

## The Challenge

**Problem: Modern agriculture relies on AI, but bad AI advice causes crop failures, economic loss, and safety hazards.**

### Crop Failures

Incorrect AI recommendations lead to devastating crop losses

### Economic Loss

Bad advice results in significant financial damage for farmers

### Safety Hazards

Unreliable AI guidance creates dangerous situations



# ExplAIInCheck

## AI Explanation Verifier for Smart Agriculture



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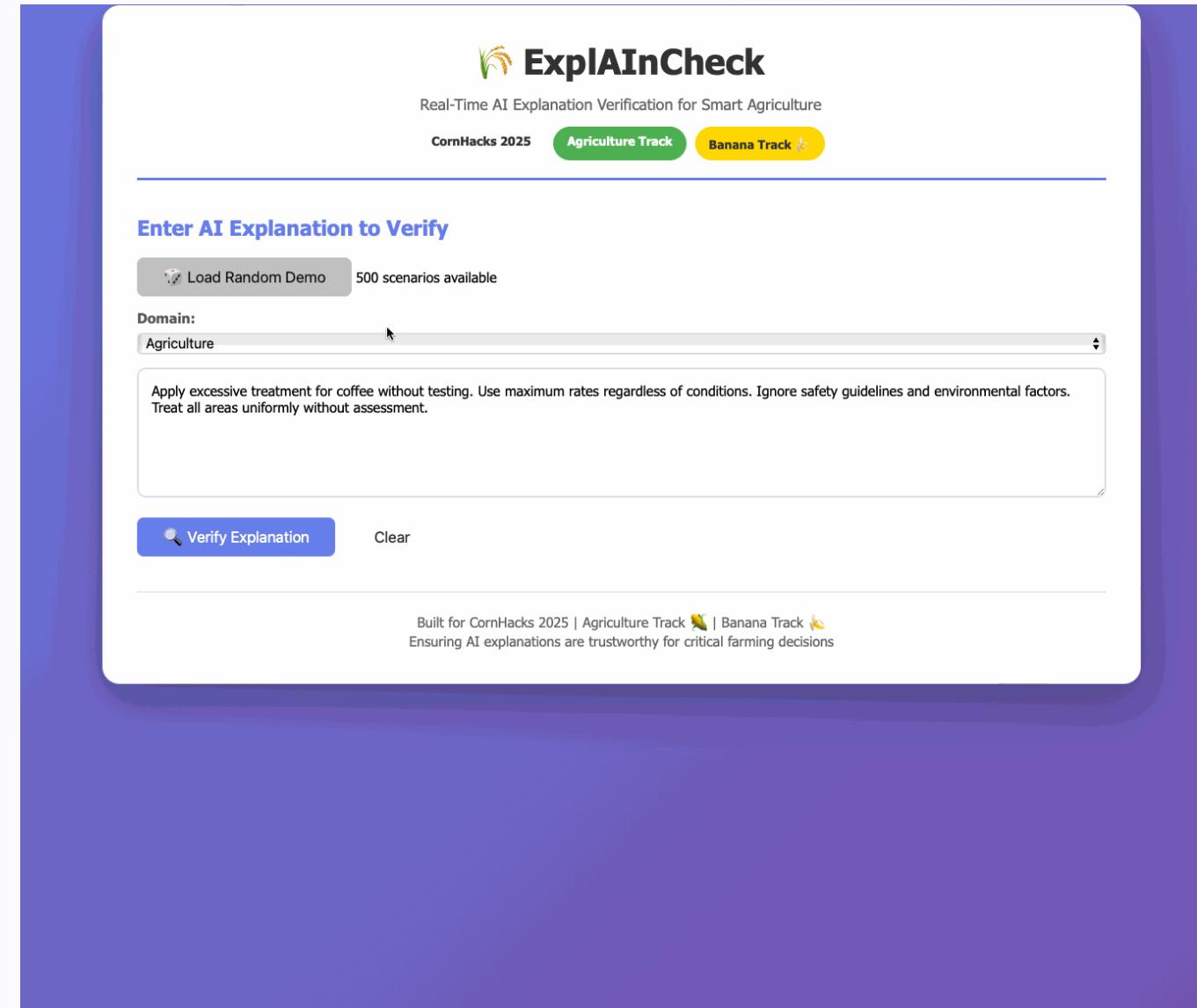
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## Value Proposition

**Solution: ExplAInCheck—world's first real-time, interactive verifier to check AI explanations for farming decisions.**

"Try it live:" [ExplAInCheck Demo](#)

- 01 AI provides farming advice
- 02 ExplAInCheck verifies in real-time
- 03 Farmer receives validated recommendations



# Why This Approach is Unique ?



## ExplAIInCheck

*Formal logic verification | interactive error detection*

**Choudhury, S. D. (2025).**  
Explainable AI for Precision Agriculture: A Data-Driven Approach to Crop Recommendation. UNL, School of Natural Resources.

Focus on transparency rather than formal logic verification

**Lu, Y. et al. (2023).** AI-Driven Validation of Digital Agriculture Models. PMC – NIH.

Not Fully interactive for each claim for Agricultural Recommendations

**AI Verify Foundation (2025).**  
AI Verify: AI Governance Testing Framework.

These typically focus on the system level, not human-readable, interactive explanation verification of individual recommendations.

**Gu, K., Shang, R., Althoff, T., et al. (2024).** How Do Analysts Understand and Verify AI-Assisted Data Analyses? arXiv:2309.10947.

Not Specialized for Agriculture

## Market & Industry Size

Agriculture tech (AgTech) is projected to hit \$25B+ by 2025, with global farms going digital.

Target users: Farmers, ag businesses, food producers.



## Novelty & Innovation

No other product verifies AI farming advice in real-time, interactively, and in plain English.



### Formal Methods

Rigorous mathematical verification ensures accuracy and reliability



### SAT/SMT Solvers

Advanced computational logic validates AI reasoning



### Domain-Specific NLP

Natural language processing tailored for agricultural contexts

Novelty & Innovation

# Technical Architecture

**Web Frontend** |  
React +  
TailwindCSS  
(User Input)

**REST API**  
| Flask  
Backend

**NLP Parser**  
(Spacy +  
Agriculture NER  
Domains)

**Formal Verifier**  
(Z3 SMT Solver  
Agricultural  
Constraints)

**Results Generator**

## Applications

# Crop Management, Irrigation, Soil Health, Pest Control, Food Safety, Banana Examples.



### Crop Management

Verify AI advice on planting schedules and crop rotation



### Irrigation

Validate water management recommendations



### Soil Health

Check nutrient and pH level guidance



### Pest Control

Ensure safe and effective pest management



### Food Safety

Verify compliance with safety standards



### Banana Examples

Specialized verification for banana cultivation

Future Work

## Integrations



Mobile app



IoT sensor support



blockchain tracking



multilingual rollout



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