

1. Utilization of American Inbreds in the South-African Breeding Program.

Only a few American lines per se can be used in this country due to poor adaptation. An attempt to utilize the reportedly high combining ability of certain American lines was made by backcrossing for two generations to adapted South African lines as the recurrent parents. All comparisons were then made after crossing to a common tester.

The unadapted American lines flowered later yet matured earlier than South African lines or backcrossed generations while F_1 's were intermediate.

Greater stalk breakage in crosses was associated with the American lines used and this character proved to be additive in inheritance; as was also the case with shelling percentage.

The test cross yields of the American lines were only average or below average. Only a few high combining selections were obtained in any of the backcrossed generations and these were considered to be new recombinations, with a more favorable gene dosage than either parent. Combining ability under South African conditions is apparently due largely to adaptation to variable moisture conditions. Selection for adaptability while backcrossing to the American lines to retain combining ability should prove more useful.

B. Stead