

The GLM Procedure

Class Level Information		
Class	Levels	Values
CYL	2	4 6
OIL	3	GASMISER MULTI STANDARD

Number of Observations Read	30
Number of Observations Used	30

The GLM Procedure**Dependent Variable: MPG**

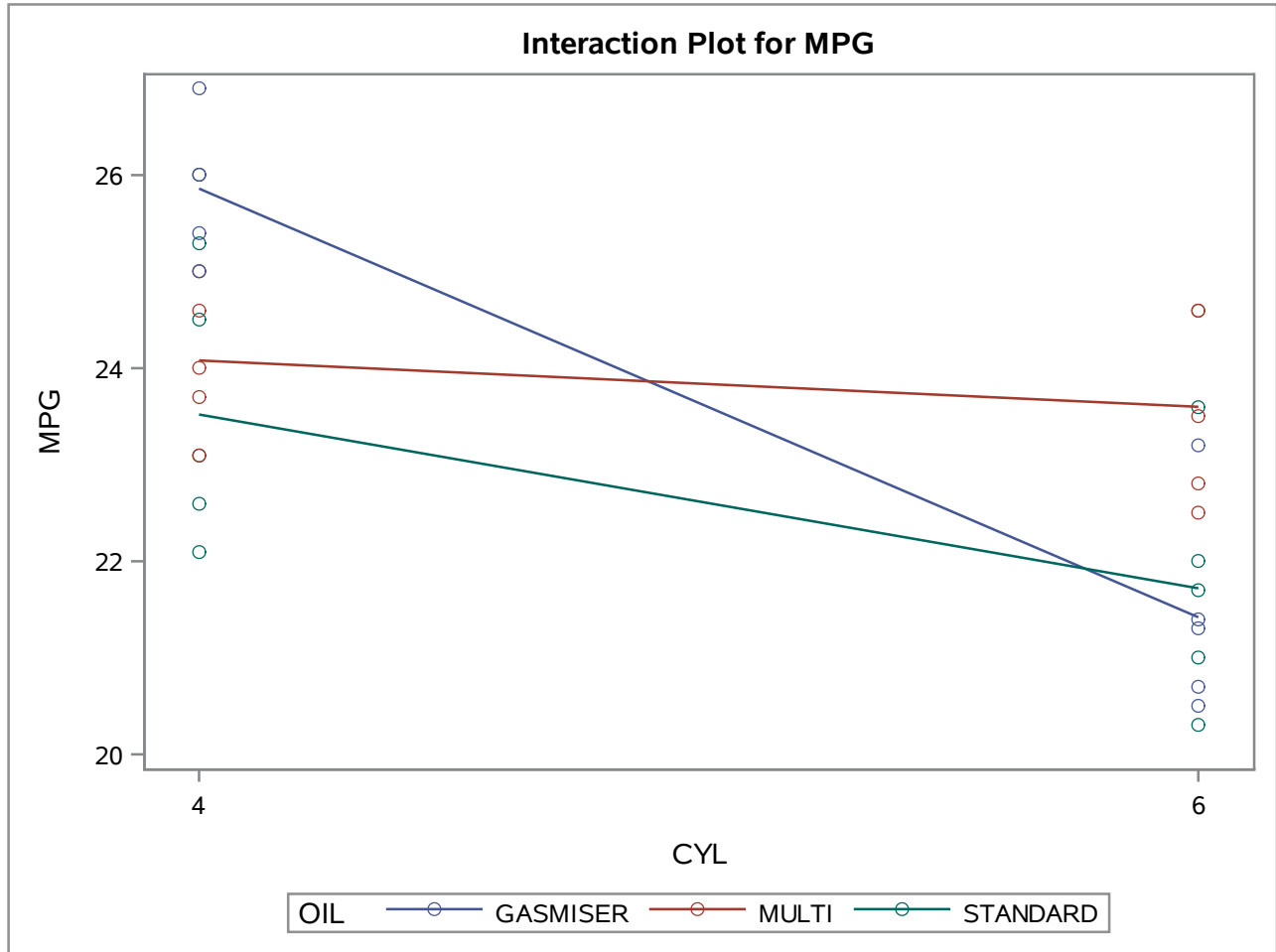
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	66.52266667	13.30453333	12.27	<.0001
Error	24	26.02400000	1.08433333		
Corrected Total	29	92.54666667			

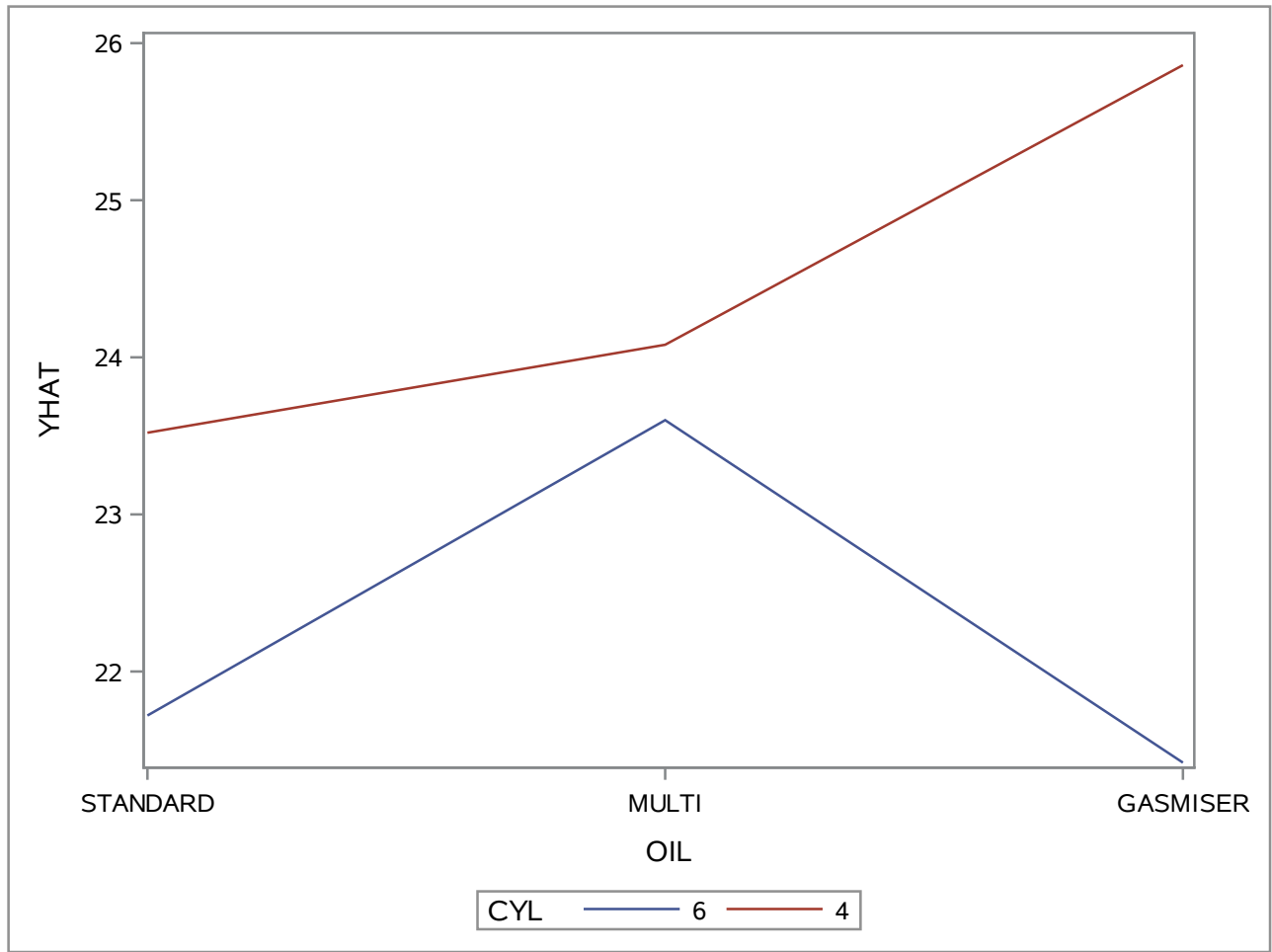
R-Square	Coeff Var	Root MSE	MPG Mean
0.718801	4.456405	1.041313	23.36667

