



**Programme Area:** Bioenergy

**Project:** Characterisation of Feedstocks

**Title:** D6 Final Report (Phase 1) Appendix 12

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### 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.

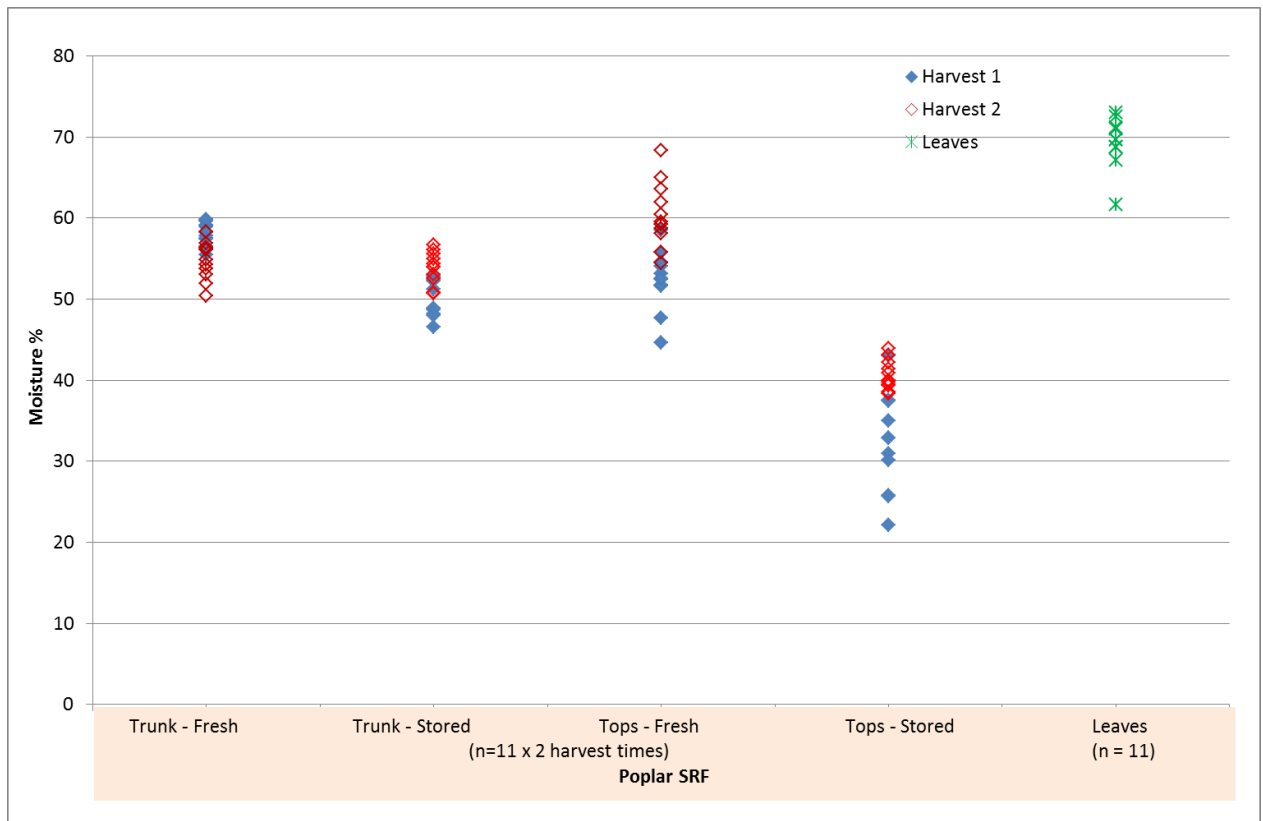
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#### Disclaimer:

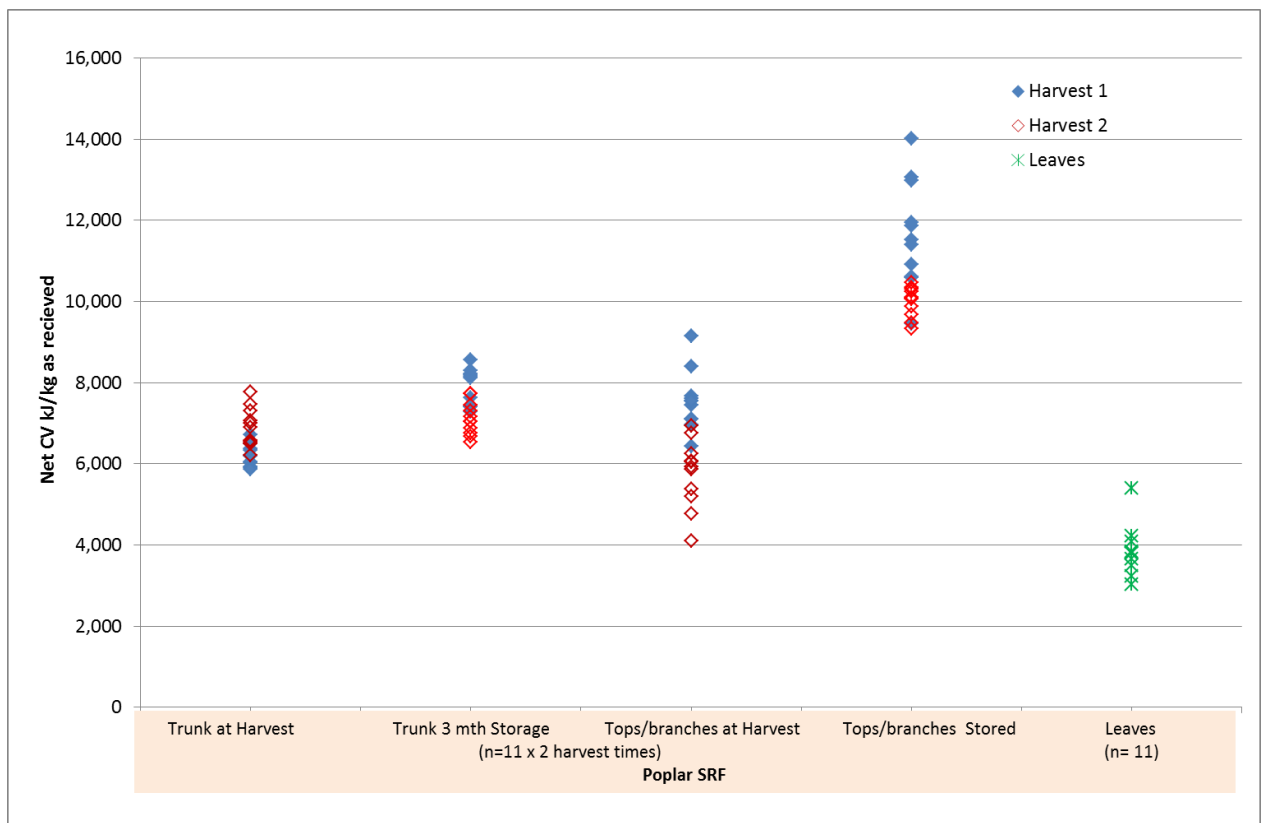
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## Appendix 12 part 1: Charts for poplar SRF

