

Supplementary Material

Identification of polymorphisms in *TYRP1*, *DCT* and *RAB38* genes and their association with coat color in alpacas

Carola Melo^{1*}, P. Walter Bravo¹, Cesar Amath¹, Celso Zapata²

¹Laboratorio de Genética. Escuela Profesional de Medicina Veterinaria Canchis. Universidad San Antonio Abad del Cusco. Cusco-Perú.

²Facultad de Medicina Veterinaria y Zootecnia. Universidad Nacional del Altiplano

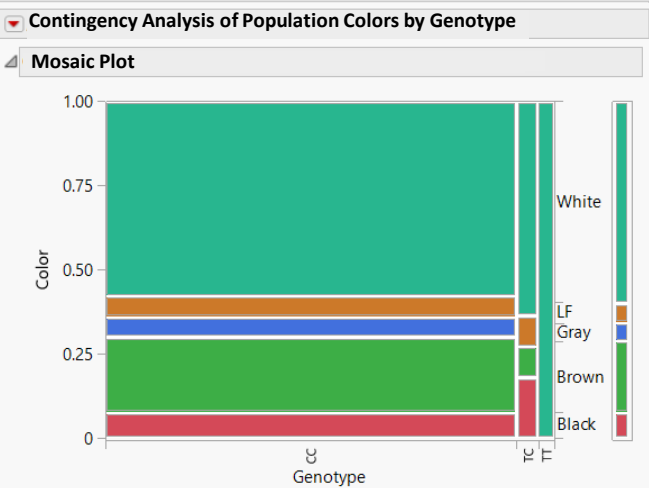
*** Correspondence:**

Corresponding Author

carola.melo@unsaac.edu.pe

Supplementary Materials- Figure 1S. Contingency analysis output files in JMP program for all the sequence variants analyzed in this study. Each image contains a mosaic plot, a contingency table and detailed statistical tests on the images, with two chi-square statistical tests to determine if there is a relationship between phenotype and genotype. The program uses the Spanish language, and all information is in this language.

TYRP1 -62



Peso: Number

Contingency Table

	Color					
	Black	Brown	Gray	LF	White	Total
Genotype	Count	16	47	12	13	121
	Total %	7.02	20.61	5.26	5.70	53.07
	Col %	88.89	97.92	100.00	92.86	88.97
	Row %	7.66	22.49	5.74	6.22	57.89
TC	Count	2	1	0	1	7
	Total %	0.88	0.44	0.00	0.44	3.07
	Col %	11.11	2.08	0.00	7.14	5.15
	Row %	18.18	9.09	0.00	9.09	63.64
TT	Count	0	0	0	0	8
	Total %	0.00	0.00	0.00	0.00	3.51
	Col %	0.00	0.00	0.00	0.00	5.88
	Row %	0.00	0.00	0.00	0.00	100.00
Total	Count	18	48	12	14	136
	Total %	7.89	21.05	5.26	6.14	59.65

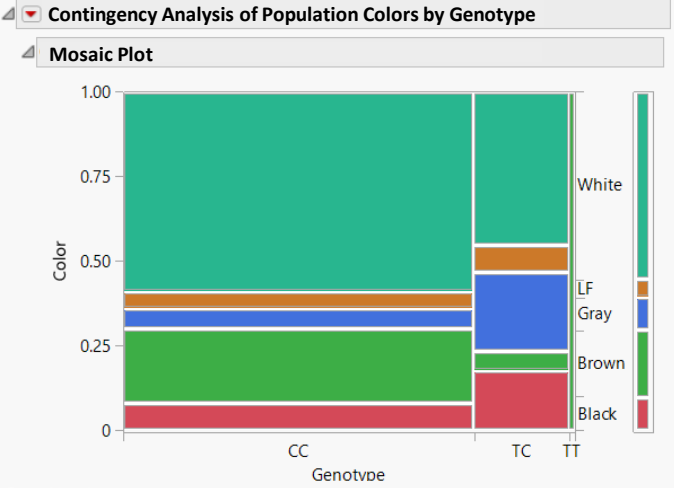
Tests

N	DF	-LogLike	RSquare (U)
228	8	6.0149094	0.0227

Test	ChiSquare	Prob>ChiSq
Likelihood Ratio	12.030	0.1499
Pearson	8.819	0.3578

Warning 20% of cells have expected count less than 5, ChiSquare suspect

TYRP1 -26



Peso: Number

Contingency Table

	Color					
	Black	Brown	Gray	LF	White	Total
Genotype	Count	15	42	11	9	111
	Total %	6.20	17.36	4.55	3.72	45.87
	Col %	62.50	87.50	47.83	69.23	82.84
	Row %	7.98	22.34	5.85	4.79	59.04
TC	Count	9	3	12	4	23
	Total %	3.72	1.24	4.96	1.65	9.50
	Col %	37.50	6.25	52.17	30.77	17.16
	Row %	17.65	5.88	23.53	7.84	45.10
TT	Count	0	3	0	0	3
	Total %	0.00	1.24	0.00	0.00	0.00
	Col %	0.00	6.25	0.00	0.00	0.00
	Row %	0.00	100.00	0.00	0.00	0.00
Total	Count	24	48	23	13	134
	Total %	9.92	19.83	9.50	5.37	55.37

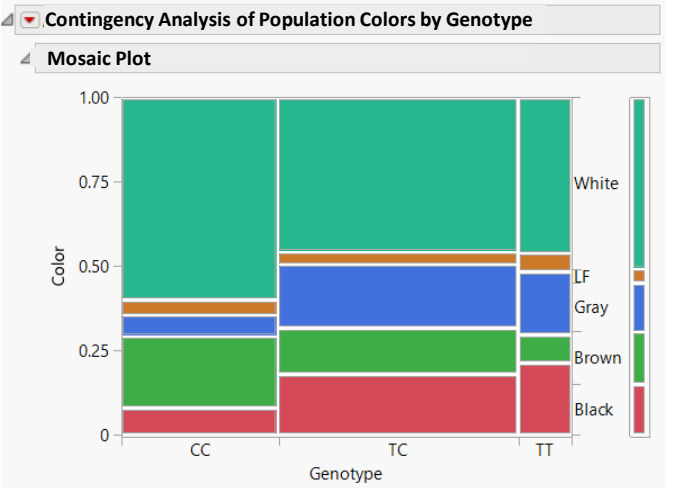
Tests

N	DF	-LogLike	RSquare (U)
242	8	16.550432	0.0544

Test	ChiSquare	Prob>ChiSq
Likelihood Ratio	33.101	<.0001*
Pearson	36.835	<.0001*

Warning 20% of cells have expected count less than 5, ChiSquare suspect

TYRP1 -8



Peso: Number

Contingency Table

	Color					
	Black	Brown	Gray	LF	White	Total
Genotype	Count	9	23	7	5	65
	Total %	2.88	7.37	2.24	1.60	20.83
	Col %	19.15	46.94	15.56	38.46	41.14
	Row %	8.26	21.10	6.42	4.59	59.63
TC	Count	30	23	31	6	76
	Total %	9.62	7.37	9.94	1.92	24.36
	Col %	63.83	46.94	68.89	46.15	48.10
	Row %	18.07	13.86	18.67	3.61	45.78
TT	Count	8	3	7	2	17
	Total %	2.56	0.96	2.24	0.64	5.45
	Col %	17.02	6.12	15.56	15.38	10.76
	Row %	21.62	8.11	18.92	5.41	45.95
Total	Count	47	49	45	13	158
	Total %	15.06	15.71	14.42	4.17	50.64

Tests

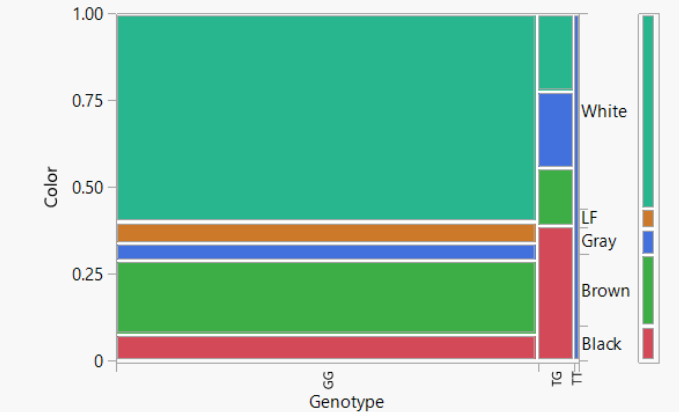
N	DF	-LogLike	RSquare (U)
312	8	10.566804	0.0254

Test	ChiSquare	Prob>ChiSq
Likelihood Ratio	21.134	0.0068*
Pearson	19.564	0.0121*

TYRP1 7

Contingency Analysis of Population Colors by Genotype

Mosaic Plot



Peso: Number

Contingency Table

	Color					
	Black	Brown	Gray	LF	White	Total
	Count					
	Total %					
	Col %					Row %
GG	16	44	11	13	124	208
	7.02	19.30	4.82	5.70	54.39	91.23
	69.57	93.62	64.71	100.00	96.88	
	7.69	21.15	5.29	6.25	59.62	
TG	7	3	4	0	4	18
	3.07	1.32	1.75	0.00	1.75	7.89
	30.43	6.38	23.53	0.00	3.13	
	38.89	16.67	22.22	0.00	22.22	
TT	0	0	2	0	0	2
	0.00	0.00	0.88	0.00	0.00	0.88
	0.00	0.00	11.76	0.00	0.00	
	0.00	0.00	100.00	0.00	0.00	
Total	23	47	17	13	128	228
	10.09	20.61	7.46	5.70	56.14	

Tests

N	DF	-LogLike	RSquare (U)
228	8	16.323475	0.0578

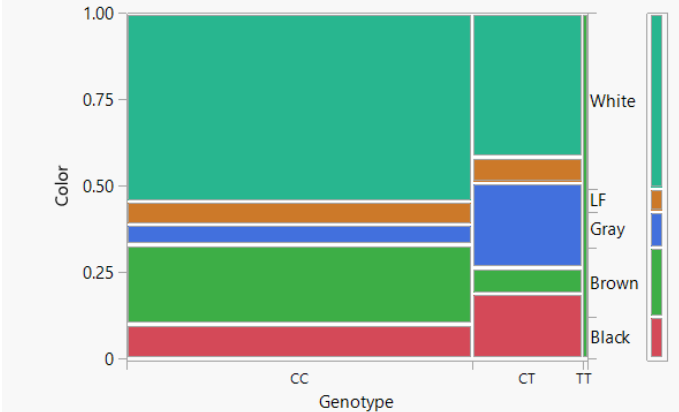
Test	ChiSquare	Prob>ChiSq
Likelihood Ratio	32.647	<.0001*
Pearson	52.820	<.0001*

Warning 20% of cells have expected count less than 5, ChiSquare suspect

TYRP1 104

Contingency Analysis of Population Colors by Genotype

Mosaic Plot



Peso: Number

Contingency Table

	Color					
	Black	Brown	Gray	LF	White	Total
	Count					
	Total %					
	Col %					Row %
CC	17	38	10	11	90	166
	7.69	17.19	4.52	4.98	40.72	75.11
	62.96	86.36	43.48	73.33	80.36	
	10.24	22.89	6.02	6.63	54.22	
CT	10	4	13	4	22	53
	4.52	1.81	5.88	1.81	9.95	23.98
	37.04	9.09	56.52	26.67	19.64	
	18.87	7.55	24.53	7.55	41.51	
TT	0	2	0	0	0	2
	0.00	0.90	0.00	0.00	0.00	0.90
	0.00	4.55	0.00	0.00	0.00	
	0.00	100.00	0.00	0.00	0.00	
Total	27	44	23	15	112	221
	12.22	19.91	10.41	6.79	50.68	

Tests

N	DF	-LogLike	RSquare (U)
221	8	13.519532	0.0456

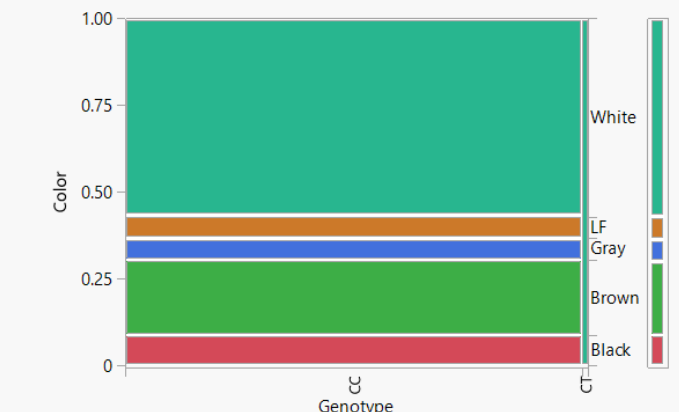
Test	ChiSquare	Prob>ChiSq
Likelihood Ratio	27.039	0.0007*
Pearson	29.865	0.0002*

Warning 20% of cells have expected count less than 5, ChiSquare suspect

TYRP1 139

Contingency Analysis of Population Colors by Genotype

Mosaic Plot



Peso: Number

Contingency Table

	Color					
	Black	Brown	Gray	LF	White	Total
	Count					
	Total %					
	Col %					Row %
CC	16	39	11	12	101	179
	8.84	21.55	6.08	6.63	55.80	98.90
	100.00	100.00	100.00	100.00	98.06	
	8.94	21.79	6.15	6.70	56.42	
CT	0	0	0	0	2	2
	0.00	0.00	0.00	0.00	1.10	1.10
	0.00	0.00	0.00	0.00	1.94	
	0.00	0.00	0.00	0.00	100.00	
TT	0	0	0	0	0	0
	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	
	0.00	0.00	0.00	0.00	0.00	
Total	16	39	11	12	103	181
	8.84	21.55	6.08	6.63	56.91	

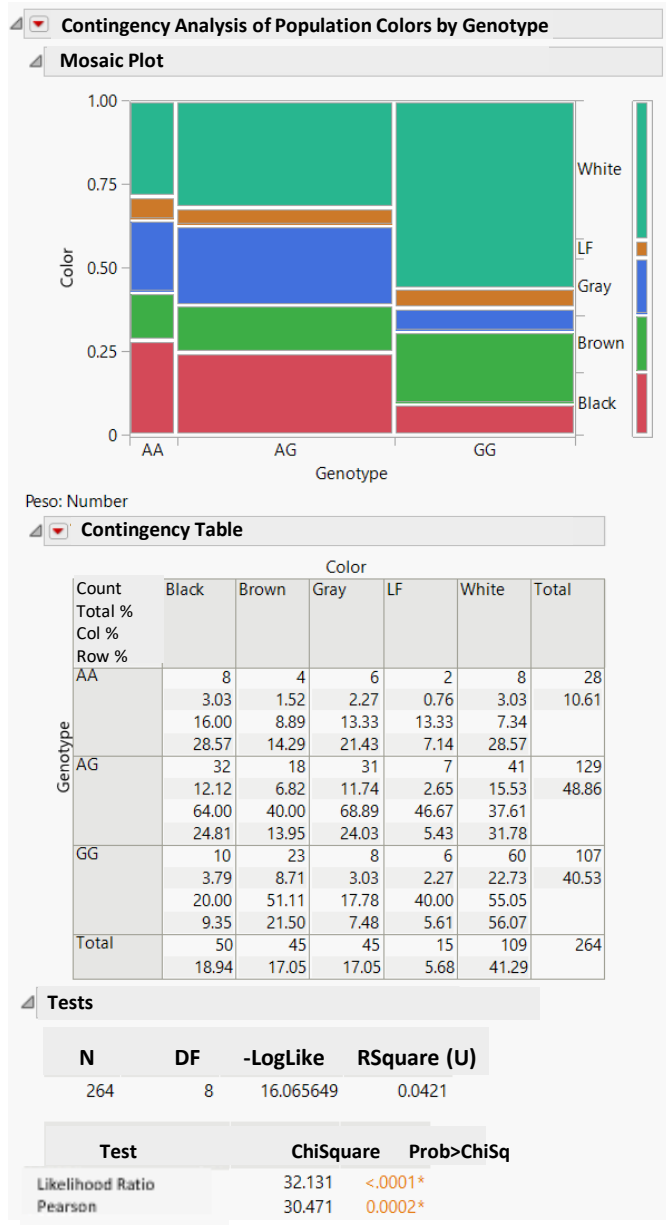
Tests

N	DF	-LogLike	RSquare (U)
181	4	1.1359898	0.0052

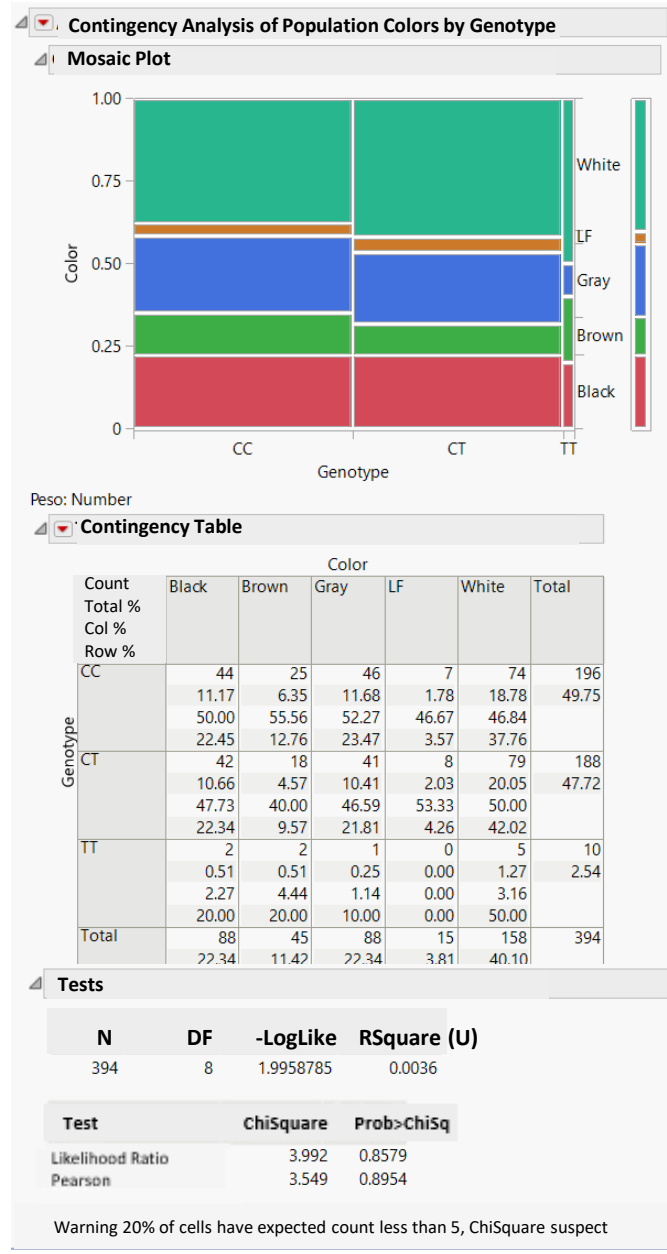
Test	ChiSquare	Prob>ChiSq
Likelihood Ratio	2.272	0.6859
Pearson	1.531	0.8210

