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Optimizing Agriculture Market Systems and Crop Advice using Machine Learning and Web-Based Applications

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Abstract: *This paper presents a smart agricultural assistance platform aimed at improving the crop selection process and streamlining the agricultural marketplace for farmers. The system integrates a machine learning-based crop recommendation model, a crop encyclopedia for knowledge dissemination, and a buy-sell platform to facilitate transparent transactions between farmers and consumers. Data-driven techniques are utilized to guide farmers toward optimal crop choices based on soil, weather, and economic factors. The platform also acts as a digital market, minimizing intermediaries and enabling better price realization. This end-to-end system is implemented using web technologies such as HTML, CSS, JavaScript, React, and a backend powered by SQL and Flask. The experimental results demonstrate improved decision-making support for farmers, market access, and awareness, thus contributing toward sustainable agriculture practices in India*

Keywords: *Crop recommendation, Agricultural market system, Machine Learning, ReactJS, Flask, Smart farming, Data-driven agriculture*