

GENETIC REGULATION OF BRANCH ORIENTATION AND GRAVITROPIC POTENTIAL IN TREES

Chris Dardick¹

¹USDA Agricultural Research Service, Appalachian Fruit Research Station, Kearneysville, WV

Tree architecture is intimately tied to environmental signals, most importantly light. Light impacts branch growth angles and, in turn, branch orientation influences the light interception by both the tree and through competitive shading of neighbors. We've identified a number of genetic factors that control branch angles. Among these are genes in the IGT gene family, which consists of TILLER ANGLE CONTROL1 (TAC1) and LAZY1. Reduction of TAC1 gene expression leads narrow, upright branch angles, whereas reduction of LAZY1 leads to non-vertical angles. Here we describe how IGT genes contribute to light-induced changes in branch angle in trees and other plants. Collectively the data suggest that IGT genes influence branch angles by integrating light and photosynthetic signals to modulate gravitropic potential.