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Crop Yield Prediction Using Machine Learning

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Abstract: *Machine learning plays a key role in helping farmers and decision-makers predict crop yields, assisting them in choosing which crops to grow and how to manage them throughout the growing season. To better understand the effectiveness of different machine learning methods, we conducted a systematic literature review. From six electronic databases, we initially gathered 567 relevant studies and, after applying our selection criteria, narrowed it down to 50 studies for in-depth analysis. We focused on identifying the commonly used algorithms and features in these studies. The analysis revealed that temperature, rainfall, and soil type are the most frequently used features for crop prediction, while Artificial Neural Networks (ANN) are the most applied machine learning models. In addition, we expanded our investigation to include studies specifically using deep learning techniques. We reviewed 30 papers in this category and found that Convolutional Neural Networks (CNN) are the most popular choice. Other widely used deep learning algorithms include Long Short-Term Memory (LSTM) networks and Deep Neural Networks (DNN). Overall, our findings offer insights into the prevalent approaches and highlight opportunities for future research in crop yield prediction using both machine learning and deep learning techniques.*

Keywords: Machine Learning, Crop Yield Prediction, Agricultural Analytics, Data Preprocessing, Feature Selection, Meteorological Data, Soil Characteristics.