Assessing Maize (*Zea Mays*) Biomass at Different Growth Stages: A UAV-Based Multispectral Study on Nitrogen Effects

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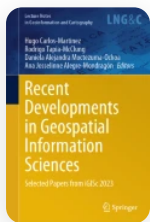
Recent Developments in Geospatial Information Sciences

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Abstract

This study analyzes the aboveground biomass (AGB) and nine vegetation indices (NDVI, GNDVI, NDRE, SAVI, ExG1, ExG2, GCI, MGRVI, and NGRDI). The study considers multiple influencing factors, including different maize hybrids, nitrogen fertilization levels, and

crop growth stages. The results highlight the sensitivity of NDVI and GCI in distinguishing physiological variations among maize hybrids. It's important to note that all the analyzed indices showed significant differences. Moreover, these vegetation indices present substantial sensitivity to variations across different fertilization levels. The study also observed that crop growth stages significantly influence AGB and vegetation indices. Among the analyzed indices, SAVI, ExG2, MGRVI, and NGRDI have the highest correlation with AGB, indicating their potential as indicators of plant biomass. Notably, the nitrogen fertilization level N2 presents a stronger correlation regarding biomass. These findings are crucial for enhancing agricultural management and optimizing plant growth assessment practices. They contribute valuable insights for improving crop yield and resource allocation strategies.

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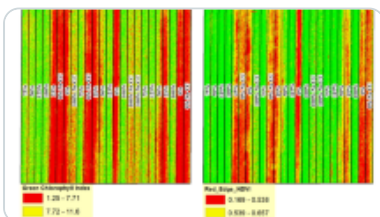
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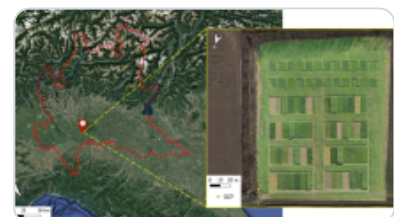Arshad S, Kazmi JH, Javed MG, Mohammed S (2023) Applicability of machine learning techniques in predicting wheat yield based on remote sensing and climate data in Pakistan, South Asia. Eur J Agronomy 147

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