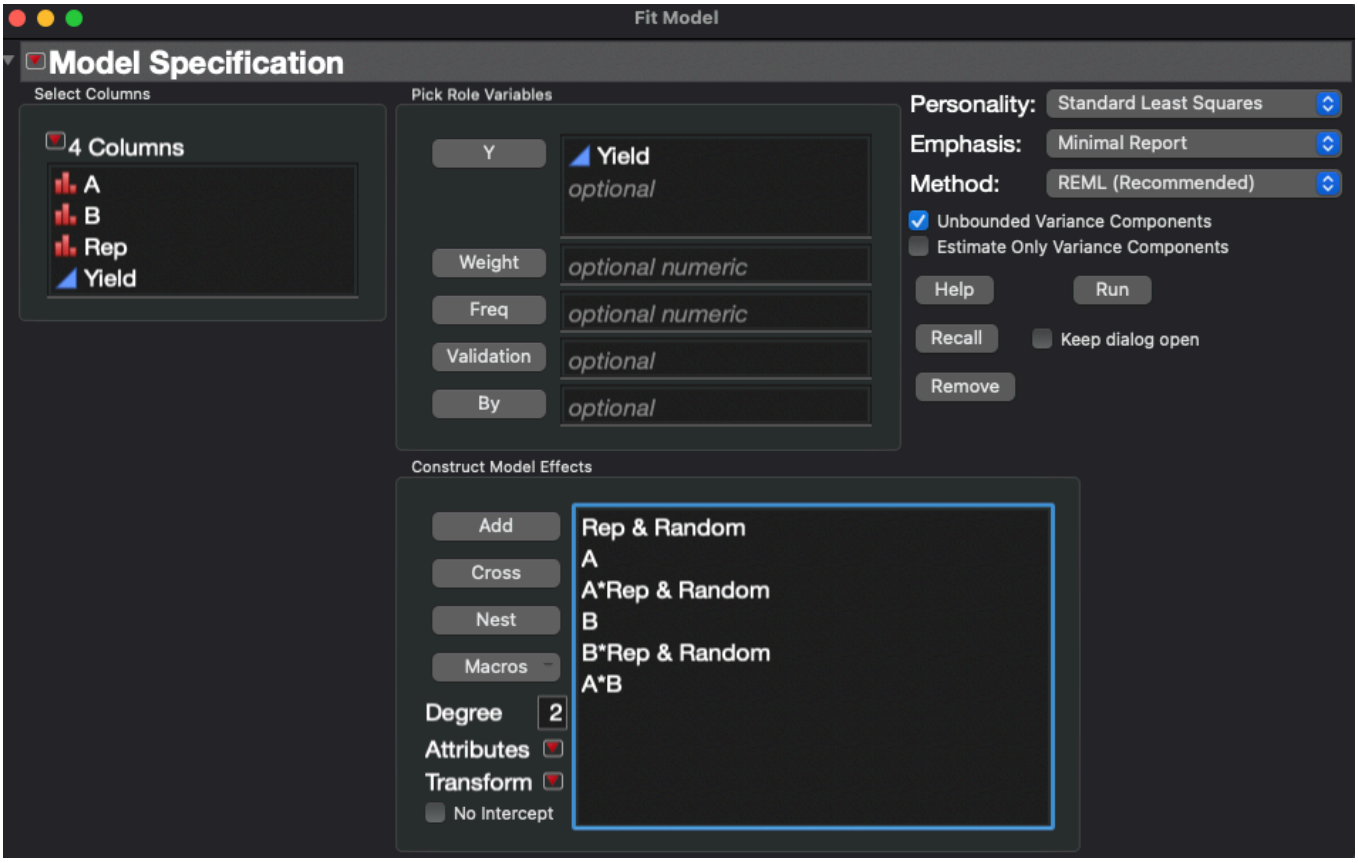
JMP Output for the REML Analysis of an RCBD with a Split Block Arrangement



JMP Output for RCBD with a Split Block Arrangement
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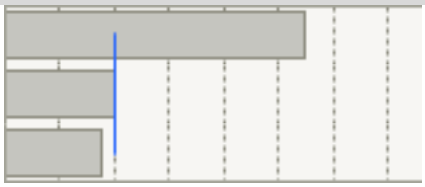
Response Yield
Effect Summary

Source	LogWorth	PValue
B	5.494	0.00000
A	2.023	0.00947
A*B	1.774	0.01683



Summary of Fit

RSquare	0.971461
RSquare Adj	0.958975
Root Mean Square Error	0.890771
Mean of Response	20.72083
Observations (or Sum Wgts)	24

