



Notat: Ny Udbyttefremgang Vinterraps Forsøgsserie 05005 og 05006 år 2014, 2015 og 2016

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Formål

- Det undersøges om udbytte niveau (udbytte kg std. kvalitet) og variation i de målte udbytter er forskellige i storparcelforsøg og småparcelforsøg.

Overordnede konklusioner

- Der er ikke statistisk forskel på udbytteneiveauet i små-parcelforsøg og stor-parcelforsøg (se Appendix – resultater for "Difference Niveau, Alle år, Udbytte (kgStdKvalitet)"). Den simple t-test for om den gennemsnitlige difference er nul indikerer dog, at der er en forskel idet p-værdien er 0,045 – dvs. hypotesen at den gennemsnitlige difference er nul forkastes. Men modellen for differencen, hvor år og lokalitet indgår som tilfældige effekter og hvor interceptet testes for om det er nul (ingen forskel mellem små- og stor-parcelforsøg) viser ingen forskel på de to forsøgstyper (p-værdi = 0,361)
- Der er statistisk forskel på variationen i udbytte i små-parcelforsøg og stor-parcelforsøg (se Appendix – resultater for "Difference CV, alle år, Udbytte (kgStdKvalitet)"). Den simple t-test for om den gennemsnitlige difference er nul giver en p-værdi < 0,001 – dvs. hypotesen at den gennemsnitlige difference er nul forkastes. Modellen for differencen, hvor år og lokalitet indgår som tilfældige effekter og hvor interceptet testes for om det er nul (ingen forskel mellem små- og stor-parcelforsøg) viser ligeledes forskel på de to forsøgstyper (p-værdi = 0,0035)

Metoder

- Data trækkes fra NFTS. De outlier markeringer der er lavet i NFTS benyttes til at udelukke enkelt-observationer.
- For Udbytte kg std. kvalitet analyseres pr år og for alle år samlet henholdsvis differencen mellem udbyttet i små- og storparcelforsøg, samt differencen i variationen (udtrykt som CV) mellem små- og storparcelforsøg.
- Differencen beregnes som:
 - o $\text{Difference udbytte} = \text{udbytte Småparcel} - \text{udbytte Storparcel}$
 - o $\text{Difference variation} = \text{variation Småparcel} - \text{variation Storparcel}$
- Derudover analyseres også niveauet i kg std. Kvalitet for effekt af parcelstørrelse pr lokalitet pr år, samt på tværs af lokalitet pr år. Niveauet Udbytte kg std. kvalitet analyseres ikke på tværs af år da behandling (faktor 1) har ændret niveau fra 2014 til 2015 og '16.
- Data er dels analyseret med en t-test (tester om differencerne er lig med nul) og i følgende lineære mixed effects modeller:
 - o Differencer analyseret pr år:

$$Y_i = \beta_0 + \beta_1 LF1 + lbnr_j + e_i$$

- Differencer analyseret på tværs af år:

$$Y_i = \beta_0 + \beta_1 LF1 + aar/lbnr_{k[j]} + e_i$$

- Niveau analyseret pr lokalitet pr år:

$$Y_i = \beta_0 + \beta_1 PARCELSTØRRELSE + \beta_2 LF1 + gentagelse_j + e_i$$

- Niveau analyseret pr år:

$$Y_i = \beta_0 + \beta_1 PARCELSTØRRELSE + \beta_2 LF1 + lbnr/gentagelse_{k[j]} + e_i$$

Tabel 1. Oversigt over hvilke led-numre der indgår i analyserne. Omdøbning af led-numre for småparcelforsøgene, således at disse passer med led-numrene for storparcelforsøgene.

Lednumre, 2014			Lednumre, 2015 og 2016		
Småparcel 05005		Storparcel 05006	Småparcel 05005		Storparcel 05006
Oprindelig NFTS led-nr.	Nyt led-nr.		Oprindelig NFTS led-nr.	Nyt led-nr.	
2	1	1	1	1	1
7	2	2	4	2	2
9	3	3	7	3	3

Tabel 2. Oversigt over forsøgsserierne og hvilke forsøg der indgår i analyserne. Omdøbning af LBNR (markeret med fed) for storparcelforsøgene, således at lokalitet passer med småparcelforsøgene.

Småparcel 010801616		Storparcel 010811616		
LBNR		Oprindelig NFTS LBNR	Nyt LBNR	By
001		001	001	Ringsted
002		002	002	Rønde
004		004	004	Holeby
005		005	005	Hjerm
006		006	006	Vojens
Småparcel 010801515		Storparcel 010811515		
LBNR		Oprindelig NFTS LBNR	Nyt LBNR	By
001		001	001	Ringsted
002		002	002	Brønderslev
004		004	004	Vojens
006		005	006	Hjerm
Småparcel 010801414		Storparcel 010811414		
LBNR		Oprindelig NFTS LBNR	Nyt LBNR	By
001		001	001	Hjerm
003		003	003	Vojens
004		004	004	Ringsted
005		005	005	Brønderslev *)
006		006	006	Rønde

*) Der er ingen data for forsøgene for LBNR 005 – denne udelades derfor

Resultater

- Alle resultater præsenteres i Appendix.

Referencer

R Core Team (2016). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL <https://www.R-project.org/>.

Appendix

Difference Niveau, 2014, Udbytte (kgStdKvalitet)

Test af differencen: Difference = SmåParcel - StorParcel (positiv: småparcel har højest værdi)

T-test af difference. H0: gennemsnitlig difference = 0

	ttest3
statistic.t	-5.99788343570764
parameter.df	11
p.value	8.95330535440737e-05

Model for difference: diff = intercept + LF1 + RandomEffects

Test af om intercept = 0

	Estimate	Std. Error	df	t value	Pr(> t)
(Intercept)	-300.1319	132.8977	8.985415	-2.258368	0.05035645
LF12	-242.2270	187.9457	8.985415	-1.288813	0.22965412
LF13	-266.5227	187.9457	8.985415	-1.418083	0.18990190

ANOVA tabel for fixed effects

	Sum Sq	Mean Sq	NumDF	DenDF	F.value	Pr(>F)
LF1	173731.4	86865.68	2	8.985415	1.22957	0.3372816

LSmeans for fixed effects

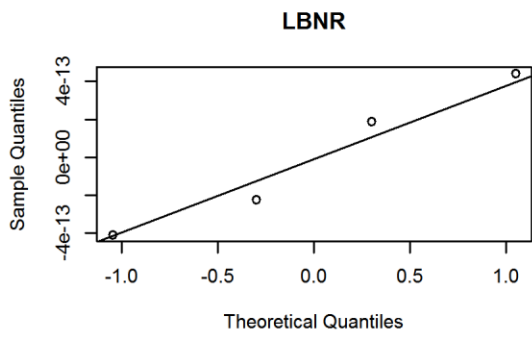
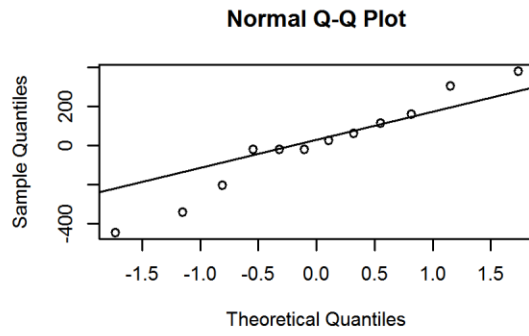
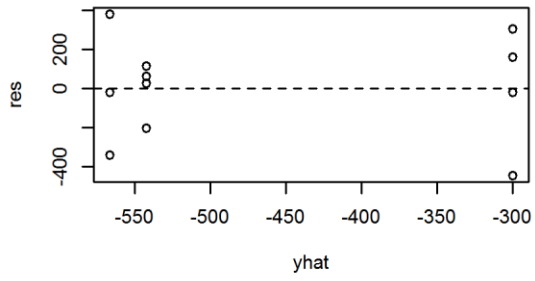
LF1	lsmean	SE	df	lower.CL	upper.CL	.group
1	-300.1	132.9	9	-600.8	0.5	a
2	-542.4	132.9	9	-843.0	-241.7	a
3	-566.7	132.9	9	-867.3	-266.0	a

LSD for fixed effects

	out[[i]]\$LSD
LF1	459.9

p-værdier for fixed effects

	out[[i]]\$pvalues
LF1	p = 0.33728



Difference Niveau, 2015, Udbytte (kgStdKvalitet)

Test af differencen: Difference = SmåParcel - StorParcel (positiv: småparcel har højest værdi)

T-test af difference. H0: gennemsnitlig difference = 0

	ttest3
statistic.t	1.34215259732202
parameter.df	11
p.value	0.206591784901294

Model for difference: diff = intercept + LF1 + RandomEffects

Test af om intercept = 0

	Estimate	Std. Error	df	t value	Pr(> t)
(Intercept)	-100.5026	269.3791	3.340724	-0.3730897	0.731516764
LF12	533.9344	107.5217	6.019418	4.9658301	0.002514155
LF13	397.2039	107.5217	6.019418	3.6941744	0.010099668

ANOVA tabel for fixed effects

	Sum Sq	Mean Sq	NumDF	DenDF	F.value	Pr(>F)
LF1	615402.8	307701.4	2	6.019607	13.30783	0.006172281

LSmeans for fixed effects

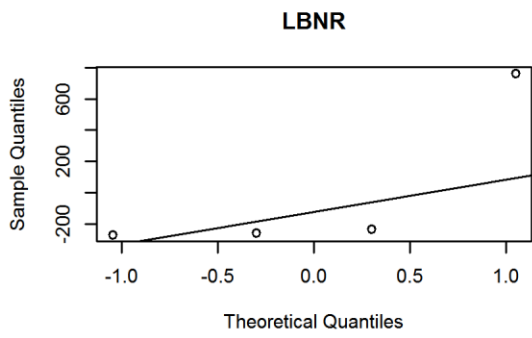
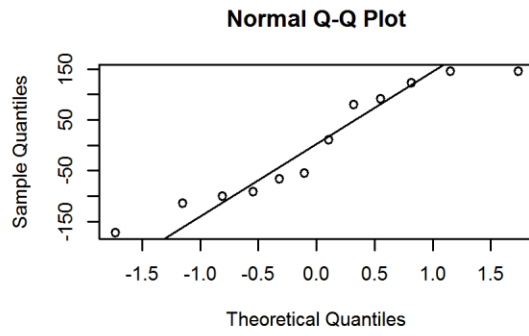
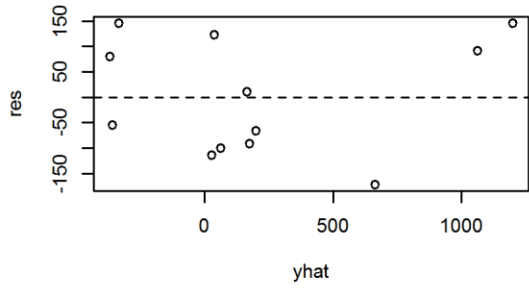
LF1	lsmean	SE	df	lower.CL	upper.CL	.group
1	-100.5	269.4	3.340689	-910.4	709.4	a
2	433.4	269.4	3.340689	-376.5	1243.3	b
3	296.7	269.4	3.340689	-513.2	1106.6	b