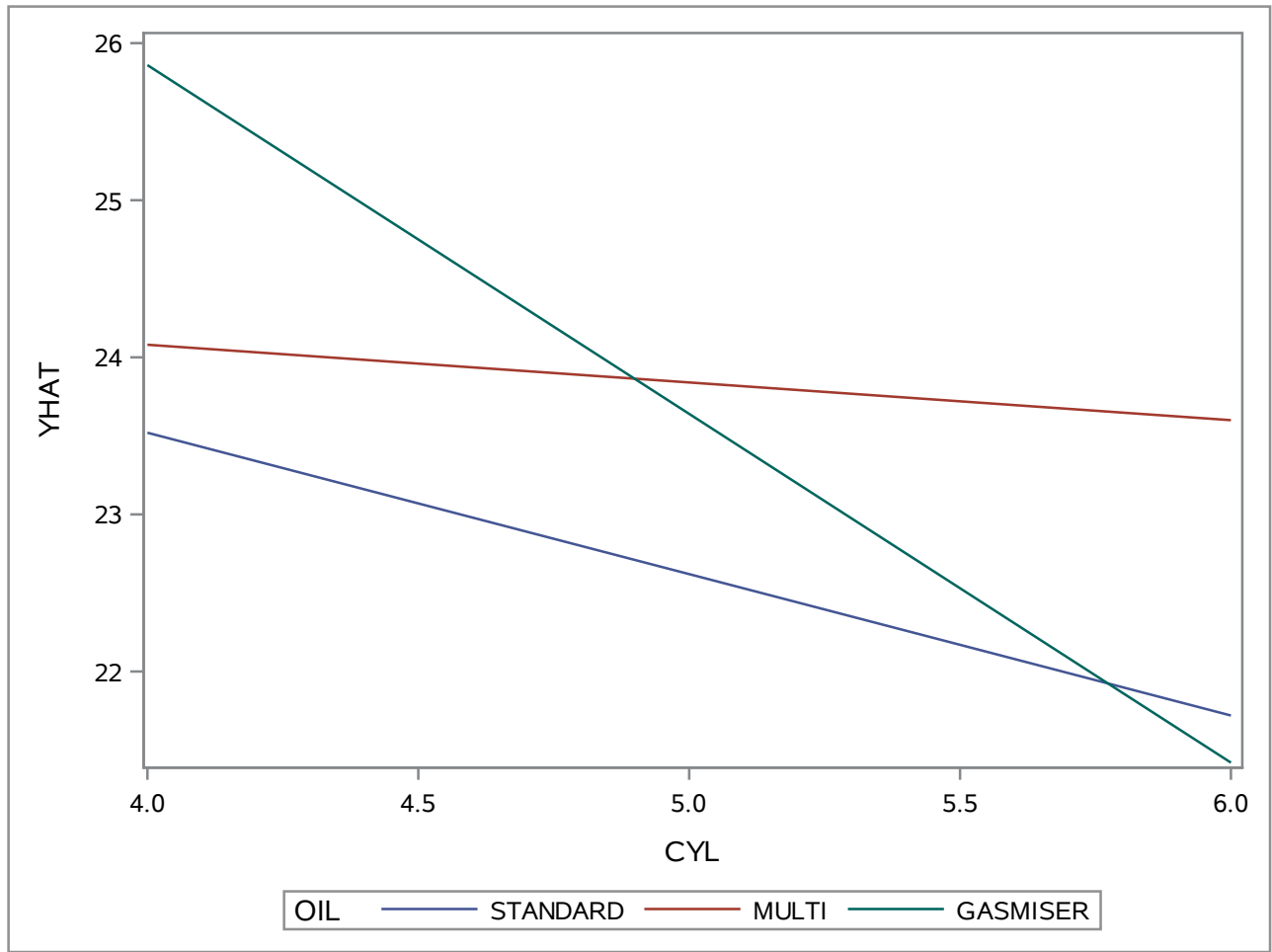
Source	DF	Type I SS	Mean Square	F Value	Pr > F
CYL	1	37.63200000	37.63200000	34.71	<.0001
OIL	2	8.56266667	4.28133333	3.95	0.0329
CYL*OIL	2	20.32800000	10.16400000	9.37	0.0010

Source	DF	Type III SS	Mean Square	F Value	Pr > F
CYL	1	37.63200000	37.63200000	34.71	<.0001
OIL	2	8.56266667	4.28133333	3.95	0.0329
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The GLM Procedure
Dependent Variable: MPG







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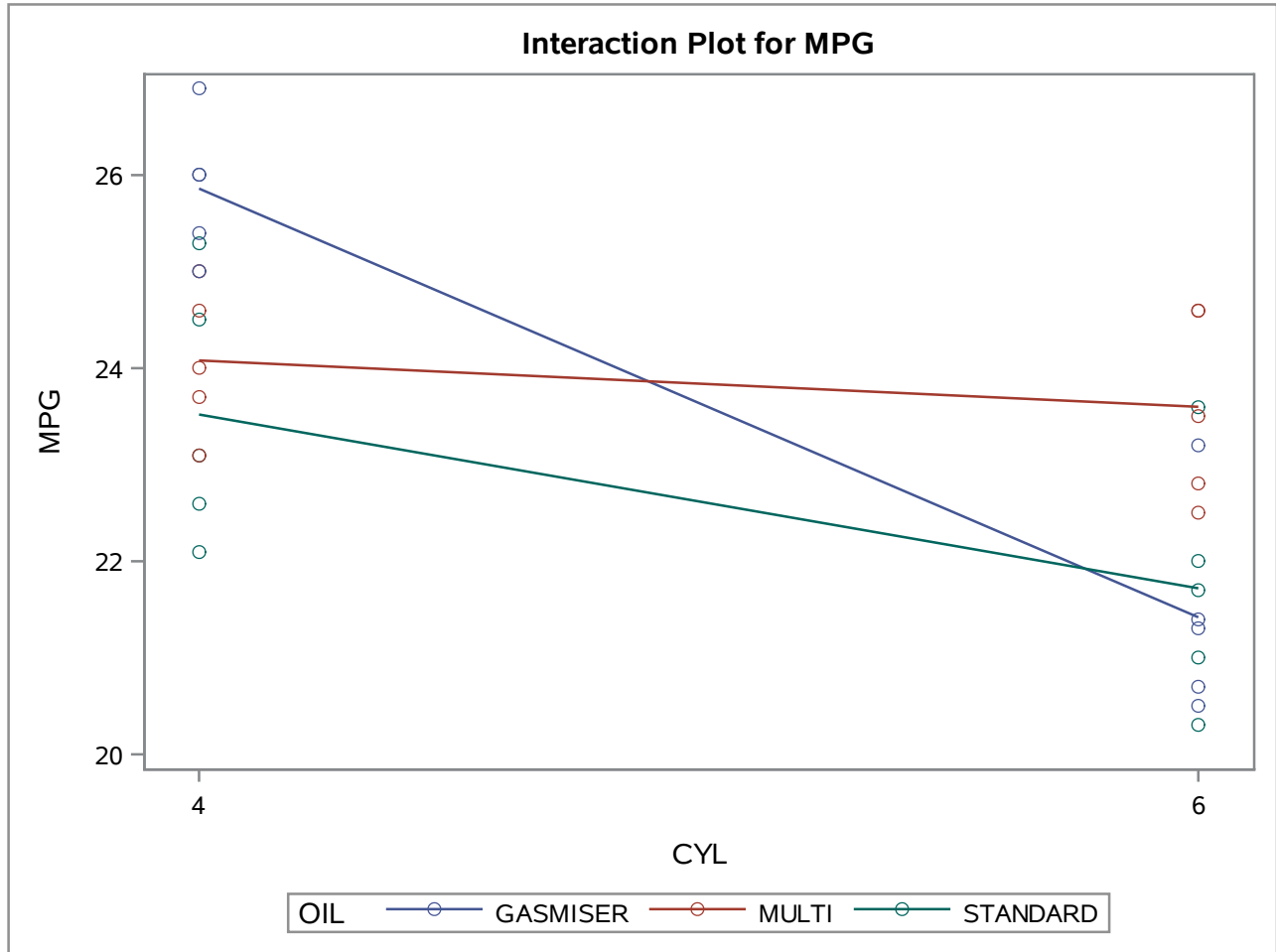
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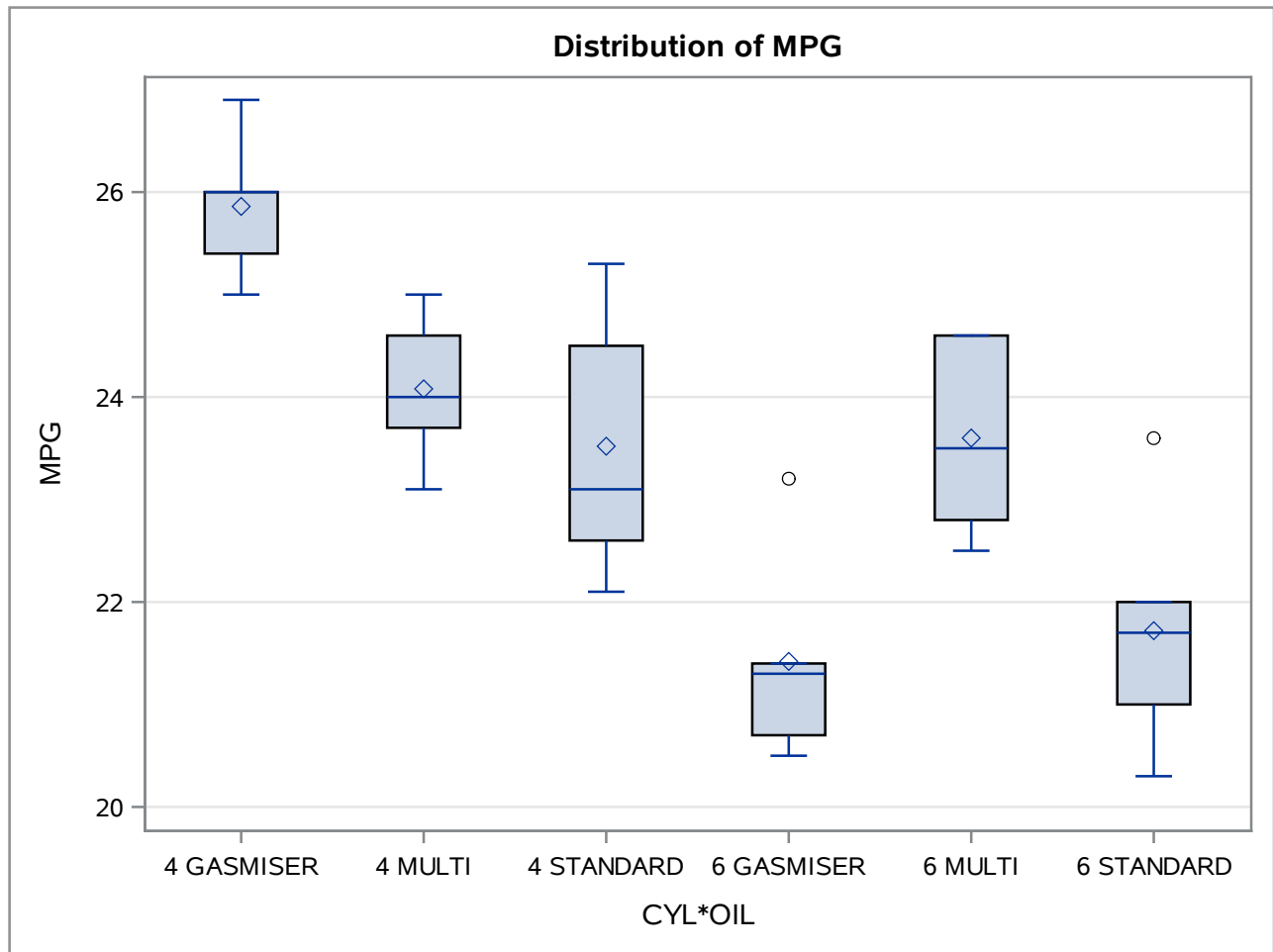
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Dependent Variable: MPG