Parameter Estimates

Term	Estimate	Std Error	DFDen	t Ratio	Prob>|t|
Intercept	20.720833	0.40481	2	51.19	0.0004*
A[0]	-3.304167	0.323903	2	-10.20	0.0095*
B[0]	-4.3375	0.227188	6	-19.09	<.0001*
B[1]	-1.1375	0.227188	6	-5.01	0.0024*
B[2]	3.3625	0.227188	6	14.80	<.0001*
A[0]*B[0]	0.4208333	0.314935	6	1.34	0.2299
A[0]*B[1]	-1.045833	0.314935	6	-3.32	0.0160*
A[0]*B[2]	1.2208333	0.314935	6	3.88	0.0082*

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REML Variance Component Estimates

Random Effect	Var Ratio	Var Component	Std Error	95% Lower	95% Upper	Wald p-Value
Rep	0.2828636	0.2244444	0.587293	-0.926629	1.3755176	0.7023
A*Rep	0.5433222	0.4311111	0.639813	-0.822899	1.6851215	0.5004
B*Rep	-0.239804	-0.190278	0.2582148	-0.696369	0.3158139	0.4612
Residual		0.7934722	0.4581114	0.3294837	3.8476223	
Total		1.4490278	0.7087402	0.6702451	5.1244902	1

Error (c) MS

-2 LogLikelihood = 63.175835181
Note: Total is the sum of the positive variance components.
Total including negative estimates = 1.25875

Fixed Effect Tests

Source	Nparm	DF	DFDen	F Ratio	Prob > F
A	1	1	2	104.0624	0.0095*
B	3	3	6	173.7730	<.0001*
A*B	3	3	6	7.8549	0.0168*

Correct results of *F*-tests on fixed effects using the proper denominators.

Effect Details
A
Least Squares Means Table

Level	Least Sq Mean	Std Error
0	17.416667	0.51844452
1	24.025000	0.51844452

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LSMeans Differences Student's t
α=0.050
LSMean[i] By LSMean[j]

Mean[i]-Mean[j] Std Err Dif Lower CL Dif Upper CL Dif	0	1
0	0 0 0 0	-6.6083 0.64781 -9.3956 -3.821
1	6.60833 0.64781 3.82105 9.39562	0 0 0 0

Standard error of the difference $s_{\overline{Y1}-\overline{Y2}}$ for calculating the LSD for comparison of the A main effect (e.g. a_0 vs. a_1).

Level		Least Sq Mean
1	A	24.025000
0	B	17.416667

Levels not connected by same letter are significantly different.

B
Least Squares Means Table

Level	Least Sq Mean	Std Error
0	16.383333	0.46420482
1	19.583333	0.46420482
2	24.083333	0.46420482
3	22.833333	0.46420482

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LSMeans Differences Student's t
α=0.050
LSMean[i] By LSMean[j]

Mean[i]-Mean[j] Std Err Dif Lower CL Dif Upper CL Dif	0	1	2	3
0	0 0 0 0	-3.2 0.371 -4.1078 -2.2922	-7.7 0.371 -8.6078 -6.7922	-6.45 0.371 -7.3578 -5.5422
1	3.2 0.371 2.2922 4.1078	0 0 0 0	-4.5 0.371 -5.4078 -3.5922	-3.25 0.371 -4.1578 -2.3422
2	7.7 0.371 6.7922 8.6078	4.5 0.371 3.5922 5.4078	0 0 0 0	1.25 0.371 0.3422 2.1578
3	6.45 0.371 5.5422 7.3578	3.25 0.371 2.3422 4.1578	-1.25 0.371 -2.1578 -0.3422	0 0 0 0

Standard error of the difference $s_{\overline{Y1}-\overline{Y2}}$ for calculating the LSD for comparison of the B main effect (e.g. b_0 vs. b_1).

Level		Least Sq Mean
2	A	24.083333
3	B	22.833333
1	C	19.583333
0	D	16.383333

Levels not connected by same letter are significantly different.