LSD for fixed effects

	out[[i]]\$LSD
LF1	263.1

p-værdier for fixed effects

	out[[i]]\$pvalues
LF1	p = 0.00617



Difference Niveau, 2016, Udbytte (kgStdKvalitet)

Test af differencen: Difference = SmåParcel - StorParcel (positiv: småparcel har højest værdi)

T-test af difference. H0: gennemsnitlig difference = 0

	ttest3
statistic.t	-2.08565182533198
parameter.df	14
p.value	0.0557932384991168

Model for difference: diff = intercept + LF1 + RandomEffects

Test af om intercept = 0

	Estimate	Std. Error	df	t value	Pr(> t)
(Intercept)	-287.20164	189.0436	6.007254	-1.5192350	0.1794505
LF12	94.57924	144.8514	8.075938	0.6529397	0.5319388
LF13	128.28492	144.8514	8.075938	0.8856311	0.4014165

ANOVA tabel for fixed effects

	Sum Sq	Mean Sq	NumDF	DenDF	F.value	Pr(>F)
LF1	44230.54	22115.27	2	8.075943	0.421606	0.6696385

LSmeans for fixed effects

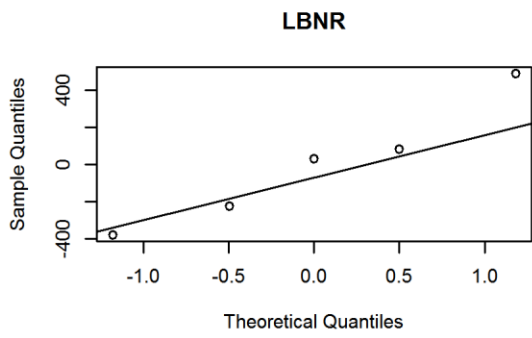
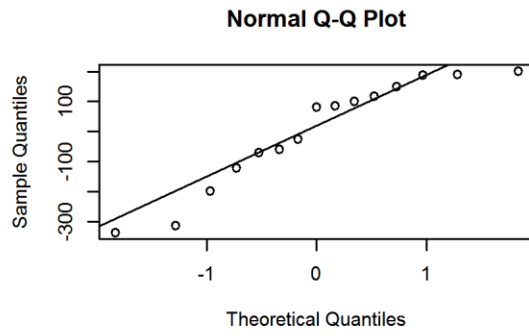
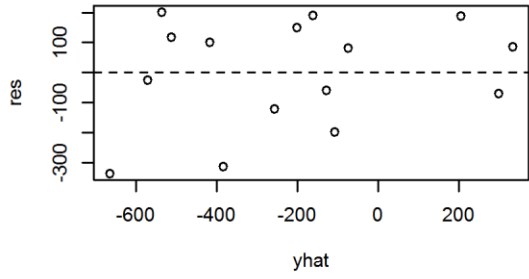
LF1	lsmean	SE	df	lower.CL	upper.CL	.group
1	-287.2	189	6.00563	-749.7	175.3	a
2	-192.6	189	6.00563	-655.1	269.8	a
3	-158.9	189	6.00563	-621.4	303.6	a

LSD for fixed effects

	out[[i]]\$LSD
LF1	334

p-værdier for fixed effects

	out[[i]]\$pvalues
LF1	p = 0.66964



Difference Niveau, Alle år, Udbytte (kgStdKvalitet)

Test af differencen: Difference = SmåParcel - StorParcel (positiv: småparcel har højest værdi)

T-test af difference. H0: gennemsnitlig difference = 0

	ttest3
statistic.t	-2.0698345716515
parameter.df	38
p.value	0.0453152118035415

Model for difference: diff = intercept + LF1 + RandomEffects

Test af om intercept = 0

	Estimate	Std. Error	df	t value	Pr(> t)
(Intercept)	-230.69854	203.3606	2.305914	-1.1344310	0.3607140
LF12	126.13277	105.7997	24.188234	1.1921844	0.2447543
LF13	89.54996	105.7997	24.188234	0.8464102	0.4056203

ANOVA tabel for fixed effects

	Sum Sq	Mean Sq	NumDF	DenDF	F.value	Pr(>F)
LF1	109490.2	54745.11	2	23.56786	0.7524245	0.4822085

LSmeans for fixed effects

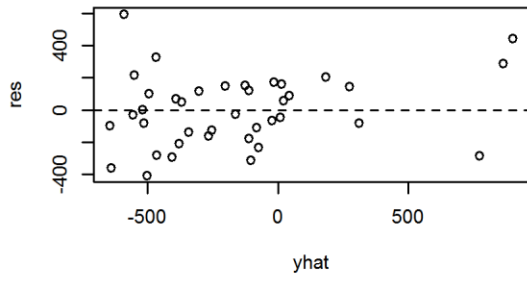
LF1	lsmean	SE	df	lower.CL	upper.CL	.group
1	-230.7	203.6	2.40846	-978.6	517.2	a
2	-104.6	203.6	2.40846	-852.5	643.3	a
3	-141.1	203.6	2.40846	-889.1	606.8	a

LSD for fixed effects

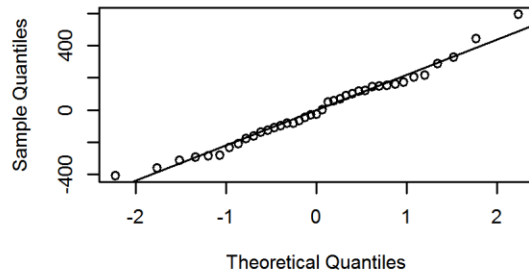
	out[[i]]\$LSD
LF1	218.4

p-værdier for fixed effects

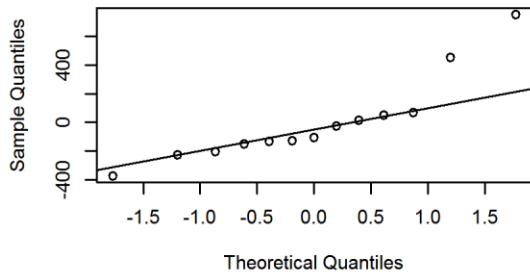
	out[[i]]\$pvalues
LF1	p = 0.48221



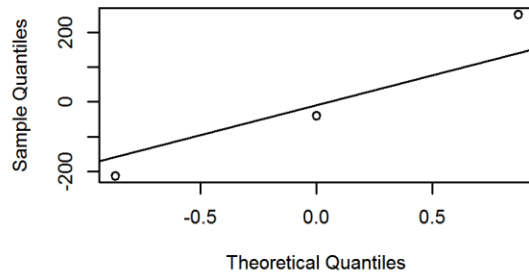
Normal Q-Q Plot



LBNR:aar



aar



Difference CV, 2014, Udbytte (kgStdKvalitet)

Test af differencen: Difference = SmåParcel - StorParcel (positiv: småparcel har højest værdi)

T-test af difference. H0: gennemsnitlig difference = 0

ttest3	
statistic.t	2.79394646713898
parameter.df	11
p.value	0.0174628344976755

Model for difference: diff = intercept + LF1 + RandomEffects

Test af om intercept = 0

	Estimate	Std. Error	df	t value	Pr(> t)
(Intercept)	5.825914	1.883278	9.000004	3.0934971	0.01285668
LF12	-5.588010	2.663357	9.000004	-2.0981077	0.06531853
LF13	-1.754092	2.663357	9.000004	-0.6586021	0.52663919

ANOVA tabel for fixed effects

	Sum Sq	Mean Sq	NumDF	DenDF	F.value	Pr(>F)
LF1	65.33548	32.66774	2	9.000004	2.302663	0.1557403

LSmeans for fixed effects

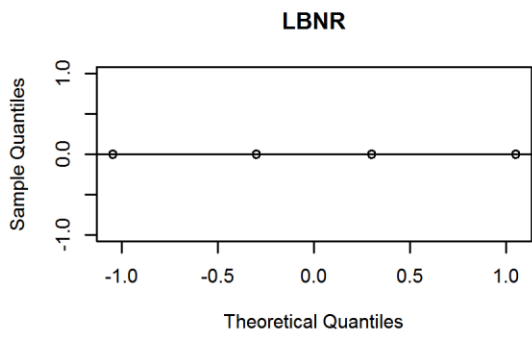
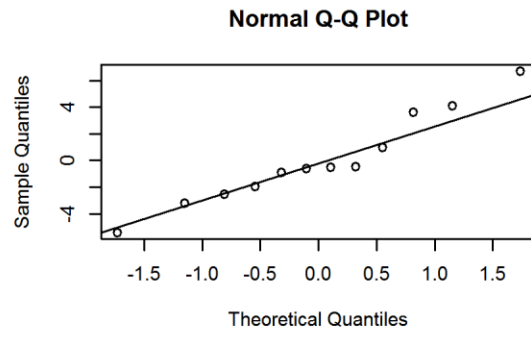
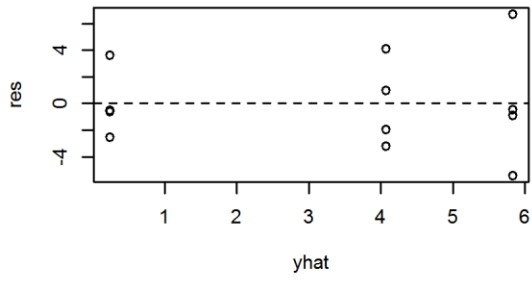
LF1	lsmean	SE	df	lower.CL	upper.CL	.group
1	5.8	1.9	9	1.6	10.1	a
2	0.2	1.9	9	-4.0	4.5	a
3	4.1	1.9	9	-0.2	8.3	a

LSD for fixed effects

	out[[i]]\$LSD
LF1	6.5

p-værdier for fixed effects

	out[[i]]\$pvalues
LF1	p = 0.15574



Difference CV, 2015, Udbytte (kgStdKvalitet)

Test af differencen: Difference = SmåParcel - StorParcel (positiv: småparcel har højest værdi)

T-test af difference. H0: gennemsnitlig difference = 0

	ttest3
statistic.t	2.21190320803291
parameter.df	11
p.value	0.0490550876824639

Model for difference: diff = intercept + LF1 + RandomEffects

Test af om intercept = 0

	Estimate	Std. Error	df	t value	Pr(> t)
(Intercept)	2.239977	1.157381	9.000001	1.9353850	0.08493586
LF12	1.105641	1.636783	9.000001	0.6754965	0.51633879
LF13	-2.697348	1.636783	9.000001	-1.6479569	0.13376455

ANOVA tabel for fixed effects

	Sum Sq	Mean Sq	NumDF	DenDF	F.value	Pr(>F)
LF1	30.61448	15.30724	2	9.000001	2.856831	0.1094833

