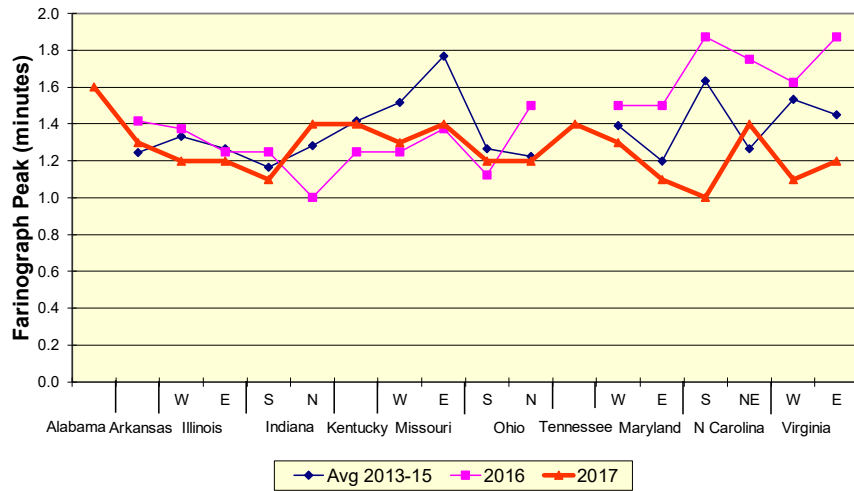


Distribution of 2017 Results and Comparisons with Previous Years For Selected Quality Factors

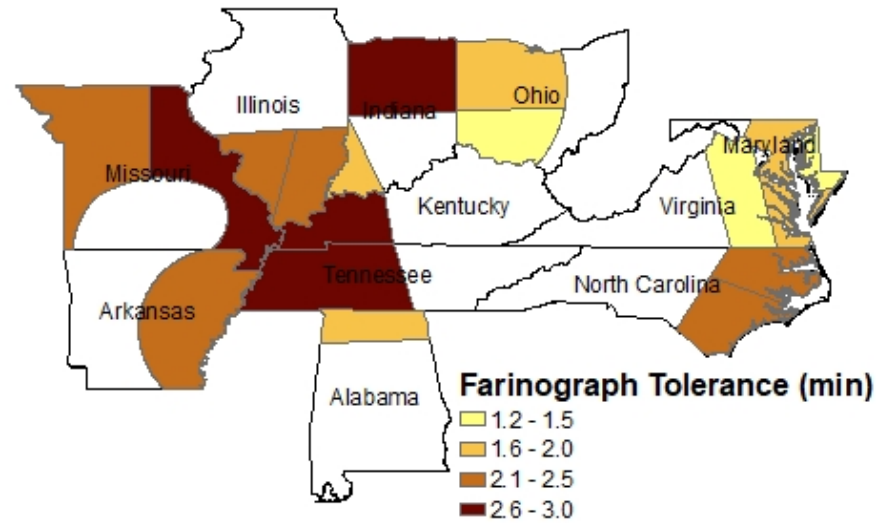
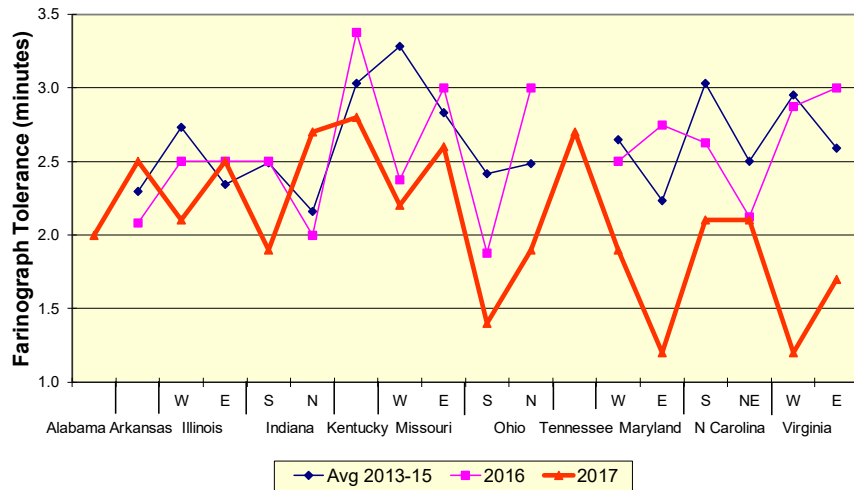


Distribution of 2017 Results and Comparisons with Previous Years For Selected Quality Factors

Farinograph Peak

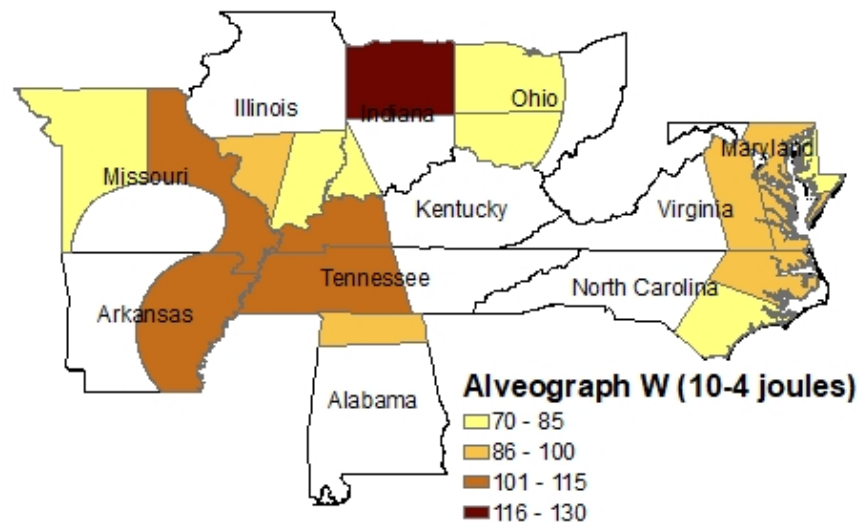
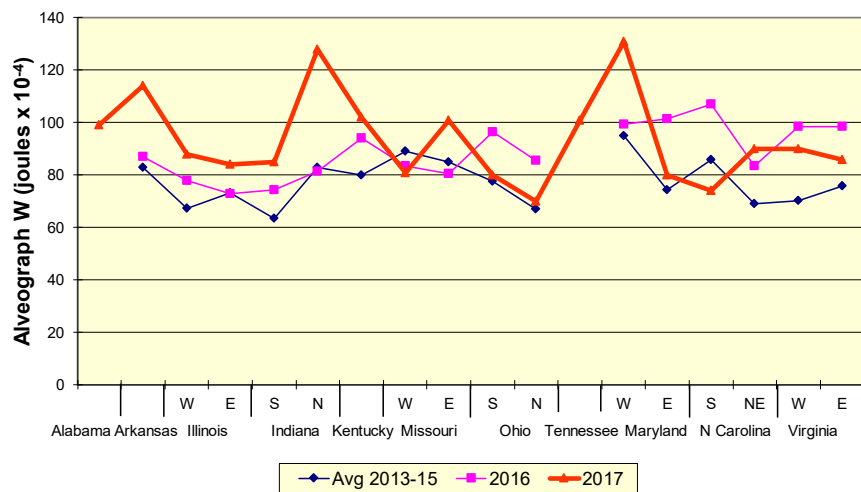


Farinograph Tolerance



Distribution of 2017 Results and Comparisons with Previous Years For Selected Quality Factors

Alveograph W Value



Alveograph P/L