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Level of CYL	Level of OIL	N	MPG	
			Mean	Std Dev
4	GASMISER	5	25.8600000	0.71972217
4	MULTI	5	24.0800000	0.74632433
4	STANDARD	5	23.5200000	1.33865604
6	GASMISER	5	21.4200000	1.06630202
6	MULTI	5	23.6000000	0.98234414
6	STANDARD	5	21.7200000	1.23975804

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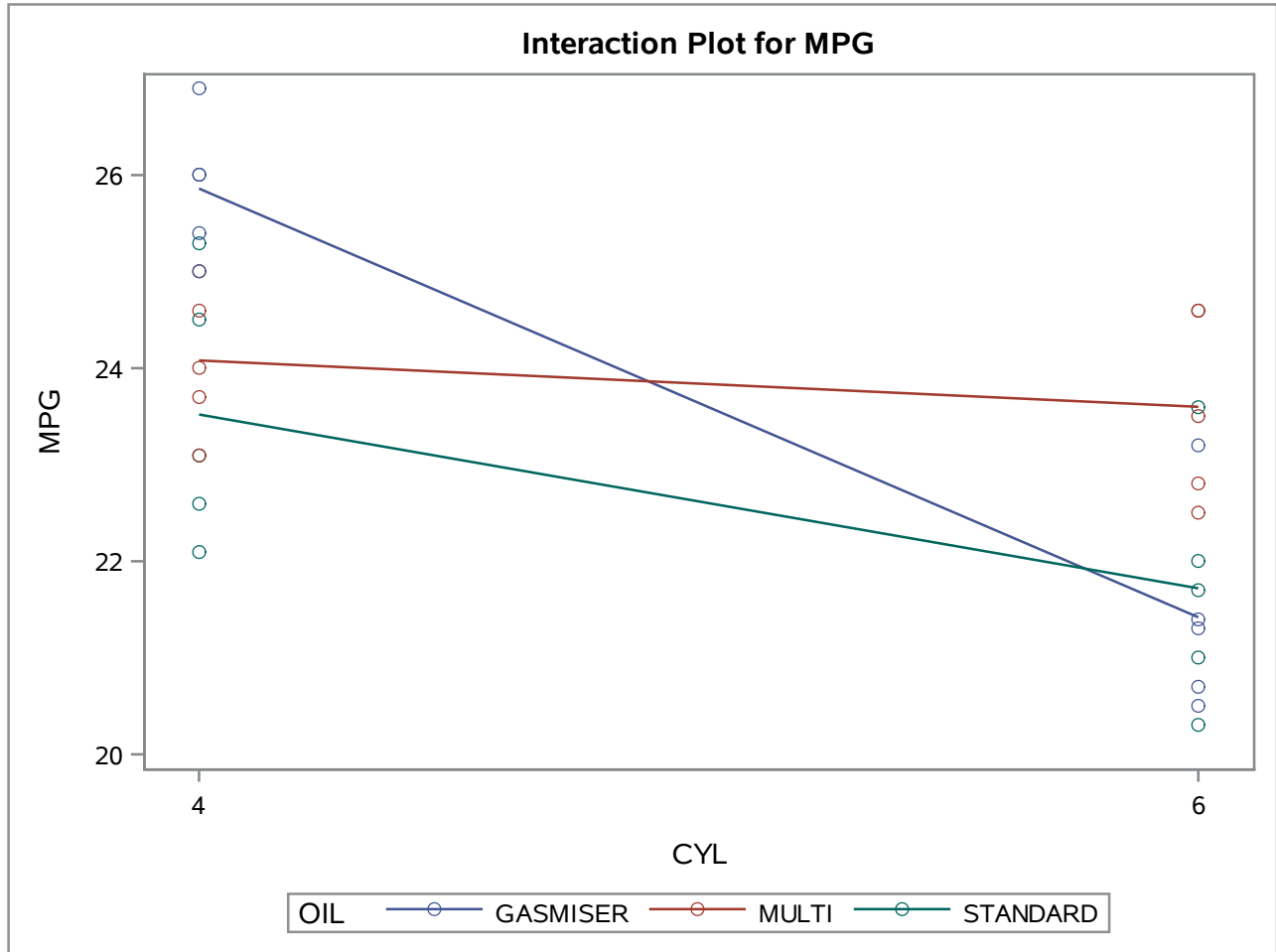
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OIL	2	8.56266667	4.28133333	3.95	0.0329
CYL*OIL	2	20.32800000	10.16400000	9.37	0.0010

Parameter	Estimate	Standard Error	t Value	Pr > t
4cyl Vs 6cyl	2.24000000	0.38023385	5.89	<.0001
Cheap Vs Expensive	-1.12000000	0.40329890	-2.78	0.0105

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 Dependent Variable: MPG



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Dependent Variable: MPG

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Corrected Total	29	92.54666667			