LSmeans for fixed effects

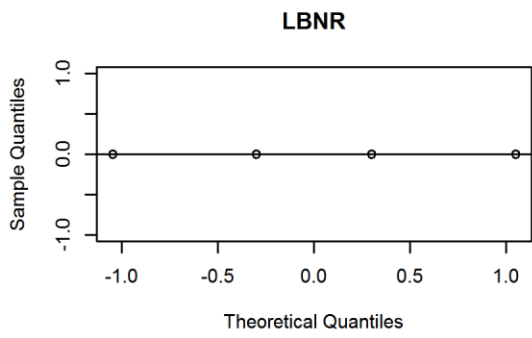
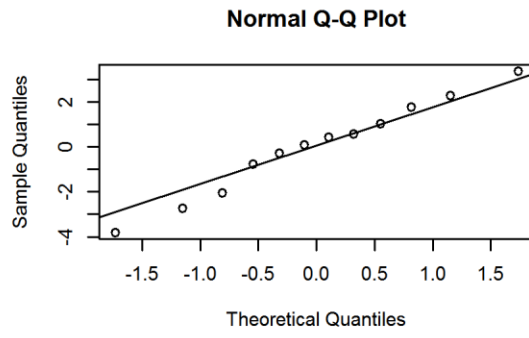
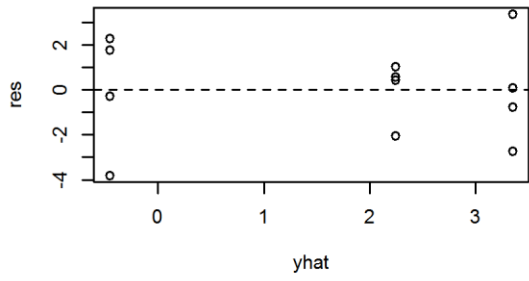
LF1	lsmean	SE	df	lower.CL	upper.CL	.group
1	2.2	1.2	9	-0.4	4.9	a
2	3.3	1.2	9	0.7	6.0	a
3	-0.5	1.2	9	-3.1	2.2	a

LSD for fixed effects

	out[[i]]\$LSD
LF1	4

p-værdier for fixed effects

	out[[i]]\$pvalues
LF1	p = 0.10948



Difference CV, 2016, Udbytte (kgStdKvalitet)

Test af differencen: Difference = SmåParcel - StorParcel (positiv: småparcel har højest værdi)

T-test af difference. H0: gennemsnitlig difference = 0

	ttest3
statistic.t	2.48043490889745
parameter.df	14
p.value	0.0264468973001776

Model for difference: diff = intercept + LF1 + RandomEffects

Test af om intercept = 0

	Estimate	Std. Error	df	t value	Pr(> t)
(Intercept)	1.444044	1.613016	10.042933	0.8952450	0.3916079
LF12	1.158302	1.891915	8.000004	0.6122376	0.5573770
LF13	1.006322	1.891915	8.000004	0.5319063	0.6092403

ANOVA tabel for fixed effects

	Sum Sq	Mean Sq	NumDF	DenDF	F.value	Pr(>F)
LF1	3.962407	1.981203	2	8.000005	0.2214041	0.8061433

LSmeans for fixed effects

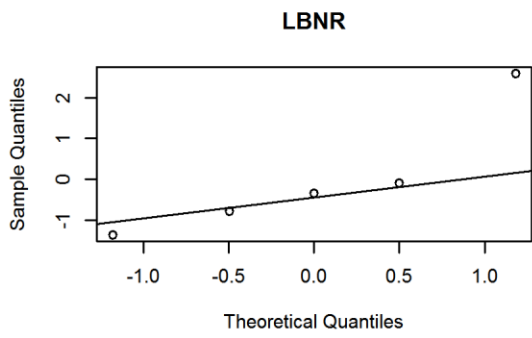
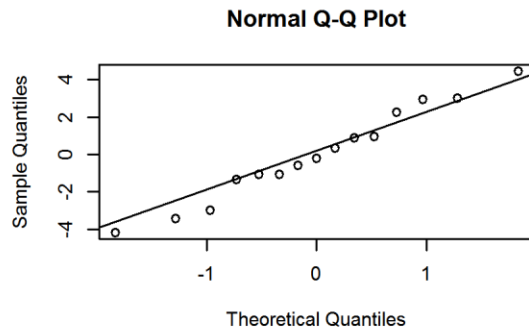
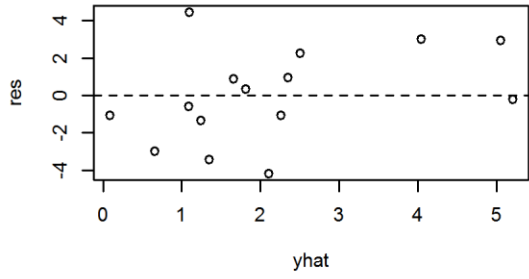
LF1	lsmean	SE	df	lower.CL	upper.CL	.group
1	1.4	1.6	10.04293	-2.1	5.0	a
2	2.6	1.6	10.04293	-1.0	6.2	a
3	2.5	1.6	10.04293	-1.1	6.0	a

LSD for fixed effects

	out[[i]]\$LSD
LF1	4.4

p-værdier for fixed effects

	out[[i]]\$pvalues
LF1	p = 0.80614



Difference CV, alle år, Udbytte (kgStdKvalitet)

Test af differencen: Difference = SmåParcel - StorParcel (positiv: småparcel har højest værdi)

T-test af difference. H0: gennemsnitlig difference = 0

ttest3	
statistic.t	4.35275286658524
parameter.df	38
p.value	9.78444164743016e-05

Model for difference: diff = intercept + LF1 + RandomEffects

Test af om intercept = 0

	Estimate	Std. Error	df	t value	Pr(> t)
(Intercept)	3.0372142	0.9718173	35.98897	3.1252934	0.003503297
LF12	-0.9336896	1.3658221	24.00002	-0.6836099	0.500768865
LF13	-0.9826272	1.3658221	24.00002	-0.7194401	0.478817454

ANOVA tabel for fixed effects

	Sum Sq	Mean Sq	NumDF	DenDF	F.value	Pr(>F)
LF1	7.972152	3.986076	2	23.99997	0.3287335	0.7230251

LSmeans for fixed effects

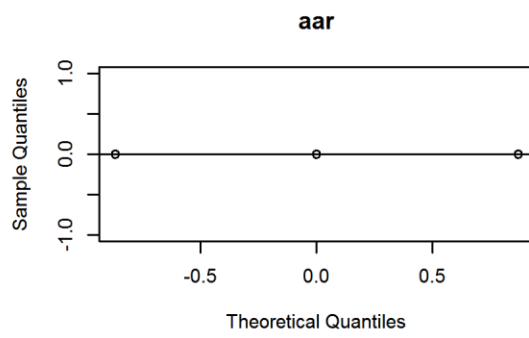
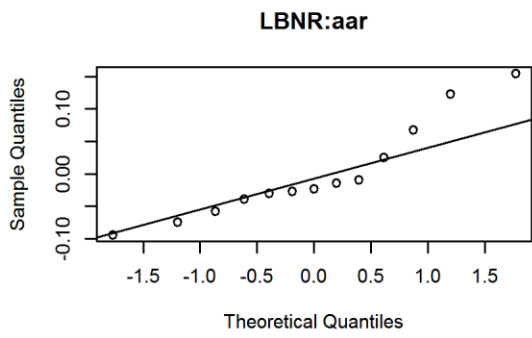
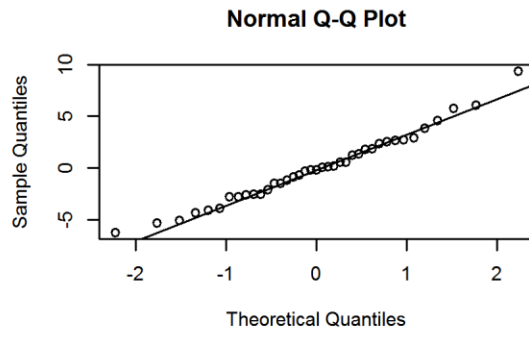
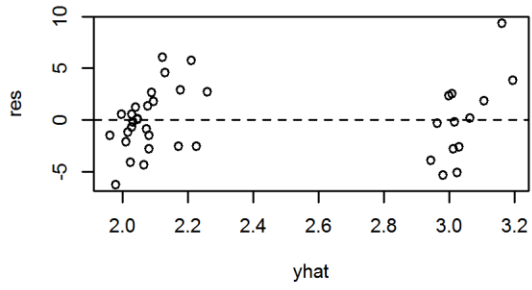
LF1	lsmean	SE	df	lower.CL	upper.CL	.group
1	3.0	1	12.78753	0.9	5.2	a
2	2.1	1	12.78753	0.0	4.2	a
3	2.1	1	12.78753	-0.1	4.2	a

LSD for fixed effects

	out[[i]]\$LSD
LF1	2.8

p-værdier for fixed effects

	out[[i]]\$pvalues
LF1	p = 0.72303



Niveau, 2014 LBNR 001, Hjern, Udbytte (kgStdKvalitet)

ANOVA tabel for fixed effects

	Sum Sq	Mean Sq	NumDF	DenDF	F.value	Pr(>F)
ParcStr	548058.04	548058.04	1	14.15574	21.511307	3.729797e-04
LF1	973616.78	486808.39	2	14.15111	19.107255	9.533989e-05
ParcStr:LF1	57937.13	28968.57	2	14.15111	1.137018	3.484008e-01

LSmeans for fixed effects

ParcStr	lsmean	SE	df	lower.CL	upper.CL	.group
SmåParceller	5625.2	74.1	4.950804	5434.3	5816.2	a
StorParceller	5936.9	72.1	4.533940	5745.7	6128.0	b

LF1	lsmean	SE	df	lower.CL	upper.CL	.group
1	5483.9	83.1	7.288706	5289.0	5678.9	a
2	5883.9	79.1	6.330315	5692.7	6075.0	b
3	5975.4	79.1	6.330315	5784.3	6166.5	b

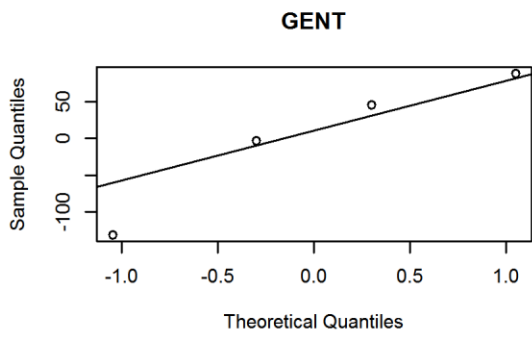
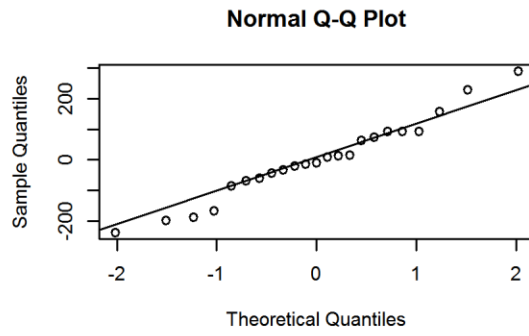
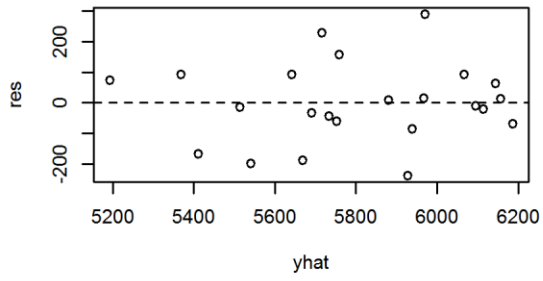
ParcStr	LF1	lsmean	SE	df	lower.CL	upper.CL	.group
SmåParceller	1	5323.1	109.8	13.68201	5087.2	5559.1	a
StorParceller	1	5644.8	97.2	11.36438	5431.7	5857.8	b
SmåParceller	2	5670.5	97.2	11.36438	5457.5	5883.5	b
StorParceller	2	6097.2	97.2	11.36438	5884.2	6310.3	c
SmåParceller	3	5882.1	97.2	11.36438	5669.1	6095.1	bc
StorParceller	3	6068.7	97.2	11.36438	5855.7	6281.7	c

