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Production of industrial enzymes in maize

Industrial enzymes are excellent technologies to apply in manufacturing to alleviate environmental pollution. Using plant-based materials allows manufacturing of goods from renewable resources. My laboratory and company are engaged in producing enzymes for industrial applications using the plant seed system. The advantages of the seed system are that the production costs can be quite low because scaling-up just involves planting more acres, the seed can be stored for years, and the enzymes are extremely stable in the seed. We use maize grain to express enzyme genes from fungal and bacterial sources that have specific applications in biofuels, bioproducts and waste water remediation. Genes for these enzymes are partially codon optimized and their expression is driven by either an embryo or an endosperm promoter and targeted to one of three subcellular locations—the cell wall, the endoplasmic reticulum or the vacuole. Expressed enzymes include three cellulases, a phospholipase, a Mn peroxidase, and a laccase. Once the gene is expressed and a high-expressing event chosen, breeding into elite inbred germplasm commences. Applications of the various enzymes will be discussed along with regulatory considerations.

Biography

Elizabeth E Hood has 35 years of experience in Biology. She is Distinguished Professor of Agriculture at Arkansas State University and; CEO of two biotechnology start-up companies—Infinite Enzymes, LLC and Infinite Eversole Strategic Crop Services, LLC. Previously, she was an Associate Vice Chancellor for Research and Technology Transfer at ASU; Program Director in Molecular and Cellular Biosciences at the National Science Foundation: Leader in forming one of the world's foremost transgenic plant research groups at ProdiGene, a plant biotechnology company. She has completed his PhD in Plant Biology at Washington University and MS in Botany awarded by Oklahoma State University.

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