## IV. REPORT ON MAIZE COOPERATIVE

Work of the past summer was concentrated primarily on stocks of Chromosomes 1, 7, 8, 9, and 10. Extensive intercrosses were made among various stocks for the purpose of deriving new multiple tester combinations. Many of these crosses will also be of value for further linkage studies, and would be particularly useful to those individuals responsible for mapping specific chromosomes. Numerous intercrosses of stocks of the remaining chromosomes (Chromosomes 2-6) were made in 1959. In many cases gene combinations not listed in the accompanying catalogue of stocks are available as segregating progenies.

Our stock collection includes about 150 chromosome rearrangements which are marked with closely-linked endosperm or seedling genes. Most of these were grown last summer to obtain fresh seed. In many cases alternatively-marked versions of individual translocations have been saved (e.g., both $\underline{Ws}\ \underline{gl_1}\ T_{7\text{-}9c}$ and $\underline{wx}\ \underline{Gl_1}\ T_{7\text{-}9c}$).

An additional extensive series of reciprocal translocations from E. G. Anderson's collection was grown at Urbana last summer. Dr. Anderson very generously devoted several weeks during the pollinating season to examining pollen and increasing seed supplies of this material. These stocks are now in excellent condition and have been added to the Maize Cooperative collection. Other large series of translocations from the Cal Tech collection are being grown by Dr. H. H. Kramer at Purdue University and by Dr. D. S. Robertson at Iowa State University to obtain new seed supplies. Dr. C. R. Burnham is increasing the inversion stocks.

Some 200 families segregating for untested, newly-acquired seedling traits were also grown. Most of these represented progenies from self-pollination of Canadian and northern U. S. varieties. Mutant segregants were crossed out to Corn Belt inbred lines and are being re-extracted in the current Florida generation. These will be allele-tested among themselves and with similar known traits. In the process of growing these progenies, a number of mature-plant traits have also been noted. Several hundred additional endosperm or seedling traits remain to be tested.

Dr. Johnie N. Jenkins, formerly at Purdue University, joined the staff of our Agronomy Department last June. He is assisting part-time with the work of the Maize Cooperative.

We again urge that you submit seed samples of any useful traits or gene combinations not yet represented in our collection. It is especially important that you do this whenever you cease active work with particular stocks in order that we may have seed of good viability for continued maintenance.

The following listing of Maize Cooperative stocks includes the more useful combinations now available. Seed requests should be sent to the Botany Department, University of Illinois, Urbana, Illinois.

Chromosome 1

$ad_1$ $an_1$ $bm_2$

$ad_1$ Kn

$an_1$ Kn $bm_2$

as

$br_1$ Vg

Hm

Kn

Kn $Ts_6$

$lw_1$

necrotic 8147-31

$p^{CR}$

$p^{CW}$

$p^{MO}$

$p^{RR}$ $ad_1$ $an_1$

$p^{RR}$ $ad_1$ $bm_2$

$p^{RR}$ $an_1$ $gs_1$ $bm_2$

$p^{RR}$ $br_1$ $f_1$ $an_1$ $gs_1$ $bm_2$

$p^{RR}$ $br_1$ $f_1$ $gs_1$ $bm_2$

$p^{VV}$

$p^{WR}$ $bm_2$

$p^{WR}$ $gs_1$ $bm_2$

$p^{WW}$ $br_1$ $f_1$ $bm_2$

$p^{WW}$ $br_1$ $f_1$ $an_1$ $gs_1$ $bm_2$

$p^{WW}$ hm $br_1$ $f_1$

Chromosome 1 (continued)

$sr_1$ $p^{WR}$ $an_1$ $bm_2$

$sr_1$ $p^{WR}$ $an_1$ $gs_1$ $bm_2$

$sr_1$ $zb_4$ $p^{WW}$

$ts_2$ $p^{WW}$ $br_1$ $bm_2$

$Ts_6$

$v_{19}$ $bm_2$

Vg

Vg $an_1$ $bm_2$

$vp_5$

$vp_8$

$zb_4$ $ms_{17}$ $p^{WW}$

$zb_4$ $p^{WW}$ $bm_2$

$zb_4$ $p^{WW}$ $br_1$

$zb_4$ $ts_2$ $p^{WW}$

Chromosome 2

al $lg_1$

al $lg_1$ $gl_2$ B sk

al $lg_1$ $gl_2$ b sk

$bs_2$

$fl_1$

$lg_1$ $gl_2$ B

$lg_1$ $gl_2$ b

$lg_1$ $gl_2$ b $fl_1$ $v_4$

Chromosome 2 (continued)