Warning 20% of cells have expected count less than 5, ChiSquare suspect

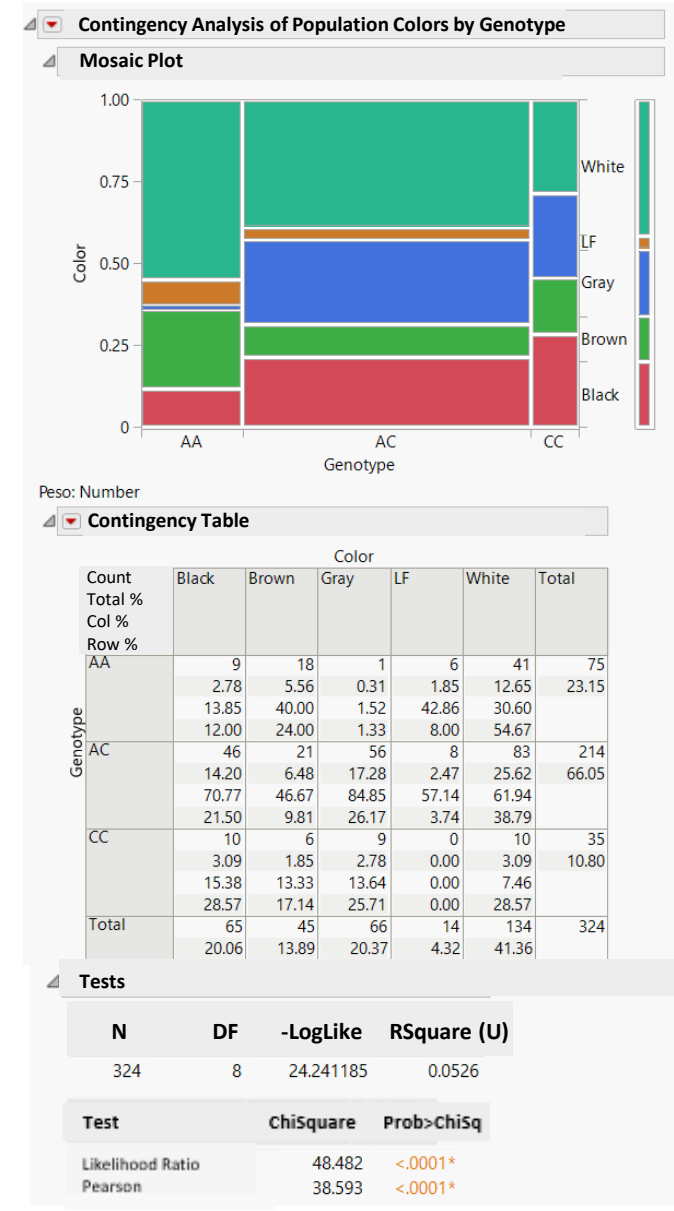
TYRP1 144



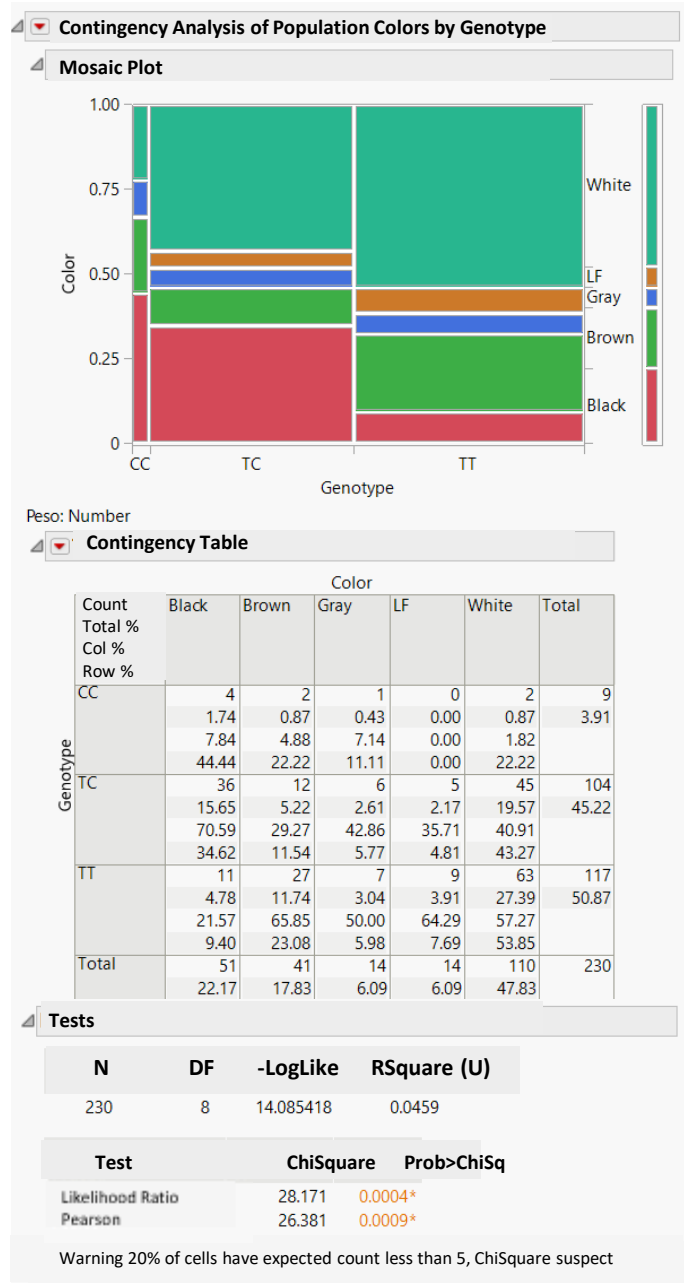
TYRP1 228



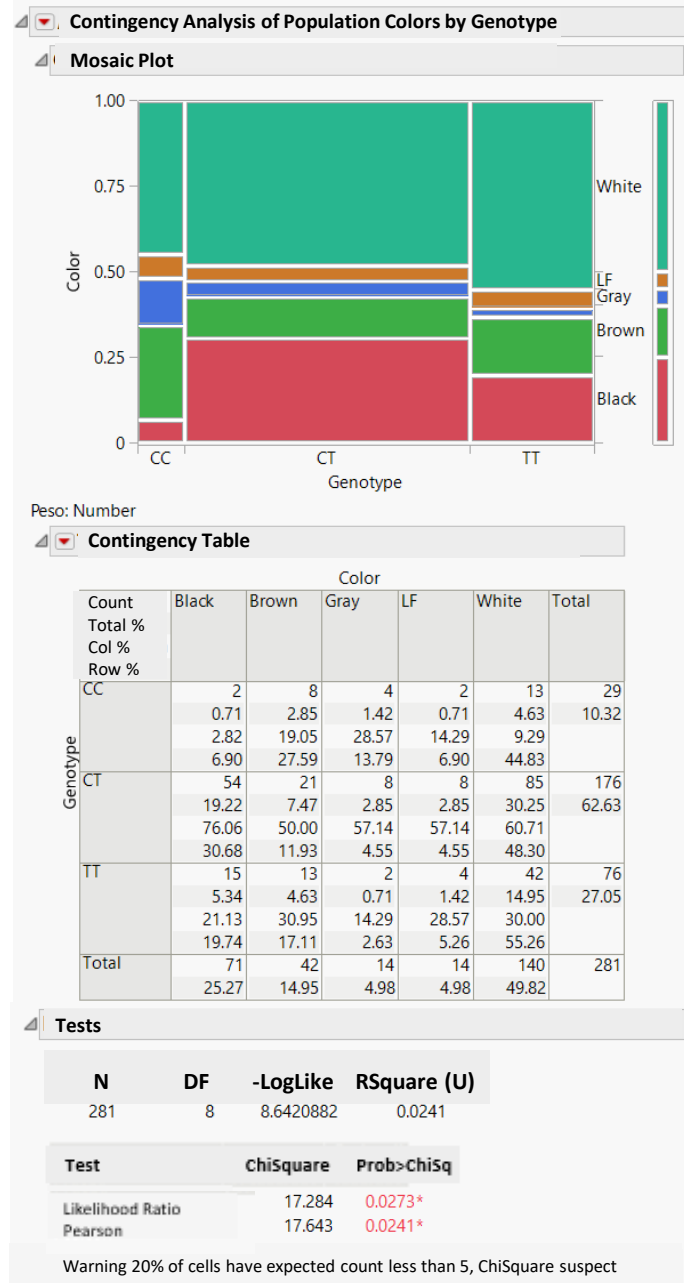
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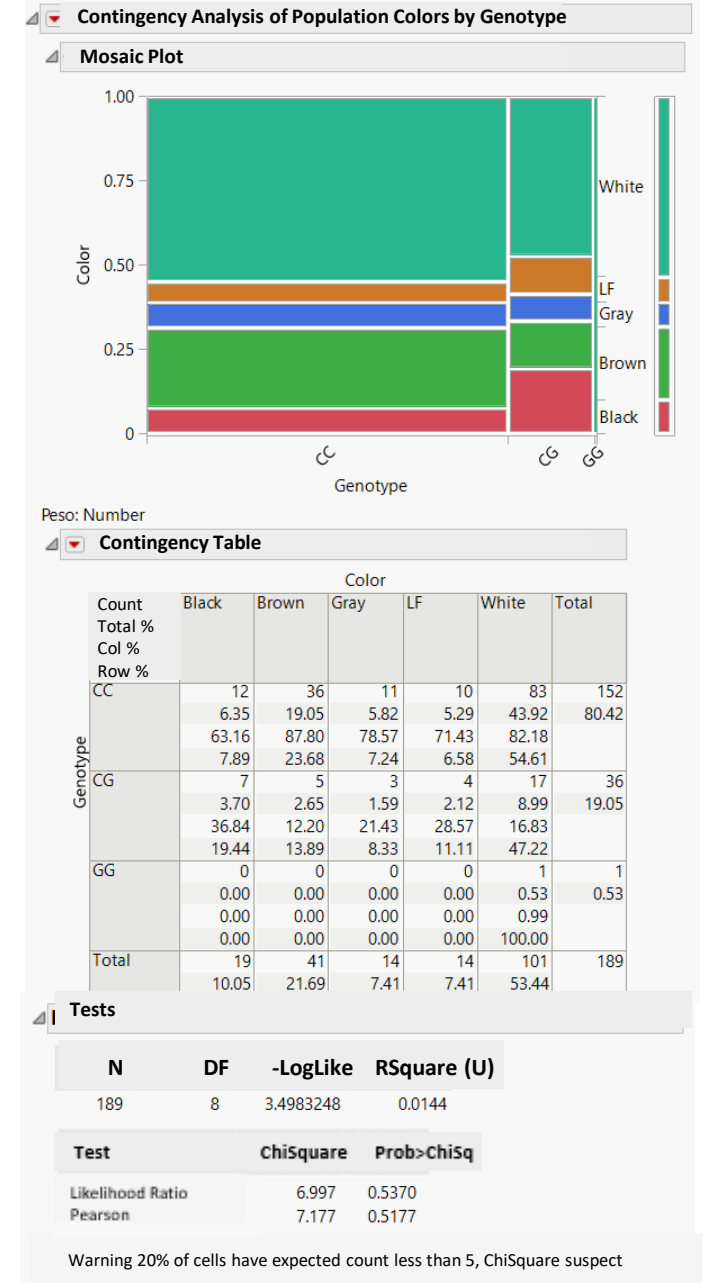
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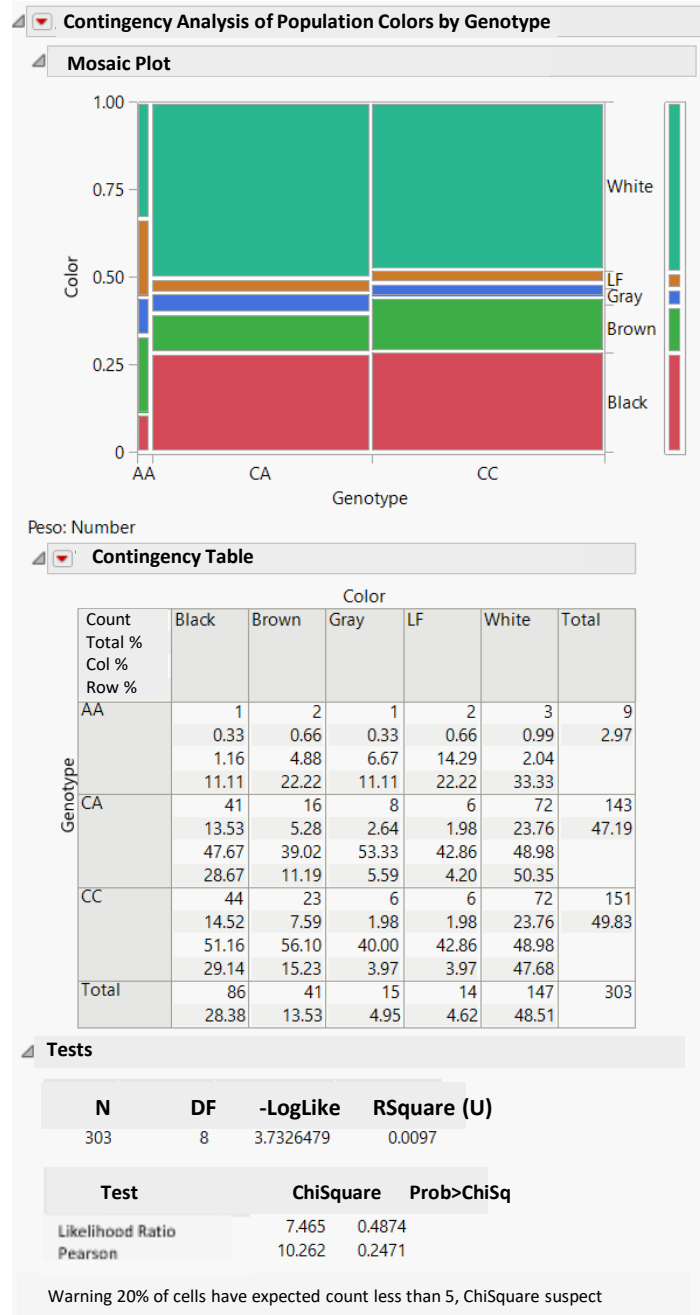
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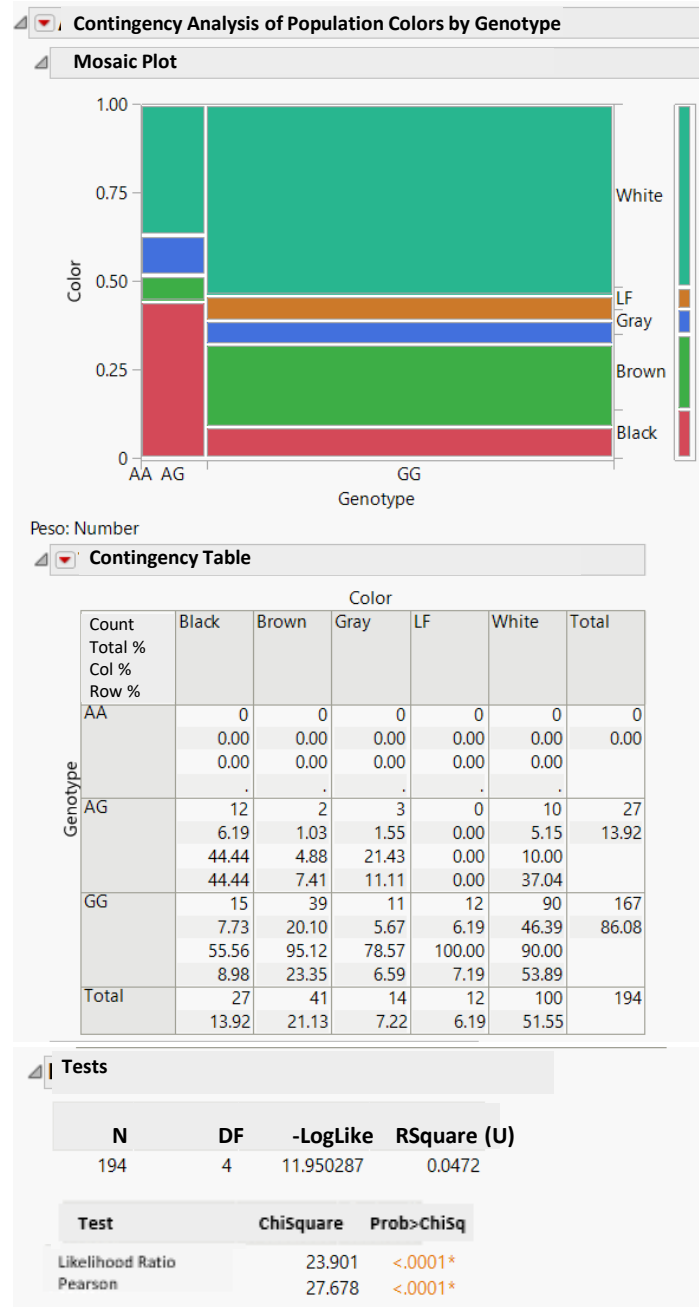
