

ASSESSMENT OF ANTHRAQUINONE (AQ) WOOD POLE TREATMENT



Woodpeckers can cause significant damage to wood poles in a short amount of time

PROJECT HIGHLIGHTS

- Provide independent analysis of Anthraquinone (AQ) as a treatment for mitigating woodpecker damage.
- Investigate the compatibility of AQ-treatment with wood preservative treatment processes.
- Measure the fate and transport of AQ in soil and groundwater.
- Investigate the effects of AQ on the deterioration rates of poles treated with existing wood preservatives.

Background, Objectives, and New Learnings

Woodpeckers cause severe damage to wood utility poles, resulting in significant annual economic losses to electric companies. Poles damaged by woodpeckers are a safety hazard to workers, may experience accelerated decay due to water trapped in holes, and may collapse under adverse conditions.

One option for repelling woodpeckers is to apply a treatment containing anthraquinone (AQ) to wood poles in areas prone to damage. The product is marketed under the brand names Flight Control, Airepel®, or AV1011 as a feeding deterrent against several species of birds on agricultural crops, lawns, and turf. A small-scale study performed in the southeastern United States has indicated that these products may diminish wood pole damage from woodpeckers.

Currently, AQ is applied by mixing it with a primer and painting it onto the surface of the wood pole, although it may also be possible to incorporate treatment into pole manufacturing. No independent research on the engineering and environmental impacts of AQ as a wood pole treatment exists. Utilities want to understand the properties and performance of AQ prior to approving widespread distribution of wood poles treated with the substance.

This research is designed to improve the understanding of AQ as a treatment for wood poles by addressing the following questions:

- Can AQ be integrated into the pressure-treatment process used to apply water-borne and oil-borne wood pole preservatives?
- What concentrations of AQ are required to deter woodpeckers and how do concentrations change over time?
- What effect does AQ-treatment have on the degradation rate of wood poles treated with existing preservatives?
- How does AQ performance vary with pole species and preservative treatment?
- How does AQ affect wood pole engineering characteristics compared to poles treated with a preservative only?
- What end-of-life options are available for poles treated with AQ?
- What are the toxicity and environmental fate and transport characteristics of AQ?

The research proposed here aims to fill knowledge gaps regarding the engineering and environmental characteristics of AQ when applied to treated wood poles and its compatibility with preservative treatment processes and performance.

Benefits

This project is expected to enable utilities to:

- Develop practices to manage potential environmental, human health, and ecosystem risks for AQ
- Define design criteria to account for potential differences in engineering performance
- Establish pole fleet management practices that facilitate long pole life

This project could benefit the public by preventing outages caused by woodpecker-induced pole failure, improving reliability. This project could also improve public safety by understanding the environmental and human health implications of AQ prior to adoption.

Project Approach and Summary

EPRI plans to assess the feasibility of combining pressure impregnation of AQ with existing wood pole treating processes. EPRI also plans to investigate the engineering and environmental performance of poles treated with AQ combined with existing pole preservatives. The following tasks are planned.

- Assess feasibility of incorporating pressure impregnation of AQ with preservative treatments, including development of methods to treat poles with AQ and determining the concentrations required to deter woodpeckers.
- Determine the effect of AQ on the deterioration rate of wood stakes treated with standard preservatives.
- Mechanical and electrical testing of poles or pole sections, such as material hardness assessments to quantify climbability, and conductivity testing.
- Flammability testing to assess impact of fire exposure on pole performance.
- Environmental impact of AQ, including review of published human health and ecosystem toxicology data and determining if AQ and its degradation products leach from wood poles into the environment.

Data collection and analysis is expected to take place over five calendar years.

Deliverables

- A minimum of annual webcasts to update participants on progress and results.
- Interim report(s) as research results emerge.
- A final technical report reviewing literature survey findings, test approaches, research results, and how results can be applied.

The non-proprietary results of this work will be incorporated into EPRI's R&D programs, and available to the public for purchase, or otherwise.

Price of Project

The cost to participate is \$150,000 which can be split over the five-year duration of the project. This project qualifies for Self-Directed Funding (SDF). The project requires a minimum of three (3) funders to begin and ten funders to execute the planned scope.

Project Status and Schedule

The project will begin when three (3) participants have joined May 2024 and end in 2029.

Who Should Join

Utilities experiencing woodpecker damage to wood poles.

Contact Information

For more information, contact the EPRI Customer Assistance Center at 800.313.3774 (askepri@epri.com).

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