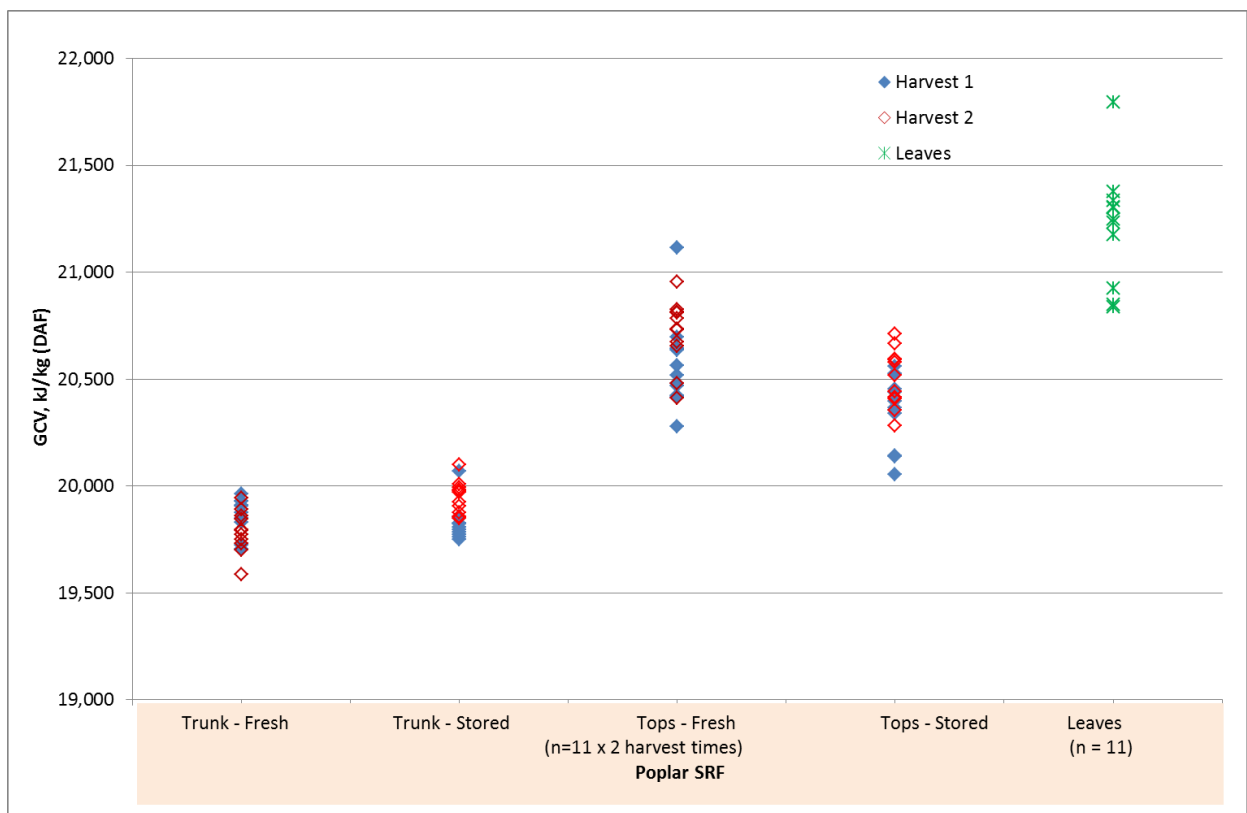
### Moisture Content of Poplar SRF



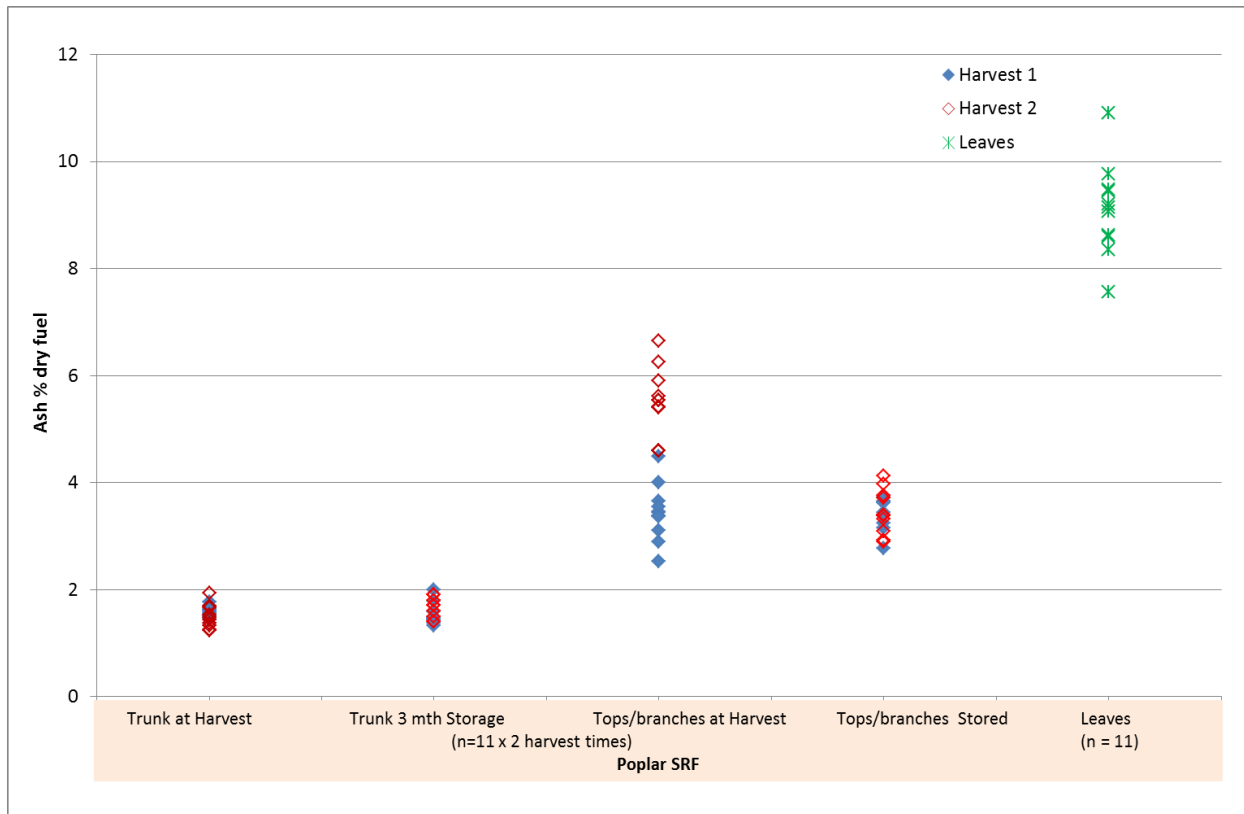
### Net Calorific Value of Poplar SRF



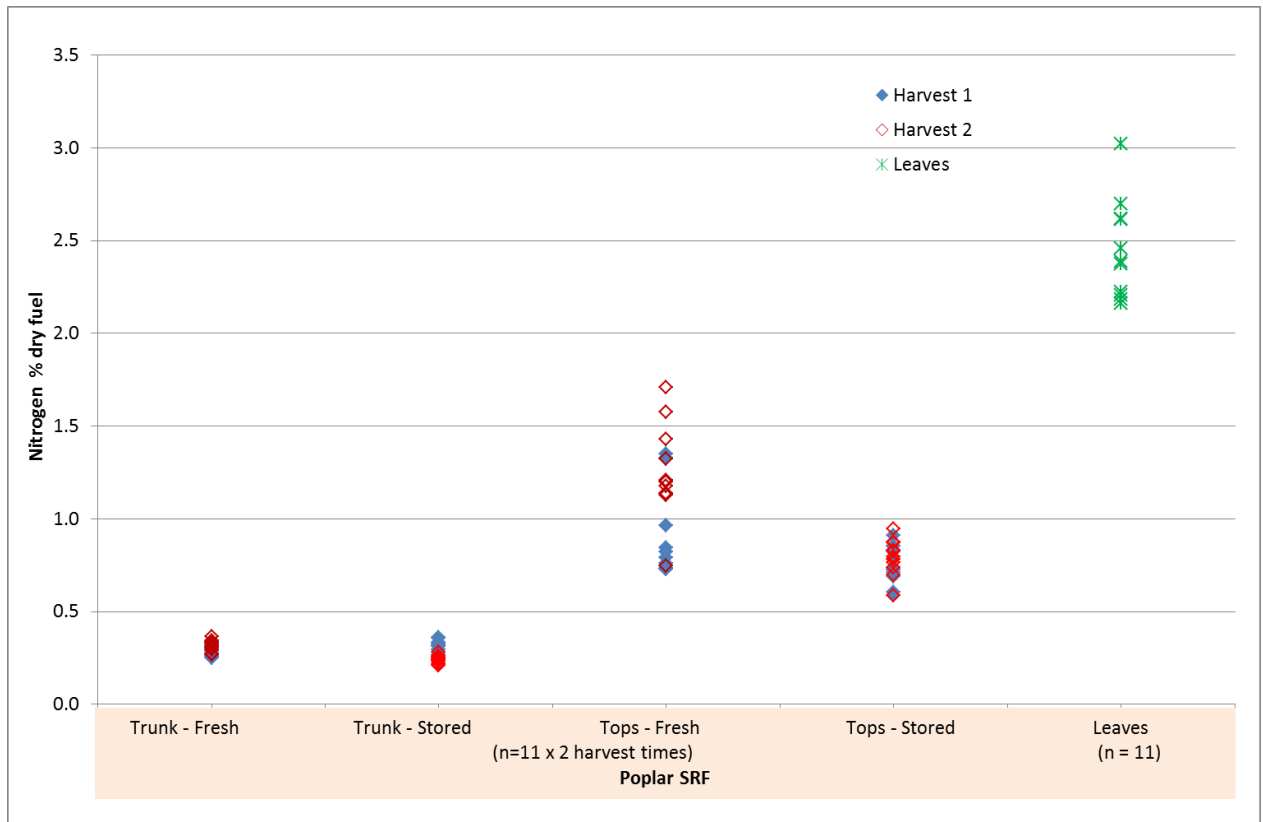
### Gross Calorific Value (DAF) of Poplar SRF



