MATHEMATICAL MODELS FOR TISSUE STRESS IN GROWING PLANT ORGANS

S. LEWICKA, M. PIETRUSZKA

University of Silesia, Katowice, Poland

In this study we propose a very simple mathematical model based on the equilibrium equation for the materials deformed elastically or visco-elastically. The very well known properties of growing multicellular plant organs – i.e. the fact that owing to the turgor pressure of the cells the peripheral walls of the outer tissue are under tension, while the extensible inner tissue is under compression – has been proven by solving the equations analytically (for a "model organ") and numerically (for a typical tissue in the elongation zone of young maize shoot).