Title:
3098- The fascination of making a plant hybrid, only sweeter -- mechanisms responsible for the sucrose-enhanced hybridization of Actinidia

Author(s):
Dr. Bob Guthrie, 1810 Alameda Street, Roseville, MN 55113, United States of America; bobguthrie@comcast.net (presenting author)
Jeff Thole, Macalester College, 1600 Grand Avenue, Olin-Rice Science Center, 112, Saint Paul MN 55105-1899, United States of America; thole@macalester.edu (co-author)

Abstract body text:
For both intraspecific and interspecific Actinidia crosses, a mixture of preserved (i.e., dried and frozen) pollen and dry finely-ground sucrose when applied on the moist stigmatic surface markedly enhances pollen-tube germination. The presence of the exogenic sugar facilitates the migration and transfer of fluids that increase osmotic pressure and turgidity of the stigma that leads to early browning of the stigmas and styles, while the introduced pollen grains are partially enveloped by the stigma’s polyp-like structures. The added sucrose also leads to increased fruit set with initially larger berries compared to when just pollen is applied to the stigma, and improves the potential for viable seed production. Since the stored pollen takes longer to germinate, for Actinidia, the pollen-sugar mixture should be applied on an individual blossom within the three days of flowering in order to increase the potential for a successful cross. As preserved pollen remains viable for 7 to 10 years, and because the attributes of male pollenizers are not always known, it is possible to repeat promising crosses in subsequent years by mixing the stored pollen with the sucrose. This investigation details the utility of this process and documents the mechanisms observed during the initial stages of interspecific hybridization. This is a simple, yet effective technique that Actinidia plant breeders should consider for use to effect difficult crosses.