



Programme Area: Bioenergy

Project: Characterisation of Feedstocks

Title: D6 Final Report (Phase 1) Appendix 13

Abstract:

The primary objective of this 2015/16/17 Project was to provide an understanding of UK produced biomass properties, how these vary and what causes this variability.

This document is one of the appendices to the Final Report from the first Phase (2015/16) of the Characterisation of Feedstocks (CofF) project, Deliverable D6. D6 is provided in a number of parts consisting of the main body text plus 13 Appendices, provided in 17 files. These 13 appendices are provided in 12 pdf files plus 46 data files in Microsoft Excel format. The purpose of this report plus its related parts is to report the variability in feedstock properties of UK produced energy biomass, the causes of these variations and the relationship between the feedstock properties and the provenance data collected. Five feedstocks were studied: Miscanthus, willow short rotation coppice (SRC), poplar SRC, poplar grown as short rotation forests (SRF), and spruce SRF, with poplar and Sitka spruce selected to represent broadleaved and coniferous biomass crops respectively. Provenance data include site properties (such as general climate zone and soil chemistry), the conditions at the time of sample collection, and past management of the site and crop with soil samples also collected for analysis. The feedstock samples were analysed in UKAS accredited laboratories.

Context:

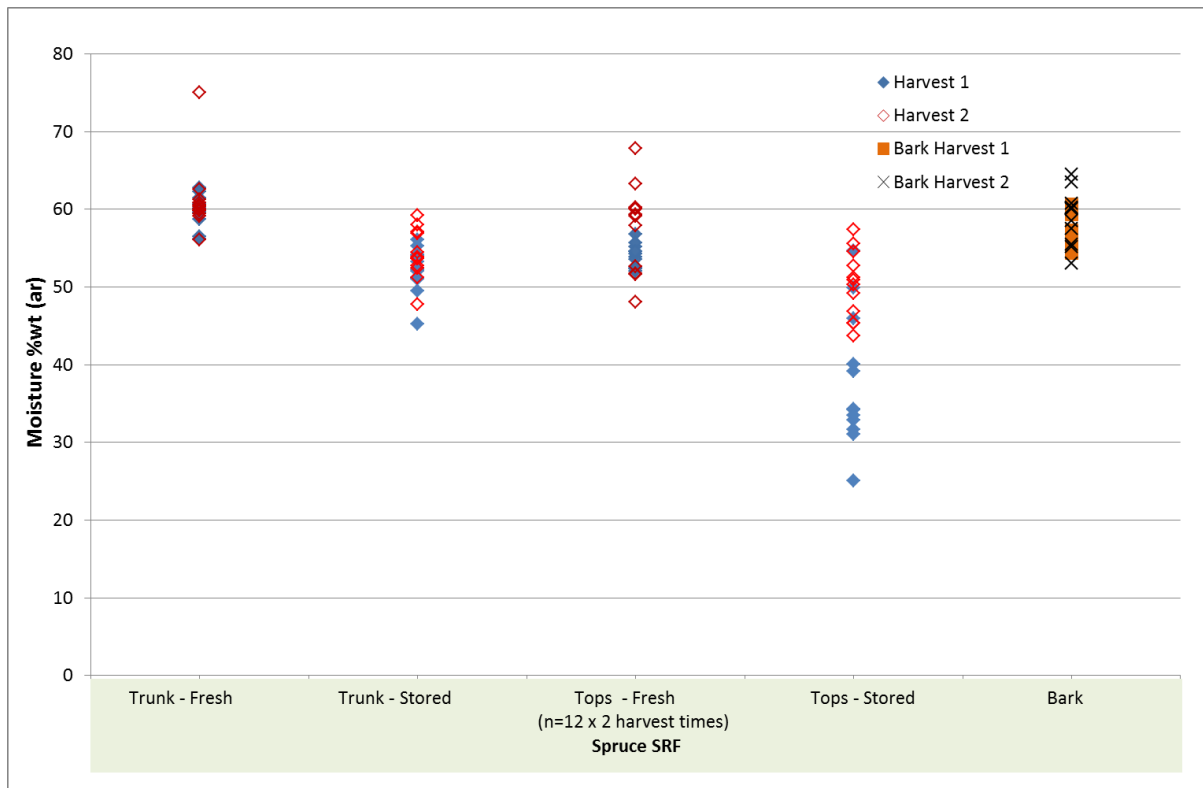
The Characterisation of Feedstocks project provides an understanding of UK produced 2nd generation energy biomass properties, how these vary and what causes this variability. In this project, several types of UK-grown biomass, produced under varying conditions, were sampled. The biomass sampled included Miscanthus, Short Rotation Forestry (SRF) and Short Rotation Coppice (SRC) Willow. The samples were tested to an agreed schedule in an accredited laboratory. The results were analysed against the planting, growing, harvesting and storage conditions (i.e. the provenance) to understand what impacts different production and storage methods have on the biomass properties. The main outcome of this project is a better understanding of the key characteristics of UK biomass feedstocks (focusing on second generation) relevant in downstream energy conversion applications, and how these characteristics vary by provenance.

Disclaimer:

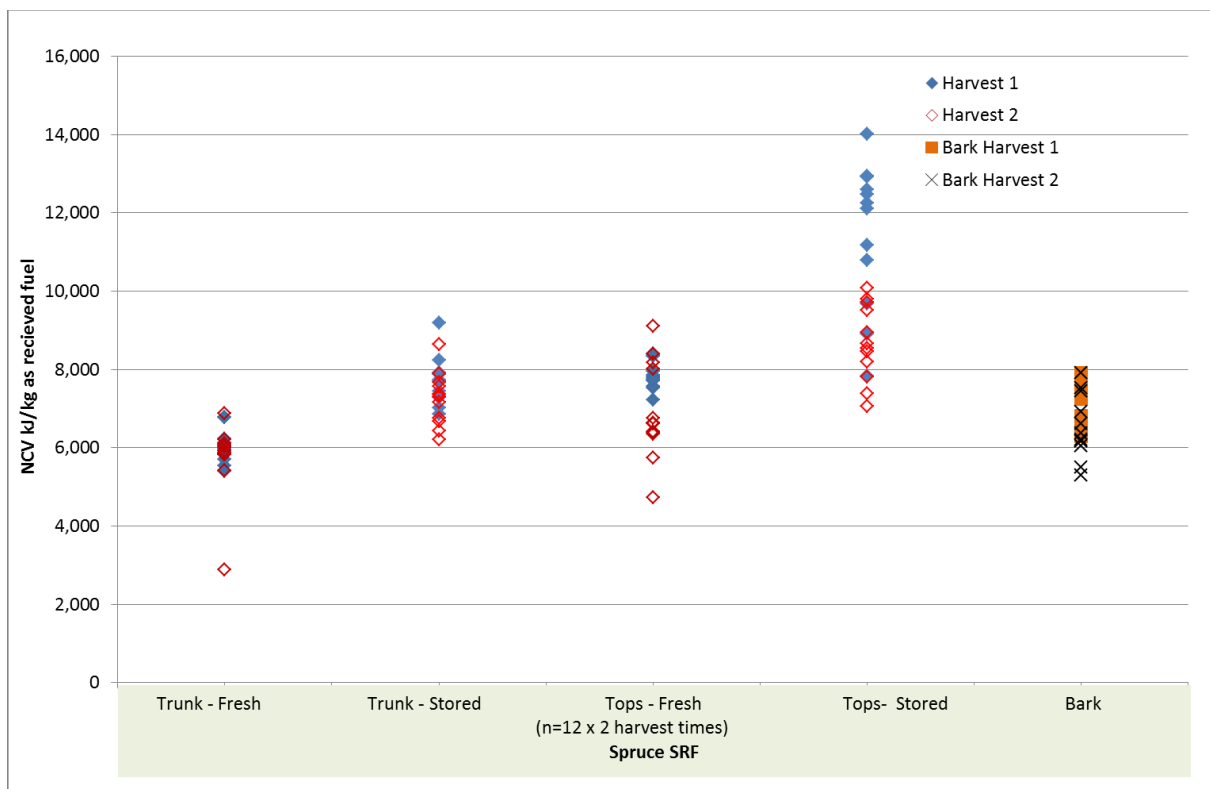
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Appendix 13 part 1: Graphs for Spruce SRF Study 1

