MAIZE GENETICS COOPERATION

NEWS LETTER

11

March 23, 1937

Department of Plant Breeding
Cornell University
Ithaca, N. Y.

MAIZE GENETICS COÖPERATION
DEPARTMENT OF PLANT BREEDING
CORNELL UNIVERSITY
ITHACA, NEW YORK

November 21, 1936

To Maize Geneticists :-

Contributions of material for the Maize Genetics Cooperation letter are hereby requested. These should include anything that you think will be of value to other maize geneticists. The deadline is January 15.

Seed stocks of many of the genes reported have never been sent to the Co-op to be kept on file for use by other cooperators. This winter a special effort will be made to bring this collection up to date. Your prompt cooperation will be very much appreciated.

Sincerely yours,

D. G. Langham

Derald Langham
Secretary

Vol. 11

MAIZE GENETICS COÖPERATION
DEPARTMENT OF PLANT BREEDING
CORNELL UNIVERSITY
ITHACA, NEW YORK

March 23, 1937

To Maize Geneticists:-

The information in this letter was contributed by a number of individuals, and has been organized into the following divisions:

I. General news items.
II. Collective publication of linkages.
III. Seed stocks grown in 1936.
IV. Seed stocks received for propagation in 1937.
V. List of genes not in Co-op.
VI. Tests of inbred strains for disease resistance.

Most of these reports are given almost verbatim but are not put in quotation marks because in numerous instances they have been somewhat condensed.

I. General News Items

Maize Genetics Cooperation, Ithaca, N. Y. -

1. Backcross data show that Hadjinov's barren stalk (ba_x) is allelomorphic to ba_2.

2. Seed received from L. C. Raymond, Quebec, labelled "Sweet Brittle", produced plants with brittle stalks and leaves. These plants differed from brittle stalk (bk_1. Wiggans, unpub.) in that they were normal size, and greenhouse tests show that "Sweet Brittle" and bk_1 are not alleles.

3. Backcross data show that Hadjinov's branched silkless (bd_x) is allelomorphic to Kempton's bd_1 (chrom. 7).

D. G. Langham

Cornell University, Ithaca, N. Y. -

1. Data sent by Anderson, with supplementary data of mine, show that sr (chrom. 1) is to the left of P, rather than between P and br as previously announced, and suggest that ts_2 is to the right of P. The following table includes the available data from three-point backcrosses:

F_1 genotype	0	1	2	1,2	Total	Author
P + br / + Tl-5b +	242	71 15.8%	108 24.1%	28 6.2%	449	Anderson
P + br / + Tl-5c +	195	60 18.1%	58 17.5%	19 5.7%	332	Anderson
+ + Tl-5b / sr P +	178	89 23.7%	88 23.5%	20 5.3%	375	Anderson

F_1 genotype	0	1	2	1,2	Total	Author
+ + T1-5c / sr P +	116	64 27.9%	36 15.7%	14 6.1%	230	Anderson
+ + T1-9a / sr P +	80 50 130	21 17 38 16.7%	39 14 53 23.2%	6 1 7 3.1%	228	Anderson Emerson
+ + T1-9c / sr P +	97	24 18.6%	5 3.9%	3 2.3%	129	Emerson
P ts_2 + / + + T1-9c	97	1 0.9%	18 15.5%	0	116	Emerson
P + T1-10b / + ts_2 +	232	3	41	0	276	Emerson
P ts_2 + / + + T1-10b	169 401	2 5 1.1%	29 70 14.7%	0 0	200 476	Emerson

There is some question about the locus of what is here designated T1-10b. If it is between P and br as previously announced, then ts_2 must be to the right of P. It is certain that sr is to the left of P, thus adding about 25 units to the length of the known linkage map of chrom. 1 and making it now approximately 150 units.

R. A. Emerson

2. Piebald (pb_x), found in Emerson's cultures, seedlings and plants with large, indefinite patches of white and yellow. Classification good, viability fair. Chrom. 6. Linkage data from F_2 crosses:

Genes	Phase	XY	Xy	xY	xy	Total	% recomb.
Y_1 Pb_x	CS	402	50	40	122	614	15.5
Pl Pb_x	CS	239	14	29	34	316	16.5

These data indicate that pb_x is located between Y_1 and Pl in chrom. 6.

G. A. Lebedeff

3. I have just returned from Canal Point, Florida, where two weeks were spent in the examination of corn sporocyte material. A brief statement about the winter planting of corn in Florida, arranged for and supervised by Dr. Jenkins, may be of some general interest. It was an unusually warm winter down there. Corn planted at Canal Point from October 25 to 28 began shedding pollen in late December and Mr. Garrison had finished making most of the crosses in this material by January 20, some 2 or 3 weeks ahead of last year. A later planting on November 24 was beginning to reach the sporocyte stage January 10, and an abundant supply of sporocyte material equal in quality to that obtained during the summer here at Ithaca was

available during the following two weeks. Tassels were beginning to show in this planting on January 25.

The location at Canal Point is well-protected from frosts, the soil is well-adapted to corn, and corn smut which often does so much damage, especially to plants from which sporocyte samples are taken, seems to be entirely absent from that region. Birds, the ear worm, sugar cane borer, and other pests caused considerable damage this year, but it looked to me as if it should be possible to get at least a reasonably good winter crop down there most every year. A stunted condition possibly due to a length of day effect was noted in some lines, but other lines looked about as good down there as they do at home here in the north.

4. Studies on induced polyploidy and other genetic effects induced by heat treatments were continued during the past year. My stocks of tetraploid corn looked much better last year than ever before in spite of the generally unfavorable weather conditions; good vigor, and a very sturdy growth habit characterized a number of lines which were also highly fertile and in other respects looked very promising. Tetraploidy was induced in both the Durango and Florida types of annual teosinte. These experimentally induced tetraploids were entirely annual with no trace of the perennial habit which characterizes the tetraploid Euchlaena perennis from Mexico. One octoploid was also obtained and it wasn't perennial either, but was dwarfed and sterile like the corn octoploids.

5. Chemical analyses of the carotinoid content of tetraploid corn are under way in cooperation with Professor D. B. Hand, a biochemist, with a growing interest in the chemical basis of heredity. Preliminary results indicate that the meal from the tetraploid yellows has appreciably more of the active provitamin A carotinoids, cryptoxanthin and beta carotin, than the comparable diploid yellows. The diploid yellows differ widely in the amount of carotinoids present in the meal, and from some "non-yellows" yellow pigment has been extracted. With what we now know about the genetics of yellow endosperm from Perry and Sprague's recent paper and from the earlier work, and with the method which Professor Hand has perfected for separating chemically the various yellow pigments in corn meal, it should be possible to find out something about the chemistry of gene action.

