ASPECTS OF DESIGN FOR REPEATED MEASUREMENTS

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The design of trials and investigations is extremely important and includes the choices of experimental or observational units, the form and timing of measurements, the choice of applied or environmental treatments and the interrelationship of these three components. It became obvious later during the workshop that many difficulties of analysis could be attributed to design deficiencies (in a broad sense).

The general principles of design, applicable to all investigations are:

(a) efficient use of resources

(b) asking many questions

(c) reducing σ^2.

The consequent statistical principles are:

(i) Using appropriate amounts and forms of replication.

(ii) Using random allocation of treatments to units within stated design restriction to provide a valid basis for inferences and for estimating σ^2.

(iii) Using small "blocks" to control random variation.

(iv) Using factorial structure with the implied priority ordering of effects.

(v) Using the minimum necessary number of levels of quantitative factors.

The aspects discussed in this paper are (i), (iii) and (v).

1. REPLICATION AND RESOURCES

Replication for comparative mean values must provide adequate power; for random variance σ^2 and a difference that should be detected,