

Breeding work (B) Theoretical studies on population structure. The theoretical conditions considered include: (a) The presence of heterotic gene pairs vs. recessive subviable genes, and (b) Continued selfing vs. random mating. The total survival value of the populations or the loss caused by selection on total productivity were taken into consideration. Under the conditions considered, the minimum loss and at the same time the highest total survival value of the population will be found with heterotic gene pairs, if at least one of the alleles present has a survival value of homozygotes not very different from the maximum value represented by that of the heterozygotes. Under such conditions the survival and productivity of indigenous races or synthetics can be explained perfectly, and also the positive effects of populational selection. Thus actually the situation with the presence of heterotic genes may not differ very much from that, where the heterotic allele with high survival value is substituted by a dominant gene at a subviable locus. This conclusion makes it rather difficult to design decisive tests to distinguish experimentally between the heterosis theory and the dominance theory. These considerations are being published in more detail in the "Handbuch für Pflanzenzüchtung", Berlin.

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