6. Some progress was made last summer in the improvement of my multiple tester stocks with markers in each of the ten linkage groups. Stocks similar to those tested last year with one or more genes added are available for distribution in limited amounts.

L. F. Randolph

Connecticut Agricultural Experiment Sta., New Haven, Conn. -

1. The character previously listed as threaded (th) has been found to be allelomorphic to striate (sr). An F_2 population segregating for f_1, bm_2, and sr gave a recombination per cent of 25 for bm_2 and sr, 25.5 for sr and ts_2. The recombination percentage for sr and f_1 was 59, or no linkage. This seems puzzling since ts_2 and bm_2 are 128 units apart. However, the population was small consisting of but 59 plants.

2. Trisomic stocks with chrom. 4 as the extra chrom. are available.

3. Unreported linkage of $\underline{o_2}$ and $\underline{ra_1}$, and $\underline{gl_1}$ and $\underline{ij}$:

Genes	Phase	XY	Xy	xY	xy	Total	No.	%
O_2 Ra_1	RB	116	597	554	109	1376	225	16
O_2 Ra_1	CB	127	15	15	112	269	30	11
O_2 Gl_1	RS	3148	1595	1487	64	6294		20
O_2 Ij	RS	405	169	184	30	688		37
O_2 V_5	RS	758	353	328	13	1452		20*

* These plants were grown in a warm greenhouse and hence the classification for $\underline{v_5}$ was difficult. All questionable plants were classified as $\underline{v_5}$. This per cent is probably not reliable.

4. A three-point test involving $\underline{o_2}$, $\underline{gl_1}$, and $\underline{ij}$ gave the following counts:

F_1 genotype	0	1	2	1,2	Total
$\frac{o_2\ +\ +}{+\ gl_1\ ij}$	467 513	115 150	94 123	28 23	1513
	980	265	217	51	
		17.5%	14.3%	3.4%	

The recombination percentages of $\underline{o_2}$ and $\underline{ra_1}$ (repulsion phase), also $\underline{o_2}$ and $\underline{gl_1}$ indicate that $\underline{o_2}$ is to the left of $\underline{v_5}$ and within 2 or 3 units of $\underline{v_5}$. The percentages between $\underline{o_2}$ and $\underline{ij}$ indicate that $\underline{o_2}$ is 2 or 3 units to the right of $\underline{v_5}$.

Stock of $\underline{o_2}$ is available.

5. By wrapping developing ears of the composition of A B pl with different colored cellophane we found that the sun-red color will not develop when all but red light is excluded, Science 27, Vol. 84, No. 2187, pages 488 and 489. More selective filters have been obtained and we will try to locate definitely in 1937 the wave lengths of light responsible for the production of the sun-red pigment.

W. R. Singleton

6. Paired mosaics (twin spots) have been found to involve C, C^I, Pr, P, Wx and some unknown aleurone color modifiers. Wx twin spots are very faint and show only in certain material with light iodine staining. The evidence indicates that some unpaired spots start as paired mosaics but one or the other altered cell is non-viable or fails to produce tissue that reaches the surface. Unpaired c mosaic areas are usually larger and more numerous than twin spots involving the same gene in the same seeds. Many of these unpaired spots probably do not start as twin spots.

In C Wx heterozygous seeds both genes go together in about 60% of both twin spots and single spots and C alone in about 40%. A shift of Wx without C has not been observed. The dark part of a C Wx twin spot may also show a further change to colorless, normal or still darker cells. In some cases these are twin spots within twin spots. Wx may shift with C the first time and not the second, or neither or both times.

Obviously these results can not all be accounted for by mutation, non-disjunction or deletion. Some kind of interchange between homologous or non-homologous chromosomes is indicated. Proof of an exchange between the C and Pr chromosomes is at hand in white and red paired mosaics in heterozygous C Pr seeds. Such mosaics are rare. Chromosomal aberration does not seem to be adequate to account for the frequent twin spots in which the two parts are equal in size and outline and crossing-over, between homologous chromosomes as shown by Stern for Drosophila (GENETICS 21:625-730) seems probable.

Proof of somatic crossing-over in plants will have to await further evidence. It may be found in 2N tissue where dominant linked genes are contributed from each parent. The 3N endosperm mosaics are not satisfactory for this purpose.

Translocation stocks having either Su or Pr with C and Wx are desired. Seed will be appreciated if such stocks are available.

Aleurone and endosperm mosaics vary in frequency in different families from none in a thousand seeds to thousands of mosaics on a single seed. They are easily seen with a low power binocular microscope. A Bausch and Lomb BKT5 microscope with a revolving drum and .7, 1 and 2x objectives and 10x eyepieces has been found convenient. The light is also important. In addition to the well-known plain spots and the twin spots that are frequent in some families, large cells, giant cells, depressions and outgrowths are easily seen. The growth changes may accompany color and other known gene changes and clearly result from somatic segregation. Depressions and outgrowths are sometimes paired, alone or with color changes. Somatic segregation has an important bearing on the cancer problem and any evidence should be put on record.

D. F. Jones

California Institute of Technology, Pasadena, Calif. -

1. Chromosome 1. Striate (sr) seems to be definitely to the left of P, making the order sr-P-br-bm_2. One interchange seems to be about 2 units still further to the left.

2. Chromosome 2. Backcrosses involving Ch and a long inversion in chrom. 2 gave 136 recombinations out of a total of 447, or a recombination percentage of 30.4.

3. Chromosome 3. Three interchanges show close linkage with d_1. The data are:

	% recombination with d_1	Number of backcross plants
T1-3d	0	109
T2-3c	0.8	608
T3-7b	0.4	462

4. Chromosome 4. Most interchanges show little crossing-over with su_1. Of those tested the following are furthest away:

	% recombination			Number of B.C. plants
T1-4a	0	with	Ts_5	359
T4-6b	1.5	"	"	320
T2-4d	0.2	"	Tu	500
Beyond gl_3				
T2-4b	16.7	"	"	215
T2-4b	15.0	"	gl_3	79
T4-9b	22.0	"	"	556

5. Chromosome 8.

T8-10a	25.0	"	j_1
T8-10b	40.0	"	"

	Order	Distance from ms_8	Number of Ms_8 plants in B.C.
3-8a	$T-ms_8-j_1$	7	139
3-8b	"	33	182
4-8	"	34	114
5-8	(uncertain)	0.4	276
6-8	$T-ms_8-j_1$	5	115
8-9b	"	27	95
8-10c	"	27	71

(Distance between ms_8 and j_1 about 10 units in all these tests;------data varies from 8.1 to 10.9).