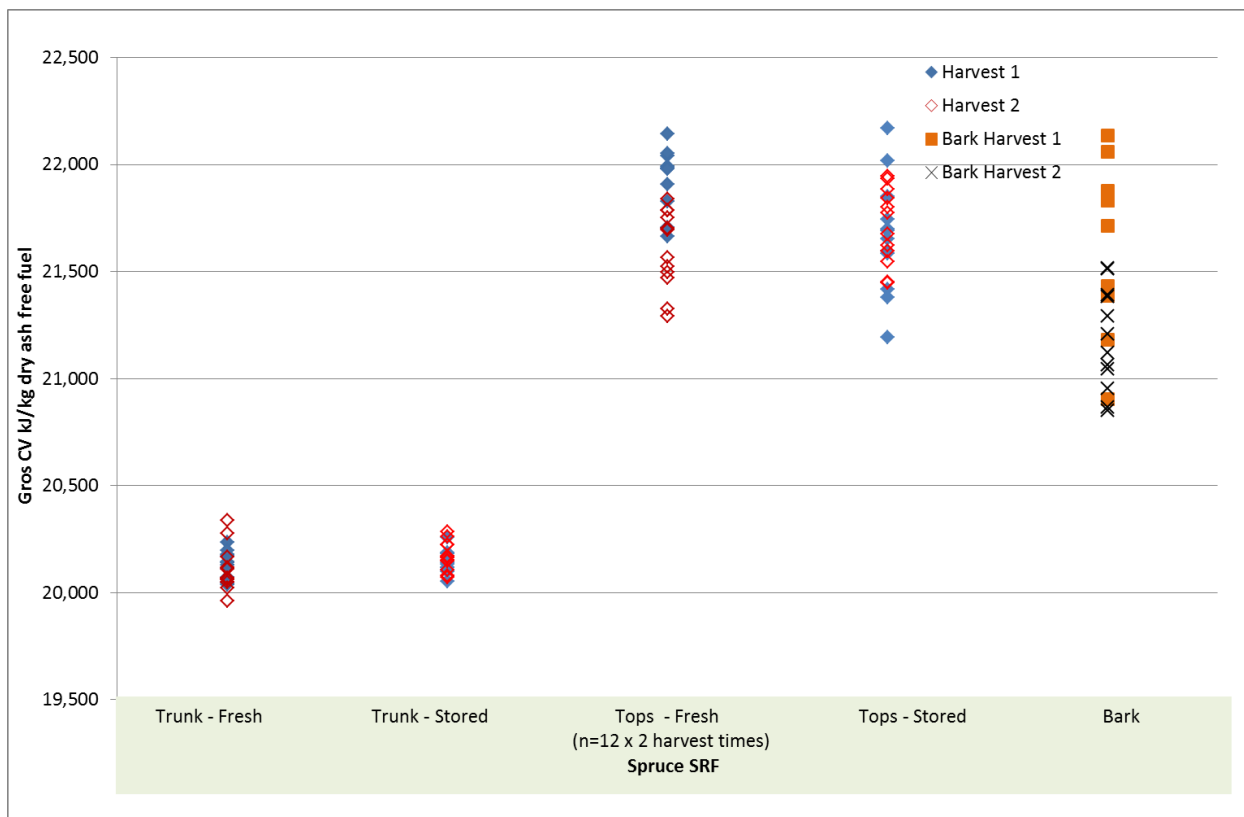
Moisture Content of Spruce SRF



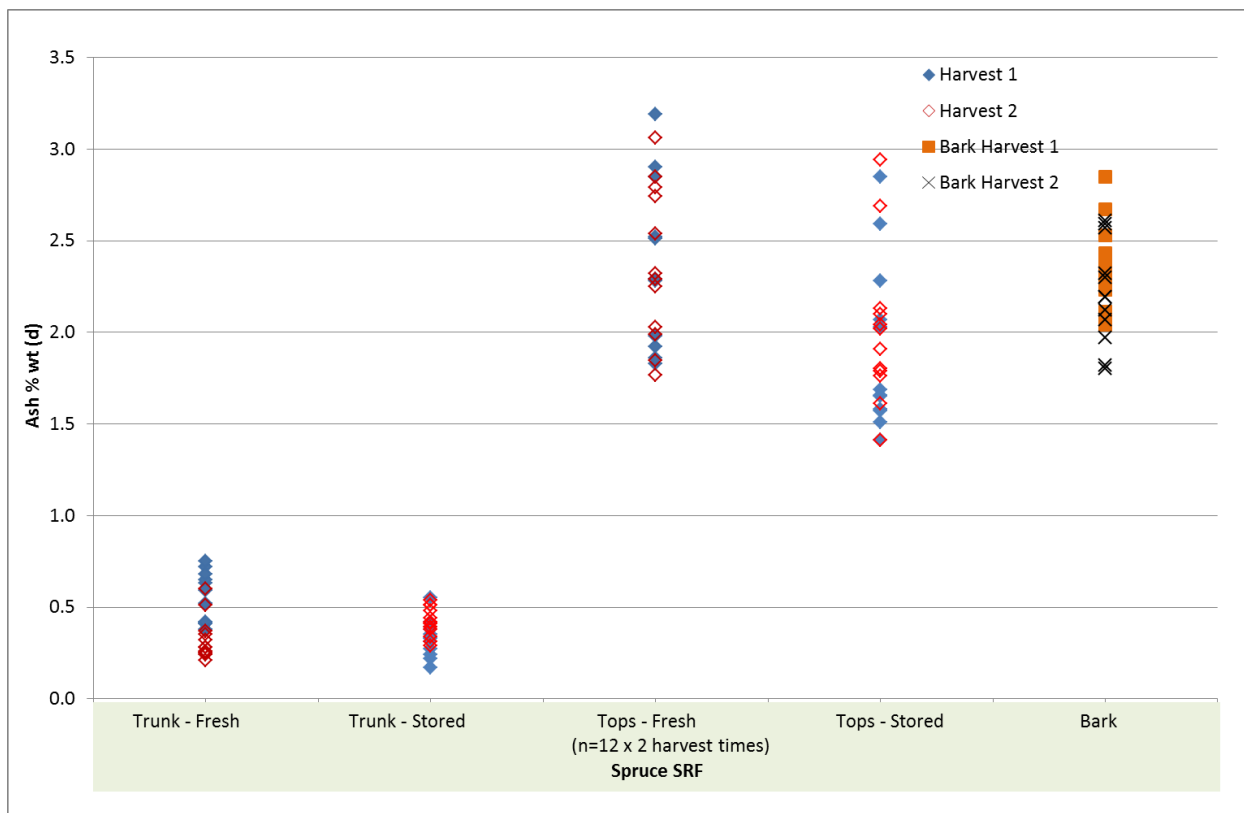
Net Calorific Value of Spruce SRF



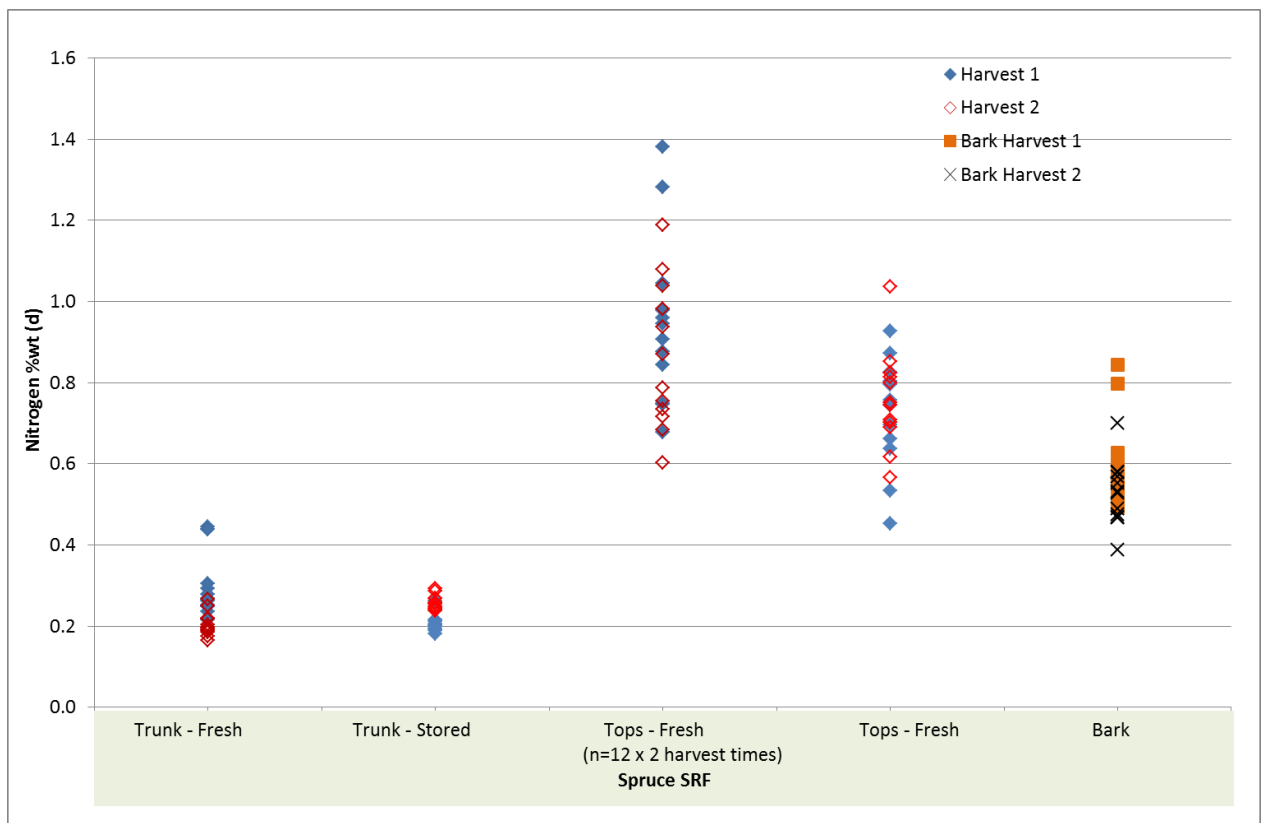
Gross Calorific Value (DAF) of Spruce SRF