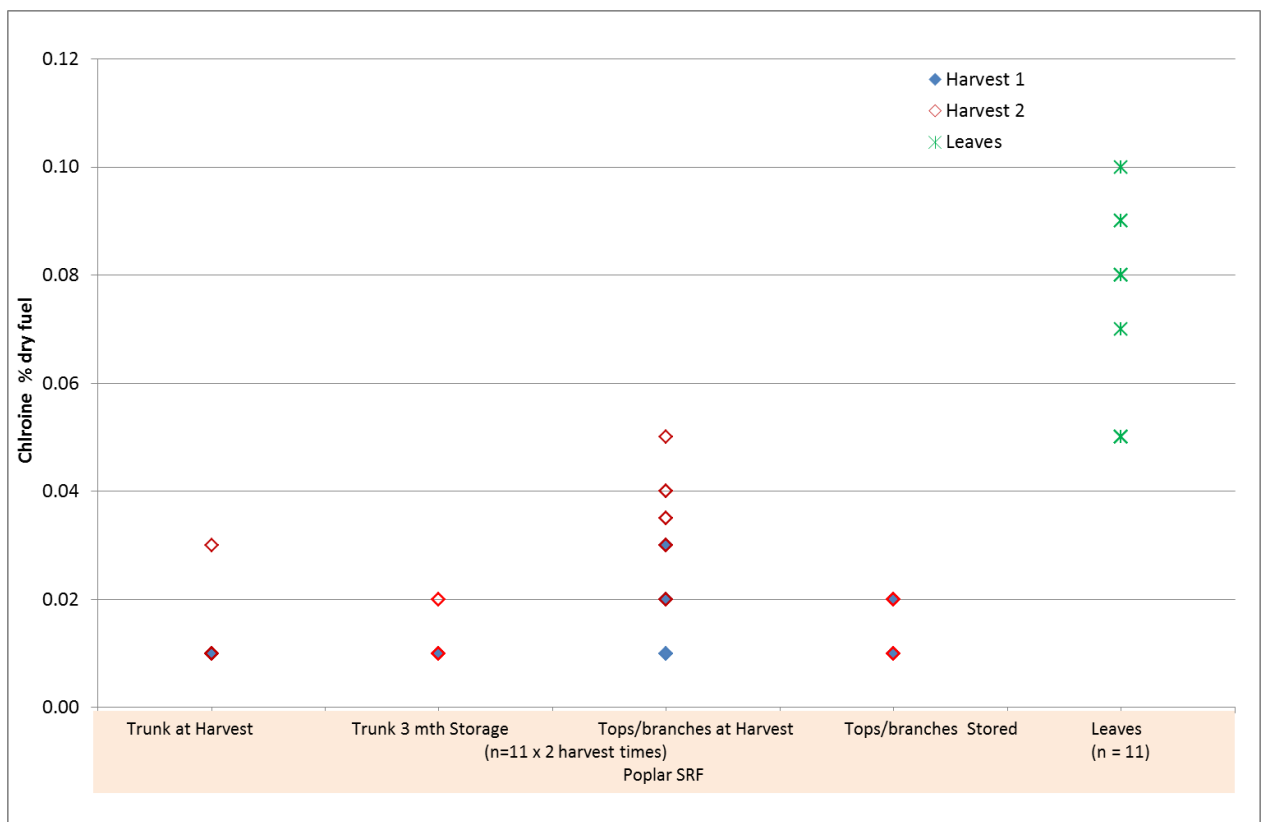
# Dry Ash content of Poplar SRF



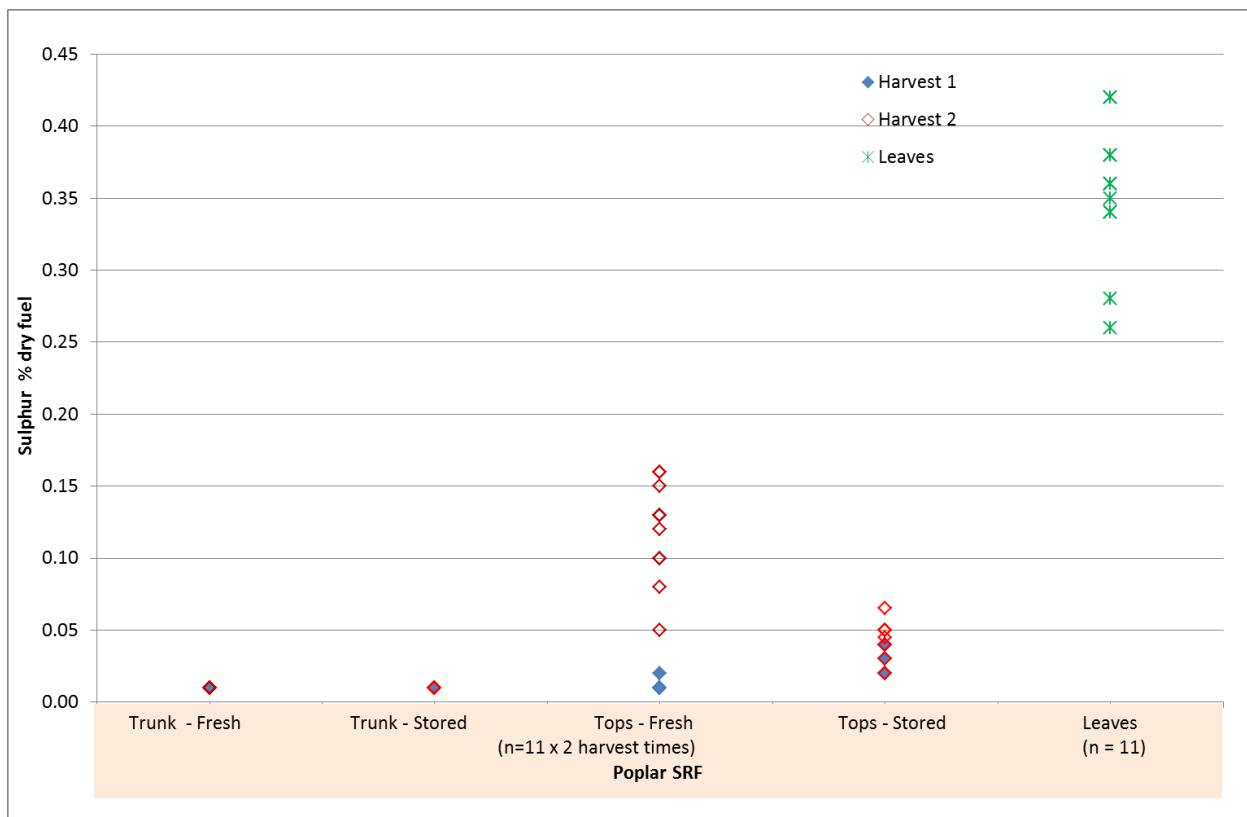
### Dry nitrogen content of Poplar SRF



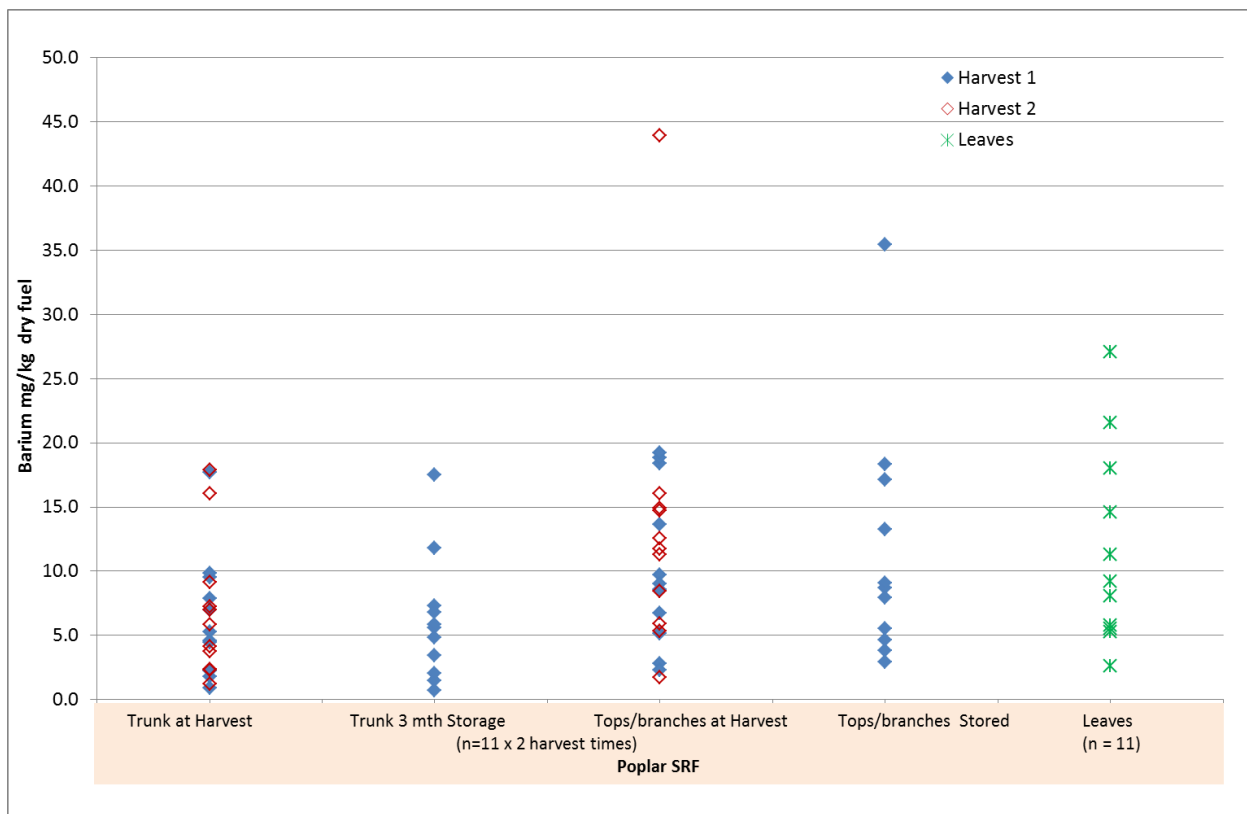
### Dry chlorine content of Poplar SRF



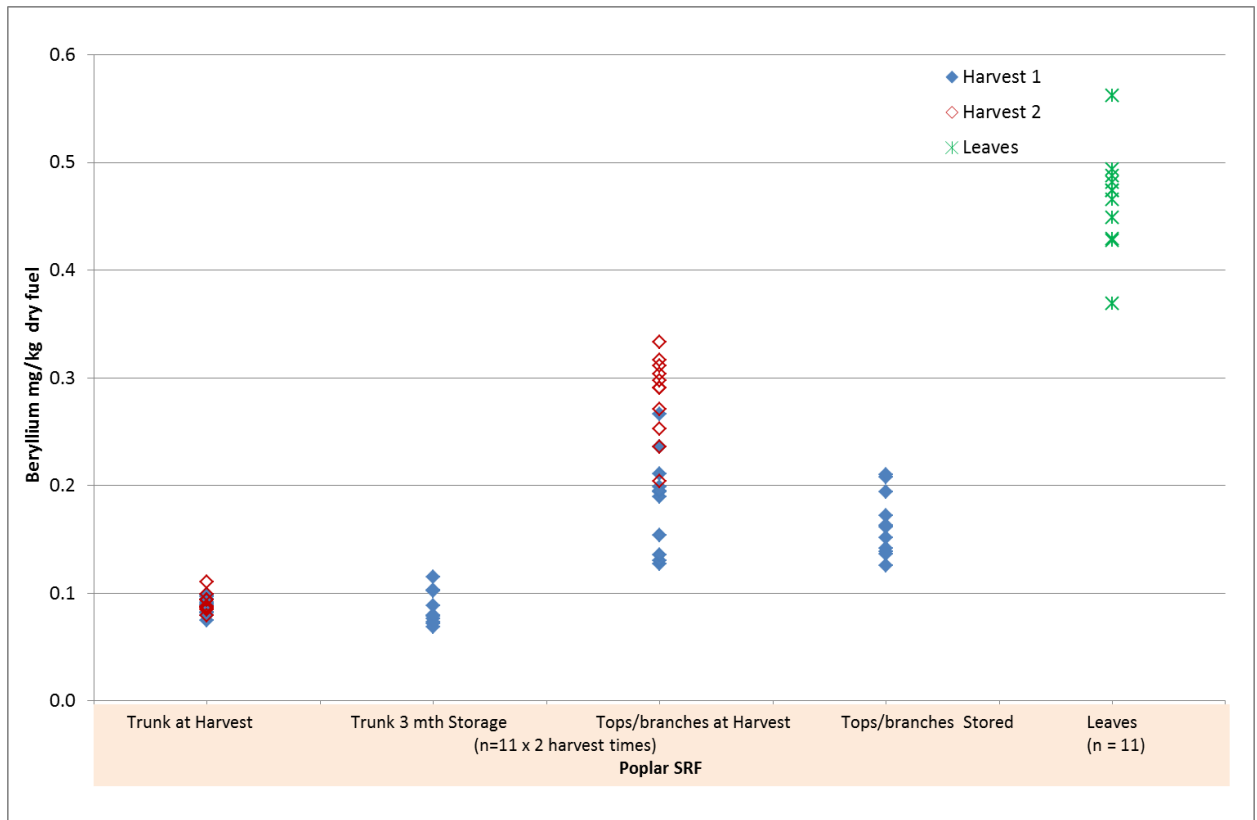
### Dry sulphur content of Poplar SRF



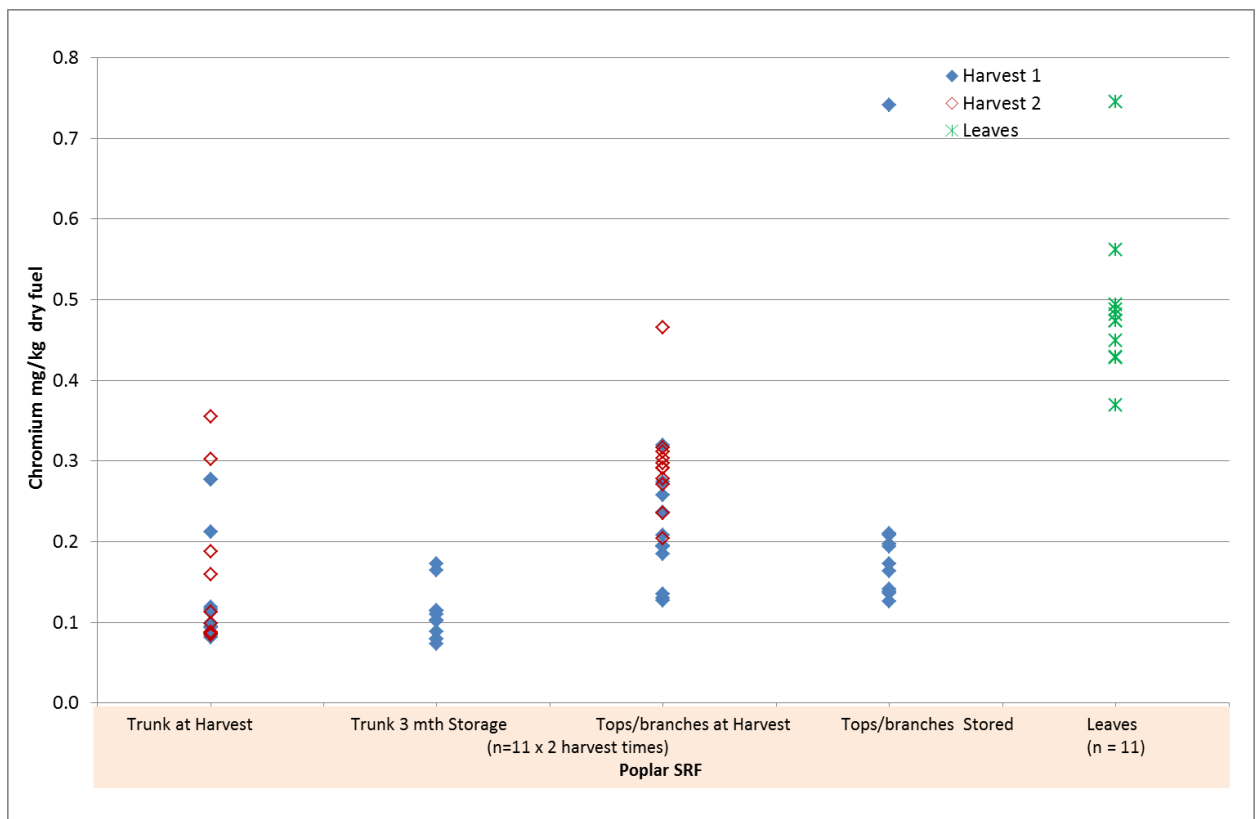
