MODIFICATIONS of the pedigree and bulk methods of breeding following hybridization have been used to produce many of the recently released soybean varieties. An early and accurate appraisal of segregates has been of vital interest to most soybean breeders. Testing in early generations, studied extensively in some open pollinated crops, has suggested the possibility of a similar application in self-pollinated crops. More precisely, the problems involved are, first, a selection of those crosses which are most likely to give the highest proportion of superior segregates, and second, an early evaluation of the potentialities of the segregates from those crosses. These two problems are closely related.

Selection of crosses has been attempted on the basis of their performance in tests of bulk hybrid populations. Harlan, Martini, and Stevens (2) reported that yields of unreplicated bulk crosses in barley aided in selecting those from which high yielding segregates might be expected. Harrington (3) concluded that tests of bulk F2 populations could be used to indicate the yield potentialities of wheat crosses. Immer (4) showed that some bulk crosses in barley were higher in the F2, F3, and F4 generations, but that the interaction of cross × planting method reduced the value of the F1 for prediction purposes. Atkins and Murphy (1) tested the bulk F7 and F8 of 10 crosses and 50 segregates selected at random from each cross and concluded that bulk populations which give the highest yield do not necessarily produce the largest proportion of higher yielding segregates. On similar studies with soybeans has been by Weiss (8) and will be summarized here. In general, primarily as a result of studies by Weiss, Weber, and Kalton (9) and Kalton (6), it has been shown that maturity date and height of spaced F2 plants give good indications of F3 line