

**HIGH RESOLUTION ANALYSIS OF EXPANSION AND CELL  
PRODUCTION DYNAMICS UNDERLYING GROWTH RATE  
REGULATION IN ROOTS OF ARABIDOPSIS THALIANA.**

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Plants live in a variable environment to which they regulate their growth and development. Plant growth is often limited by water deficiency, typically though roots are less affected than shoots. Shoots stop growing at minor stress while roots are capable of continuing growth, even under severe drought conditions. Although root growth rate is reduced, the continued growth does imply regulation of the processes involved. Growth is the production and expansion of cells. I studied the role of both processes in regulation of growth by exposing seedlings of *Arabidopsis thaliana* to constant levels of water deficit.

Seedlings were grown on an agar-solidified nutrient media containing high molecular weight polyethylene glycol to mimic drought conditions. A moderate stress treatment increased root growth rate for the first few days and under severe water deficit root growth was decreased compared to well-watered controls. The increased growth rate under moderate stress was paralleled by longer cells and higher cell production rate, while under severe stress cell length was the same as under well-watered conditions and cell production was reduced by half.

Cell production can be altered either by changes in the number of dividing cells or by changes in cell division rate.