Composite-Sibbing Versus Selfing in Development of Corn Inbred Lines

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The low yields and lack of vigor of inbred parents of corn hybrids present serious problems to both plant breeders and seed producers. One generation selfed (S1) lines of corn are expected to possess vigor which is intermediate between that of the original S0 selection and of homozygous lines isolated from it. Thus, S1 lines would ordinarily be superior in yielding ability to homozygous inbred lines derived from the same source. This leads to the speculation of whether the greater yielding ability of less highly inbred lines might be utilized in the production of commercial hybrids. It is the purpose of the investigations reported here to determine the feasibility of such an approach.

LITERATURE REVIEW

It was only after Jones (5) suggested the double cross system of seed production to obviate the difficulty of using as the immediate parents of commercial hybrid corn the seeds of highly inbred lines as the immediate parents of commercial hybrid corn that large scale hybrid seed corn production became feasible. Krantz and Harvey (7) reported large increases in yield of inbred lines in North Carolina as a result of heavy applications of fertilizer and increased rates of planting. Richey and Sprague (15), after allowing for differences in degree of inbreeding, indicated a 13 to 15% improvement in yield of backcrossed lines over the recurrent parent in their studies on convergent improvement. Richey (13) reported increased yields of lines developed by backcrossing and for their line crosses. Singleton (16) reported increased yield...