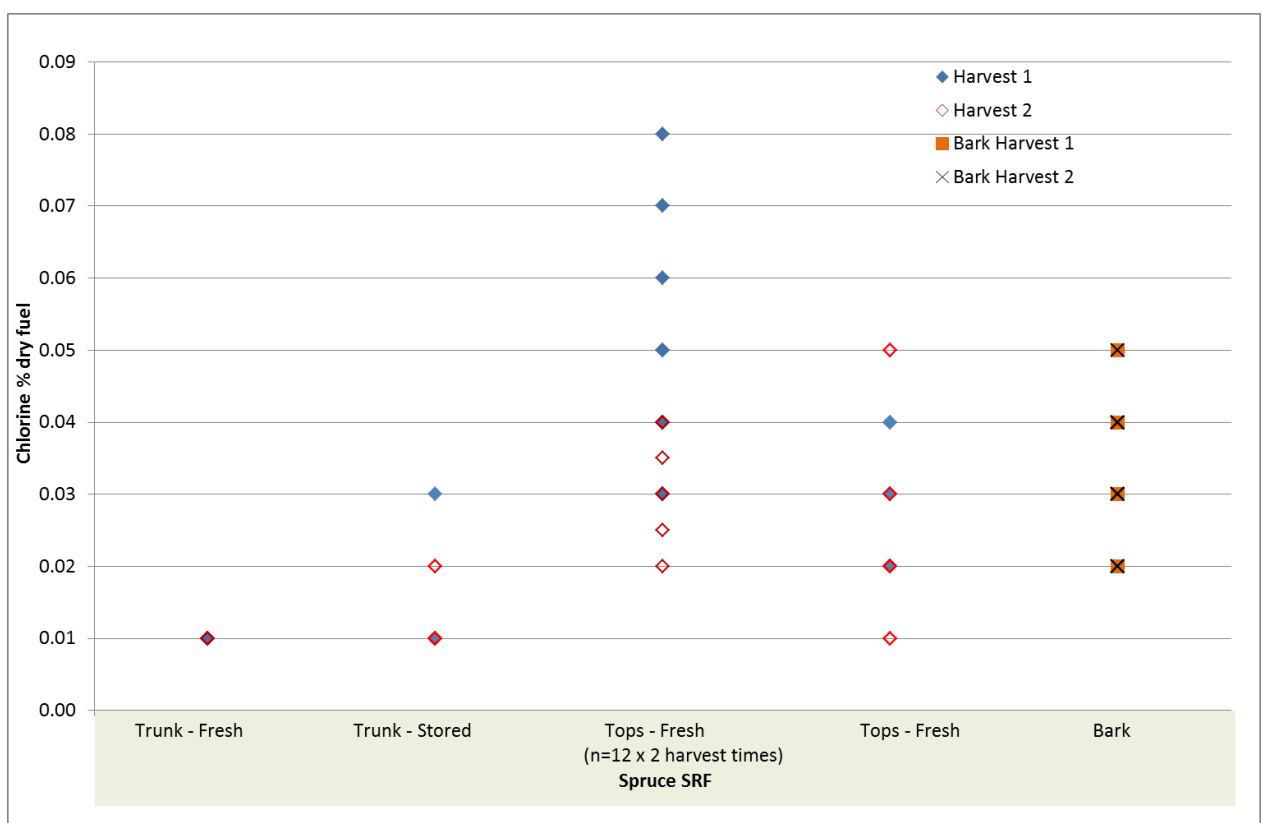
Dry Ash content of Spruce SRF



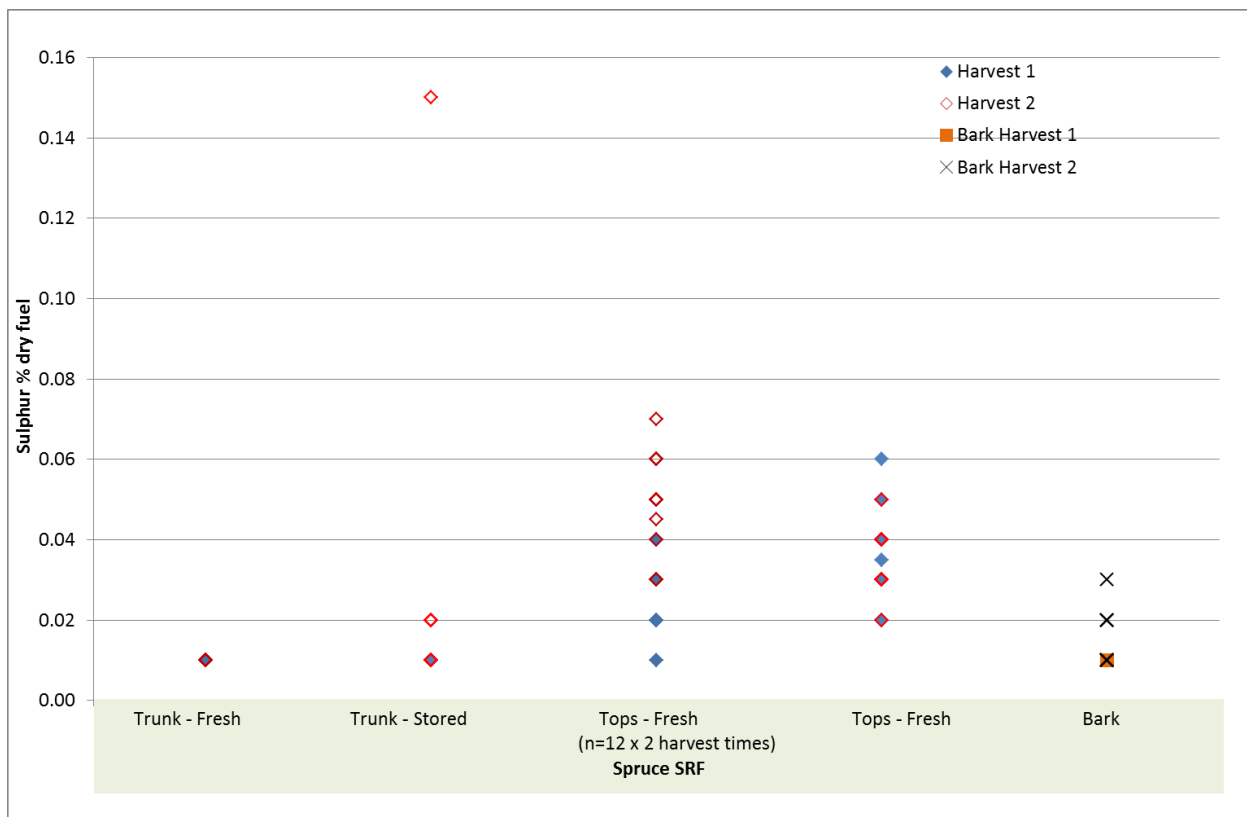
Dry nitrogen content of Spruce SRF



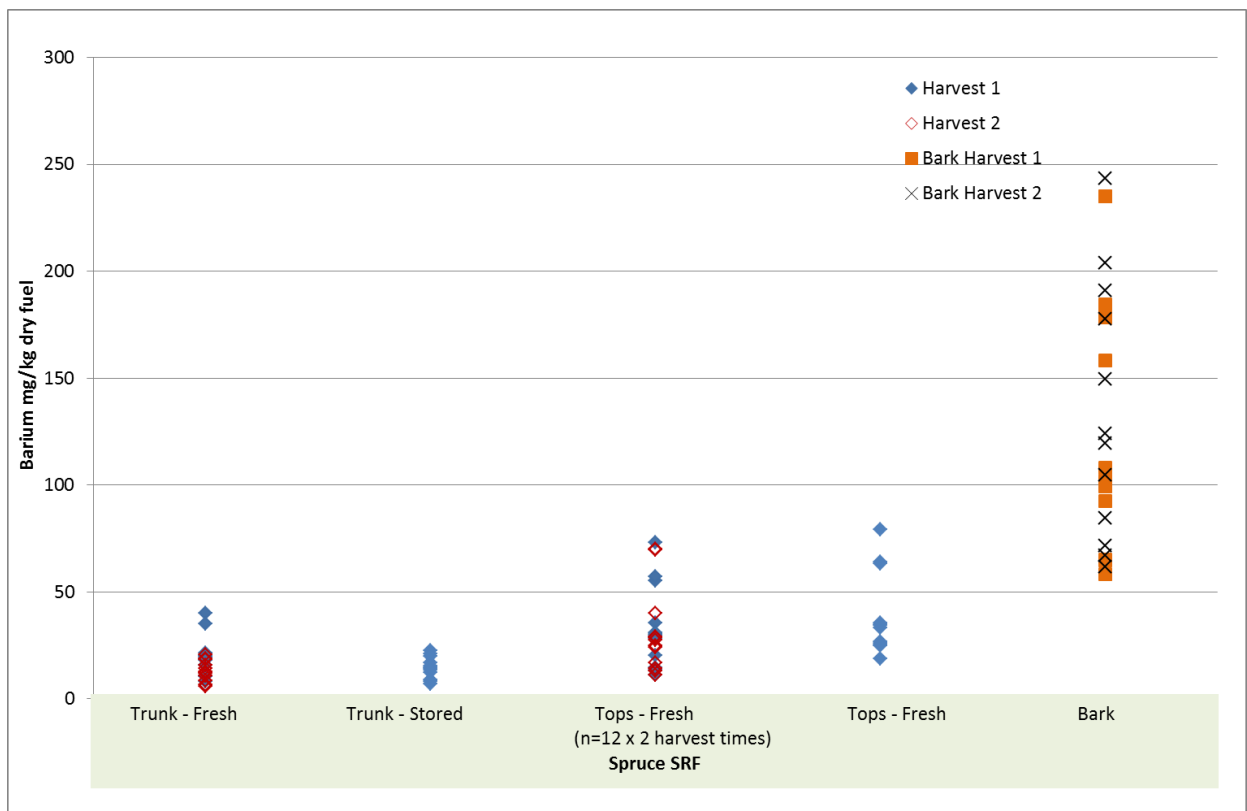
Dry chlorine content of Spruce SRF



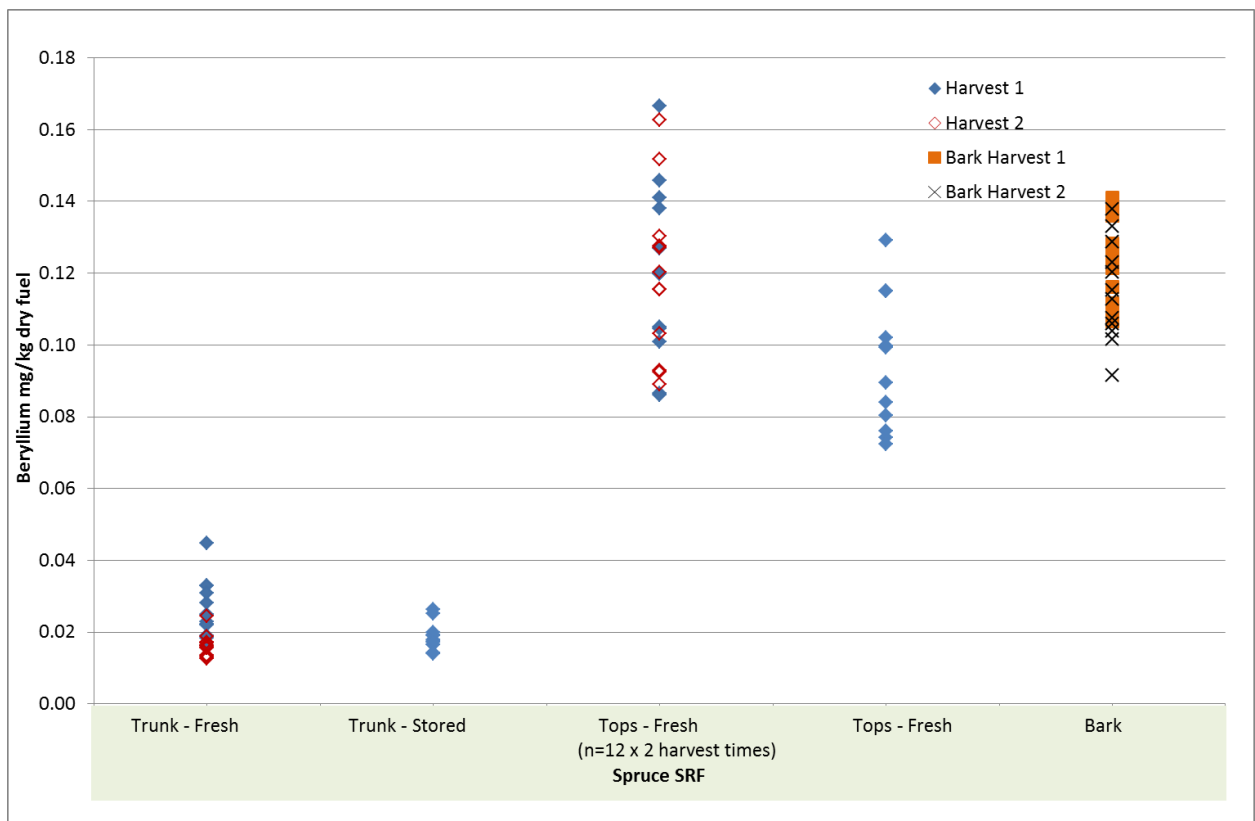
Dry sulphur content of Spruce SRF



