

Research Highlights

Commentary on Extension Programming: An Online Platform for Area-Wide Management of Western X-Disease

Khashi Ghorbani; Shady S. Atallah; R. Karina Gallardo

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Overview

Western X-disease (WXD) poses a significant threat to sweet cherry production in the western United States by rendering fruit unmarketable through reduced size, poor color, and inferior flavor. Because the disease is transmitted by highly mobile leafhopper vectors, effective management often requires coordinated action across farms. This study presents an Extension program designed to support area-wide management (AWM) of WXD through an online decision-aid platform grounded in bioeconomic analysis.

Extension Program Design

The Extension program was developed using a logic model to ensure alignment between the problem definition, target audience, objectives, and outreach activities. The core of the program is a web-based platform that provides transparent, research-based recommendations on optimal tree removal rates. The platform is built on a previously developed bioeconomic model of WXD management and allows users to input orchard-specific characteristics such as tree density, orchard size, yield potential, and disease pressure.

A key innovation of the platform is its ability to reduce strategic uncertainty among growers. Participants voluntarily share information about the number of infected trees removed from their orchards, which can be verified using publicly available satellite imagery. This feature increases confidence in collective participation and addresses a common barrier to successful AWM programs.

Economic Insights

Simulation results illustrate the economic benefits of coordinated disease management. Compared to a no-management scenario, removing symptomatic trees increases net present value (NPV) at the farm level. When removal is implemented within an AWM framework, reduced incoming infection pressure from neighboring orchards generates additional gains. For a representative Washington State sweet cherry orchard, participation in AWM increases long-term profitability relative to unilateral management decisions.

Implications for Extension and Policy

The study demonstrates how integrating bioeconomic modeling with Extension programming can enhance growers' decision-making and promote collective action. The

online platform complements traditional Extension tools such as workshops, fact sheets, and presentations by offering real-time, customized economic analysis. Beyond Western X-disease, the framework presented in this study can be adapted to other pest and disease challenges where regional coordination is essential. The results underscore the role of Extension-led digital tools in improving participation, accountability, and economic outcomes in area-wide disease management programs.