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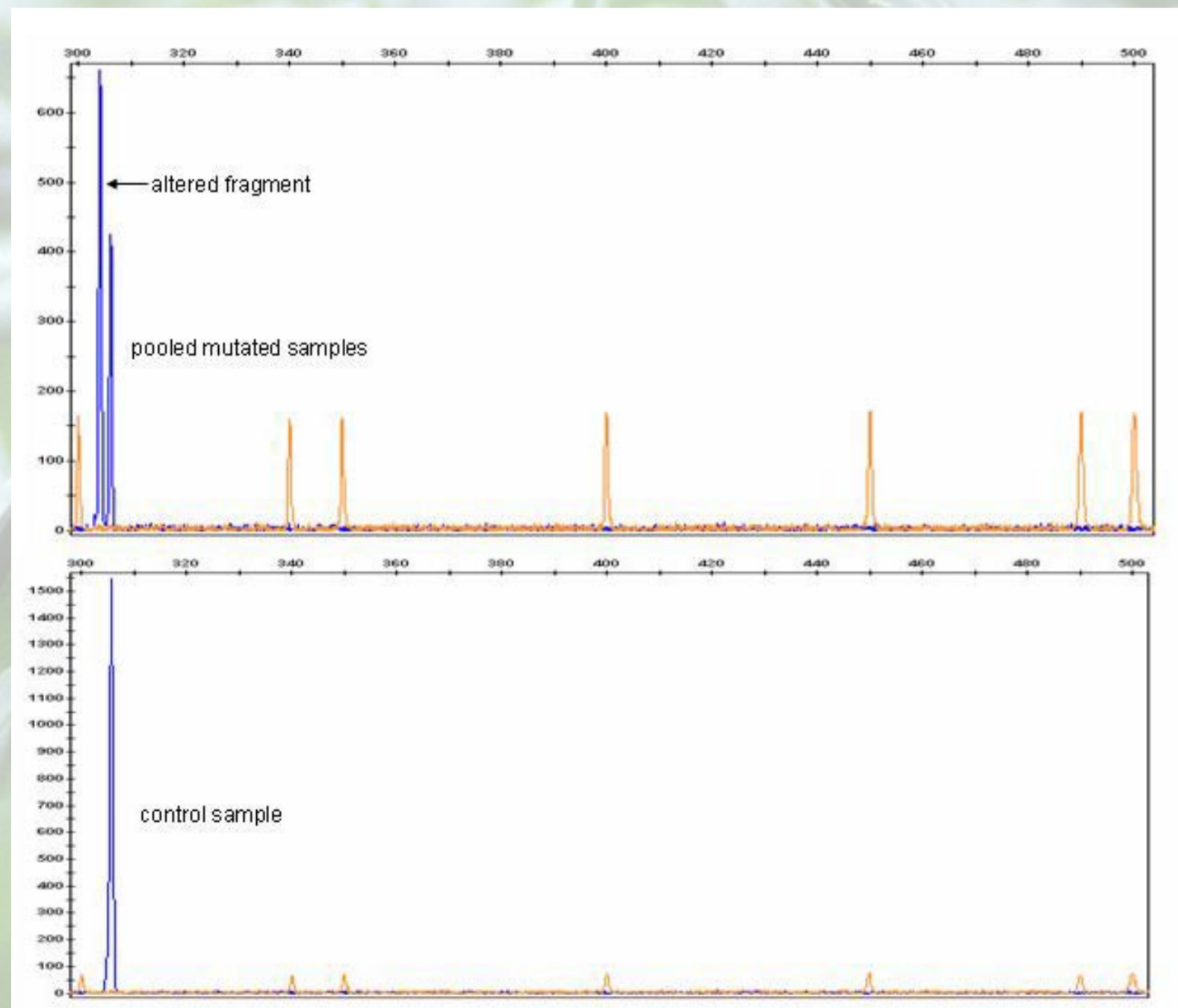
## Introduction

Induced mutation in plant breeding has resulted in thousands of novel plant varieties. Molecular technologies provide the tools to discover at the DNA level the exact determinants of specific phenotypic traits. Using the mutational effects of gamma irradiation, mutated sorghum populations were produced then analysed by gene-specific PCR and capillary electrophoresis for alterations in the DNA sequence. Individuals exhibiting any mutations at the gene locus of interest are selected to be assessed in regard to their phenotype for the genetic trait under investigation. Plants with novel characteristics can be used in genetic improvement programs.

