

ANSC/TPSS 603
Assignment 3

Number of Replicates

1. Calculate the number of replicates required to obtain a significant difference at the 1% level in a two-tailed test with a 90% probability of detecting a significant result. The experiment has 5 treatments in a randomized complete block design. The standard deviation is 2.5 and the mean is 25 kg/ha. The difference it is desired to detect is 2.0 kg/ha. Remember to repeat the calculation using the appropriate degrees of freedom for the calculated r value until the input and newly calculated degrees of freedom are the same.
2. Recalculate the number of replicates to obtain a practical number of replicates, such as 4 to 10 reps. In order to do this you must vary the values of the terms in the equation until you can achieve the desired number of replicates. Remember to keep it reasonable.

Mathematical Model and Normal Equations

An experiment with three treatments and two replicates is installed in a randomized complete block design.

	T1	T2	T3	B Totals	B Means	Dev. from Mean
B1	3	9	6	18	6	+1
B2	5	1	6	12	4	-1
T Totals	8	10	12	30		
T Means	4	5	6		5	
Dev. from Mean	-1	0	+1			

3. Calculate the analysis of variance of the experiment and verify that the error MS is 14.
4. Write out the normal equation for the grand total $Y_{..} = 30$ in the above experiment.