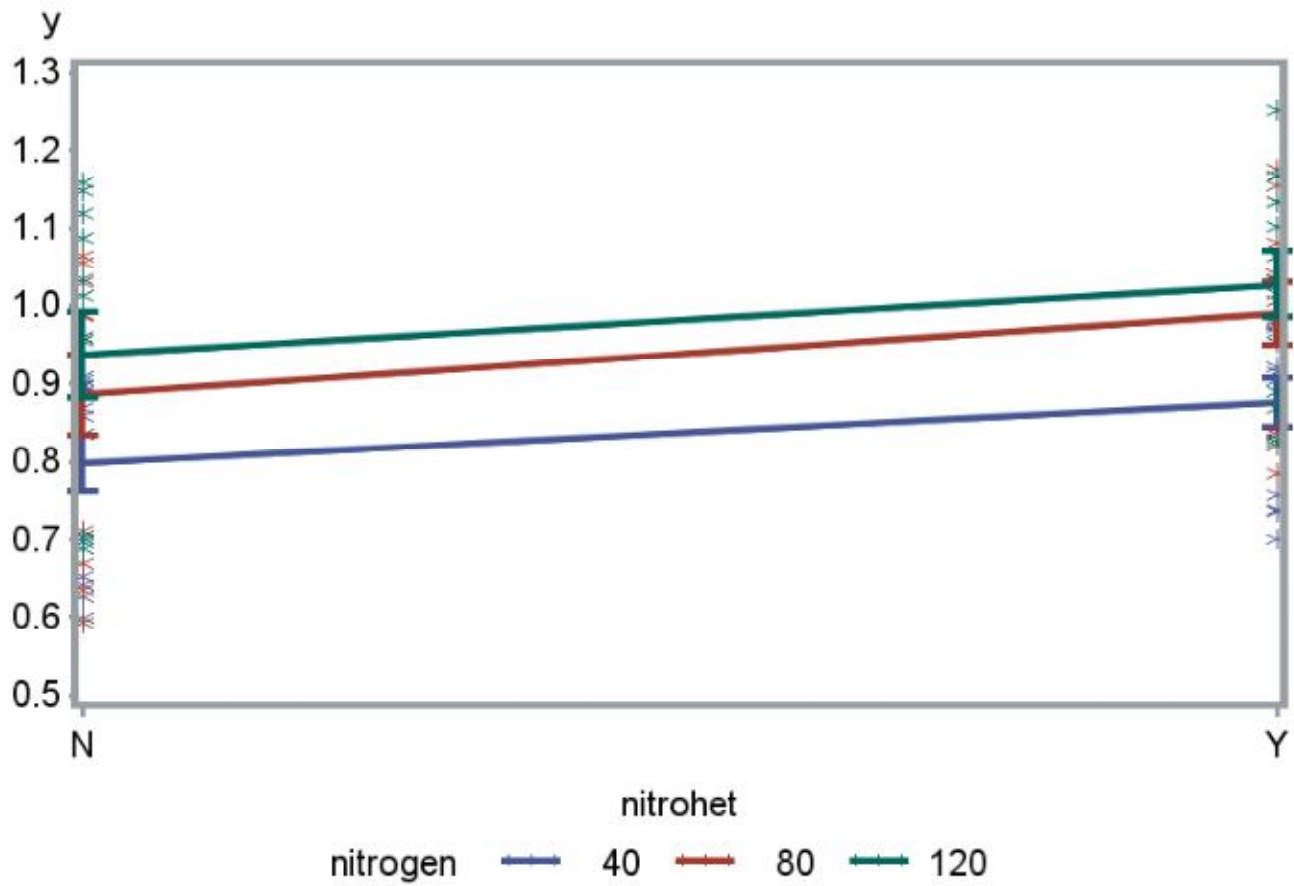


Three-way ANOVA for biomass
Data from Maestre and Reynolds (2007)

