Sweet success: Genes identified that could lead to sucrose-boosting GM sugarcane

Scientists in Brazil are taking steps towards genetically modifying sugarcane so it produces more sucrose naturally, looking to eventually boost the productivity and economic benefits of the tropical grass.

Currently, it is common for producers to raise sucrose levels in sugarcane by applying artificial growth regulators or chemical ripeners. This inhibits flowering, which in turn prolongs harvest and milling periods.

…

Ethylene, considered a ripening hormone in plants, contributes to increasing the storage of sucrose in sugar cane.

To study how ethylene acts on sugarcane, the researchers sprayed ethephon and an ethylene inhibitor … on sugarcane before it began to mature.

…

Those plants treated with the ethephon ripener had 60 percent more sucrose in the upper and middle internodes at the time of harvest….

The researchers were then able to identify genes that respond to the action of ethylene during ripening of the sugar cane.

“Knowing which genes or ripeners make it possible for the plant to increase the accumulation of sucrose will allow us to make genetic improvements in sugarcane and develop varieties that over-express these genes, without the need to apply ethylene, for example,” explained [Marcelo] Menossi [professor at the University of Campinas in Brazil].

Growing sugar cane to find genes

Scientists were then able to identify genes that regulate sucrose in sugar cane