Poster: Water relations

Abs # 153: Effects of Water Stress on Xylem Anatomy, Xylem Functioning and Vase Life during Growth of two Zinnia Elegans cv's

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In cut flowers, hydraulic properties and dimensions of xylem vessels in the stem directly influence vase-life and thus post-harvest quality. Xylem hydraulic conductance as well as recovery from air embolisms at the start of vase life strongly depends on number, diameter and length of xylem vessels in the base of the cut flower stems. In this work we used two different water availability levels, low (20%v/v) and high (50%v/v) water content (LWC and HWC respectively) in the growing medium of two cv's of *Zinnia elegans* plants ('Envy', and 'Purple Prince') to modify xylem anatomy, post-harvest xylem functioning and vase life of cut flowers from these plants. Vase-life was longer among fresh-cut *Zinnia* flowers in both cv's grown under LWC medium. However, with vase life of HWC cut flowers, Envy had longer vase life than Purple Prince. Both cv's grown in high HWC were not able to sufficiently restore water uptake at the start of their vase life. Shoot hydraulic conductivity was lower in LWC or water-stressed plants of both cv's but it was not different among the two cv's within same treatment. Anatomical analysis showed smaller xylem vessel diameters in LWC plants of both cv's. Xylem vessel length was different in the two treatments in both cv but showed no difference between cv's. We conclude that within these *Zinnia elegans* cv's water stress conditions in the root environment significantly affected xylem anatomy and functioning which correlates well with a longer vase life. However, there is also genetic effect. Purple Prince cv is more interesting model plant for understanding xylogenesis process in water stress conditions. This *in planta* results form basis of *in vitro* studies of xylogenesis between these cv's currently going on in our laboratory.

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