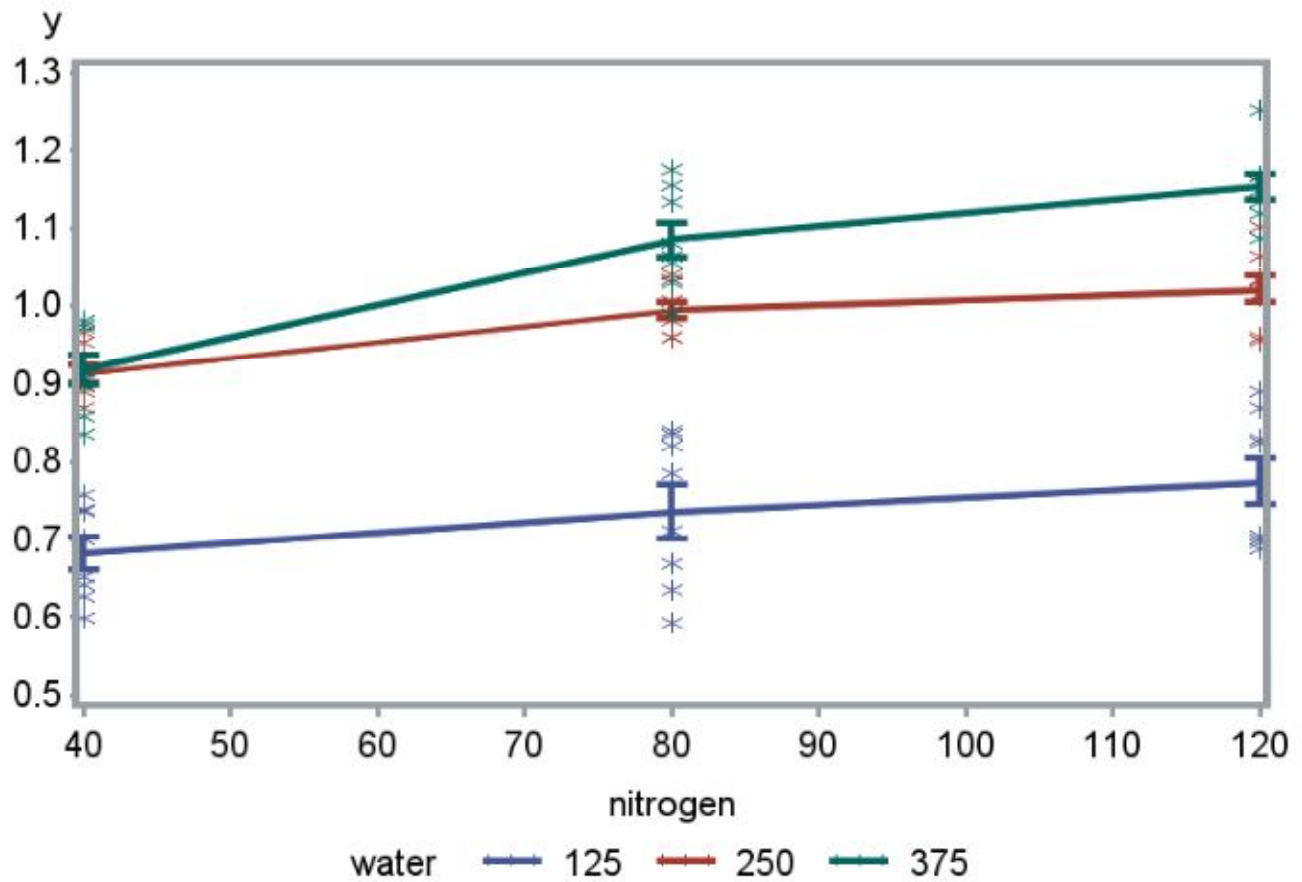
Obs	nitrohet	nitrogen	water	biomass	y
1	N	40	125	4.372	0.64068
2	N	40	125	4.482	0.65147
3	N	40	125	4.221	0.62542
4	N	40	125	3.977	0.59956
5	N	40	250	7.400	0.86923
6	N	40	250	8.027	0.90455
7	N	40	250	7.883	0.89669
8	N	40	250	7.769	0.89037
9	N	40	375	7.226	0.85890
10	N	40	375	8.126	0.90988
11	N	40	375	6.840	0.83506
12	N	40	375	7.901	0.89768
13	N	80	125	5.140	0.71096
14	N	80	125	3.913	0.59251
15	N	80	125	4.669	0.66922
16	N	80	125	4.306	0.63407
17	N	80	250	9.099	0.95899
18	N	80	250	9.711	0.98726
19	N	80	250	9.123	0.96014
20	N	80	250	9.709	0.98717
21	N	80	375	10.701	1.02942
22	N	80	375	11.552	1.06266
23	N	80	375	11.356	1.05523
24	N	80	375	9.759	0.98941
25	N	120	125	5.021	0.70079
26	N	120	125	4.970	0.69636
27	N	120	125	5.055	0.70372
28	N	120	125	4.862	0.68681
29	N	120	250	9.029	0.95564
30	N	120	250	10.791	1.03306
31	N	120	250	9.115	0.95976
32	N	120	250	10.319	1.01364
33	N	120	375	12.189	1.08597
34	N	120	375	14.381	1.15779
35	N	120	375	13.153	1.11902
36	N	120	375	14.066	1.14817
37	Y	40	125	5.458	0.73703
38	Y	40	125	5.017	0.70044
39	Y	40	125	5.479	0.73870

