

LONG DISTANCE NITROGEN SIGNALING VIA CYTOKININ IN POPLAR

M. Cline*, M. Thangavelu and K. Dong-II

Plant Biology Department, The Ohio State University, 318 W. 12th Ave., Columbus, OH 43210 USA

Nitrogen fertilization of certain clones of young hybrid poplar trees strongly enhances sylleptic branching. Although direct treatment of undeveloped sylleptic buds with ammonium nitrate has no promotive effect on bud outgrowth, the daily treatment of these buds with cytokinin (1 mM benzyladenine) results in the initiation of vigorous outgrowth. B. Forde has hypothesized that nitrate applied to the roots of herbaceous plants can be transduced via *ipt* enzymes to cytokinin which can then be transported up the xylem to the shoot with subsequent binding to a CRE1-type receptor and promotion of leaf outgrowth. Sakakibara has demonstrated in Maize and in *Arabidopsis* that Type A response regulator genes in the shoot's receiver domain (triggering shoot growth) are inducible only by cytokinin and not by nitrate whereas nitrate can only be transduced to cytokinin in the roots and not in the shoots. The poplar data in the present study are consistent with the herbaceous model of nitrogen signaling of Forde and Sakakibara.