

(1) normally fertile, (2) partially fertile with about 50 percent or more of normally released pollen, (3) partially fertile with about 50 percent or less of normally released pollen, (4) completely sterile. In the first category the normal functioning of the pollen has been checked many times by self and cross pollinations made by hand. The last category shows no anthers as long as the silks are receptive, and the anthers are devoid of any normally appearing pollen grains.

For convenience in classification the first three categories are lumped together to compare the effectiveness of this method of testing segregation. In 1956 six progenies were grown in replicated plantings, about 100 plants in each replication. Five of the lots were F_2 selfed progenies of crosses of S and T sterile inbreds by the pollen restoring inbreds NC77, Tx127 and Ky21. One lot was the F_1 cross of a T sterile inbred by the single cross (Ky21 x Tx127). The differences in the percent of plants with or without anthers appearing ranged from 0 to 12 percent. None of these differences is significant.

2. Seasonal differences in pollen restoration.

Using this method of field examination and the same arbitrary classification of plants with and without anthers the differences shown by the same F_2 segregating progenies were determined for the two growing seasons of 1955 and 1956. The same lots of seed were planted each year and the results averaged for the three pollen restoring inbreds given above. In 1955 the growing season up to the time of flowering was unusually dry and above normal in temperature. The leaves were wilted and rolled on many days. The 1956 season was quite adequate in moisture before flowering and temperatures were normal. The results combined from the three inbreds used as pollinators in 18 different selfed F_2 progenies are as follows:

| | Number of Plants | | Percent | |
|----------------|-------------------------|----------------------------|-------------------------|----------------------------|
| | <u>With Anthers</u> | <u>Without Anthers</u> | <u>With Anthers</u> | <u>Without Anthers</u> |
| 1955 Observed | 480 | 356 | 57 | 43 |
| Calculated 9:7 | 470 | 366 | 56 | 44 |
| 1956 Observed | 1014 | 331 | 75 | 25 |
| Calculated 3:1 | 1009 | 336 | 75 | 25 |

The agreement in 1955 with a 9:7 calculated ratio and in 1956 with a 3:1 calculated ratio is remarkably close. This indicates that in the relatively unfavorable season of 1955 two restoring genes were needed for the plants to show any anther. In the more favorable season of 1956 only one restoring gene was necessary.