Goodbye Cold Storages: IIT Indore’s Cost-Effective Solution for Rural India

OR

Smart Storage for Farmers: IIT Indore's Game-Changer for Farmers

IIT Indore, a leading institute in Central India, is making strides in improving rural life through innovative research. With initiatives spearheaded by the Centre of Rural Development and Technology (CRDT), the institute has adopted nearby villages and addressed critical issues like sustainability, post-harvest management, water and sanitation, solid waste management, education, and governance.

Prof. Suhas Joshi, Director, IIT Indore said, “Recognizing the challenges faced by small and marginal farmers in Madhya Pradesh, IIT Indore has developed a groundbreaking alternative to cold storage facilities for preserving vegetables and grains.” Led by **Prof. Debayan Sarkar**, with significant contributions from student **Niladri Sekhar Roy**, this innovative technology provides a cost-effective and environmentally friendly solution to tackle post-harvest storage issues.

The system employs Photodynamic Inactivation (PDI) of microbes using a specially designed kit. This kit utilizes a safe, derivatized Vitamin B2 spray as a photosensitizer and a flash visible light source at effective wavelengths of 455 and 476 nm. This combination effectively destroys microbes on open and packed food items, ensuring complete sterilization and preventing microbial reproduction.

Prof. Debayan Sarkar added “The system incorporates IoT-enabled features for enhanced functionality. Farmers can manage and monitor the device remotely through a mobile app, which also provides a user-friendly interface for customer interactions. A bottom-view camera is integrated for visualization and monitoring during operation. Designed to fit in a small 10x10 ft room, the system can store significant quantities of vegetables and fruits, extending their shelf life and keeping them fresh longer.”

This visible disinfectant lighting system, which combines chemical and visual lighting, is safe, energy-efficient, and customizable. It is suitable for industrial use, warehouses, and other large-scale applications while prioritizing human health. Delivered on a subscription model, the device is accessible and affordable for small farmers, reducing dependency on expensive cold storage facilities and increasing their profits.

IIT Indore’s post-harvest storage solution promises to be a game-changer for small-scale farmers, providing an eco-friendly and cost-effective way to preserve their produce, enhance food security, and reduce environmental impact.

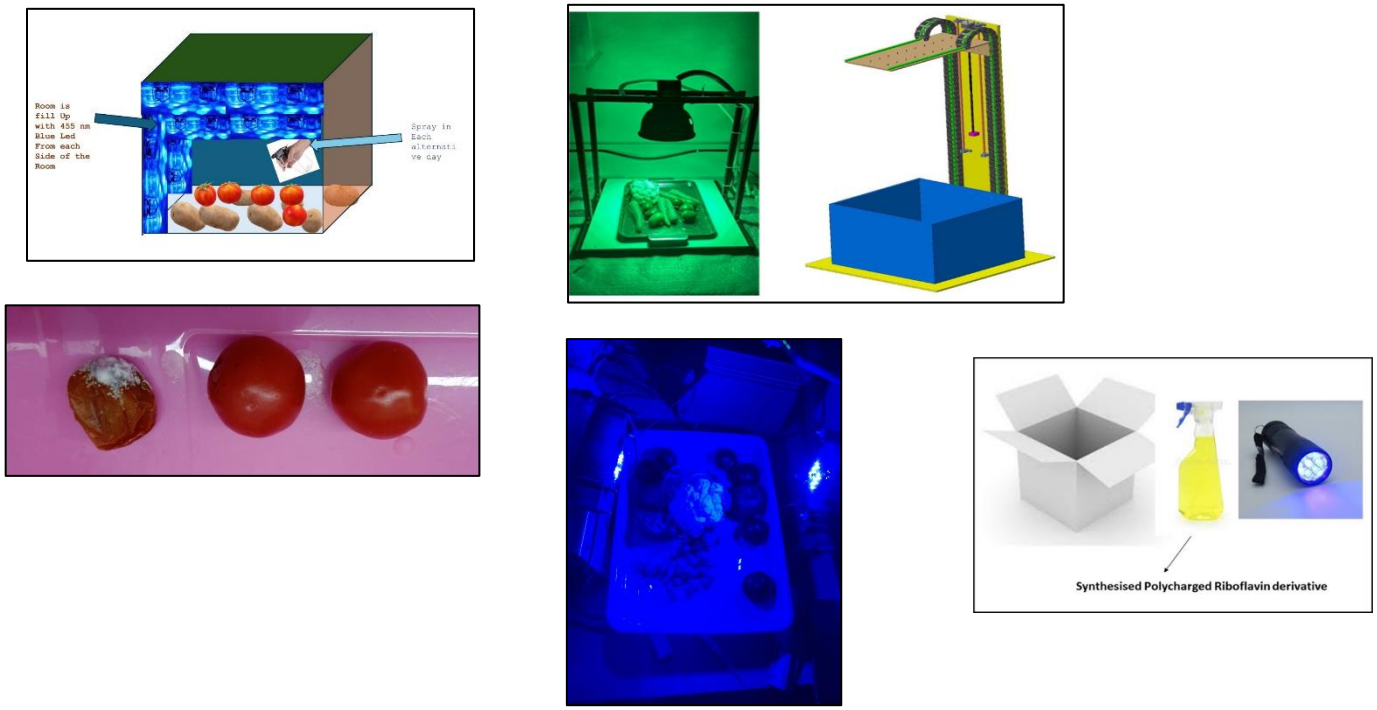

Figure 1: Overview of Developed PDI storage Technology