### Barium content of Poplar SRF



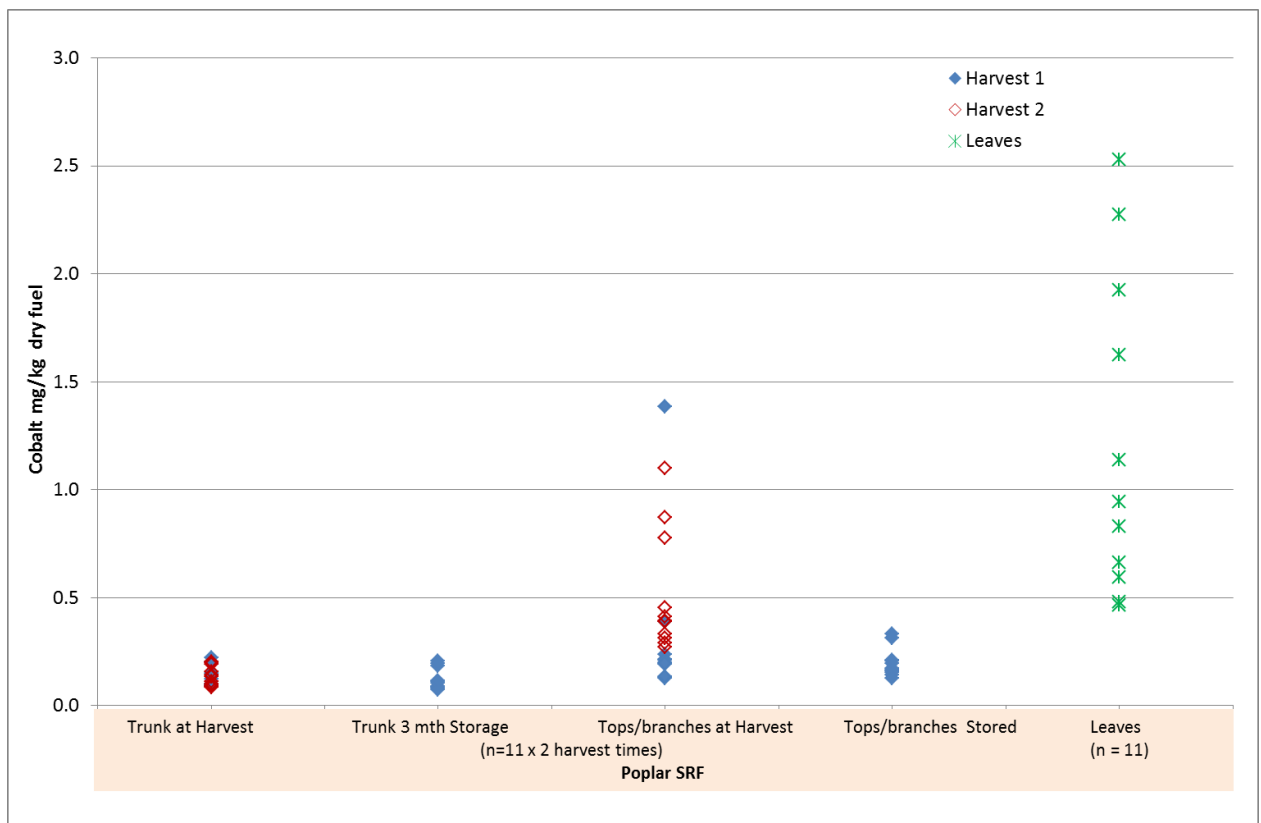
### Beryllium content of Poplar SRF



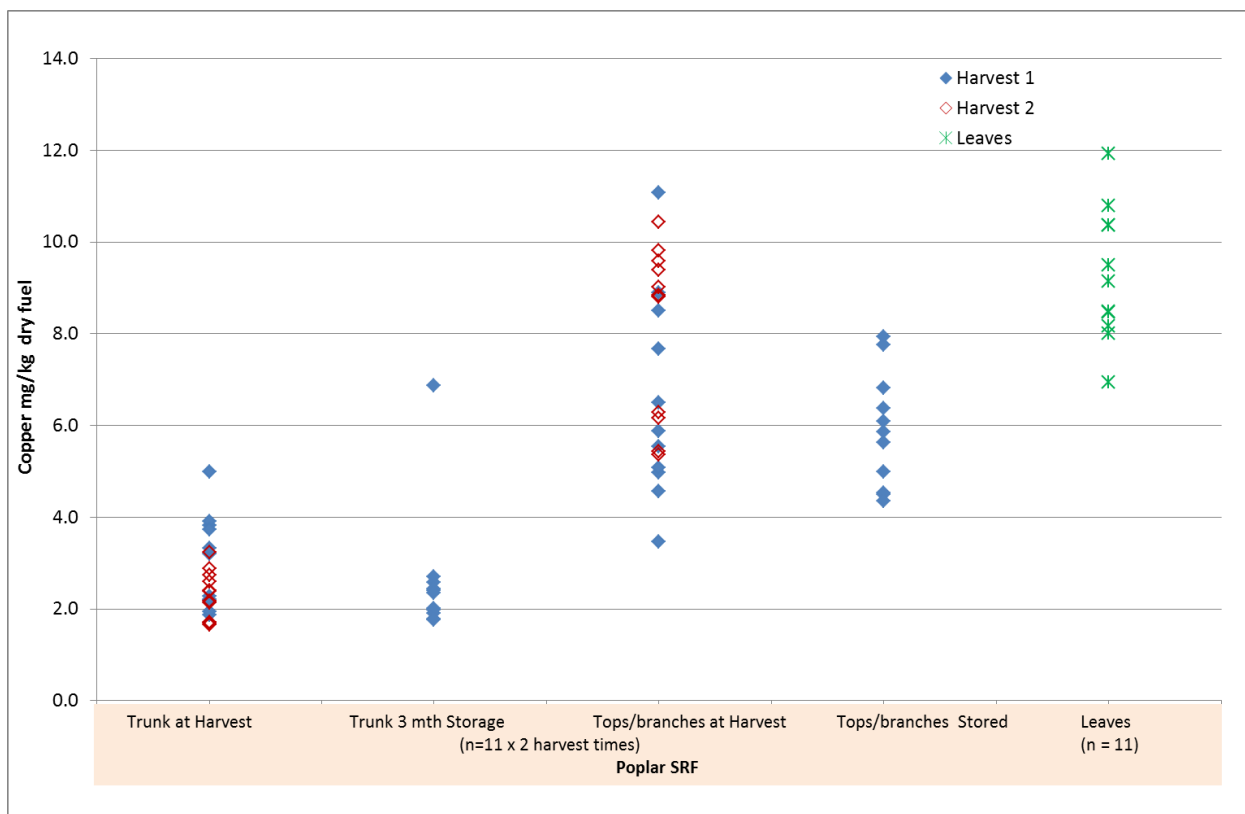
### Chromium content of Poplar SRF



### Cobalt content of Poplar SRF

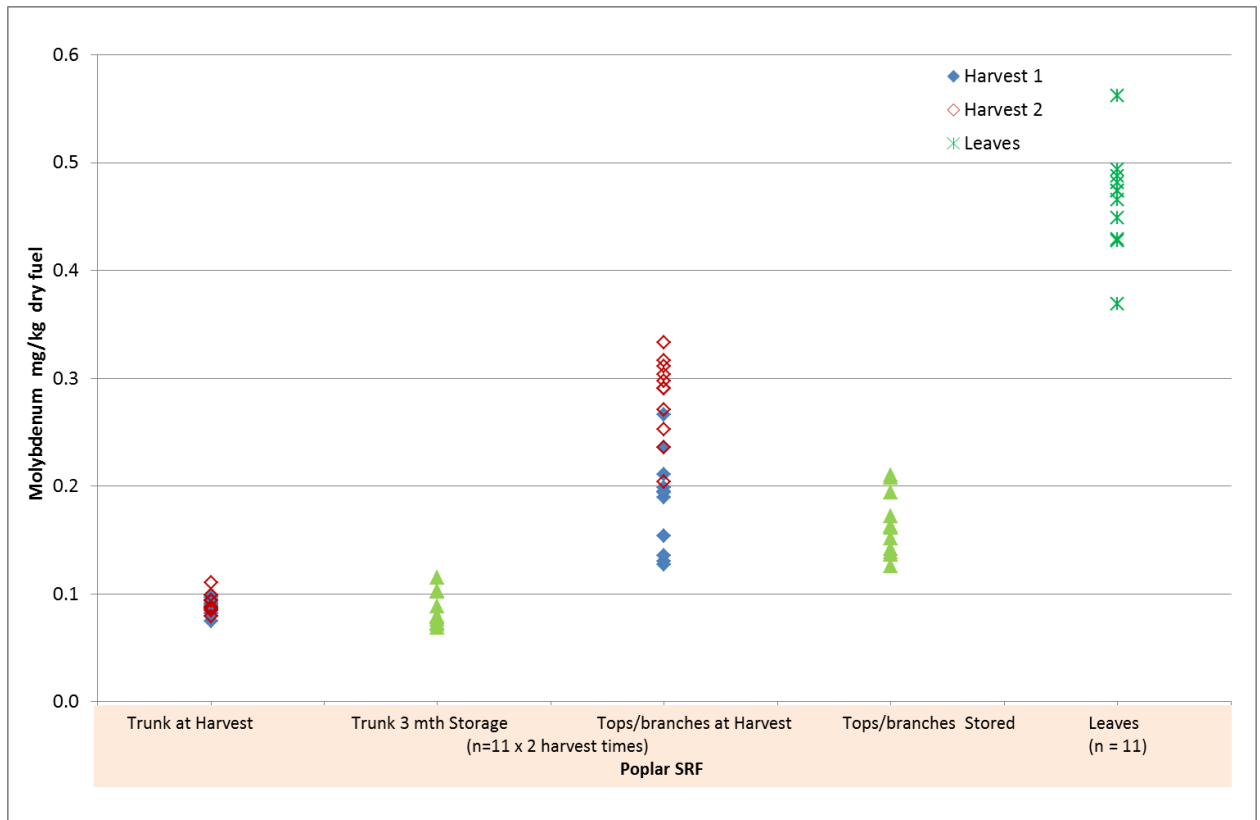


