



BIOMETRICS INFORMATION

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PAMPHLET NO. # 4

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SUBJECT: ANOVA using SAS: How to pool error terms

With some analysis of variance designs, it is desirable to pool several error terms together. Consider the following randomized block design:

Source of Variation		Degrees of Freedom	Error Term
Blocks	B	1	--
Fertilizer	F	1	Pooled Error
Hormone	H	1	
FxH		2	
BxF	Pooled Error	1	--
BxH		2	
BxFxH		2	
Trees	T(HFB)	120	--

In this case, 3 terms: $B \times F$, $B \times H$ and $B \times F \times H$, are to be pooled into one error term, which will be used to test F, H and FxH. This analysis can be performed using SAS. To inform the SAS system of which terms to pool, code only the highest order source in the MODEL statement. All lower related sources will automatically be pooled into the coded source. The required SAS commands appear below.

```
PROC ANOVA;
  CLASS B F H;
  MODEL HEIGHT = B F H F*H B*F*H;
  TEST H= F H F*H E=B*F*H;
  MEANS F H F*H / DUNCAN E=B*F*H;
  TITLE 'ANALYSIS OF VARIANCE WITH POOLED ERROR TERM';
```

Note that of the three terms to be pooled, only $B \times F \times H$ is coded in the model statement. SAS automatically pools it with $B \times F$ and $B \times H$. The pooled error term is subsequently specified in the TEST and MEANS statements.

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