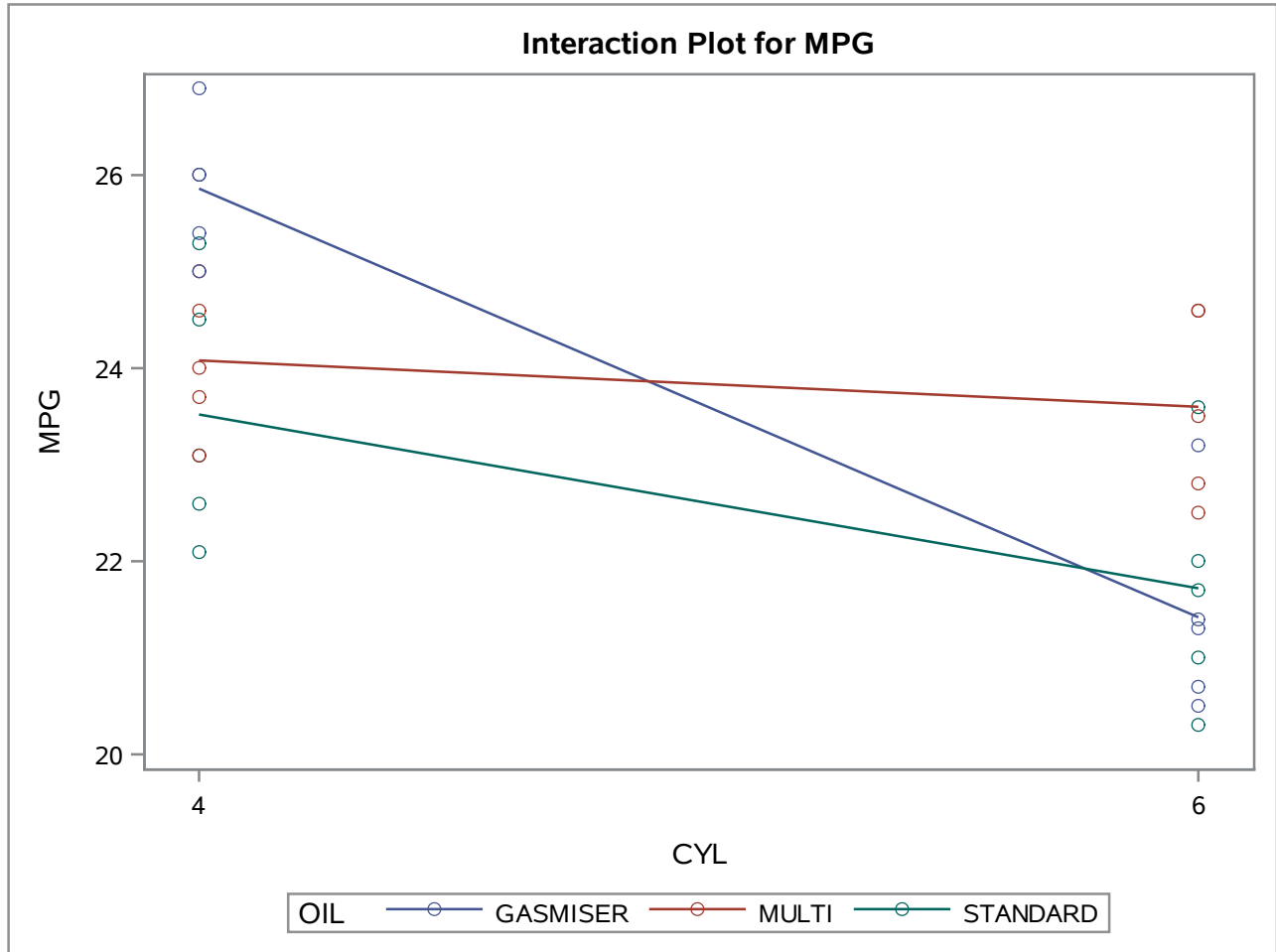
R-Square	Coeff Var	Root MSE	MPG Mean
0.718801	4.456405	1.041313	23.36667

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CYL	1	37.63200000	37.63200000	34.71	<.0001
OIL	2	8.56266667	4.28133333	3.95	0.0329
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CYL	1	37.63200000	37.63200000	34.71	<.0001
OIL	2	8.56266667	4.28133333	3.95	0.0329
CYL*OIL	2	20.32800000	10.16400000	9.37	0.0010

Parameter	Estimate	Standard Error	t Value	Pr > t
4cyl Vs 6cyl, Gasmiser	4.44000000	0.65858434	6.74	<.0001
4cyl Vs 6cyl, Multi	0.48000000	0.65858434	0.73	0.4732
4cyl Vs 6cyl, Standard	1.80000000	0.65858434	2.73	0.0116
Cheap Vs Expensive, 4-cyl	-1.45000000	0.57035077	-2.54	0.0179
Cheap Vs Expensive, 6-cyl	-0.79000000	0.57035077	-1.39	0.1788

The GLM Procedure
Dependent Variable: MPG



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OIL	3	GASMISER MULTI STANDARD

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Dependent Variable: MPG

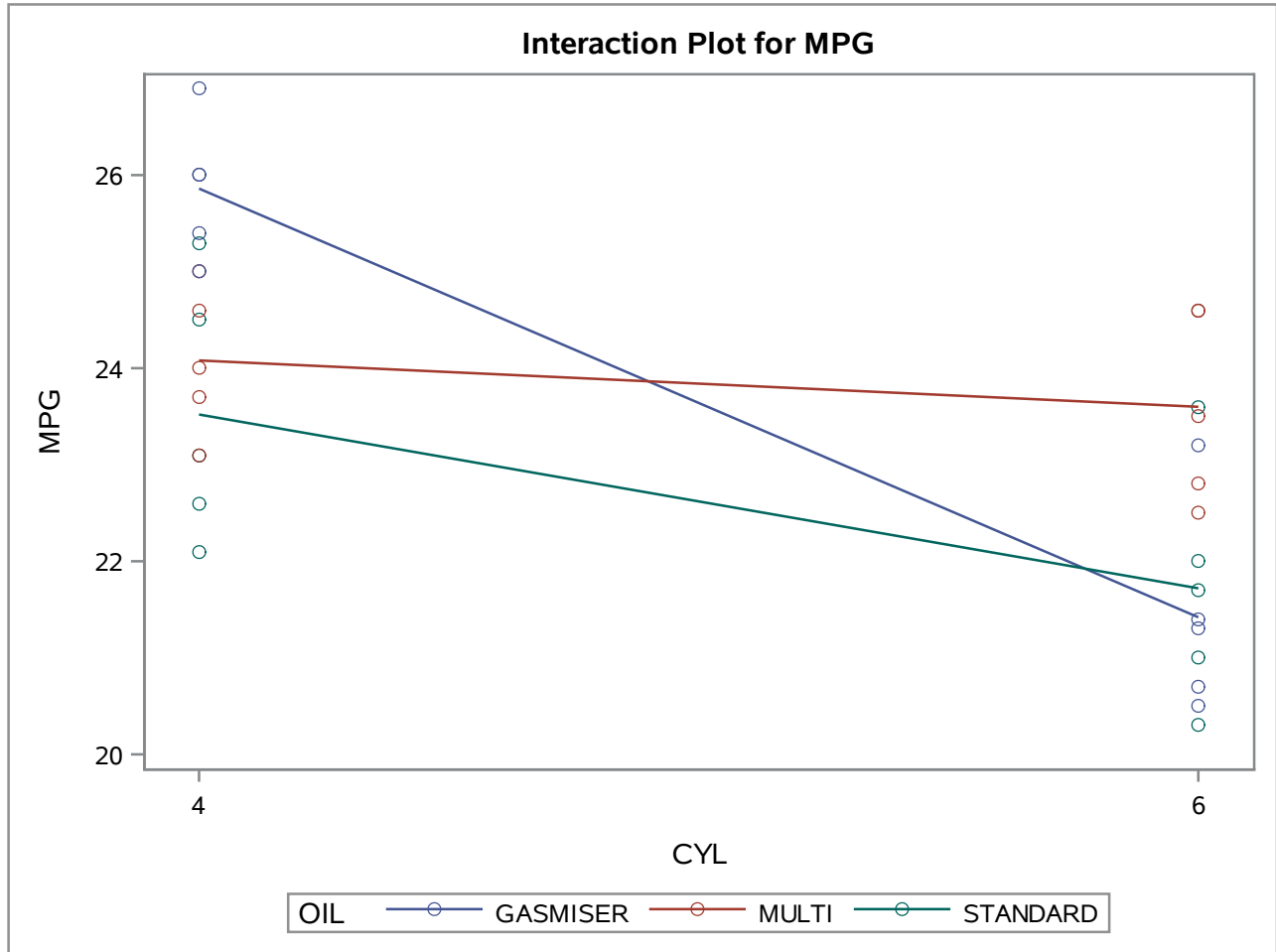
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Error	24	26.02400000	1.08433333		
Corrected Total	29	92.54666667			