E. G. Anderson

Iowa State College, Ames, Iowa -

1. Chromosome 1.

Genes	Phase	XY	Xy	xY	xy	Total	No.	%
Ts_6 Gs_1	CB	128	37	46	113	324	83	25.6

2. Chromosome 10.

Genes	Phase	XY	Xy	xY	xy	Total	No.	%
Og R	RB	55	193	178	62	488	117	24.0

F_1 genotype	0	1	2	1,2	Total
Og + + / + li g_1	266 225 491	31 33 64 10.3%	21 34 55 8.9%	2 6 8 1.3%	618
Og + r / + g_1 +	68 77 145	17 25 42 18.3%	10 21 31 13.5%	5 7 12 5.2%	230

3. Chromosome 4. Order of three linked genes is established by F_2 data of small magnitude as: $la-su_1-w_4$.

E. W. Lindstrom

4. Further studies with plants hyperploid for the short arm of chrom. 5 show that secondary trisomes, involving the fragment chrom.,

are found in the progeny of hyperploid individuals. The breeding behavior of the fragment of hyperploid plants is as follows:

Type of offspring in %	Fragment plant as female	Fragment plant as male
2N	70.0%	98.9%
2N + fragment	29.7%	0.6%
Secondary trisomes	0.3%	0.5%

The above data show that the fragment chrom. is readily transmissable through the female side but only rarely do male gametophytes hyperploid for the fragment chrom. function. The frequency of secondaries, however, through the male side is as great, at least, as through the female side. Pollen from secondary trisomes gave only disomic offspring in the limited backcross tests made which indicates that pollen hyperplid for the "secondary" chrom. can not successfully compete with haploid grains. Among the questions to be answered are (1) How do the secondaries arise and (2) How do those male gametophytes from fragment plants which bring in the "secondary" chrom. manage to successfully compete with haploid pollen when pollen hyperploid for the fragment chrom. is rarely successful.

5. Hayes recently reported a new virescent linked with $\underline{j_1}$ and therefore belonging in chrom. 8. This virescent was designated $\underline{v_{21}}$. Trisomic tests showed that $\underline{v_{16}}$ was in chrom. 8. Crosses made between $\underline{v_{16}}$ and $\underline{v_{21}}$ show them to be allelic.

6. $\underline{v_{10}}$ is linked with an endosperm color gene with 43% recombination as shown by the following data:

XY	Xy	xY	xy	Total	% recomb.
816	241	226	108	1391	43

Tests are in progress to see whether $\underline{v_{10}}$ is in chrom. 2 or 6.

7. A new viable pale green is in chrom. 9 on the basis of trisomic tests.

8. F_2 linkage data places $\underline{ws_3}$ ten units to the left of $\underline{lg_1}$. The locus of $\underline{lg_1}$ has been shown by McClintock to be near the end of the short arm of chrom. 2, so $\underline{ws_3}$ must occupy a nearly terminal position in this arm.

9. A second occurrence of a chrom. fragment consisting of the short arm of chrom. 5 was found among the progeny of a disomic plant. This fragment is apparently identical with the one mentioned in item 4.

10. A new annual form of teosinte, resembling the Durango variety, was crossed by sh-wx maize. Five F_1 plants had approximately normal amounts of crossing-over in the sh-wx region while one F_1 plant showed no recombinations in this interval. The F_1 ears had 8-10 rows of seeds as contrasted with the usual 4-rowed ears found for F_1 hybrids of the other annual forms of Euchlaena. No segregation into types occurred when selfed and sibbed seed of the pure Euchlaena was grown. No admixture with maize was evident as the tassels had no main spikelet.

11. Small pollen ($\underline{sp_2}$) and $\underline{l_g}$ are probably between g_1 and $\underline{li}$ with the order $li-sp_2-l_g-g_1-R$. Plants trisomic for chrom 10. and having the constitution $\underline{Sp_2}$ $\underline{Sp_2}$ $\underline{sp_2}$ had about 20% small pollen ($\underline{sp_2}$) and about 80% normal pollen. This indicates that n+1 pollen of $\underline{Sp_2}$ $\underline{sp_2}$ constitution is of normal size and that $\underline{sp_2}$ is recessive to $\underline{Sp_2}$ in such gametophytes.

12. More data have been obtained on the dosage relation of $\underline{Dt}$ and $\underline{a_1}$. Three levels of dosage for $\underline{a_1}$ show a linear effect while increasing the dosage of the $\underline{Dt}$ gene, as shown by three dosage levels, results in a non-linear effect. The genes $\underline{Dt}$ and $\underline{a_1}$ interact to produce the dotted aleurone character.

13. Linkage data for chrom. 2.

Genes	Phase	XY	Xy	xY	xy	Total	% recomb.
Lg_1 Ws_3	RS	480	252	253	3	988	10
Gl_2 Ws_3	RS	251	100	85	9	445	32
Lg_1 Al	RS	361	161	183	0	705	0
Gl_2 Al	RS	128	66	50	2	246	19

14. Linkage data for chrom. 10.

R L_g	CS	1368	179	702	575	2824	18
$\frac{*+sp_2\ +}{g_1\ +\ li}$	CB	529	130	39	824	1524	
$\frac{+\ l_g\ +}{g_1\ +\ li}$	CB	657	33	48	314	l_g 341 1393	

*(could not classify for $\underline{sp_2}$ because of drouth and heat damage). Previous data have shown about 3% recombination for $\underline{sp_2}$ and $\underline{l_g}$, and $\underline{sp_2}$ to be fairly close to g_1. These facts together with the above data indicate the order is $li-sp_2-l_g-g_1$.

M. M. Rhoades

15. Linkage data for chrom. 10.

F_1 genotype	0	1	2	1,2	Total
$\frac{Rp\ +\ r}{+\ g_1\ +}$	179 161	109 114	31 30	16 13	653
	340	223	61	29	
		34.2%	9.3%	4.4% order is $Rp-g_1-r$	
* $\frac{Rp\ +\ +}{+\ li\ g_1}$	223	90	40	13	366
		24.5%	10.9%	3.6% order is $Rp-li-g_1$	

*(seedlings inoculated in flats and only resistant individuals transplanted to field, to prevent spreading the rust to other cultures).

