

SALT EFFECTS ON CRANBERRY SOILS, PLANT GROWTH, AND PRODUCTIVITY



Massachusetts
Transportation
Research Program



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Technical Report Document Page

1. Report No. SPRIL97.09	2. Government Accession No. n/a	3. Recipient's Catalog No. n/a	
4. Title and Subtitle SALT EFFECTS ON CRANBERRY SOILS, PLANT GROWTH, AND PRODUCTIVITY		5. Report Date June 30, 2005	
		6. Performing Organization Code n/a	
7. Author(s) Carolyn DeMoranville		8. Performing Organization Report No. UMTC-05-03	
9. Performing Organization Name and Address University of Massachusetts Amherst Cranberry Station One State Bog Road, P.O. Box 569 East Wareham, MA 02538 508-295-2212 x25		10. Work Unit No. (TRAIS) n/a	
		11. Contract or Grant No. ISA# 8073	
12. Sponsoring Agency Name and Address Executive Office of Transportation Office of Transportation Planning Ten Park Plaza, Suite 4150 Boston, MA 02116		13. Type of Report and Period Covered Final Report 1998 - 2004	
		14. Sponsoring Agency Code n/a	
15. Supplementary Notes n/a			
16. Abstract <p>The Massachusetts Highway Department (MassHighway) engages in Environmental Stewardship as part of its mission "To support the construction and maintenance activities that provide the Commonwealth with safe roads and bridges and to protect and where possible enhance the environment." The use of salt for highway deicing is a necessary activity with potential for environmental impact though migration of salt into water supplies and through salt contamination of soils. Since cranberry farming is a significant land use in Southeastern Massachusetts, the research project described herein was undertaken by the UMass Amherst Cranberry Station with funding provided by MassHighway and the Federal Highway Administration.</p> <p>Salt applied to roads may migrate onto cranberry bogs and into their water supplies. Does salt adversely effect cranberry soils, growth, and/or productivity? If so, at what concentration are these effects apparent and what concentrations of salt would be present in affected cranberry soils or plants? The overall objective of this project was to define both chronic and acute salt concentrations in irrigation water that can adversely impact cranberry production systems by evaluating the effects of salt exposure on cranberry growth, yield, or soil chemistry.</p> <p>Based on these research results, there is good indication that a cranberry water supply containing Cl at 250 ppm or greater would be cause for concern and indicate the potential need for remedial action. Symptoms, soil chemistry changes, and possible growth stimulation at 100-125 ppm Cl indicate that a cranberry water supply containing 100 ppm or greater Cl for extended periods might also be cause for concern. Taking all of these results into account, setting the level of concern for Cl in cranberry irrigation water at 100 ppm appears warranted. This is well below the 250 ppm that was definitively associated with negative effects in greenhouse experiments and the 500 ppm that negatively affected growth in soil-free culture. Therefore, 100 ppm Cl is proposed as the level at which closer scrutiny of a water supply over time would be warranted. If the 100 ppm level persisted for more than 2 months, particularly during the irrigation season, chronic effects might become a concern. This Cl level is equivalent to ~165 ppm NaCl.</p>			
17. Key Word Cranberry, salt effects, highway deicing		18. Distribution Statement Document available to the public through the sponsoring organization	
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages 103	22. Price