

3. Organic solvents as pollen suspending media.

Among solvents tested and reported previously, paraffin oil has been found very satisfactory for protracted suspension of pollen before pollination, an aqueous sucrose- CaCl_2 medium suitable for short-term suspension, and glycerol unsuitable. Tests of carbon tetrachloride, cyclohexane, and p-dioxane were conducted in 1972. All three solvents are injurious to silks, and few or no kernels result following application of fluid suspensions. However, the volatility of these solvents permits recovery of dry pollen grains after suspension and drying. Pollen suspended in carbon tetrachloride for one minute, allowed to dry for two minutes and applied conventionally to silks yielded nearly normal sets (300 or more kernels); pollen suspended for two minutes before drying yielded reduced sets (50 or so); five or ten minutes yielded few or no kernels. Pollen suspended in cyclohexane for 1, 2, 5, or 10 minutes before drying was powdery and free-flowing in conventional pollinations, and yielded fully set ears indistinguishable from the usual. In dioxane, one minute or longer exposure before drying destroyed functioning of the pollen.

Although cyclohexane is not a very broad-spectrum solvent, its promise as a suspending agent is considerable: It is a low-density solvent in which pollen grains distribute easily yet settle quickly; it volatilizes rapidly, leaving dry, loose pollen grains that are easily applied in conventional fashion; it appears to be harmless to pollen for exposures as long as 10 minutes, and possibly for much longer exposures. Any agent that can be solubilized in this solvent could be applied (and washed free) with facility before pollination.

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4. Selection for resistance of pollen to ultraviolet light.

Studies reported in 1971 (Newsletter 45:140) examined whether two generations of selection by exposure of pollen to ultraviolet light (UV) resulted in changes in types or frequencies of mutational events induced by UV upon a third exposure; the data were suggestive but required retests. Tests have been completed, partly in parallel (two generations of selection)

and partly in extension (three generations of selection). The populations were similar in size to those reported in 1971. The results were negative unequivocally--i.e., no differences in types or frequencies of events were found among unselected, twice-selected, and thrice-selected lineages when the pollen was once more treated with high doses of UV.

The tests for increase in transmission frequency of mutants under UV selection, also reported in 1971, have been expanded with negative results also. Those mutants that had significantly higher transmission in the initial tests were tested in numbers averaging three to four times greater, and none was found to show an increase in transmission under UV selection pressure.

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5. Tentative map positions of genes and A-B translocations on chromosome 10.

Following are the results of tests of chromosome 10 genes with TB-10a, TB-10b, and TB-10c (yes = gene uncovered [distal to translocation], no = gene not uncovered):

<u>Gene</u>	<u>TB-10c</u>	<u>TB-10b</u>	<u>TB-10a</u>
oy	yes	no	no
tn ₂	yes	no	no
y ₉	yes	no	
sr ₃	yes	no	no
nl	yes	no	no
zn		no	no
du ₁	no	no	no
li		yes	no
bf ₂	no	yes	no
ms ₁₀		yes	no
g ₁	no	yes	yes
r	no	yes	yes
w ₂	no	yes	yes
sr ₂	no	yes	yes

Additional data have been gathered on zn. Two hypoploid plants from a cross of zn by TB-10b were self-pollinated and a total progeny of 5