40	Y	40	125	5.714	0.75694
41	Y	40	250	8.972	0.95289
42	Y	40	250	9.234	0.96539
43	Y	40	250	8.032	0.90482
44	Y	40	250	8.372	0.92283
45	Y	40	375	9.464	0.97607
46	Y	40	375	9.563	0.98059
47	Y	40	375	9.385	0.97243
48	Y	40	375	8.226	0.91519
49	Y	80	125	6.616	0.82060
50	Y	80	125	6.909	0.83942
51	Y	80	125	6.851	0.83575
52	Y	80	125	6.098	0.78519
53	Y	80	250	10.792	1.03310
54	Y	80	250	10.164	1.00706
55	Y	80	250	10.947	1.03930
56	Y	80	250	9.582	0.98146
57	Y	80	375	14.936	1.17423
58	Y	80	375	13.607	1.13376
59	Y	80	375	14.231	1.15324
60	Y	80	375	12.038	1.08055
61	Y	120	125	7.389	0.86859
62	Y	120	125	6.683	0.82497
63	Y	120	125	7.759	0.88981
64	Y	120	125	6.752	0.82943
65	Y	120	250	10.731	1.03064
66	Y	120	250	12.640	1.10175
67	Y	120	250	10.350	1.01494
68	Y	120	250	11.550	1.06258
69	Y	120	375	14.697	1.16723
70	Y	120	375	17.826	1.25105
71	Y	120	375	14.711	1.16764
72	Y	120	375	13.614	1.13399

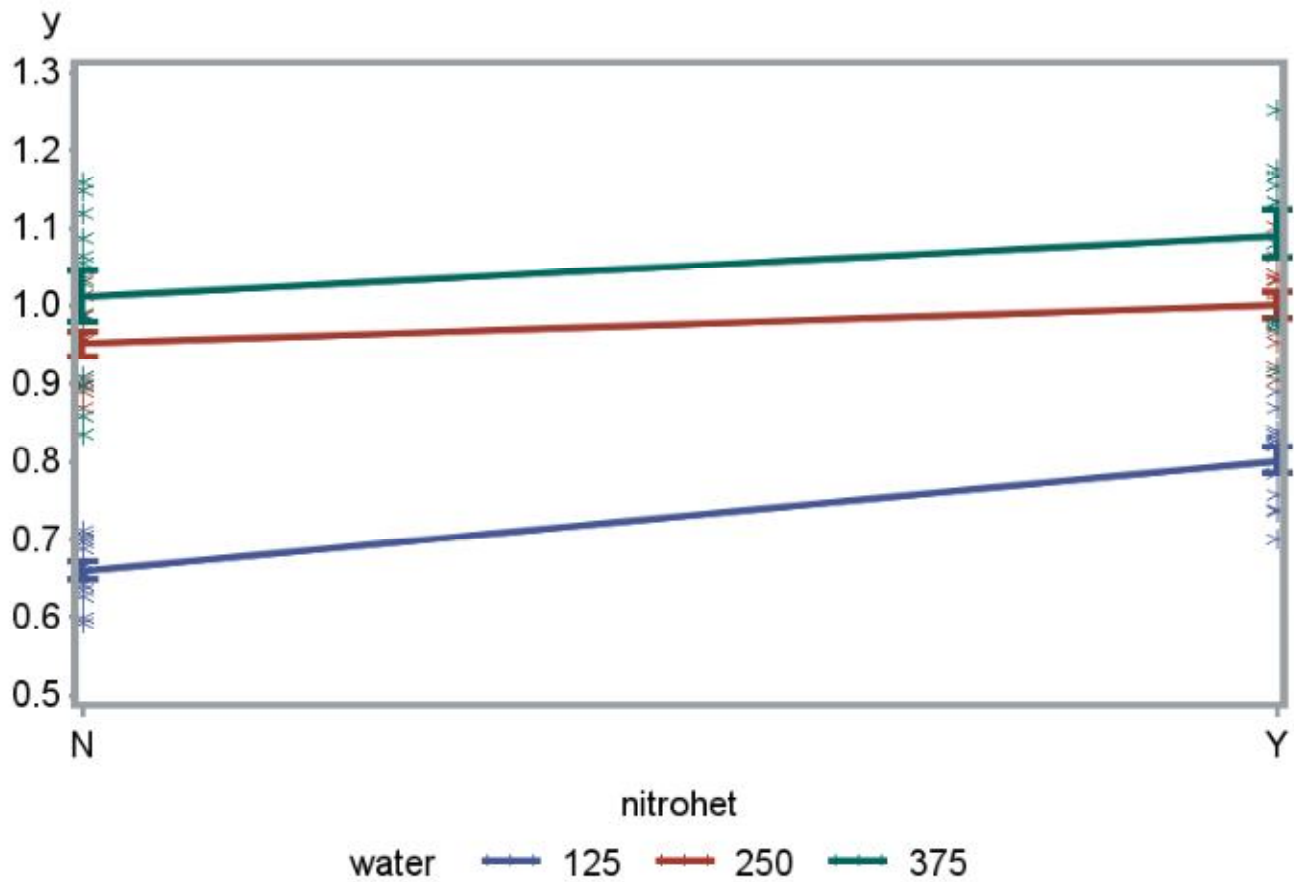
Three-way ANOVA for biomass
Data from Maestre and Reynolds (2007)