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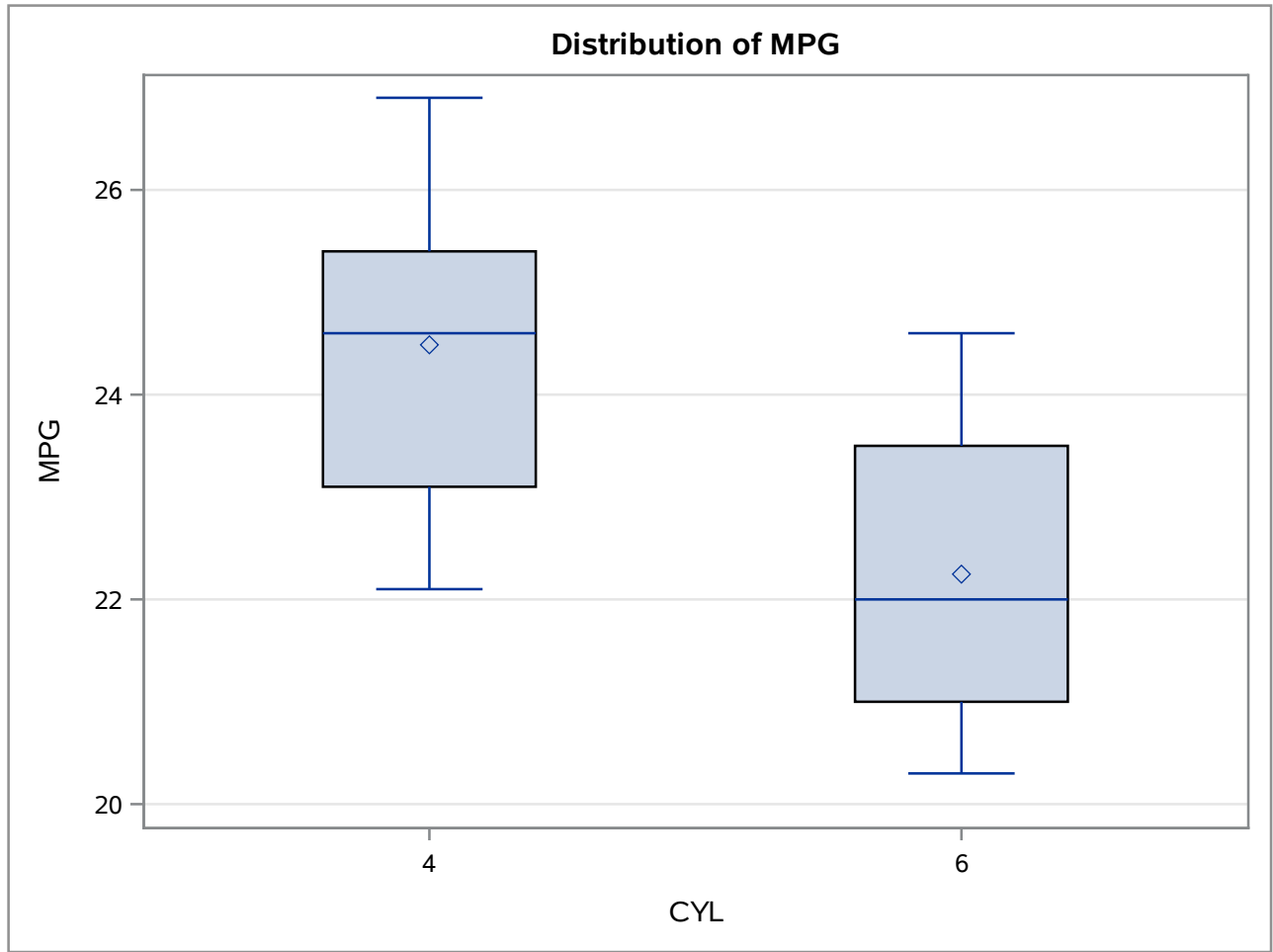
Source	DF	Type I SS	Mean Square	F Value	Pr > F
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OIL	2	8.56266667	4.28133333	3.95	0.0329
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The GLM Procedure
Dependent Variable: MPG



The GLM Procedure



The GLM Procedure

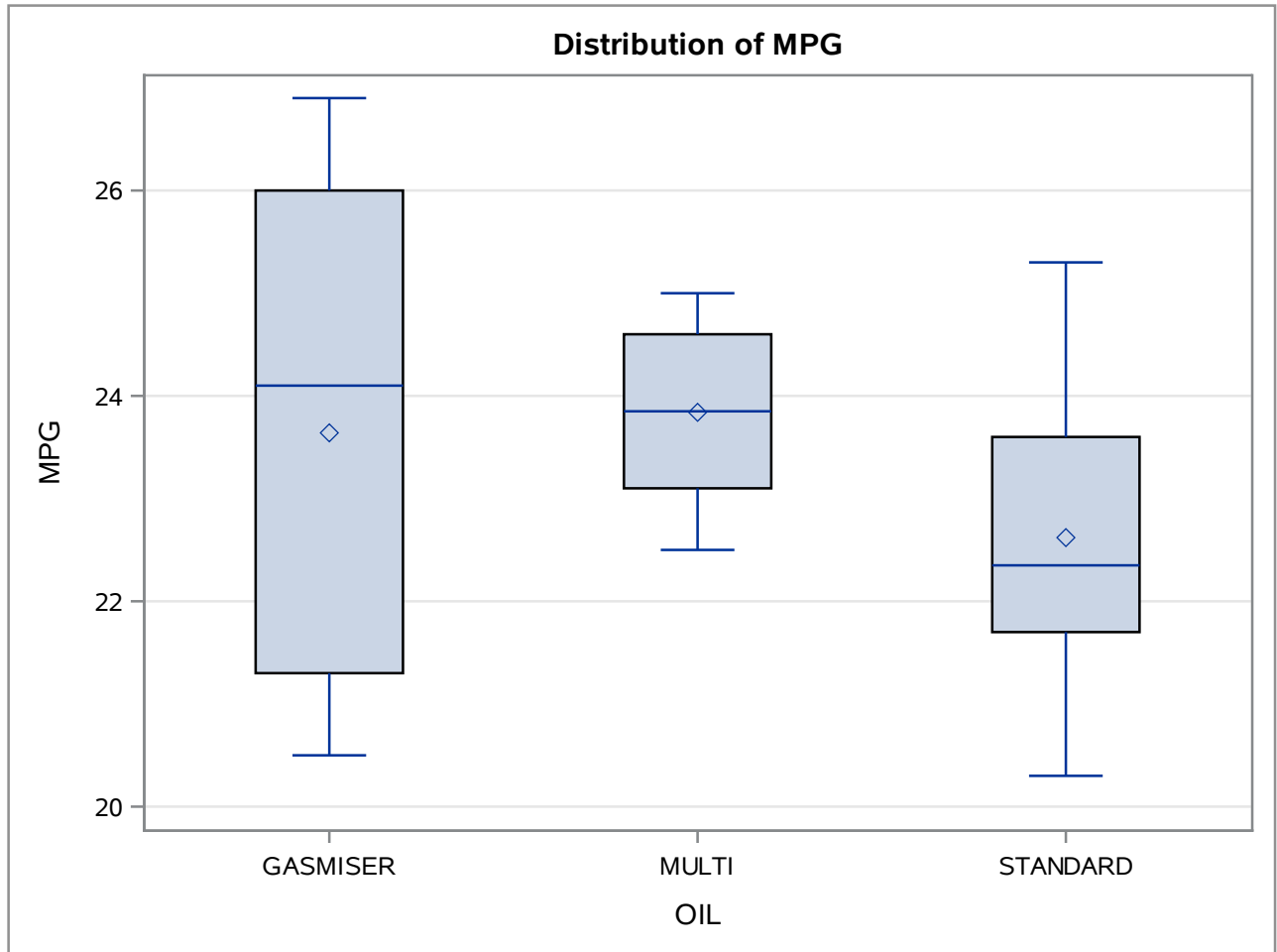
Tukey's Studentized Range (HSD) Test for MPG

Note: This test controls the Type I experimentwise error rate, but it generally has a higher Type II error rate than REGWQ.