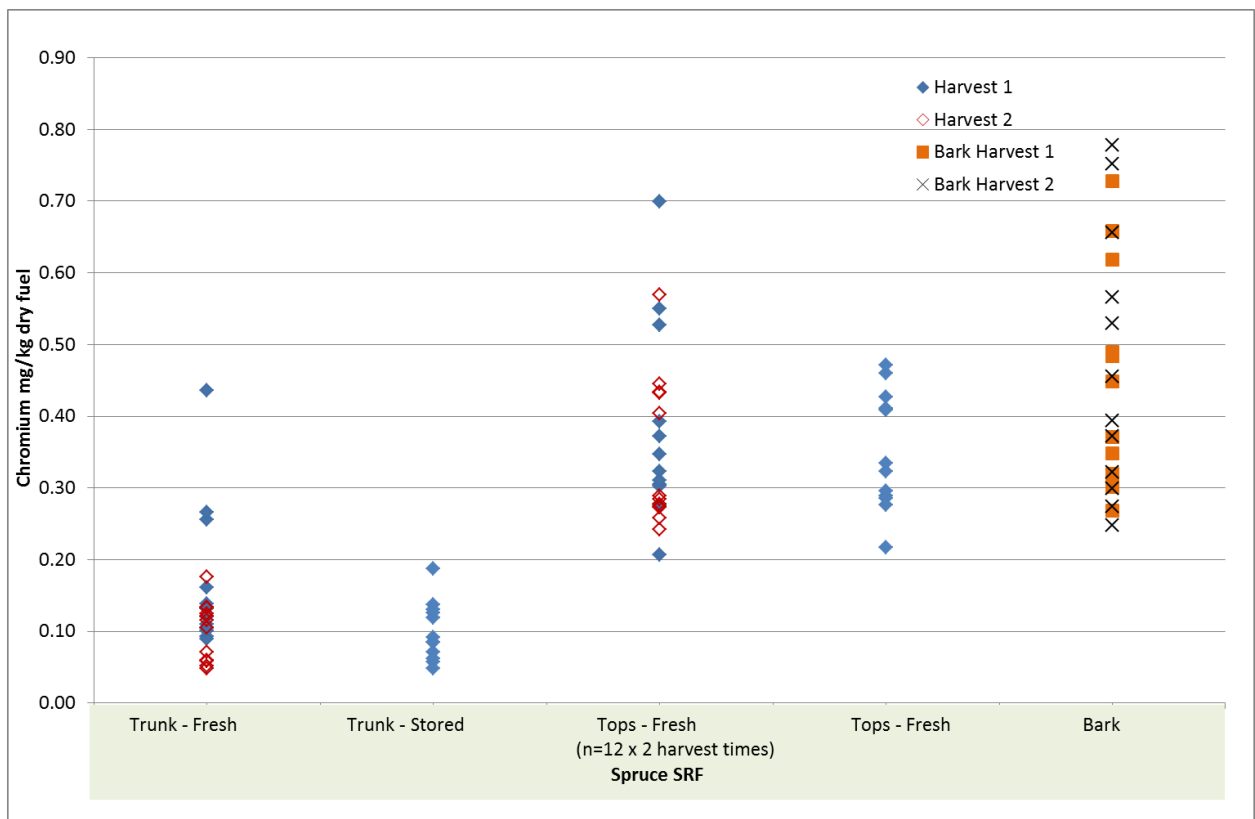
Barium content of Spruce SRF



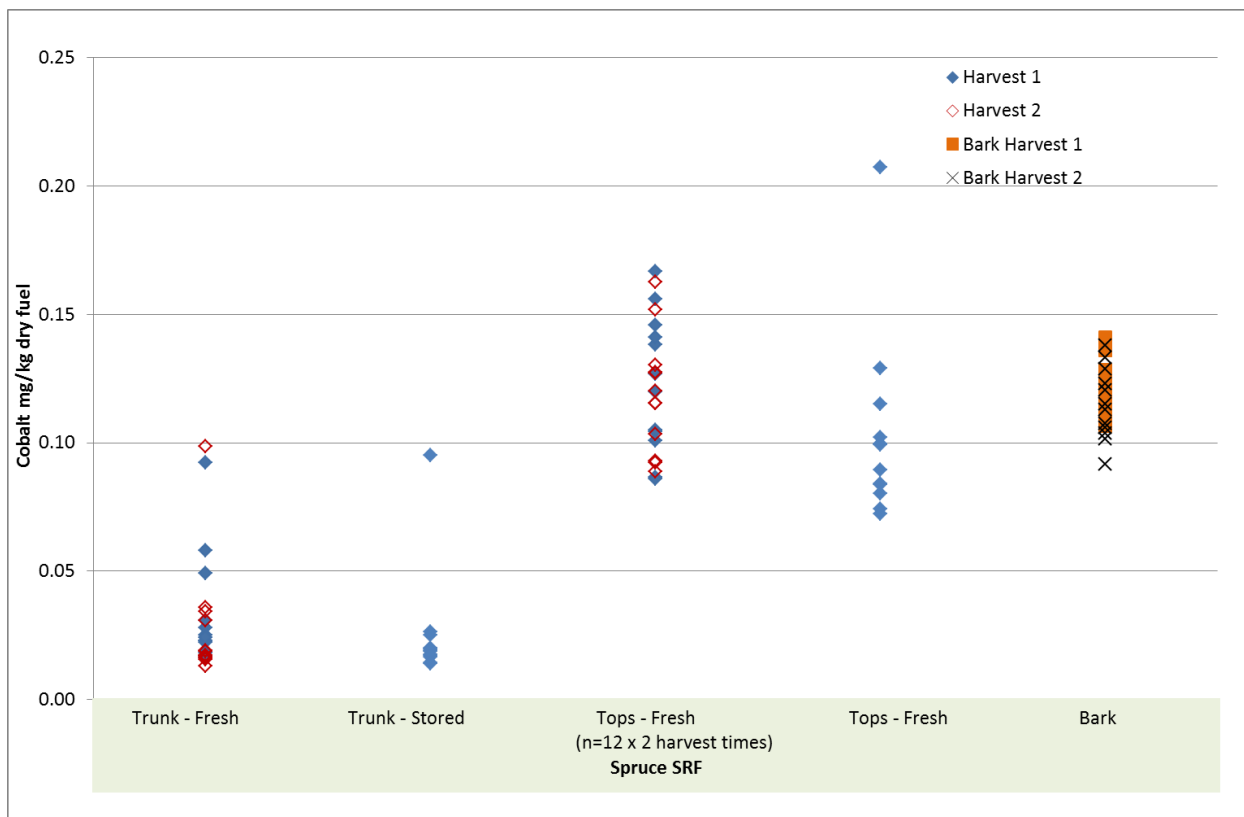
Beryllium content of Spruce SRF



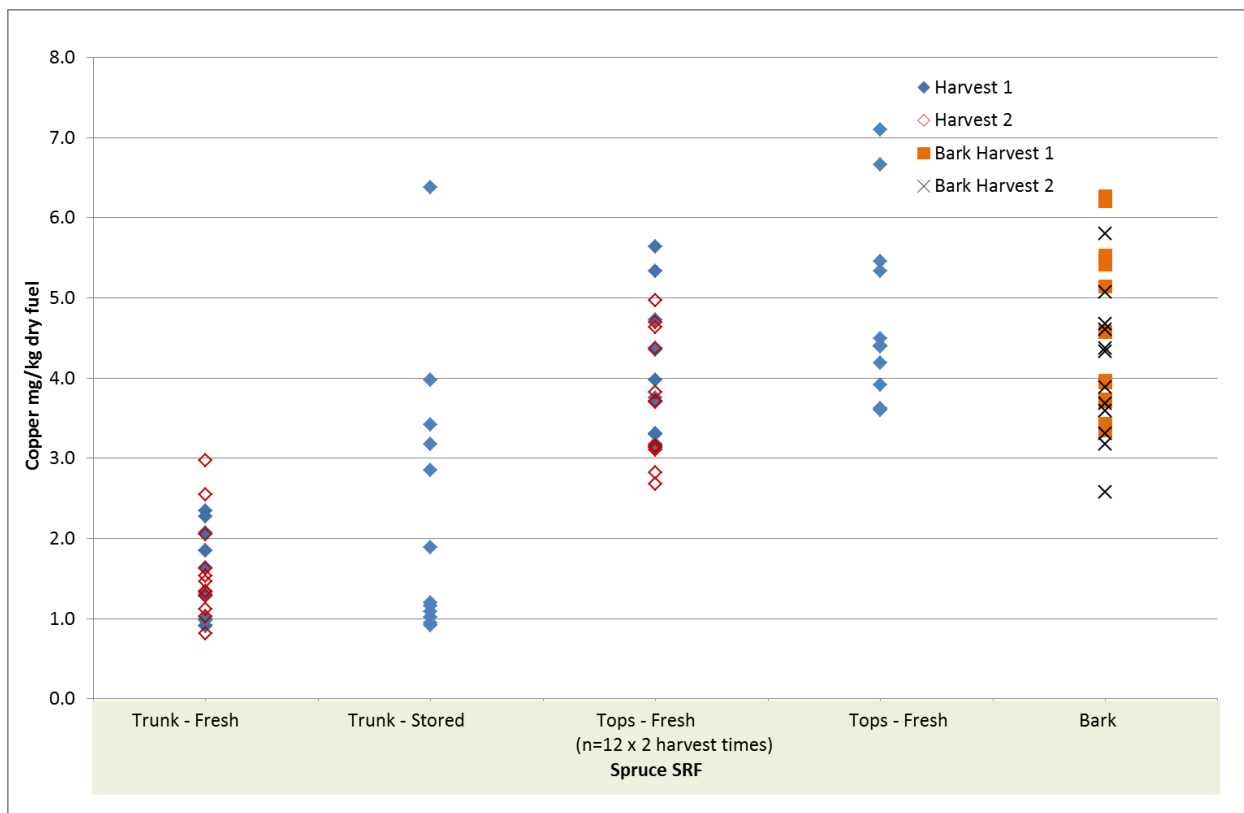
Chromium content of Spruce SRF



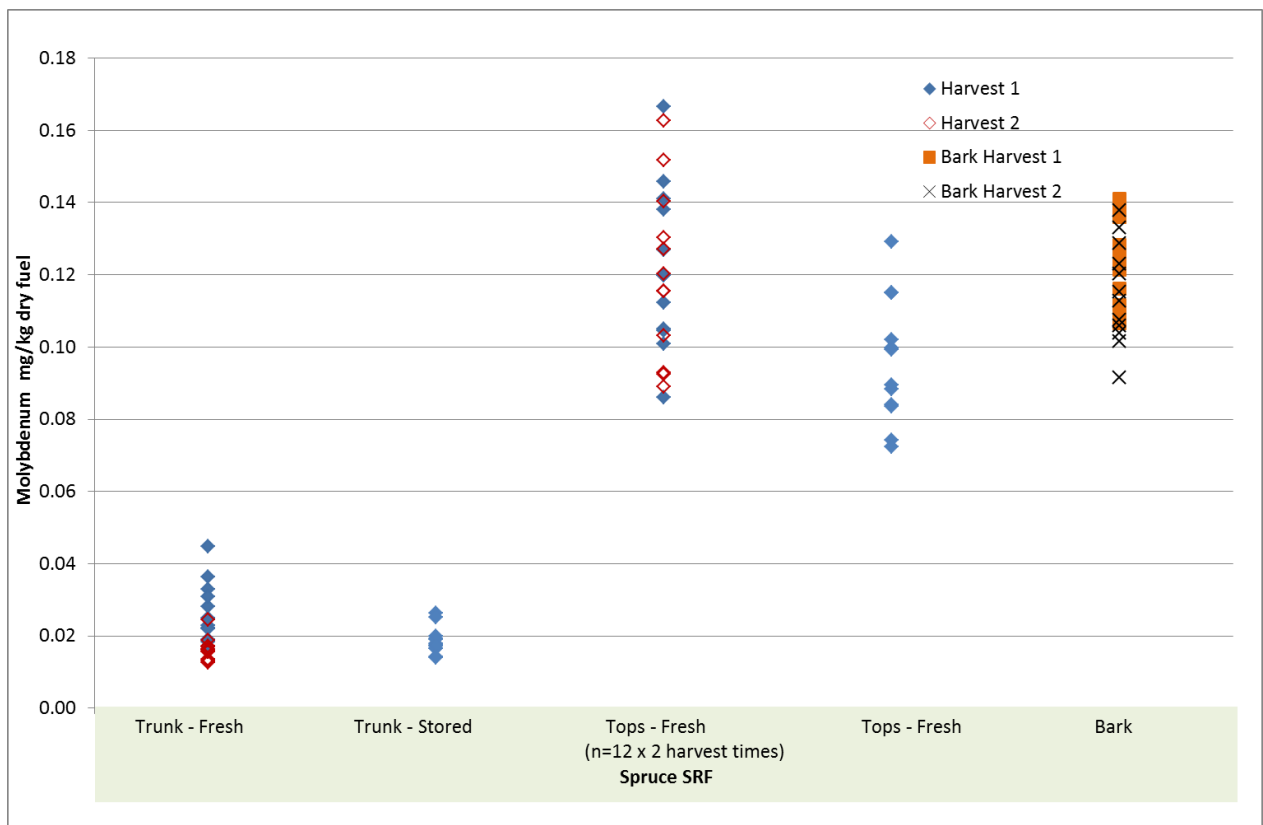
Cobalt content of Spruce SRF



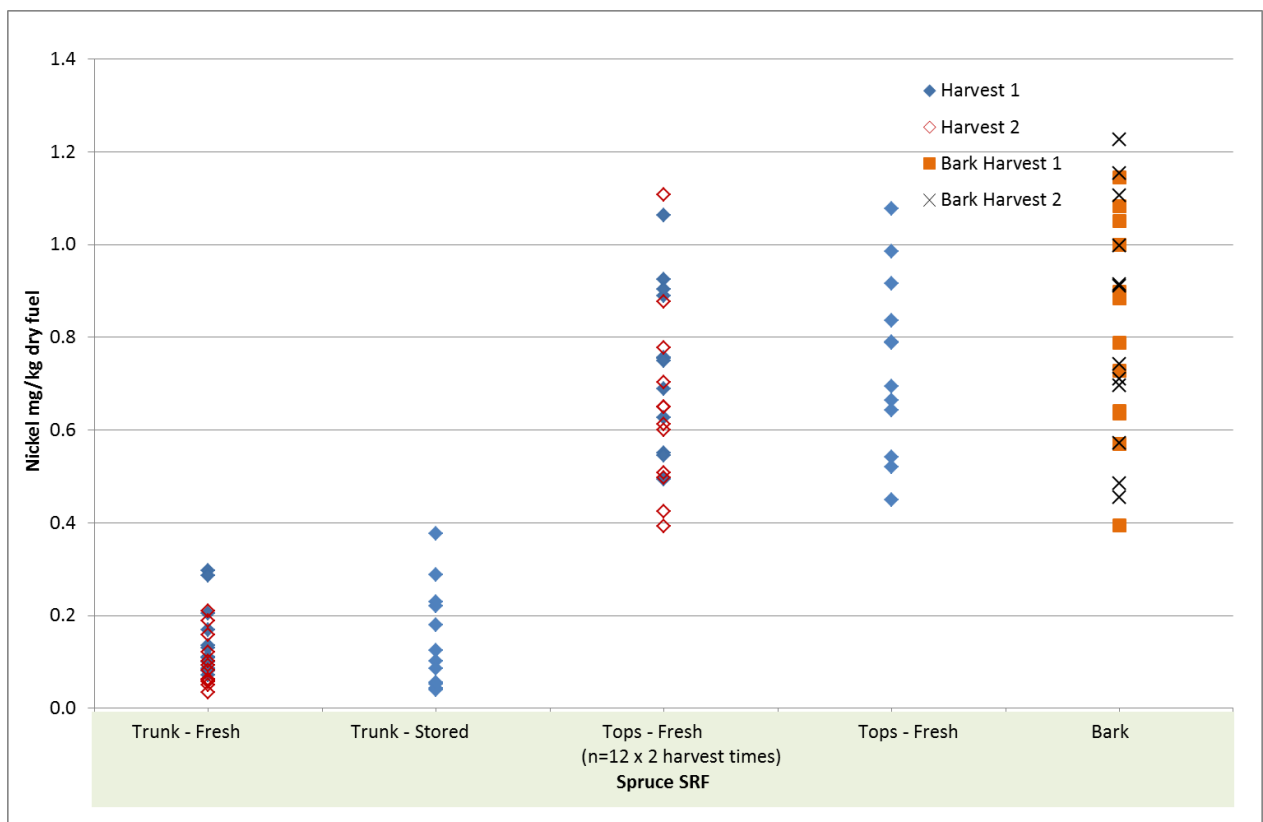
