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 \textit{Wx} \textit{g1} \textit{T7-9c} and \textit{Wx} \textit{g1} \textit{T7-9c}).

An additional extensive series of reciprocal translocations from E. K. 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

\[ a_d \ a_{1} \ b_{m_2} \]
\[ a_d \ K_n \]
\[ a_n \ K_n \ b_{m_2} \]
\[ a_s \]
\[ b_{r_1} \ V_g \]
\[ H_m \]
\[ K_n \]
\[ K_n \ T_{a_6} \]
\[ l_w_1 \]
\[ necrotic \ S_{ll_{47-31}} \]
\[ p_{CR} \]
\[ p_{CW} \]
\[ p_{MO} \]
\[ P_{RR} \ a_d \ a_{1} \ a_{n_1} \]
\[ P_{RR} \ a_d \ b_{m_2} \]
\[ P_{RR} \ a_n \ g_{s_1} \ b_{m_2} \]
\[ P_{RR} \ b_{r_1} \ f_1 \ a_n \ g_{s_1} \ b_{m_2} \]
\[ P_{VV} \]
\[ P_{WR} \ b_{m_2} \]
\[ P_{WR} \ g_{s_1} \ b_{m_2} \]
\[ P_{WW} \ b_{r_1} \ f_1 \ b_{m_2} \]
\[ P_{WW} \ b_{r_1} \ f_1 \ a_n \ g_{s_1} \ b_{m_2} \]
\[ P_{WW} \ m_{m} \ b_{r_1} \ f_1 \]

Chromosome 1 (continued)

\[ s_r \ p_{WR} \ a_n \ b_{m_2} \]
\[ s_r \ p_{WR} \ a_n \ g_{s_1} \ b_{m_2} \]
\[ s_r \ b_{z_{b_4}} \ P_{WW} \]
\[ t_{s_2} \ P_{WW} \ b_{r_1} \ b_{m_2} \]
\[ T_{s_6} \]
\[ v_{19} \ b_{m_2} \]
\[ V_g \]
\[ V_g \ a_{n_1} \ b_{m_2} \]
\[ V_{p_5} \]
\[ V_{p_6} \]
\[ z_{b_4} \ m_{s_{17}} \ P_{WW} \]
\[ z_{b_4} \ P_{WW} \ b_{m_2} \]
\[ z_{b_4} \ P_{WW} \ b_{r_1} \]
\[ z_{b_4} \ t_{s_2} \ P_{WW} \]

Chromosome 2

\[ a_{l} \ l_{g_1} \]
\[ a_{l} \ l_{g_1} \ g_{l_2} \ B \ sk \]
\[ a_{l} \ l_{g_1} \ g_{l_2} \ b \ sk \]
\[ b_{a_2} \]
\[ f_{l_1} \]
\[ l_{g_1} \ g_{l_2} \ B \]
\[ l_{g_1} \ g_{l_2} \ b \]
\[ l_{g_1} \ g_{l_2} \ b \ f_{l_1} \ v_{4} \]
Chromosome 2 (continued)

\[ lg_1 \text{ gl}_2 \ b \ f_{11} \ v_4 \ \text{Ch} \]
\[ lg_1 \text{ gl}_2 \ B \ gs_2 \]
\[ lg_1 \text{ gl}_2 \ b \ gs_2 \ v_4 \]
\[ lg_1 \text{ gl}_2 \ b \ gs_2 \ v_4 \ \text{Ch} \]
\[ lg_1 \text{ gl}_2 \ B \ sk \ v_4 \]
\[ lg_1 \text{ gl}_2 \ b \ sk \ v_4 \]
\[ lg_1 \text{ gl}_2 \ b \ sk \ f_{11} \ v_4 \]
\[ lg_1 \text{ gl}_2 \ B \ v_4 \]
\[ lg_1 \text{ gl}_2 \ b \ v_4 \]
\[ lg_1 \text{ gl}_2 \ b \ v_4 \ \text{Ch} \]
\[ lg_1 \text{ gs}_2 \ b \ v_4 \]
\[ ws_3 \text{ lg}_1 \text{ gl}_2 \ B \]
\[ ws_3 \text{ lg}_1 \text{ gl}_2 \ b \]
\[ ws_3 \text{ lg}_1 \text{ gl}_2 \ b \ f_{11} \ v_4 \]
\[ ws_3 \text{ lg}_1 \text{ gl}_2 \ B \ sk \]
\[ ws_3 \text{ lg}_1 \text{ gl}_2 \ b \ sk \]

