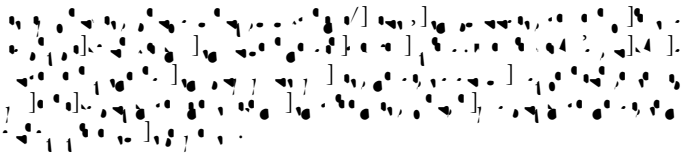


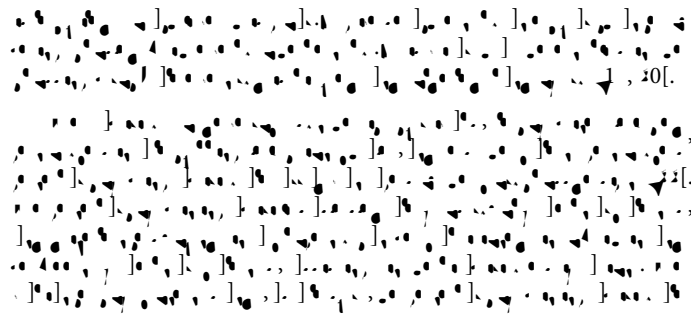


Common Mating Design for Hybrid Development

Temesgen Begna* and Workissa Yali

Abstract





Method I or full diallel design: $y_{ijk} = \mu + P_i + P_j + G_{ij} + S_{ij} + r_{ij} + e_{ijk}$ (Table 6).

Method II or half diallel design: $y_{ijk} = \mu + P_i + P_j + G_{ij} + S_{ij} + r_{ij} + e_{ijk}$ (Table 8).

Diallel design

Method III: $y_{ijk} = \mu + P_i + P_j + G_{ij} + S_{ij} + r_{ij} + e_{ijk}$ (Table 9).

Method IV: $y_{ijk} = \mu + P_i + P_j + G_{ij} + S_{ij} + r_{ij} + e_{ijk}$ (Table 10).

Method I or full diallel design: $y_{ijk} = \mu + P_i + P_j + G_{ij} + S_{ij} + r_{ij} + e_{ijk}$ (Table 6).

Method II or half diallel design: $y_{ijk} = \mu + P_i + P_j + G_{ij} + S_{ij} + r_{ij} + e_{ijk}$ (Table 8).

Table 6:

Source	Df	MS	Ems
			+ r
			+ 2r
			+ r

Method I or full diallel design: $y_{ijk} = \mu + P_i + P_j + G_{ij} + S_{ij} + r_{ij} + e_{ijk}$ (Table 7).

Method II or half diallel design: $y_{ijk} = \mu + P_i + P_j + G_{ij} + S_{ij} + r_{ij} + e_{ijk}$ (Table 8).

Method III: $y_{ijk} = \mu + P_i + P_j + G_{ij} + S_{ij} + r_{ij} + e_{ijk}$ (Table 9).

Method IV: $y_{ijk} = \mu + P_i + P_j + G_{ij} + S_{ij} + r_{ij} + e_{ijk}$ (Table 10).

Table 7:

Expected mean squares					
Source	Df	SS	MS	Model I	Model II
				$\frac{c}{p-1} g$	$\frac{p-1}{p} + 2p$
				$\frac{c}{p(p-1)} s$	$\frac{p-1}{p^2}$
ef.				$\frac{c}{p(p-1)} r$	+ 2

Table 8:

Expected mean squares					
Source	Df	SS	MS	Model I	Model II
				$\frac{c}{p-1} g$	+ +(p+2)
				$\frac{c}{p(p-1)} s$	+

Table 9:

Expected mean squares					
Source	Df	SS	MS	Model I	Model II
				$\frac{c}{p-1} g$	+ 2 +2(p-2)
				$\frac{c}{p(p-3)} s$	+ 2
Reciprocal ef.				$\frac{c}{p(p-1)} r$	+ 2

Line × Tester Design

The line × tester design was conducted in a randomized block design with three replicates. The experimental design was a 3 × 3 factorial design. The first factor was the line (L1, L2, L3) and the second factor was the tester (T1, T2, T3). The response variables were the yield and quality parameters of the grain. The data were analyzed using a two-way ANOVA.

The results of the ANOVA are presented in Table 11. The main effects of the line and tester were highly significant ($P < 0.001$). The interaction between the line and tester was also highly significant ($P < 0.001$). The yield and quality parameters were significantly affected by the line and tester. The line L1 produced the highest yield and quality parameters, while the tester T1 produced the lowest yield and quality parameters. The interaction between the line and tester was also highly significant, indicating that the effect of the line on yield and quality parameters depends on the tester used.

Conclusion

The line × tester design was conducted in a randomized block design with three replicates. The experimental design was a 3 × 3 factorial design. The first factor was the line (L1, L2, L3) and the second factor was the tester (T1, T2, T3). The response variables were the yield and quality parameters of the grain. The data were analyzed using a two-way ANOVA.

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