$lg_1$ $gl_2$ b $fl_1$ $v_4$ Ch

$lg_1$ $gl_2$ B $gs_2$

$lg_1$ $gl_2$ b $gs_2$ $v_4$

$lg_1$ $gl_2$ b $gs_2$ $v_4$ Ch

$lg_1$ $gl_2$ B sk $v_4$

$lg_1$ $gl_2$ b sk $v_4$

$lg_1$ $gl_2$ b sk $fl_1$ $v_4$

$lg_1$ $gl_2$ B $v_4$

$lg_1$ $gl_2$ b $v_4$

$lg_1$ $gl_2$ b $v_4$ Ch

$lg_1$ $gs_2$ b $v_4$

$ws_3$ $lg_1$ $gl_2$ B

$ws_3$ $lg_1$ $gl_2$ b

$ws_3$ $lg_1$ $gl_2$ b $fl_1$ $v_4$

$ws_3$ $lg_1$ $gl_2$ B sk

$ws_3$ $lg_1$ $gl_2$ b sk

Chromosome 3

$A_1$ $ga_7$; $A_2$ C R

$A_1$ $sh_2$; $A_2$ C R

$A^d$-31; $A_2$ C R

$A^d$-31 $sh_2$; A2 C R

$a^p$ et; $A_2$ C R $Dt_1$

$a_1$; $A_2$ C H B Pl $dt_1$

Chromosome 3 (continued)

$a_1$ et; $A_2$ C R $Dt_1$

$a_1$ $sh_2$; $A_2$ C R $Dt_1$

$a_1$ $sh_2$ et; $A_2$ C R $Dt_1$

$a_1^{st}$ $sh_2$; $A_2$ C R $Dt_1$

$a_1^{st}$ et; $A_2$ C R $Dt_1$

$a_{x-1}$; $A_2$ C R

$a_{x-3}$; $A_2$ C R

$a_{x-3}$ et; $A_2$ C R

$an_2$ = allele of $d_1$

$ba_1$

Cg

$cr_1$

$d_1$

$d_1$ Cg

$d_1$ $gl_6$

$d_1$ $gl_6$ $Lg_3$

$d_1$ $lg_2$

$d_1$ $Lg_3$

$d_1$ $Lg_3$ Rg

$d_1$ $pg_2$

$d_1$ Rg

$d_1$ rt

$d_1$ $ts_4$ $lg_2$

$d_1$ $ts_4$ $lg_2$ $a_1$; $A_2$ C R $Dt_1$

Chromosome 3 (continued)

$d_2$

$gl_6$

$gl_6$ $lg_2$ $a_1$ et; $A_2$ C R $Dt_1$

$gl_6$ $Lg_3$

$gl_6$ Rg

$gl_6$ $v_{17}$

$gl_6$ $v_{17}$ $lg_2$

$gl_7$

$lg_2$ $A_1^b$ et; $A_2$ C R $Dt_1$

$lg_2$ $a_1$ et; $A_2$ C R $Dt_1$

$lg_2$ $a_1$ $sh_2$ et; $A_2$ C R $Dt_1$

$lg_2$ $a_1^{st}$ et; $A_2$ C R $Dt_1$

$lg_2$ $a_1^{st}$ $sh_2$; $A_2$ C R $Dt_1$

$lg_2$ pm

$Lg_3$

$Lg_3$ Rg

$pg_2$

pm

$ra_2$

$ra_2$ $gl_6$ $lg_2$

$ra_2$ $lg_2$ pm

$ra_2$ Rg

$ra_2$ Rg $lg_2$

Rg

Chromosome 3 (continued)

rt; $A_1$ $A_2$ C R

$ts_4$ $na_1$

$v_{17}$

$vp_1$

Primary trisomic 3

Chromosome 4

$bm_3$

$bt_2$

$de_{(1 \text{ or } 16?)}$

$\underline{Ga_1\ Su_1}$
$ga_1$ $su_1$

$gl_3$

$j_2$

$j_2$ $gl_3$

la $su_1$ $gl_3$

la $su_1$ Tu $gl_3$

lo $Su_1$

lo $su_1$

$lw_4$; $lw_3$

$o_1$

$sp_1$ $su_1$

st

$su_1$ $bm_3$

Chromosome 4 (continued)

