

## **ABSTRACT**

# **MACHINE LEARNING-BASED PREDICTIVE MODELING OF OUTCOMES IN EMS-INDUCED PLANT MUTAGENESIS: AN INNOVATIVE APPROACH FOR GENETIC IMPROVEMENT**

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**June 2024**

Chemically mutating DNA by alkylating guanine bases, EMS is a mutagen that causes mutations that cause notable changes in the genotype and phenotype of plants that are treated. In order to predict the results of mutagenesis based on phenotypic and genotypic data gathered, this research focuses on building a predictive model using logistic regression. In training, the logistic regression model's accuracy was 65%, and in testing, it was 56%. These results show how plant breeding operations can be made more productive and efficient by combining conventional mutagenesis methods with cutting-edge machine learning techniques.