

3. New Cross-Sterility Factors in Maize

A gametophyte factor Ga^s/ga in corn has been shown to be linked with the sugary locus Su/su . There are 12.5 to 15 per cent sugary seeds in the F_2 progeny of various crosses of $Ga^s/Su/Ga^s \times ga\ su/ga\ su$. Corn homozygous for Ga^s sets no seed with field corn pollen, ga , but Ga^s pollen will induce seed set in ga/ga stocks. The cross-sterile types found previously have been compatible with each other.

Several years ago Mr. James Murray of the Central Popcorn Co. noticed that 401-127, an inbred derived from Minnesota Superb, which is non-reciprocally cross-sterile with field corn, would not set seed with South American inbreds (Ga^s/Ga^s). Two years observation at Purdue has demonstrated that 401-127 plants set little seed with Ga^s pollen and fail to induce a full set on Ga^s/Ga^s stocks. The factor producing cross-sterility in 401-127, is not located at the Ga^s/ga locus as crosses with $ga\ su/ga\ su$ plants result in 25 per cent sugary seeds in the F_2 .

Several inbreds have been found at Purdue that do not show the usual cross sterile reaction. The inbred 4513-K2, derived from Baby Golden, will not set seed with ga or Ga^s pollen, but it will set seed with 401-127 pollen and induce a full seed set on the 401-127 stock. It appears from the results that 4513-K2 may also carry the same factor for cross-sterility that 401-127 does.

The inbred 4501-LA, obtained from South American, sets no seed with 401-127 nor with two Ga^s stocks. It has a reduced set with another Ga^s stock. Sixteen per cent sugary seeds occurring in the F_2 progeny of the cross P51B ($ga\ su/ga\ su$) \times 4501-LA indicates an allele of the Ga^s type at the Ga^s/ga locus in 4501-LA. The sterility reactions of 4501-LA; that is, the lack of seed set with Ga^s stocks but a reduction in the percentage of sugary seeds in the F_2 of a cross with $ga\ su/ga\ su$, could be caused by 4501-LA carrying Ga^s plus one or more sterility factors not linked with sugary.

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