SUCCESSFUL development of improved corn hybrids is dependent upon accurate evaluation of line genotypes under selection. Early work in development of hybrids was based upon visual selection of lines during inbreeding followed by production of and selection among single-cross and double-cross combinations using trial and error methods. The number of hybrid combinations taking 2 or 4 lines at a time increases rapidly with increasing numbers of lines. It was soon realized that an evaluation procedure was needed which would permit culling of lines not likely to be of value in cross combinations. The system developed was that of initial selection in topcross combinations for general combining ability (gca) followed by tests for specific combining ability (sca) among lines exhibiting high gca. Tests for gca are based upon topcrosses to a tester providing a broad genetic base (2, 6, 8). Information on sca is obtained mainly from single-cross combinations. The latter tests have been used widely for predicting which of the possible double-cross combinations might logically be made up for actual field trials (5).

Testcross evaluation procedures may vary somewhat depending upon objectives of the program. The use of different testers to evaluate inbred lines for gca resulting in rather inconsistent selection of those indicated to be best is disturbing (4, 7, 10). Recent work relating selection success in topcrosses to level of performance of the tester population may be a step in the right direction (11).

One source of inconsistency in testcross evaluation is undoubtedly due to rather limited testing such that geno-