Genes	Phase	XY	Xy	xY	xy	Total	% recomb.
Rp D_7	RS	409	127	133	41	710	50

Singleton reported 35% recombination between D_7-G_1 and 27% between D_7-R. This suggests the order is G_1-R-D_7, but might be different. However, if $\underline{D_7}$ falls to the left of R it should show fairly strong linkage with Rp, but it does not. Therefore the order in chrom. 10 is:

Rp	li	g_1	R	d_7
0	28	43	57	84

V. H. Rhoades

16. The following data were obtained from three-point tests involving gl_1, ij, and bd_7:

F_1 genotype	0	1	2	1,2	Total
$\frac{+ \quad + \quad bd}{gl_1 \; ij \quad +}$	344 271 615	37 26 63 5.4%	255 198 453 38.8%	18 18 36 3.1%	1167

17. Data were obtained on a dominant or partially dominant character which we have been calling knotted leaf and designating by the symbol Kn kn. A full description has not been published. Superficial observations indicate a more rapid growth of the vascular tissue, resulting in a kinking or knotting of the veins. Plants known to be heterozygous for this character usually make normal growth with only an occasional knot on the leaf blade and a slight knotting of the leaf sheath. Other plants proven to be homozygous were so badly knotted that the tassels could not make their appearance without assistance.

Backcross data were obtained in 1933 on 531 plants and in 1936 on 252 plants involving the genes f, ts_2, and Kn. The combined data for the two years are as follows:

F_1 genotype	0	1	2	1,2	Total
$\frac{+ \quad + \quad Kn}{ts_2 \; f_1 \; +}$	171 125 296	101 161 262 33.5%	94 31 125 16.0%	29 71 100 12.8%	783

A marked deficiency of f_1 plants in 1933 made interpretation of the data doubtful. The results in 1936, however, were very similar to those in 1933.

Backcross stocks involving the genes for br, f_1, bm_2, and Kn were obtained this year for classification in 1937.

A. A. Bryan

University of Missouri, Columbia, Missouri -

1. Gl_6 and gl_8 have become mixed some time in the past and the stocks of gl_8 which have been distributed are gl_6. An ultra-violet induced glossy is tentatively assigned the symbol gl_8.

The linkage relations of gl_6 are listed below:

Genes	Phase	XY	Xy	xY	xy	Total	% recomb.
Bt Gl_6	RS	339	175	77	1	592	10.0
Pr Gl_6	RS	305	169	164	0	638	8.5 (if 1 xy)
V_{12} Gl_6	RS	148	74	93	1	316	10.5

2. Gl_{10} (not the one reported by Emerson) is in the 9th linkage group. A small F_2 repulsion gave no double recessives with wx.

3. Intercrosses were made between 18 newly-acquired glossies and glossies 1-10 inclusive. Due to the unfavorable season, seed was not obtained from many of the crosses. However, crosses were complete enough to suggest that this group included some new glossies.

4. Intercrosses have been made between Hadjinov's and the writer's glossies. The following identities have been established: H gl_3 = gl_4; H gl_{10} = gl_3; H gl_5 = gl_{10}; H gl_6 = gl_6 (see News Letter of March 4, 1936, page 3). His stock designated Gl_8 gl_8 did not segregate and his stock gl_9 has been lethal under conditions at Columbia.

5. Seed has been sent of a new dominant character tentatively designated "vestigial glume" with symbol Vg. In the presence of the dominant allele Vg there is almost complete suppression of glumes in both the staminate and pistillate inflorescence.

G. F. Sprague

6. The following list of mutants is submitted as a sample of the types of mutant observed following treatment of pollen with ultra-violet radiation. The list includes the seed and seedling character mutations observed in experiments recently reported (Proc. Nat. Acad. Sci. 22:572-578) in which unfiltered radiation from a commercial quartz mercury vapor arc was used. Similar mutants have been observed in later experiments.

Many of the mutants listed are of little value for general genetic purposes, because of lethality or low viability, or in a few cases, because of overlapping the normal type. In (2), (15), and (33) the parent F_1 plant had defective pollen, but the mutant appeared to be unrelated to the factor causing the pollen defect. In all other cases the parent F_1 plant had normal pollen so far as could be determined by pollen examination. It is possible that among the mutant seed characters reported there may be included instances of small seed due to heterozygous deficiencies not manifested by defective pollen development. Tests against this possibility have not yet been completed.

Mutant	Description (seedling character)	Notes
(1) red leaf	dark to faint red coloration in seedling leaves	not distinct on mature plants
(2) virescent yellow-green-a	some seedlings virescent yellow green, others near white	possibly two separate mutants; may be associated with small seed

Mutant	Description (seedling character)	Notes
(3) glossy-a	glossy seedling with possibly some normal overlap	occurred with a small seed, unlinked
(4) yellow green-a	clear yellow green, later develops necrotic areas and dies	
(5) virescent yellow green-b	nearly pure yellow at emergence; turns green	probably a usable mutant
(6) rolled	early seedling leaves tightly rolled and adherent	many die but a few survive to produce normal mature plants
(7) dwarf	dwarf seedling and plant	not induced; possibly a recurrence of dwarf 3; closely linked with wx
(8) corrugated	leaves narrow with well marked corrugation	occurred with aleurone spot; original material showed complete association with aleurone spot
(9) virescent yellow green-c	nearly pure yellow on emergence, gradually turns a greenish yellow	probably a usable mutant
(10) speckled	seedling leaves prominently speckled and semi-dwarf	
(11) yellow green-b	seedlings distinct yellow green; do not green up in seedling stage	may be viable
(12) glossy-b	clear glossy	indication of linkage with pr; tentatively designated as gl_g
(13) virescent yellow	seedlings appear luteus with slight greening	lethal
(14) yellow green-c	segregates for yellow green and white seedlings	occurred with a germless, unlinked
(15) white tip	seedling leaves have a distinct white tip; present also on some mature plants	occurred with an unassociated pollen segregation

Mutant	Description Seed Characters	Notes
(16) germless-a		
(17) small-a	1/8-1/4 normal size	deficiency of small seeds
(18) small-b	1/10-3/4 normal size; very irregular shape	occurred with a virescent yellow green, unlinked
(19) aborted	very small and poorly developed	all aborted seeds are germless, but some normal size germless seeds present
(20) small-c	clear separation, approximately 25% recessive type	many small seeds are germless
(21) small-d	seeds normal in height and width, reduced in thickness	occurred with a glossy seedling, unlinked
(22) miniature-a	seeds reduced in size and characteristically scarred	
(23) miniature-b	variable in size with probable normal overlap	
(24) miniature-c	seed size reduced but with probable normal overlap	occurred in check, not induced
(25) aleurone spot	aleurone layer absent in scattered areas over the seed	occurred with seedling character corrugated
(26) small-e	seeds normal width and 1/4-3/4 normal height and thickness	only slight deficiency of small
(27) germless-b	seeds normal in size	marked deficiency of germless seeds
(28) miniature-d	seeds about 1/2 normal size, some normal overlap	all miniature seeds are germless
(29) small-f	seed reduced in size	small seeds are germless
(30) gnarled	seeds small and variously mis-shapen	
(31) shriveled	seeds poorly developed and shriveled	shriveled are also germless

Mutant	Description (seed character)	Notes
(32) miniature-e	seeds 1/2-3/4 normal size apparently clear separation	small seeds not germless
(33) miniature-f	seeds reduced in size	not germless
(34) germless-b	seeds nearly normal size	
(35) scar	scarred seeds range from 1/8 to normal size	
(36) miniature-g	seeds 1/8-1/2 normal thickness and 3/4 height and width	
(37) germless-c	many seed also scar	occurred with virescent yellow and white seedlings, unlinked

Further information regarding these mutants will be included in a research bulletin of the Missouri Agricultural Experiment Station.