### Copper content of Poplar SRF

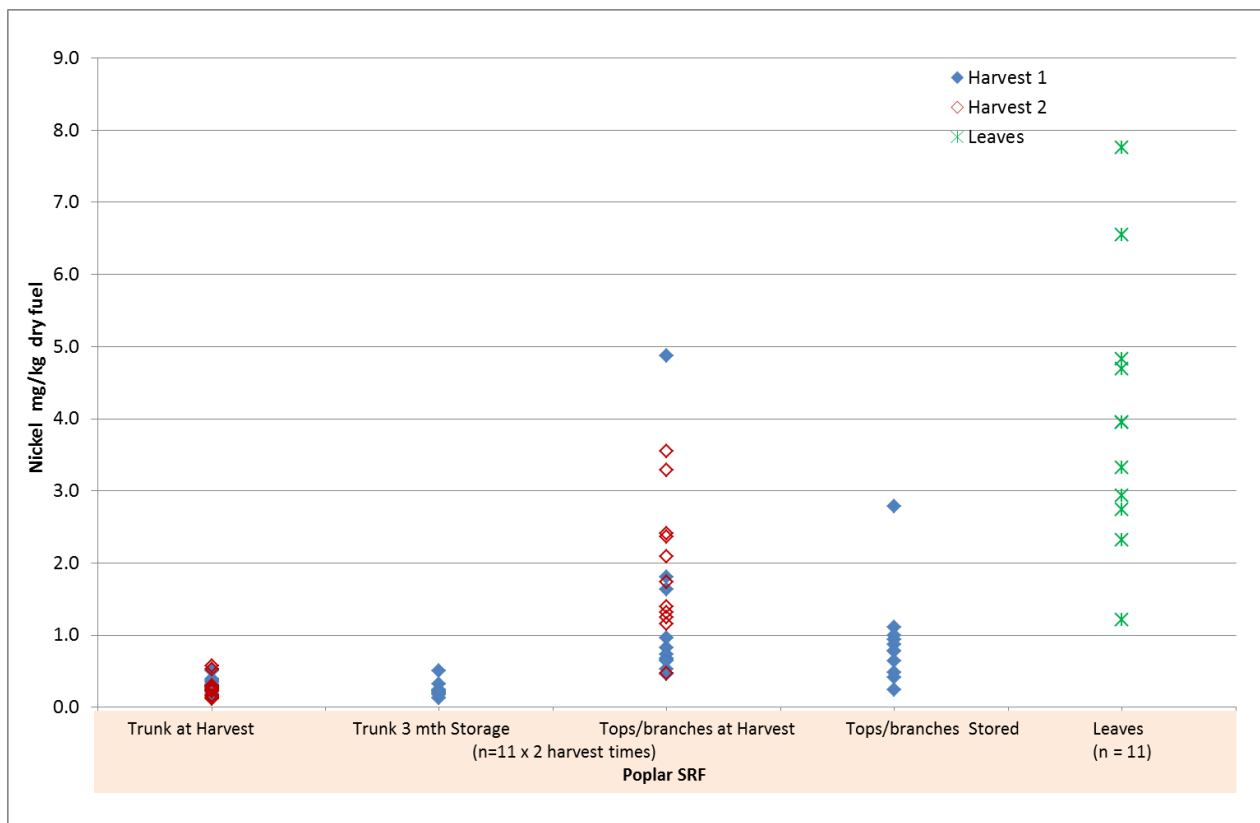




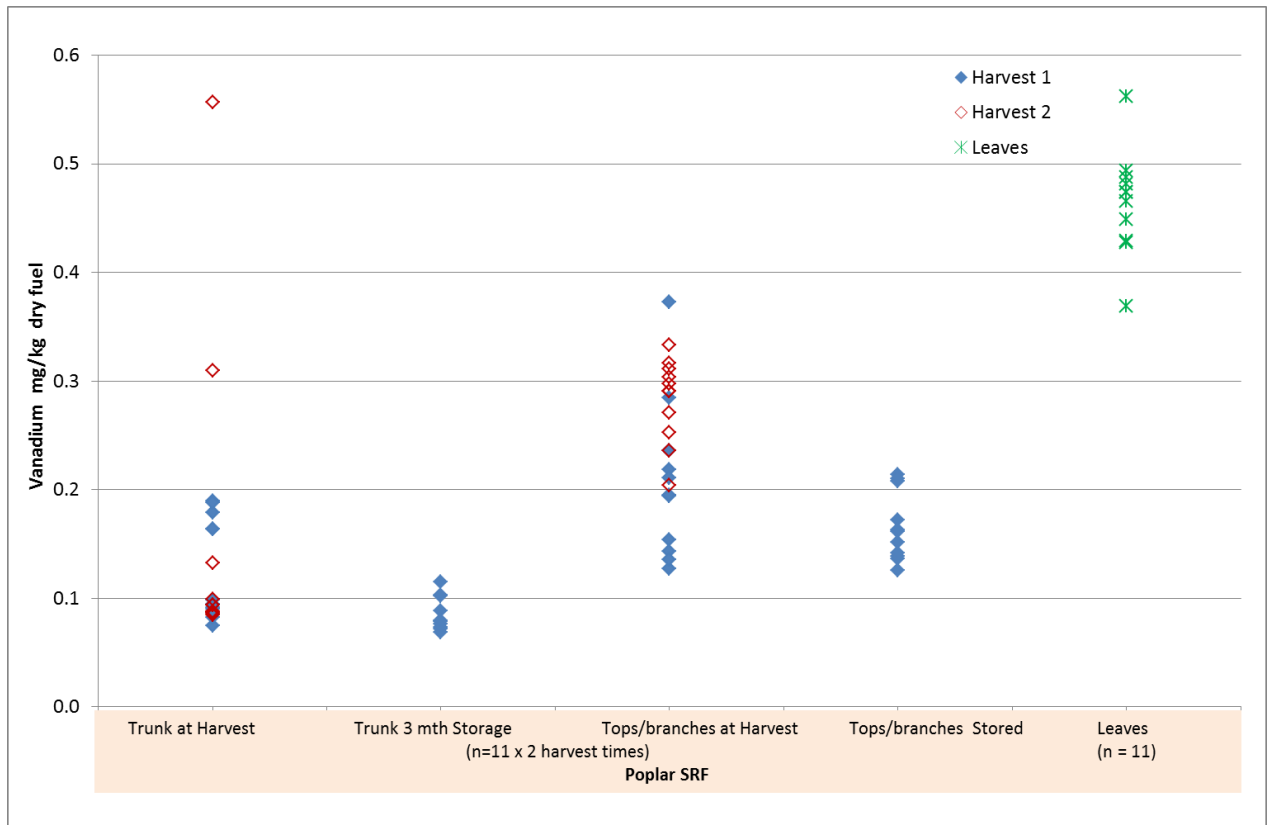
### Molybdenum content of Poplar SRF



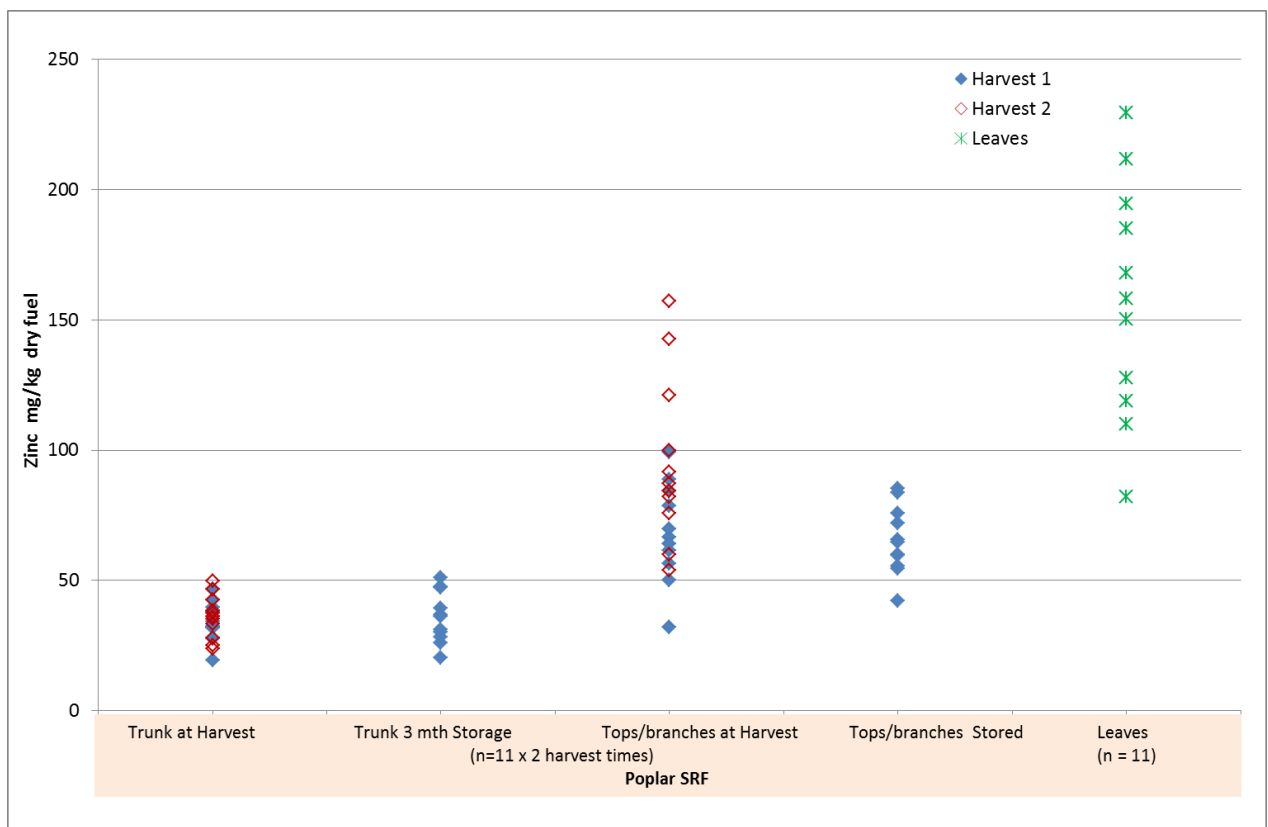
### Nickel content of Poplar SRF



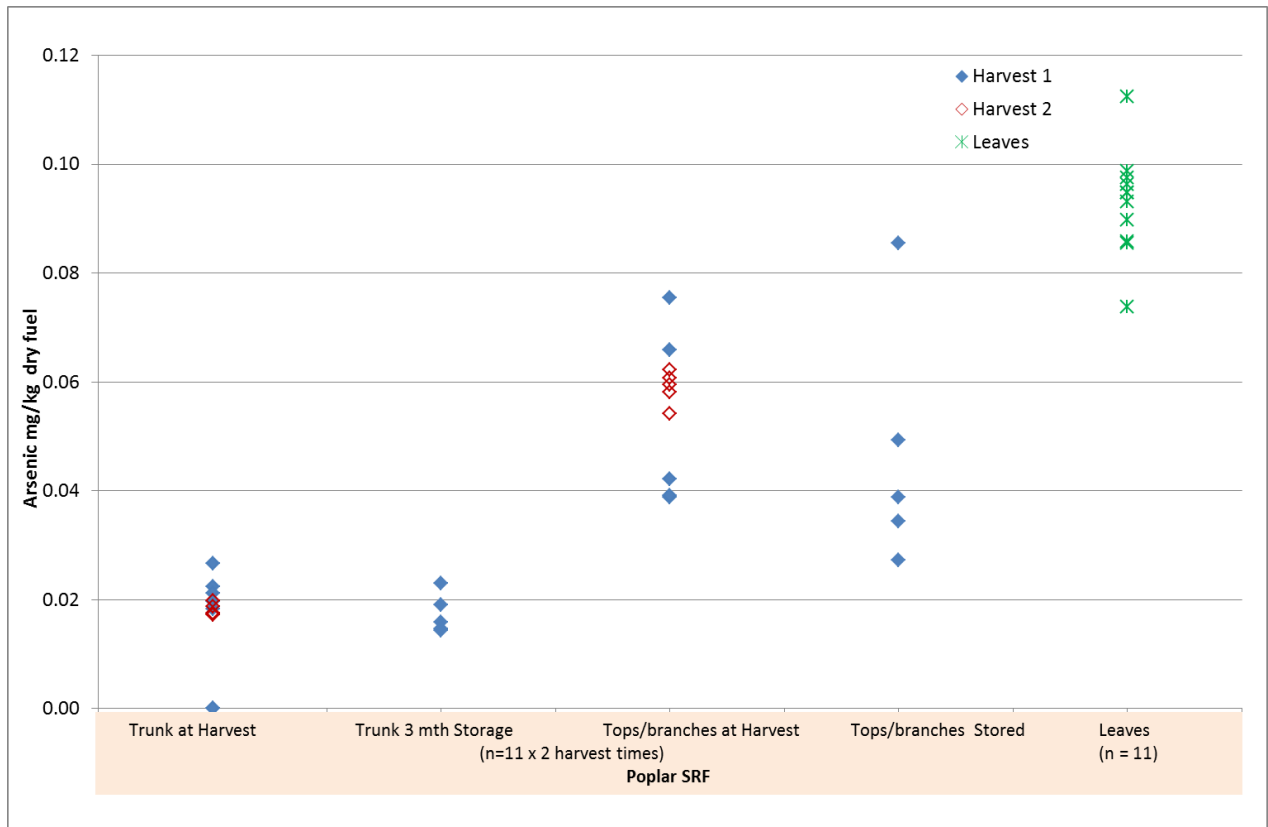
### Vanadium content of Poplar SRF



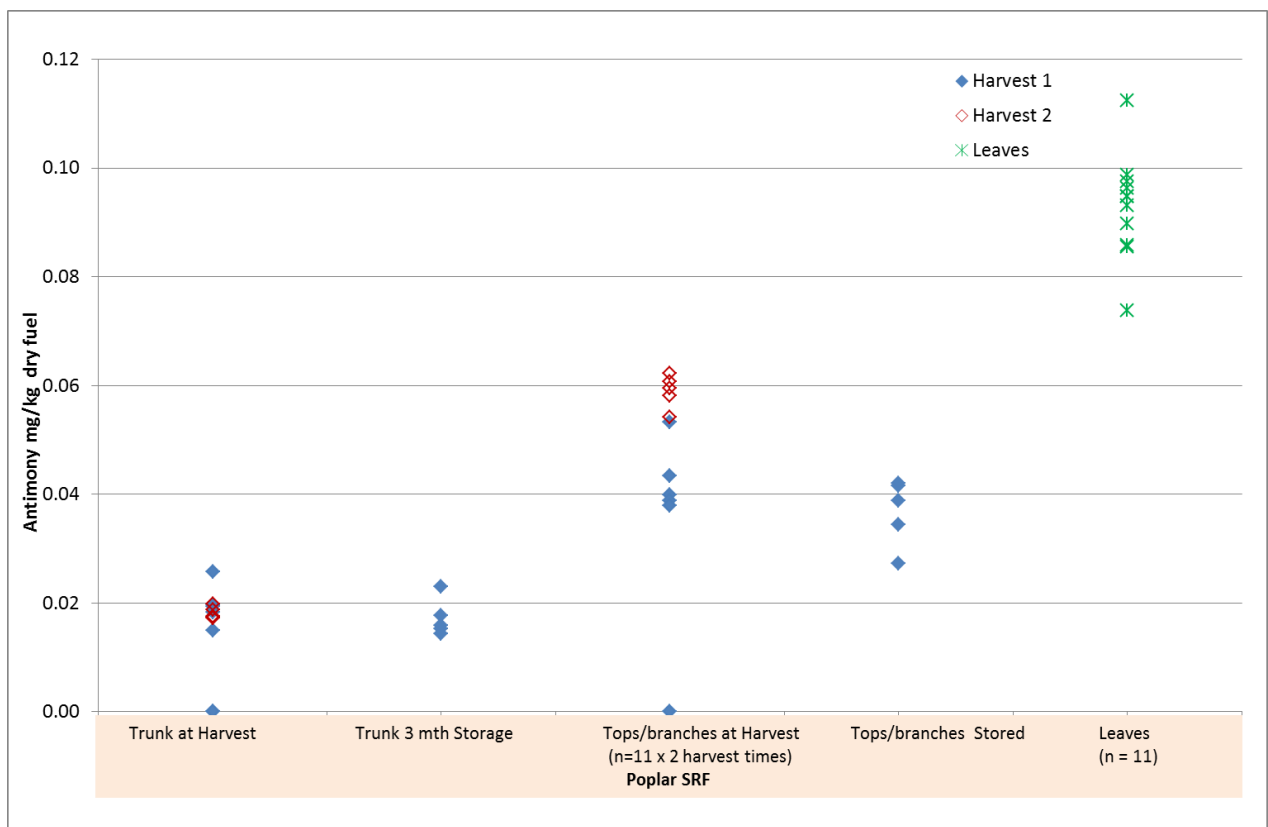
