

In all cases, higher percentages of pollen restoration were obtained during the Dry Season than during the Wet Season. The low night temperatures in December, when the plants tasseled, probably enhanced the pollen production of the restored sterile hybrids.

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1. Continued study of defective WF9 cytoplasm.

Further breeding studies of the apparently defective cytoplasm discovered in an open-pollinated plant of WF9 (Duvick, 1958 Coop News Letter) have indicated that the degree of expression of the aberrant cytoplasm is influenced by the genotype. The original open-pollinated aberrant plant was selfed four times, giving rise to a relatively uniform, viable line of "wsp" phenotype (pale green streaks in the leaves, especially at about the 5 - 7 leaf stage, accompanied by some loss of vigor). In each generation the selfed plant used to propagate the stock also was backcrossed as male to a stock which was originally normal WF9. This has produced a line approaching the general phenotype of the selfed stock in all respects except that no plants have shown any wsp characteristics, and the backcrossed line, although uniform, is considerably more vigorous.

When the wsp line, after four selfs, was crossed reciprocally to four normal inbred lines (Os 420, WF9, M14 and SK2) all crosses with wsp as female showed wsp in some but not all plants of the single cross. The reciprocals in no case had any wsp plants. When the single crosses with wsp as female were backcrossed (as female) to the normal inbred lines, or selfed, wsp plants occurred in the backcross and F₂ progenies, with varying degrees of expression. The progenies involving Os 420 and WF9 showed a much higher percentage of wsp plants than did those involving M14 and SK2, in both the F₁ and the advanced generations. Some wsp plants in the advanced generations of the cross of the wsp line and WF9 greatly exceeded the parent wsp line in degree of expression of wsp. Each of the original F₁ crosses described above was made in duplicate and in all cases the degree of wsp expressed was more similar within progenies involving the same normal inbred line than between progenies involving different inbred lines.

The present plan is to continue backcrossing the four stocks to the respective normal inbreds until four reasonably homozygous stocks, in wsp cytoplasm, are obtained. These will then be used for further genetic studies of effect of the genotype on expression of wsp, as

well as for the perhaps more important study of the permanence of inheritance of this presumed cytoplasmic characteristic. It may be that the relative loss of expression of *wsp* when *ML4* and *SK2* genotypes are introduced is due to a permanent modification of the *wsp* cytoplasm, back to normality. The question of non-uniformity of expression in F_1 is also of importance.

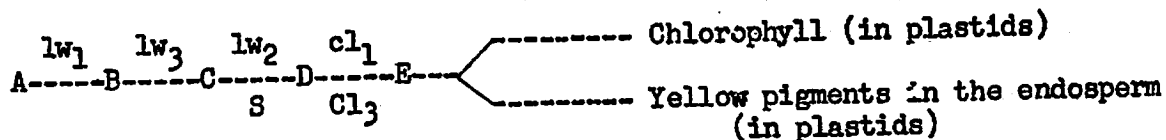
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1. Some speculation on the action of lemon-white alleles.

The lemon-white mutants in maize have attracted some attention because of their pleiotropic effect and the detection of suppressors for one of the two effects. The important features of these mutants are as follows: All the natural mutants (at least four cases involving different chromosomes) show a simultaneous effect on both characters. The suppressor effects are specific for the individual mutants.

One can interpret the pleiotropic effect on the basis of interruption at different steps in a chain reaction which subsequently bifurcates to give rise to different end products.



The influence of suppressors on only one of the two effects could be due to a difference in their quantitative action and competition for the substrate at the point of bifurcation.

S. H. Tulpule

2. Pachytene chromosomes treated with paradichlorobenzene.

Pretreatment of root tips with paradichlorobenzene gives well spread metaphase plates with shortened chromosomes. The effect on chromosome length was investigated by a study of its action on maize chromosomes at pachytene. The pretreatment consisted of immersing the cut ends of suitable spikes in a saturated aqueous solution of paradichlorobenzene for a definite period and then fixing them in acetic-alcohol. Preliminary results show that: (1) The treatment does not result in any marked increase in the frequency of well spread pachytene configurations. (2) The cells show globules of various sizes resembling the nucleolus in their staining reaction with carmine.