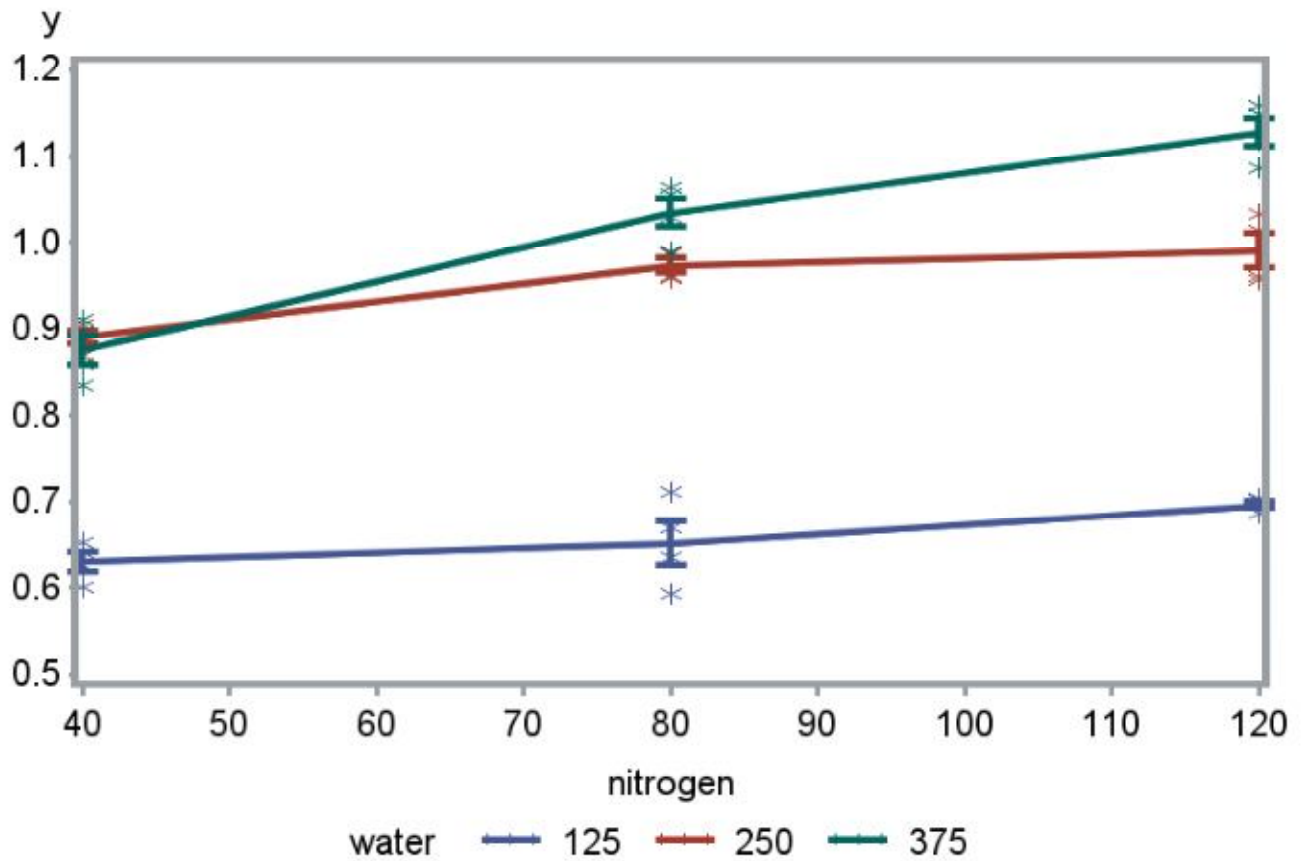
Three-way ANOVA for biomass
Data from Maestre and Reynolds (2007)