LSD for fixed effects

	out[[i]]\$LSD
ParcStr	144.4
LF1	176.8
ParcStr:LF1	250.1

p-værdier for fixed effects

	out[[i]]\$pvalues
ParcStr	p = 0.00037
LF1	p = 1e-04
ParcStr:LF1	p = 0.3484



Niveau, 2014 LBNR 003, Vojens, Udbytte (kgStdKvalitet)

ANOVA tabel for fixed effects

	Sum Sq	Mean Sq	NumDF	DenDF	F.value	Pr(>F)
ParcStr	1813314.7	1813314.7	1	17.98832	34.738775	1.405073e-05
LF1	547290.5	273645.3	2	17.98832	5.242389	1.607562e-02
ParcStr:LF1	948214.8	474107.4	2	17.98832	9.082764	1.876269e-03

LSmeans for fixed effects

ParcStr	lsmean	SE	df	lower.CL	upper.CL	.group
SmåParceller	6213.1	66	10	6066.1	6360.0	a
StorParceller	6762.8	66	10	6615.9	6909.8	b

LF1	lsmean	SE	df	lower.CL	upper.CL	.group
1	6294.6	80.8	15	6122.4	6466.7	a
2	6506.2	80.8	15	6334.0	6678.4	ab
3	6663.1	80.8	15	6490.9	6835.3	b

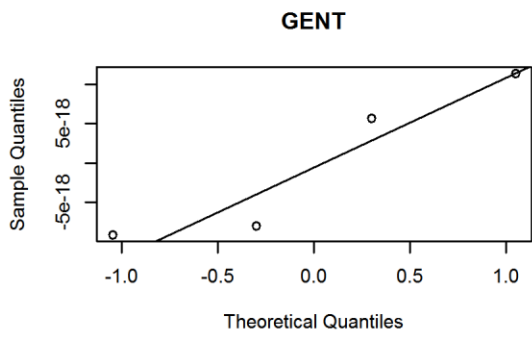
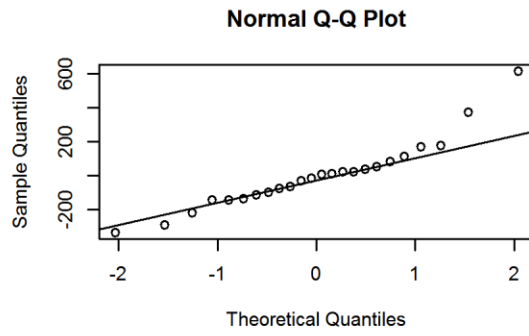
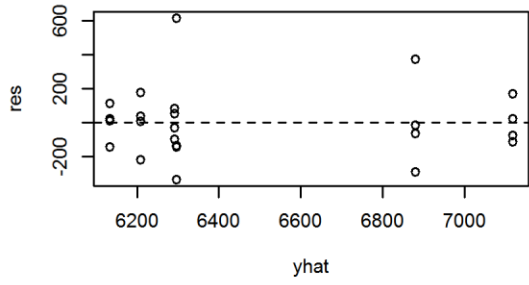
ParcStr	LF1	lsmean	SE	df	lower.CL	upper.CL	.group
SmåParceller	1	6296.9	114.2	18	6056.9	6536.9	a
StorParceller	1	6292.2	114.2	18	6052.2	6532.2	a
SmåParceller	2	6133.0	114.2	18	5893.0	6373.0	a
StorParceller	2	6879.3	114.2	18	6639.3	7119.3	b
SmåParceller	3	6209.3	114.2	18	5969.3	6449.3	a
StorParceller	3	7116.9	114.2	18	6876.9	7356.9	b

LSD for fixed effects

	out[[i]]\$LSD
ParcStr	198.8
LF1	243.5
ParcStr:LF1	344.3

p-værdier for fixed effects

	out[[i]]\$pvalues
ParcStr	p = 1e-05
LF1	p = 0.01608
ParcStr:LF1	p = 0.00188



Niveau, 2014 LBNR 004, Ringsted, Udbytte (kgStdKvalitet)

ANOVA tabel for fixed effects

	Sum Sq	Mean Sq	NumDF	DenDF	F.value	Pr(>F)
ParcStr	2273058.35	2273058.35	1	15.02261	23.3000180	0.00022091
LF1	932804.58	466402.29	2	15.02261	4.7808635	0.02473052
ParcStr:LF1	53669.44	26834.72	2	15.02261	0.2750697	0.76326290

LSmeans for fixed effects

ParcStr	lsmean	SE	df	lower.CL	upper.CL	.group
SmåParceller	5020.7	113.9	6.104484	4743.0	5298.3	a
StorParceller	5636.2	113.9	6.104484	5358.5	5913.8	b

LF1	lsmean	SE	df	lower.CL	upper.CL	.group
1	5049.6	130.6	9.400412	4756.2	5343.1	a
2	5470.1	130.6	9.400412	5176.7	5763.6	b
3	5465.6	130.6	9.400412	5172.1	5759.0	b

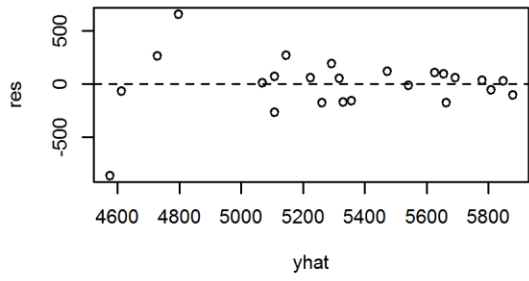
ParcStr	LF1	lsmean	SE	df	lower.CL	upper.CL	.group
SmåParceller	1	4678.1	171	15.8212	4315.2	5040.9	a
StorParceller	1	5421.2	171	15.8212	5058.4	5784.1	bc
SmåParceller	2	5211.6	171	15.8212	4848.7	5574.4	b
StorParceller	2	5728.7	171	15.8212	5365.8	6091.5	c
SmåParceller	3	5172.4	171	15.8212	4809.6	5535.3	b
StorParceller	3	5758.7	171	15.8212	5395.9	6121.5	c

LSD for fixed effects

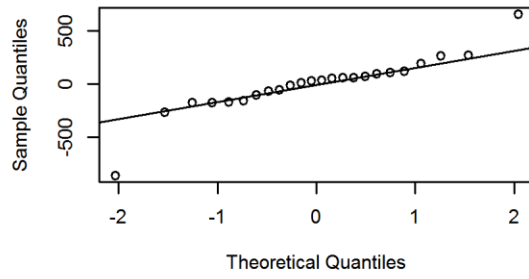
	out[[i]]\$LSD
ParcStr	271.8
LF1	332.9
ParcStr:LF1	470.7

p-værdier for fixed effects

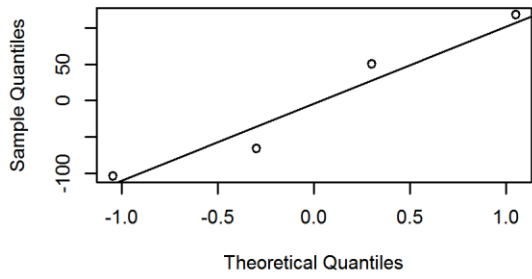
	out[[i]]\$pvalues
ParcStr	p = 0.00022
LF1	p = 0.02473
ParcStr:LF1	p = 0.76326



Normal Q-Q Plot



GENT



Niveau, 2014 LBNR 006, Rønde, Udbytte (kgStdKvalitet)

ANOVA tabel for fixed effects

	Sum Sq	Mean Sq	NumDF	DenDF	F.value	Pr(>F)
ParcStr	970956.665	970956.665	1	14.9273	13.3151356	0.002391698
LF1	8499.587	4249.794	2	14.9273	0.0582792	0.943600081
ParcStr:LF1	215554.447	107777.223	2	14.9273	1.4779942	0.259630885

LSmeans for fixed effects

ParcStr	lsmean	SE	df	lower.CL	upper.CL	.group
SmåParceller	5557.5	109.8	5.240228	5279.0	5836.0	a
StorParceller	5959.8	109.8	5.240228	5681.2	6238.3	b

LF1	lsmean	SE	df	lower.CL	upper.CL	.group
1	5736.0	122.9	7.699743	5450.6	6021.3	a
2	5757.9	122.9	7.699743	5472.5	6043.2	a
3	5782.1	122.9	7.699743	5496.7	6067.4	a

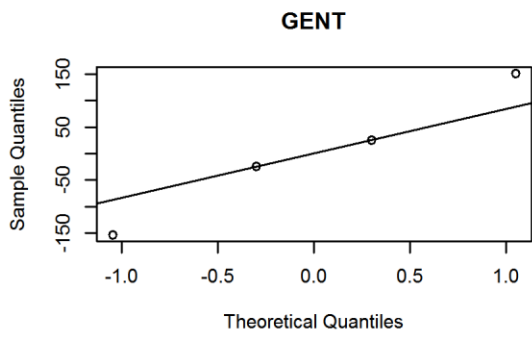
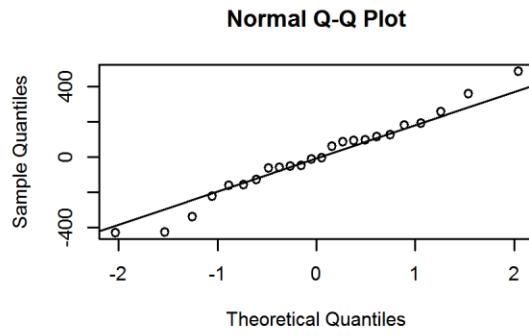
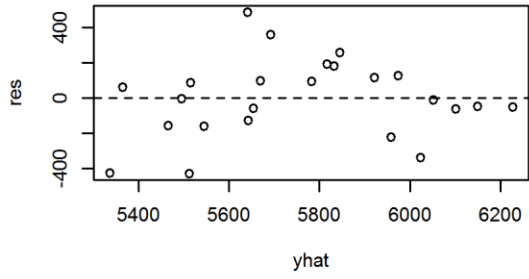
ParcStr	LF1	lsmean	SE	df	lower.CL	upper.CL	.group
SmåParceller	1	5665.3	155.6	13.78426	5331.0	5999.6	ab
StorParceller	1	5806.7	155.6	13.78426	5472.4	6141.0	abc
SmåParceller	2	5518.2	155.6	13.78426	5183.9	5852.5	a
StorParceller	2	5997.5	155.6	13.78426	5663.2	6331.8	bc
SmåParceller	3	5489.0	155.6	13.78426	5154.7	5823.3	a
StorParceller	3	6075.1	155.6	13.78426	5740.8	6409.4	c