$su_1$ $gl_3$

$su_1$ $gl_4$

$su_1$ $j_2$ $gl_3$

$su_1$ $o_1$

$su_1$ $ra_3$

$su_1$ Tu

$su_1$ Tu $gl_3$

$su_1$ $zb_6$

$su_1$ $zb_6$ $gl_3$

$su_1$ $zb_6$ Tu

$su_1^{am}$

$Ts_5$

$Ts_5$ st

$Ts_5$ $su_1$

Tu $gl_3$

$v_8$

Chromosome 5

$a_2$; $A_1$ C R

$a_2$ $bm_1$ $bt_1$ $bv_1$ pr; $A_1$ C R

$a_2$ $bm_1$ pr $v_2$; $A_1$ C R

$a_2$ $bm_1$ pr $ys_1$; $A_1$ C R

$a_2$ $bt_1$ pr; $A_1$ C R

$a_2$ $bt_1$ pr $ys_1$; $A_1$ C R

Chromosome 5 (continued)

$a_2$ pr; $A_1$ C R

ae

$bm_1$ pr; $A_1$ $A_2$ C R

$bm_1$ pr $v_2$; $A_1$ $A_2$ C R

$bm_1$ pr $ys_1$; $A_1$ $A_2$ C R

$bm_1$ pr $ys_1$ $v_2$; $A_1$ $A_2$ C R

$bm_1$ $yg_1$

$bt_1$ pr; $A_1$ $A_2$ C R

$\frac{Ga\ Bt_1}{ga\ bt_1}$

$gl_5$

$gl_8$

$gl_{17}$ $a_2$ $bt_1$ $v_2$; $A_1$ C R

$gl_{17}$ $v_2$

intensifier of pr closely linked to $bt_1$

$lw_2$

$lw_3$; $lw_4$

$na_2$

$na_2$ pr

pr; $A_1$ $A_2$ C R

pr $ys_1$; $A_1$ $A_2$ C R

$sh^{fl}$ = "$sh_4$"

"$sh_3$" = allele of $bt_1$

tn

Chromosome 5 (continued)

$v_3$ pr; $A_1$ $A_2$ C R

$v_{12}$

$vp_2$ $gl_8$

$vp_2$ pr; $A_1$ $A_2$ C R

$vp_7$

$vp_7$ pr; $A_1$ $A_2$ C R

Chromosome 6

at = allele of $si_1$

po $Y_1$ pl

po $y_1$ pl

Pt

$si_1$ $Y_1$ Pl

$si_1$ $Y_1$ pl

$si_1$ $y_1$ pl

$y_1$ $l_{10}$

$Y_1$ $ms_{(1?)}$

$y_1$ $ms_{(1?)}$

$Y_1$ $pb_4$ pl

$y_1$ $pb_4$ Pl

$y_1$ $pb_4$ pl

$Y_1$ $pg_{11}$; wx $pg_{12}$

$y_1$ $pg_{11}$; wx $pg_{12}$

$y_1$ Pl Bh

Chromosome 6 (continued)

$y_1$ pl Bh

$Y_1$ Pl sm py; $A_1$ $A_2$ b $P^{RR}$

$Y_1$ pl $su_2$

$y_1$ pl $su_2$

$Y_1$ Pl; seg $w_1$

$Y_1$ pl; seg $w_1$

$y_1$ Pl; seg $w_1$

$y_1$ pl; seg $w_1$

"male sterile-silky" = allele of $si_1$

"orobanche" (seedling)

"ragged" (seedling)

"white 8522" (seedling)

"white 8896" (seedling)

Chromosome 7

bd

$Bn_1$

$g_2$

$gl_1$ ij bd

$gl_1$ sl $Bn_1$

Hs

ij

in; pr $A_1$ $A_2$ C R

$o_2$

Chromosome 7 (continued)

$o_2$ $gl_1$ sl

$o_2$ $gl_1$ sl $Bn_1$

$o_2$ $ra_1$ $gl_1$

$o_2$ $ra_1$ $gl_1$ ij

$o_2$ $ra_1$ $gl_1$ $Tp_1$

$o_2$ $v_5$ $gl_1$; seg $ra_1$

$o_2$ $v_5$ $ra_1$ $gl_1$

$o_2$ $v_5$ $ra_1$ $gl_1$ Hs

$o_2$ $v_5$ $ra_1$ $gl_1$ $Tp_1$

$ra_1$ $gl_1$

$Tp_1$

$v_5$ $gl_1$ $Tp_1$

$va_1$

$vp_9$ $gl_1$; wx

Chromosome 8

$v_{16}$ $j_1$

$v_{16}$ $ms_8$ $j_1$

$v_{16}$ $ms_8$ $j_1$; $l_1$

"necrotic 6697" (seedling)

"sienna 7748" (seedling)

Chromosome 9

$au_1$ $au_2$

Chromosome 9 (continued)