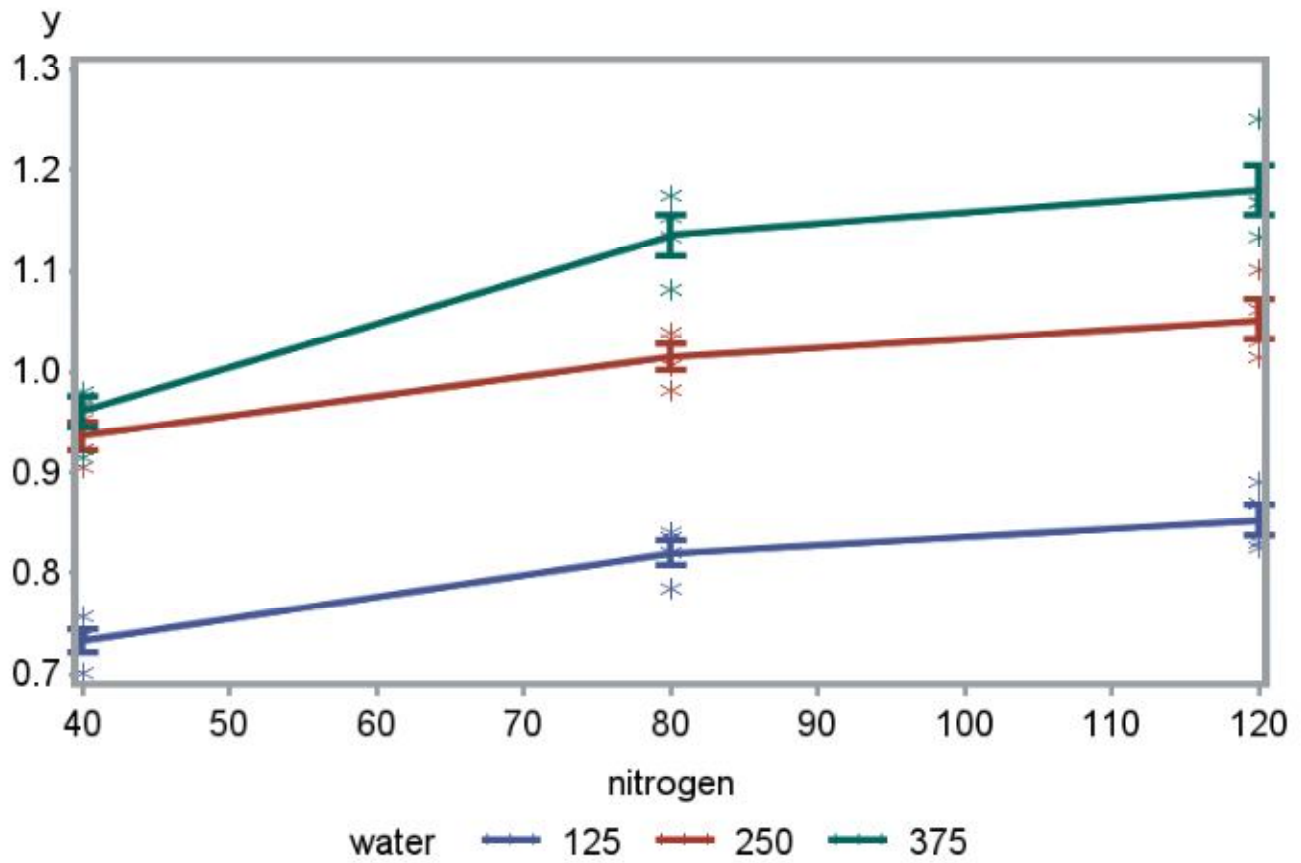
Three-way ANOVA for biomass
Data from Maestre and Reynolds (2007)



