Stability and Yield Performance of QPM Hybrids Tested at 35 Tropical Locations

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Materials and Methods

- 18 QPM genotypes—12 hybrids and 6 open pollinated varieties—and two normal maize commercial hybrids as checks.
- A 4 x 5 lattice design was used.
- Trials were grown at 9 locations in Mexico, Central America, Colombia, and Thailand in 1997 and at 26 locations in Africa, Latin America, and Asia in 1998.
- Genotype x environment interaction and yield stability were estimated by means of the AMMI Model (Gauch 1992) for 12 genotypes common at 35 tropical locations (Table 1).

Adoption of QPM cultivars has been limited by their susceptibility to ear rot and foliar diseases. Recent CIMMYT breeding strategies for QPM hybrids have emphasized resistance to biotic and abiotic stresses. As a result, the new QPM hybrids in this study were more resistant to ear rot and rust than the commercial checks (Table 2; Fig. 2). Table 2 shows the performance of the top three, single-cross hybrids across trials. 1997-98 QPM hybrid CML144 x CML159 topped the list with an average yield of 6.0 Mg ha⁻¹—60 kg more than the check—and showed more resistance to ear rot and rust and fewer uncovered tips (ears with exposed tips are more prone to damage from birds and storage pests). The three superior hybrids also had nearly twice the typhoon resistance (which is highly correlated with lysine) as the checks, and were as stable.

These encouraging results have rekindled the interest in QPM in developing countries. Release of new QPM hybrids are taking place in 1999 in China, El Salvador, Guatemala and Mexico (photo).
References


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Figure 3. Additive and multiplicative effects for genotype and environment among QPM genotypes tested at 35 tropical locations.