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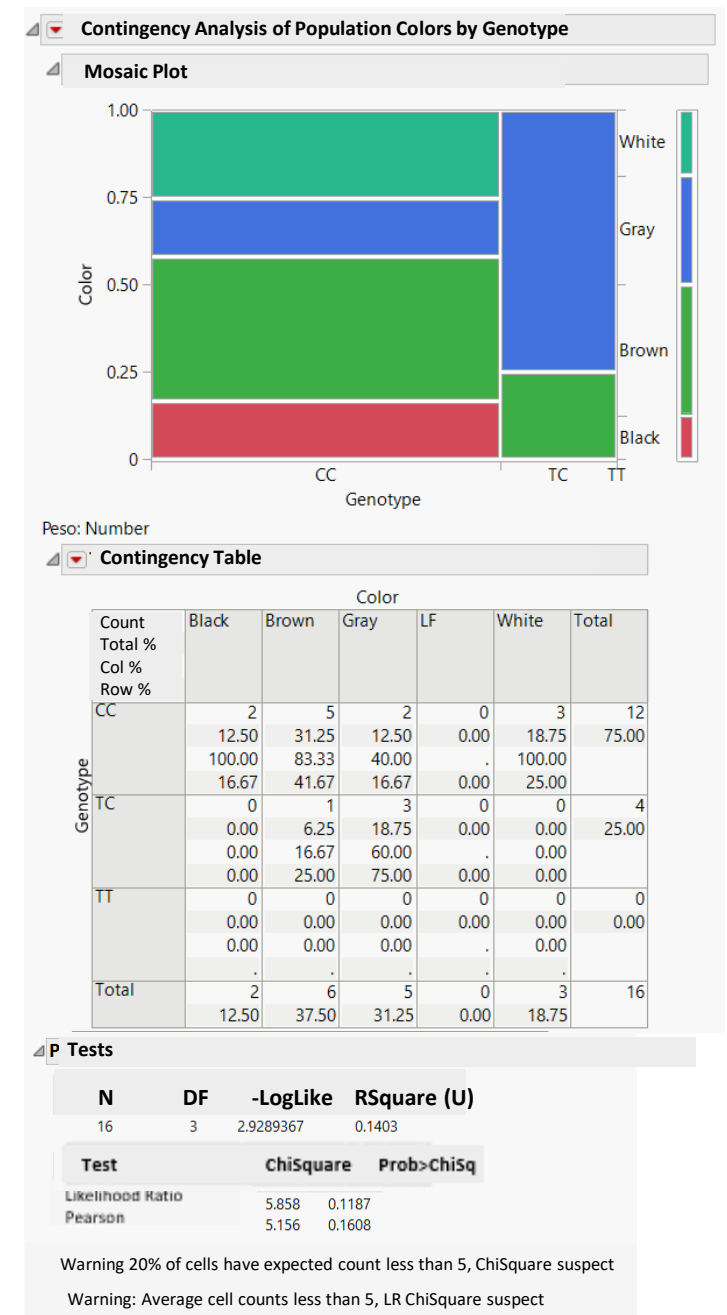
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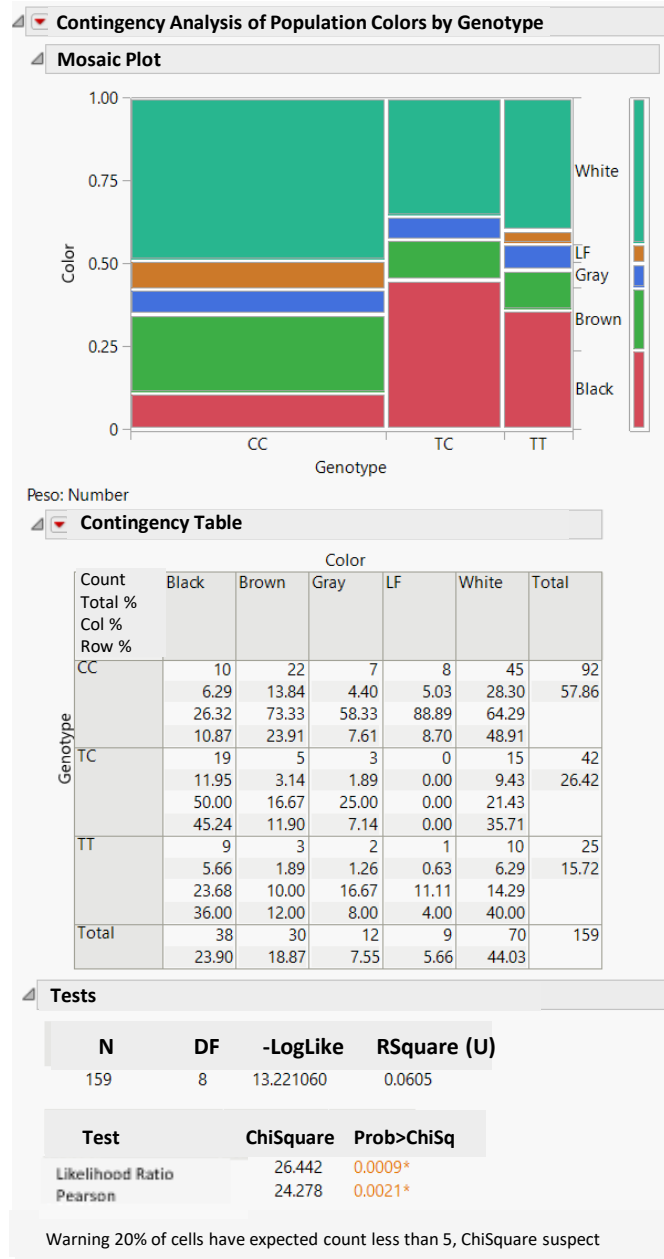
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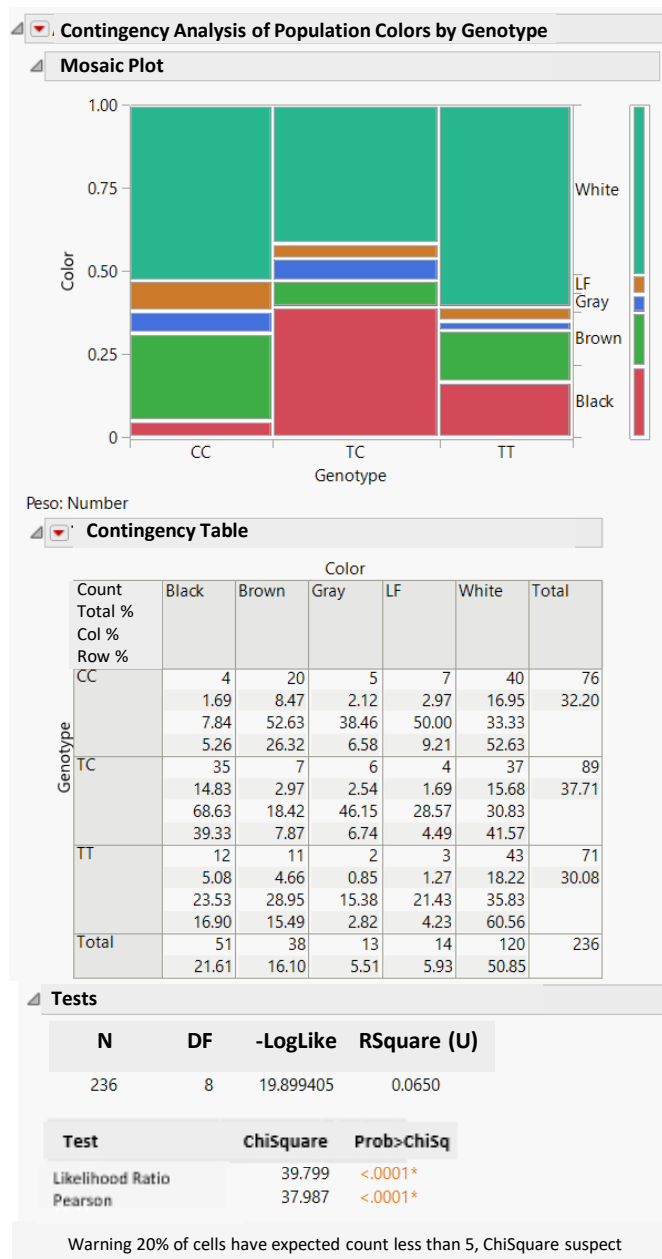
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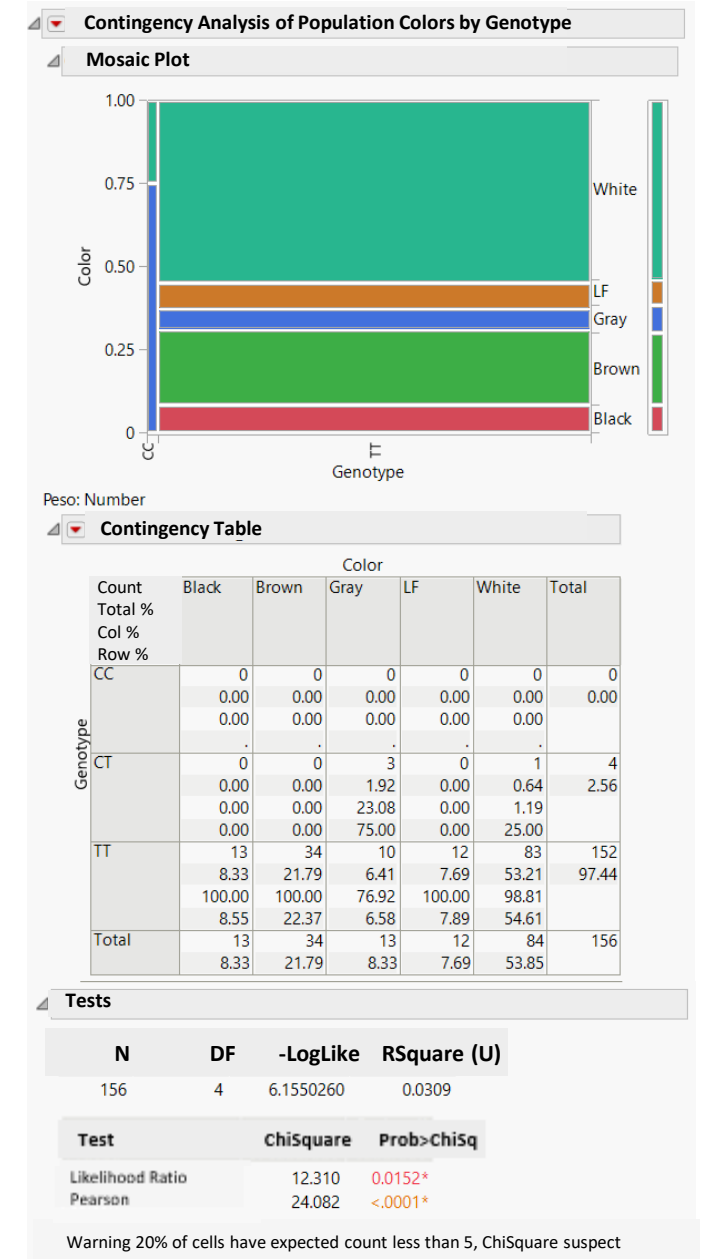
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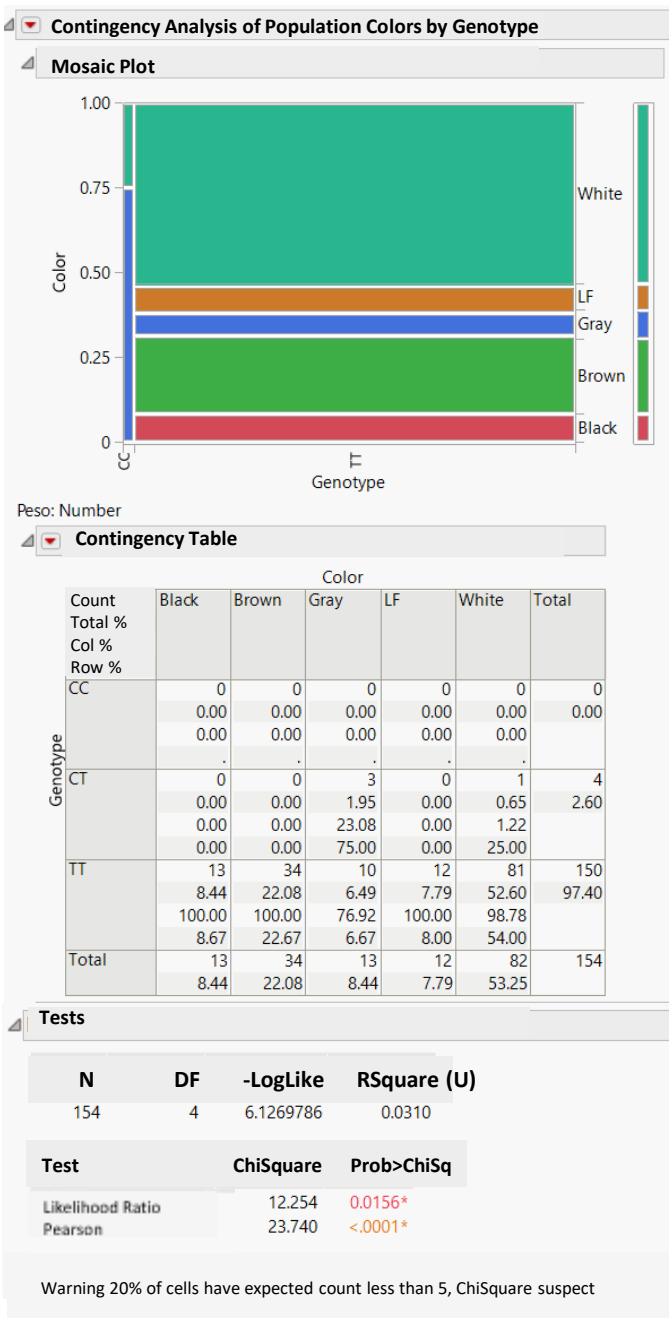
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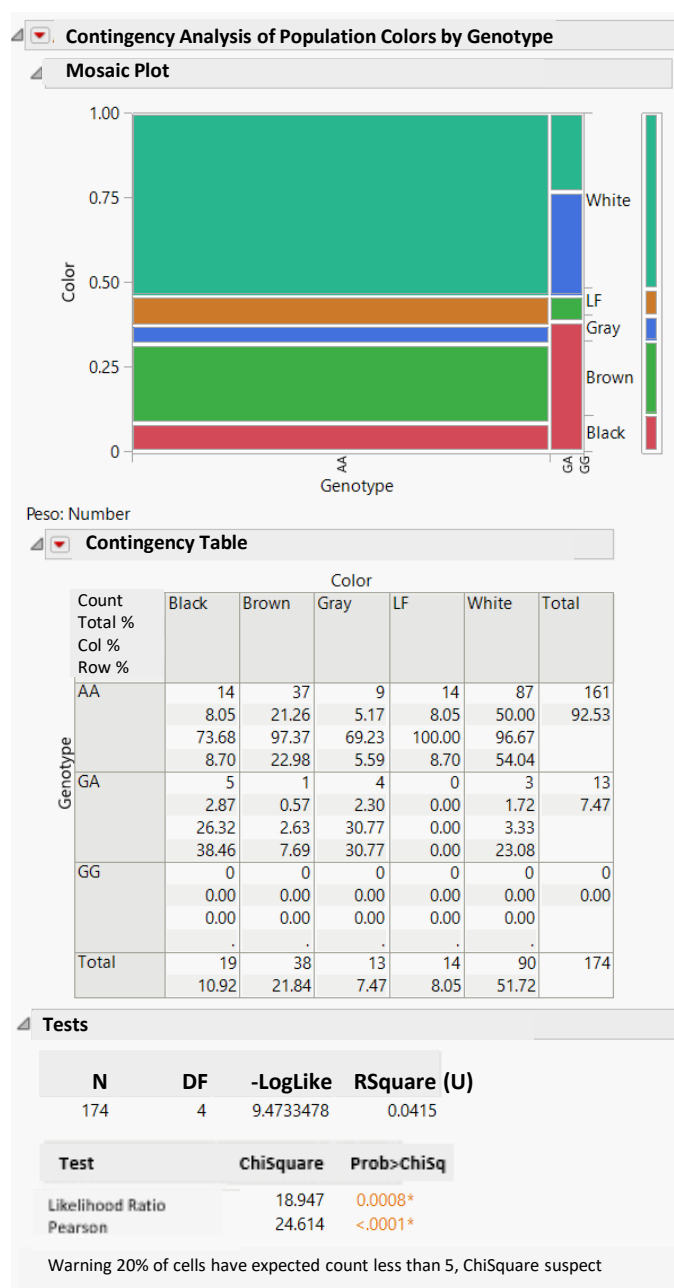
TYRP1 1503



