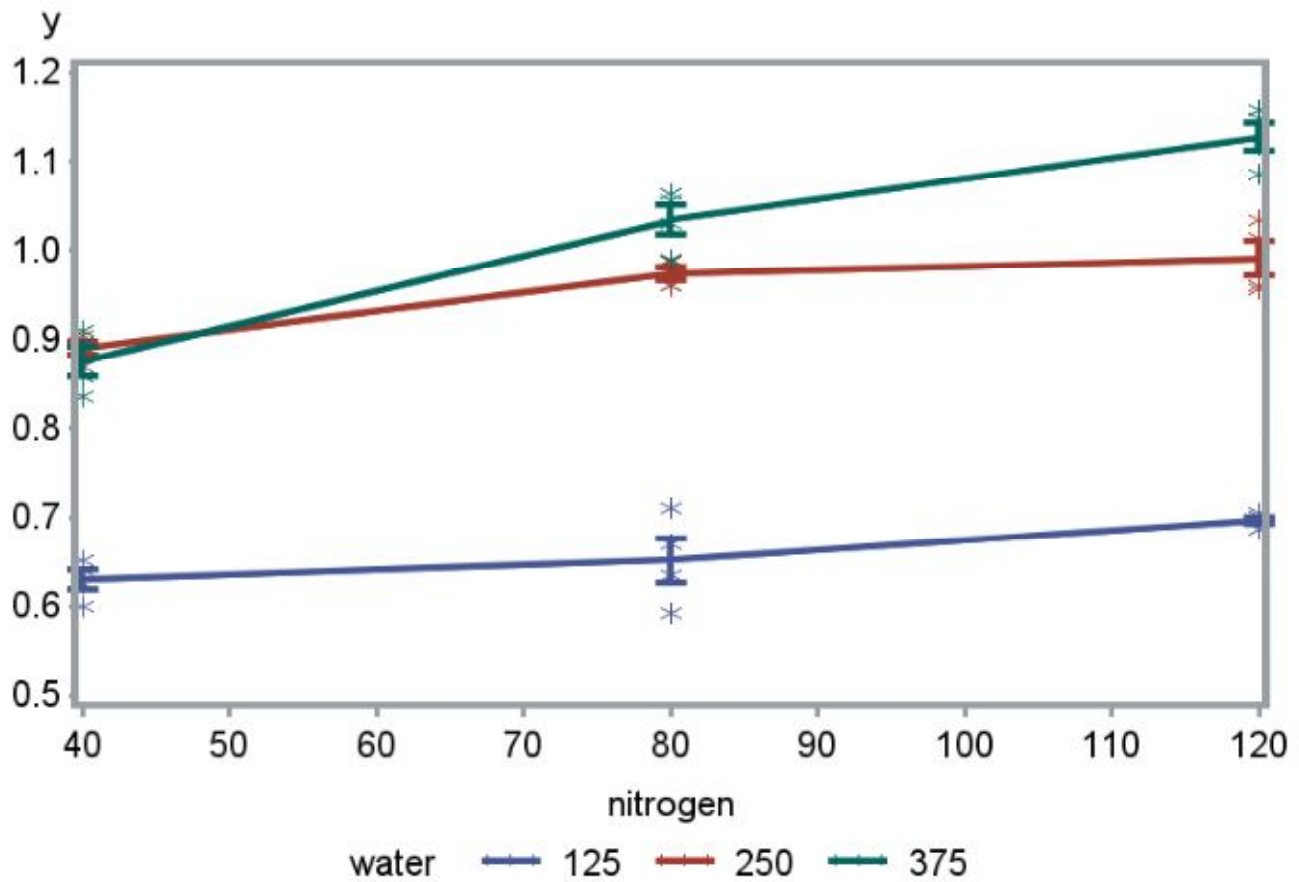


**Two-way ANOVA for biomass**  
**Data from Maestre and Reynolds (2007)**

Obs	nitrogen	water	biomass	y
1	40	125	4.372	0.64068
2	40	125	4.482	0.65147
3	40	125	4.221	0.62542
4	40	125	3.977	0.59956
5	40	250	7.400	0.86923
6	40	250	8.027	0.90455
7	40	250	7.883	0.89669
8	40	250	7.769	0.89037
9	40	375	7.226	0.85890
10	40	375	8.126	0.90988
11	40	375	6.840	0.83506
12	40	375	7.901	0.89768
13	80	125	5.140	0.71096
14	80	125	3.913	0.59251
15	80	125	4.669	0.66922
16	80	125	4.306	0.63407
17	80	250	9.099	0.95899
18	80	250	9.711	0.98726
19	80	250	9.123	0.96014
20	80	250	9.709	0.98717
21	80	375	10.701	1.02942
22	80	375	11.552	1.06266
23	80	375	11.356	1.05523
24	80	375	9.759	0.98941
25	120	125	5.021	0.70079
26	120	125	4.970	0.69636
27	120	125	5.055	0.70372
28	120	125	4.862	0.68681
29	120	250	9.029	0.95564
30	120	250	10.791	1.03306
31	120	250	9.115	0.95976
32	120	250	10.319	1.01364
33	120	375	12.189	1.08597
34	120	375	14.381	1.15779
35	120	375	13.153	1.11902
36	120	375	14.066	1.14817

**Two-way ANOVA for biomass**  
Data from Maestre and Reynolds (2007)



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**Two-way ANOVA for biomass**  
**Data from Maestre and Reynolds (2007)**

**The GLM Procedure**

Class Level Information		
Class	Levels	Values
nitrogen	3	40 80 120
water	3	125 250 375

<b>Number of Observations Read</b>	36
<b>Number of Observations Used</b>	36

**Two-way ANOVA for biomass**  
**Data from Maestre and Reynolds (2007)**

The GLM Procedure

Dependent Variable: y

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
<b>Model</b>	8	1.01770131	0.12721266	135.84	<.0001
<b>Error</b>	27	0.02528594	0.00093652		
<b>Corrected Total</b>	35	1.04298725			

R-Square	Coeff Var	Root MSE	y Mean
0.975756	3.499961	0.030603	0.874368

Source	DF	Type I SS	Mean Square	F Value	Pr > F