### Zinc content of Poplar SRF



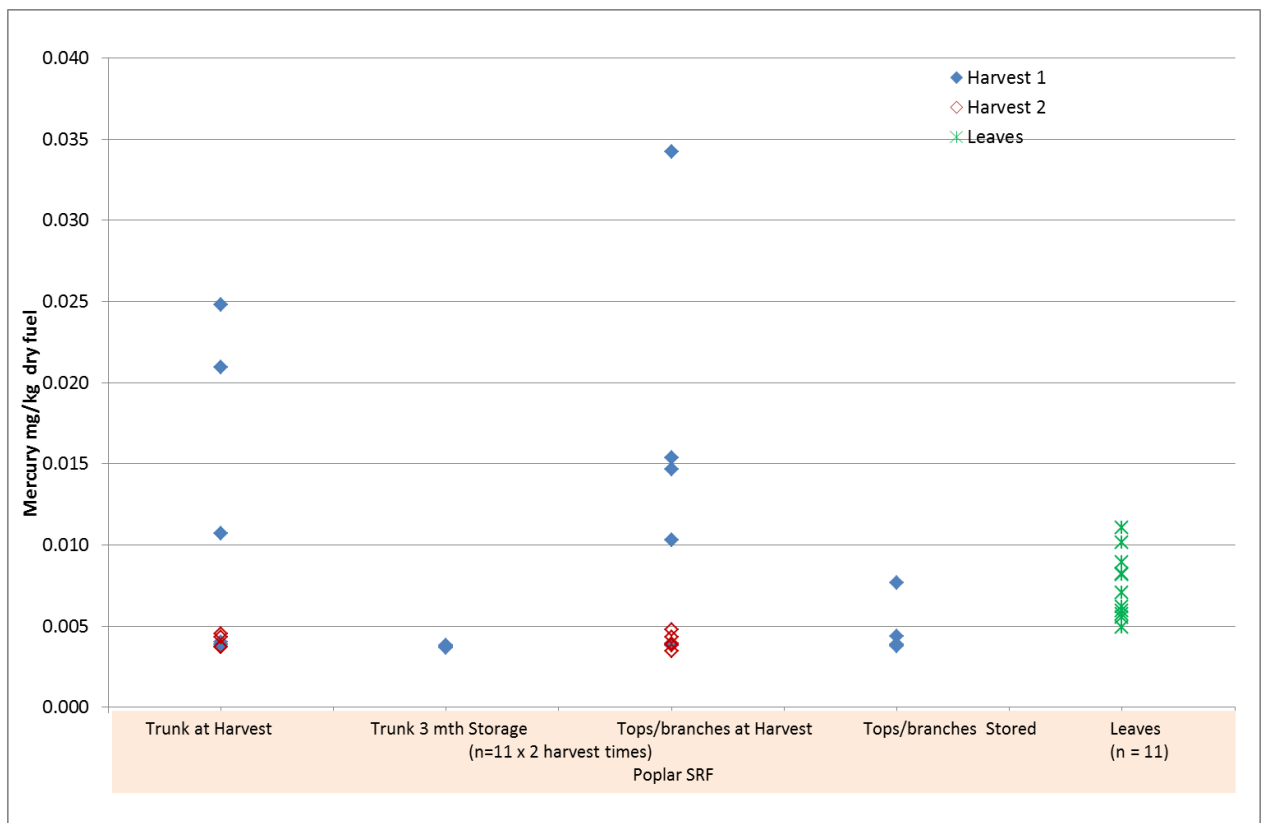
### Arsenic content of Poplar SRF



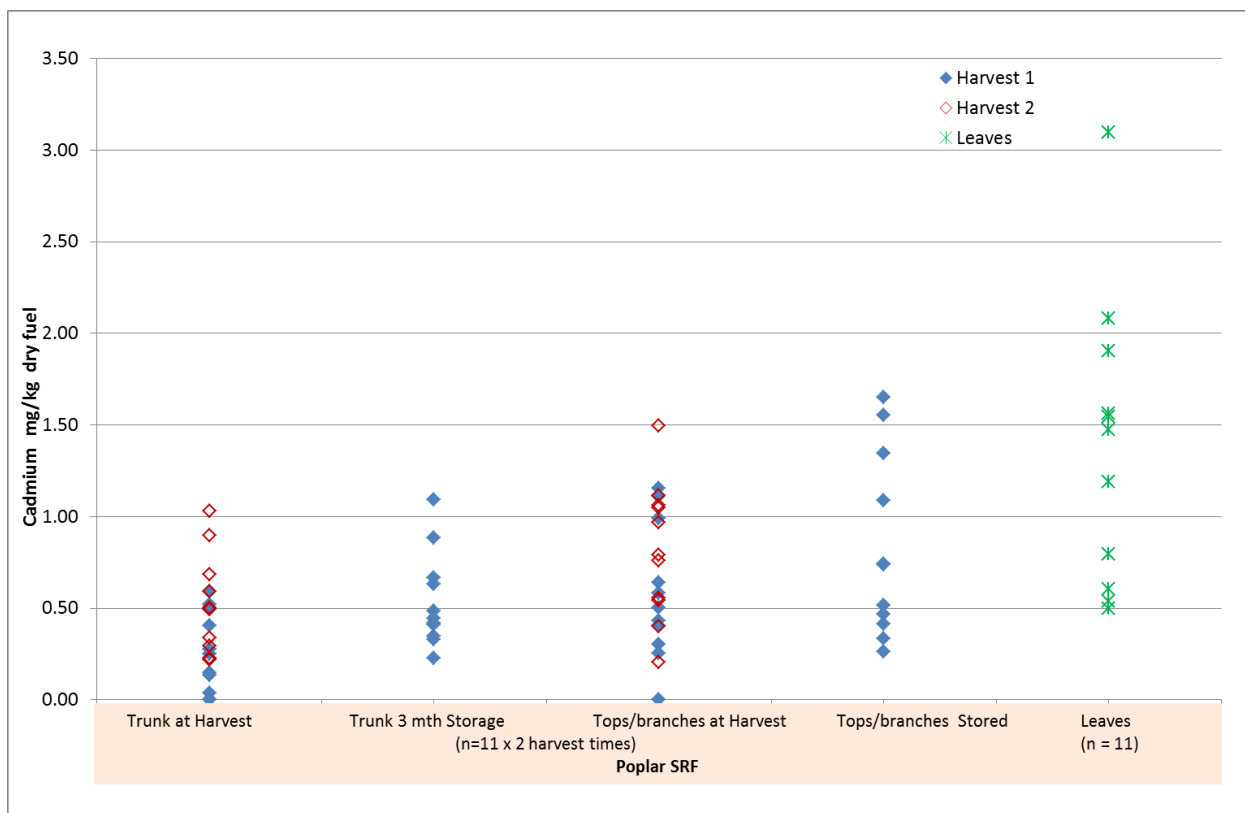
### Antimony content of Poplar SRF



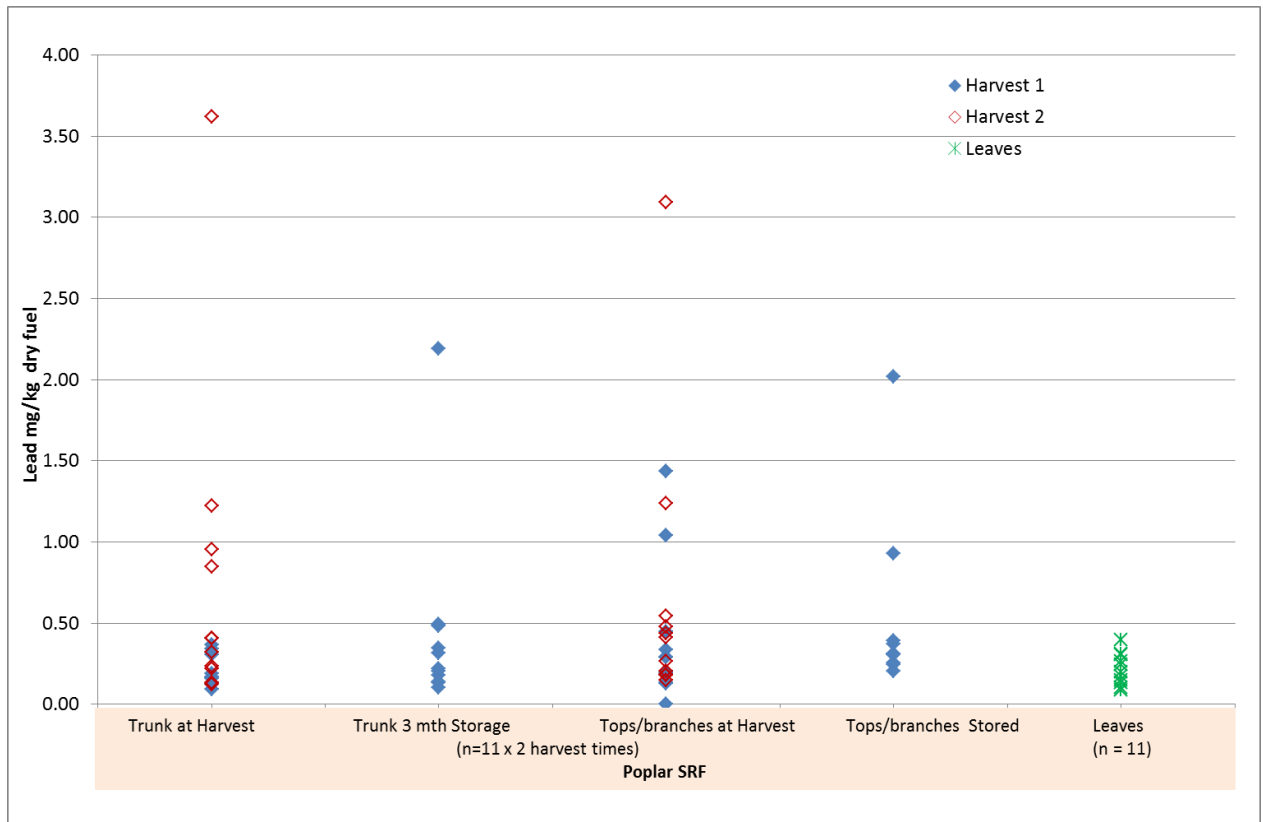
### Mercury content of Poplar SRF



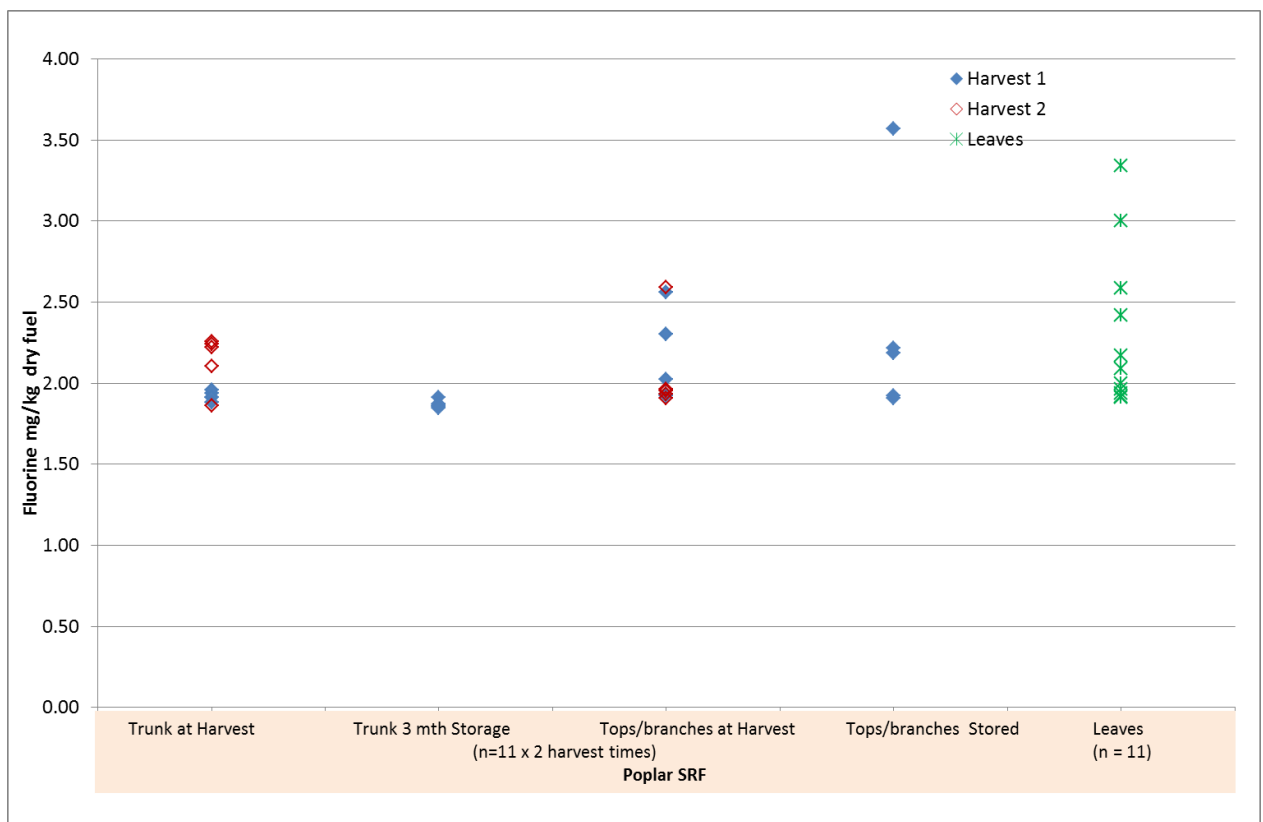