Chromosome 3 (continued)

\[ a_1 \text{ et}; \ A_2 \ C \ R \ D_{t1} \]
\[ a_1 \text{ sh}_2; \ A_2 \ C \ R \ D_{t1} \]
\[ a_1 \text{ sh}_2 \ et; \ A_2 \ C \ R \ D_{t1} \]
\[ a_1 \text{ st} \ sh_2; \ A_2 \ C \ R \ D_{t1} \]
\[ a_1 \text{ st} \ et; \ A_2 \ C \ R \ D_{t1} \]
\[ a_{x-1}; \ A_2 \ C \ R \]
\[ a_{x-3}; \ A_2 \ C \ R \]
\[ a_{x-3} \ et; \ A_2 \ C \ R \]
\[ a_{n2} = \text{allele of } d_1 \]
\[ b_{s1} \]
\[ Cg \]
\[ cr_1 \]
\[ d_1 \]
\[ d_1 \ Cg \]
\[ d_1 \text{ gl}_6 \]
\[ d_1 \text{ gl}_6 \text{ Ig}_3 \]
\[ d_1 \text{ Ig}_2 \]
\[ d_1 \text{ Ig}_3 \]
\[ d_1 \text{ Ig}_3 \text{ Rg} \]
\[ d_1 \text{ pg}_2 \]
\[ d_1 \text{ Rg} \]
\[ d_1 \text{ rt} \]
\[ d_1 \text{ ts}_4 \text{ Ig}_2 \]
\[ d_1 \text{ ts}_4 \text{ Ig}_2 \ a_1; \ A_2 \ C \ R \ D_{t1} \]
Chromosome 3 (continued)

d_2

g_{16}
g_{16} lg_2 a_1 et; A_2 C R Dt_1
g_{16} lg_3

g_{16} Rg

g_{16} v_{17}
g_{16} v_{17} lg_2

g_{17}

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 g_{16} 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

te_4 na_1

v_{17}

vp_1

Primary trisomic 3

Chromosome 4

bm_3

bt_2

de (1 or 16?)

Ga_1 Su_1

ga_1 su_1

g_{13}

j_2

j_2 g_{13}

l_1 su_1 g_{13}

l_1 su_1 Tu g_{13}

l_0 Su_1

l_0 su_1

l_w_4; l_w_3

o_1

sp_1 su_1

st

su_1 bm_3
Chromosome 4 (continued)

- su
- gl
- jb
- a
- ra
- Tu
- Tu
- gl
- zb
- zb
- zb
- Tu
- am
- Ts
- Ts
- Ts
- Ts
- Tu
- gl
- v

Chromosome 5 (continued)

- a
- pr
- A
- C
- R
- bm
- pr
- A
- C
- R
- pr
- v
- A
- C
- R
- pr
- su
- a
- C
- R
- bt
- pr
- A
- C
- R
- bt
- pr
- A
- C
- R
- ga
- bt
- ga
- bt
- gl
- gl
- gl
- 17
- a
- bt
- v
- A
- C
- R
- gl
- 17
- v
- intensifier of pr
- closely linked to bt
- lw
- lw
- na
- na
- pr
- pr
- A
- C
- R
- pr
- ys
- A
- C
- R
- sh
- = "sh"
- "sh"
- = allele of bt
- tn
Chromosome 5 (continued)

\n\v_3\ pr; A_1 A_2 C R
\v_12 
\v_p 2 gl_8 
\v_p 2 pr; A_1 A_2 C R 
\v_p 7 
\v_p 7 pr; A_1 A_2 C R 

Chromosome 6

at = allele of \( s_{1} \)
po \( y_1 \) pl
po \( y_1 \) pl
Pt
\( s_{1} \) \( y_1 \) pl
\( s_{1} \) \( y_1 \) pl
\( y_1 \) 1 10 
\( y_1 \) ms(1?)
\( y_1 \) ms(2?)
\( y_1 \) pb_4 pl
\( y_1 \) pb_4 pl
\( y_1 \) pb_4 pl
\( y_1 \) PG11; \( wx \) PG12
\( y_1 \) PG11; \( wx \) PG12
\( y_1 \) pl Bh

Chromosome 6 (continued)

