

EXST7015 : Daily Design Question 22

Carefully read the description of the experiment below. Be prepared to answer the questions that follow the design description as a class quiz. The experiment is patterned after one by titled Augmentation of AM Fungi Fails to Ameliorate the Adverse effects of Temporal resource variation on a Lettuce crop. by Erik S. Berg, Gregory K. Eaton¹, and Matthew P. Ayres, from Dartmouth College, Hanover, NH 03755, USA and Virginia Polytechnic Institute and State University, Blacksburg, VA 24061 in June 2001.

The Lettuce Crop experiment was done on three treatment variables (each with two levels). The eight treatment combinations resulted from combining the following: mycorrhizal inoculation (yes or no), water volume applied (high or low), and variability in timing of irrigation (high or low). The experiment was done on 8 plots at each of two sites. The variable of interest was nutrient levels, which were estimated as a mean for each plot for several distinct parts of the plant. (Note: the parts of the plant are to be analyzed separately)

Table 3. Results of ANOVA testing the effects of treatments on phosphorus concentration in leaves, nitrogen concentration in leaves, total shoot phosphorus, and total shoot nitrogen from second harvest.

Source	df	[P](%)	[N](%)	F-statistic	
				Total P (mg)	Total N (mg)
Site	1	1.02	1.28	0.02	0.71
Inoculation	1	0.02	0.15	0.01	0.00
Variability	1	0.47	2.49	36.80***	22.42**
Volume	1	0.39	14.87**	0.15	5.65*
InocxVar	1	5.09+	6.37*	0.32	0.00
InocxVol	1	3.34	7.53*	2.22	0.13
VarxVol	1	1.52	1.86	0.01	0.01
InocxVarxVol	1	0.52	0.63	2.67	6.27*
MSError	7	0.000954	0.03	31.60	4867.6

+p < 0.10, *p < 0.05, **p < 0.01, ***p < 0.001

Questions:

What is the treatment arrangement for this experiment?

- (a) single factor (b) factorial (c) nested

What is the experimental design for this experiment?

- (a) CRD (b) RBD (c) LSD (e) Split-plot (d) Repeated Measures

Does it seem to you that the treatments are fixed or random?

- (a) fixed (b) random

What is the experimental unit for this experiment?

- (a) site (b) Lettuce crop (c) plot (d) irrigation (e) nitrogen (f) levels

What is the sampling unit for this experiment?

- (a) site (b) Lettuce crop (c) plot (d) irrigation (e) nitrogen (f) levels

What is the dependent variable for this experiment?

- (a) site (b) Lettuce crop (c) plot (d) irrigation (e) nitrogen (f) levels

If the design is RBD, what are the blocks?

- (a) site (b) Lettuce crop (c) plot (d) irrigation (e) nitrogen (f) levels

How many degrees of freedom are available for testing the treatments?

Enter the correct value here: _____