

Genes to Increase Growth in Monocots

The Technology

Researchers at the University of Tennessee have identified switchgrass genes that increase biomass yield and cellulose content in switchgrass and have potential to increase biomass yield and cellulose content in other monocot species such as corn, rice and barley. When the sequence of the derived amino acids were compared with other plant homolog genes, the cluster analysis showed that the genes were clustered into three groups, and each switchgrass gene is clustered with its homolog from other monocot species such as rice, maize, and barley, with a high percentage of amino acid identity (up to 98%). Transient expression analysis of the switchgrass gene for subcellular localization using a fluorescent protein marker showed that the protein was localized to the plant plasma membrane. Transgenic switchgrass plants overexpressing the switchgrass gene were produced and the plants looked phenotypically normal and showed an increase in the plant height, number of tillers, and dry biomass weight.

Benefits

- Potential to create transgenic plants with increased plant growth.
- Potential to create transgenic plants to increase both plant biomass and cellulose content thereby increasing biofuel production per land area cultivated.

The Inventor



Dr. Neal Stewart is the director of the Tennessee Plant Research Center at The University of Tennessee. He is a professor of plant sciences and holds the Ivan Racheff Chair of Excellence in plant molecular genetics. The Stewart Lab's research spans plant biotechnology, genomics, and ecology. He has been performing agricultural biotechnology and biotechnology risk assessment research since 1994.