<b>nitrogen</b>	2	0.12039036	0.06019518	64.28	<.0001
<b>water</b>	2	0.85496135	0.42748068	456.46	<.0001
<b>nitrogen*water</b>	4	0.04234959	0.01058740	11.31	<.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
<b>nitrogen</b>	2	0.12039036	0.06019518	64.28	<.0001
<b>water</b>	2	0.85496135	0.42748068	456.46	<.0001
<b>nitrogen*water</b>	4	0.04234959	0.01058740	11.31	<.0001

**Two-way ANOVA for biomass**  
**Data from Maestre and Reynolds (2007)**

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

nitrogen	y LSMEAN	LSMEAN Number
40	0.79828979	1
80	0.88642108	2
120	0.93839425	3

Least Squares Means for effect nitrogen Pr >  t  for H0: LSMean(i)=LSMean(j) Dependent Variable: y			
i/j	1	2	3
1		<.0001	<.0001
2	<.0001		0.0008
3	<.0001	0.0008	

nitrogen	y LSMEAN	95% Confidence Limits	
40	0.798290	0.780164	0.816416
80	0.886421	0.868295	0.904547
120	0.938394	0.920268	0.956521

Least Squares Means for Effect nitrogen				
i	j	Difference Between Means	Simultaneous 95% Confidence Limits for LSMean(i)-LSMean(j)	
1	2	-0.088131	-0.119107	-0.057156
1	3	-0.140104	-0.171080	-0.109129
2	3	-0.051973	-0.082949	-0.020998

Tukey Comparison Lines for Least Squares Means of nitrogen			
LS-means with the same letter are not significantly different.			
	y LSMEAN	nitrogen	LSMEAN Number
A	0.93839425	120	3
B	0.88642108	80	2
C	0.79828979	40	1

**Two-way ANOVA for biomass**  
**Data from Maestre and Reynolds (2007)**

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

water	y LSMEAN	LSMEAN Number
125	0.65929804	1
250	0.95137559	2
375	1.01243148	3

Least Squares Means for effect water  
Pr > |t| for H0: LSMean(i)=LSMean(j)  
Dependent Variable: y

i/j	1	2	3
1		<.0001	<.0001
2	<.0001		0.0001
3	<.0001	0.0001	

water	y LSMEAN	95% Confidence Limits	
125	0.659298	0.641172	0.677424
250	0.951376	0.933249	0.969502
375	1.012431	0.994305	1.030558