C. F. Sprague and L. J. Stadler.

Agricultural Experiment Station, College Station, Texas -

1. Several years ago we reported a new type of sugary, "amylaceous sugary," the inheritance of which depends upon two factors, one of which, $\underline{su_1^{am}}$, is allelomorphic to $\underline{su_1}$, the other $\underline{du}$ being located in chromosome 10. The genotype $\underline{su_1^{am}}$ $\underline{su_1^{am}}$ $\underline{Du}$ $\underline{Du}$ is indistinguishable from pure starchy, while the genotype $\underline{su_1^{am}}$ $\underline{su_1^{am}}$ $\underline{du}$ $\underline{du}$ is a good sugary though not as wrinkled and translucent as ordinary sugary. Since the presence of the $\underline{du}$ gene in homozygous condition can convert $\underline{su_1^{am}}$ $\underline{su_1^{am}}$ from starchy to sugary, it occurred to us that this same gene might have a similar effect on ordinary sugary, $\underline{su_1}$ $\underline{su_1}$, converting it to a "super sugary." Chemical analyses of ordinary sugary, $\underline{su_1}$ $\underline{su_1}$ $\underline{Du}$ $\underline{Du}$ and "super sugary," $\underline{su_1}$ $\underline{su_1}$ $\underline{du}$ $\underline{du}$, have been made which confirm this assumption. The former has 48.7 per cent total sugars, the latter 62.6 per cent. Several commercial sweet corn varieties are now being converted to "super sugary" by introducing the $\underline{du}$ gene through repeated backcrossing to determine whether this gene will have any value in practical sweet corn breeding.

2. In a stock derived from a cross of Tripsacum and Zea, comprising 20 Zea and 1 Tripsacum chromosomes, the extra Tripsacum chromosome carries the allelomorph of the sugary gene. This chromosome shows regular, though not complete pairing with the first chromosome of Zea and not with fourth on which the $sugary_1$ gene is located in Zea.

3. Tripsacum is apparently homozygous for the <u>A</u> factor. Its composition with regard to the <u>C</u>, <u>R</u>, and <u>Pr</u> factors is being determined.

4. Corn seedlings left in refrigerator for brief periods showed frequent islands of tetraploid tissue in root tips. Treatment of ears with dry ice soon after pollination has not produced any tetraploid plants.

5. A new gene for premature germination, or vivipary, is linked with $\underline{su_1}$. A new gene which causes a peculiar mottling of the endosperm appears to be a usable endosperm character. Linkage tests are being made.

6. Observations for several years have indicated that $\underline{B}$ factor causes plants to bloom earlier. Extensive data this season on date of anthesis in $\underline{B}$ and $\underline{b}$ plants from same segregating progenies show no significant difference.

7. A study has been in progress for several years to determine whether the marked differences between Euchlaena and Zea are genic and whether the genes which differentiate the two genera can be located on definite chromosomes. Four chromosomes have been studied, using marker genes from corn, and it has been found that the V-Pl genes are definitely linked with genes for number of tassel branches, B-lg_1 genes are linked with genes for height of stalk, number of tillers, number of leaves, number of ears, and number of tassel branches. Waxy gene is linked with genes for number of tillers, number of leaves, and number of ovules per ear. $\underline{su_1 Tu}$ genes are linked with genes for height of stalk, number of leaves, number of ears, number of tassel branches, length of ear, number of rows of ovules and number of ovules. So far as the results go they indicate that the genes which differentiate Zea and Euchlaena are scattered at random over all the chromosomes.

P. C. Mangelsdorf and R. G. Reeves

University of Wisconsin, Madison, Wisconsin -

1. Linkage data on Chrom. 3:

Genes	Phase	XY	Xy	xY	xy	Total	% recomb.
G_2-D_1	RS	241	89	85	13	428	38
Rg-Ra_2	CB	61	18	41	77	197	30

Severe drought injury made accurate classification of $\underline{cr}$ and g_2 impossible. The g_2-d_1 results, however, indicate that g_2 may be in chrom. 3.

$$\frac{a_1 \quad lg_2 \quad +}{+ \quad + \quad ra_2} \ (X)$$

Genes	% recombination
A - Lg_2	39
A - Ra_2	45
Lg_2-Ra_2	54

The data of these two tables (together with earlier findings) indicate that the $\underline{ra_2}$ locus is in the neighborhood of $\underline{d_1}$, probably between $\underline{d_1}$ and $\underline{cr}$.

R. A. Brink

University of West Virginia, Morgantown, W. Va. -

1. Linkage data on Chromosome 2:

Genes	Phase	XY	Xy	xY	xy	% recomb.
AL-B	CB	30	15	15	43	27
	RB	50	127	118	57	34

2. Linkage test with $\underline{su_2}$:

F_1 genotype	0	1	2	1,2	Total
$\frac{+ \quad Pl \quad +}{y_1 \quad + \quad su_2}$	189 163	64 52	11 22	4 2	507
	352	116	33	6	
		22.9%	6.5%	1.2%	

(separation of Y_1-y_1 poor, especially in $\underline{su_2}$ class)

C. R. Burnham

Bureau of Plant Industry, Washington, D.C. -

1. Recent morphological studies of the chromosomes of strains of Indian corn and of teosintes from the experiment station at Chapingo near Mexico City have shown several strains in which chromosome 10 is abnormal. This chromosome has a piece attached to the end of the long arm about the length of its short arm. This piece is much knobbed and at present nothing definite can be said concerning its origin.

A small quantity of both corn and teosinte seed carrying this abnormality are available for distribution.

A. E. Longley

2. In connection with making the corrections in the linkage summary pointed out on page 3 of the March 4 Maize Genetics Letter, I note on page 43 that $\underline{w_4}$ is listed as reported by Demerec 1923B. I assume that this should be changed to Lindstrom as on page 25.