LSD for fixed effects

	out[[i]]\$LSD
ParcStr	235.0
LF1	287.8
ParcStr:LF1	407.0

p-værdier for fixed effects

	out[[i]]\$pvalues
ParcStr	p = 0.00239
LF1	p = 0.9436
ParcStr:LF1	p = 0.25963



Niveau, 2015 LBNR 001, Ringsted, Udbytte (kgStdKvalitet)

ANOVA tabel for fixed effects

	Sum Sq	Mean Sq	NumDF	DenDF	F.value	Pr(>F)
ParcStr	27477.16	27477.16	1	15.05787	0.5276142	0.47875160
LF1	945955.20	472977.60	2	15.05787	9.0820787	0.00258575
ParcStr:LF1	217107.72	108553.86	2	15.05787	2.0844426	0.15880360

LSmeans for fixed effects

ParcStr	lsmean	SE	df	lower.CL	upper.CL	.group
SmåParceller	5412.2	70.3	8.497607	5251.8	5572.7	a
StorParceller	5479.9	70.3	8.497607	5319.5	5640.4	a

LF1	lsmean	SE	df	lower.CL	upper.CL	.group
1	5620.0	84.3	13.25562	5438.2	5801.8	a
2	5550.0	84.3	13.25562	5368.2	5731.8	a
3	5168.2	84.3	13.25562	4986.4	5350.0	b

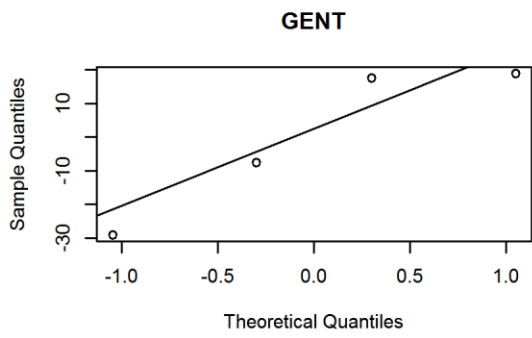
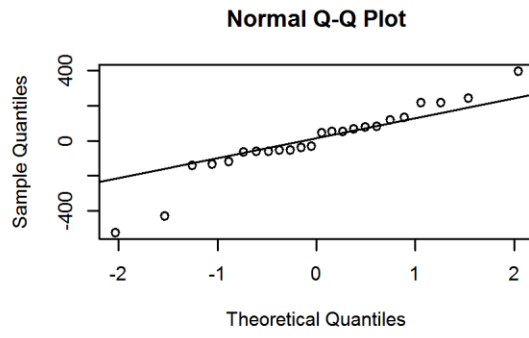
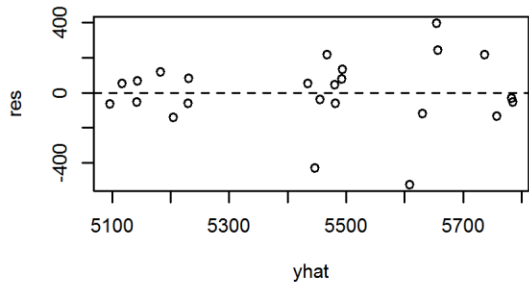
ParcStr	LF1	lsmean	SE	df	lower.CL	upper.CL	.group
SmåParceller	1	5474.8	116.7	17.82681	5229.5	5720.2	ab
StorParceller	1	5765.1	116.7	17.82681	5519.8	6010.5	a
SmåParceller	2	5637.2	116.7	17.82681	5391.9	5882.6	a
StorParceller	2	5462.8	116.7	17.82681	5217.4	5708.2	abc
SmåParceller	3	5124.7	116.7	17.82681	4879.3	5370.0	c
StorParceller	3	5211.8	116.7	17.82681	4966.5	5457.2	bc

LSD for fixed effects

	out[[i]]\$LSD
ParcStr	198.6
LF1	243.2
ParcStr:LF1	343.9

p-værdier for fixed effects

	out[[i]]\$pvalues
ParcStr	p = 0.47875
LF1	p = 0.00259
ParcStr:LF1	p = 0.1588



Niveau, 2015 LBNR 002, Brønderslev, Udbytte (kgStdKvalitet)

ANOVA tabel for fixed effects

	Sum Sq	Mean Sq	NumDF	DenDF	F.value	Pr(>F)
ParcStr	16516.67	16516.67	1	14.10105	0.9785385	3.392312e-01
LF1	2117785.30	1058892.65	2	14.09776	62.7346141	9.591922e-08
ParcStr:LF1	381411.01	190705.51	2	14.09776	11.2984411	1.179030e-03

LSmeans for fixed effects

ParcStr	lsmean	SE	df	lower.CL	upper.CL	.group
SmåParceller	4665.0	72.5	4.206483	4467.4	4862.5	a
StorParceller	4719.1	71.2	3.941980	4520.2	4918.0	a

LF1	lsmean	SE	df	lower.CL	upper.CL	.group
1	5034.5	76.0	5.032625	4839.5	5229.5	a
2	4764.0	76.0	5.032625	4569.0	4958.9	b
3	4277.6	78.8	5.662476	4082.1	4473.2	c

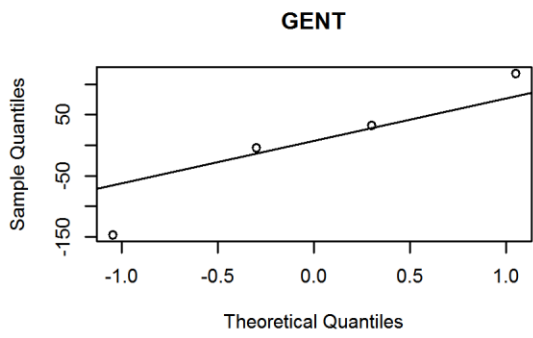
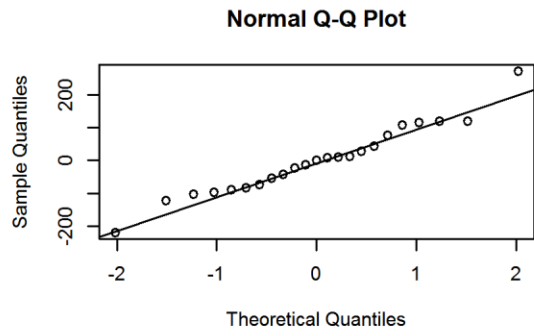
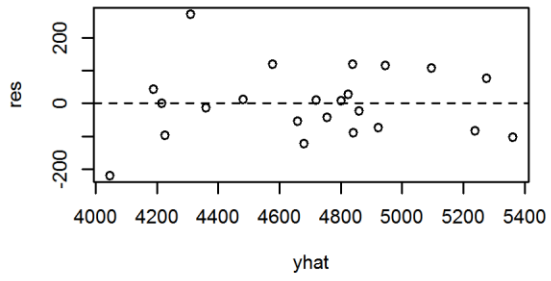
ParcStr	LF1	lsmean	SE	df	lower.CL	upper.CL	.group
SmåParceller	1	4826.9	88.8	8.452278	4624.1	5029.8	a
StorParceller	1	5242.0	88.8	8.452278	5039.2	5444.9	b
SmåParceller	2	4805.0	88.8	8.452278	4602.1	5007.9	a
StorParceller	2	4722.9	88.8	8.452278	4520.0	4925.8	a
SmåParceller	3	4362.9	98.0	10.697036	4146.5	4579.3	c
StorParceller	3	4192.3	88.8	8.452278	3989.4	4395.2	c

LSD for fixed effects

	out[[i]]\$LSD
ParcStr	117.5
LF1	143.9
ParcStr:LF1	203.5

p-værdier for fixed effects

	out[[i]]\$pvalues
ParcStr	p = 0.33923
LF1	p < 0.001
ParcStr:LF1	p = 0.00118



Niveau, 2015 LBNR 004, Vojens, Udbytte (kgStdKvalitet)

ANOVA tabel for fixed effects

	Sum Sq	Mean Sq	NumDF	DenDF	F.value	Pr(>F)
ParcStr	5761.351	5761.351	1	17.98875	0.2956125	5.933212e-01
LF1	874893.651	437446.825	2	17.98875	22.4452135	1.292721e-05
ParcStr:LF1	103981.955	51990.978	2	17.98875	2.6676353	9.669693e-02

LSmeans for fixed effects

ParcStr	lsmean	SE	df	lower.CL	upper.CL	.group
SmåParceller	6161.4	40.3	10	6071.6	6251.2	a
StorParceller	6192.4	40.3	10	6102.6	6282.2	a

LF1	lsmean	SE	df	lower.CL	upper.CL	.group
1	6404.7	49.4	15	6299.5	6509.9	a
2	6188.5	49.4	15	6083.2	6293.7	b
3	5937.5	49.4	15	5832.3	6042.7	c

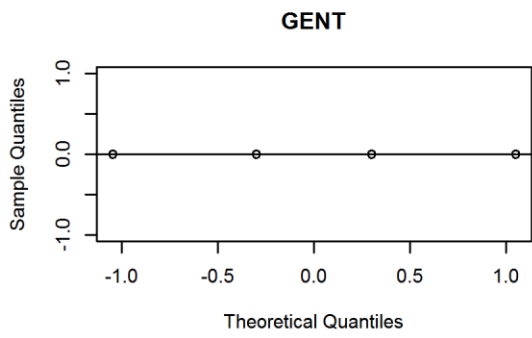
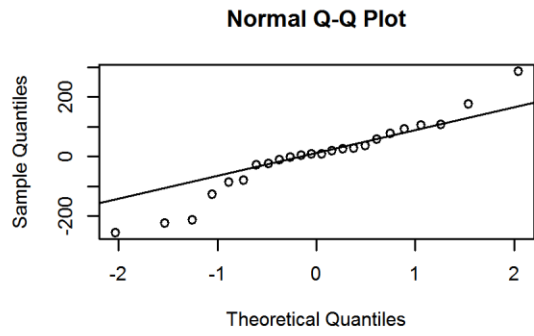
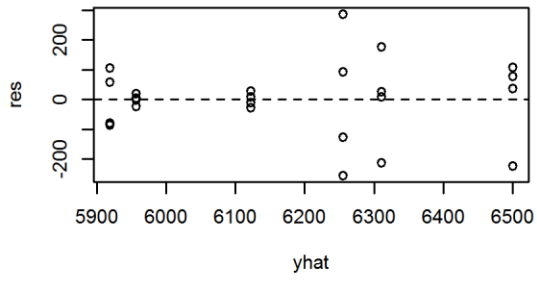
ParcStr	LF1	lsmean	SE	df	lower.CL	upper.CL	.group
SmåParceller	1	6310.3	69.8	18	6163.7	6457.0	ab
StorParceller	1	6499.1	69.8	18	6352.5	6645.8	a
SmåParceller	2	6255.2	69.8	18	6108.5	6401.8	b
StorParceller	2	6121.7	69.8	18	5975.1	6268.4	bc
SmåParceller	3	5918.7	69.8	18	5772.0	6065.3	c
StorParceller	3	5956.3	69.8	18	5809.7	6103.0	c