Copper content of Spruce SRF



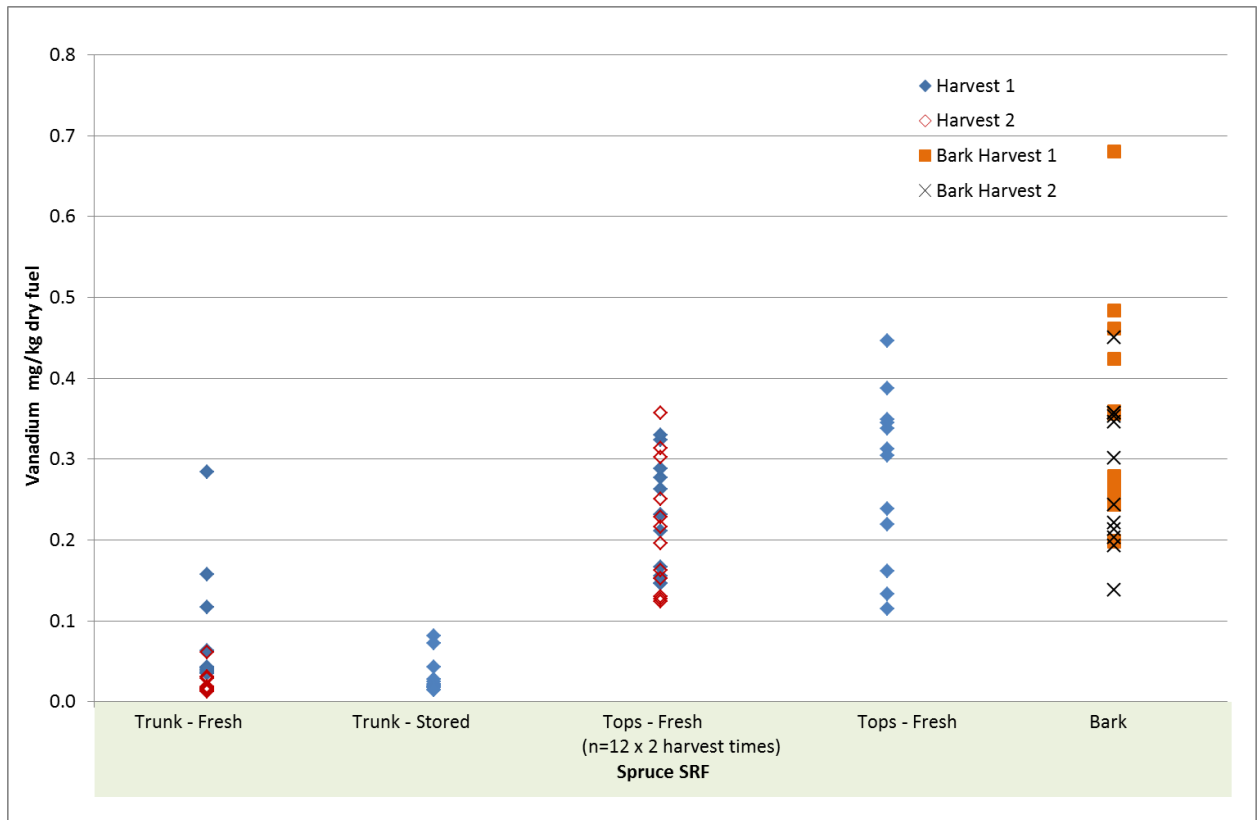
Molybdenum content of Spruce SRF



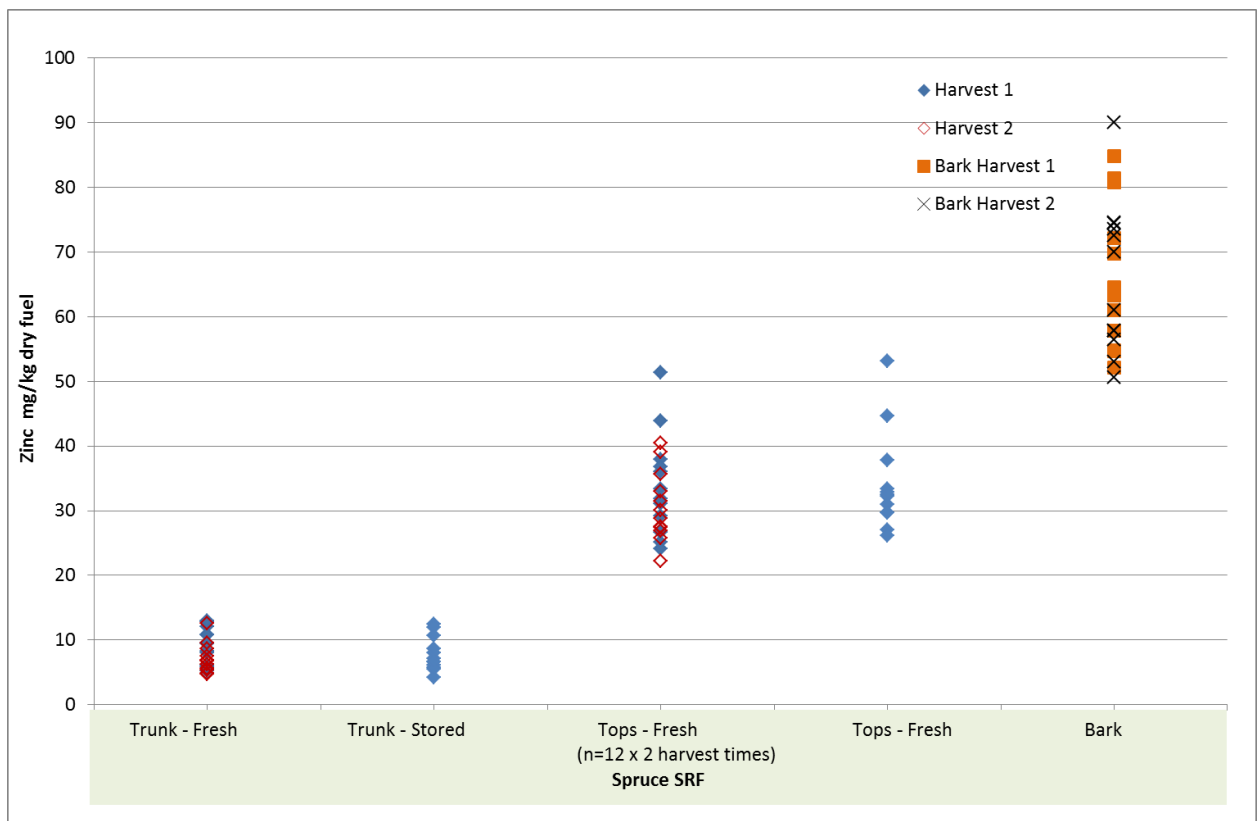
Nickel content of Spruce SRF



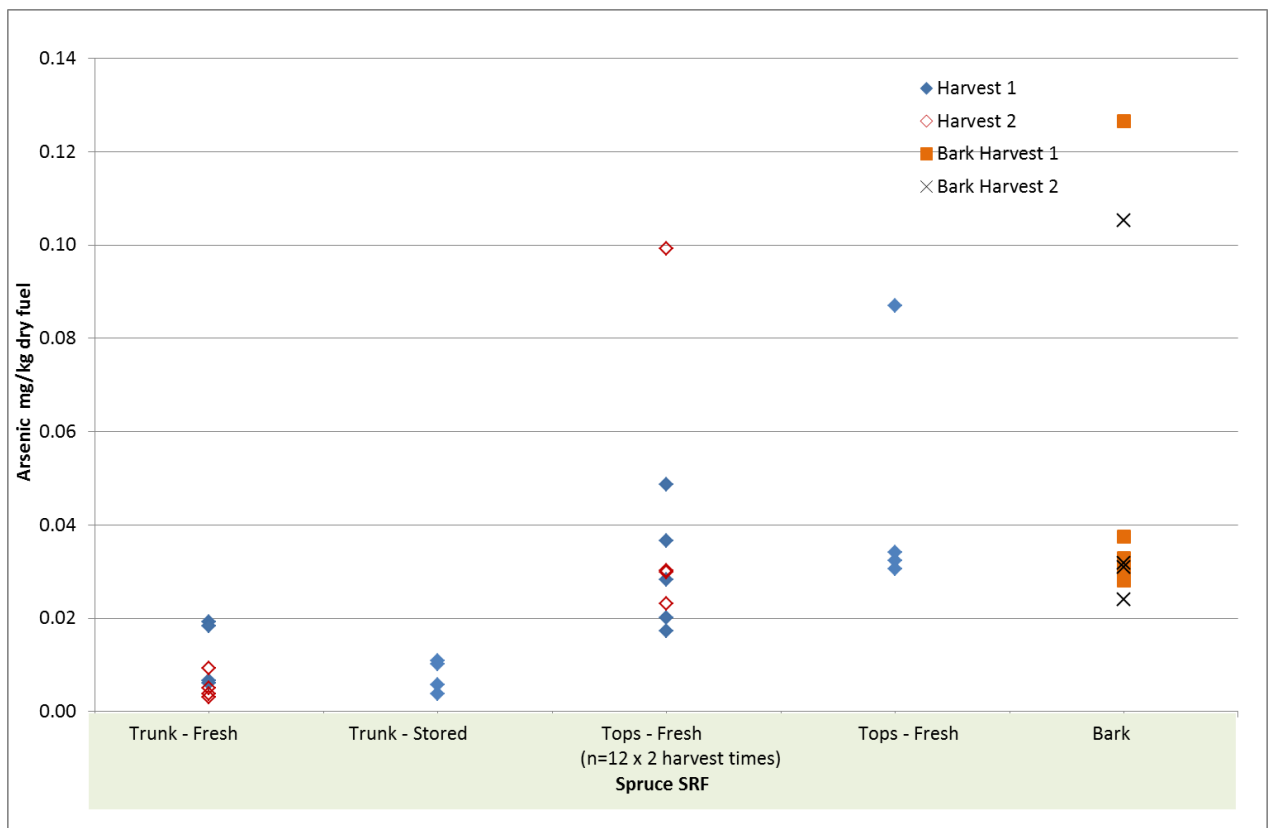
Vanadium content of Spruce SRF



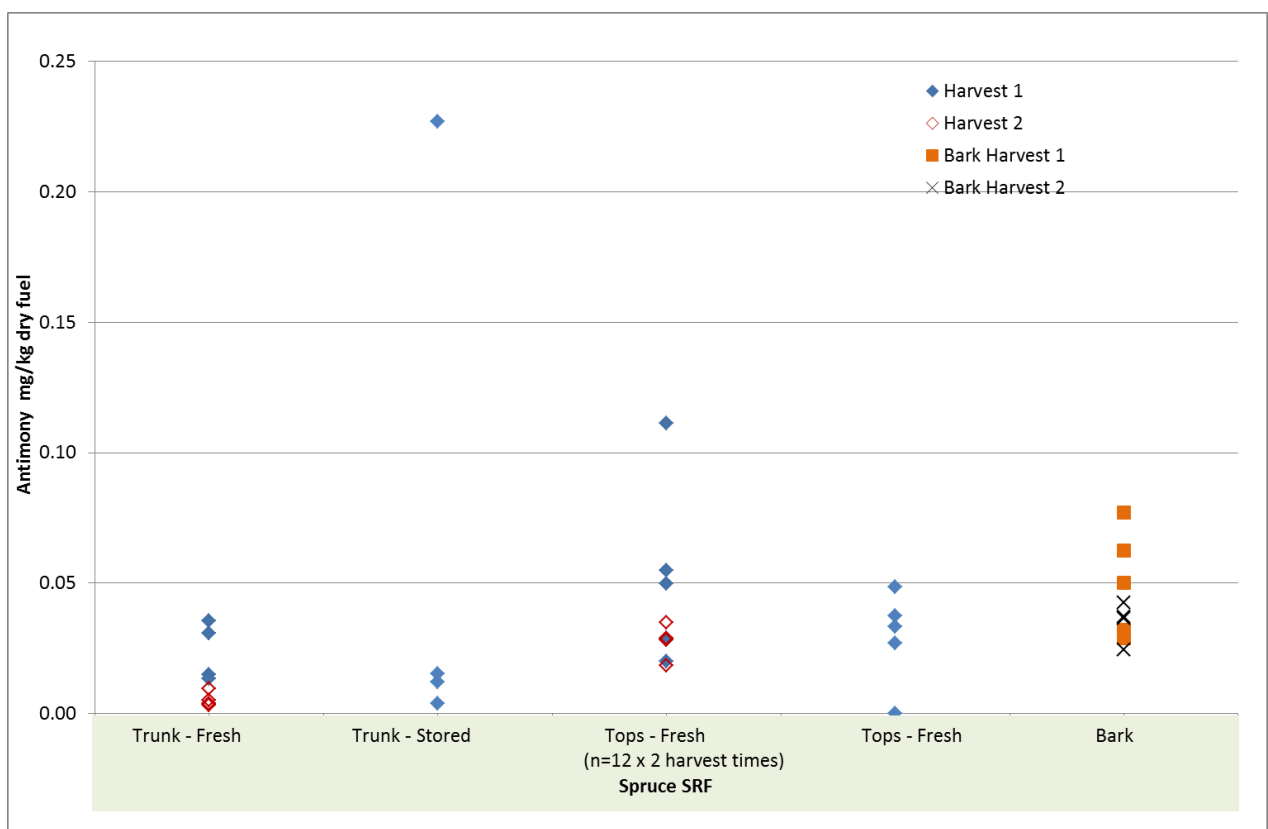
