

### Abstract:

The influences of several endogenous and exogenous factors influencing water stress of cut roses during vase life have been studied using ultrasonic technique. Measurements of cavitations, detected as ultrasonic acoustic emissions (UAE), have been done at the peduncle due to a high sensitivity of this stem segment. To improve the information value of cavitation events long time UAE profiles instead of cumulative UAE are used in this paper.

As documented in literature for intact woody plants also for cut roses a close relationship between UAE rate and transpiration rate could be detected. Factors influencing transpiration such as photoperiod, leaf area and temperature influenced UAE in a strong way. Stems which did not follow this pattern often showed a reduction in vase life, obviously due to their loss of stomata control. Factors influencing water uptake or transport also determine occurrence and intensity of acoustic emissions. Shortening the stem length or the addition of preservatives delays the occurrence of acoustic events. Rose cultivars exhibit varying patterns of acoustic emission profiles. For water stress tolerant genotypes a delayed onset of cavitations under water stress and well expressed day/night rhythm of cavitation rates were characteristic.

From these experiments it can be concluded that cavitation profiles have a good perspective for studying water stress phenomena of cut roses. The use of such profiles opens up possibilities for optimizing the post-harvest process, for detecting water stress tolerant genotypes, and possibly also for a vase life prognosis of cut roses.