

Date as fixed effect, Apiary as random, Allowing interaction between variables

BQCV
#####

Linear mixed model fit by maximum likelihood ['merModLmerTest']
Formula: databees\$bqcv ~ dwv * ache * varroa * Treatment + Date + (1 | Apiary)
Data: databees

AIC BIC logLik deviance df.resid
483.3 537.0 -222.6 445.3 106

Scaled residuals:
Min 1Q Median 3Q Max
-2.1310 -0.7154 -0.2174 0.6100 2.6731

Random effects:
Groups Name Variance Std.Dev.
Apiary (Intercept) 0.0153 0.1237
Residual 2.0491 1.4315
Number of obs: 125, groups: Apiary, 4

Fixed effects:

	Estimate	Std. Error	df	t value	Pr(> t)
(Intercept)	12.9012	3.6948	121.2800	3.492	0.00067 ***
dwv	-0.2927	0.6913	120.2100	-0.423	0.67276
ache	-4.8183	2.1333	121.0500	-2.259	0.02570 *
varroa	-5.4298	5.4733	119.5000	-0.992	0.32318
Treatment	-19.1765	8.2633	121.1200	-2.321	0.02198 *
Date	-0.5633	0.1509	121.5600	-3.732	0.00029 ***
dwv:ache	0.2908	0.4000	119.2400	0.727	0.46861
dwv:varroa	0.4005	1.2170	119.6500	0.329	0.74263
ache:varroa	3.4787	3.1361	119.6000	1.109	0.26954
dwv:Treatment	4.1424	2.6624	122.3100	1.556	0.12231
ache:Treatment	10.6525	4.4005	120.7500	2.421	0.01698 *
varroa:Treatment	12.2821	7.8996	119.2400	1.555	0.12265
dwv:ache:varroa	-0.3121	0.6933	119.7100	-0.450	0.65345
dwv:ache:Treatment	-2.1893	1.3703	121.7900	-1.598	0.11271
dwv:varroa:Treatment	-2.0881	2.1793	119.7100	-0.958	0.33990
ache:varroa:Treatment	-6.8555	4.3559	119.3200	-1.574	0.11817
dwv:ache:varroa:Treatment	1.2724	1.1757	119.6300	1.082	0.28132

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:

	(Intr)	dwv	ache	varroa	Trtmnt	Date	dwv:ch	dwv:vr	ach:vr	dwv:Tr	ach:Tr
vrr:Tr											
dwv											
ache		-0.878									
varroa		-0.982	0.865								
Treatment		-0.675	0.637	0.670							
Date		-0.446	0.390	0.436	0.301						
dwv:ache		0.031	-0.063	-0.069	-0.017	0.029					
		0.861	-0.975	-0.880	-0.635	-0.385	-0.006				

```

dvw:varroa  0.538 -0.643 -0.537 -0.906 -0.240  0.004  0.641
ache:varroa 0.669 -0.633 -0.689 -0.988 -0.299  0.011  0.656  0.894
dvw:Tretmnt 0.227 -0.257 -0.222 -0.165 -0.934 -0.025  0.253  0.167  0.164
ache:Trtmnt 0.474 -0.415 -0.480 -0.324 -0.991 -0.031  0.427  0.260  0.333  0.912
varr:Trtmnt 0.466 -0.438 -0.461 -0.692 -0.795 -0.046  0.440  0.628  0.684  0.701  0.796
dvw:ach:vr  -0.538  0.641  0.558  0.899  0.240 -0.008 -0.666 -0.987 -0.910 -0.166 -0.270
-0.623
dvw:ch:Trtm -0.251  0.283  0.255  0.185  0.935  0.024 -0.292 -0.187 -0.191 -0.994 -0.925
-0.710  0.194
dvw:vr:Trt  -0.299  0.356  0.297  0.505  0.811  0.035 -0.358 -0.558 -0.499 -0.846 -0.802
-0.896  0.551  0.854
ach:vr:Trt  -0.481  0.453  0.493  0.710  0.771  0.036 -0.472 -0.644 -0.719 -0.671 -0.789
-0.989  0.655  0.692  0.878
dvw:ch:vr:T  0.316 -0.376 -0.327 -0.530 -0.788 -0.024  0.393  0.582  0.536  0.818  0.792
0.893 -0.589 -0.837 -0.991 -0.892