LSD for fixed effects

	out[[i]]\$LSD
ParcStr	121.5
LF1	148.8
ParcStr:LF1	210.4

p-værdier for fixed effects

	out[[i]]\$pvalues
ParcStr	p = 0.59332
LF1	p = 1e-05
ParcStr:LF1	p = 0.0967



Niveau, 2015 LBNR 006, Hjern, Udbytte (kgStdKvalitet)

ANOVA tabel for fixed effects

	Sum Sq	Mean Sq	NumDF	DenDF	F.value	Pr(>F)
ParcStr	5951132.4	5951132.4	1	14.99308	226.31390	1.875391e-10
LF1	1188387.3	594193.6	2	14.99308	22.59642	2.985785e-05
ParcStr:LF1	798033.2	399016.6	2	14.99308	15.17409	2.495416e-04

LSmeans for fixed effects

ParcStr	lsmean	SE	df	lower.CL	upper.CL	.group
SmåParceller	6236.4	61	5.820997	6085.9	6386.8	a
StorParceller	5240.4	61	5.820997	5090.0	5390.9	b

LF1	lsmean	SE	df	lower.CL	upper.CL	.group
1	5842.0	69.4	8.85794	5684.6	5999.4	a
2	5943.9	69.4	8.85794	5786.5	6101.4	a
3	5429.3	69.4	8.85794	5271.8	5586.7	b

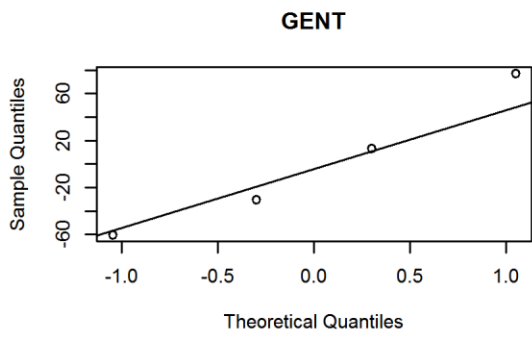
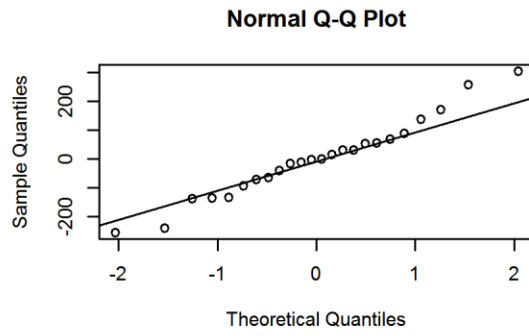
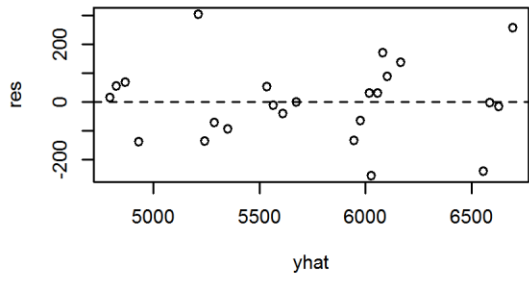
ParcStr	LF1	lsmean	SE	df	lower.CL	upper.CL	.group
SmåParceller	1	6088.1	90	15.27234	5896.5	6279.7	a
StorParceller	1	5595.9	90	15.27234	5404.3	5787.5	b
SmåParceller	2	6615.8	90	15.27234	6424.2	6807.4	c
StorParceller	2	5272.1	90	15.27234	5080.5	5463.7	d
SmåParceller	3	6005.2	90	15.27234	5813.6	6196.8	a
StorParceller	3	4853.3	90	15.27234	4661.7	5044.9	e

LSD for fixed effects

	out[[i]]\$LSD
ParcStr	141.1
LF1	172.8
ParcStr:LF1	244.4

p-værdier for fixed effects

	out[[i]]\$pvalues
ParcStr	p < 0.001
LF1	p = 3e-05
ParcStr:LF1	p = 0.00025



Niveau, 2016 LBNR 001, Ringsted, Udbytte (kgStdKvalitet)

ANOVA tabel for fixed effects

	Sum Sq	Mean Sq	NumDF	DenDF	F.value	Pr(>F)
ParcStr	172998.2	172998.19	1	15.90527	2.596748	0.1267468
LF1	339842.7	169921.37	2	15.90527	2.550564	0.1094555
ParcStr:LF1	152373.1	76186.57	2	15.90527	1.143580	0.3435312

LSmeans for fixed effects

ParcStr	lsmean	SE	df	lower.CL	upper.CL	.group
SmåParceller	4461.5	85.6	9.223928	4268.5	4654.5	a
StorParceller	4640.5	74.5	8.470588	4470.3	4810.7	a

LF1	lsmean	SE	df	lower.CL	upper.CL	.group
1	4643.9	100.1	13.75439	4428.8	4859.0	a
2	4637.6	91.3	13.09091	4440.6	4834.6	a
3	4371.4	100.1	13.75439	4156.4	4586.5	a

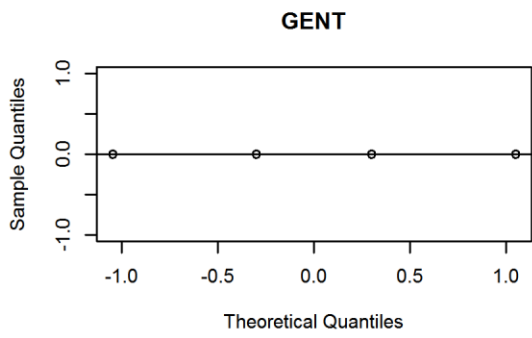
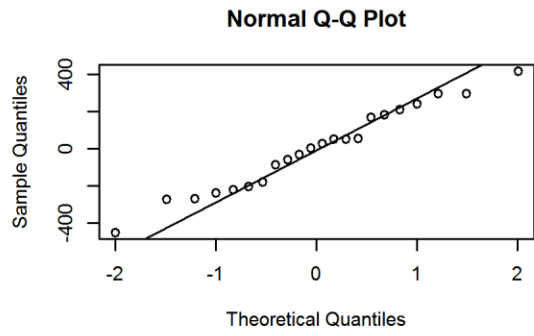
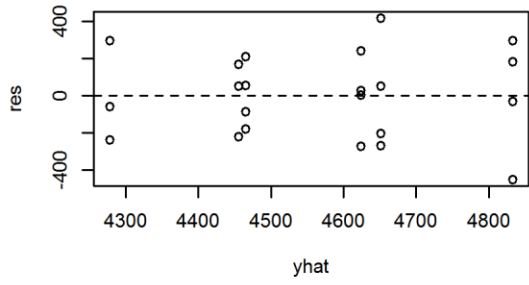
ParcStr	LF1	lsmean	SE	df	lower.CL	upper.CL	.group
SmåParceller	1	4455.3	153.1	16	4130.8	4779.9	ab
StorParceller	1	4832.6	129.1	16	4559.0	5106.1	a
SmåParceller	2	4651.5	129.1	16	4377.9	4925.1	ab
StorParceller	2	4623.7	129.1	16	4350.1	4897.3	ab
SmåParceller	3	4277.7	153.1	16	3953.1	4602.3	b
StorParceller	3	4465.2	129.1	16	4191.6	4738.8	ab

LSD for fixed effects

	out[[i]]\$LSD
ParcStr	243.5
LF1	294.8
ParcStr:LF1	417.9

p-værdier for fixed effects

	out[[i]]\$pvalues
ParcStr	p = 0.12675
LF1	p = 0.10946
ParcStr:LF1	p = 0.34353



Niveau, 2016 LBNR 002, Rønde, Udbytte (kgStdKvalitet)

ANOVA tabel for fixed effects

	Sum Sq	Mean Sq	NumDF	DenDF	F.value	Pr(>F)
ParcStr	1327044.2	1327044.15	1	14.98226	22.023055	0.0002896422
LF1	1868805.4	934402.72	2	14.98226	15.506946	0.0002242535
ParcStr:LF1	160050.5	80025.25	2	14.98226	1.328065	0.2944535199

LSmeans for fixed effects

ParcStr	lsmean	SE	df	lower.CL	upper.CL	.group
SmåParceller	3967.9	93.4	5.728	3736.7	4199.1	a
StorParceller	4438.2	93.4	5.728	4207.0	4669.4	b

LF1	lsmean	SE	df	lower.CL	upper.CL	.group
1	4501.4	106	8.676531	4260.3	4742.5	a
2	4277.5	106	8.676531	4036.4	4518.7	a
3	3830.2	106	8.676531	3589.0	4071.3	b

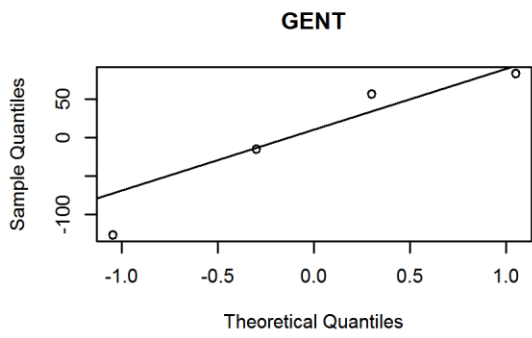
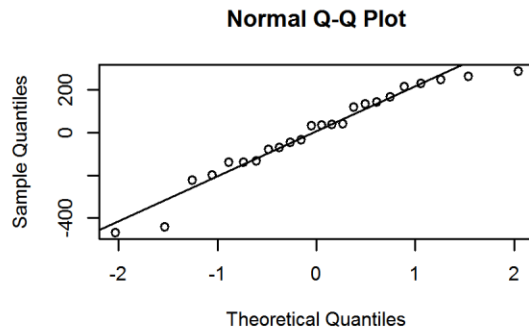
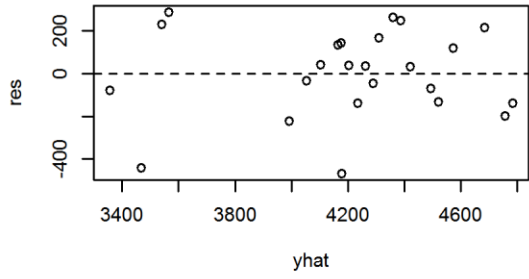
ParcStr	LF1	lsmean	SE	df	lower.CL	upper.CL	.group
SmåParceller	1	4303.6	137	15.06898	4011.7	4595.4	a
StorParceller	1	4699.2	137	15.06898	4407.4	4991.1	b
SmåParceller	2	4118.4	137	15.06898	3826.5	4410.2	a
StorParceller	2	4436.7	137	15.06898	4144.8	4728.6	ab
SmåParceller	3	3481.7	137	15.06898	3189.8	3773.6	c
StorParceller	3	4178.6	137	15.06898	3886.8	4470.5	a

LSD for fixed effects

	out[[i]]\$LSD
ParcStr	213.6
LF1	261.6
ParcStr:LF1	370.0

p-værdier for fixed effects

	out[[i]]\$pvalues
ParcStr	p = 0.00029
LF1	p = 0.00022
ParcStr:LF1	p = 0.29445



Niveau, 2016 LBNR 004, Holeby, Udbytte (kgStdKvalitet)

