

NOTES SECTION

Pollen Viability Determination With Tetrazolium Bromide¹

The purpose of this research note is to report an improvement in the tetrazolium bromide technique for determination of sugar beet pollen viability. Hecker (1) originally reported that a 0.5% solution of 3-(4,5-dimethylthiazolyl-2)-2,5-diphenyl tetrazolium bromide at 20°C provided a specific and rapid means of determining the viability of mature sugar beet pollen. However, considerable cell rupture occurred, resulting in difficulty in discerning ruptured pollen cells from non-stained pollen cells.

This problem of pollen cell rupture is avoided by using the tetrazolium bromide in a sucrose solution of approximately the same osmotic concentration as the cytoplasm. A 0.5% solution of tetrazolium bromide in 40% sucrose solution successfully eliminated the problem. This allows greater latitude in the period of examination, which can be made any time after 5 minutes. The solution maintains its staining ability for at least 90 days. Some pollen sources stain better at lower tetrazolium bromide concentrations (as low as 0.05%) but take proportionately longer to react. Refrigeration of the solution will largely eliminate the problem of microorganism contamination and decomposition. It is convenient to maintain a stock solution of tetrazolium bromide which, prior to use, can be mixed with distilled water and sucrose.

In use it was found most convenient to drop the tetrazolium bromide-sucrose solution on the pollen grains on a glass microscope slide, mix slightly, cover with a glass cover slip, and set aside at 20°C in daylight until examined. Mature pollen assumed to be viable was stained purple to deep-purple, whereas non-viable and abortive pollen was not stained. The method provides a specific and rapid means of determining the viability of mature sugar beet pollen.

Literature Cited

- (1) HECKER, R. J. 1963. Use of tetrazolium salts in determining viability of sugarbeet pollen. *J. Am. Soc. Sugar Beet Technol.* 12 (6): 521-528.
Richard J. Hecker, Research Geneticist
Crops Research Division, ARS, USDA
Salinas, California

¹ Joint contribution of the Crops Research Division, Agricultural Research Service, U.S. Department of Agriculture, the Colorado Agricultural Experiment Station, and the Beet Sugar Development Foundation. Approved by the Colorado Agricultural Experiment Station for publication as Scientific Series Article No. 1006.