

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)