Alpha	0.05
Error Degrees of Freedom	24
Error Mean Square	1.084333
Critical Value of Studentized Range	2.91879
Minimum Significant Difference	0.7848

Means with the same letter are not significantly different.			
Tukey Grouping	Mean	N	CYL
A	24.4867	15	4
B	22.2467	15	6

The GLM Procedure



The GLM Procedure

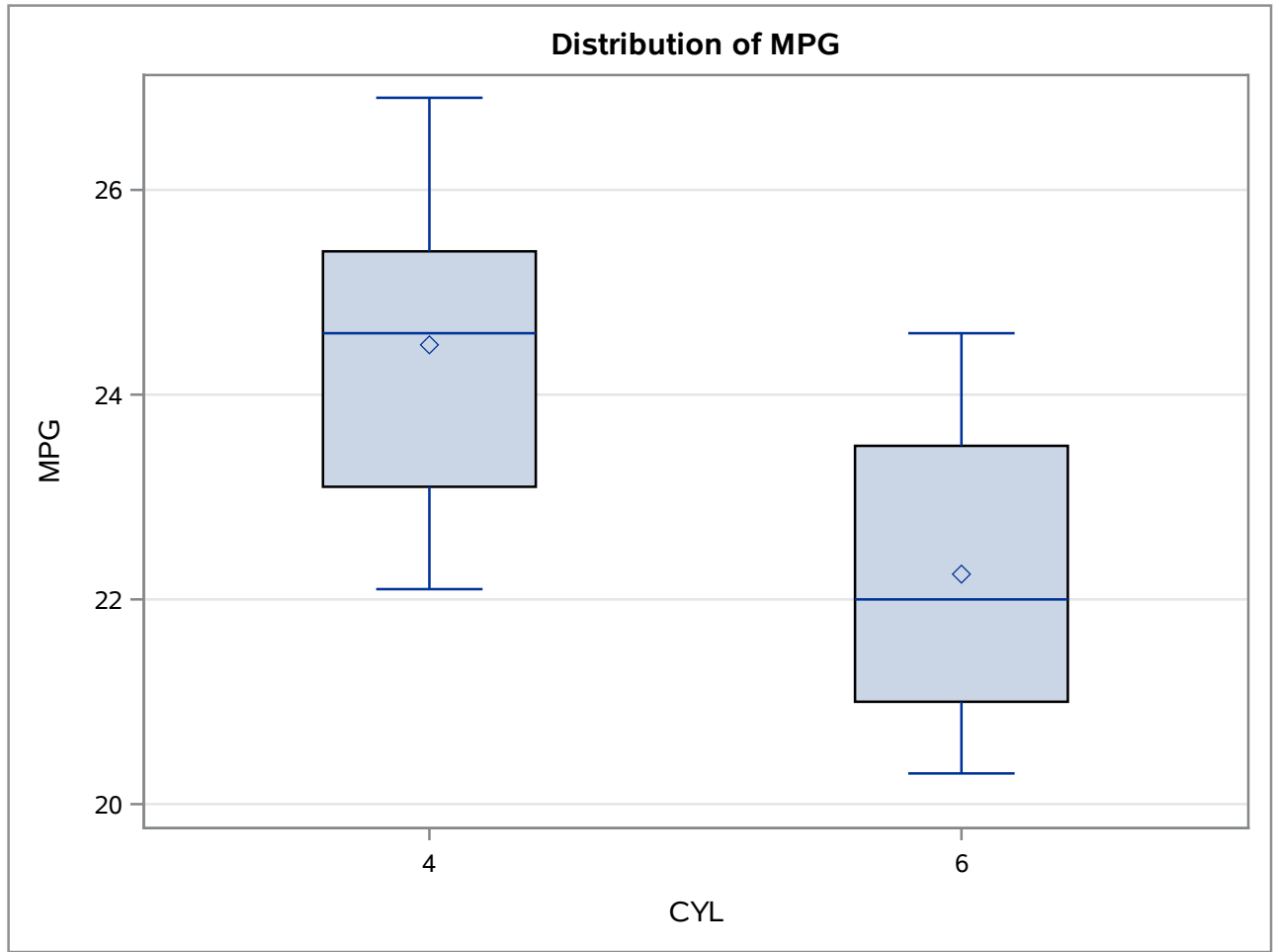
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Note: This test controls the Type I experimentwise error rate, but it generally has a higher Type II error rate than REGWQ.

Alpha	0.05
Error Degrees of Freedom	24
Error Mean Square	1.084333
Critical Value of Studentized Range	3.53170
Minimum Significant Difference	1.163

Means with the same letter are not significantly different.				
Tukey Grouping		Mean	N	OIL
	A	23.8400	10	MULTI
	A			
B	A	23.6400	10	GASMISER
B				
B		22.6200	10	STANDARD

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The GLM Procedure

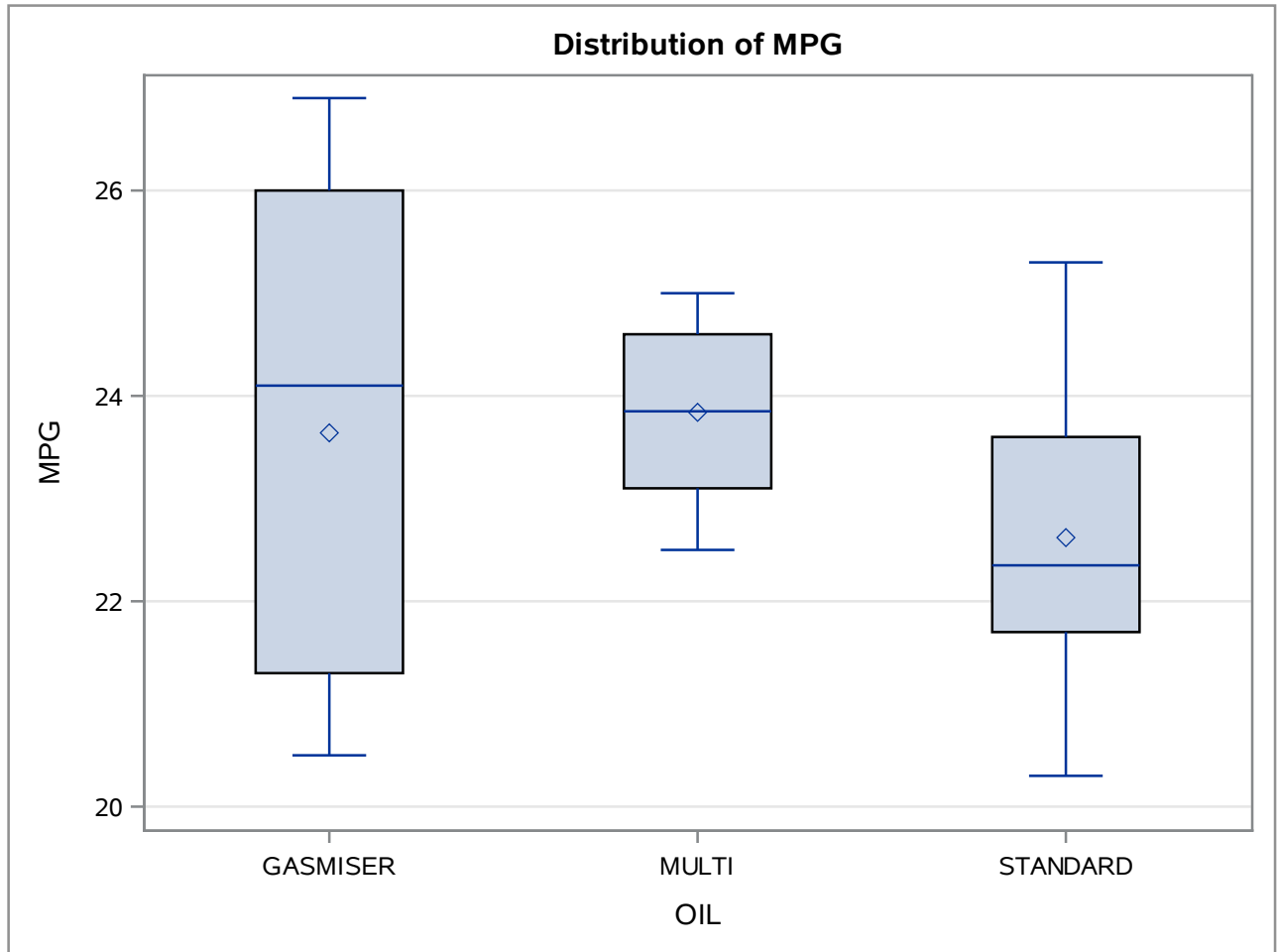
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Note: This test controls the Type I experimentwise error rate.