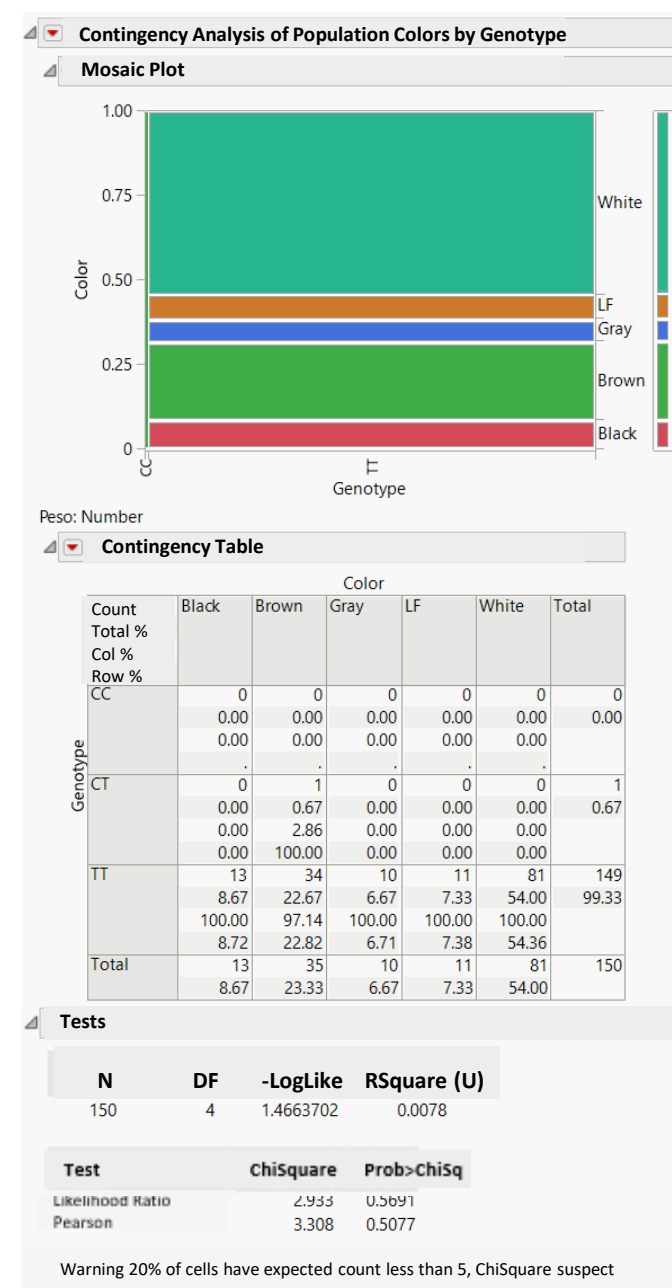
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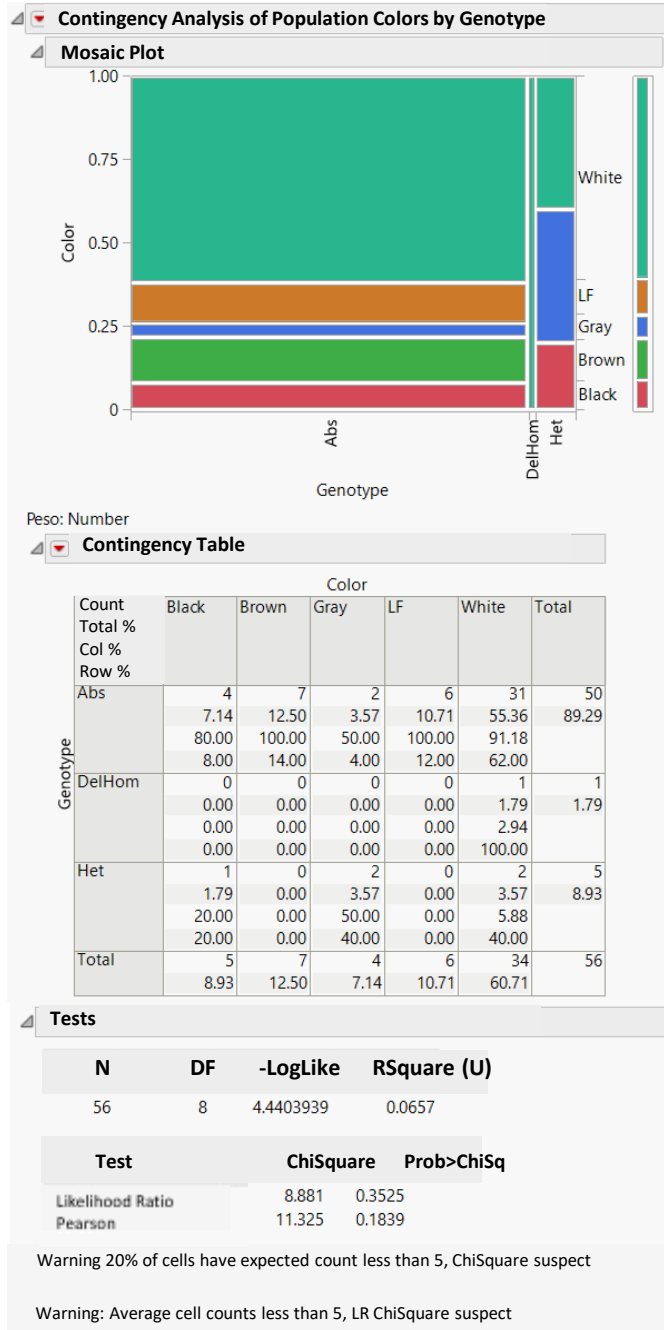
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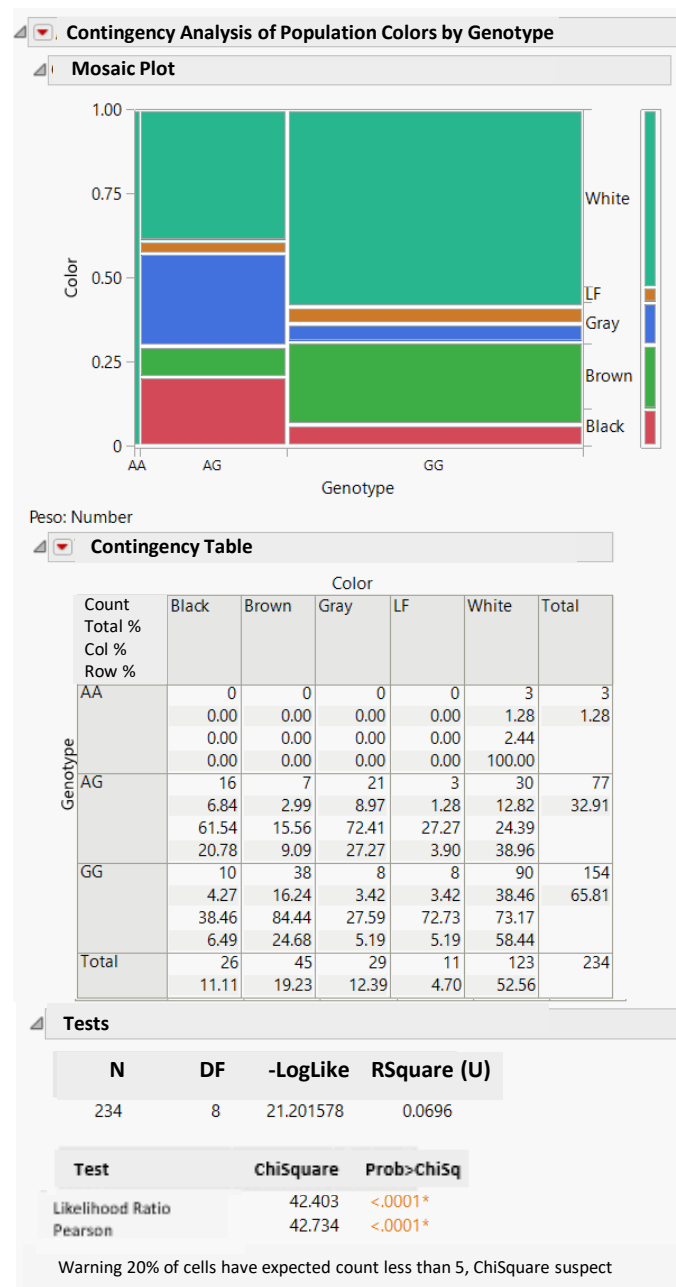
TYRP1 1607