\( y_1 \) pl Bh
\( y_1 \) pl su_2
\( y_1 \) pl su_2
\( y_1 \) pl; seg \( w_1 \)
\( y_1 \) pl; seg \( w_1 \)
\( y_1 \) pl; seg \( w_1 \)
"male sterile-silky" = allele of \( s_{1} \)
"crobonanche" (seedling)
"ragged" (seedling)
"white 8522" (seedling)
"white 8896" (seedling)

Chromosome 7

bd
\( Bn_1 \)
\( e_2 \)
\( gl_1 \) ij bd
\( gl_1 \) sl \( Bn_1 \)
\( Hs \)
ij
in; pr \( A_1 A_2 C R \)
\( o_2 \)
<table>
<thead>
<tr>
<th>Chromosome 7 (continued)</th>
<th>Chromosome 9 (continued)</th>
</tr>
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<tbody>
<tr>
<td>o₂ g₁₁ sl</td>
<td>Bf₁</td>
</tr>
<tr>
<td>o₂ g₁₁ sl Bn₁</td>
<td>bk₂ ms₂₀</td>
</tr>
<tr>
<td>o₂ ra₁ g₁₁</td>
<td>bk₂ Wc</td>
</tr>
<tr>
<td>o₂ ra₁ g₁₁ i₁</td>
<td>bm₄</td>
</tr>
<tr>
<td>o₂ ra₁ g₁₁ Tp₁</td>
<td>bp wx; P °RR</td>
</tr>
<tr>
<td>o₂ v₅ g₁₁; seg ra₁</td>
<td>C Ds wx</td>
</tr>
<tr>
<td>o₂ v₅ ra₁ g₁₁</td>
<td>C sh₁ wx; A₁ A₂ R</td>
</tr>
<tr>
<td>o₂ v₅ ra₁ g₁₁ Hs</td>
<td>c sh₁ wx; A₁ A₂ R</td>
</tr>
<tr>
<td>o₂ v₅ ra₁ g₁₁ Tp₁</td>
<td>c sh₁ wx g₁₁₅; A₁ A₂ R</td>
</tr>
<tr>
<td>ra₁ g₁₁ Tp₁</td>
<td>C wx; A₁ A₂ R</td>
</tr>
<tr>
<td>v₅ g₁₁ Tp₁</td>
<td>c wx; A₁ A₂ R</td>
</tr>
<tr>
<td>va₁</td>
<td>c wx bk₂; A₁ A₂ R</td>
</tr>
<tr>
<td>v₉₁ g₁₁; wx</td>
<td>Dt₁ (See Chromosome 3 stocks)</td>
</tr>
<tr>
<td></td>
<td>gl₁₁₅ bm₄</td>
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<tr>
<td></td>
<td>I Ds wx</td>
</tr>
<tr>
<td></td>
<td>I wx; A₁ A₂ R Pr B pl</td>
</tr>
<tr>
<td></td>
<td>I wx; A₁ A₂ R pr B pl</td>
</tr>
<tr>
<td></td>
<td>X₉₁ g sh₁ wx; A₁ A₂ R</td>
</tr>
<tr>
<td></td>
<td>l₇</td>
</tr>
<tr>
<td></td>
<td>ms₂</td>
</tr>
<tr>
<td></td>
<td>ms₂ sh₁; A₁ A₂ C R</td>
</tr>
<tr>
<td></td>
<td>ms₂₀</td>
</tr>
<tr>
<td></td>
<td>sh₁ wx d₃</td>
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<tr>
<td></td>
<td>sh₁ wx l₇</td>
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<table>
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<tbody>
<tr>
<td>v₁₆ j₁</td>
</tr>
<tr>
<td>v₁₆ ms₁ j₁</td>
</tr>
<tr>
<td>v₁₆ ms₁ j₁ ; l₁</td>
</tr>
<tr>
<td>&quot;necrotic 6697&quot; (seedling)</td>
</tr>
<tr>
<td>&quot;sienna 7748&quot; (seedling)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chromosome 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>au₁ au₂</td>
</tr>
</tbody>
</table>
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 e_4
wx l_6
wx pg_12; y pg_11 pl
wx pg_12; y pg_11
wx^a

ye_2 c sh_1 wx; A_1 A_2 R
ye_2 C sh_1 bz wx; A_1 A_2 R

Primary trisomic 9

Chromosome 10 (continued)