### Cadmium content of Poplar SRF



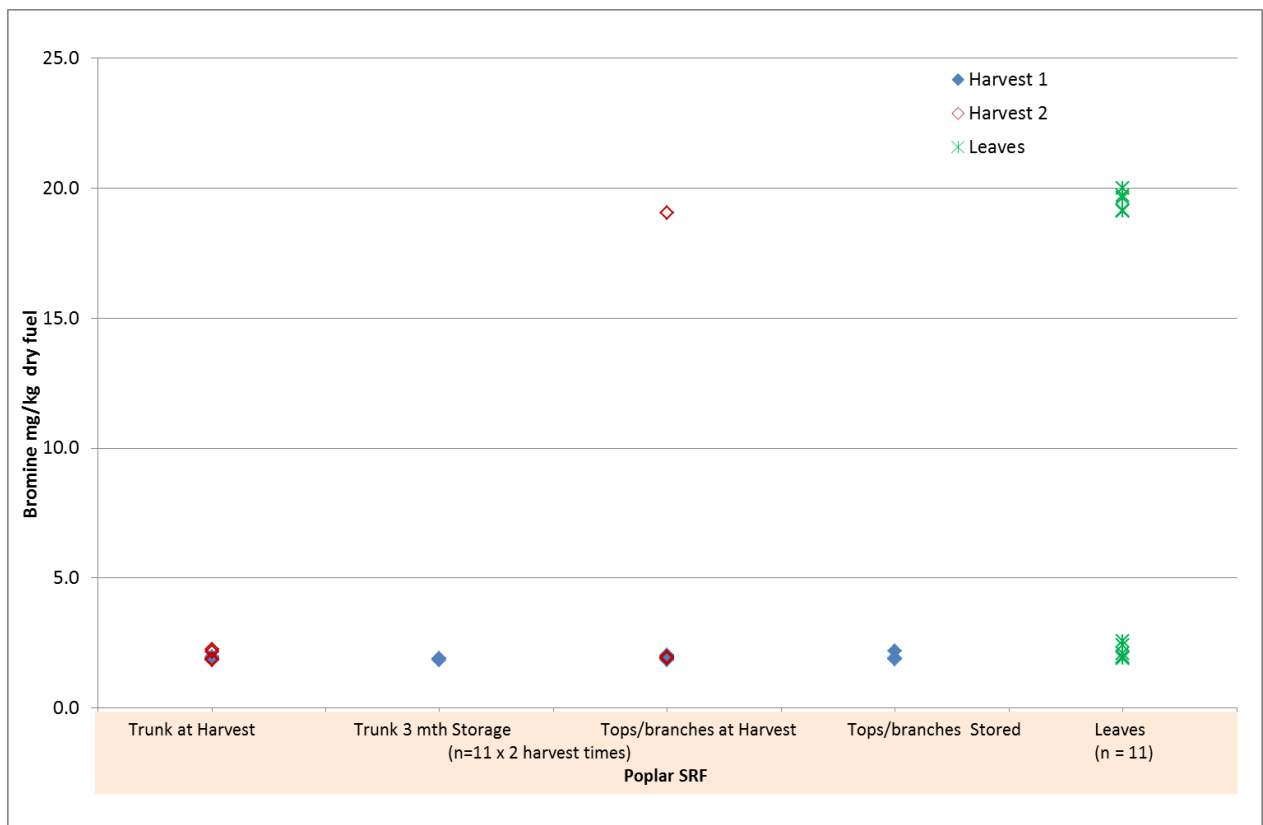
### Lead content of Poplar SRF



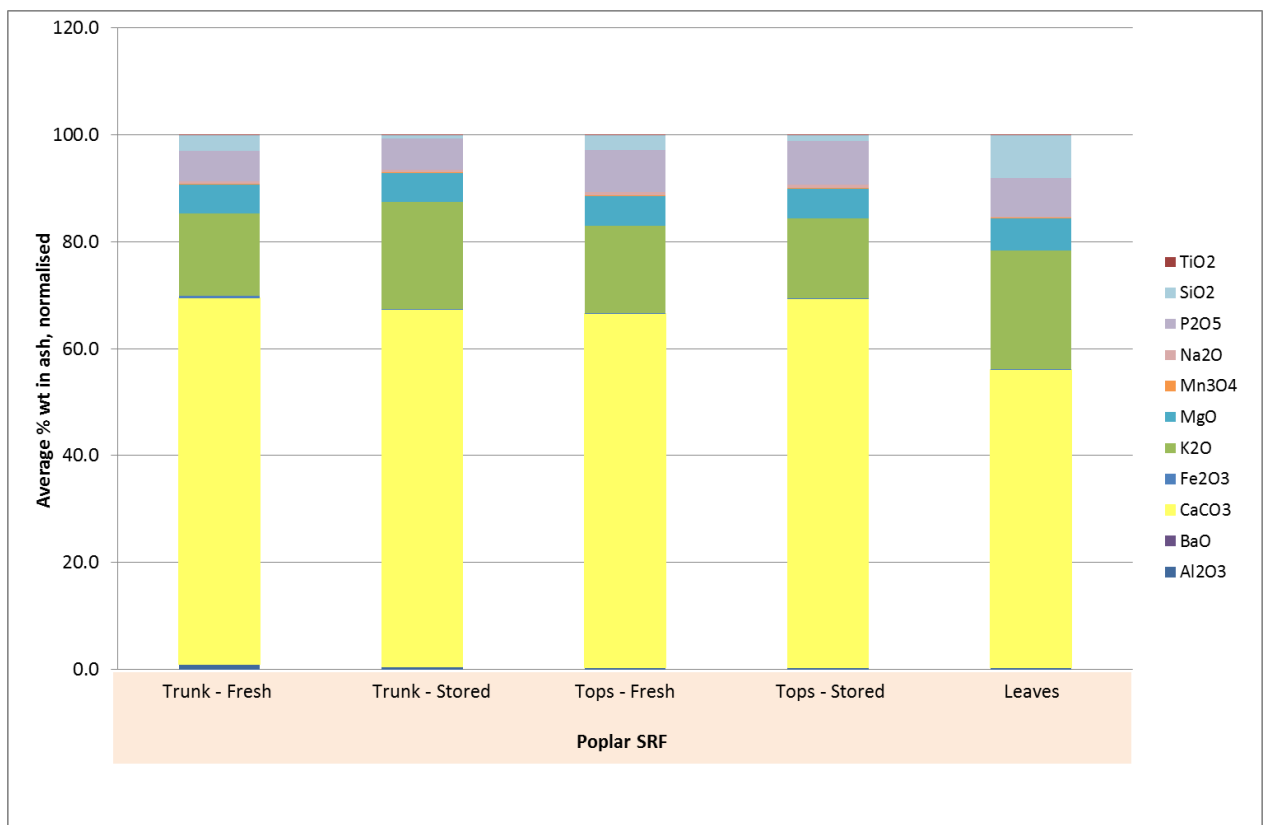
### Fluorine content of Poplar SRF



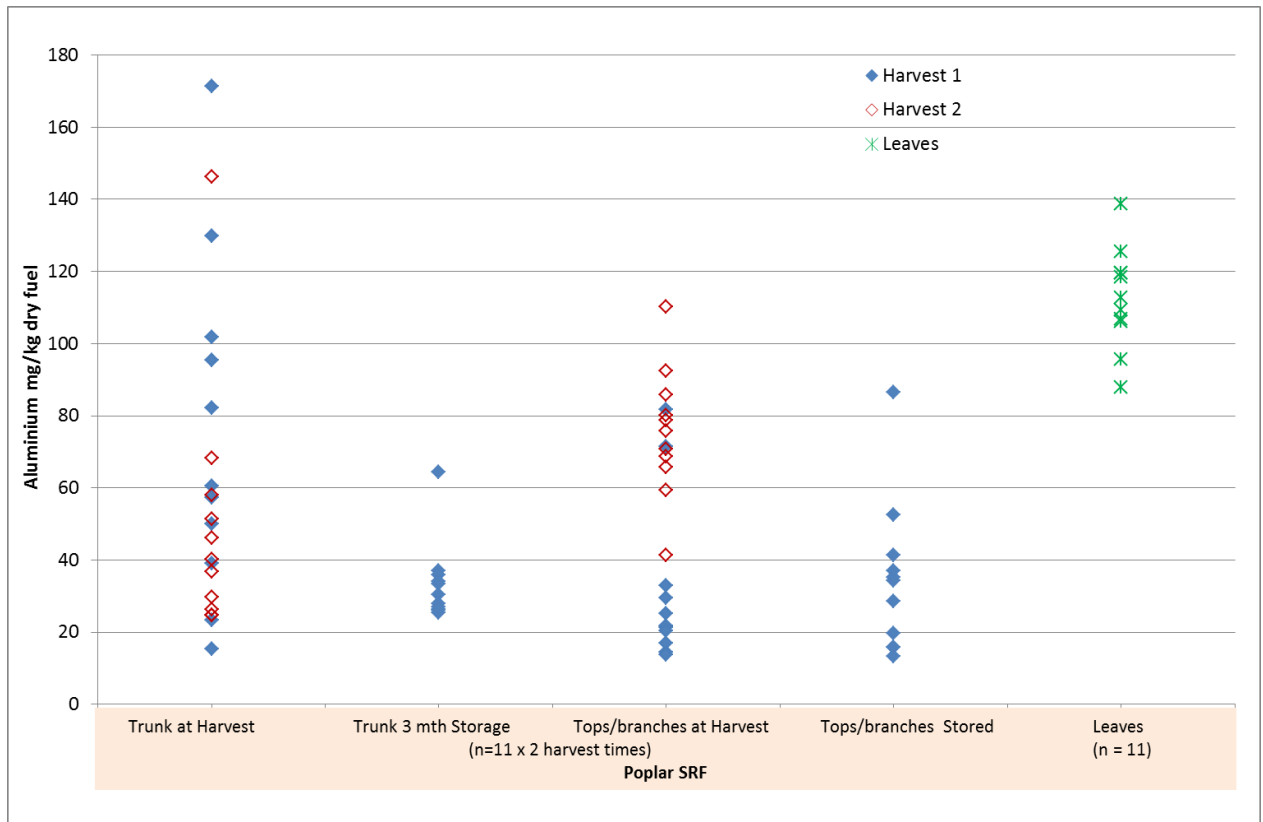
### Bromine content of Poplar SRF



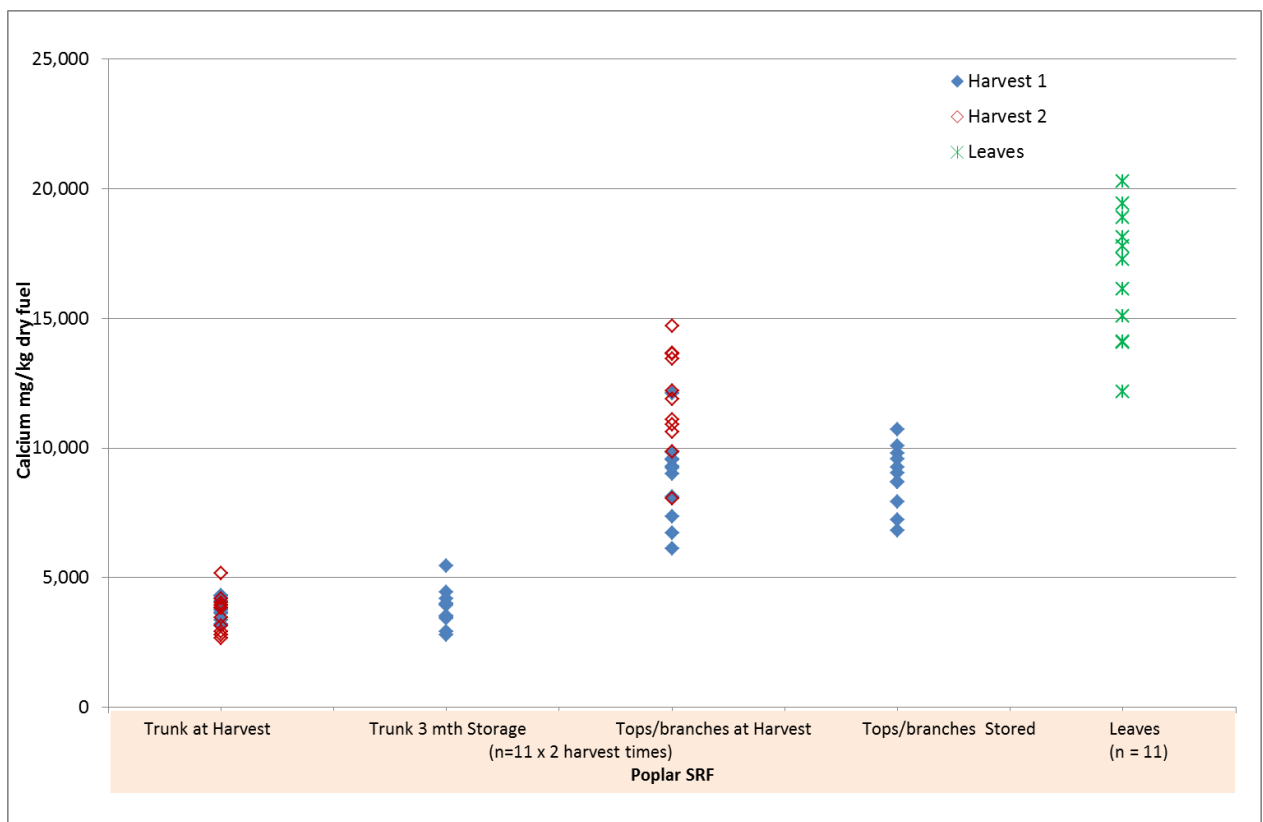
### Variation in ash composition of Poplar SRF