**Least Squares Means for Effect water**

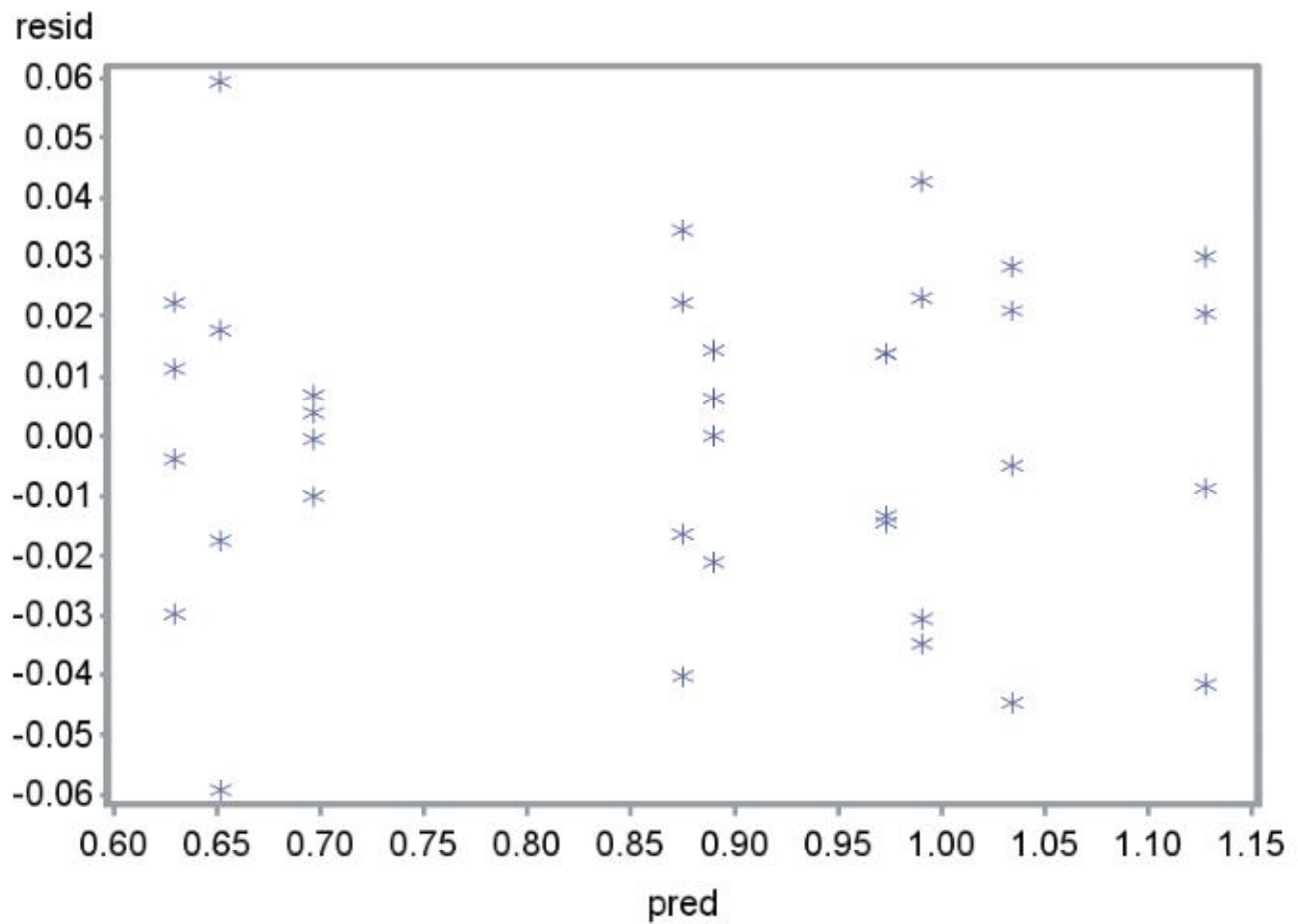
i	j	Difference Between Means	Simultaneous 95% Confidence Limits for LSMean(i)-LSMean(j)	
1	2	-0.292078	-0.323053	-0.261102
1	3	-0.353133	-0.384109	-0.322158
2	3	-0.061056	-0.092031	-0.030080

**Tukey Comparison Lines for Least Squares Means of water**

LS-means with the same letter  
are not significantly different.

	y LSMEAN	water	LSMEAN Number
A	1.01243148	375	3
B	0.95137559	250	2
C	0.65929804	125	1

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**Diagnostic plots to check anova assumptions**

## The UNIVARIATE Procedure

## Diagnostic plots to check anova assumptions

