5. Liquid retention on the surface of the glossy mutant.

As is known, when sprinkled with water, normal seedlings shed it almost completely, while glossy mutants retain drops on the surface of the leaves. A quantitative demonstration of such a differential behaviour has been obtained by weighing the first leaves of Gl, gl^H, gl_1, gl_2 and gl_3 types before and after sinking them in water; the weight difference has been related to the calculated leaf surface. As shown in Table 1, gl_1, gl_2 and gl_3 are expressed throughout all the leaves while gl^H differentiates from the 4th leaf onward.

Since the practice of providing the plants with nutrient elements through the leaves is now spreading, and because insecticide treatments to the plants are likely to be more efficient as long as the active solutions adhere to the leaf surface, the above mentioned types have been sprinkled with the following solutions:

1% Foliar K (chemical mixture containing N_2 14%, P_2O_5 13%, K_2O 20%, minor elements, phytohormones, tension-active, especially suited for leaf nutrition);

3% Cytox PB 50 (DDT 50%) plus Irol (adhesive liquid);

5% Foliar (chemical mixture containing N_2 15%, P_2O_5 15%, K_2O_5 16%, minor elements, phytohormones, tension-active, especially suited for leaf nutrition).

It is apparent from Table X that the solutions provided with tension-active chemicals, especially suited for the normal type, greatly reduce or eliminate completely the difference between the Gl and gl phenotypes. Although more extensive data are needed, it seems that, with the solutions used, there is no special advantage in substituting the Gl factor with gl in the inbred lines and eventually in their hybrids in order to improve their properties for some field practices.

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Table X. Liquid retention on the leaf surface of normal and gl mutants (average values expressed as mg of the specified liquid per cm^2).

Genotype	Leaf No.					
	1	2	3	4	5	6
	Distilled water					
Gl	6.7	5.1	4.0	1.8	1.2	5.0
gl^H	4.8	5.5	5.4	5.0	4.4	13.7
gl_1	9.1	9.2	8.0	5.5	4.8	15.7
gl_2	15.2	10.2	8.6	8.3	7.3	7.9
gl_3	12.2	12.1	8.0	9.7	6.6	5.8
	Foliar K, 1%					
Gl	10.8	10.1	8.5	9.3	12.2	
gl^H	9.4	4.2	10.5	3.1	8.3	
gl_1	20.5	11.6	8.8	7.4	12.4	
gl_2	9.5	8.5	6.9	9.2	10.4	
gl_3	4.9	6.9	5.8	3.8	6.1	

Genotype	Leaf No.					
	1	2	3	4	5	6
	Citrox PB 50, 3% plus Irol					
Gl	16.3	5.6	8.2	9.0	15.7	
gl^H	14.6	7.9	10.5	5.2	11.9	
gl_1	18.9	12.7	7.2	5.6	9.7	
gl_2	11.5	6.6	8.7	7.7	7.8	
gl_3	13.1	7.5	10.0	10.0	12.5	
	Foliar, 5%					
Gl	9.0	10.2	7.1			
gl^H	11.5	10.6	8.2			
gl_1	9.0	8.7	6.5			
gl_2	9.8	11.2	6.3			
gl_3	9.7	8.0	6.0			

6. Crossing-over in the C-sh-bz-wx region, in male and female flowers.

The F_1 Yg I Sh Bz Wx Ds/yg C sh wx (ds) has been crossed by and on the multiple recessive tester yg C sh bz wx (ds). The data obtained are summarized below.

From the totals of the Table XI, the following percents of crossing over may be calculated ± P.E., according to Immer's Tables:

	I-Sh	Sh-Bz	Bz-Wx
F_1 X multiple recessive	5.8 ± 1.5	3.3 ± 1.0	20.0 ± 2.5
Multiple recessive X F_1	5.1 ± 1.7	3.7 ± 1.4	18.2 ± 3.0

The discrepancy between the two series of values is clearly not significant.

It may be noted, however, that the regions I-Sh and Sh-Bz appear larger than the standard ones; the contrary is true for the region Bz-Wx (the Yg-Sh distance is being investigated).

Table XI. Actual frequency in the classes of the indicated kernel phenotype.

Number of examined ears	I Sh Bz Wx+ I Sh bz Wx	C Sh Bz Wx	C Sh bz Wx	I sh Bz Wx+ I sh bz Wx	C sh Bz Wx	C sh bz Wx	I Sh Bz wx+ I Sh bz wx	C Sh Bz wx	C Sh bz wx	I sh Bz wx+ I sh bz wx	C sh Bz wx	C sh bz wx
	F_1 X multiple recessive											
47	4456	268	30	25	132	1131	1287	20	48	311	4	4320
	Multiple recessive X F_1											
38	2793	148	15	13	101	582	831	7	12	188	3	2920

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1. Expanded glumes.

Previous tests for linkage using interchanges had indicated that this gene is in the long arm of chromosome 5 (M.N.L. 32:93). Tests in F_2 with bm ys yg and bm v_2 indicate about 32% recombination with v_2 and with yg. Limited data suggest the order is bm ys yg -- expanded. If true, crossing over must be high in the distal segment of 5. There was some variability of expression of the expanded character in F_2. Backcross tests are planned.

2. Linkage studies in multiple interchange heterozygotes.

Studies of the effect of a ⊙ 8 (1-5-6-7) and a ⊙ 10 (1-5-6-7-8) on crossing over in genetically marked chromosomes in the rings are in progress. In the regions measured thus far there is little if any difference between the two stocks. The use of genetic markers in chromosomes 5 and 7 should make it possible to check the products of crossing over in the differential segment in 5 and those from c.o. in the differential segment in 7. From the former, T1-5 and T5-6-7 are predicted; from the latter T6-7 and T1-5-7 (M.N.L. 27:64).

3. Progress in producing multiple interchange stocks.

A stock homozygous for 1-7-5-9 has been established (a combination of 1-7 (4405), 5-7 (5179), and 1-9b interchanges). This stock was isolated from the cross of 1-7-5 x 1-7-9 (2 rings of 4). Other combinations for rings of 8 made up in a similar manner are being tested. Various problems dealing with the use of multiple interchange stocks in studies of the inheritance of quantitative characters are being studied, e.g., frequencies of crossing over in differential segments, methods of making com-