Three-way ANOVA for biomass
Data from Maestre and Reynolds (2007)
nitrohet=N



Three-way ANOVA for biomass
Data from Maestre and Reynolds (2007)
nitrohet=Y



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

The GLM Procedure

Class Level Information		
Class	Levels	Values
nitrohet	2	N Y
nitrogen	3	40 80 120
water	3	125 250 375

Number of Observations Read	72
Number of Observations Used	72

Three-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
Model	17	1.86010971	0.10941822	106.05	<.0001
Error	54	0.05571723	0.00103180		
Corrected Total	71	1.91582694			

R-Square	Coeff Var	Root MSE	y Mean
0.970917	3.492176	0.032122	0.919818

Source	DF	Type I SS	Mean Square	F Value	Pr > F
nitrohet	1	0.14872636	0.14872636	144.14	<.0001
nitrogen	2	0.26766625	0.13383312	129.71	<.0001
nitrohet*nitrogen	2	0.00191433	0.00095717	0.93	0.4017
water	2	1.35577897	0.67788949	657.00	<.0001
nitrohet*water	2	0.02702407	0.01351204	13.10	<.0001
nitrogen*water	4	0.05325694	0.01331423	12.90	<.0001
nitroh*nitroge*water	4	0.00574279	0.00143570	1.39	0.2492

Source	DF	Type III SS	Mean Square	F Value	Pr > F
nitrohet	1	0.14872636	0.14872636	144.14	<.0001
nitrogen	2	0.26766625	0.13383312	129.71	<.0001
nitrohet*nitrogen	2	0.00191433	0.00095717	0.93	0.4017
water	2	1.35577897	0.67788949	657.00	<.0001
nitrohet*water	2	0.02702407	0.01351204	13.10	<.0001
nitrogen*water	4	0.05325694	0.01331423	12.90	<.0001
nitroh*nitroge*water	4	0.00574279	0.00143570	1.39	0.2492

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

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

nitrohet	y LSMEAN	H0:LSMean1=LSMean2
		Pr > t
N	0.87436837	<.0001
Y	0.96526708	

nitrohet	y LSMEAN	95% Confidence Limits	
N	0.874368	0.863635	0.885102
Y	0.965267	0.954534	0.976000

Least Squares Means for Effect nitrohet				
i	j	Difference Between Means	Simultaneous 95% Confidence Limits for LSMean(i)-LSMean(j)	
1	2	-0.090899	-0.106077	-0.075720

Tukey Comparison Lines for Least Squares Means of nitrohet			
LS-means with the same letter are not significantly different.			
	y LSMEAN	nitrohet	LSMEAN Number
A	0.96526708	Y	2
B	0.87436837	N	1

**Three-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	0.83761753	1
80	0.93836289	2
120	0.98347277	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		<.0001
3	<.0001	<.0001	

nitrogen	y LSMEAN	95% Confidence Limits	
40	0.837618	0.824472	0.850763
80	0.938363	0.925217	0.951508
120	0.983473	0.970327	0.996618

Least Squares Means for Effect nitrogen				
i	j	Difference Between Means	Simultaneous 95% Confidence Limits for LSMean(i)-LSMean(j)	
1	2	-0.100745	-0.123092	-0.078399
1	3	-0.145855	-0.168202	-0.123509
2	3	-0.045110	-0.067457	-0.022763

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	0.98347277	120	3
B	0.93836289	80	2
C	0.83761753	40	1

Three-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	0.73076846	1
250	0.97638611	2
375	1.05229861	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		<.0001
3	<.0001	<.0001	

water	y LSMEAN	95% Confidence Limits	
125	0.730768	0.717623	0.743914
250	0.976386	0.963241	0.989532
375	1.052299	1.039153	1.065444