$Bf_1$

$bk_2$ $ms_{20}$

$bk_2$ Wc

$bm_4$

bp Wx; $P^{RR}$

C Ds wx

C $sh_1$ wx; $A_1$ $A_2$ R

c $sh_1$ wx; $A_1$ $A_2$ R

c $sh_1$ wx $gl_{15}$; $A_1$ $A_2$ R

C wx; $A_1$ $A_2$ R

c wx; $A_1$ $A_2$ R

c wx $bk_2$; $A_1$ $A_2$ R

$Dt_1$ (See Chromosome 3 stocks)

$gl_{15}$ $bm_4$

I Ds Wx

I wx; $A_1$ $A_2$ R Pr B pl

I wx; $A_1$ $A_2$ R pr B pl

$K^L9$ C $sh_1$ wx; $A_1$ $A_2$ R

$l_7$

$ms_2$

$ms_2$ $sh_1$; $A_1$ $A_2$ C R

$ms_{20}$

$sh_1$ wx $d_3$

$sh_1$ wx $l_7$

Chromosome 9 (continued)

$sh_1$ wx $pg_{12}$; y $pg_{11}$ pl

$sh_1$ wx $v_1$

wx ar

wx $Bf_1$

wx $bk_2$

wx $d_3$

wx $da_1$; $A_1$ $A_2$ C R

wx $g_4$

wx $l_6$

wx $pg_{12}$; Y $pg_{11}$ pl

wx $pg_{12}$; y $pg_{11}$

$wx^a$

$yg_2$ c $sh_1$ wx; $A_1$ $A_2$ R

$yg_2$ C $sh_1$ bz wx; $A_1$ $A_2$ R

Primary trisomic 9

Chromosome 10

$a_3$

$a_3$ $g_1$

$bf_2$

$du_1$

$g_1$

$g_1$ $l_2$

$g_1$ $r^g$; $A_1$ $A_2$ C

Chromosome 10 (continued)

$g_1$ $r^{ch}$

$g_1$ R $sr_2$

$g_1$ r $sr_2$

$gl_9$

$l_1$; $v_{16}$ $ms_8$ $j_1$

$l_1$; $w_1$

li $g_1$ R; $A_1$ $A_2$ C

li $g_1$ r; $A_1$ $A_2$ C

li $g_1$ r; $A_1$ $A_2$ C;
carries abnormal 10

$nl_1$ $g_1$ R; $A_1$ $A_2$ C

Og R; $A_1$ $A_2$ C B Pl

r abnormal 10

$R^g$ $sr_2$

$r^r$ $sr_2$

$R^r$:Boone; $A_1$ $A_2$ C

$R^{mb}$; $A_1$ $A_2$ C

$R^{nj}$; $A_1$ $A_2$ C

$R^{st}$; $A_1$ $A_2$ C

$v_{18}$

$w_2$

zn

"oil yellow" (seedling and plant)

Primary trisomic 10

## Unplaced genes

cl

ct

$de_{17}$

dv

dy

el

$fl_2$

$gl_{11}$

$gl_{12}$

$gl_{14}$

$gl_{16}$

$gl_g$

h

$l_3$

mn

$ms_5$

$ms_6$

$ms_7$

$ms_9$

$ms_{10}$

$ms_{11}$

$ms_{12}$

$ms_{13}$

$ms_{14}$

## Unplaced genes (continued)

Mt

New Starchy

rd

$Rs_1$

$rs_2$

"$sh_5$"

$tw_1$

$tw_2$

$v_{13}$

$va_2$

$vp_6$

wi

$ws_1$ $ws_2$

$zb_1$

$zb_2$

$zb_3$

## Multiple gene stocks

$A_1$ $A_2$ C $R^r$ Pr B Pl

$A_1$ $A_2$ C $R^g$ Pr B Pl

$A_1$ $A_2$ C $R^g$ Pr B pl $lg_1$ y

$A_1$ $A_2$ C R Pr

$A_1$ $A_2$ C R Pr wx

$A_1$ $A_2$ C R Pr wx $gl_1$

Multiple gene stocks (continued)