ANOVA tabel for fixed effects

	Sum Sq	Mean Sq	NumDF	DenDF	F.value	Pr(>F)
ParcStr	61617.75	61617.75	1	13.99712	1.473257	0.2449165672
LF1	1075768.21	537884.10	2	13.99712	12.860602	0.0006760629
ParcStr:LF1	94573.74	47286.87	2	13.99712	1.130611	0.3506152109

LSmeans for fixed effects

ParcStr	lsmean	SE	df	lower.CL	upper.CL	.group
SmåParceller	3780.9	59.0	6.872727	3640.8	3921.0	a
StorParceller	3897.9	84.8	8.414960	3704.1	4091.7	a

LF1	lsmean	SE	df	lower.CL	upper.CL	.group
1	4193.0	92.8	12.55351	3991.7	4394.2	a
2	3657.7	72.3	11.11765	3498.7	3816.6	b
3	3667.6	92.8	12.55351	3466.3	3868.8	b

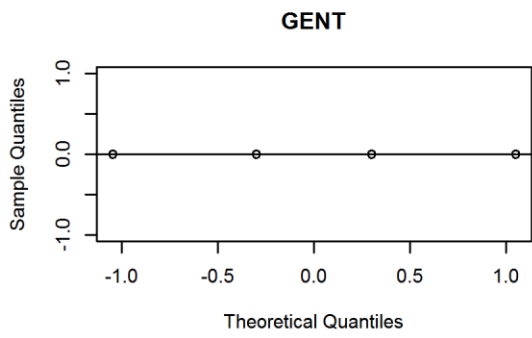
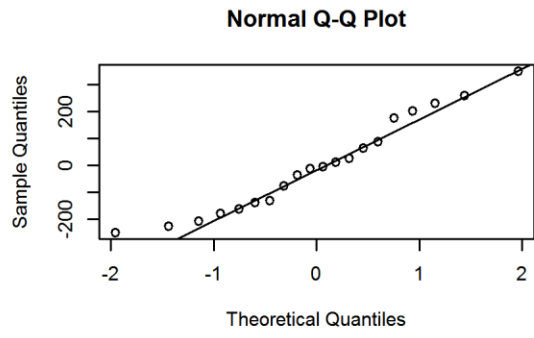
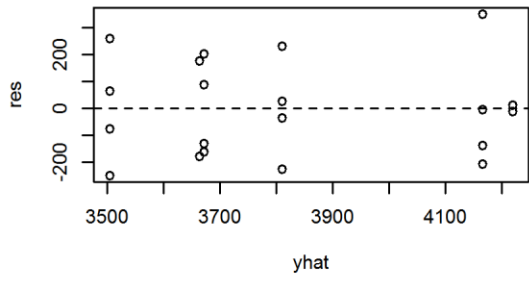
ParcStr	LF1	lsmean	SE	df	lower.CL	upper.CL	.group
SmåParceller	1	4166.6	102.3	14	3947.3	4385.9	a
StorParceller	1	4219.3	155.0	14	3887.0	4551.7	a
SmåParceller	2	3504.5	102.3	14	3285.2	3723.8	b
StorParceller	2	3810.8	102.3	14	3591.5	4030.1	b
SmåParceller	3	3671.5	102.3	14	3452.2	3890.9	b
StorParceller	3	3663.6	155.0	14	3331.2	3995.9	b

LSD for fixed effects

	out[[i]]\$LSD
ParcStr	222.9
LF1	262.7
ParcStr:LF1	374.9

p-værdier for fixed effects

	out[[i]]\$pvalues
ParcStr	p = 0.24492
LF1	p = 0.00068
ParcStr:LF1	p = 0.35062



Niveau, 2016 LBNR 005, Hjern, Udbytte (kgStdKvalitet)

ANOVA tabel for fixed effects

	Sum Sq	Mean Sq	NumDF	DenDF	F.value	Pr(>F)
ParcStr	717928.80	717928.80	1	17.98066	92.033691	1.701804e-08
LF1	7710218.82	3855109.41	2	17.98066	494.199356	2.220446e-16
ParcStr:LF1	41770.65	20885.32	2	17.98066	2.677359	9.598684e-02

LSmeans for fixed effects

ParcStr	lsmean	SE	df	lower.CL	upper.CL	.group
SmåParceller	4833.1	25.5	10	4776.3	4889.9	a
StorParceller	4487.2	25.5	10	4430.4	4544.0	b

LF1	lsmean	SE	df	lower.CL	upper.CL	.group
1	5342.1	31.2	15	5275.5	5408.7	a
2	4683.9	31.2	15	4617.4	4750.5	b
3	3954.3	31.2	15	3887.8	4020.9	c

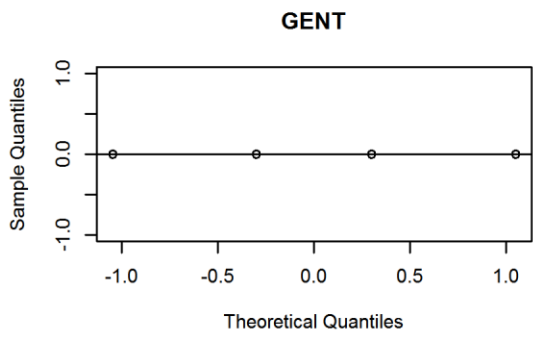
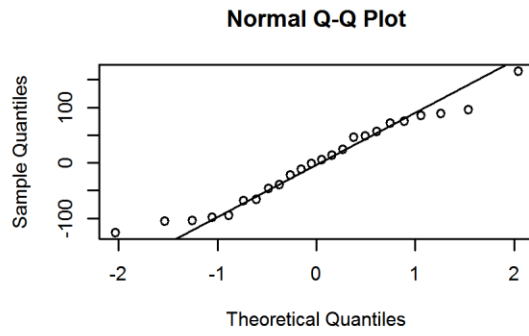
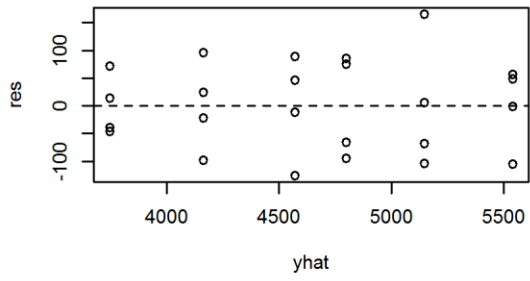
ParcStr	LF1	lsmean	SE	df	lower.CL	upper.CL	.group
SmåParceller	1	5537.7	44.2	18	5444.9	5630.5	a
StorParceller	1	5146.5	44.2	18	5053.7	5239.3	b
SmåParceller	2	4798.4	44.2	18	4705.6	4891.2	c
StorParceller	2	4569.5	44.2	18	4476.7	4662.3	d
SmåParceller	3	4163.2	44.2	18	4070.4	4256.0	e
StorParceller	3	3745.5	44.2	18	3652.7	3838.3	f

LSD for fixed effects

	out[[i]]\$LSD
ParcStr	76.9
LF1	94.1
ParcStr:LF1	133.1

p-værdier for fixed effects

	out[[i]]\$pvalues
ParcStr	p < 0.001
LF1	p < 0.001
ParcStr:LF1	p = 0.09599



Niveau, 2016 LBNR 006, Vojens, Udbytte (kgStdKvalitet)

ANOVA tabel for fixed effects

	Sum Sq	Mean Sq	NumDF	DenDF	F.value	Pr(>F)
ParcStr	2358791.7	2358791.7	1	17.03516	127.40997	2.493394e-09
LF1	2250631.7	1125315.9	2	17.03516	60.78386	1.759439e-08
ParcStr:LF1	421960.1	210980.1	2	17.03516	11.39607	7.218068e-04

LSmeans for fixed effects

ParcStr	lsmean	SE	df	lower.CL	upper.CL	.group
SmåParceller	3215.4	39.3	9.189189	3126.8	3304.0	a
StorParceller	3859.6	41.9	10.068108	3766.3	3952.9	b

LF1	lsmean	SE	df	lower.CL	upper.CL	.group
1	3963.4	48.1	14.02062	3860.3	4066.6	a
2	3436.5	48.1	14.02062	3333.3	3539.6	b
3	3212.6	52.9	14.70432	3099.7	3325.5	c

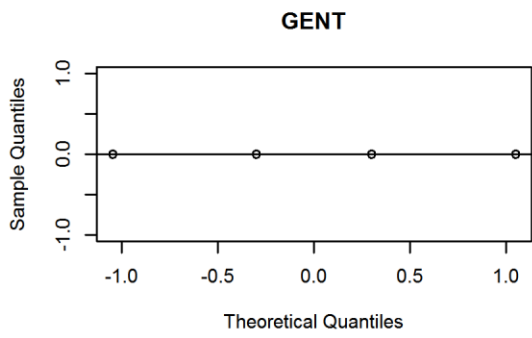
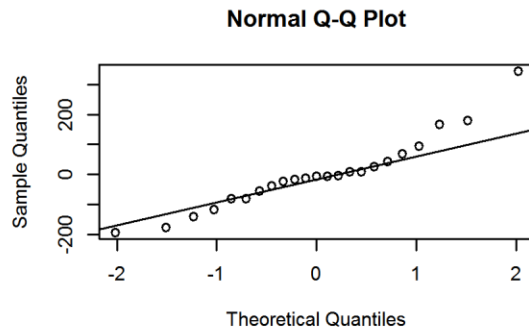
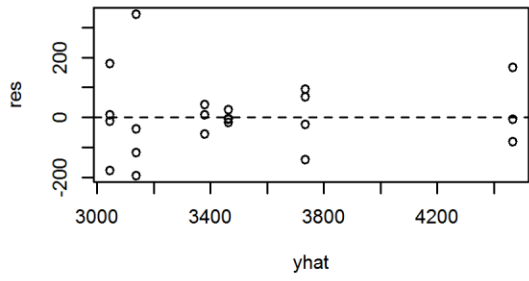
ParcStr	LF1	lsmean	SE	df	lower.CL	upper.CL	.group
SmåParceller	1	3462.6	68	17	3319.1	3606.2	a
StorParceller	1	4464.2	68	17	4320.7	4607.7	b
SmåParceller	2	3138.9	68	17	2995.3	3282.4	c
StorParceller	2	3734.1	68	17	3590.5	3877.6	d
SmåParceller	3	3044.7	68	17	2901.2	3188.3	c
StorParceller	3	3380.5	81	17	3209.7	3551.3	a

LSD for fixed effects

	out[[i]]\$LSD
ParcStr	123.0
LF1	150.6
ParcStr:LF1	213.0

p-værdier for fixed effects

	out[[i]]\$pvalues
ParcStr	p < 0.001
LF1	p < 0.001
ParcStr:LF1	p = 0.00072



Niveau, 2014, Udbytte (kgStdKvalitet)

ANOVA tabel for fixed effects

	Sum Sq	Mean Sq	NumDF	DenDF	F.value	Pr(>F)
ParcStr	5171979.4	5171979.4	1	74.07337	67.884590	4.539924e-12
LF1	1857895.1	928947.6	2	74.07156	12.192861	2.645531e-05
ParcStr:LF1	360646.4	180323.2	2	74.07156	2.366824	1.008348e-01