Alpha	0.05
Error Degrees of Freedom	24
Error Mean Square	1.084333
Critical Value of Studentized Range	2.91879
Minimum Significant Difference	0.7848

Comparisons significant at the 0.05 level are indicated by ***.				
CYL Comparison	Difference Between Means	Simultaneous 95% Confidence Limits		
4 - 6	2.2400	1.4552	3.0248	***
6 - 4	-2.2400	-3.0248	-1.4552	***

The GLM Procedure



The GLM Procedure

Tukey's Studentized Range (HSD) Test for MPG

Note: This test controls the Type I experimentwise error rate.

Alpha	0.05
Error Degrees of Freedom	24
Error Mean Square	1.084333
Critical Value of Studentized Range	3.53170
Minimum Significant Difference	1.163

Comparisons significant at the 0.05 level are indicated by ***.				
OIL Comparison	Difference Between Means	Simultaneous 95% Confidence Limits		
MULTI - GASMISER	0.2000	-0.9630	1.3630	
MULTI - STANDARD	1.2200	0.0570	2.3830	***
GASMISER - MULTI	-0.2000	-1.3630	0.9630	
GASMISER - STANDARD	1.0200	-0.1430	2.1830	
STANDARD - MULTI	-1.2200	-2.3830	-0.0570	***
STANDARD - GASMISER	-1.0200	-2.1830	0.1430	

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OIL	3	GASMISER MULTI STANDARD

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The GLM Procedure

Dependent Variable: MPG

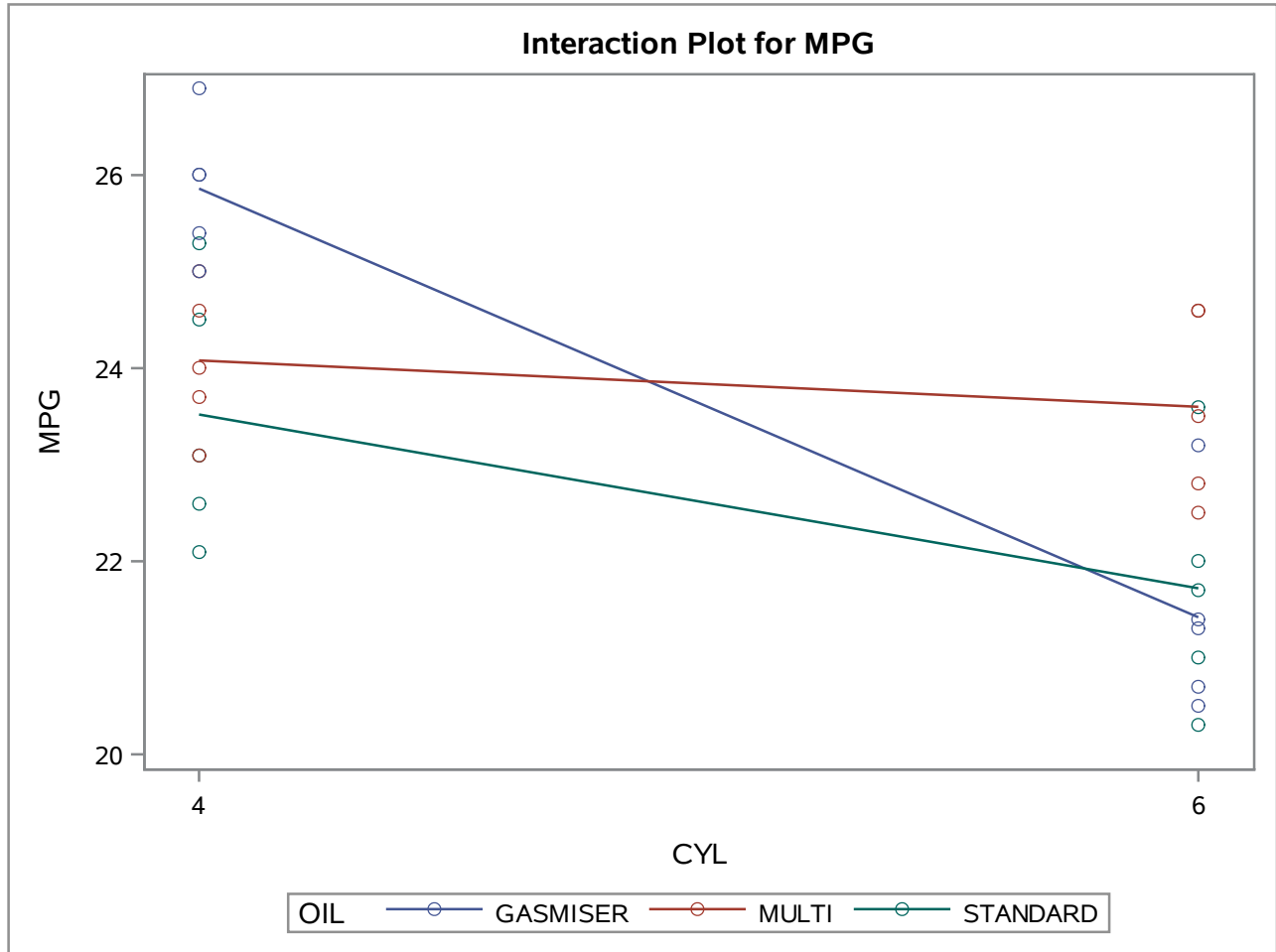
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	66.52266667	13.30453333	12.27	<.0001
Error	24	26.02400000	1.08433333		
Corrected Total	29	92.54666667			

R-Square	Coeff Var	Root MSE	MPG Mean
0.718801	4.456405	1.041313	23.36667

Source	DF	Type I SS	Mean Square	F Value	Pr > F
CYL	1	37.63200000	37.63200000	34.71	<.0001
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Source	DF	Type III SS	Mean Square	F Value	Pr > F
CYL	1	37.63200000	37.63200000	34.71	<.0001
OIL	2	8.56266667	4.28133333	3.95	0.0329
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The GLM Procedure
Dependent Variable: MPG