```

```

#####
DWV
#####
Linear mixed model fit by maximum likelihood ['merModLmerTest']
Formula: databees$dvw ~ bqcv * ache * varroa * Treatment + Date + (1 | Apiary)
Data: databees

```

```

      AIC      BIC  logLik deviance df.resid
500.7    554.4   -231.3   462.7     106

```

```

Scaled residuals:
  Min      1Q  Median      3Q      Max
-2.1855 -0.7253 -0.1208  0.7115  2.2402

```

```

Random effects:
 Groups Name      Variance Std.Dev.
Apiary (Intercept) 0.07284  0.2699
Residual          2.31990  1.5231
Number of obs: 125, groups: Apiary, 4

```

```

Fixed effects:
              Estimate Std. Error   df t value Pr(>|t|)
(Intercept)  -0.71726    5.69049 121.50000  -0.126  0.8999
bqcv          0.31095    0.83059 120.16000   0.374  0.7088
ache         0.29021    3.11686 121.77000   0.093  0.9260
varroa       6.79138    7.07281 120.54000   0.960  0.3389
Treatment    11.44966   10.33849 120.82000   1.107  0.2703
Date         1.13336    0.14369 123.82000   7.888 1.38e-12 ***
bqcv:ache    0.05302    0.49420 120.82000   0.107  0.9147
bqcv:varroa -1.63238    1.36800 120.52000  -1.193  0.2351
ache:varroa -3.01242    3.79833 120.40000  -0.793  0.4293
bqcv:Treatment -2.26555    1.96521 120.06000  -1.153  0.2513
ache:Treatment -6.02029    5.73336 120.42000  -1.050  0.2958
varroa:Treatment -21.62695   11.76479 121.68000  -1.838  0.0685 .
bqcv:ache:varroa  0.65620    0.75553 120.43000   0.869  0.3868
bqcv:ache:Treatment  1.10634    1.13215 120.08000   0.977  0.3304
bqcv:varroa:Treatment  4.32992    2.30035 121.03000   1.882  0.0622 .

```

```

ache:varroa:Treatment      10.26471    6.42239 121.13000    1.598    0.1126
bqcv:ache:varroa:Treatment -2.03966    1.29783 120.65000   -1.572    0.1187

```

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:

```

(Intr) bqcv  ache  varroa Trtmnt Date  bqcv:c bqcv:v ach:vr bqcv:T ach:Tr
vrr:Tr bqcv:: bqcv:c:T bqcv:v:T ach::T
bqcv      -0.925
ache      -0.980  0.938
varroa    -0.770  0.705  0.749
Treatment -0.552  0.507  0.535  0.428
Date      -0.024 -0.033 -0.075  0.070  0.081
bqcv:ache  0.843 -0.964 -0.902 -0.636 -0.457  0.099
bqcv:varroa 0.561 -0.582 -0.554 -0.902 -0.314 -0.078  0.547
ache:varroa 0.774 -0.729 -0.776 -0.987 -0.430 -0.060  0.691  0.898
bqcv:Trtmnt 0.392 -0.420 -0.391 -0.303 -0.947 -0.054  0.401  0.251  0.312
ache:Trtmnt 0.536 -0.506 -0.535 -0.415 -0.987 -0.070  0.479  0.310  0.429  0.948
vrr:Trtmnt 0.463 -0.424 -0.451 -0.601 -0.815 -0.034  0.383  0.542  0.593  0.756  0.807
bqcv:ch:vrr -0.553  0.605  0.574  0.867  0.308  0.055 -0.611 -0.980 -0.893 -0.260 -0.318
-0.521
bqcv:ch:Trt -0.370  0.418  0.388  0.283  0.913  0.037 -0.429 -0.245 -0.306 -0.982 -0.943
-0.735  0.271
bqcv:vrr:Tr -0.333  0.347  0.331  0.535  0.745  0.026 -0.327 -0.593 -0.533 -0.767 -0.749
-0.940  0.582  0.761
ach:vrr:Trt -0.458  0.431  0.460  0.583  0.816  0.031 -0.409 -0.531 -0.591 -0.768 -0.828
-0.989  0.528  0.769  0.940
bqcv:ch:v:T 0.322 -0.353 -0.335 -0.504 -0.733 -0.020  0.357  0.570  0.519  0.770  0.759
0.913 -0.582 -0.791  -0.986  -0.936

