Abstract

The NSW Department of Primary Industries Biometrics group has recently developed a 2-day basic statistics course. This course has been delivered on nine occasions in the past two years to staff principally involved in scientific research. The course has a strong emphasis on experimental design basics including the theoretical and practical benefits of replication. When the concept of replication is introduced, many course participants struggle with the idea that treatments ideally should be independently applied to experimental units and a lively debate about what is a 'true' replicate ensues. The identification of experimental units, the independence of the experimental unit and the consequent scope of inference are all important concepts to understand and apply. An experimental unit can be defined as the physical unit to which a treatment is independently applied usually through a randomisation process. True replication occurs when the same treatment it is independently applied to a number of experimental units. The term 'pseudoreplication' is used to describe the situation where there is not true replication and a potentially incorrect statistical analysis and interpretation has occurred.

Typically in a postharvest experiment there are insufficient resources available to independently apply treatments to experimental units. For example, in a study to determine optimum storage temperatures, temperature application may take place within a single cold room. Whilst we recognise this as the day-to-day reality for many researchers, the temptation to draw inference as if the treatments were properly replicated should be avoided or at the very least clearly acknowledged.