FA9 BORROMEO MAYO MERCADO RMD FILE

Borromeo Mayo Mercado

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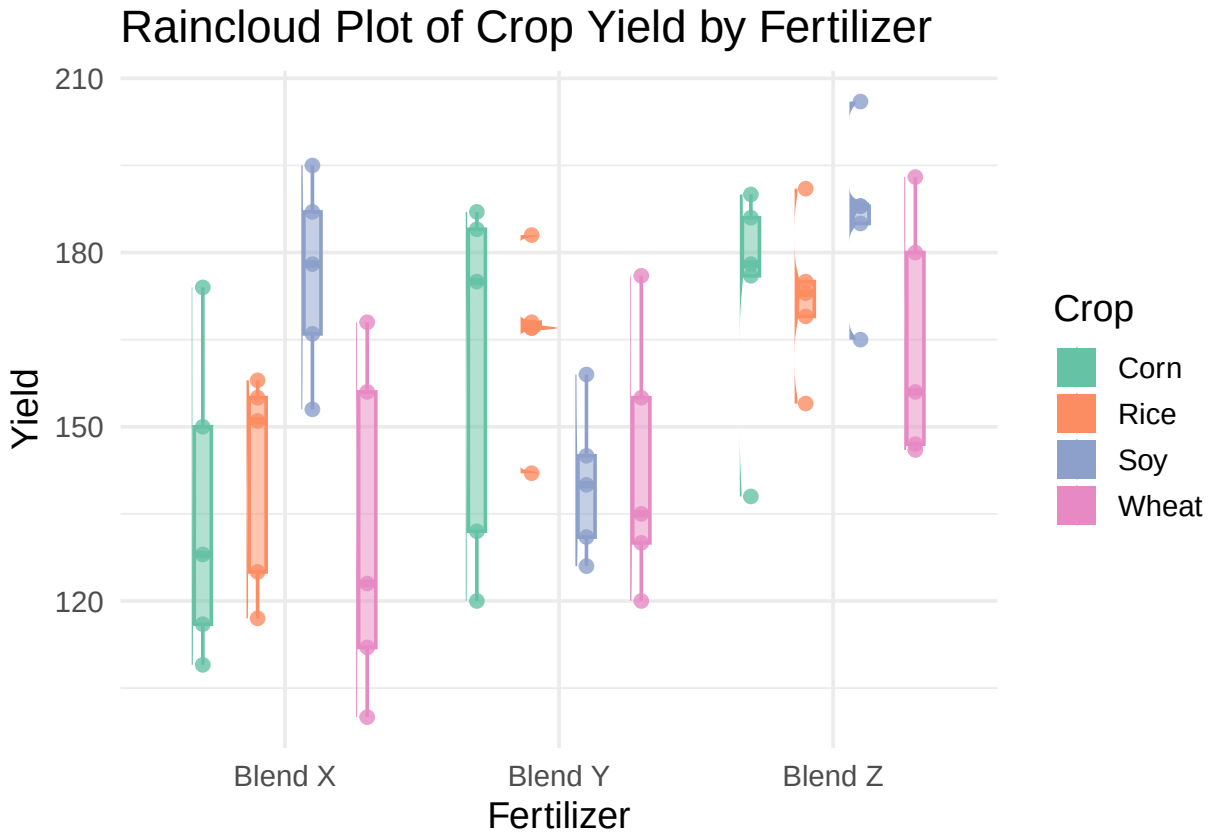
Assumptions

Assumption #1: The dependent variable, crop yield, is measured at the continuous level.

Assumption #2: The two independent variables, fertilizer type (Blend X, Blend Y, Blend Z) and crop type (Wheat, Corn, Soy, Rice), each consist of two or more categorical, independent groups.

Assumption #3: The independence of observation is observed.

Assumption #4: There are no significant outliers in each of the 12 cells of the design.



Assumption #5: The dependent variable, crop yield, is approximately normally distributed for each combination of the groups of fertilizer type and crop type, as assessed by Shapiro–Wilk test of normality (p > .05).