LSmeans for fixed effects

ParcStr	lsmean	SE	df	lower.CL	upper.CL	.group
SmåParceller	5606.9	241.7	3.087453	4849.8	6363.9	a
StorParceller	6073.9	241.6	3.083343	5316.6	6831.3	b

LF1	lsmean	SE	df	lower.CL	upper.CL	.group
1	5645.1	243.5	3.177032	4894.2	6396.1	a
2	5904.5	243.3	3.167661	5153.0	6656.0	b
3	5971.5	243.3	3.167661	5220.0	6723.1	b

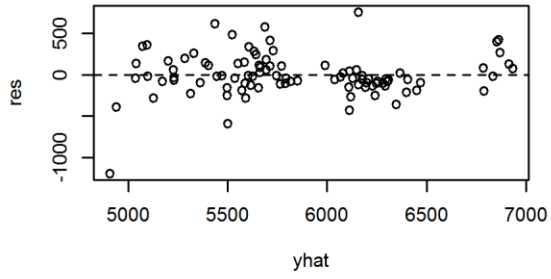
ParcStr	LF1	lsmean	SE	df	lower.CL	upper.CL	.group
SmåParceller	1	5499.1	248.8	3.466107	4764.1	6234.0	a
StorParceller	1	5791.2	248.1	3.427111	5054.5	6528.0	b
SmåParceller	2	5633.3	248.1	3.427111	4896.6	6370.1	ab
StorParceller	2	6175.7	248.1	3.427111	5438.9	6912.4	c
SmåParceller	3	5688.2	248.1	3.427111	4951.4	6425.0	ab
StorParceller	3	6254.9	248.1	3.427111	5518.1	6991.6	c

LSD for fixed effects

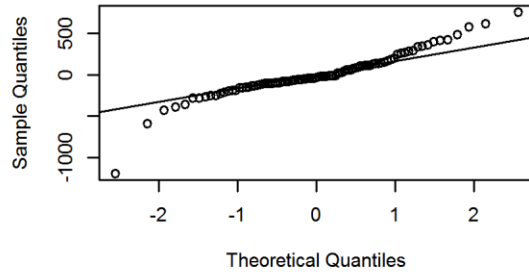
	out[[i]]\$LSD
ParcStr	113.0
LF1	138.4
ParcStr:LF1	195.7

p-værdier for fixed effects

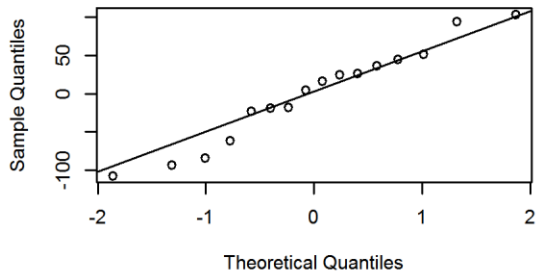
	out[[i]]\$pvalues
ParcStr	p < 0.001
LF1	p = 3e-05
ParcStr:LF1	p = 0.10083



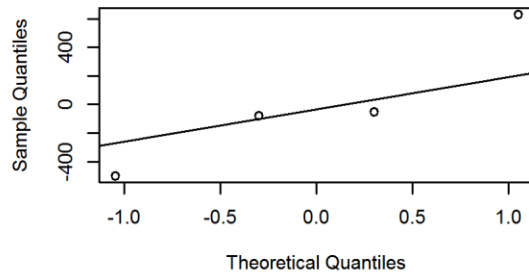
Normal Q-Q Plot



GENT:LBNR



LBNR



Niveau, 2015, Udbytte (kgStdKvalitet)

ANOVA tabel for fixed effects

	Sum Sq	Mean Sq	NumDF	DenDF	F.value	Pr(>F)
ParcStr	1087655	1087654.7	1	86.41717	11.408636	1.097901e-03
LF1	4625709	2312854.3	2	86.41717	24.260007	4.342834e-09
ParcStr:LF1	1246824	623412.1	2	86.41717	6.539099	2.267320e-03

LSmeans for fixed effects

ParcStr	lsmean	SE	df	lower.CL	upper.CL	.group
SmåParceller	5622.1	312.5	3.064119	4639.3	6604.9	a
StorParceller	5408.0	312.4	3.061257	4424.9	6391.0	b

LF1	lsmean	SE	df	lower.CL	upper.CL	.group
1	5725.3	314.0	3.123830	4748.1	6702.6	a
2	5611.6	314.0	3.123830	4634.4	6588.8	a
3	5208.1	314.2	3.130334	4231.4	6184.8	b

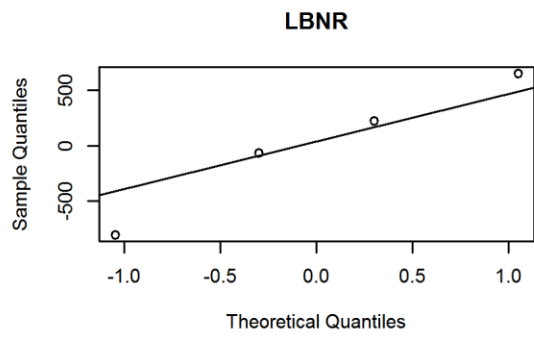
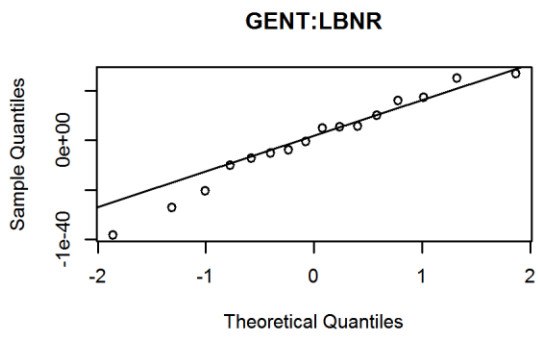
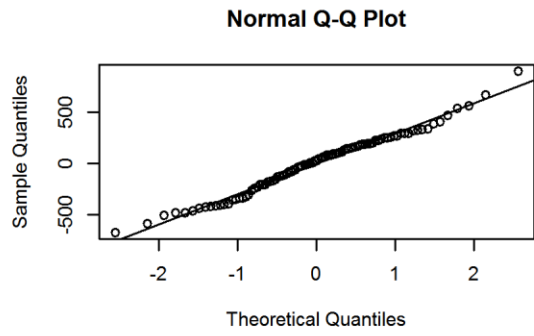
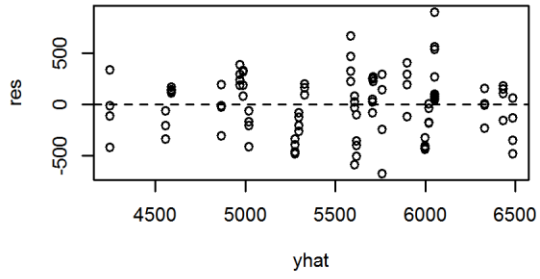
ParcStr	LF1	lsmean	SE	df	lower.CL	upper.CL	.group
SmåParceller	1	5675.1	318.7	3.315171	4713.2	6636.9	a
StorParceller	1	5775.6	318.7	3.315171	4813.7	6737.4	a
SmåParceller	2	5828.3	318.7	3.315171	4866.5	6790.2	a
StorParceller	2	5394.9	318.7	3.315171	4433.0	6356.7	b
SmåParceller	3	5362.8	319.4	3.341977	4402.8	6322.9	b
StorParceller	3	5053.4	318.7	3.315171	4091.6	6015.3	c

LSD for fixed effects

	out[[i]]\$LSD
ParcStr	126.3
LF1	154.7
ParcStr:LF1	218.8

p-værdier for fixed effects

	out[[i]]\$pvalues
ParcStr	p = 0.0011
LF1	p < 0.001
ParcStr:LF1	p = 0.00227



Niveau, 2016, Udbytte (kgStdKvalitet)

ANOVA tabel for fixed effects

	Sum Sq	Mean Sq	NumDF	DenDF	F.value	Pr(>F)
ParcStr	1229469.9	1229469.92	1	102.9074	11.5754930	9.529570e-04
LF1	10285015.2	5142507.61	2	102.8722	48.4168499	1.554312e-15
ParcStr:LF1	88275.7	44137.85	2	102.8770	0.4155591	6.610740e-01

LSmeans for fixed effects

ParcStr	lsmean	SE	df	lower.CL	upper.CL	.group
SmåParceller	4054.6	215.0	4.158228	3466.5	4642.7	a
StorParceller	4264.5	215.3	4.180660	3676.7	4852.3	b

LF1	lsmean	SE	df	lower.CL	upper.CL	.group
1	4545.2	217.4	4.348555	3960.1	5130.3	a
2	4138.6	216.9	4.306567	3553.0	4724.3	b
3	3794.8	217.7	4.364423	3209.9	4379.7	c

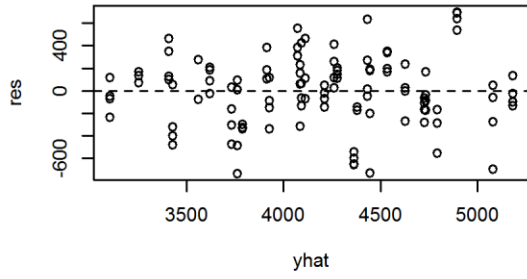
ParcStr	LF1	lsmean	SE	df	lower.CL	upper.CL	.group
SmåParceller	1	4402.0	223.6	4.860658	3822.2	4981.8	a
StorParceller	1	4688.3	224.4	4.928526	4108.9	5267.7	b
SmåParceller	2	4042.3	222.9	4.804713	3462.2	4622.5	cd
StorParceller	2	4235.0	222.9	4.804713	3654.8	4815.1	a c
SmåParceller	3	3719.4	223.6	4.860658	3139.6	4299.2	e
StorParceller	3	3870.2	225.2	4.997287	3291.1	4449.2	de

LSD for fixed effects

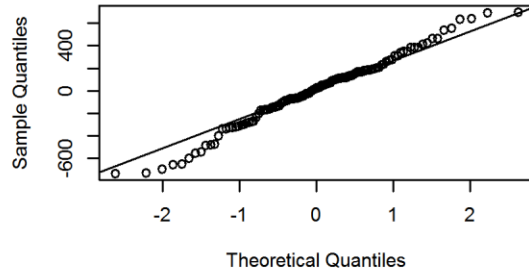
	out[[i]]\$LSD
ParcStr	122.8
LF1	149.7
ParcStr:LF1	211.9

p-værdier for fixed effects

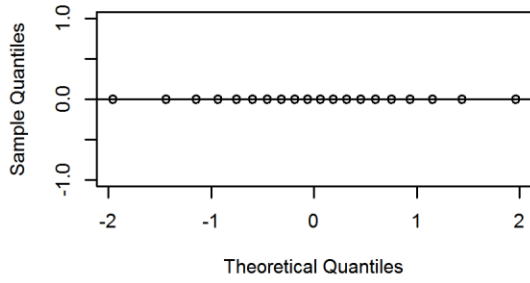
	out[[i]]\$pvalues
ParcStr	p = 0.00095
LF1	p < 0.001
ParcStr:LF1	p = 0.66107



Normal Q-Q Plot



GENT:LBNR



LBNR

