

3. Cross-sterility factors in pop corn races.

Using descendants of Pira, the Colombian pop corn type, we notice a high degree of cross-sterility in advanced generations, and thus a test was carried out including some 100 different origins of South American pop corn, in order to test for the frequency of occurrence of cross sterility. A number of plants of each sample were pollinated by a common variety, and the frequency of fully sterile, half fertile and fully fertile ears determined. These samples gave a complete series from complete cross sterility to complete cross fertility; the latter were samples which on the whole showed a higher degree of infiltration from flint corn. The frequency of half-fertile ears was correlated to the degree of sterility in samples with 100 to 60% sterility and also in those samples with from 100 to 60% of full fertility. In the middle group the percentage of half fertile ears increased, and the maximum was reached in samples with about equal parts of fully sterile, half fertile and fully fertile ears. New samples will now be selected out of this lot, in order to verify the genetic basis of the different types obtained.

It can be however already accepted as a fact, that the cross sterility factor is of very common occurrence in nearly all pop corn races. This raises several interesting questions on the history of corn and on the question of population genetics. It is hardly possible to assume that this isolating gene has been introduced by man into this oldest racial type of corn, and we must determine where it may have come from in the beginning and if it came from the wild grasses which entered into the composition of the most primitive cultivated corn. Next it would be very interesting to know what caused the loss of this cross-sterility system when the higher developed races of corn appeared, such as flint, floury and dent races. Since there is no reason to suppose that the cross-sterility factor in these populations differs from other genes, it will mutate recurrently to the cross fertility genes. If the difference between these two types of factors has to do with rate of pollen tube growth, then the new genes for a slower growth rate can hardly have had any possibility of accumulating in the population and thus of increasing their frequency. Thus if the cross-sterility factors were eventually lost, some special situation of selection against them must have appeared. No definite conclusions can be drawn as yet, and the complete analysis of these indigenous races will be necessary.

F. G. Brieger
J. T. A. Gurgel