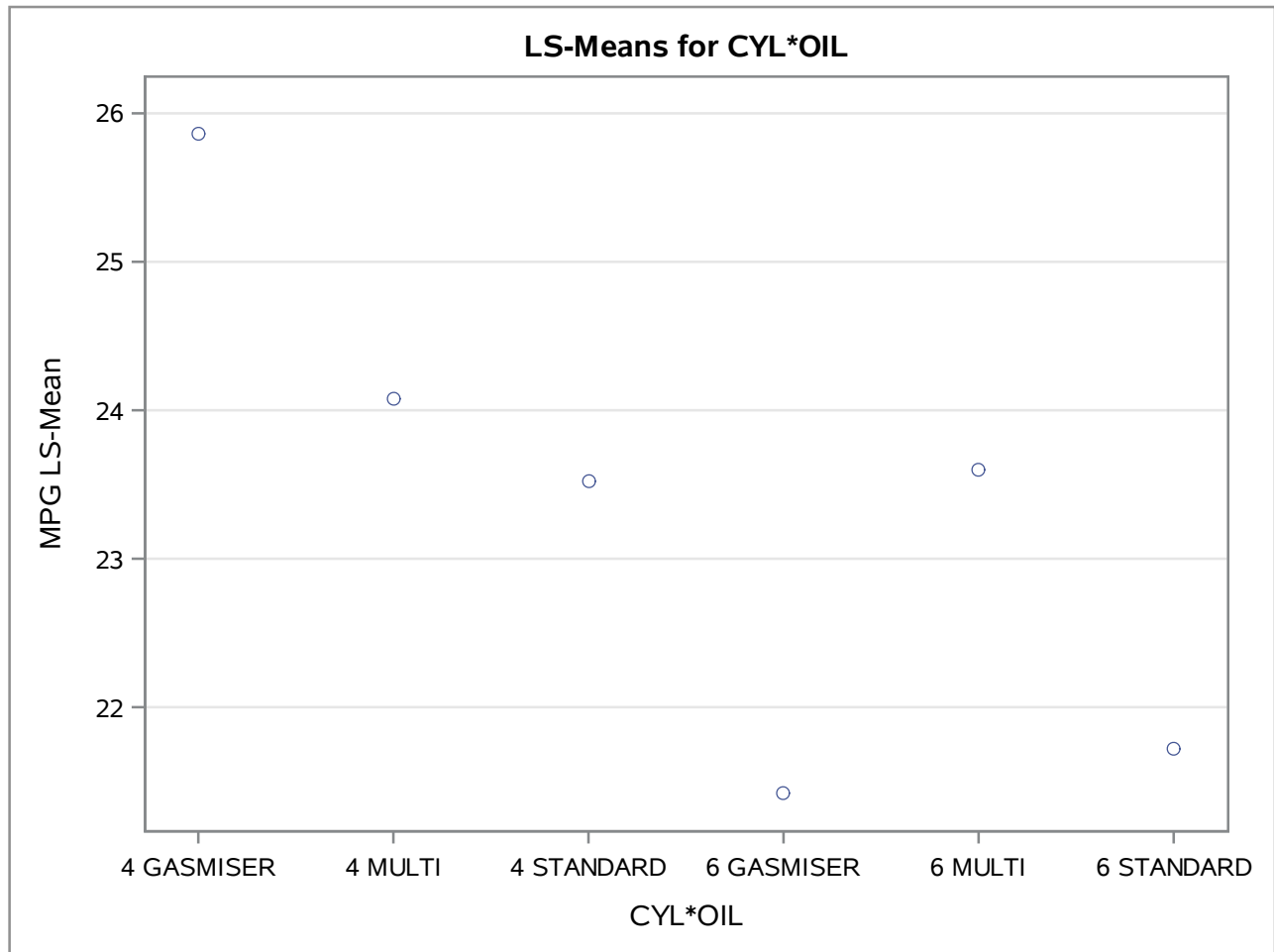


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey

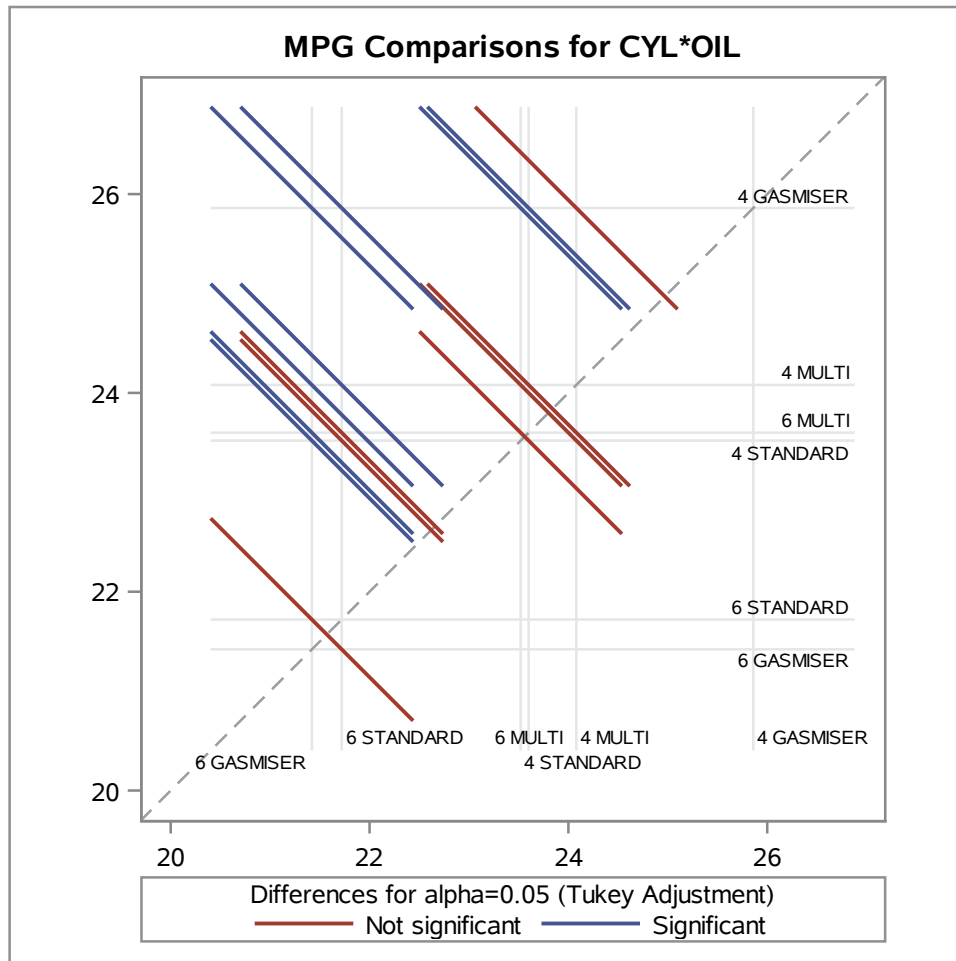
CYL	OIL	MPG LSMEAN	LSMEAN Number
4	GASMISER	25.8600000	1
4	MULTI	24.0800000	2
4	STANDARD	23.5200000	3
6	GASMISER	21.4200000	4
6	MULTI	23.6000000	5
6	STANDARD	21.7200000	6

Least Squares Means for effect CYL*OIL Pr > t for H0: LSMean(i)=LSMean(j)						
Dependent Variable: MPG						
i/j	1	2	3	4	5	6
1		0.1115	0.0178	<.0001	0.0235	<.0001
2	0.1115		0.9546	0.0056	0.9763	0.0166
3	0.0178	0.9546		0.0405	1.0000	0.1050
4	<.0001	0.0056	0.0405		0.0310	0.9972
5	0.0235	0.9763	1.0000	0.0310		0.0823
6	<.0001	0.0166	0.1050	0.9972	0.0823	

The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey



The GLM Procedure
 Least Squares Means
 Adjustment for Multiple Comparisons: Tukey



The GLM Procedure

Class Level Information		
Class	Levels	Values
L	4	B C E K
VARIETY	3	B L N
NIT	4	60 90 120 150

Number of Observations Read	48
Number of Observations Used	48

The GLM Procedure

Dependent Variable: YIELD

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	47	75391008.48	1604064.01	.	.
Error	0	0.00	.		
Corrected Total	47	75391008.48			

R-Square	Coeff Var	Root MSE	YIELD Mean
1.000000	.	.	4241.104

Source	DF	Type I SS	Mean Square	F Value	Pr > F
L	3	34397399.06	11465799.69	.	.
VARIETY	2	12429614.04	6214807.02	.	.
NIT	3	3428486.56	1142828.85	.	.
L*VARIETY	6	17855604.13	2975934.02	.	.
L*NIT	9	3415525.52	379502.84	.	.
VARIETY*NIT	6	415137.13	69189.52	.	.
L*VARIETY*NIT	18	3449242.04	191624.56	.	.

Source	DF	Type III SS	Mean Square	F Value	Pr > F
L	3	34397399.06	11465799.69	.	.
VARIETY	2	12429614.04	6214807.02	.	.
NIT	3	3428486.56	1142828.85	.	.
L*VARIETY	6	17855604.12	2975934.02	.	.
L*NIT	9	3415525.52	379502.84	.	.
VARIETY*NIT	6	415137.13	69189.52	.	.
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Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	29	71941766.44	2480750.57	12.95	<.0001
Error	18	3449242.04	191624.56		
Corrected Total	47	75391008.48			

R-Square	Coeff Var	Root MSE	YIELD Mean
0.954249	10.32159	437.7494	4241.104

Source	DF	Type I SS	Mean Square	F Value	Pr > F
L	3	34397399.06	11465799.69	59.83	<.0001
VARIETY	2	12429614.04	6214807.02	32.43	<.0001
NIT	3	3428486.56	1142828.85	5.96	0.0052
L*VARIETY	6	17855604.13	2975934.02	15.53	<.0001
L*NIT	9	3415525.52	379502.84	1.98	0.1039
VARIETY*NIT	6	415137.13	69189.52	0.36	0.8940

Source	DF	Type III SS	Mean Square	F Value	Pr > F
L	3	34397399.06	11465799.69	59.83	<.0001
VARIETY	2	12429614.04	6214807.02	32.43	<.0001
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L*NIT	9	3415525.52	379502.84	1.98	0.1039
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