Zinc content of Spruce SRF



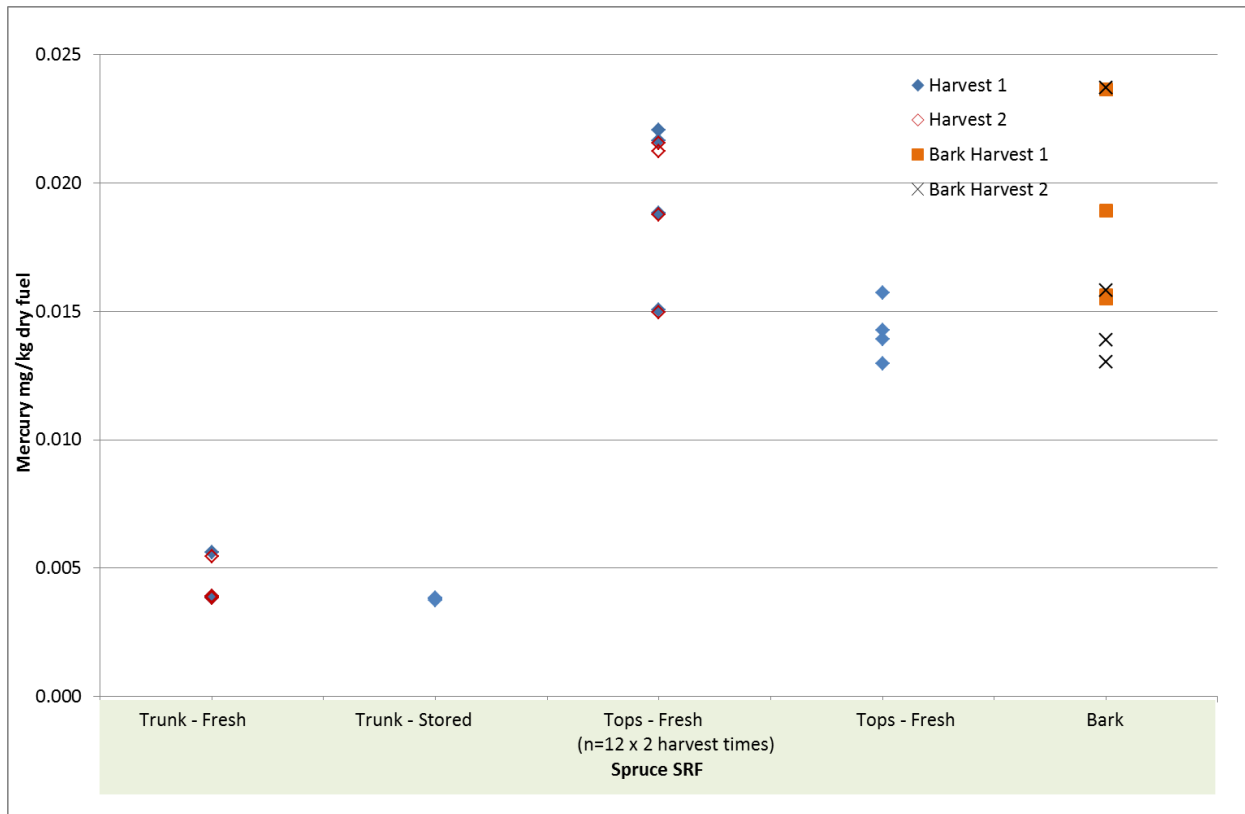
Arsenic content of Spruce SRF



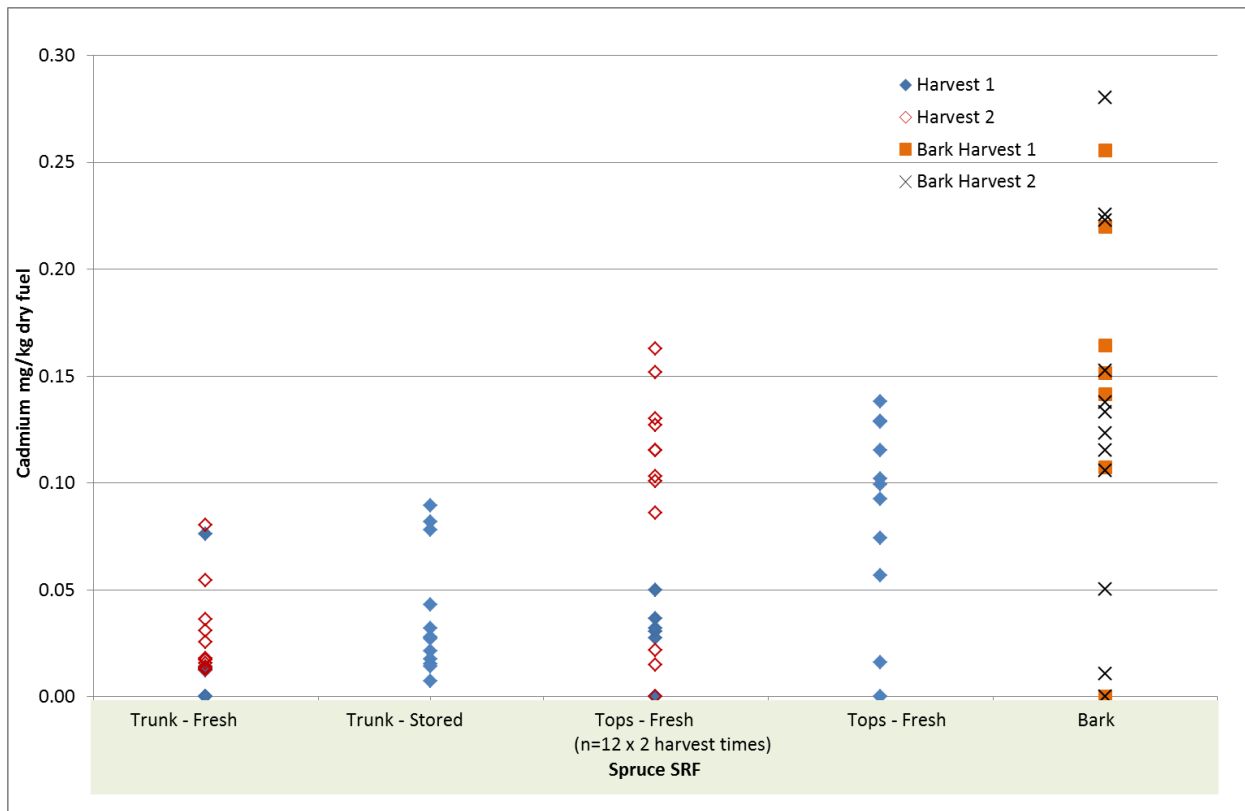
Antimony content of Spruce SRF



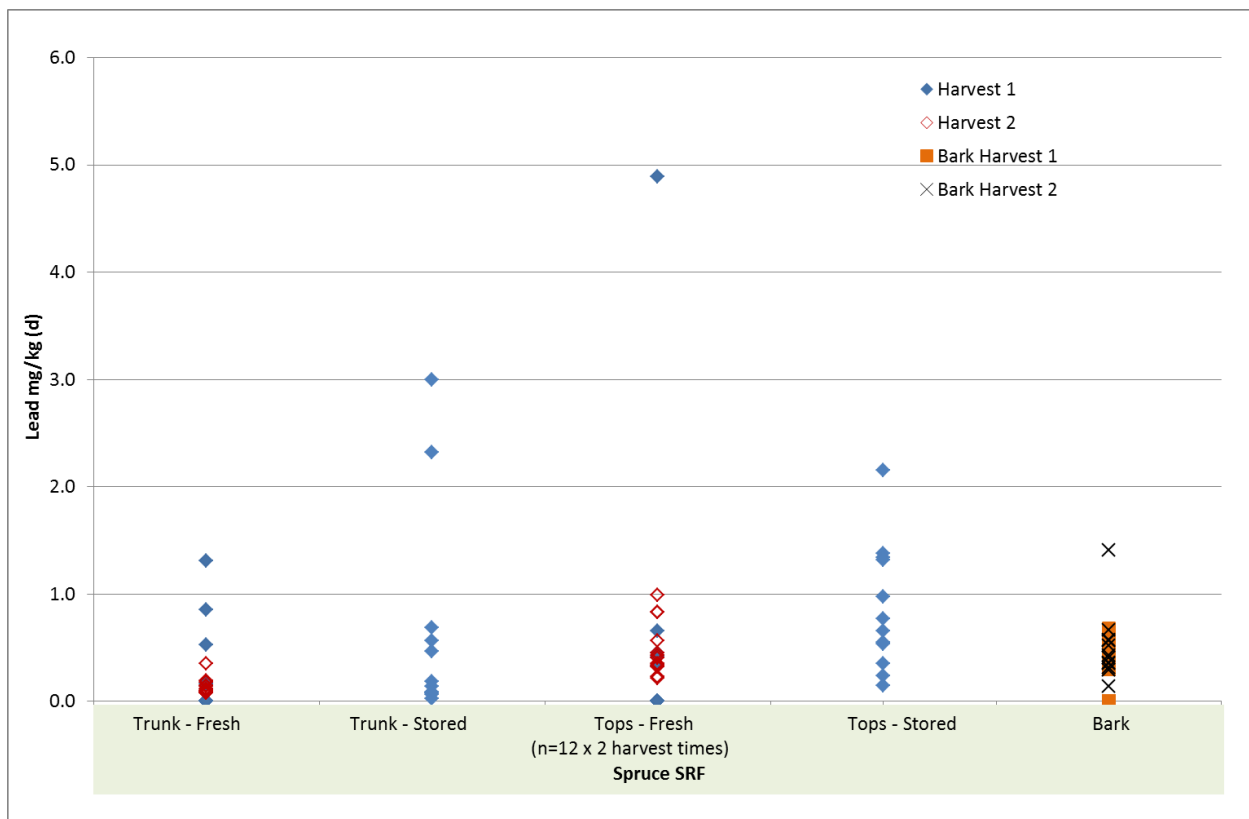
Mercury content of Spruce SRF



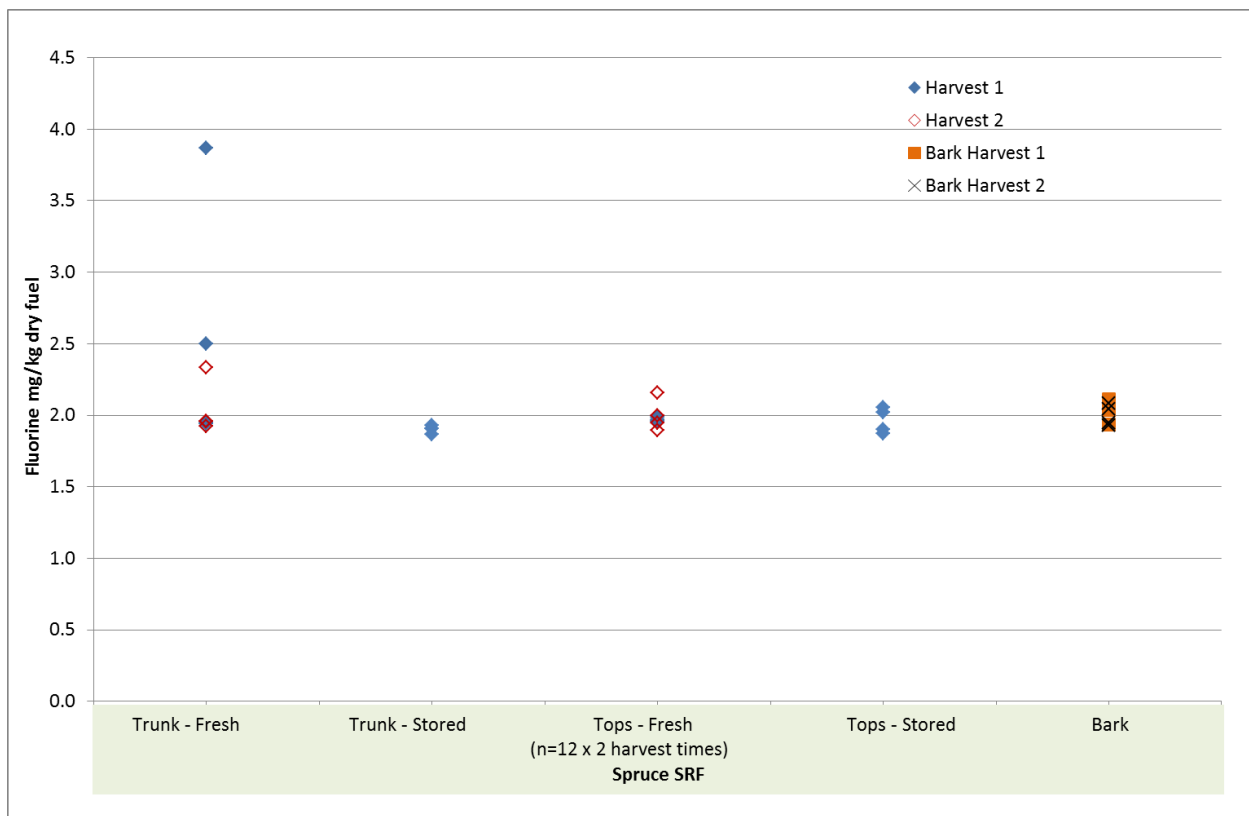
Cadmium content of Spruce SRF