F. D. Richey

II. Collective Publication of Linkages

Some of the linkage data presented in this News Letter would seem suitable material for a general linkage paper to be published. (see News Letters of March 6 and November 30, 1935, and March 4, 1936).

If the authors of these data will signify their desire to have it published as presented in this News Letter or will rewrite it in the form they prefer, we will attempt to make arrangements for having it published this summer. If others of you with similar data will send it to the Co-op. not later than April 10, we shall be glad to include it in this publication.

In the News Letter of March 4, 1936, Dr. Emerson gave some very good suggestions regarding the manner of arranging the linkage data: "Manuscripts should be typed and ready for publication without change. When new genes are involved, a short, concise description of the characters differentiated by them might well be included.

well-known genes should not require such treatment. Tables should be presented in summary form. Different cultures involving the same kind of data should not be listed separately unless that is essential in order to demonstrate significant differences between them. Of course F_2 and backcross data for coupling and repulsion must be entered separately in the tables. A single frequency distribution may often be displayed in the text to better advantage than in a table. Tables of data should be accompanied by such discussion only as is essential to make clear any points not obvious from an examination of the tabular data themselves, or as is necessary to indicate the relation of the unreported observations to other linkage tests, etc. The tabular arrangement and headings used in the Linkage Summary are convenient and I, naturally, think them good. No limit can be set now to the length of the individual contributions, but, unless a very considerable amount of data are presented, individual papers might well be kept to not over one or two pages of printed matter, and it is my hope that some may be not more than half that long".

III. Seed Stocks Grown, 1936

Inbred strains. Selfed or sibbed ears of all the inbred strains in disease resistance test.
su_1 gl_3 Y_1 la_{34a} (allel to la_1)

r Pr_1 mr (mottled aleurone-Horovitz) may seg. g_1

Homo. A_1 C R a_2 bt_1 bv pr_1

Homo. A_1 C R a_2 bt_1 bv pr_1 seg. v_2

Homo. A_1 C R A_2 bt_1 bv pr_1

Inbred line of supergold pop corn (Jenkins)

seg. cultures of y_4 y_4 It It x Y_4 Y_4 it it

y_4 y_4 It It a_1 c r pr_1 i

Trisomics 3, 5, and 6

Sweet Brittle (L. C. Raymond)

seg. cultures of lg_1 gs_2 b x lg_1 gs_2 b v_4

" " " yt x a_1 na ts_4

" " " a_1 Dt x a_1 lg_2 B Pl

" " " a_2 x v_2 pr_1 bm_1 A_1C R

" " " R g_1 nl_1 x zb_5

au_1 au_2 sh

a_1 na ts_4 Dt

Tp gl_1 ra_1 v_5 ✓

ar wx

hf

Kn

gl_5

v_x (Wiggans)

P ts_2 br f_1 bm_3

lg_1 gl_2 b v_4

A_1Pl sm seg b

gl_4 x yg_2 c sh wx

da au_1 au_2 sh

g_4 wx

a_1 lg_2 Dt

g_2 A_1B Pl

bm_3

gi

gl_g

fr_1 fr_2 gl_1 ij ✓

yg_2

lg_1 gl_2 B v_4

j_1 msg x j_1 Msg/msg

r_1 zb_5

No germination:

d_7 g_1 x gl_g

A_1C r sh wx y_1 pr_1 Su/su_1 x d_x

su_2

Y_4 Y_4 it it

Too late:

yg_3

va_1

gl_{33a} (= gl_2)

gl_{33b} (amargo corn)

seg. lg_{34a} ms

af_{34a} (= aristifolia)

sn (= siamensis)

10 pkges. of seed from Australia

(Note: this seed from Australia is of various inbred strains, developed at Queensland Agricultural High School and College, which show seedling characters such as fine-stripe and virescent. These characters ought to be studied in a region with a longer growing season than at Ithaca. A small amount of this seed is available for distribution.)

IV. Seed Stocks Received for Propagation in 1937

1. A. A. Bryan, Ames, Iowa:-
   $br\ f_1\ bm_2\ kn \times \frac{+\ +\ +\ \ Kn}{br\ f_1\ bm_2\ +}$

   $\frac{+\ \ +\ \ bd}{gl_1\ ij\ +} \times gl_1\ ij\ bd$

2. R. A. Brink, Madison, Wisconsin:-
   $A_1\ lg_2 \times A_1\ lg_2\ ts_4\ d_1$

   $a_1\ lg_2\ ra_2$

   $a_1\ lg_2\ d_1 \times A_1\ lg_2\ d_1\ ts_4$

3. G. F. Sprague, Columbia, Missouri:-
   $b\ gs_2\ lg_1$

   $\frac{Vg}{vg} \times vg$

4. J. Shafer, Pasadena, California:-
   (inbred x sb)#
   (sb x A b pl $Y_1 y_1$ su_2)#
   $y_1\ su_2$

5. A. E. Longley, Washington, D.C.:-
   Indian maize carrying an extra piece attached to chrom. 10.
   Teosinte (Tecubaya) carrying an abnormality similar to that found in the Indian maize stock.

6. J. H. Kempton, Washington, D.C.:-
   Teosinte from Mexico-
   - Novocayan, from the hacienda of that name near Durango City (from the same place as the original Durango seed).
   - Nobogame, from the town of that name in Southwestern Chihuahua. Represents the farthest north for teosinte.
   - Trampas, from near northern border of Durango.

7. G. A. Lebedeff, Ithaca, New York:-
   $pb_x\ wx\ y_1$
   Pl sm x pb_x

8. S. Horowitz, Buenos Aires, Argentina:-
   J_{33a} (dominant japonica) x A_1c R sh wx B pl

9. R. G. Wiggans, Ithaca, N. Y.:-
   Chlorophyll types -
   - Yellowish green seedlings
   - Dark green
   - Rather light green
   - Medium to light green
   - Good foliage, leaves broad, excellent in general appearance

