3. A summary of an extensive screening project for "T" and "S" sterile cytoplasm restorers.

A large number of sources of germ plasm were sampled for restoring genes for the "T" and "S" sources of sterility. These gene sources are being practically evaluated as will be discussed later.

Upon summarizing results, an attempt was made to correlate frequency of restoring gametes with the geographic origin of the source material. Geographic areas were arbitrarily set-up as follows:

Area	
1	New England and No. Eastern Canada
2	Extreme No. Western Corn Belt, centering in South Dakota.
3	Eastern Corn Belt, centering in Pennsylvania.
4	Middle Corn Belt, centering in Illinois and Iowa.
5	South-western United States and No. Mexico
6	South-eastern United States, centering in Georgia.
7	Carribean Islands and So. Florida.
8	So. Mexico and Central America.
9	Northern half of So. America.
10	Southern half of So. America.
11	Mediterranean Countries.
12	So. Africa and Ethiopia.
13	Northern Europe.
14	South East Asia and India.
15	No. East Asia and Japan.
16	Australia.

All possible correlations were run on data from areas 2, 3, 4, 5, 6, 7, and 8, in order to determine the degree to which origin affected the relationship between occurrence of restorers in this material. Results were as follows:

			d/f
Between T completes and T partials	r =	.235	15
Between T completes and S completes	r =	-.106	6
Between T completes and S partials	r =	.243	6
Between T partials and S completes	r =	-.266	6
Between T partials and S partials	r =	.141	6
Between S completes and S partials	r =	.544	6

Table 1. -- "T" Texas Type Sterility.

Area	No. of varieties or sources sampled	No. of plants sampled	No. of Gametes sampled	% Completely restoring gametes	% Partially restoring gametes	% Non-restoring gametes
1	8	21	211	3.8	0.9	95.3
2	26	143	205	2.6	5.6	91.8
3	8	66	921	8.8	4.0	87.2

4	165	736	10,498	6.3	3.2	90.5
5	71	370	5,333	13.4	2.7	83.9
6	116	356	5,112	10.5	3.0	86.5
7	21	156	2,266	25.8	9.1	65.1
8	10	37	533	34.3	5.4	60.3
9	10	26	387	8.8	2.3	88.9
10	64	64	896	23.5	13.5	63.0
11	745	766	10,677	9.6	10.4	80.0
12	53	53	747	12.3	4.8	82.9
13	66	77	1,082	1.4	6.1	92.5
14	23	41	563	38.5	3.7	57.8
15	10	10	134	6.7	7.5	85.8
16	25	25	339	13.9	5.6	80.5
Total	1,421	2,947	41,754			
Average all readings not weighted by areas.				10.7	5.8	83.5

--"S" Connecticut - U.S.D.A. Type Sterility.

1	7	10	137	0.7	65.0	34.3
2	22	79	1,083	4.0	70.1	25.9
3	6	52	740	1.9	64.2	33.9
4	138	491	6,940	2.5	42.6	54.9
5	69	314	4,508	3.8	70.4	25.8
6	125	335	4,808	14.8	75.9	9.3
7	21	130	1,835	3.7	66.9	29.4
8	7	29	397	3.5	69.0	27.5
9	1	5	78	0	29.5	70.5
11	1	13	182	0.6	45.6	53.8
13	1	11	154	0	59.7	40.3
14	3	19	268	0	46.3	53.7
15	1	1	11	0	45.5	54.5
Total	402	1,489	21,141			
Average all readings not weighted by areas				5.6	61.2	33.2

Next, all possible correlations were run on data from the 32 best sampled varieties (individual data not shown here), in order to determine the degree to which varieties affected the relationship between occurrence of restorers in this material. Results were as follows:

			d/f
Between T completes and T partials	r =	.130	31
Between T completes and S completes	r =	.014	31
Between T completes and S partials	r =	.079	31
Between T partials and S completes	r =	-.028	31
Between T partials and S partials	r =	-.154	31
Between S completes and S partials	r =	.025	31

The reader is left to his own interpretation as to the meaning of these correlation values, only one of which approached significance.

It would seem that the most important information presented here is the estimate that material derived from regions 5, 6, 7, 10, 12, 14, and 16, provides the most abundant sources of T restorers, while region 6 seemed to be the only area abundant in good "S" restorers. Also, assuming that we have made an unbiased sampling of Zea Mays, then the general frequency of complete and partial restoring gametes for "T" and "S" cytoplasm for the species may be shown in the following table.

	No. sources sampled	Percent complete restoring gametes	Percent partial restoring gametes	Percent Nonrestoring
T cytoplasm	1421	10.7	5.8	83.5
S cytoplasm	402	5.6	61.2	33.2

The expectation that restorer characters should most likely enjoy their greatest frequency in areas where the corresponding cytoplasm originated, makes this summary a matter of interesting speculation.