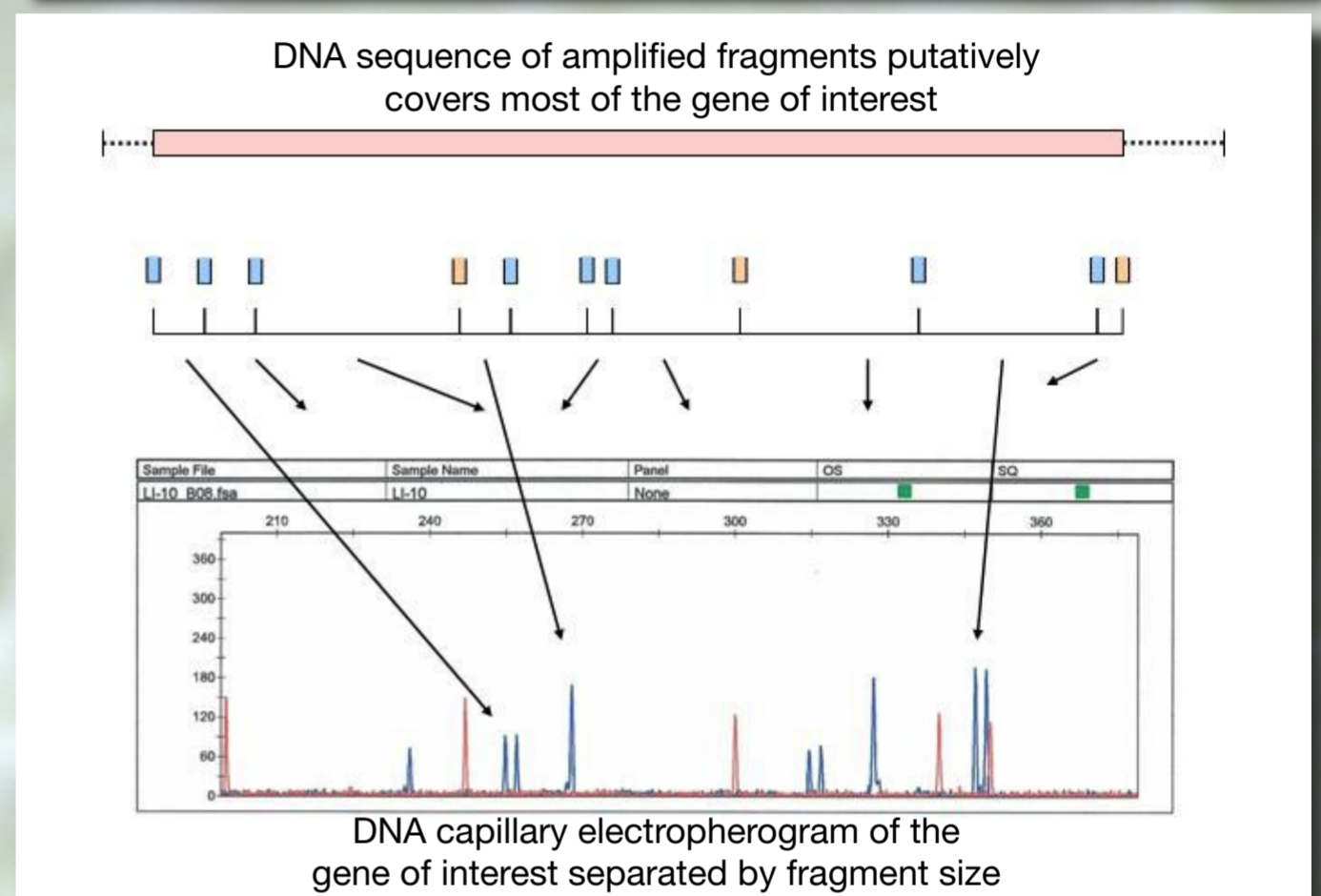
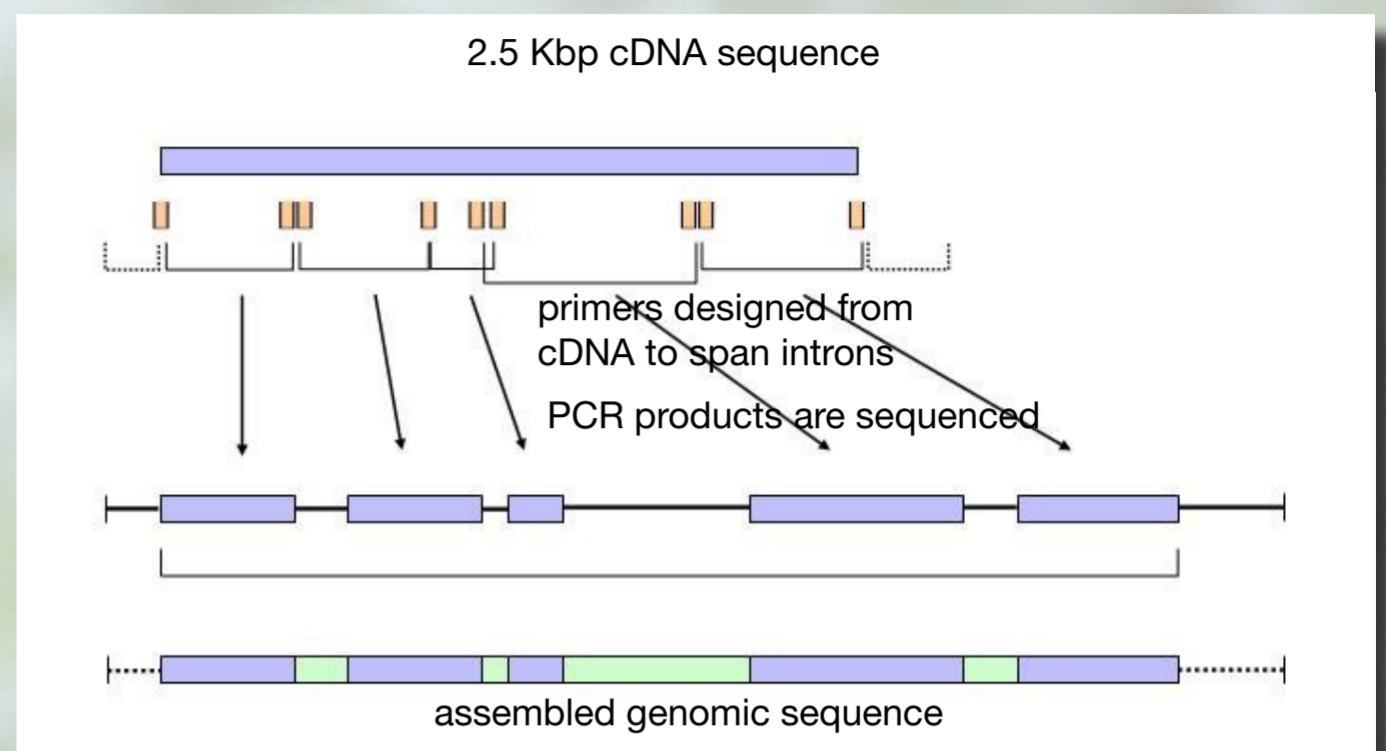
Known cDNA sequences from public EST databases of the gene of interest are used to design PCR primers to amplify fragments of genomic DNA across the unknown intronic regions.

Sequencing of the PCR products provides most of the genomic sequence of the gene of interest; additional optimised primers are designed to efficiently amplify fragments across all parts of the genomic sequence ensuring amplicons <450bp, ideal for multiplexing in capillary electrophoresis.

The procedure uses PCR and high resolution capillary electrophoresis and so enables samples to be pooled at various points to efficiently analyse large numbers of putative mutants



Mutation amongst pooled\* irradiated sorghum accessions detected as an additional PCR fragment in the Starch Branching Enzyme gene when compared with an untreated control sample (\*pool of PCR template from 5 samples)



Examples of mutations detectable include fragment relocations and deletions...

