IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 3, January 2026
Impact Factor: 7.67

Automated Canopy System

Rohini Walke[1], Samarth Mole[1], Rohan More[1], Sonali Salunkhe[1], Rahul Jadhav[1], Suhas B Khadake[2]
[1]EE Students, SVERI's College of Engineering, Pandharpur. India
[2]Assistant Professor, SVERI's College of Engineering, Pandharpur. India
suhaskhadake@gmail.com

Abstract: *Unpredictable and heavy rainfall poses a major challenge in open-field agriculture, leading to waterlogging, soil erosion, and crop yield loss. Existing crop protection methods are often costly, labor-intensive, and slow to respond during sudden rainfall events.*

This paper presents an automated crop protection system that uses rainfall and soil moisture sensors with a smart control unit to deploy a dual-side retractable waterproof canopy in real time. The structure is supported by height-adjustable poles, enabling adaptation to different crop heights and growth stages. The system making it modular, eco-friendly, and cost-effective.

Due to its flexible and scalable design, automated canopy system is suitable not only for agriculture but also for wide applications such as open storage areas, warehouses, nurseries, temporary shelters, and industrial yards. The results confirm that the proposed system effectively reduces crop damage, minimizes labor dependency, and enhances overall resilience against adverse weather conditions..

Keywords: automated crop protection, rainfall monitoring, retractable canopy system, climate-resilient farming