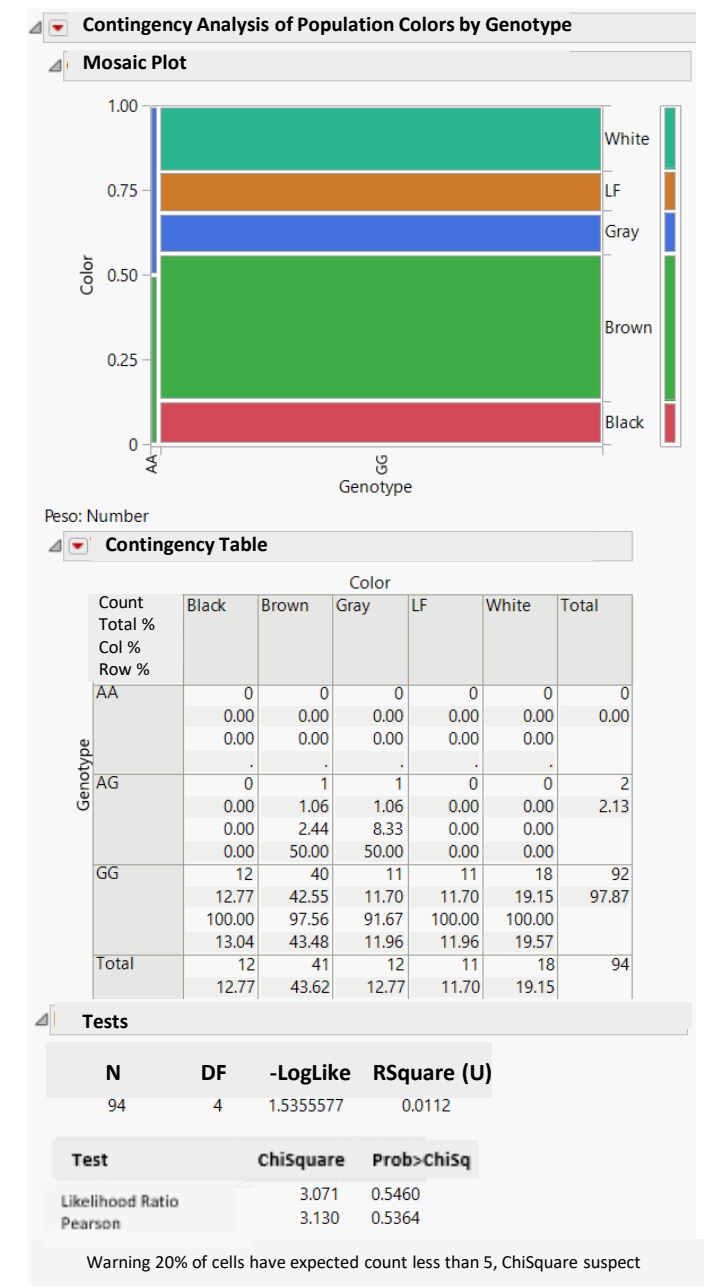
TYRP1 +2



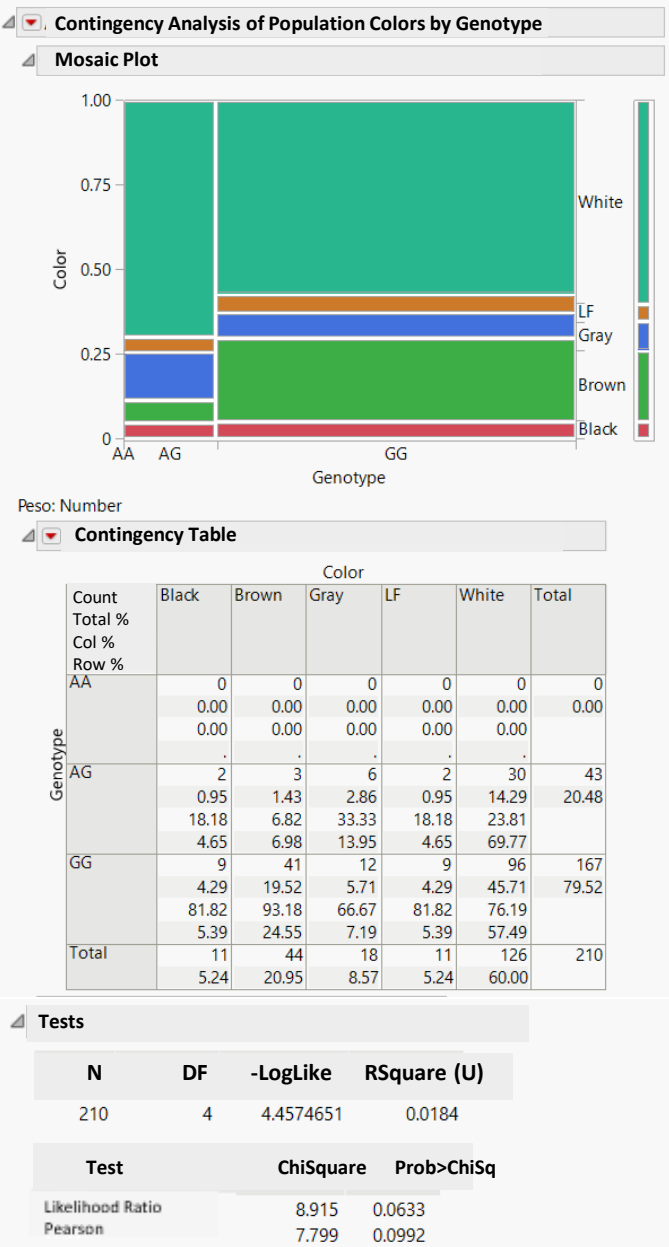
DCT -20



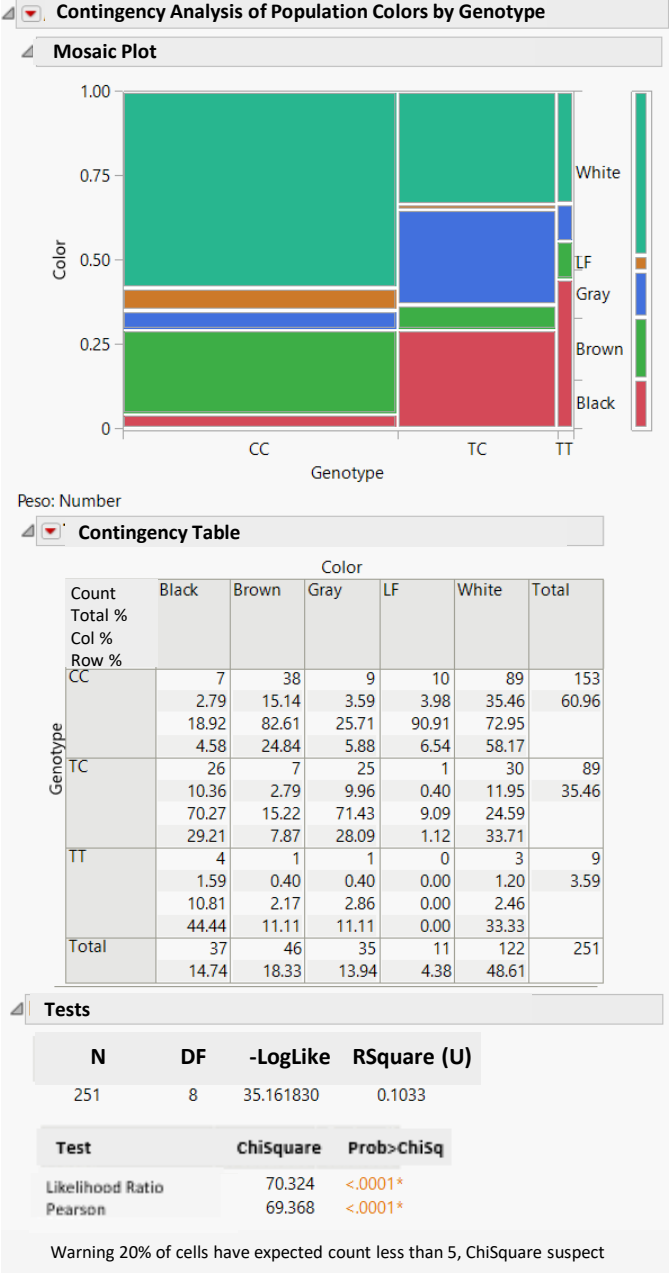
DCT 56



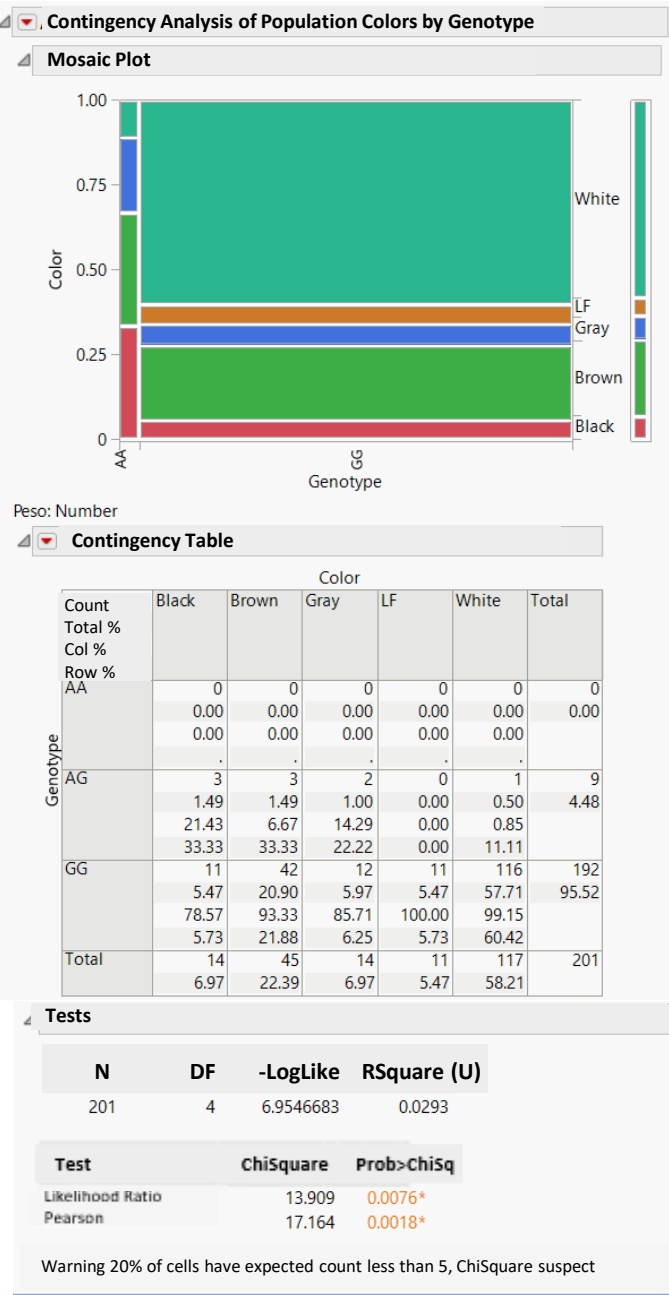
DCT 166



DCT 168



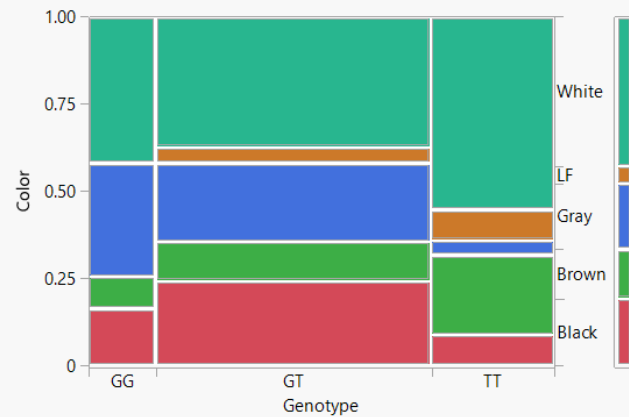
DCT 226



DCT 471

Contingency Analysis of Population Colors by Genotype

Mosaic Plot



Peso: Number

Contingency Table

		Color					
Genotype	Count	Black	Brown	Gray	LF	White	Total
	Total %						
	Col %						
	Row %						
	GG	7	4	14	0	18	43
		2.36	1.35	4.71	0.00	6.06	14.48
		12.28	9.52	25.00	0.00	14.17	
		16.28	9.30	32.56	0.00	41.86	
	GT	43	20	39	8	66	176
		14.48	6.73	13.13	2.69	22.22	59.26
	75.44	47.62	69.64	53.33	51.97		
	24.43	11.36	22.16	4.55	37.50		
TT	7	18	3	7	43	78	
	2.36	6.06	1.01	2.36	14.48	26.26	
	12.28	42.86	5.36	46.67	33.86		
	8.97	23.08	3.85	8.97	55.13		
Total	57	42	56	15	127	297	
	19.19	14.14	18.86	5.05	42.76		

Tests

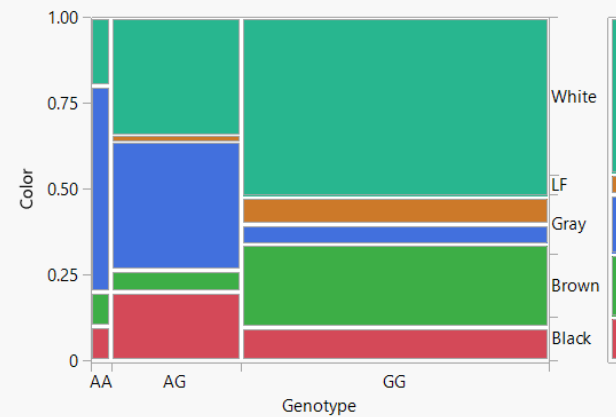
N	DF	-LogLike	RSquare (U)
297	8	20.904933	0.0495

Test	ChiSquare	Prob>ChiSq
Likelihood Ratio	41.810	<.0001*
Pearson	36.223	<.0001*

DCT 480

Contingency Analysis of Population Colors by Genotype

Mosaic Plot



Peso: Number

Contingency Table

		Color					
Genotype	Count	Black	Brown	Gray	LF	White	Total
	Total %						
	Col %						
	Row %						
	AA	1	1	6	0	2	10
		0.44	0.44	2.67	0.00	0.89	4.44
		3.45	2.44	15.38	0.00	1.94	
		10.00	10.00	60.00	0.00	20.00	
	AG	13	4	24	1	22	64
		5.78	1.78	10.67	0.44	9.78	28.44
	44.83	9.76	61.54	7.69	21.36		
	20.31	6.25	37.50	1.56	34.38		
GG	15	36	9	12	79	151	
	6.67	16.00	4.00	5.33	35.11	67.11	
	51.72	87.80	23.08	92.31	76.70		
	9.93	23.84	5.96	7.95	52.32		
Total	29	41	39	13	103	224	
	12.89	18.22	17.33	5.78	45.78		

Tests

N	DF	-LogLike	RSquare (U)
225	8	28.020914	0.0889

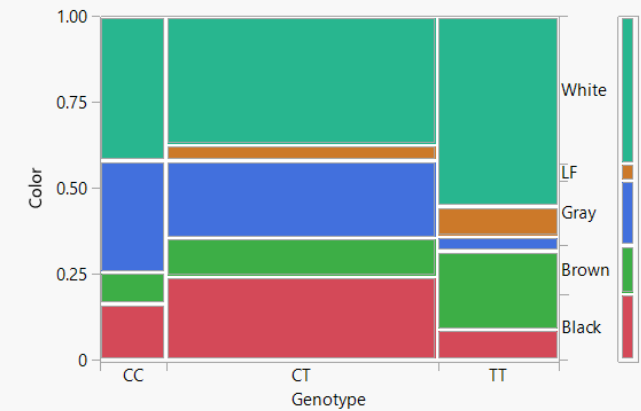
Test	ChiSquare	Prob>ChiSq
Likelihood Ratio	56.042	<.0001*
Pearson	57.089	<.0001*

Warning 20% of cells have expected count less than 5, ChiSquare suspect

DCT 501

Contingency Analysis of Population Colors by Genotype

Mosaic Plot



Peso: Number

Contingency Table

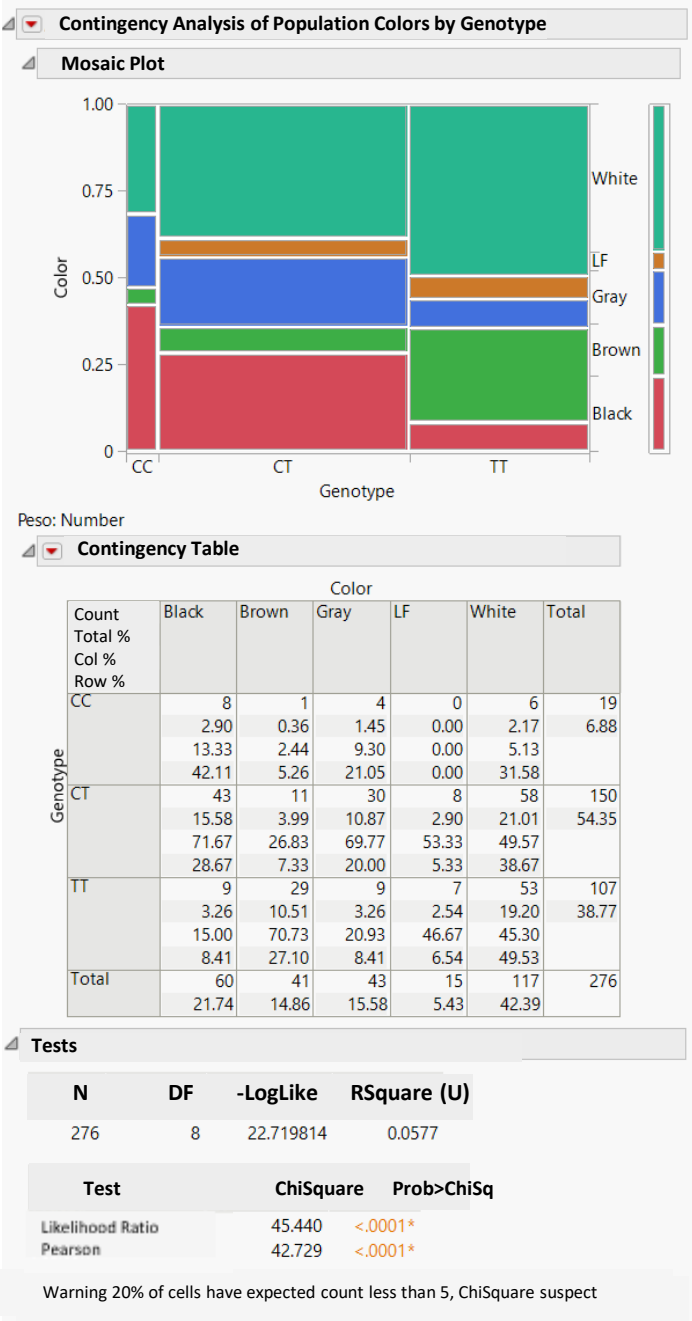
		Color					
Genotype	Count	Black	Brown	Gray	LF	White	Total
	Total %						
	Col %						
	Row %						
	CC	7	4	14	0	18	43
	2.36	1.35	4.71	0.00	6.06	14.48	
	12.28	9.52	25.00	0.00	14.17		
	16.28	9.30	32.56	0.00	41.86		
CT	43	20	39	8	66	176	
	14.48	6.73	13.13	2.69	22.22	59.26	
	75.44	47.62	69.64	53.33	51.97		
	24.43	11.36	22.16	4.55	37.50		
TT	7	18	3	7	43	78	
	2.36	6.06	1.01	2.36	14.48	26.26	
	12.28	42.86	5.36	46.67	33.86		
	8.97	23.08	3.85	8.97	55.13		
Total	57	42	56	15	127	297	
	19.19	14.14	18.86	5.05	42.76		

Tests

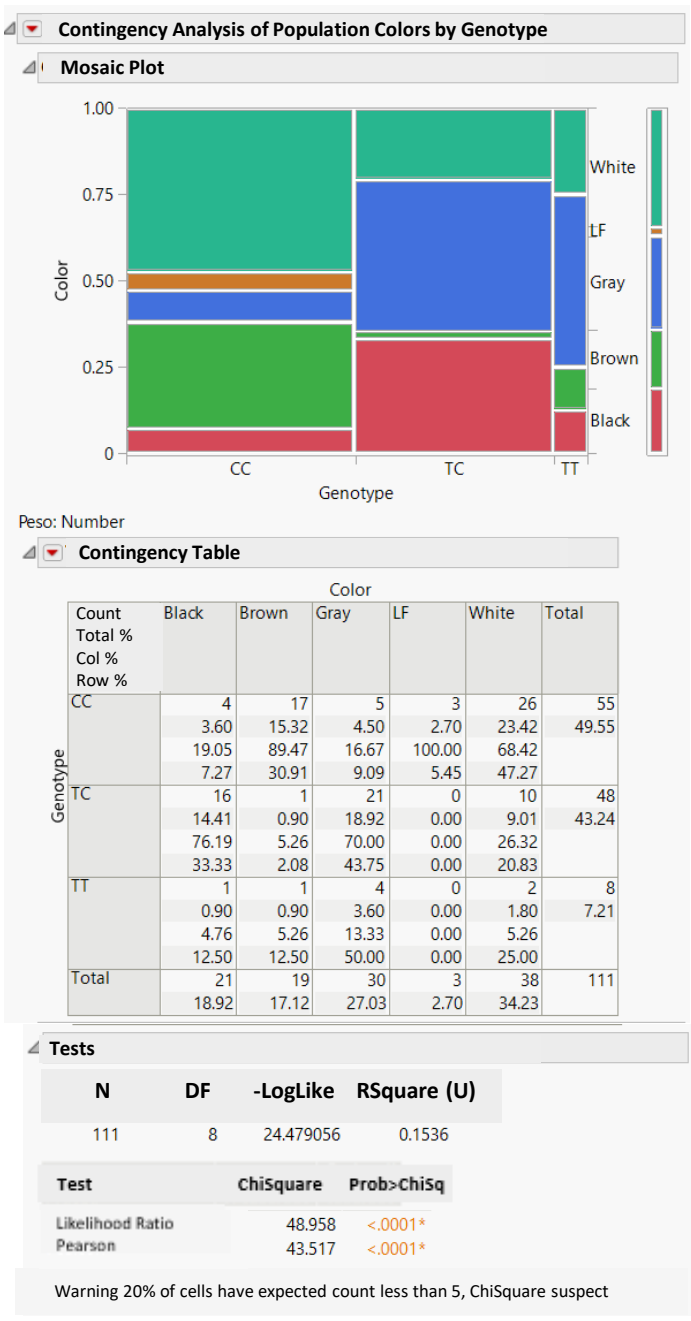
N	DF	-LogLike	RSquare (U)
297	8	20.904933	0.0495

