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(54) Title: TRANSGENIC PLANTS OF ALTERED MORPHOLOGY AND THE ISOLATED *ARABIDOPSIS THALIANA* ENDO-1,4- β -GLUCANASE GENE, PROMOTER AND PROTEIN

(57) Abstract

The present invention discloses genetically engineered plants which display altered structure or morphology. The transgenic plants express a cell wall modulation transgene or gene construct that results in the altered structure or morphology. The altered structure or morphology can be associated with, for example, altered biomass, growth, yield, greater or less resistance to biodegradation, more or less digestible to ruminants, altered cellulose content, larger leaves/normal hypocotyls or smaller leaves/longer hypocotyls, etc. compared to a non-transgenic plant of the same species. The cell wall modulation transgene can be any cellulose binding domain, a cellulose binding protein, or a cell wall modifying protein or enzyme such as endoxyloglucan transferase, xyloglucan endo-transglycosylase, an expansin, cellulose synthase, or a novel isolated endo-1,4- β -glucanase of *Arabidopsis thaliana*. The invention also discloses transgenic plants containing a gene construct comprising a promoter operably linked to the cell wall modulation protein or polypeptide gene and may further comprise a sequence encoding a secretion signal peptide. In particular, the invention discloses transgenic plants containing a gene construct comprising the cell promoter, operably linked to the cell signal peptide and any cellulose binding domain.