

November 19, 1937

Dear Mr Lyle,

The mean square for one of the groups suspected of containing additional sources of variation does occasionally come significantly lower than the mean square residue supposed not to contain these causes. This may be due

a) to pure chance, for the number of cases tested for which the two variations are practically equal is very large, and one in 20 of these may be expected to give a significantly sub-normal mean square.

b) There may be real compensation; for example, the yield density of a field is usually significantly heterogeneous, in the sense that small areas near together are more alike than similar areas further apart. However, when samples are taken from adjacent single rows of plants the differences may be found to be greater than between similar lengths of row not immediately adjacent. This is due to competition between the plants in one row and the plants in the row immediately beside them. ~~All~~ reactions dependent on human emotions I think such compensations may be not uncommon.

In any case, I should always plan for the experiment to yield an adequate component of pure error, and to use this consistently as a basis for comparisons. This does not, however, exclude comparisons, when appropriate, between any effect and some higher order interaction of the same fact.

Yours sincerely,