e_1 rch

e_1 R sr_2

e_1 r sr_2

e_1 gl

l_1; v_16 ms_8 j_1

l_1; w_1

li g_1 R; A_1 A_2 C

li e_1 r; A_1 A_2 C

li e_1 r; A_1 A_2 C; cafries abnormal 10

nl_1 g_1 R; A_1 A_2 C

g_1 R; A_1 A_2 C B Pl

r abnormal 10

R^e sr_2

r^r sr_2

R^x: Boone; A_1 A_2 C

R^m; A_1 A_2 C

R^n; 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

c1
ct
de_{17}
dv
dy
el
f_{12}
g_{11}
g_{12}
g_{14}
g_{16}
g_{16}
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}
v_{a2}
vp_{6}
wi
ws_{1} ws_{2}
zb_{1}
zb_{2}
zb_{3}

Multiple gene stocks

A_{1} A_{2} C R^{F} Pr B Fl
A_{1} A_{2} C R^{S} Pr B Fl
A_{1} A_{2} C R^{F} 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 g_{1}

Multiple gene stocks (continued)

\[ A_1 A_2 C R Pr \, wx \, y \]
\[ A_1 A_2 C R pr \]
\[ A_1 A_2 C R pr \, su_1 \]
\[ A_1 A_2 C R pr \, su_1 wy \]
\[ A_1 A_2 C R pr y \, gl_1 \]
\[ A_1 A_2 C R pr y \, wx \]
\[ A_1 A_2 C R pr y \, wx \, gl_1 \]
\[ A_1 A_2 c R Pr \, su_1 \]
\[ A_1 A_2 c R Pr y \, wx \]
\[ A_1 A_2 c R Pr y \, sh_1 \, wx \]
\[ A_1 A_2 c R \, pr \, su_1 \]
\[ A_1 A_2 c R \, pr \, su_1 y \, gl_1 \]
\[ A_1 A_2 c R \, pr y \, wx \]
\[ A_1 A_2 c R \, pr y \, sh_1 \, wx \]
\[ \text{colored soutellum} \]
\[ \text{colored soutellum} \]
\[ \text{colored soutellum} \]
\[ \text{colored soutellum} \]
\[ \text{colored soutellum} \]

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 chapalote
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**

1g₁ or gl₂ 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 l4995 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 l4817 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 l4505 6L.13; 9 cont
wx 6-9 l778 6S.80; 9L.30
Reciprocal translocations (continued)

wx 7-9a 7L.63; 9S.07
wx or gl1 7-9 h363 7 cent; 9 cent
wx 8-9d 8L.09; 9S.16
wx 3-9 6673 8L.35; 9S.31
wx 9-10b 9S.13; 10S.40
su1 1-4a (also available with pRR) 1L.51; 4S.69
su1 1-4d (also available with pRR) 1L.27; 4L.30
su1 h-5j 4L.21; 5L.36
su1, y h-6a 4L.37; 6L.13
su1 h-8a 4S.59; 8S.19
su1, R h-10b 4L.15; 10L.60
y 1-6c (also available with pRR) 1S.25; 6L.27
g12 2-3c 2S.46; 3S.52
g12 2-3 5304 2S.62; 3L.29
g12 2-6b 2S.69; 6L.49
g12, R 2-10b 2S.50; 10L.75
g11 6-7 4545 6L.25; 7S.73

Stocks of A-B chromosome translocations

<table>
<thead>
<tr>
<th>B-1a</th>
<th>1L.2</th>
<th>Proximal to Hm</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-1b</td>
<td>1S.05</td>
<td></td>
</tr>
<tr>
<td>B-3a</td>
<td>3L.1</td>
<td></td>
</tr>
<tr>
<td>B-4a</td>
<td>4S.25</td>
<td>Proximal to su1</td>
</tr>
<tr>
<td>B-7b</td>
<td>7L.3</td>
<td>Proximal to ra1</td>
</tr>
<tr>
<td>B-9a</td>
<td>9L.5</td>
<td></td>
</tr>
<tr>
<td>B-9b</td>
<td>9S.4</td>
<td>Between C and wx; close to wx</td>
</tr>
<tr>
<td>B-10a</td>
<td>10L.35</td>
<td>Proximal to g1</td>
</tr>
</tbody>
</table>

Earl B. Patterson