   Yellow stripe

10. R. A. Emerson, Ithaca, N. Y.:-

$$\frac{+ \quad gl_3 \quad +}{su_1 \quad + \quad j_2} \text{ (X)}$$

$$\frac{+ \quad Ts_5 \quad su_1}{wl \quad + \quad +} \text{ (X)}$$

$$\frac{+ \quad su_1 \quad gl_3}{wl \quad + \quad +} \text{ (X)}$$

$$\frac{+ \quad Ts_5 \quad su_1}{la \quad + \quad su_1} \text{ (X)}$$

11. C. A. Krug, Sao Paulo, Brazil:-

Variety	Numbers	Characteristics	Ratios
Amarello	41B-1B	segregating mealy endosperm	(3 : 1)
"	47-1	"brown pericarp" bp ?	(3 : 1)?
"	83-1-4	seg. dwarf plants	(3 : 1)
Crystal	96-4-1	seg. tassel seed	(3 : 1)?
"	97-1	"ragged" Rg ?	3 : 1
"	111-2-3	"oily spots" (blotched leaf)?	
"	119-6	branched ear (homozygous)	
Amarello	129-1-1	striped leaves	3 : 1
Crystal	134-2-1	semi-dwarfs	
"	137-1-3	seg. zebra seedling leaves	3 : 1
Amarello	146-1	semi-dwarfs (homozygous)	
"	149-2	"rolled leaves" ro ?	
Crystal	150-1-1a	seg. defective endosperm	3 : 1
"	156	"rolled leaves" ro? (homo.)	
Negro	164-2-1	colored pericarp and aleurone	
Morango	189 A	variegated pericarp	
Amparo	242	seg. defective endos. sh ?	3 : 1
Crystal	256	bracts in the tassel	
Amarello	254-1	male sterility	3 : 1
"	266-1	zebra-striped leaves (homo.)	
Hickory King (?)	267	defective cob Rw_1, Rw_2 (?)	
Crystal	280-1	"crinkly" cr ? (homo.)	

V. List of Genes Not in Co-op

The genes that have been reported and are not in the Cooperative Collection are listed below. If you have any of these genes in your seed stocks, will you kindly send us a few seeds so that we may get a stock for the Co-op? Your cooperation will be greatly appreciated by all who are interested in having available in a central repository a complete set of maize genetic seed stocks.

a_3	gl_{10}	gm_e	gm_1
ad_2	gm_2	gm_3	gm_4
an_2	Hs	l_1	l_5

bl_2	le	lp	mc
bn_2	Md	me	mg
bt_3	mi	na_2	o_3
cb	Og	oy	pb_2
cr_2	pb_3	Pc_{1-4}	pg_{3-10}
d_4	pi_1	pi_2	pm
d_6	Pr_2	ps	Pu_1
Da_2	Pu_2	ra_2	re_{1-4}
de_{pl}	ro	Rp	rt
de_f	S_{1-5}	sa_2	sc_1
de_{1-16}	sc_2	sf	so_1
dl	so_2	su_3	sy
dm	th	tw_{1-3}	v_{10}
du	$v_{11,13,15,16,19}$	va_1	va_2
f_2	vp_3	w_{4-10}	wa
f_3	ws_3	$xn_{1,2}$	Y_2
fs	yd	yf	$yg_{1,3}$
gc	Yp	ys_2	zb_{1-4}
ge_{1-15}	$zg_{1,2}$		

VI. Tests of Inbred Strains for Disease Resistance

Last spring seed of five inbreds furnished by Wiggans, one by Hayes, one by Kvakan, three by Bryan, and five by Singleton were sent to eight cooperators in various parts of the United States. The severe drouth and heat in some areas made possible a good comparison of the inbred lines in regard to resistance to firing.

The following tables and supplementary notes on the inbreds were received by the Co-op.:

Arlington Experiment Farm, Rosslyn, Virginia -

Line	Date Silked	Total No. Plants	No. Erect Plants	No. Smutted Plants	Remarks
Co 206	7/30	27	3	0	Very little pollen
Co 208	7/26	34	13	0	Good line
Co 210	7/30	36	1	2	
Co 211	7/26	33	21	0	Pollen 5 or 6 days later than silks
Co 214	7/26	29	17	0	
S283	7/30	14	12	0	
I 234	8/10	29	17	0	
Dr 276 A	8/10	30	9	0	
WD 456 A2	8/2	23	22	1	Very good line
Kvakan 6991	7/30	9	2	0	Light green & spotted No good here
Singleton C2		25		0	: Too early. Entirely
" C6		36		2	: unsuited to
" C13		39		2	: Arlington
" C85		33		0	: conditions
" C78		34		1	:

M. T. Jenkins

Ames, Iowa -

The season in Iowa was so unfavorable that observations must not be taken too seriously. Early lines were more affected by these conditions than the later lines. No attempt was made to hand-pollinate any ears. Under open-pollination the set of seed was fair on some lines and poor on others.

The season was good for testing smut resistance, the smut infection being about as heavy as in 1935. The following notes were made on the inbred lines:

C 206: Free from smut; no firing of leaves, tassels good, ear shoots good but poorly filled; roots weak; plants about 5' high; ears about 1½ to 2' high; not very promising.

C 208: Smutted ears on about 30% of the plants; tassels good; one or two top leaves fired; plants erect; ear shoots good but not very well filled; tendency toward 2-eared condition and some multiple earing; rather promising stock except for the smutting of the ears.

C 210: One smutted plant in a total of 36; roots weak, badly lodged; not at all promising.

C 211: No smutted plants; extremely early, very short plants; produced considerable seed; a useful stock.

C 214: No smut; roots very weak; unproductive; not promising.

S 283: No smut; early; lodging-resistant, at least until late in the season when a tendency toward stalk-breaking became apparent; produced a fair amount of seed for the season; probably a useful line.

Kvakan 6991: About one-third of the plants had bud smut; stalks weak, broke badly; not promising.

I 234: Rather late compared to others in this group but also relatively good; only two smutted plants in a total of 33 (bud smut); good set of seed; promising but possibly rather late for general use.

Dr 2764: Two suckers with ear smut and one plant with stalk smut just below the ear; short, thick, well-filled ears; very weak roots; not especially promising.

WD 456A2: Four plants with small bud smut galls near the base of the plant; no lodging; ears fairly well-filled with seed of excellent quality; poor pollen producer; relatively late; an excellent line for Iowa conditions but probably too late for general use.

Sweet Corn Lines: All of these lines were so extremely early and made such poor growth under the prevailing conditions that fair judgment can hardly be passed upon them. They were nearly or quite smut-free. Numbers C6, C13, C78, and C85 had a fair set of seed. They are not promising for our conditions.

A. A. Bryan

Columbia, Missouri -

Line	Firing Notes
Co 214	yellow green in color; no ear shoots
S 283	tassels were blasted on 7/6; first silk appeared 7/9
Co 206	wilted badly followed by firing and tassel blasting; tassels blasted 7/15
Co 208	little firing but tassels blasted 7/15
Co 210	little firing but tassels blasted 7/16
Co 211	upper leaves fired; tassels blasted 7/9
Kvakan 6991	very slender stalk; yellow green color; tassels blasted 7/9; first silks 7/11
Dr 276 A	lower leaves fired 7/17; pollen shed 7/17
WD 456 2A	silked 7/13; all tassels blasted by 7/17
Bryan 234	upper leaves fired 7/15; first silks 7/20

No rust, bacterial blight or smut was noticed in these cultures. None of the strains produced ears.

