RETASTE Conference Abstracts
RETASTE-APP-1453-In-person Poster
Rethymno, September 16-18, 2026
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DOI:10.5281/zenodo.23678129

Integrating Peanut, Soybean, and Sweet Potato for a Holistic Approach to Combating Malnutrition

Yohannes Gelaye, and Prof.[1,2] and Huaiyong Luo[1]

[1]*Chinese Academy of Agricultural Sciences, China*
[2]*Debre Markos University, Ethiopia*

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Abstract

Malnutrition, particularly protein-energy malnutrition and deficiencies of vitamin A, iron, and zinc, remains a major global challenge (Ali and Bhattacharjee, 2023). This review evaluates the integrated cultivation of peanut (*Arachis hypogaea* L.), soybean (*Glycine max* L.), and sweet potato (*Ipomoea batatas* L.) as a sustainable strategy for addressing nutritional deficiencies and improving food security. These crops provide complementary nutritional benefits: peanut and soybean supply high-quality proteins, including arachin, conarachin, glycinin, and β-conglycinin, which compensate for the low protein content of sweet potato, while the lysine-rich amino acid profile of soybean complements cereal-based diets (Langyan et al., 2021). In addition, lipids from peanut and soybean, particularly oleic, linoleic, and α-linolenic acids, enhance β-carotene absorption from sweet potato, thereby improving vitamin A bioavailability (Neela and Fanta, 2019). The combined system also increases the availability of iron, zinc, folate, and antioxidants essential for growth, immunity, and overall health. Beyond nutritional benefits, integrated cultivation enhances land-use efficiency, improves soil fertility through biological nitrogen fixation and organic matter accumulation, diversifies farm income, reduces dependence on chemical inputs, and strengthens resilience to climatic stresses. Evidence from dietary diversification approaches suggests that integrating nutrient-dense crops can contribute significantly to reducing malnutrition and micronutrient deficiencies in vulnerable populations (Burchi et al., 2011). The review highlights the importance of supportive policies, strengthened seed systems, extension services, and nutrition-sensitive agricultural frameworks to promote adoption. Future research should focus on location-specific evaluations, gender-responsive implementation strategies, and long-term environmental and socioeconomic impacts. Collectively, the integration of peanut, soybean, and sweet potato represents a promising, nutritionally complementary, and environmentally sustainable approach to combating malnutrition and enhancing food-system resilience.

Keywords: Food security, Intercropping, Malnutrition, Protein, Soil fertility

References

Ali, A., Bhattacharjee, B., 2023. Nutrition security, constraints, and agro-diversification strategies of neglected and underutilized crops to fight global hidden hunger. Frontiers in Nutrition 10. doi:10.3389/fnut.2023.1144439.

Burchi, F., Fanzo, J., Frison, E., 2011. The role of food and nutrition system approaches in tackling hidden hunger. International Journal of Environmental Research and Public Health 8, 358–373. doi:10.3390/ijerph8020358.

Langyan, S., Yadava, P., Khan, F.N., Dar, Z.A., Singh, R., Kumar, A., 2021. Sustaining Protein Nutrition Through Plant-Based Foods. Frontiers in Nutrition 8, 772573. doi:10.3389/fnut.2021.772573.

Neela, S., Fanta, S.W., 2019. Review on nutritional composition of orange-fleshed sweet potato and its role in management of vitamin A deficiency. Food Science & Nutrition 7, 1920–1945. doi:10.1002/fsn3.1063.

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