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Technical Report · December 2024

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T1A22. SATHI: The digital ecosystem driving quality assurance in Indian agriculture

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Seed certification is a quality assurance system whereby seed intended for marketing is subject to quality control and inspection. The Government of India is embarking on a transformative endeavor, the Seed Traceability Project, to build a Digital Ecosystem, to effectively monitor the seed production and distribution chain and to provide complete traceability of the seeds from point of origin till sale. This is a Centralized Online System for Seed Traceability by the Department of Agriculture and Farmers Welfare (DA&FW). This system encompasses a comprehensive array of features designed to ensure the utmost efficiency, transparency, and quality assurance throughout the seed production chain. Key components of the Seed Traceability Portal include the implementation of QR codes printed on seed packets, facilitating quality assurance and tracking of spurious seeds. The system integrates seven verticals of the seed chain, spanning research organizations, seed certification, licensing, inventory management, sales, and subsidy disbursement. Through this framework, only seeds with valid certification can be sold by licensed dealers to registered farmers, who receive subsidies directly in their pre-validated bank accounts via Direct Benefit Transfer (DBT). Moreover, the system enables real-time monitoring and automation of various processes, from seed certification to inventory management, dealer registration, and license issuance. Each seed packet is tagged with a QR code/barcode containing essential information, such as source details, grower information, production details, and relevant regulatory compliance data. Crucially, the Seed Traceability system harnesses blockchain technology to ensure tamper-proof records and uniformity across the nation. State-specific server nodes communicate with a central blockchain server, enabling secure and immutable data storage. By enhancing traceability and accountability, this initiative promises to revolutionize the seed industry in India, fostering a paradigm shift towards greater transparency and efficiency. To monitor these events, an online portal has been already developed and in use with a name SATHI. The purpose of the SATHI portal is development and hosting of a national portal for automation of the entire life cycle of seeds which includes seed certification, seed traceability and seed supply chain for all the states of India.
Keywords: *SATHI portal, traceability, inventory management, QR codes*

T1A23. Seed quality assurance: challenges and solutions

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Ensuring seed quality is an essential component of modern agriculture. Quality seed is the most vital and basic input which regulates agriculture for enhanced production and productivity as the nucleus in a cell. Quality seed and varietal improvement have played a significant role in better utilization of inputs and thereby contributed to enhanced agriculture production. Improved varieties with good quality seed contribute up to 45 percent in crop production under optimum management. The contribution of quality seed alone for production is estimated to be about 15-20 percent depending upon crops. In the face of today's unpredictable environmental conditions, where plants are challenged by unfavorable and uncertain weather patterns, the risk of reduced crop yields looms large. To mitigate this risk and ensure a robust harvest, the importance of using high-quality seeds becomes evident. Certifying the quality of seeds is a vital component of today's agriculture. As the world's population continues to grow per day and arable land remains scarce, the demand for good quality seeds becomes increasingly apparent to maximize agricultural productivity within limited space and save the world from food scarcity. Access to high-quality seeds is imperative for optimal crop production. However, this vital component of the agricultural supply chain is not without its challenges. There are several challenges associated with maintaining seed quality. In this study, we have explored the challenges faced in seed quality assurance and