

Research Summary

Using Mycofiltration Treatment for Stormwater Management

Research Need

Environmental regulations require stormwater management to improve water quality from transportation projects. Mycofiltration is a process that uses fungal webs as biological filters within organic matter and soil. Scientific literature shows benefits for water quality improvement and plant health from mycofiltration. A comprehensive review of existing research is needed to determine if and how MassDOT could use this technology successfully.

Goals/Objectives

1. Synthesize information derived from completed research and current stormwater control measures (SCMs) that is related to mycofiltration (MYCO) treatment design and operations.
2. Inform treatment design options to refine SCMs for stormwater management and water quality improvement.
3. Identify needs for additional research such as field trials and pilot projects with specific MYCO systems in conditions typical of transportation projects that would provide supporting documentation for enhancing SCMs.
4. Identify completed research and/or research needs that could serve as supporting documentation for water quality credits for environmental permitting.
5. Identify project research partners for additional research identified as part of this investigation.



Methodology

1. Conduct an initial investigation into existing information. This includes a comprehensive review of published scientific literature, recorded personal interviews with experts in the field, review of relevant case studies and existing research data related to MYCO treatment design and operations.
2. In coordination with MassDOT, identify potential SCMs that MYCO systems could be appropriate for transportation projects.
3. Develop conceptual details for identified MYCO systems.
4. Interview potential regional vendors of fungal inoculates and feed stock materials.
5. Based on analysis of compiled information, make recommendations for next steps to test the feasibility of MYCO systems for transportation projects.

Key Findings

The study team found that mycofiltration (MYCO) has potential to enhance Stormwater Control Measures (SCMs) on transportation projects. MYCO is a nascent field of study by scientists globally. Many studies underway will add to the scientific literature and refine understanding of how the technology can be adopted. Three SCMs have been identified for MassDOT to focus its next steps in applied research and potential research partners to contribute to the body of knowledge.

Use of Findings

The findings recommend that additional on-the-ground research and field trials be conducted prior to adopting MYCO in transportation projects. Taking this methodical approach can result in long term efficacy and savings compared to a trial and error approach without supporting research.

One goal of this effort has been to determine if MYCO can help achieve stormwater credits for environmental permitting. Although existing data to immediately support MYCO for credits was not revealed, this study paves the way for inquiries which could lead to that goal. Achieving credits for enhanced SCMs could increase stormwater management options. However, that must be substantiated with data.

Determining if MYCO can improve efficacy of SCMs commonly used for transportation projects could improve long term ecosystem health and result in savings. For example, MassDOT spends roughly \$22 million annually on compost filter tubes (CFTs) which have a typical functional life of 1-1.5 years. Projects with a contract duration greater than that can potentially see a doubling in quantity of CFTs installed. Extending their functional life with MYCO enhancements is a potential opportunity for significant savings.

Project Information

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