inbred strain of Wilbur's flint, (2) to compare the phenomenon of homozygosis with that of heterozygosis for teosinte chromosome segments by both selfing and crossing to its maize parent.

Y. C. Ting

10. Estimation of tripsacoid germplasm in teosinte and "Tripsacum" derivatives of maize.

In last year's News Letter, a new method for estimating teosinte and "Tripsacum" introgression into maize was described. This was based upon the comparative study of the cobs in a longitudinal section. While these studies are still in progress, another method has been found to be of some additional help. This involves crossing with Nobogame teosinte: (1) the original strain of A158, (2) strains of A158 modified by introducing teosinte chromosomes, (3) A158 strains modified by introducing extracted chromosomes from tripsacoid races of maize which are not in obvious contact with teosinte. The F_1 pistillate spikes have been studied for the following characteristics: (1) distichous versus polystichous arrangement, (2) single versus paired spikelets. The results for the first character which are based upon scores of 1-3 are shown in Table 1. The three grades are: 1 = distichous; 2 = intermediate; 3 = polystichous. In addition to this, those pistillate spikes having single spikelets are marked with one or two asterisks respectively depending upon whether less than or more than half the individuals of the F_1 population exhibit this feature. Absence of an asterisk indicates no single spikelets. Observations are based on 18-24 spikes from 9-12 plants.

Table 1. Results of crosses between modified and unmodified strains of A158 with Nobogame teosinte.

"Tripsacum" derivative X Nobogame teosinte		Teosinte derivative X Nobogame teosinte	
Country[1]	Average score	Derivative[2]	Average score
Cuba	1.00*	Nobogame 4	1.0**
Honduras	1.07	Durango 1,9,7	1.0**
Nicaragua	1.18	Florida 4	1.0*
Bolivia	1.20	Florida 9	1.0*
Argentina	1.21	Florida 1,3 or 9	1.0*
Paraguay	1.27	Florida 3,4,9	1.0**
Brazil	1.33	Florida 3	1.1*
Mexico	1.43		
Control:			
A158 X Nobogame	2.6		2.6

[1]Countries representing the source of races from which the chromosome with "Tripsacoid" effects has been extracted and introduced into A158.

[2]Varieties of teosinte representing the most likely source of chromosomes or chromosomal segments which have been introduced into A158.

It is obvious from the results set forth in Table 1 that the hybrids between A158 and Nobogame teosinte have a general tendency towards polystichous arrangement whereas those between modified derivatives and Nobogame show more tendency towards distichous arrangement. This demonstrates the fact that both types of derivatives carry concealed genes for distichous arrangement which is one of the distinguishing characteristics of teosinte and Tripsacum. Most of the "Tripsacum" derivatives, however, fail to show single spikelets. It is possible that Nobogame teosinte which is one of the most maize-like of the teosinte varieites, has failed to produce a threshold effect for this character. Crosses with Florida teosinte have been made during the past summer to see whether this teosinte would, in crosses, expose the hidden features in "Tripsacum" derivatives.

S. M. Sehgal

UNIVERSITY OF ILLINOIS
Urbana, Illinois
Department of Botany

1. Proembryo irradiation to produce blue-fluorescent and albino seedlings.

Maize plants were given approximately 750 r of gamma radiation (cobalt^{60}) at various times after pollination in order to produce chimeras in embryos, sectored for chlorophyll or carotenoid deficient phenotypes and normal tissue.

In one experiment the resulting embryos heterozygous for factors on chromosome 9 from the following cross were irradiated at various periods after pollination: wd* - C - sh - bz - wx/Yg_2 - C - Sh - Bz - wx (McClintock's rearranged chromosome*) X wx - Bf_1. The kernels from 10 ears of the treatment above were grown and the number of albino and blue fluorescent seedlings was observed. The loss of wild-type markers was independent in these two cases since these factors were on different homologous chromosomes. The results are given in Table 1.

Table 1. Frequency of seedling mutants resulting from irradiated proembryos.

Total seeds	Phenotype of seedlings				Period after fertilization of 750 r treatment
	wd +	wd Bf_1	+ Bf_1	+ + gl**	
723	4	2	8	--	28 - 45 hours
(percent)	0.55	0.27	1.1		
596	--	--	1	1**	52 - 68 hours
(percent)			0.16	0.16	

*See McClintock (1941) Genetics 26: 234-282 and (1944) Genetics 29: 478-502.

**Sectored seedling, 1/2 glossy and 1/2 non-glossy.