

Effect of low temperature near flowering time on ovule development and pollen tube growth in the grapevine (*Vitis vinifera* L.) cvs Chardonnay and Shiraz

A. Ebadi

Dept. of Horticulture, College of Agriculture, Tehran University, Karaj.

To study ovule development, small Chardonnay and Shiraz vines were grown in pots under controlled conditions at 25°/20°c day/night temperature until flowering or were transferred to 12°/9°c two days before flowering and then returned to 25°/20°c after one week. The ovules of flowers at three positions within the inflorescence were excised on the day after they had opened. The ovules exposed to the lower temperatures tended to be smaller and less advanced in development, even when otherwise normal, especially on Chardonnay, and the ovules of king flowers tended to be larger than those of the other flowers. Over half of the ovules of Chardonnay exposed to the low temperatures were abnormal (with abnormal or no embryo sacs, and some also having a degenerated nucellus) while 35% of the Shiraz ovules were without normal embryo sacs. To study pollination and pollen tube growth, vines similar to those of the ovule study were exposed to 12°/9°c two days before or on the day of flowering. In the pistils exposed to low temperature, a reduction occurred in the number of pollen tubes present in the lower ovary on days 2 and 4 after flowering, from about four to almost nil in Chardonnay, but a smaller reduction occurred in Shiraz. In the absence of cool temperatures, pollen tubes penetrated on average less than one ovule per ovary in Chardonnay and about one ovule per ovary in Shiraz. It is concluded that temperature sensitivity to fruit-set is a varietal characteristic, expressing itself in quantitative differences in the damage imparted to the structure of the ovules and the function of the pollen.