Test	ChiSquare	Prob>ChiSq
Likelihood Ratio	41.810	<.0001*
Pearson	36.223	<.0001*

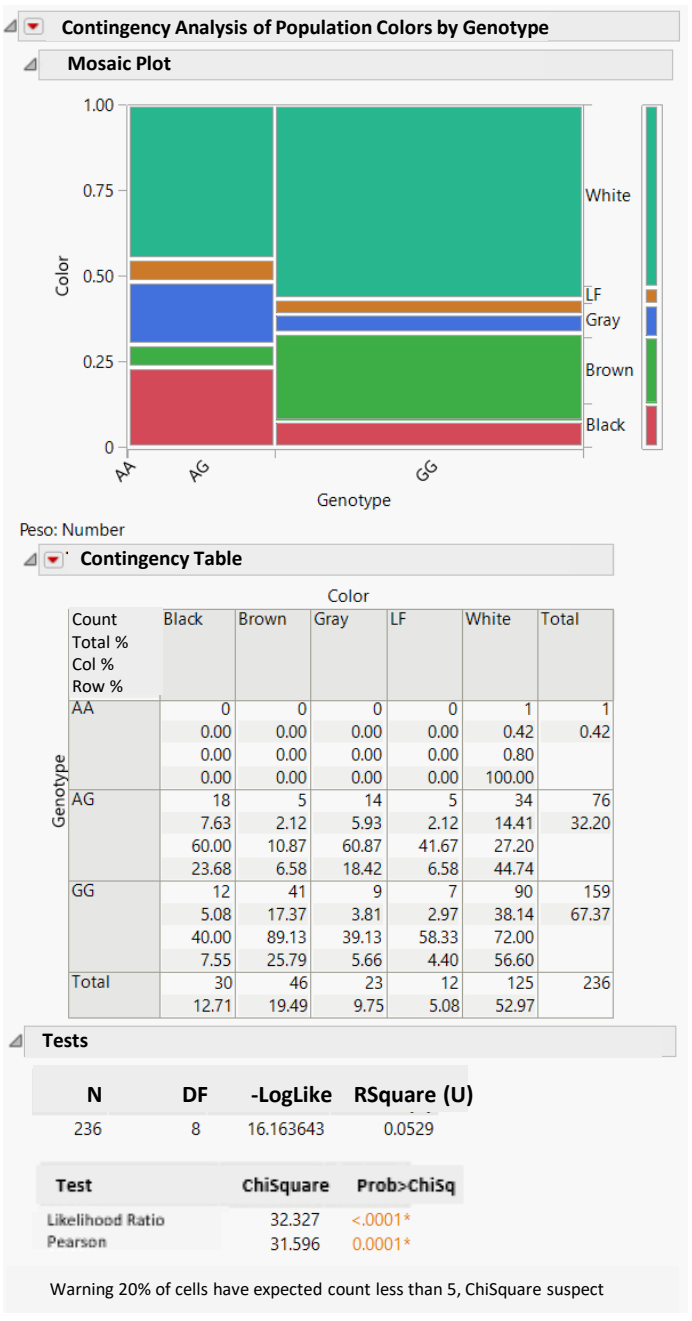
DCT 546



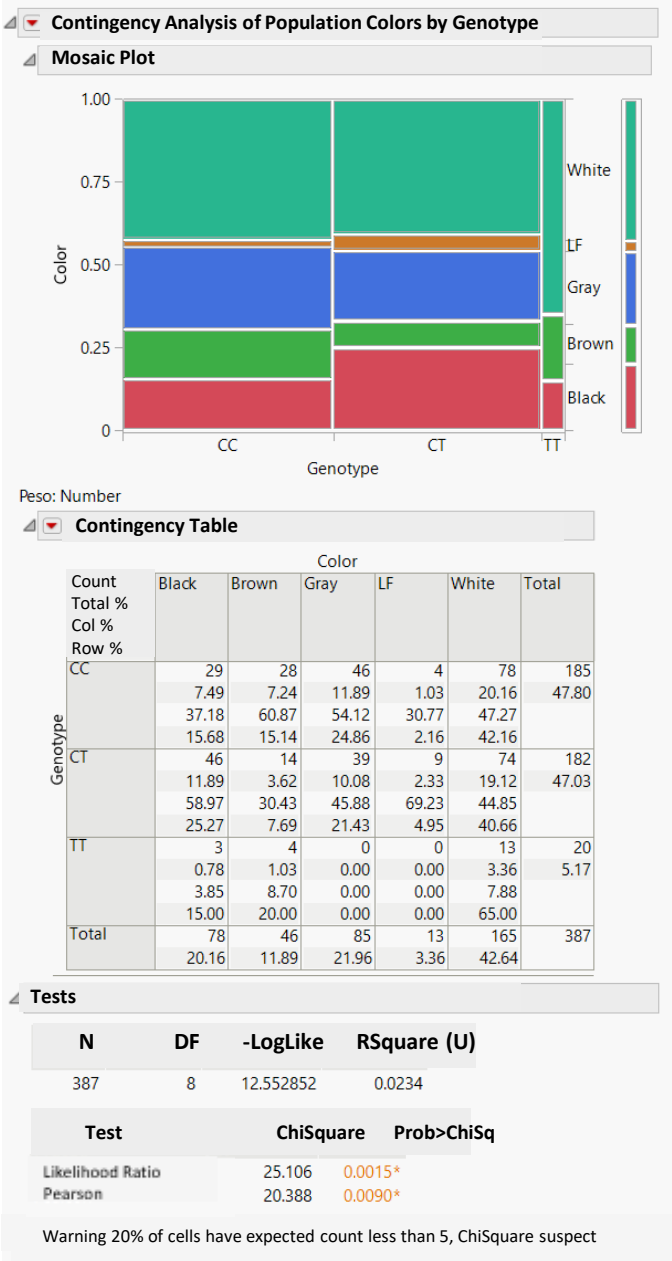
DCT 660



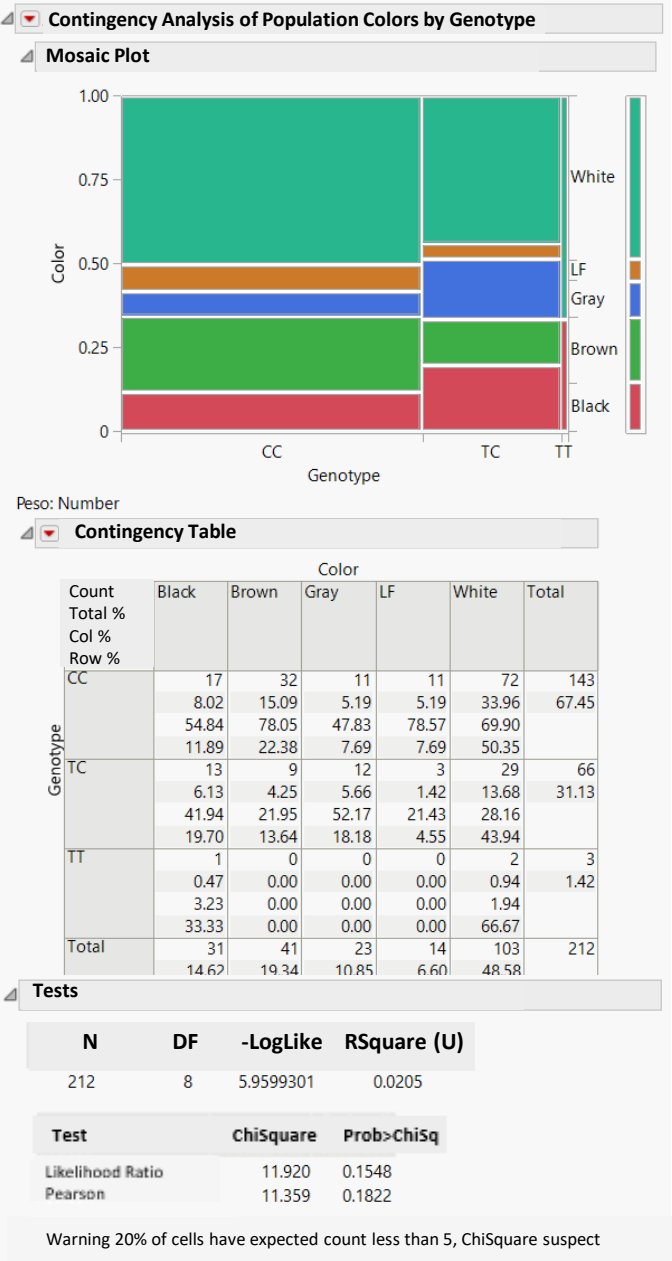
DCT 894



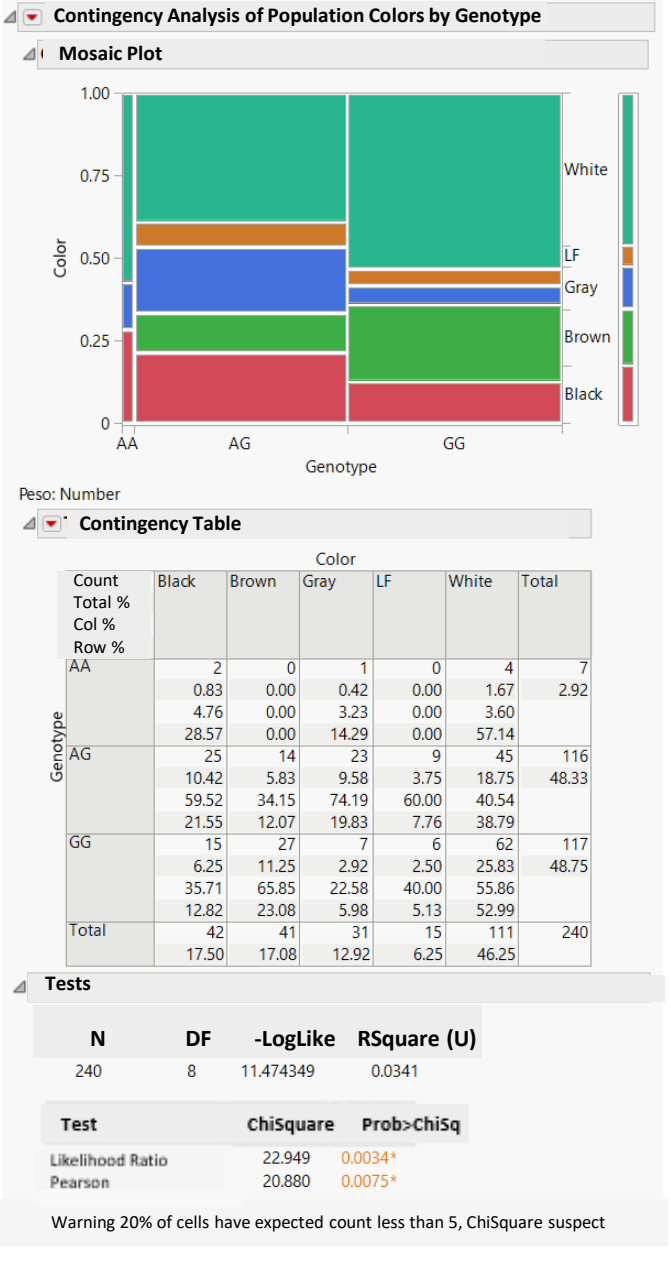
DCT 972



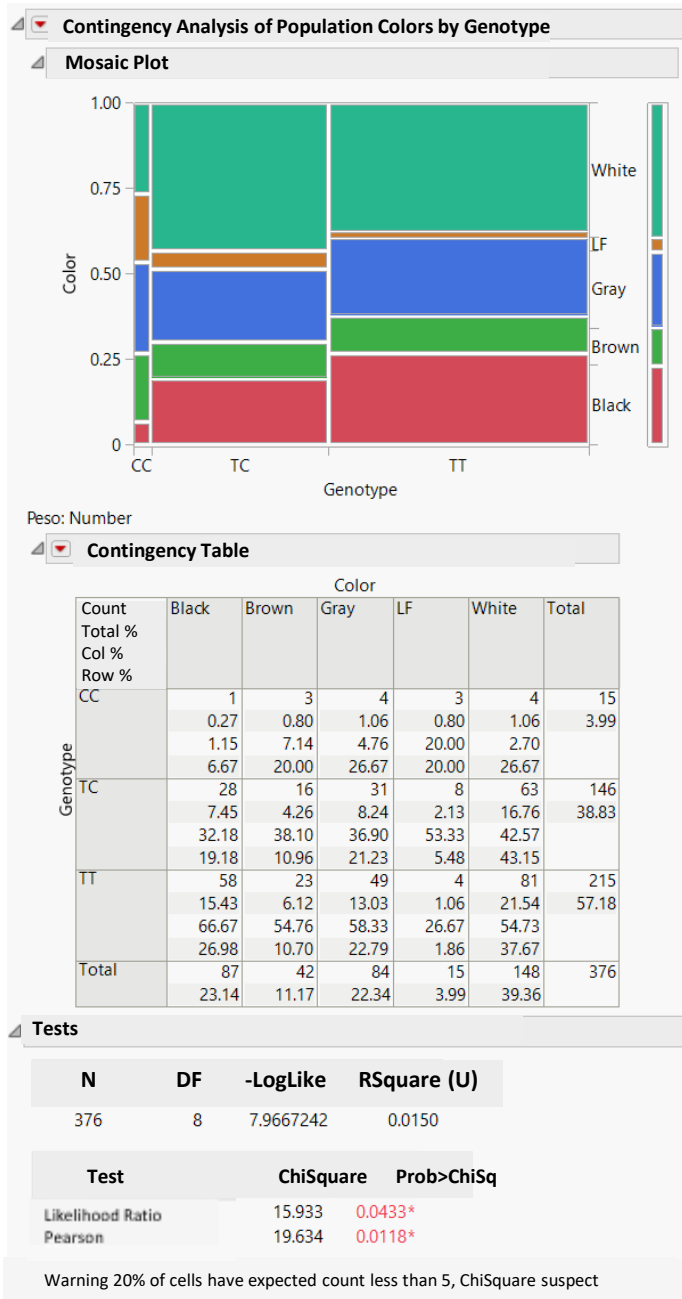
DCT 1102



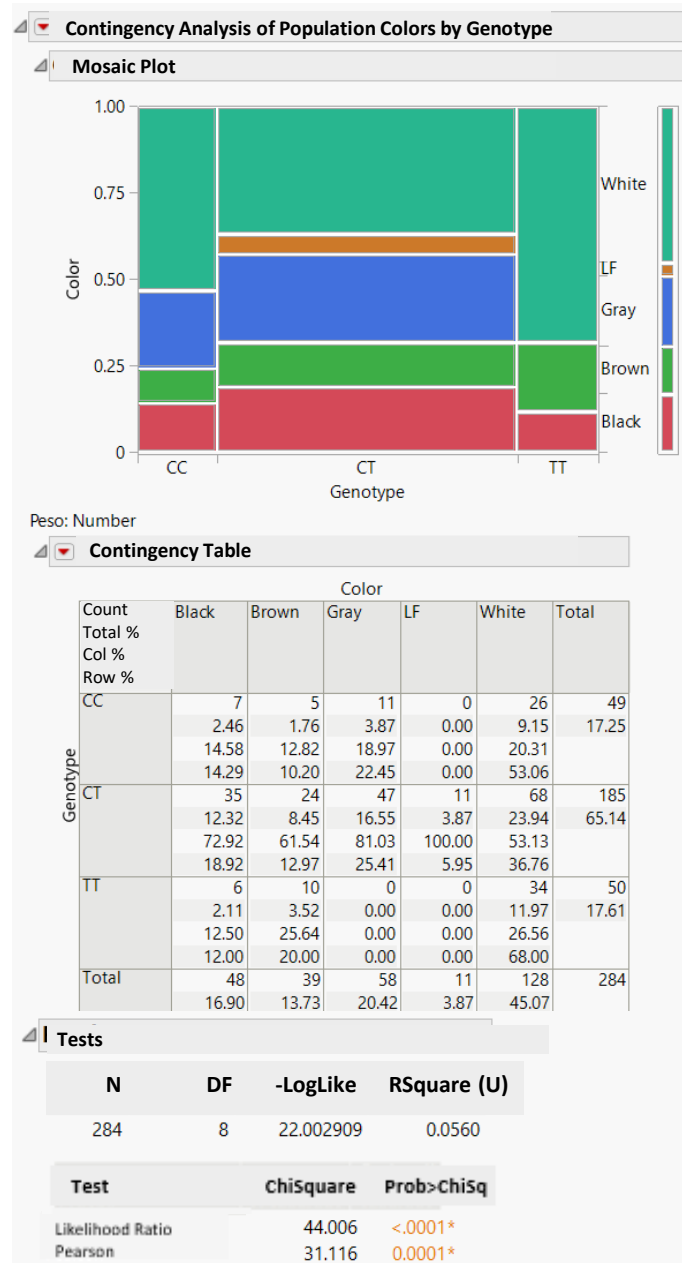
DCT 1113