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A*B
Least Squares Means Table

Level	Least Sq Mean	Std Error
0,0	13.500000	0.64775252
0,1	15.233333	0.64775252
0,2	22.000000	0.64775252
0,3	18.933333	0.64775252
1,0	19.266667	0.64775252
1,1	23.933333	0.64775252
1,2	26.166667	0.64775252
1,3	26.733333	0.64775252

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LSMeans Differences Student's
α=0.050
LSMean[i] By LSMean[j]

Standard error of the difference $s_{\overline{Y1}-\overline{Y2}}$ for calculating the LSD for comparison of different horizontal whole plot means at the same level of the vertical whole plot factor (e.g. a_0b_0 vs. a_0b_1).

Mean[i]-Mean[j] Std Err Dif Lower CL Dif Upper CL Dif	0,0	0,1	0,2	0,3	1,0	1,1	1,2	1,3
0,0	0 0 0 0	-1.7333 0.63414 -3.1304 -0.3363	-8.5 0.63414 -9.8971 -7.1029	-5.4333 0.63414 -6.8304 -4.0363	-5.7667 0.90354 -7.9931 -3.5402	-10.433 0.83038 -12.561 -8.3053	-12.667 0.83038 -14.795 -10.539	-13.233 0.83038 -15.361 -11.105
0,1	1.73333 0.63414 0.33626 3.1304	0 0 0 0	-6.7667 0.63414 -8.1637 -5.3696	-3.7 0.63414 -5.0971 -2.3029	-4.0333 0.83038 -6.1614 -1.9053	-8.7 0.90354 -10.926 -6.4736	-10.933 0.83038 -13.061 -8.8053	-11.5 0.83038 -13.628 -9.3719
0,2	8.5 0.63414 7.10293 9.89707	6.76667 0.63414 5.3696 8.16374	0 0 0 0	3.06667 0.63414 1.6696 4.46374	2.73333 0.83038 0.60527 4.8614	-1.9333 0.83038 -4.0614 0.19473	-4.1667 0.90354 -6.3931 -1.9402	-4.7333 0.83038 -6.8614 -2.6053
0,3	5.43333 0.63414 4.03626 6.8304	3.7 0.63414 2.30293 5.09707	-3.0667 0.63414 -4.4637 -1.6696	0 0 0 0	-0.3333 0.83038 -2.4614 1.79473	-5 0.83038 -7.1281 -2.8719	-7.2333 0.83038 -9.3614 -5.1053	-7.8 0.90354 -10.026 -5.5736
1,0	5.76667 0.90354 3.54022 7.99311	4.03333 0.83038 1.90527 6.1614	-2.7333 0.83038 -4.8614 -0.6053	0.33333 0.83038 -1.7947 2.4614	0 0 0 0	-4.6667 0.63414 -6.0637 -3.2696	-6.9 0.63414 -8.2971 -5.5029	-7.4667 0.63414 -8.8637 -6.0696
1,1	10.4333 0.83038 8.30527 12.5614	8.7 0.90354 6.47355 10.9264	1.93333 0.83038 -0.1947 4.0614	5 0.83038 2.87194 7.12806	4.66667 0.63414 3.2696 6.06374	0 0 0 0	-2.2333 0.63414 -3.6304 -0.8363	-2.8 0.63414 -4.1971 -1.4029
1,2	12.6667 0.83038 10.5386 14.7947	10.9333 0.83038 8.80527 13.0614	4.16667 0.90354 1.94022 6.39311	7.23333 0.83038 5.10527 9.3614	6.9 0.63414 5.50293 8.29707	2.23333 0.63414 0.83626 3.6304	0 0 0 0	-0.5667 0.63414 -1.9637 0.8304
1,3	13.2333 0.83038 11.1053 15.3614	11.5 0.83038 9.37194 13.6281	4.73333 0.83038 2.60527 6.8614	7.8 0.90354 5.57355 10.0264	7.46667 0.63414 6.0696 8.86374	2.8 0.63414 1.40293 4.19707	0.56667 0.63414 -0.8304 1.96374	0 0 0 0

Standard error of the difference $s_{\overline{Y1}-\overline{Y2}}$ for calculating the LSD for comparison of different vertical whole plot means at the same level of the whole plot factor (e.g. a_0b_0 vs. a_1b_0).

Standard error of the difference $s_{\overline{Y1}-\overline{Y2}}$ for calculating the LSD for comparison of different vertical whole plot means at different levels of the whole plot factor (e.g. a_1b_2 vs. a_0b_3).

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Level						Least Sq Mean
1,3	A					26.733333
1,2	A					26.166667
1,1		B				23.933333
0,2		B				22.000000
1,0			C			19.266667
0,3			C			18.933333
0,1				D		15.233333
0,0					E	13.500000

Levels not connected by same letter are significantly different.