```

```

#####
ACHE
#####

```

Linear mixed model fit by maximum likelihood [`'merModLmerTest'`]
Formula: `databees$ache ~ dwv * bqcv * varroa * Treatment + Date + (1 | Apiary)`
Data: `databees`

```

      AIC      BIC  logLik deviance df.resid
 44.3    98.0    -3.1     6.3     106

```

Scaled residuals:

```

      Min      1Q  Median      3Q      Max
-4.1343 -0.4840  0.1183  0.6344  2.0283

```

Random effects:

```

Groups  Name          Variance Std.Dev.
Apiary  (Intercept)  0.00000  0.0000
Residual                0.06156  0.2481

```

Number of obs: 125, groups: Apiary, 4

Fixed effects:

	Estimate	Std. Error	df	t value	Pr(> t)	
(Intercept)	2.161275	0.308206	124.950000	7.012	1.3e-10	***
dvw	-0.049698	0.064380	124.950000	-0.772	0.4416	
bqcv	-0.107375	0.061701	124.950000	-1.740	0.0843	.
varroa	-0.388218	0.430370	124.950000	-0.902	0.3688	
Treatment	0.446184	0.672911	124.950000	0.663	0.5085	
Date	0.061029	0.027138	124.950000	2.249	0.0263	*
dvw:bqcv	0.005855	0.012289	124.950000	0.476	0.6346	
dvw:varroa	0.052630	0.094181	124.950000	0.559	0.5773	
bqcv:varroa	0.084171	0.088936	124.950000	0.946	0.3458	
dvw:Treatment	-0.302981	0.206077	124.950000	-1.470	0.1440	
bqcv:Treatment	-0.167538	0.150699	124.950000	-1.112	0.2684	
varroa:Treatment	-0.849082	0.726835	124.950000	-1.168	0.2450	
dvw:bqcv:varroa	-0.009517	0.019905	124.950000	-0.478	0.6334	
dvw:bqcv:Treatment	0.079849	0.043938	124.950000	1.817	0.0716	.
dvw:varroa:Treatment	0.393552	0.213210	124.950000	1.846	0.0673	.
bqcv:varroa:Treatment	0.224105	0.158859	124.950000	1.411	0.1608	
dvw:bqcv:varroa:Treatment	-0.086501	0.043544	124.950000	-1.987	0.0492	*

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:

	(Intr)	dvw	bqcv	varroa	Trtmnt	Date	dvw:bq	dvw:vr	bqcv:v	dvw:Tr	bqcv:T
vrr:Tr											
dvw:b											
dvw:b:T											
dvw:v:T											
bqcv::T											
dvw		-0.847									
bqcv		-0.919	0.780								
varroa		-0.805	0.757	0.726							
Treatment		-0.446	0.406	0.415	0.372						
Date		-0.133	-0.211	0.067	-0.036	-0.027					
dvw:bqcv		0.817	-0.908	-0.884	-0.693	-0.382	0.084				
dvw:varroa		0.711	-0.807	-0.631	-0.918	-0.331	0.061	0.729			
bqcv:varroa		0.727	-0.672	-0.754	-0.937	-0.334	0.018	0.707	0.863		
dvw:Treatment		0.269	-0.305	-0.246	-0.235	-0.914	0.031	0.281	0.250	0.209	
bqcv:Treatment		0.369	-0.331	-0.406	-0.299	-0.964	0.030	0.367	0.262	0.310	0.888
vrr:Treatment		0.477	-0.447	-0.430	-0.592	-0.889	0.017	0.410	0.543	0.555	0.808
dvw:bqcv:vr		-0.617	0.703	0.629	0.845	0.289	-0.071	-0.729	-0.932	-0.906	-0.217
		-0.500									
dvw:bqcv:Tr		-0.226	0.258	0.246	0.194	0.896	-0.041	-0.281	-0.205	-0.198	-0.976
		-0.781	0.205								
dvw:vrr:Trt		-0.313	0.357	0.278	0.406	0.849	-0.030	-0.322	-0.442	-0.381	-0.917
		-0.913	0.412	0.881							
bqcv:vrr:Tr		-0.403	0.382	0.420	0.526	0.865	-0.040	-0.398	-0.485	-0.560	-0.788
		-0.963	0.509	0.803	0.882						
dvw:bqcv::T		0.279	-0.326	-0.286	-0.387	-0.842	0.051	0.335	0.427	0.414	0.900
		0.898	-0.458	-0.907	-0.971	-0.922					