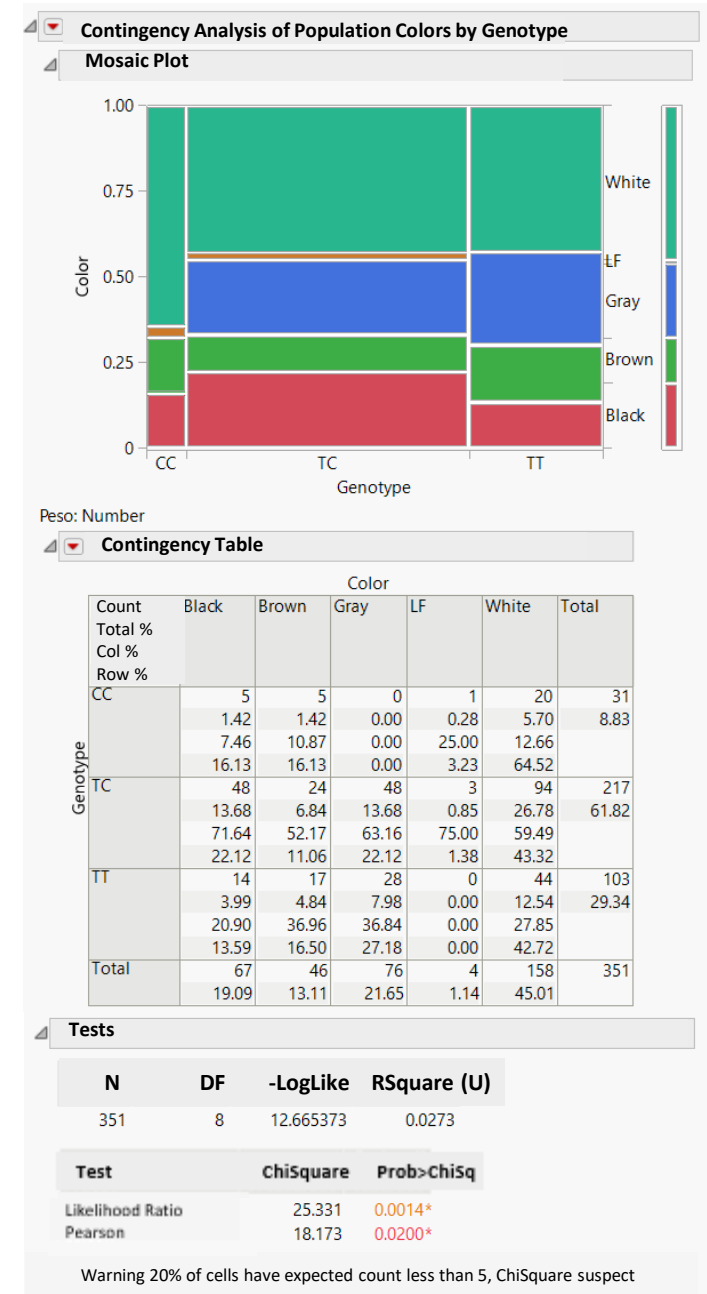
DCT 1119



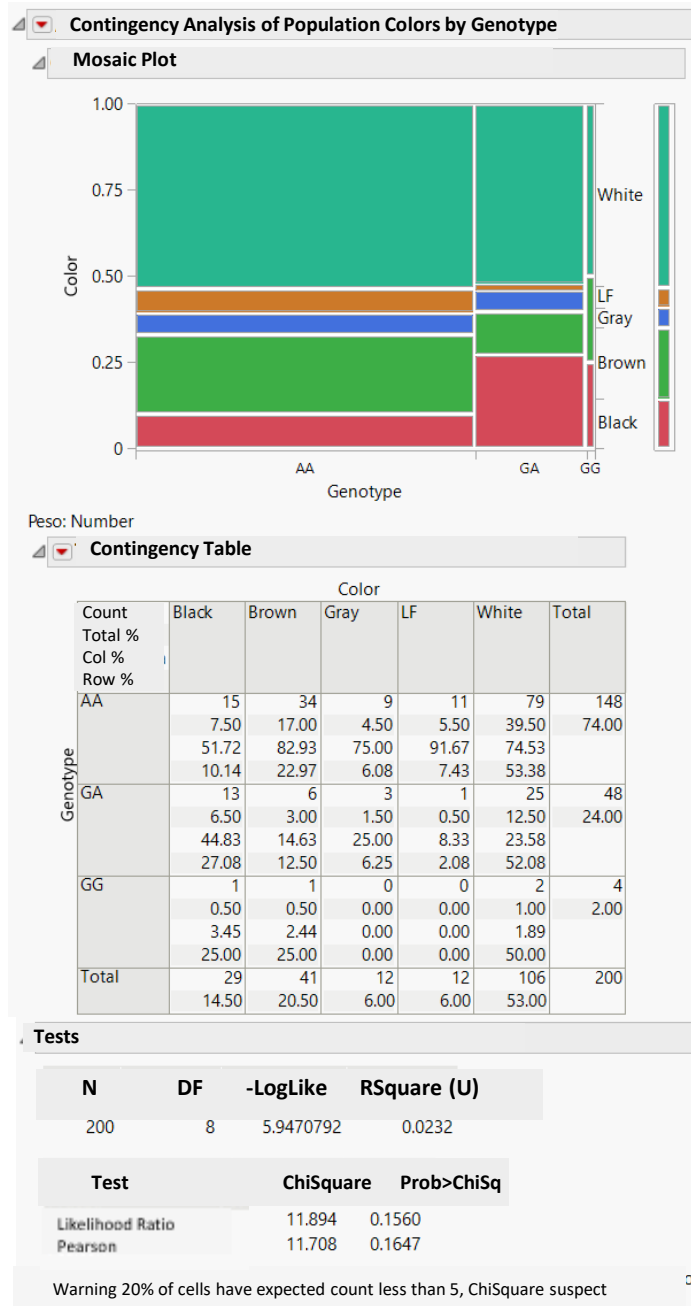
DCT 1191



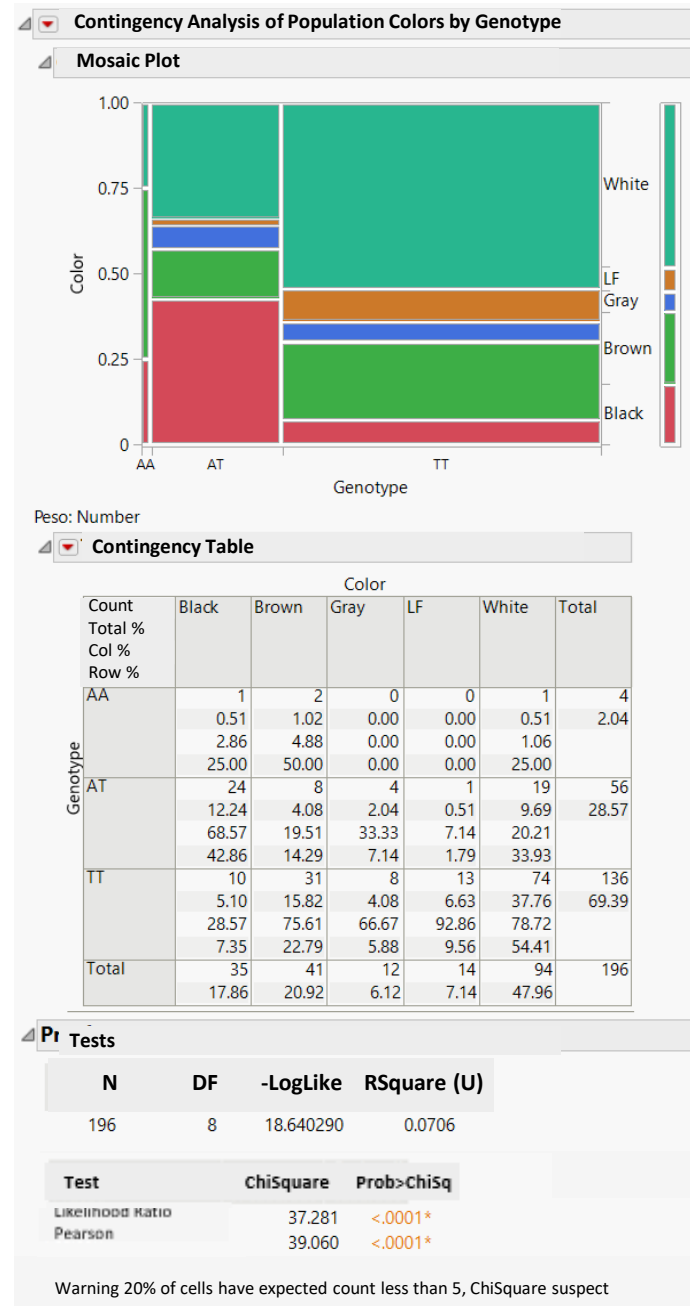
DCT 1323



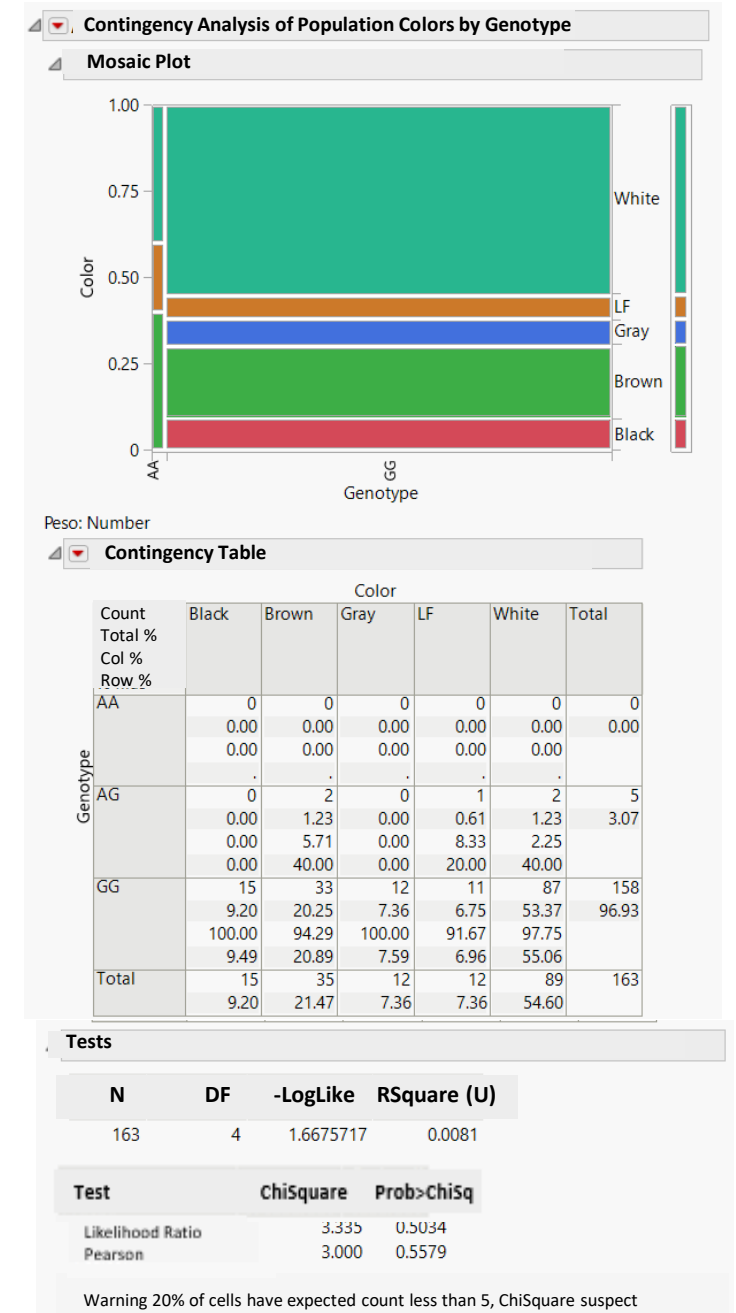
DCT 1417



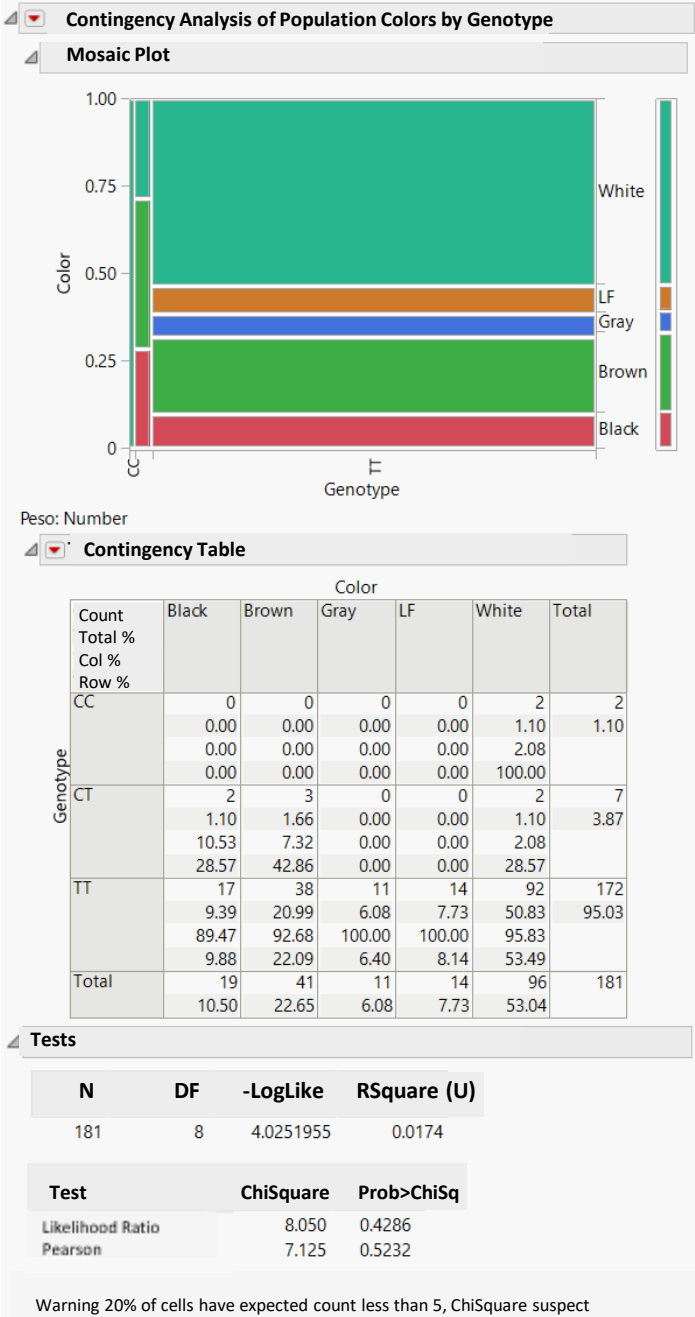
DCT +2



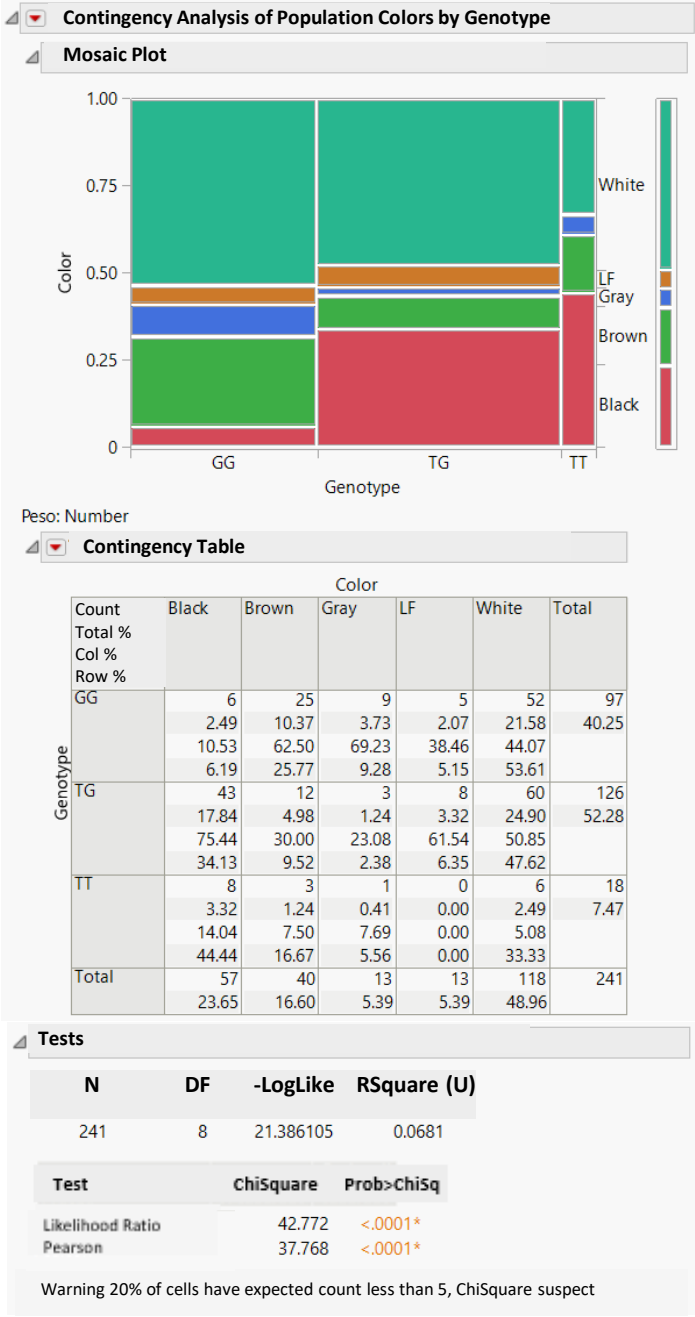
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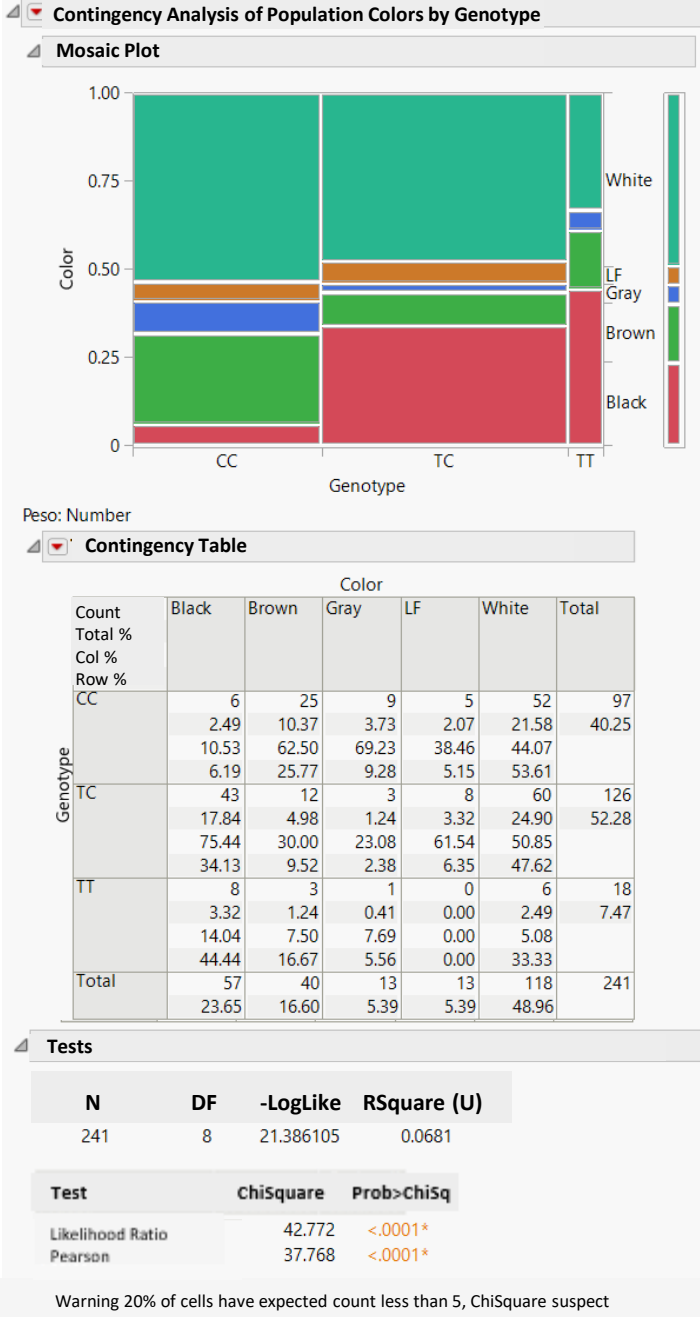