$A_1$ $A_2$ C R Pr wx y

$A_1$ $A_2$ C R pr

$A_1$ $A_2$ C R pr $su_1$

$A_1$ $A_2$ C R pr $su_1$ y wx

$A_1$ $A_2$ C R pr y $gl_1$

$A_1$ $A_2$ C R pr y wx

$A_1$ $A_2$ C R pr y wx $gl_1$

$A_1$ $A_2$ c R Pr $su_1$

$A_1$ $A_2$ c R Pr y wx

$A_1$ $A_2$ c R Pr y $sh_1$ wx

$A_1$ $A_2$ C r Pr $su_1$

$A_1$ $A_2$ C r Pr $su_1$ y $g_1$

$A_1$ $A_2$ C r Pr y wx

$A_1$ $A_2$ C r Pr y $sh_1$ wx

$bm_2$ $lg_1$ $a_1$ $su_1$ pr $y_1$ $gl_1$ $j_1$ wx $g_1$

colored scutellum

$lg_1$ $su_1$ $bm_2$ $y_1$ $gl_1$ $j_1$

$su_1$ $y_1$ wx $a_1$ $A_2$ C Rg pr

$y_1$ $su_1$ $ra_1$ $gl_1$

$y_1$ wx $gl_1$

Popcorns

Amber Pearl

Argentine

Black Beauty

Hulless

Ladyfinger

Ohio Yellow

Red

South American

Strawberry

Supergold

Tom Thumb

White Rice

Exotics and Varieties

Black Mexican Sweet Corn (with B chromosomes)

Black Mexican Sweet Corn (without B chromosomes)

Gourdseed

Maiz chapolote

Papago Flour Corn

Parker's Flint

Tama Flint

Zapaluta chica

## Chromosome rearrangements

The following rearrangements are being maintained primarily for use in determining the chromosome locations of new traits. All are marked with closely-linked endosperm or seedling traits.

The cytological positions of Inv 2a were determined by Dr. Morgan; those of Inv 9a were determined by Dr. Li. The indicated interchange points of the reciprocal translocations are taken from published work of Dr. Longley.

### Inversions

| | |
|---|---|
| $lg_1$ or $gl_2$ Inv 2a (also available with Ch) | 2S.7; 2L.8 |
| wx Inv 9a | 9S.7; 9L.9 |

### Reciprocal translocations

| | |
|---|---|
| wx 1-9c | 1S.48; 9L.22 |
| wx 1-9 4995 | 1L.19; 9S.20 |
| wx 2-9b | 2S.18; 9L.22 |
| wx 3-9c | 3L.09; 9L.12 |
| wx 3-9 5775 | 3L.09; 9S.24 |
| wx 4-9b | 4L.90; 9L.29 |
| wx 4-9 5657 | 4L.33; 9S.25 |
| wx 4-9g | 4S.27; 9L.27 |
| wx 5-9a | 5L.69; 9S.17 |
| wx 5-9c | 5S.07; 9L.10 |
| wx 5-9 4817 | 5L.06; 9S.07 |
| wx 5-9 5614 | 5L.09: 9L.06 |
| wx 6-9a | 6S.79: 9L.40 |
| wx, y 6-9b | 6L.10; 9S.37 |
| wx 6-9 4505 | 6L.13; 9 cent |
| wx 6-9 4778 | 6S.80; 9L.30 |

Reciprocal translocations (continued)

| | |
|---|---|
| wx 7-9a | 7L.63; 9S.07 |
| wx or $gl_1$ 7-9 4363 | 7 cent; 9 cent |
| wx 8-9d | 8L.09; 9S.16 |
| wx 8-9 6673 | 8L.35; 9S.31 |
| wx 9-10b | 9S.13; 10S.40 |
| $su_1$ 1-4a (also available with $P^{RR}$) | 1L.51; 4S.69 |
| $su_1$ 1-4d (also available with $P^{RR}$) | 1L.27; 4L.30 |
| $su_1$ 4-5j | 4L.21; 5L.36 |
| $su_1$, y 4-6a | 4L.37; 6L.43 |
| $su_1$ 4-8a | 4S.59; 8L.19 |
| $su_1$, R 4-10b | 4L.15; 10L.60 |
| y 1-6c (also available with $P^{RR}$) | 1S.25; 6L.27 |
| $gl_2$ 2-3c | 2S.46; 3S.52 |
| $gl_2$ 2-3 5304 | 2S.62; 3L.29 |
| $gl_2$ 2-6b | 2S.69; 6L.49 |
| $gl_2$, R 2-10b | 2S.50; 10L.75 |
| $gl_1$ 6-7 4545 | 6L.25; 7S.73 |

Stocks of A-B chromosome translocations

| | | |
|---|---|---|
| B-1a | 1L.2 | Proximal to Hm |
| B-1b | 1S.05 | |
| B-3a | 3L.1 | |
| B-4a | 4S.25 | Proximal to $su_1$ |
| B-7b | 7L.3 | Proximal to $ra_1$ |
| B-9a | 9L.5 | |
| B-9b | 9S.4 | Between C and wx; close to wx |
| B-10a | 10L.35 | Proximal to $g_1$ |

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