Induction of Mutations in the Illinois Low Protein Strain. (A00-shore161817-Oral)

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Abstract:

Illinois Low Protein (ILP) is a strain of corn that has been bred to contain only 3% protein, while commercial strains contain roughly 9%. ILP also has a high starch concentration because grain starch and protein content are inversely related. Previous studies have suggested that many genes influence protein and starch concentrations, but the specific nature of these genes is unknown. One strategy for identifying the genes involved with protein and starch concentrations is to induce mutations and then study the traits of the mutant corn. In this experiment, point mutations were induced in genes of ILP using the chemical mutagen ethyl methanesulfanoate (EMS). Of the many mutations created with EMS, five appeared to represent defects in starch or protein biosynthesis. The mutant seeds were grown and the plants that developed were tested for comparison against known mutant strains using genetic crosses. The results of these tests make it possible to determine whether the mutants induced in ILP are novel or if they represent previously characterized genes. The induction of mutations in ILP promises to improve our understanding of the genes that control corn grain composition and may create novel genotypes that could have uses in grain processing applications.

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