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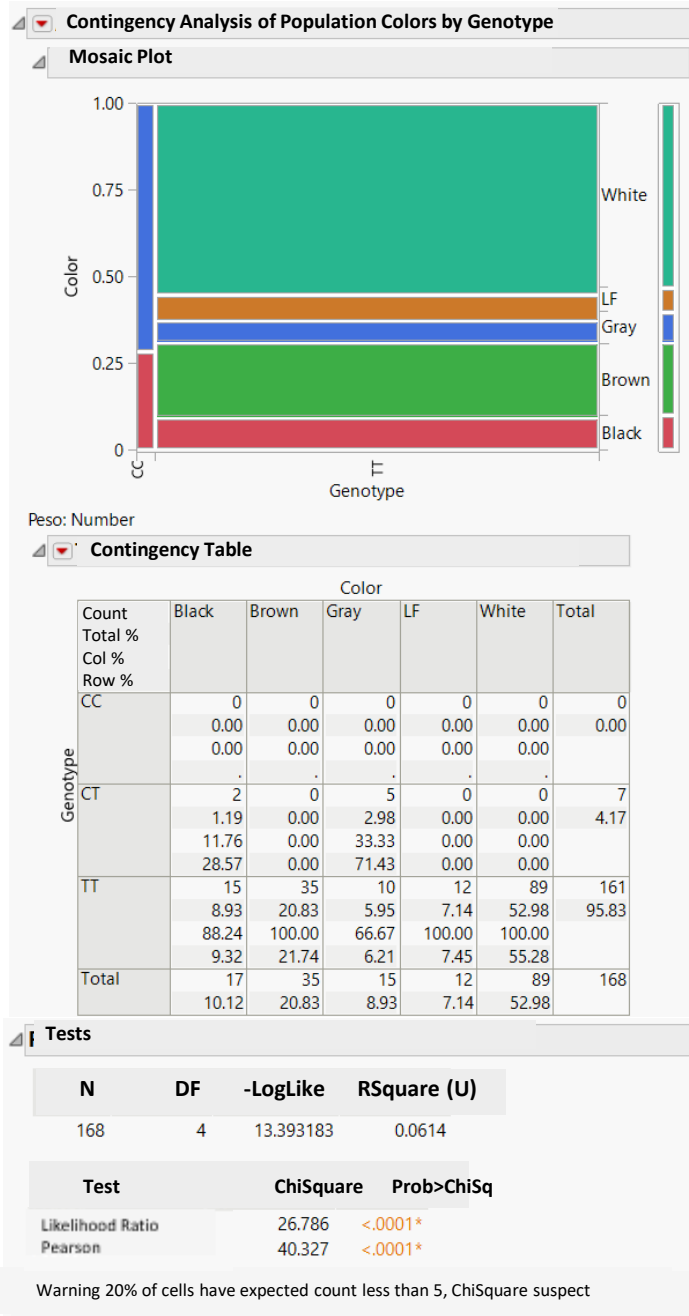
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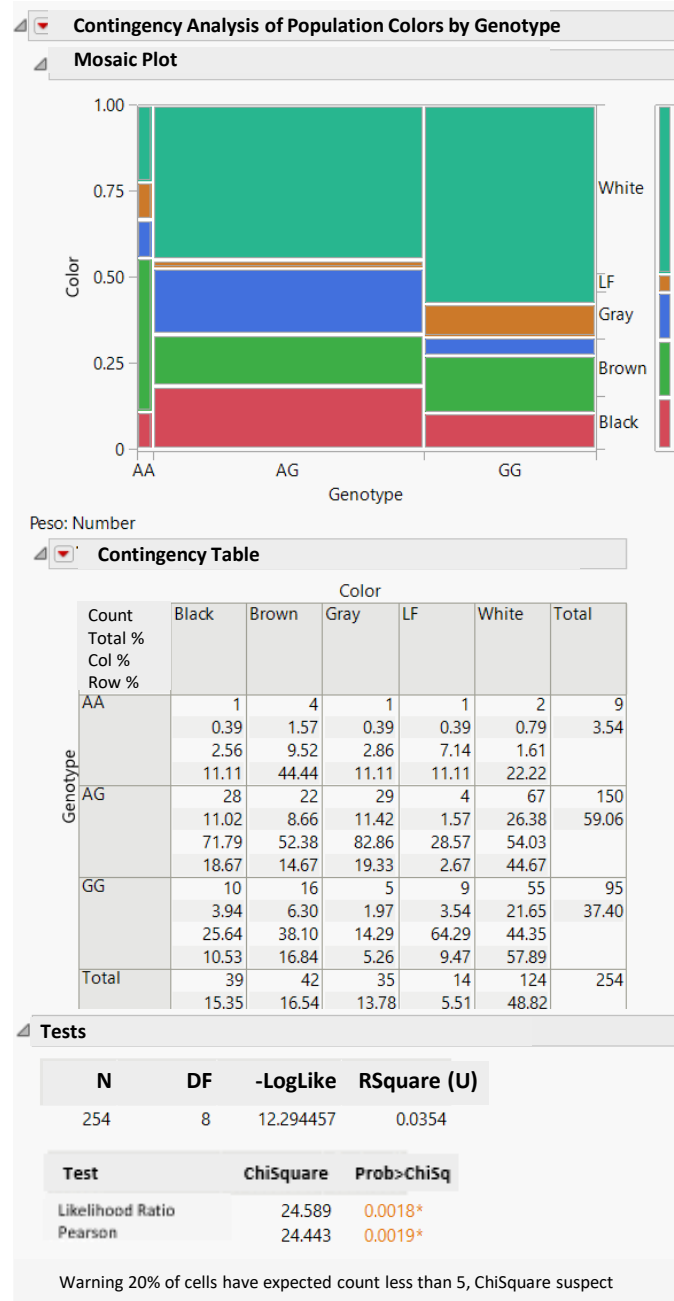
RAB38 408



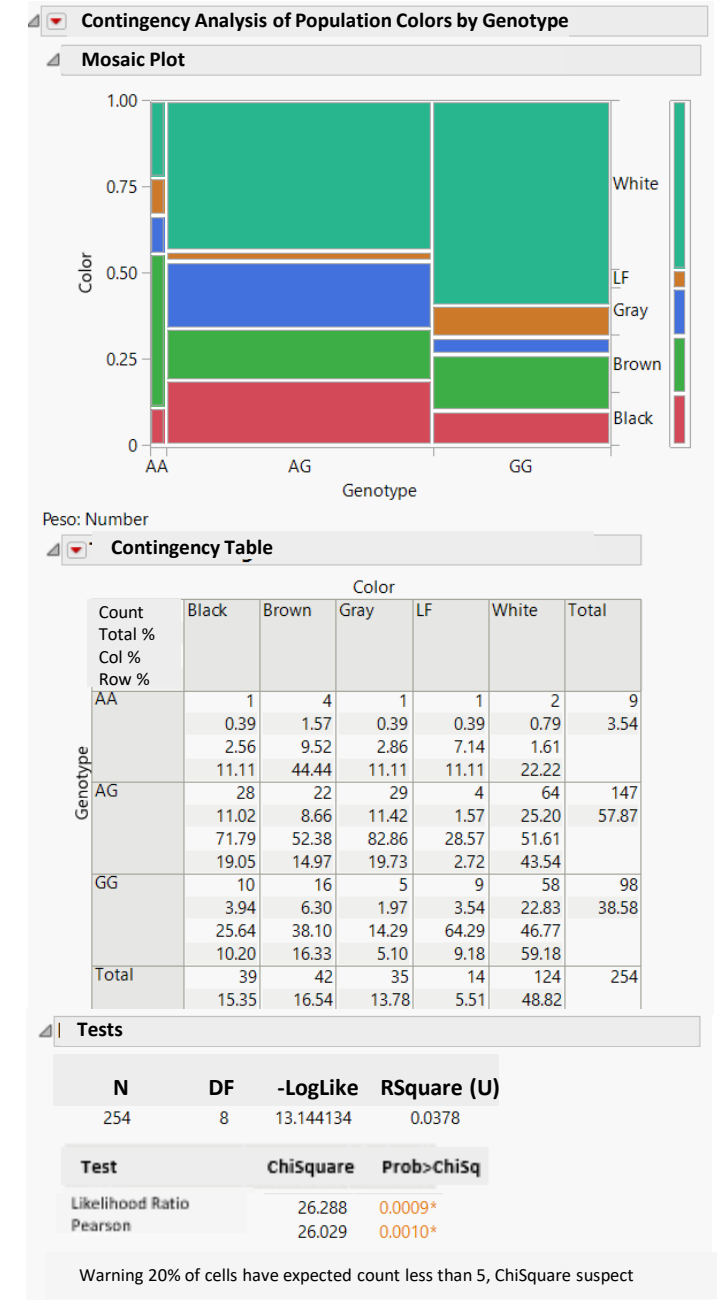
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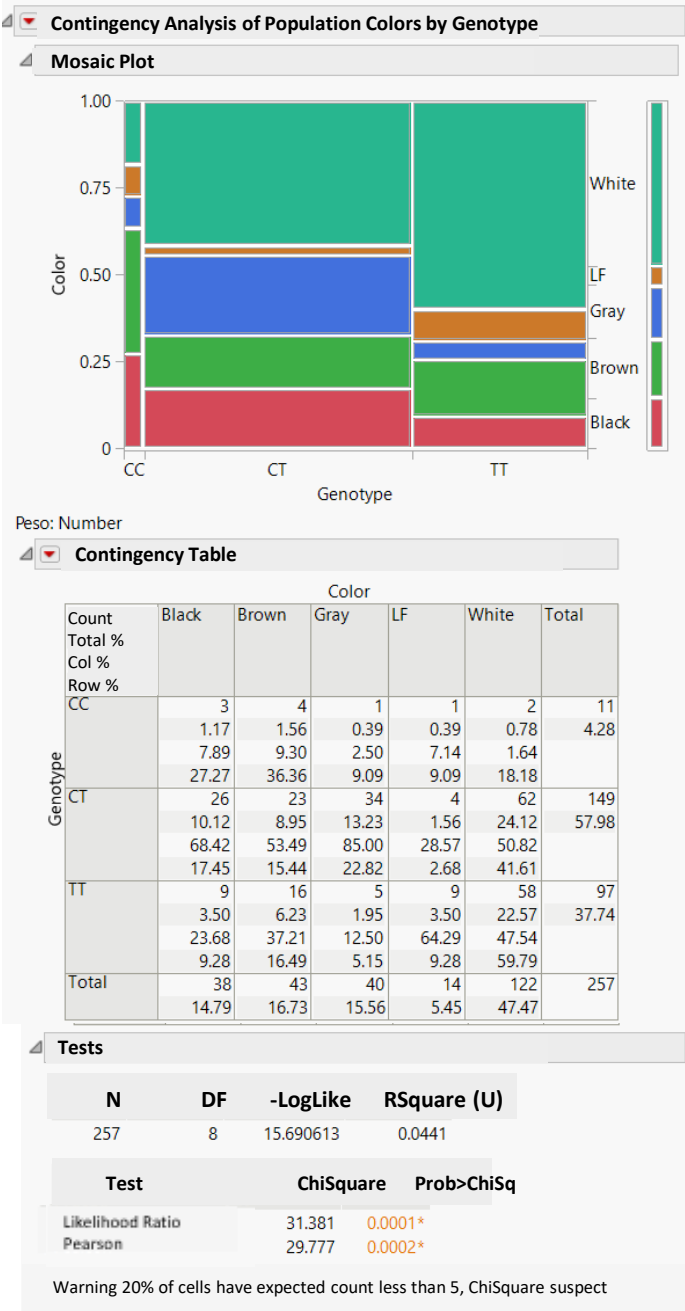
RAB38 592



RAB38 +14



RAB38 +85



RAB38+107