G. F. Sprague

Durham, North Carolina -

Approximate order of adaptability	Number of diseased plants observed		Maturity	Miscellaneous observations
Group I (good)	Smut	Rust		
1.*Dr 276-A	0	0	late	general appearance sturdy
2.*Co 208	0	13(50%)	med.	Rust injury negligible
3.*S 283	0	0	med.	
4.*WD 456-A2	0	0	med.	two plants runty
Group 2 (fair)				
5. Co 210	0	0	med.	seg. small plants
6. Kvakan 6991	0	0	med.	
7. I 234	1(5%)	0	late	
8.*C 78	1(3%)	0	med.	
Group 3 (poor) (not in order)				
C 85	1(5%)	0	med.-late	Two "F_1 hybrids" ruled out.
#Co 211	0	0	med.	General appearance satisfactory
Co 214	0	0	med.	Very few seeds on open-pol. ears
Co 206	0	0	med.	Not much pollen; probably protandrous
C 13	0	0	early	
C 2	0	0	med.	
C 6	0	0	med.-early	

* eight to 20 hand-pollinations in each of these inbreds.

\# all pollination failures were of same date. This inbred may deserve better rating.

Conditions prevailing here last summer were in general too favorable to afford a rigorous test. The weather was consistently hot but rainfall was adequate (for late plantings which included these inbreds). No firing, no lodging, and no bacterial blight was observed. The infrequency of smut and rust infection in the inbred lines may not mean much, since my cultures generally suffered little from smut and rust.

I had occasion to use some of these inbreds in crosses and also made a few self and sib pollinations in each line. The rating as to adaptability is based largely on the results of these pollinations. The proportion of successful pollinations and the yield of grain resulting provided a basis for rating.

H. S. Perry

Morgantown, West Virginia -

Line	Height (inches)	% lodging bent	% lodging lodged	Rooting system	% Smut	No. Plants	Remarks
Bryan 276 A	44	24	12	fair	0	39	Very short ears
" 234 *	70	0	0	v. good	0	25	#1 of Iowa lines, late
" 456 A2	65	0	0	v. good	neck 10.3	29	#2 of Iowa lines,
Co 206	53	72	9	fair	neck 7.7	13	
Co 208	50	0	0	v. good	neck 7.7	13	
Smut check					gen'l 26.3	19	
Co 210	60	0	33	fair	0	11	
Co 211	42	0	0	poor	0	15	
Co 214	33	0	0	poor	0	11	
S 283	50	0	0	good	0	18	
Wiggans 206-32(X)*	65	90	0	poor	0	52	
" 211-10(X)	45	0	0	good	ear 3.8	52	
" 212-18(X)	54	20	15	fair	below ear 1.5	66	
" 210-11(X)*	64	15	10	fair+	ear, neck 3.4	59	
" 209-13(X)	46	70	0	----	0	10	stalks break down early
Smut check					gen'l 54.9	51	
Wiggans 208-9(X)	58	5	5	good	0	47	stalks break down early
Hayes S-42	58	0	10	fair	0	51	
Singleton C78, C 13, C 85, C 2, C 6	Planted late and on different plot, no smut. May be able to run this 1938						

* These are considered the best lines.

C. R. Burnham

New Haven, Connecticut -

Pedigree	Date of Pollin-ation	Erect-ness	No. plants	Smut plants	Smut ears	Good ears	Rust 1-10	Row No.	Notes
Co 206	8/15	/	13	0	0	9	1	14-16	fairly good
Co 208	8/13	/	15	0	0	13	6	12-14	slender, poorly filled
Co 210	8/20	⌒	10	0	0	8	0	12	irregular rows, poorly filled
*Co 211	8/15	⌒	19	0	0	14	5? all dead	12	sl. irr. rows, smooth dent
**Dr 276 A	8/21	/	16	0	0	13	2	20	good dent, vig., uniform, late
*WD 456 A2	8/20	|	17	1	1	24	0	14-16	very good roots,2 ears to stalk, sl. irregular rows
I 234	?	/	8	0	0	10	0	16-18	irregular rows, poorly filled
Co 214	?	/	19	0	0	21	3	12	poorly filled
**S 283	8/13	/	17	0	0	17	0	12-16	reg. rows, well-filled, slender, green, good
Kvakan 6991	8/15	⌒	10	0	0	8	2	14-16	fair, early

* good ** very good

W. R. Singleton

Ithaca, New York -

Inbred line	Smut	Rust	Ears	Maturity	Plant Type
Co 206	Some ear smut	1	fair	med.	weak stalk
Co 208	Badly smutted	2	poor	med.	very desirable
Co 210	Moderate amt.	2	poor	med.	slender stalk
Co 211	Trace	1	good	med.	sturdy plants
Co 214	0	2	good	early	sturdy plants
S 283	0	3	fair	med.	very weak
WD 456-A2	Trace	1	good	late	rel. sturdy
Dr. 276A	0	1	good	late	short, sturdy
I 234	Trace	1	good	late	rel. sturdy
Kvakan 6991	Moderate amt.	4	v.poor	med.	lodged badly

(Rust notes taken latter part of Sept., rating is 1-5)

No bacterial blight and very little firing.

Inbred Co 211 is the most desirable one of this group for Ithaca. It excells in the favorable combination of suitable maturity, resistance to smut, good plant type, good ears, and vigor. It did show some top firing, however.

Co 208 has excellent plant type and proper maturity, but it has much tassel and ear smut. Bryan's inbreds Dr 276A, I 234, and W.D. 456A2 are eliminated only because of maturity. They are too late for Ithaca.

D. G. Langham

Summary

A general summary of the above tables approaches impossibility, and may not be desirable, anyway, because certain inbreds are best adapted to certain localities. We note, however, that inbreds WD 456-A2, Co 208, Co 211, and S 283 met with the greatest approval and should be included in the test another year. Perhaps inbreds Dr 276A, I234, Co 210, and Co 206 should also be tested further.

Several of the cooperators in this test of inbred lines for disease resistance have suggested that a uniform system of taking notes on the different inbreds be established. What is your opinion in the matter? If those of you who are interested will send to the Co-op. the type of form that you prefer for this purpose, we will attempt to combine the best suggestions into one blank to be used in 1937.

Any of you who would like to conduct this test on disease resistance in 1937 will please notify us soon. If you have some inbreds that are quite resistant to disease and have desirable plant type, we should like to include them in the test this year. There is, of course, a limit to the number of inbreds we can handle properly.

D. G. Langham
Secretary