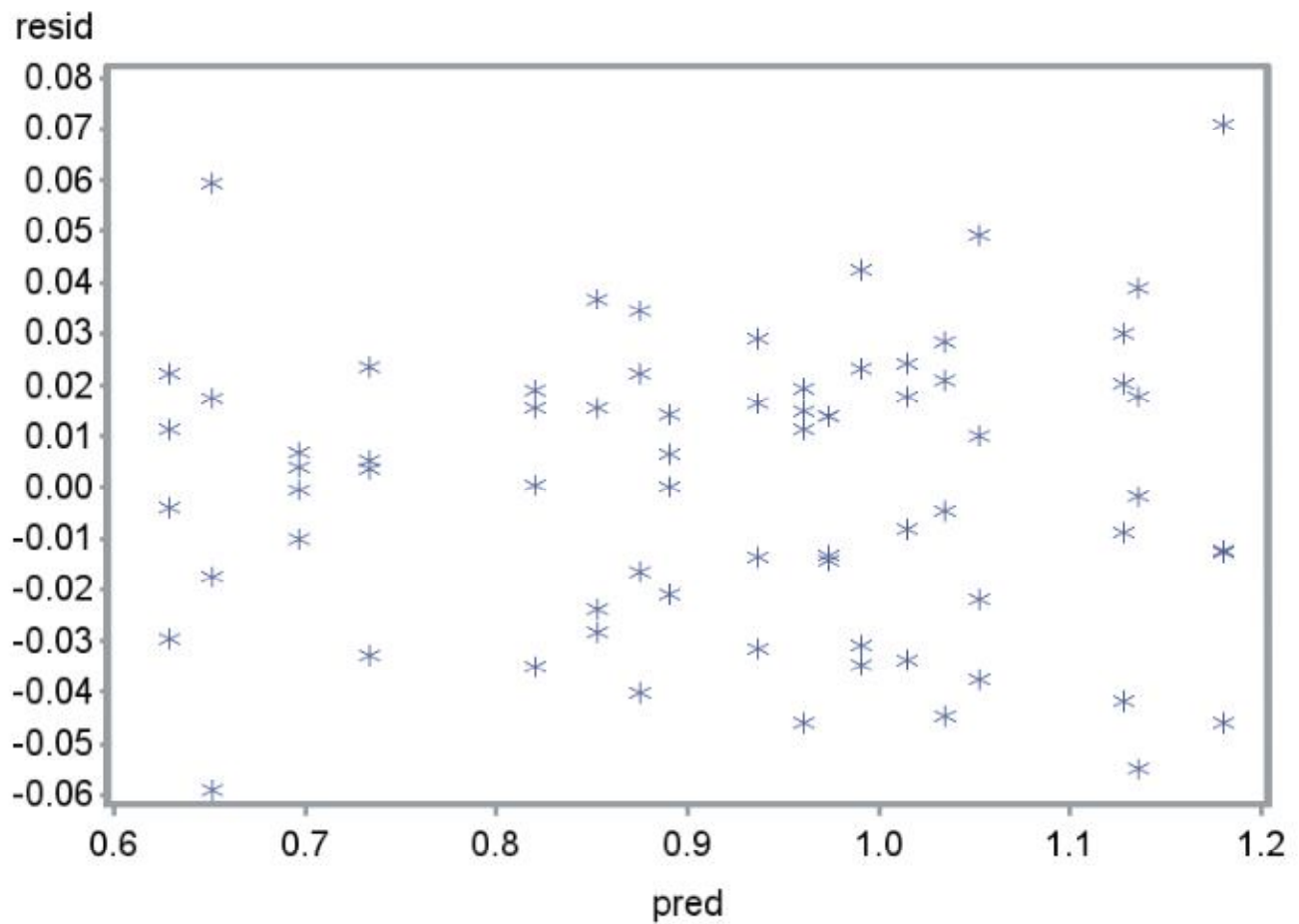
Least Squares Means for Effect water

i	j	Difference Between Means	Simultaneous 95% Confidence Limits for LSMean(i)-LSMean(j)	
1	2	-0.245618	-0.267964	-0.223271
1	3	-0.321530	-0.343877	-0.299183
2	3	-0.075913	-0.098259	-0.053566

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	1.05229861	375	3
B	0.97638611	250	2
C	0.73076846	125	1

Diagnostic plots to check anova assumptions

The UNIVARIATE Procedure

Diagnostic plots to check anova assumptions