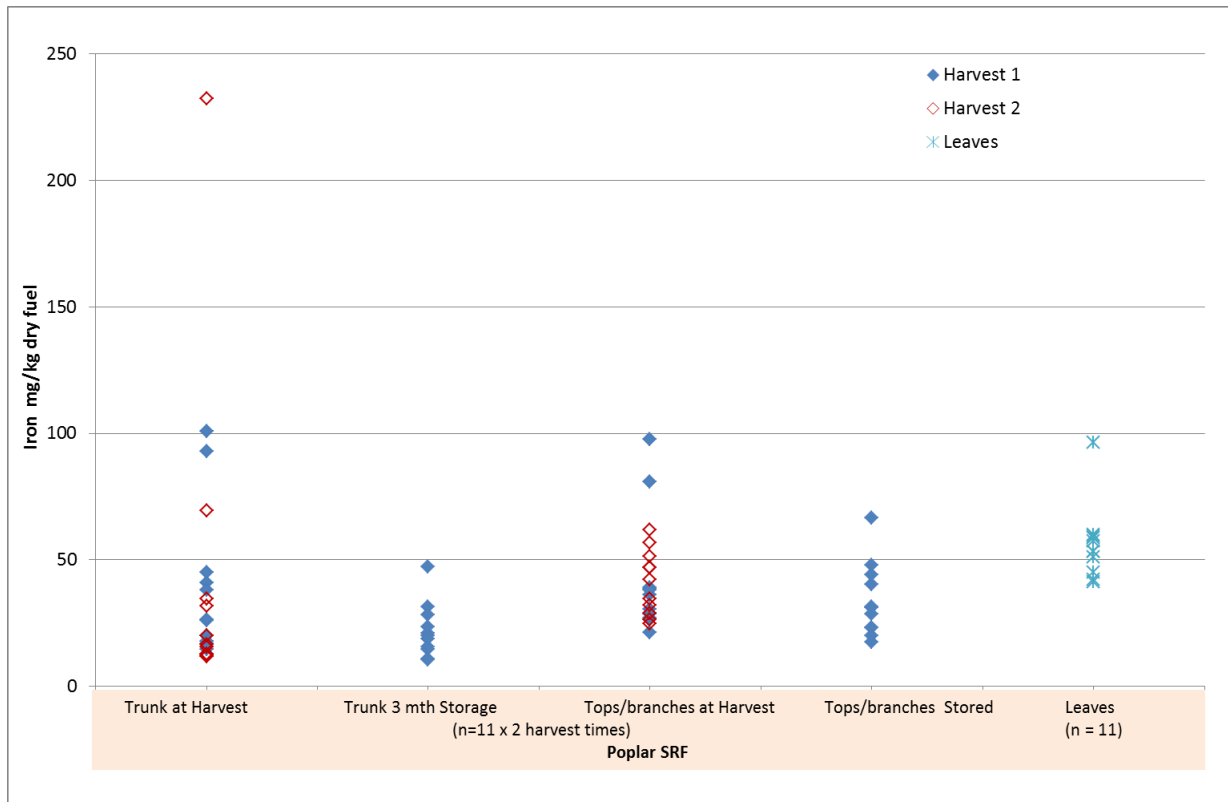
### Aluminium content of Poplar SRF



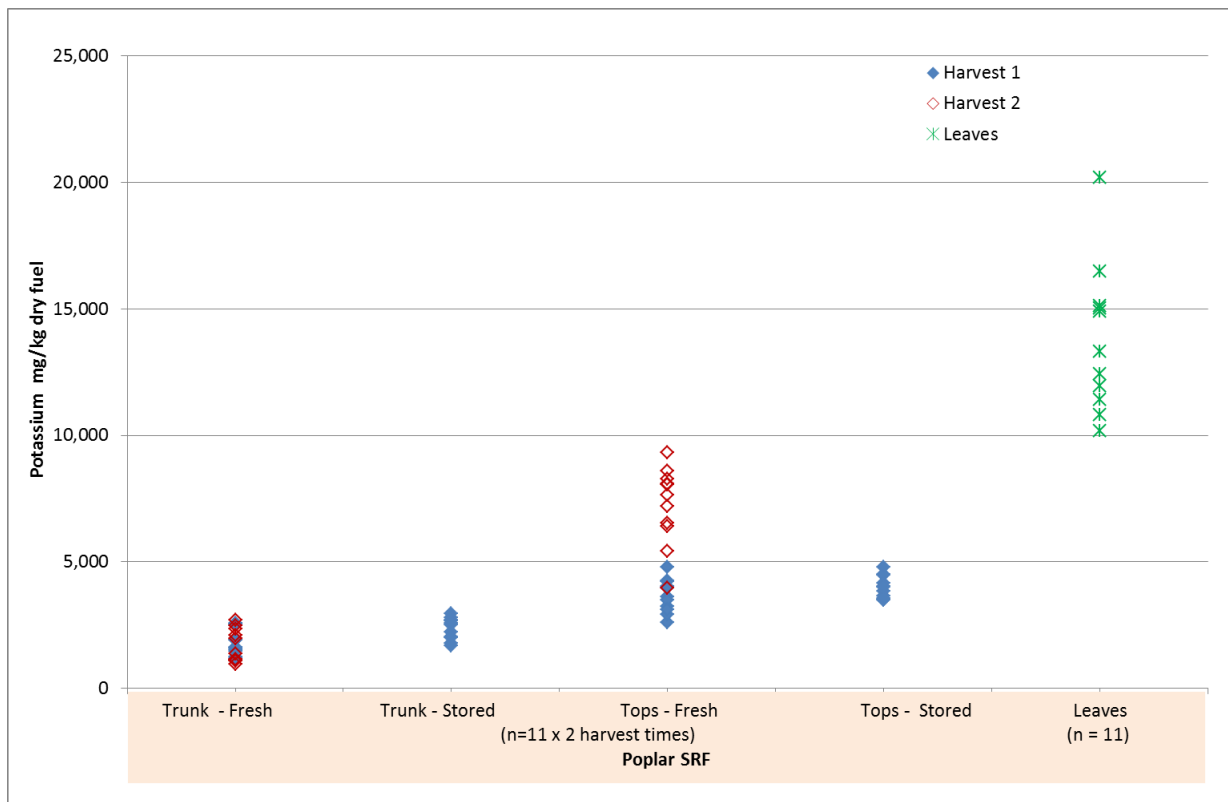
### Calcium content of Poplar SRF



### Iron content of Poplar SRF

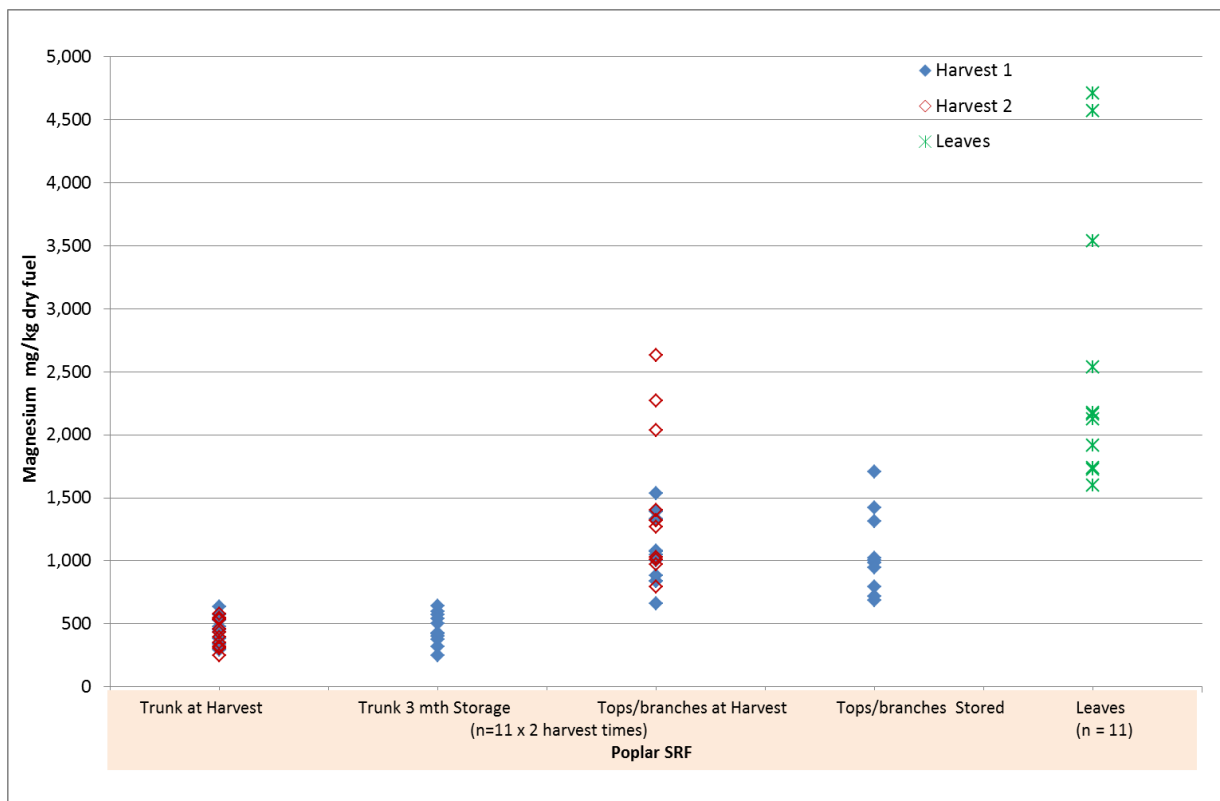


### Potassium content of Poplar SRF

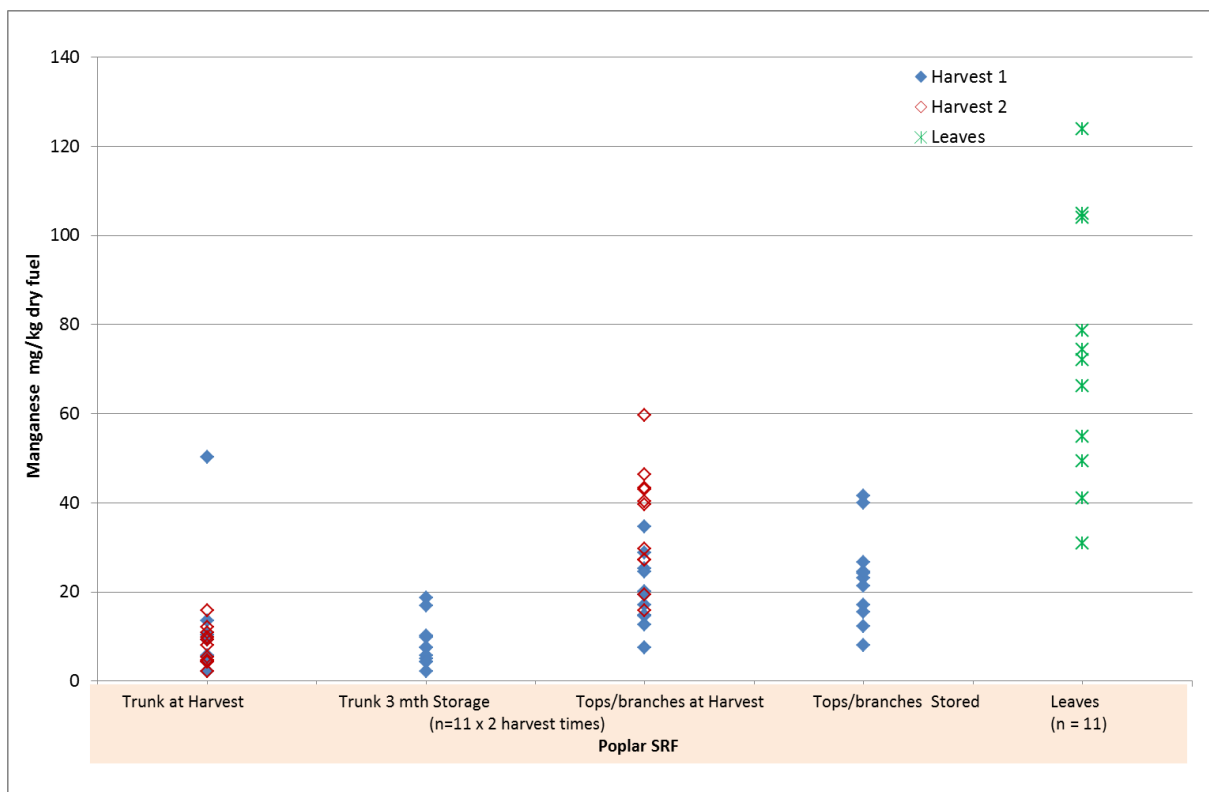




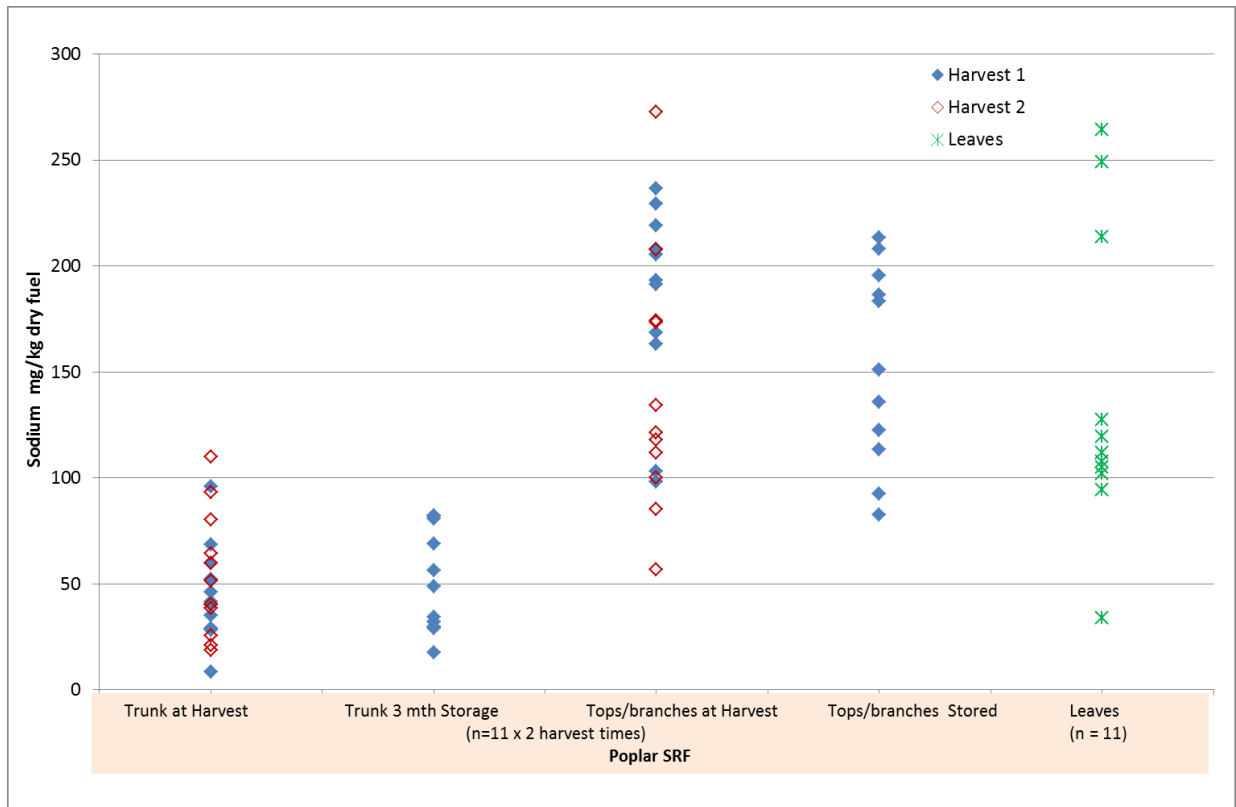
### Magnesium content of Poplar SRF



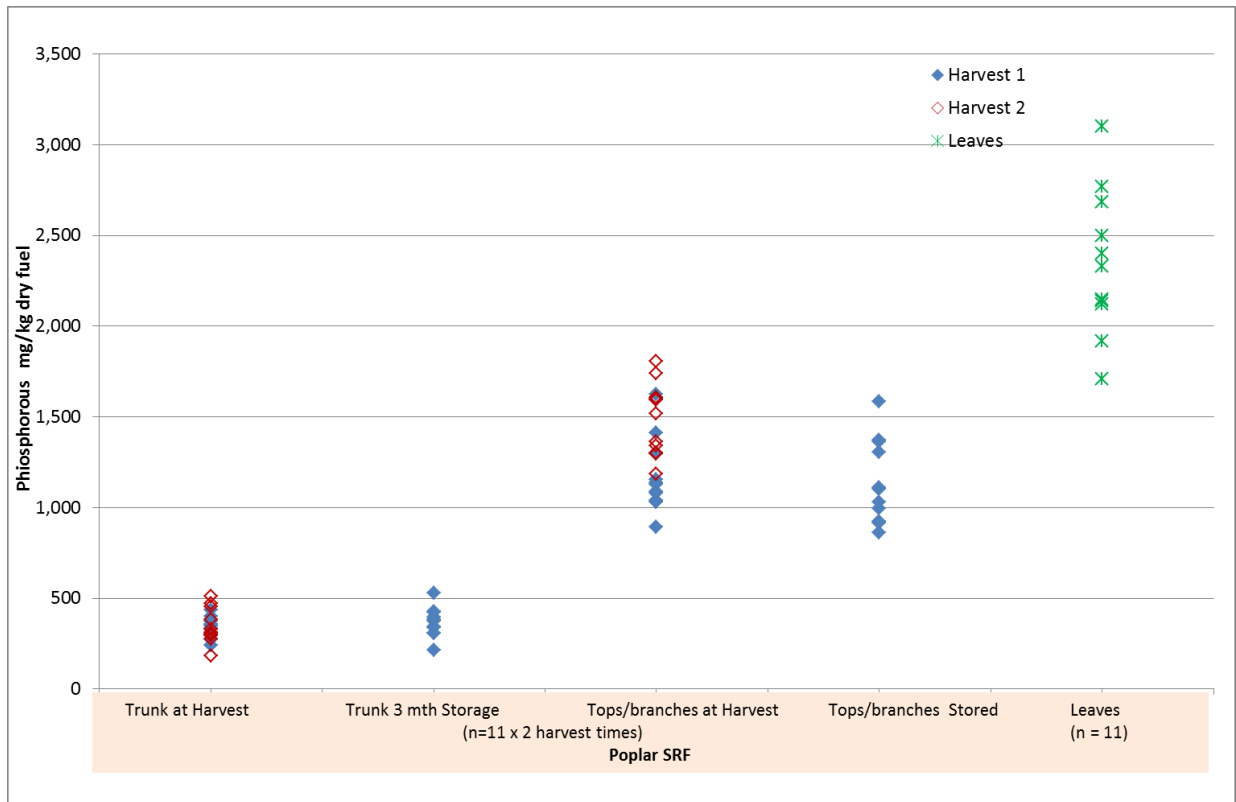
### Manganese content of Poplar SRF



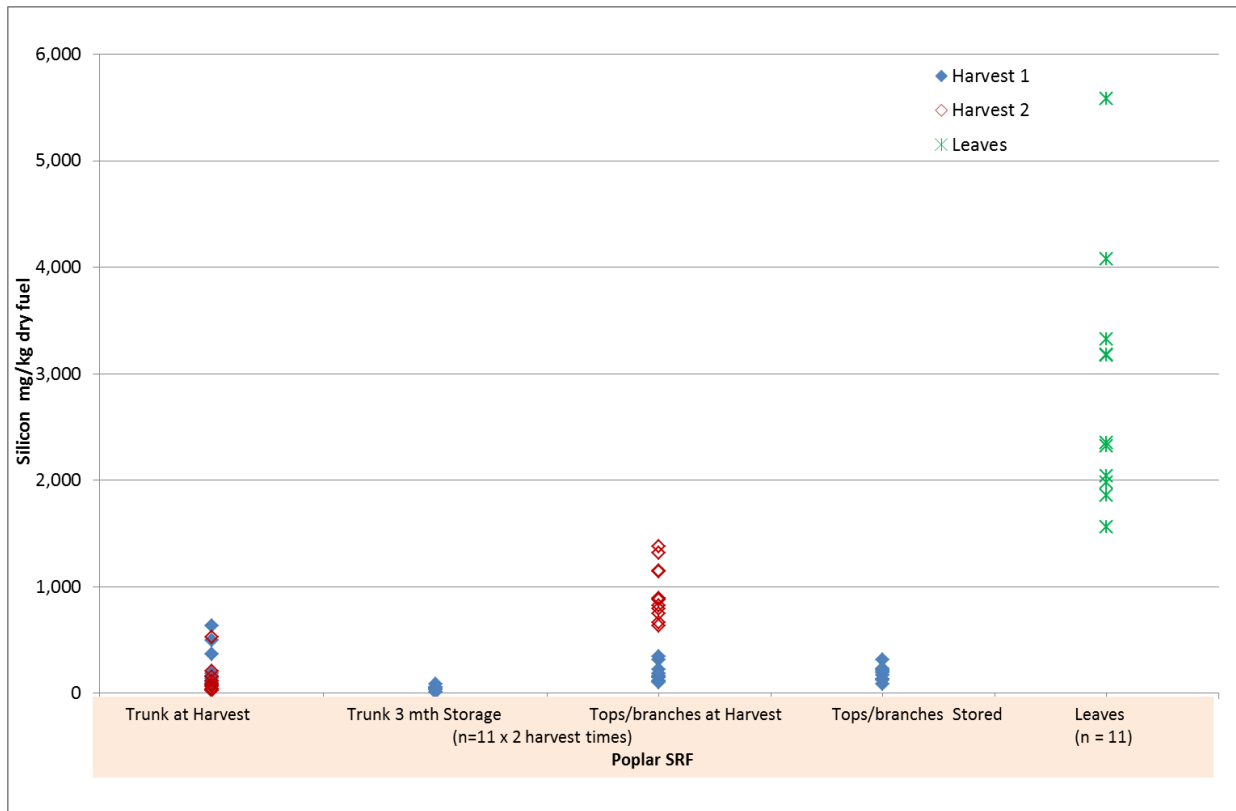
### Sodium content of Poplar SRF



### Phosphorous content of Poplar SRF



### Silicon content of Poplar SRF



### Titanium content of Poplar SRF

