8. <u>Test of doubleness at C^i-C-c locus.</u>

Assuming C^i to be compound, its order and constitution may be CI, IC, cI, or Ic. In a test for separability of two components, crosses have been set up to obtain C-carrying C^i frcm the last two structures, in case this is necessary:

+ C^i +/yg C sh x yg c sh;

select yg C^i + and + C^i sh;

backcross to yg c sh.

The final backcross provides tests of all four possibilities for the structure of C^i, through the detection of exceptional colored kernels arising by crossing-over. Selection of crossovers for the markers should serve to increase the likelihood of recovering CI from cI, or IC from Ic, among the individuals given in the final backcross.

1955 data on the final backcross:

Colorless shrunken class

Est. Examined	Plants	Per plant	cases
69,250	182	380	1 Sh?

Yellow-green colorless non-shrunken

218,900	581	377	3 Sh (Separate plants)

In 288,150 gametes, one colored case found on an ear of the sh class, may be a Sh contamination; three colored cases found on ears of the yg Sh class, one extra small, one extra large, and one near eartip. All cases thus appear very tenuous, and may be contaminations. These are to be tested for validity in 1956. Accepting these four cases for the present, insofar as they can possibly reflect crossing-over events, maximum map distances can be calculated for C to I, depending upon the assumed structure of C^i:

1. I C: All four cases could be crossover-derived, and both classes of plants can be considered as tests. In the 288,150 gametes, half were tested for crossing-over: 4/144,075 = 0.0028 map units maximum.

2. C I: Only the one case in the sh group could be derived by crossing-over: 1/144,075 = 0.00069 map units maximum.

3. I c: Only the sh group tests this, since crossover-derived I C individuals would be restricted to this selected class. The one case here could possibly prove valid. Taking into account the C^i - Sh map distance (4 units), the number of plants tested, and the number of kernels per plant, a maximum distance of 0.11 map units can be derived.

4.   C I: Only the yg group tests this, in a fashion similar to assumption 3. No cases fit the assumption of crossover derivation. Assuming one case, and considering yg - C^i map distance (20 units), a maximum of 0.14 map units can be derived.

Tests of cases, of case-carrying plants, and of additional final backcrosses are planned for 1956.