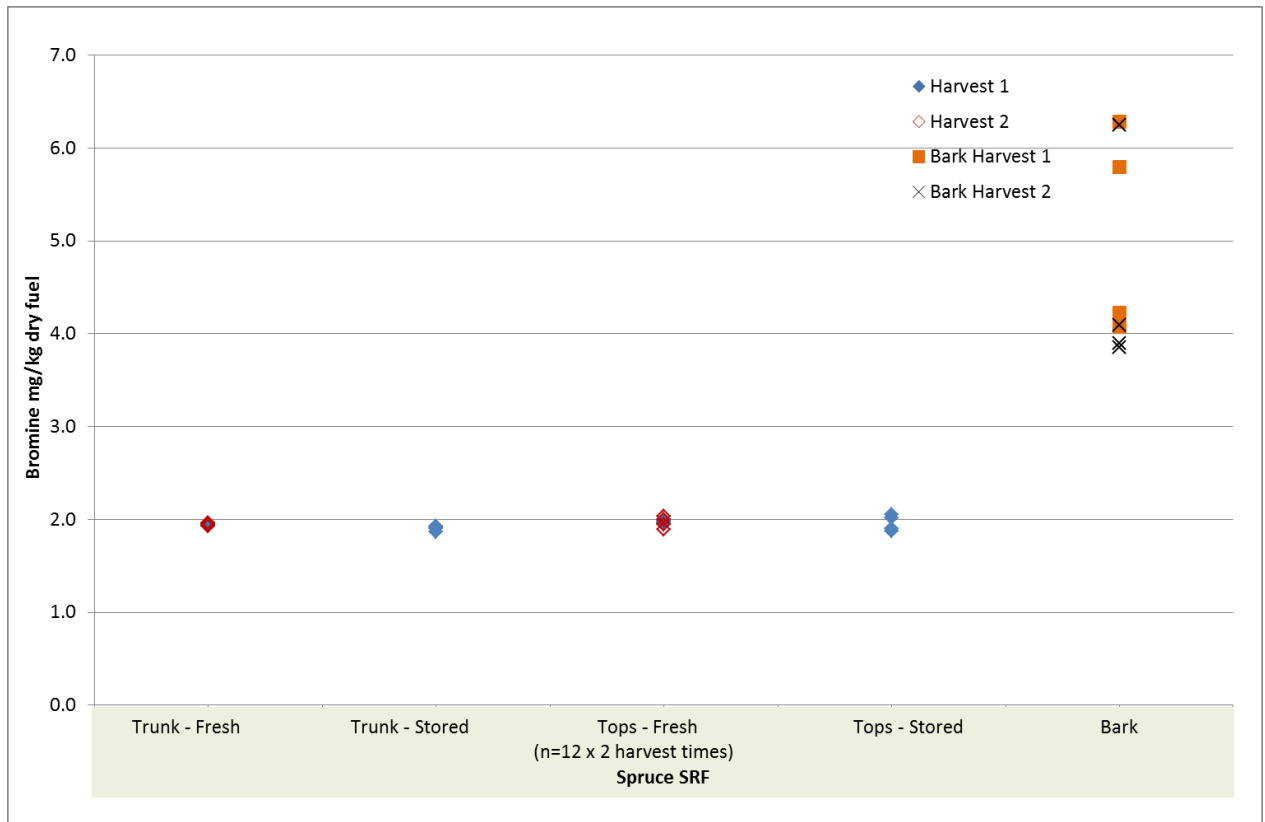
Lead content of Spruce SRF



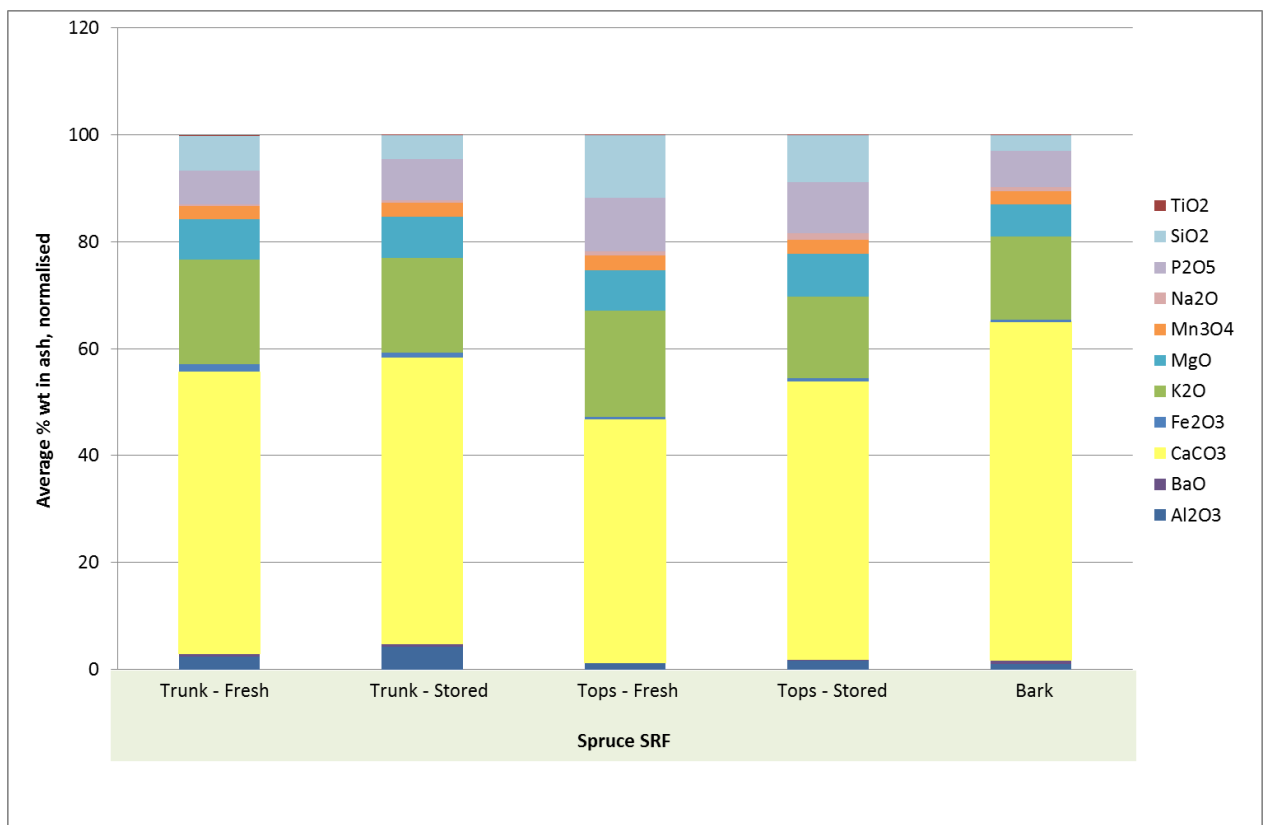
Fluorine content of Spruce SRF



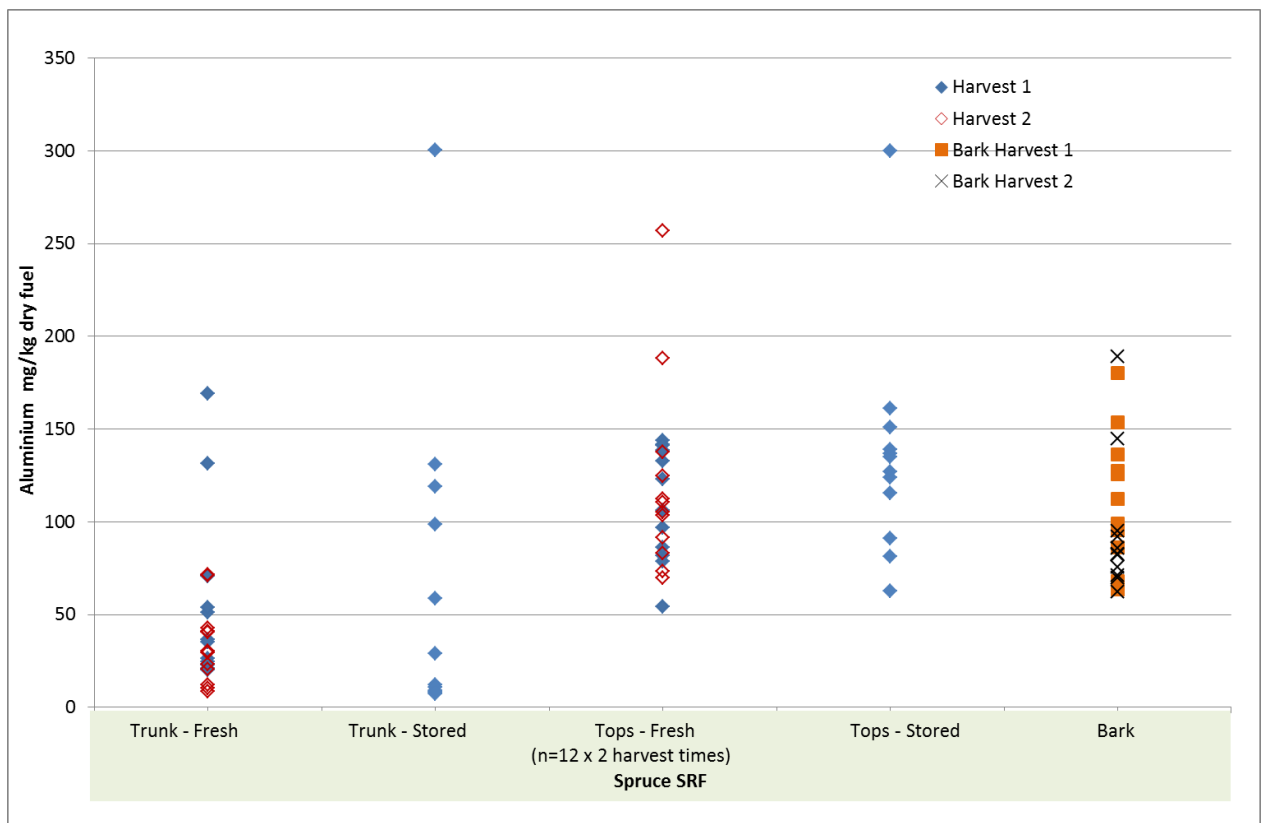
Bromine content of Spruce SRF



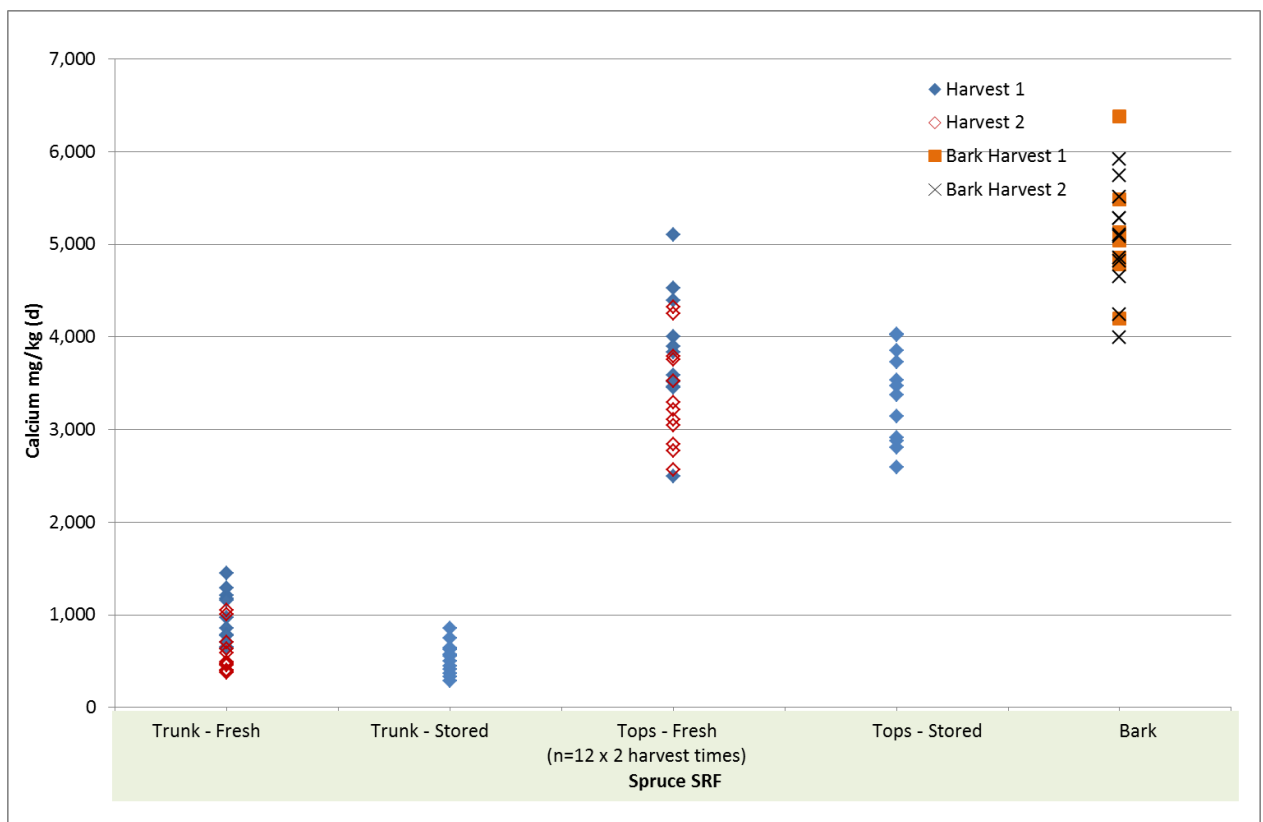
Variation in ash composition of Spruce SRF



