

Peer Review

Review of: "Artificial Intelligence & Nature-Based Solutions in Agriculture: A BT Cotton Pest Management Case Study in India"

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The paper explores an AI-based pest management tool ("cottonace") for Bt cotton farmers in India, focusing on controlling the pink bollworm pest. Field trials in Karnataka and Maharashtra showed that using the AI advisory helped farmers improve yield by up to 22% and increase income by about 20-25%, mainly through better-timed pesticide sprays. The study also discusses competing nature-based pest control methods and the socioeconomic and environmental benefits of AI-assisted integrated pest management. The authors provide a balanced view, noting limitations such as farmer reluctance to perform manual trap checks and climate variability affecting pest pressure.

Notes for Improvement:

Expand Socioeconomic Analysis: Include more insights on farmer adoption barriers, digital literacy, and willingness to pay to understand scalability.

Deepen Climate Impact Discussion: Analyze how climate variability (e.g., heavy rainfall) affects AI tool reliability and pest dynamics in more detail.

Compare with Competing Technologies: Provide direct comparative data or analysis on cost, effectiveness, and scalability versus other pest management approaches like mating disruption or mechanical models.

Enhance Environmental Impact Metrics: Quantify pesticide reduction benefits with environmental or health data to strengthen claims about sustainability.

Clarify AI Novelty: Elaborate on what distinguishes this AI solution from traditional monitoring or mechanical advisory systems.

Discuss Long-Term Sustainability: Consider pest resistance evolution, cost-benefit over multiple seasons, and labor impacts in the long run.

Declarations

Potential competing interests: No potential competing interests to declare.