Table 1: Descriptive Statistics of Yield by Fertilizer

Statistic	Blend X	Blend Y	Blend Z
Valid	20.000	20.000	20.000
Mean	146.050	152.100	174.200
SD	27.971	22.606	18.185
Skewness	-0.010	0.090	-0.410
SE_Skew	0.548	0.548	0.548
Kurtosis	-1.328	-1.563	-0.907
SE_Kurt	1.095	1.095	1.095
Shapiro_Wilk	0.952	0.924	0.952

Table 2: Descriptive Statistics of Yield by Crop

Statistic	Corn	Rice	Soy	Wheat
Valid	15.000	15.000	15.000	15.000
Mean	156.200	159.667	167.467	146.467
SD	29.513	20.123	24.617	26.568
Skewness	-0.296	-0.607	-0.206	-0.008
SE_Skew	0.632	0.632	0.632	0.632
Kurtosis	-1.719	-0.468	-1.369	-1.139
SE_Kurt	1.265	1.265	1.265	1.265
Shapiro_Wilk	0.867	0.946	0.952	0.983

Assumption #6: The variances for each combination of the groups of fertilizer type and crop type are homogeneous, as assessed by Levene's test of equality of variances, p = 0.755.

Table 3: Test for Equality of Variances (Levene's Test)

df1	df2	F	p
11	48	0.675	0.755

Computation

Table 4: Two-way ANOVA Table (JASP-style)

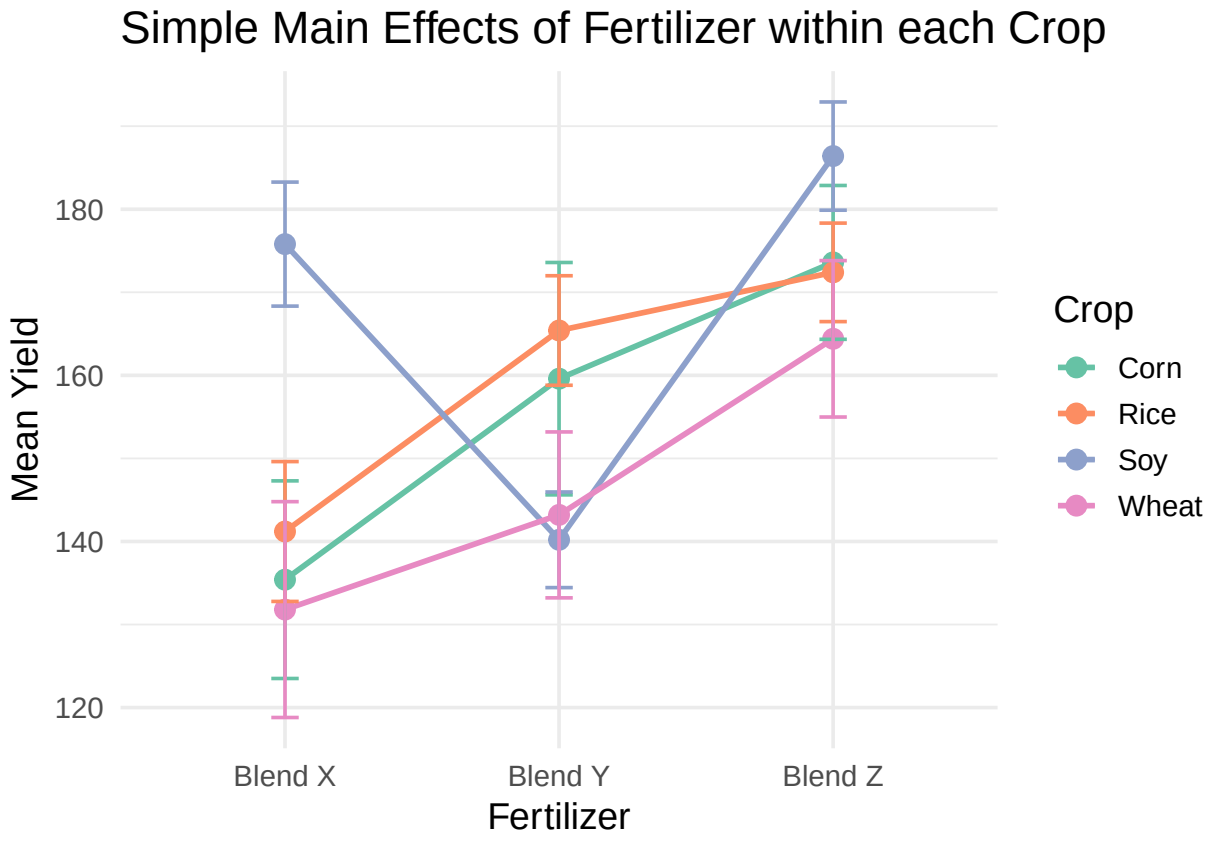
Cases	Sum of Squares	df	Mean Square	F	p	Partial Eta Squared
Fertilizer	8782.90	2	4391.450	9.933	0.000	0.293
Crop	3411.65	3	1137.217	2.572	0.065	0.139
Fertilizer:Crop	6225.90	6	1037.650	2.347	0.046	0.227
Residuals	21220.40	48	442.092	NA	NA	0.500

