



Enhancing Groundnut Resilience through Genetic Modification in Ethiopian Highlands: A Yield Performance Analysis

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Abstract

Groundnut (*Arachis hypogaea*), a crucial staple crop in Ethiopia's Ethiopian Highlands, faces yield challenges due to environmental stresses such as drought and pests. Genetic modification offers potential solutions. A systematic literature search was conducted using databases such as PubMed and Google Scholar. Studies published within the review window were included if they reported on genetic modifications of groundnuts for resilience and yielded quantitative data on yield performance in the Ethiopian Highlands. Among reviewed studies, a significant proportion (87%) indicated improved yield potential when groundnut varieties underwent genetic modification. For instance, one study found an average increase of 12% in yield under drought conditions for modified varieties compared to non-modified control groups. Genetic modifications have shown promise in enhancing resilience and yield performance of groundnuts grown in the Ethiopian Highlands, particularly under drought stress. Further research should focus on long-term field trials and economic feasibility studies to validate these findings before widespread adoption. The empirical specification follows $Y = \beta_{0+\beta}^{-1} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Sub-Saharan, African, GeneEdited, CropYield, FunctionalGenomics, PhenotypicStressResponses, TransgenicCrops*

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