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Research Article

OPTIMIZING CASHEW PRODUCTIVITY: ENHANCING SITE-SPECIFIC NUTRIENT MANAGEMENT WITH A MOBILE APP IN COASTAL INDIA

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ABSTRACT

This study explores the utilization of a mobile app to improve cashew productivity through site-specific nutrient management in coastal India. Cashew cultivation is a significant economic activity in this region; however, inefficient nutrient management practices often result in suboptimal yields. To address this issue, a mobile app was developed to provide farmers with real-time information on soil nutrient levels, tailored nutrient recommendations, and application schedules based on site-specific conditions. The app aims to enhance the efficiency and accuracy of nutrient management, ultimately leading to increased cashew productivity. Through the app, farmers can access comprehensive data on soil fertility, nutrient deficiencies, and appropriate fertilizer dosages, facilitating informed decision-making. By implementing this technology, farmers can optimize their nutrient management practices, minimize input wastage, reduce environmental impact, and improve their overall productivity and profitability. This study investigates the efficacy of the mobile app in terms of its usability, impact on nutrient management practices, and subsequent effects on cashew yields. Findings from this research will contribute to the development of sustainable and technology-driven solutions for enhancing cashew productivity in coastal India.

KEYWORDS

Cashew, nutrient management, mobile app, site-specific, productivity, coastal India, soil fertility, fertilizer, sustainability, technology.

INTRODUCTION

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Cashew cultivation plays a crucial role in the agricultural economy of coastal India, providing livelihoods for numerous farmers. However, suboptimal nutrient management practices often hinder cashew productivity in the region. Inefficient fertilizer application, inadequate understanding of soil nutrient requirements, and lack of site-specific recommendations contribute to yield losses and increased input costs. To address these challenges, the present study proposes the utilization of a mobile app as a tool for enhancing site-specific nutrient management in cashew cultivation. The mobile app aims to provide farmers with real-time information, tailored nutrient recommendations, and application schedules based on their specific field conditions. By optimizing nutrient management practices through this technology-driven approach, cashew farmers can potentially improve their productivity, reduce environmental impact, and enhance their profitability.

METHOD

Mobile App Development:

The first step involved developing a mobile app specifically designed for cashew farmers in coastal India. The app was designed to provide a user-friendly interface, allowing farmers to input their field data, access soil nutrient information, and receive customized nutrient recommendations.

Database Creation:

A comprehensive database was compiled, consisting of soil fertility data from cashew-growing regions in coastal India. This database included information on nutrient levels, soil types, and cashew productivity from various locations. The data formed the basis for generating site-specific nutrient recommendations.

Nutrient Recommendation Algorithm:

An algorithm was developed using the database to generate nutrient recommendations based on the farmer's input data, such as soil type, nutrient levels, and cashew growth stage. The algorithm considered optimal nutrient ratios, crop nutrient requirements, and soil fertility indicators.

Field Trials:

Field trials were conducted in collaboration with cashew farmers in coastal India. Participating farmers were provided access to the mobile app and trained on its usage. Experimental plots were established, and the app-guided nutrient management practices were implemented. Control plots with conventional nutrient management practices were also maintained for comparison.

Data Collection and Analysis:

Data on nutrient application, crop growth, and yield parameters were collected from both the app-guided plots and control plots. Parameters such as plant height, leaf nutrient content, flower and fruit development, and yield were recorded at regular intervals. The collected data were analyzed to assess the impact of the mobile app on nutrient management practices and cashew productivity.

Evaluation and Feedback:

Farmers' feedback regarding the usability, effectiveness, and economic viability of the mobile app was collected through surveys and interviews. Their perspectives on the app's impact on nutrient management and productivity were recorded to evaluate its overall performance.

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The combination of mobile technology, site-specific nutrient recommendations, and field trials provides a comprehensive approach to optimize cashew productivity in coastal India. The integration of this technology-driven solution has the potential to revolutionize nutrient management practices, leading to sustainable cashew cultivation and improved livelihoods for farmers in the region.

RESULTS

Usability and Adoption:

The mobile app was found to be user-friendly and easily adopted by cashew farmers in coastal India. Farmers reported that the app interface was intuitive, and they were able to input their field data without difficulty.

Site-Specific Nutrient Recommendations:

The mobile app provided site-specific nutrient recommendations based on farmers' input data and the database of soil fertility information. The recommendations took into account the specific soil type, nutrient levels, and cashew growth stage, ensuring more accurate and tailored nutrient management practices.

Improved Nutrient Management:

Farmers using the mobile app demonstrated improved nutrient management practices compared to those relying on conventional methods. The app-guided farmers followed recommended fertilizer dosages, timings, and application techniques more effectively, resulting in better nutrient utilization and reduced wastage.

Enhanced Cashew Productivity:

The implementation of site-specific nutrient management through the mobile app positively impacted cashew productivity. The app-guided plots exhibited healthier plant growth, higher leaf nutrient content, improved flower and fruit development, and ultimately higher yields compared to the control plots.

Economic Benefits:

Farmers using the mobile app reported improved profitability due to higher cashew yields and reduced input costs. By optimizing nutrient management practices, farmers were able to achieve better returns on their investment and enhance their overall economic viability.

DISCUSSION

The introduction of the mobile app for site-specific nutrient management in cashew cultivation proved to be a promising approach in coastal India. By leveraging technology and data-driven recommendations, farmers were able to make informed decisions regarding fertilizer application. The app facilitated precision agriculture by considering the specific nutrient requirements of cashew plants and tailoring recommendations to individual field conditions. This approach not only optimized nutrient utilization but also minimized the risk of over-application or deficiency, resulting in improved plant health and productivity.

The successful adoption of the mobile app by cashew farmers highlights their willingness to embrace technological solutions to enhance their agricultural practices. The app's user-friendly interface and accurate nutrient recommendations contributed to its high usability and acceptance among farmers. The integration of real-time data and on-field observations enabled timely decision-making, contributing to

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efficient nutrient management and improved cashew yields.

The study also emphasized the environmental benefits of site-specific nutrient management. By accurately supplying nutrients according to plant requirements, the app-guided approach reduced the risk of nutrient runoff and groundwater contamination. This sustainable practice aligns with the principles of precision agriculture, promoting responsible resource management and minimizing environmental impact.

CONCLUSION

The utilization of a mobile app for site-specific nutrient management proved to be a valuable tool for optimizing cashew productivity in coastal India. The app provided farmers with real-time information, customized nutrient recommendations, and application schedules based on their specific field conditions. The integration of technology-driven solutions improved nutrient management practices, resulting in healthier cashew plants, increased yields, and enhanced profitability.

By adopting the mobile app, cashew farmers in coastal India can make informed decisions regarding fertilizer application, ensuring that nutrients are supplied in an efficient and tailored manner. This approach minimizes input wastage, reduces environmental impact, and contributes to sustainable cashew cultivation. The successful implementation and positive outcomes of the mobile app highlight its potential as a practical and effective solution for enhancing productivity in other cashew-growing regions as well.

In conclusion, the integration of site-specific nutrient management with a mobile app has the potential to revolutionize cashew cultivation practices, leading to improved livelihoods for farmers and sustainable growth in the coastal regions of India.

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