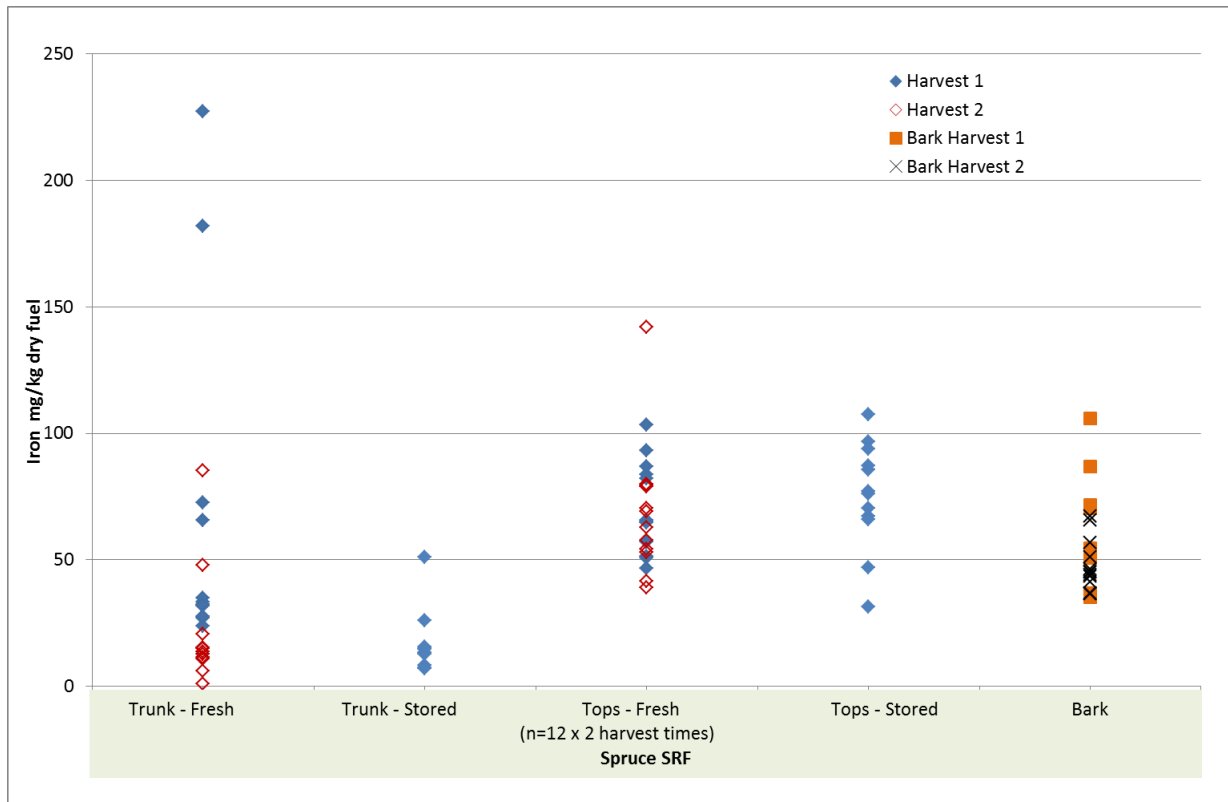
Aluminium content of Spruce SRF



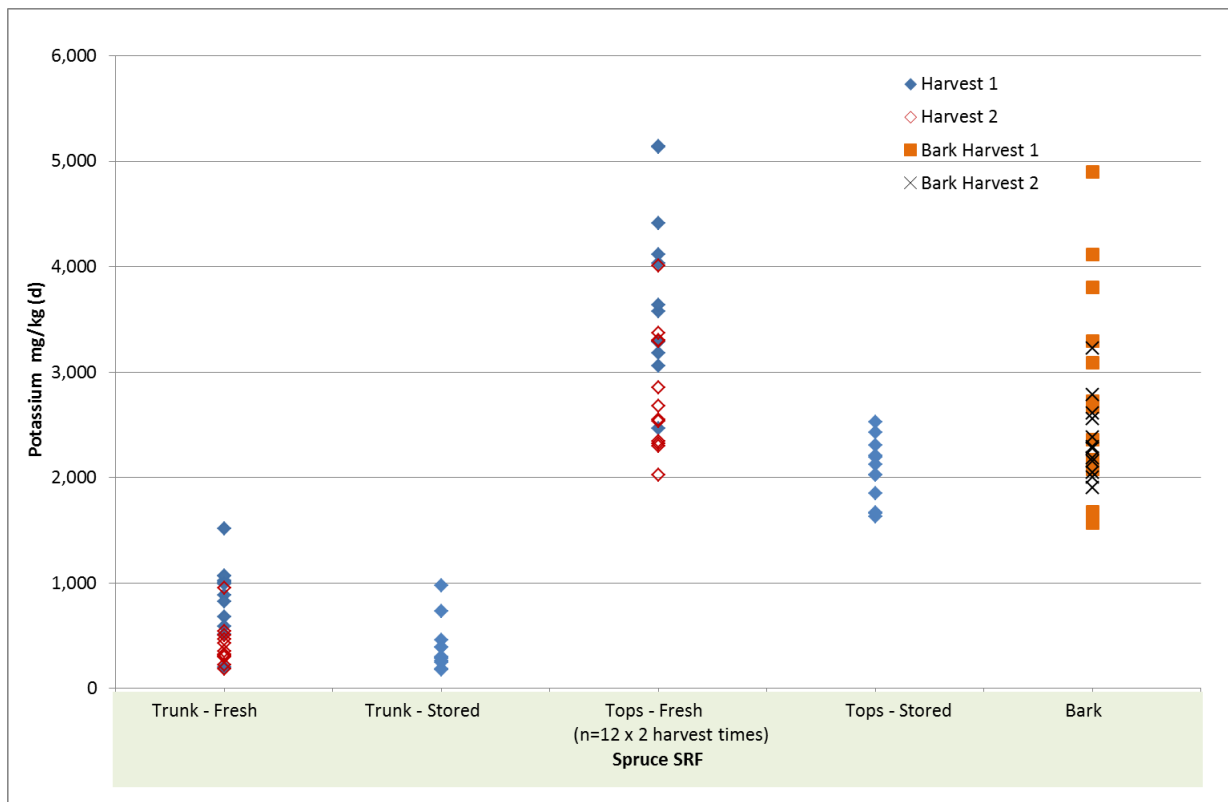
Calcium content of Spruce SRF



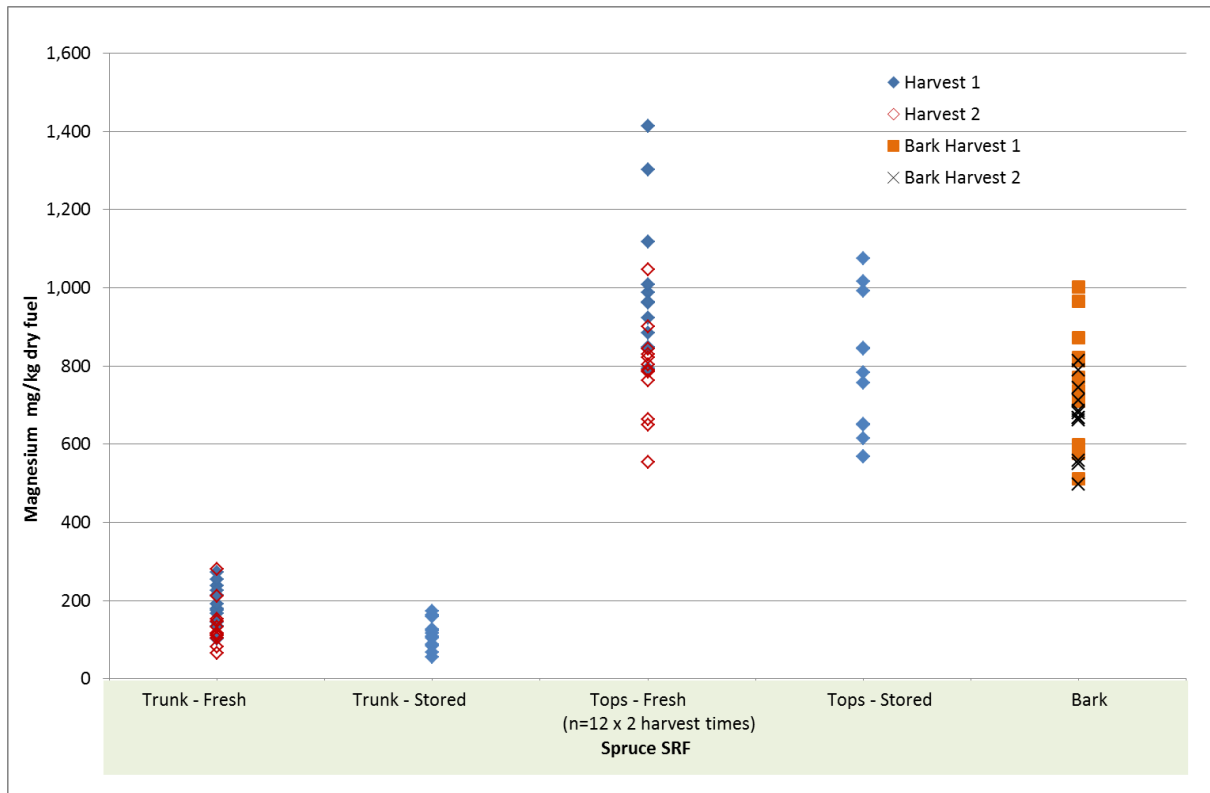
Iron content of Spruce SRF



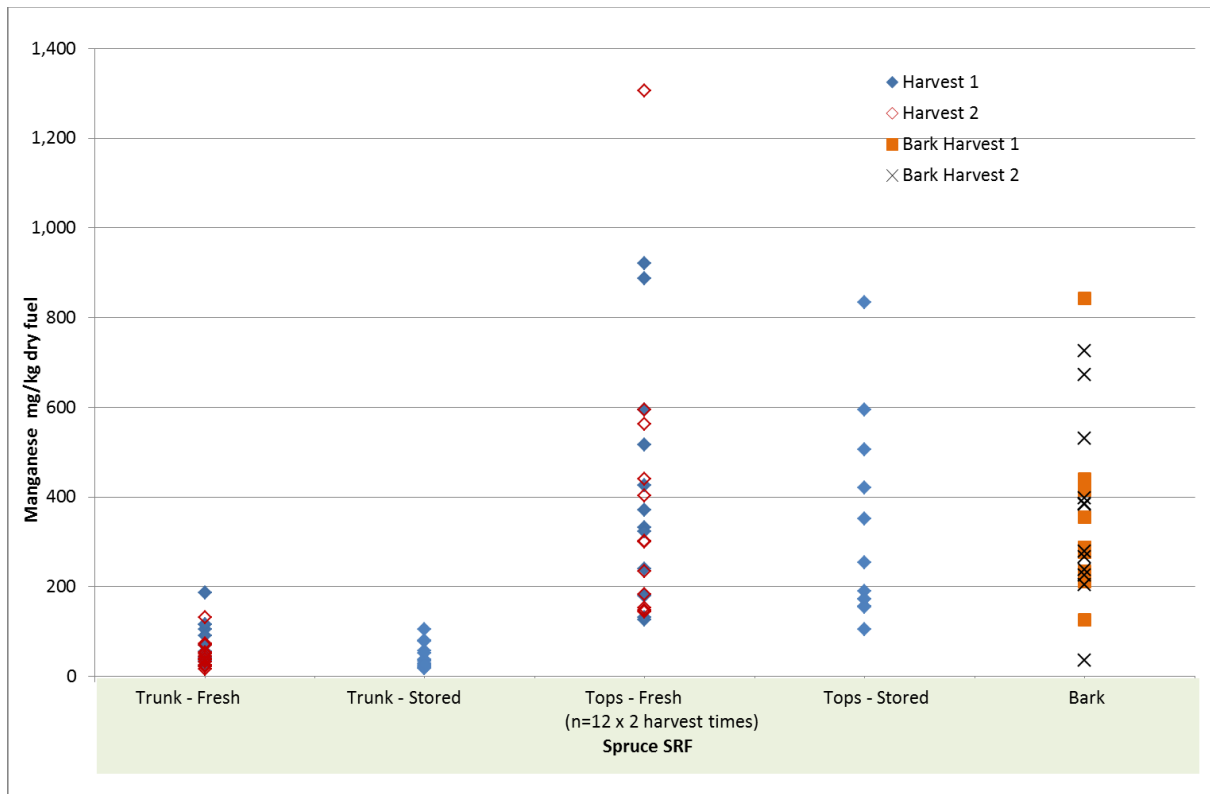
Potassium content of Spruce SRF



Magnesium content of Spruce SRF

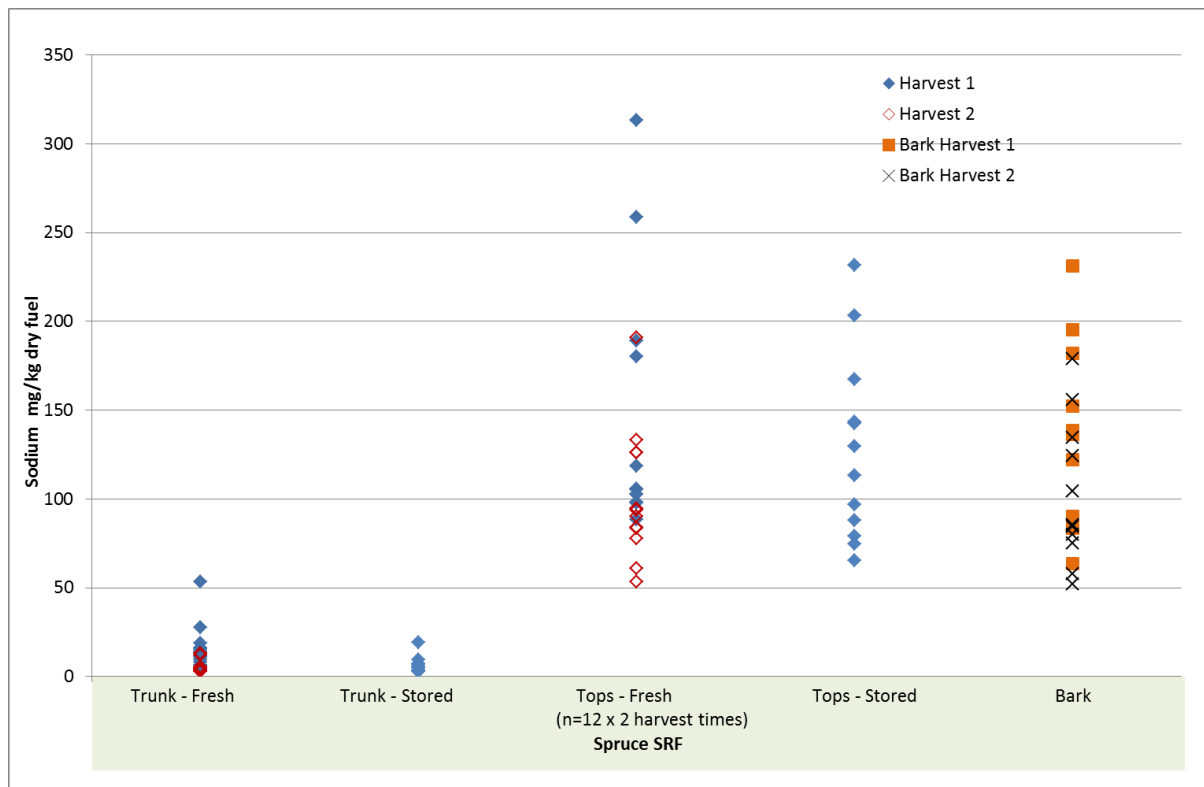


Manganese content of Spruce SRF

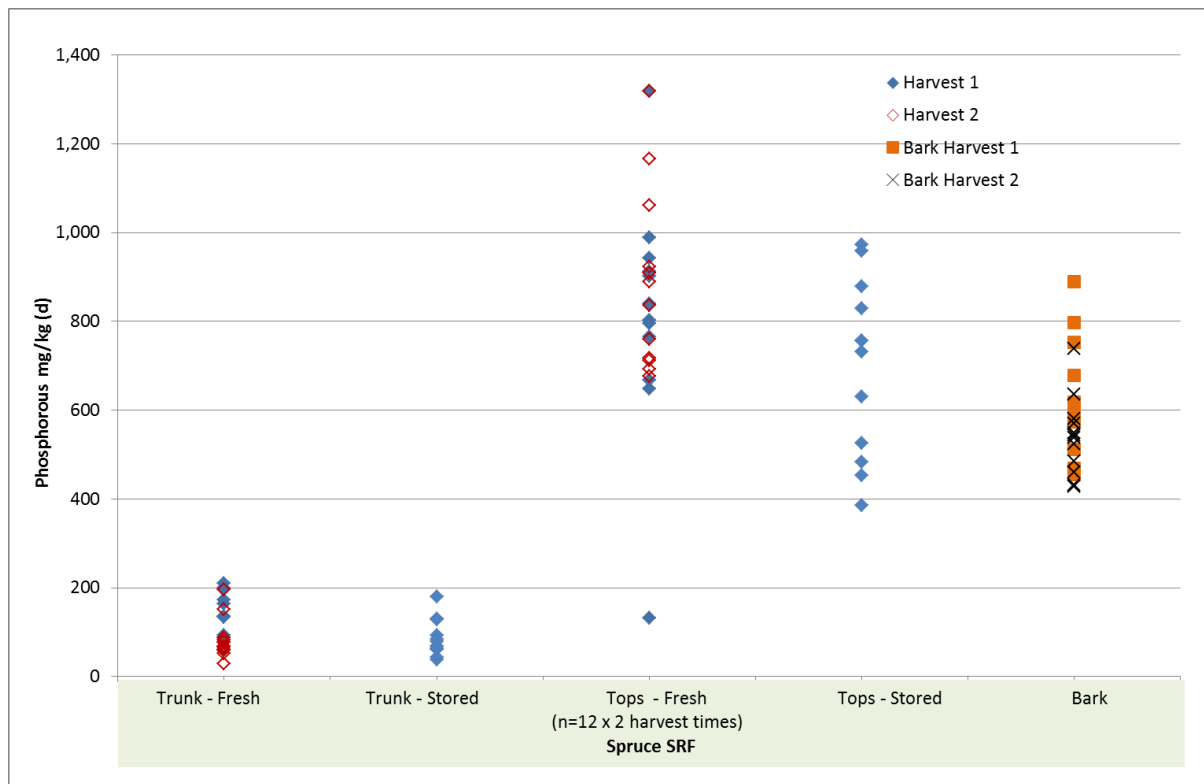


Sodium content of Spruce SRF

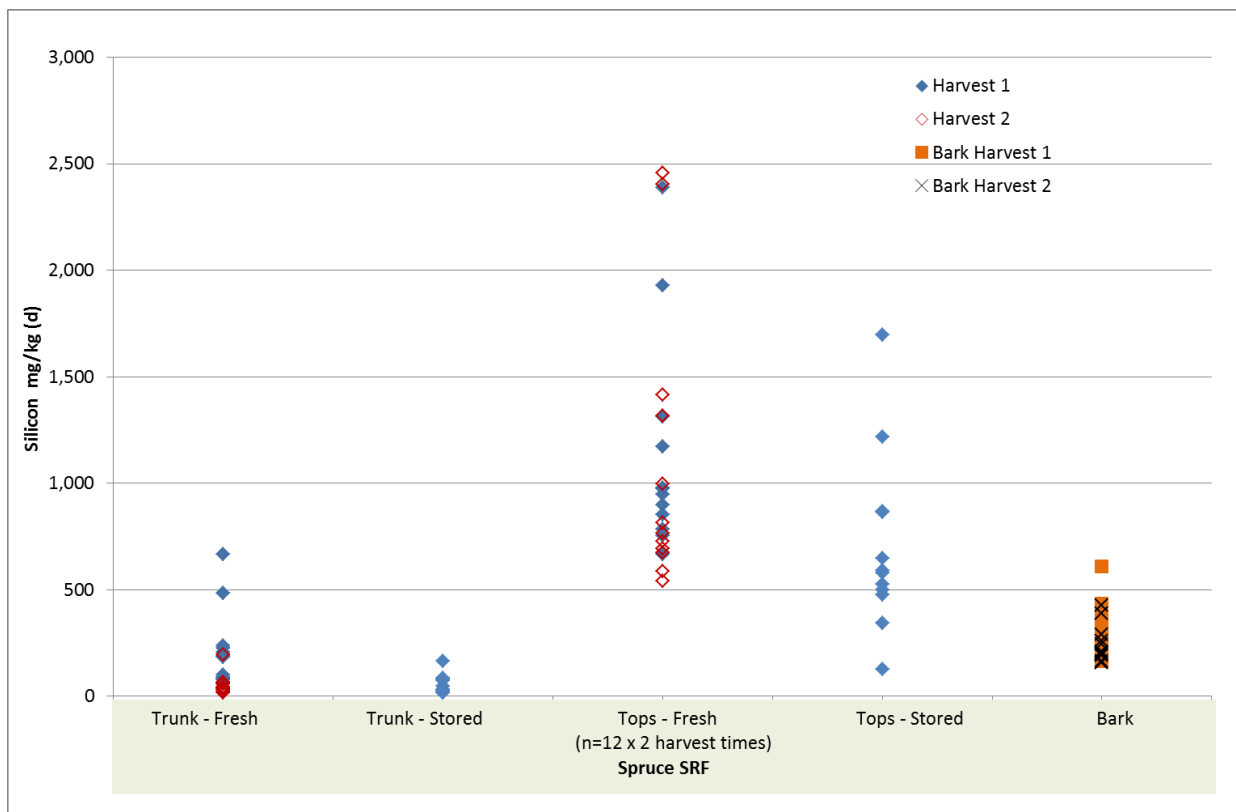
v



Phosphorous content of Poplar SRF



Silicon content of Spruce SRF



Titanium content of Spruce SRF

