

Demonstration of propagation of heat-stress signal via leaf vein system. A small spot of a dandelion leaf was intensely heated using a near-infrared laser pulse. The laser spot heating occurred between measurement 15 and 16 at the area of interest nr. 7. After the laser pulse, there was an immediate stimulation of photochemical quenching (qP) and of the effective quantum yield (Yield) along the vein system. With a delay of about 20 s, nonphotochemical quenching (qN or NPQ) propagated over the leaf vein system, accompanied by declines of qP and of Yield. While 20 s after the heating event the qN response was restricted to the close vicinity of the hole burnt by the laser beam, within the following 50 s a spectacular propagation of the qN response took place, which first was limited to the right hand side of the mid rib and then in the course of another 90 s also propagated to the left hand side of the mid rib.

The signal that propagated via the leaf vein system could involve depolarization of the cellular membrane potentials, moving from cell to cell via the plasmodesmata (Schreiber et al., 2003, PAMNews03-01.<http://www.pam-news.de>)