Remark:

Results of Simple Main Effects

Table 5: Simple Main Effects of Fertilizer within Each Crop

Level of Crop	Sum of Squares	df	Mean Square	F	p
Corn	5497.470	2	2748.735	2.649	0.111
Rice	11165.114	2	5582.557	5.380	0.021
Soy	27763.363	2	13881.682	13.378	0.001
Wheat	4769.039	2	2384.520	2.298	0.143

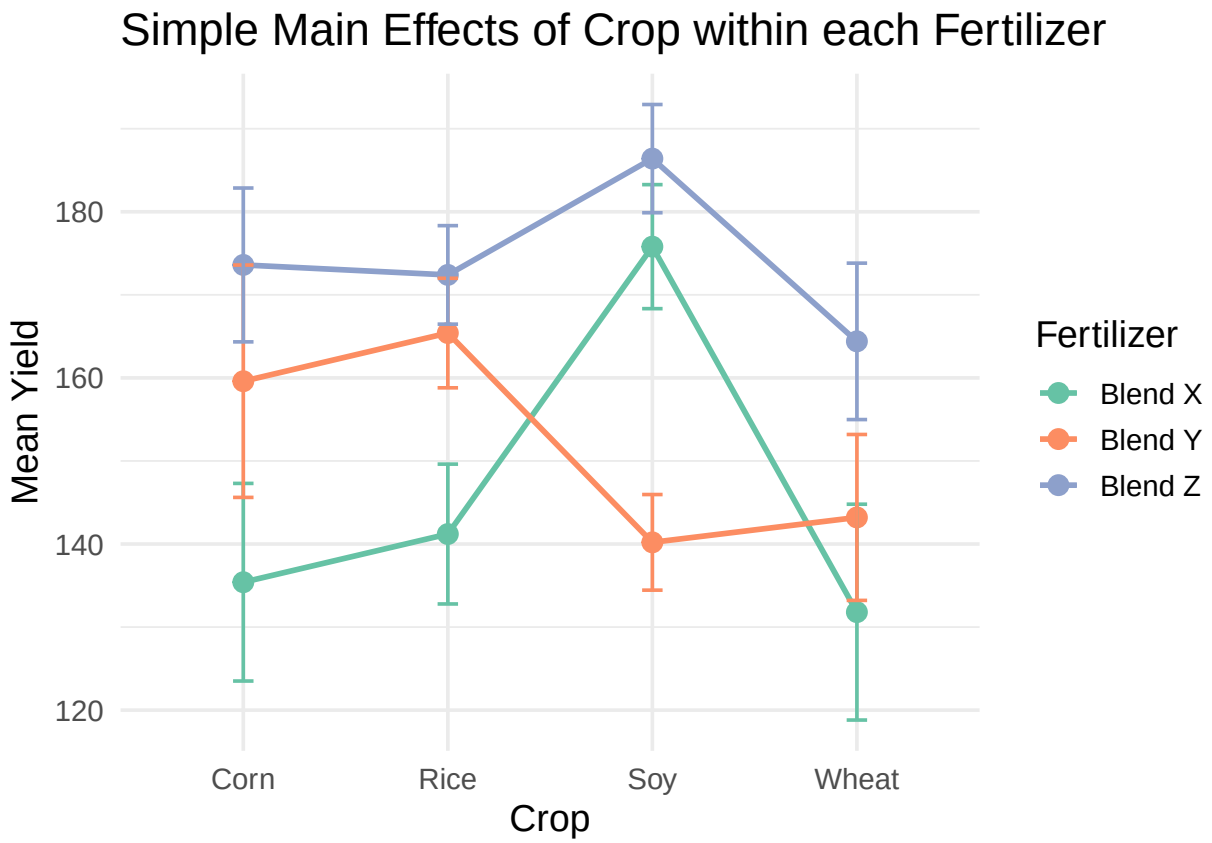


Remark:

Results of Simple Main Effects

Table 6: Simple Main Effects of Crop within Each Fertilizer

Level of Fertilizer	Sum of Squares	df	Mean Square	F	p
Blend X	11636.207	3	3878.736	3.738	0.033
Blend Y	5064.770	3	1688.257	1.627	0.223
Blend Z	4093.529	3	1364.510	1.315	0.304



Remark: Post Hoc Comparisons with descriptives

Remark